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SASKATCHEWAN NUCLEAR SUPPLY CHAIN ASSESSMENT

PHASE 1 REPORT

OPPORTUNITIES, GAPS AND PATHWAYS FOR PARTICIPATION IN EMERGING SMR & NUCLEAR SUPPLY CHAINS







Prepared By

MARCH

Saskatchewan Nuclear Supply Chain Readiness Assessment: Opportunities, Gaps, and Pathways in Emerging SMR and Nuclear Supply Chains (2026)

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On behalf of:
Saskatchewan Industrial and Mining Suppliers Association (SIMSA) and Natural Resources Canada (NRCan)

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"Working Together, Winning Together"
Partnering to build a stronger, inclusive, and ready SMR supply chain for Saskatchewan.

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Views and findings presented in this report are based on the study analysis and stakeholder input and do not necessarily represent the official position of any individual participant, organization, funding agency or government body.

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Executive Summary

Saskatchewan is entering a more defined phase of nuclear planning as the province considers future grid-scale SMRs, microreactors and potentially larger nuclear generation as part of its long-term energy system. This direction is being shaped by electricity demand expected to increase significantly toward mid-century, the need to transition the provincial electricity system toward net-zero emissions by 2050 [1], and a broader Canadian shift toward renewed nuclear development. Recent federal and provincial strategies reinforce this momentum by positioning nuclear energy as an important contributor to energy security, economic development, domestic supply chain growth and innovation [2], [3].

This evolving landscape creates an opportunity for Saskatchewan to not only host future nuclear power generation plants, but also to capture greater economic benefits through local supply chain participation and engagement in broader Canadian and international nuclear markets. Realizing this opportunity requires a clear understanding of existing provincial industrial capabilities, how they align with nuclear supply chain requirements, where readiness gaps remain, and what actions are needed to position Saskatchewan suppliers for participation before major procurement and construction activities begin.

Study Purpose and Assessment Approach

This two-phase study was undertaken to assess and establish a baseline of Saskatchewan's readiness to participate in emerging SMR and large-scale nuclear supply chains across four technical areas: *Manufacturing; Deployment and Construction; Operations and Maintenance; and the Fuel Cycle*. Phase 1, documented in this report, establishes the readiness baseline by defining relevant supply chain requirements, assessing Saskatchewan's existing capabilities, identifying key gaps and barriers, and informing the targeted case studies undertaken in Phase 2 to examine selected participation pathways in greater detail. The assessment was technology-agnostic and assumed a forward-looking 15-year horizon.

The assessment relied heavily on direct engagement with industry and other stakeholders. Four technical Working Groups brought together Saskatchewan-based and external participants representing suppliers, utilities, reactor vendors, project-delivery organizations, Indigenous organizations, government, academia and nuclear subject-matter experts. Working Group discussions were supplemented by interviews, workshops, supplier engagement, technical research and market analysis.



A capability-mapping assessment was developed to compare representative nuclear component and service requirements with Saskatchewan's existing industrial capabilities. This provided a structured basis for identifying areas of stronger alignment, transferable capabilities from adjacent sectors, and scopes where additional qualification, experience or capability development may be required.

Although the study mandate was focused on SMRs, many of the requirements, capabilities and participation pathways identified also overlap with the broader nuclear supply chain.

Saskatchewan Nuclear Supply Chain Readiness at a Glance

Overall, Saskatchewan enters the emerging nuclear supply chain from a position of strong foundational industrial capabilities and developing nuclear readiness, as presented in Table i. This assessment represents a snapshot of readiness during the study period, recognizing that project plans, supplier capabilities, market conditions and nuclear-sector momentum continue to evolve.

Table i – Snapshot of Saskatchewan Nuclear Supply Chain Readiness

Assessment Area	Overall Finding	What It Means
Industrial Capability	Strong foundation	Significant transferable capability across major industrial sectors
Uranium & Fuel Cycle Expertise	World Class	Established nuclear sector strength and front-end nuclear fuel cycle experience
Research & Innovation Ecosystem	Established and growing	Strong base for research, testing, training and capability development
Interest in Nuclear Supply Chain	High	Strong interest, but participation pathways remain unclear
Nuclear Power Supply Chain Experience	Developing	Direct experience with commercial nuclear power projects is currently limited.
Nuclear Quality & Qualification Readiness	Developing	Few nuclear-accredited companies; requirements are not consistently understood and are often viewed as complex and resource-intensive.
Nuclear Inspection, Certification, and Authorization Access	Developing	Provincial nuclear pressure-boundary inspection and authorization pathway not yet established.
Market Certainty & Procurement Visibility	Limited near-term certainty	Suppliers have limited visibility to project timing, specifications and procurement opportunities; vendors have limited visibility to Saskatchewan suppliers' capabilities
Workforce & Specialized Resources	Strong industrial base; specialized gaps	Specialized nuclear quality, inspection, procurement and supervisory resources may require further development.
Near-Term Opportunity	Strongest in Tier 2/ Tier 3 scopes	Best alignment in balance-of-plant, construction, fabrication, site services, logistics and other scopes aligned with existing capabilities.
Longer-Term Opportunity	Significant Potential	Broader participation is possible as experience and qualified suppliers increase

Note: Detailed fuel-cycle opportunities and readiness are addressed in the companion Fuel Cycle Report.

Saskatchewan has existing strengths in mining, uranium, energy, heavy construction, fabrication, engineering, logistics, environmental services and large-project execution which provide a credible base for participation. Near-term alignment is strongest in Tier 2 and Tier 3 supply chain roles, particularly in conventional and balance-of-plant construction, site infrastructure, fabrication and machining, logistics, environmental services, selected mechanical and electrical scopes, and operations support activities.

Participation in more specialized, safety-related and vendor-controlled scopes is expected to develop progressively as suppliers gain nuclear experience, establish relationships, demonstrate capability and quality, and progress through applicable qualification pathways.

Key Findings and Readiness Gaps

The assessment identified several cross-cutting issues that currently influence Saskatchewan supplier readiness.

Market certainty and procurement visibility

Suppliers may need to invest in readiness before detailed specifications, procurement schedules or firm orders are available. This creates a mismatch between investment timing and market certainty.

Qualification and nuclear quality requirements

Nuclear QA and safety requirements are critical drivers of cost, effort, and rigor. However, applicable requirements are not yet consistently understood across the supplier base and are often viewed as complex and resource-intensive. Not all goods and services supplied to nuclear facilities require a nuclear-specific quality program; requirements vary by scope, safety significance and customer expectations. Owners, utilities and project organizations are responsible for clearly defining and flowing down applicable requirements, while suppliers must understand, implement and demonstrate conformity with the requirements applicable to their scope.

Nuclear inspection and authorization capacity

This is an important readiness consideration for pressure-boundary work. Saskatchewan does not yet have an established provincial nuclear pressure-boundary inspection and authorization pathway, and suppliers currently rely on qualified external inspection resources for applicable work.

Workforce and specialized nuclear expertise

Engagement identified experienced quality personnel, Quality Engineers, QMS specialists, procurement engineers, project managers, inspectors and trades supervision as important roles that may be difficult to scale quickly as nuclear activity increases.

Financial capacity

Readiness investments in quality systems, certification, training, equipment and technical qualification can occur well before nuclear revenue is realized, creating a particular challenge for the majority of the industrial base comprised of small- and medium-sized enterprises and other firms with limited capacity to finance significant upfront investments.

Supplier visibility and integration

Earlier and more structured engagement with utilities, vendors, major contractors and established nuclear suppliers is required to identify realistic entry points and build the relationships needed for future participation.

Project-specific decisions

Technology selection, reactor size, modularization strategy, localization objectives, contracting model and procurement structure will ultimately shape the scale and type of opportunities available.

Saskatchewan's development pathway will not necessarily mirror that of established nuclear jurisdictions such as Ontario. Relevant capabilities in Saskatchewan are distributed across multiple firms and industrial sectors

and may require a more collaborative approach involving suppliers, project developers, industry associations, and public institutions. Government and Crown organizations can play an enabling role through policy clarity, coordination, targeted support and workforce development, while commercial procurement and supplier investment decisions remain market-driven.

Recommendations

Seven recommendations were developed to address the principal readiness gaps identified through the study (see Table ii).

Each recommendation is structured around four key stakeholder groups—Saskatchewan suppliers; nuclear project developers and delivery organizations; government and public institutions; and industry and supplier associations—with detailed actions, timing and responsibilities provided in the body of the report.

These recommendations are sensitive to timing and sequencing. Successful implementation will require coordinated action across suppliers, project developers, government, Crown corporations, industry associations, Indigenous organizations and supporting institutions. Importantly, several of these activities are already underway; future implementation should build on effective existing initiatives, avoid duplication and improve coordination where gaps remain.

As a practical next step, the study recommends developing a *"Saskatchewan Nuclear Supply Chain Action Plan"* to translate these recommendations into coordinated actions, identify lead and supporting organizations, set implementation milestones, define progress measures, and establish periodic reporting.

Table ii - Summary of Phase 1 Recommendations

#	Recommendations	Intended Effect
1	**Strengthen Market Signals and Clarify Participation Expectations**	Improve visibility into project timing, procurement and realistic participation opportunities, supported by a clearer provincial framework for supplier participation and readiness planning
2	**Establish Clear Qualification and Nuclear Readiness Pathways**	Provide staged, scope-specific pathways and supplier readiness support that help suppliers understand applicable requirements and progress toward qualification and participation in nuclear supply chains
3	**Strengthen Nuclear Inspection, Certification and AIA Capability**	Ensure reliable access to nuclear inspection and authorization services and strengthen Saskatchewan-based capability where practical
4	**Improve Supply Chain Engagement, Visibility and Information Access**	Create structured engagement and information sharing mechanisms that connect suppliers with project organizations and improve visibility of provincial capabilities
5	**Support Supplier Readiness Through Financial and Capability Development Mechanisms**	Improve access to targeted funding, financing, technical support, workforce development and capability investment.
6	**Align Procurement, Contracting and Project Delivery Models**	Structure procurement and delivery approaches to create practical entry points for qualified Saskatchewan suppliers while maintaining cost, schedule, quality, safety and project-risk objectives.
7	**Strengthen Supplier Collaboration and Strategic Partnerships**	Support supplier collaboration, partnerships with established nuclear organizations, shared capability development and pathways for practical nuclear experience.

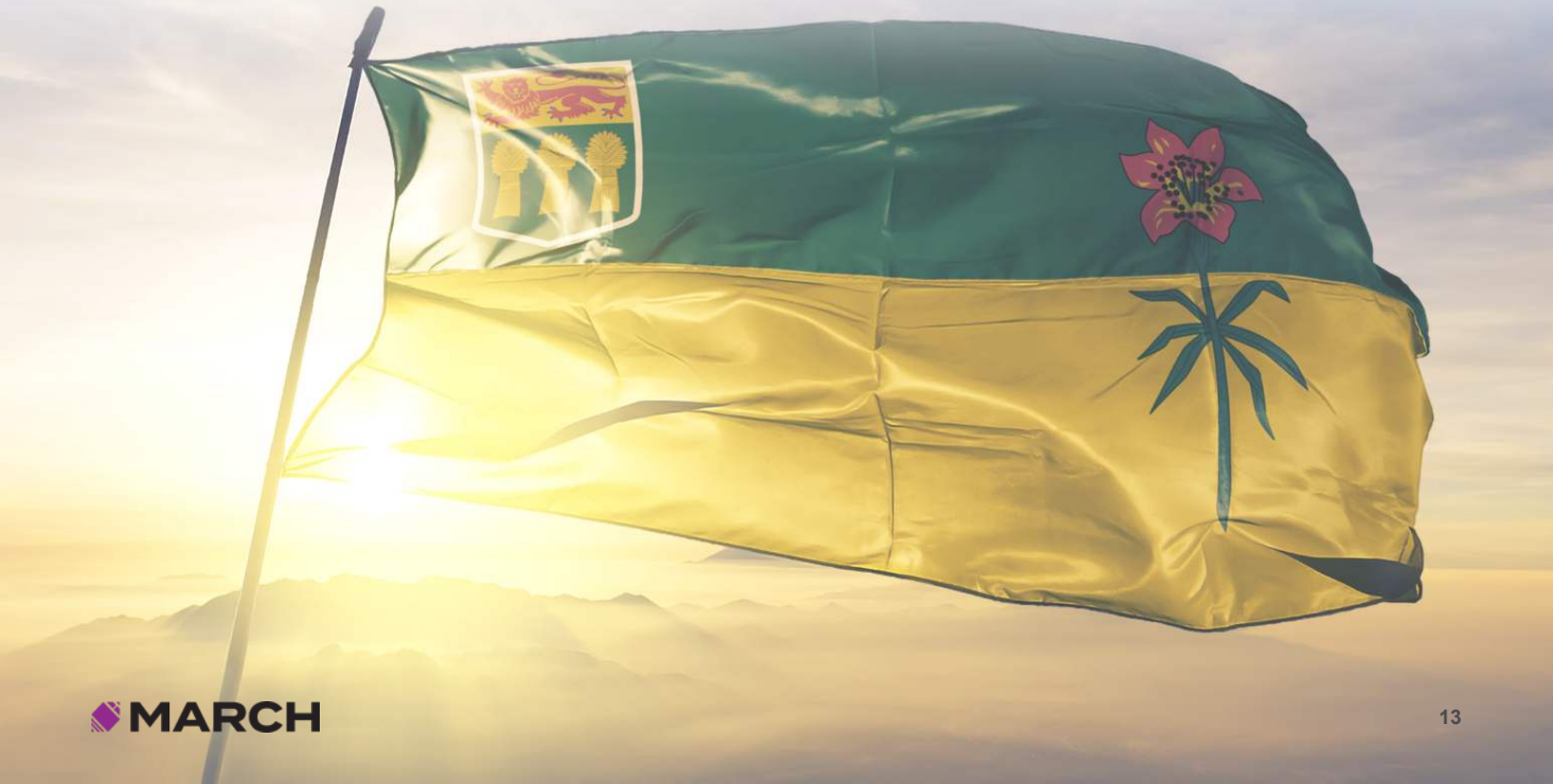
Looking Forward

The recommendations align closely with Canada's 2026 Nuclear Energy Strategy [2], [3], particularly its objectives related to enabling new nuclear builds, strengthening Canada's position as a global supplier and exporter, and advancing nuclear innovation. This alignment means actions to strengthen Saskatchewan's nuclear supply chain can support both provincial readiness and broader national objectives, while creating opportunities to leverage federal programs, partnerships, and investment initiatives that support nuclear deployment and industrial development. Saskatchewan's established uranium and fuel-cycle position provides additional alignment with the Strategy's fuel-cycle objectives, which are addressed more fully in the companion Fuel Cycle Report.

Overall, Saskatchewan has a credible foundation from which to build a more mature and adaptable nuclear supply chain. Progress will depend on sustained project signals, clear articulation of requirements, targeted investment, early engagement and coordinated action across all key interested parties. Advancing these enabling conditions alongside evolving project timelines and procurement needs will better position Saskatchewan to convert its existing industrial strengths into meaningful and sustained participation in the nuclear supply chain.

Building on Strong Foundations

Sustaining momentum in supplier readiness today can position Saskatchewan for meaningful participation in tomorrow's nuclear projects—at home, across Canada and internationally.



Abbreviations

AI	Artificial Intelligence
AIA	Authorized Inspection Agencies
ANI	Authorized Nuclear Inspectors
ASME	American Society of Mechanical Engineers
BOP	Balance Of Plant
BPVC	Boiler and Pressure Vessel Code
BWR	Boiling Water Reactor
CANDU	CANada Deuterium Uranium reactor
CANIAC	Canadian Nuclear Industry Assessment Committee
CANPAC	Canadian Nuclear Procurement Audit Committee
CCT	Cross-Cutting Themes
CGD	Commercial Grade Dedication
CIC	Crown Investments Corporation of Saskatchewan
CNA	Canadian Nuclear Association
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
DNNP	Darlington New Nuclear Project
EPC	Engineering, Procurement, Construction
EPCM	Engineering, Procurement, Construction Management
FEED	Front-End Engineering Design
FOAK	First of a Kind
GDP	Gross Domestic Product
GIEMS	Global Institute for Energy, Minerals and Society
GTH	Global Transportation Hub
HALEU	High-Assay Low-Enriched Uranium
HTGR	High-Temperature Gas-Cooled Reactors
HVAC	Heating, Ventilation, and Air Conditioning
IAEA	International Atomic Energy Agency
IMCN	Indigenous Manufacturing and Contracting Network
IPD	Integrated Project Delivery
ISO	International Organization for Standardization
IT	Information Technology
MOU	Memorandum of Understanding
NDE	Non-Destructive Examination
NEA	Nuclear Energy Agency
NIAC	Nuclear Industry Assessment Corporation
NPP	Nuclear Power Plant
US NRC	United States Nuclear Regulatory Commission
NUPIC	Nuclear Procurement Issues Corporation
OCNI	Organization of Canadian Nuclear
OEM	Original Equipment Manufacturers
OPG	Ontario Power Generation
PAC	Project Advisory Committee
PHWR	Pressurized Heavy Water Reactor
PWR	Pressurized Water Reactor
QA	Quality Assurance
QAP	Quality Assurance Program
QC	Quality Control
QMS	Quality Management System
QSL	Qualified Supplier List
REGDOC	Regulatory Documents
RFI	Request For Information
SIMSA	Saskatchewan Industrial and Mining Suppliers Association
SME	Subject Matter Expert
SMR	Small Modular Reactor
SRC	Saskatoon Research Council
SSC	Systems, Structures, and Components
TRISO	Tri-structural Isotropic Fuel
TSASK	Technical Safety Authority of Saskatchewan
VDR	Vendor Design Review
VSL	Vendor Supplier Lists
WG	Working Group

Glossary

Advanced Manufacturing	Advanced manufacturing refers to the use of innovative technologies, processes, and systems to improve how products are designed, produced, and delivered—typically resulting in higher precision, improved performance, greater efficiency, and enhanced flexibility compared to conventional manufacturing. This may include advanced physical processes such as additive manufacturing, electron beam welding (EBW), etc., as well as digital technologies such as artificial intelligence and machine learning (AI/ML), industrial Internet of Things (IIoT), and virtual/augmented reality (VR/AR) used for design, monitoring, and process optimization.
COP28	28th session of the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC)
Gen II reactors	Gen II reactors are the current nuclear power plant (NPP) technological, operational reactors worldwide with a life expectancy of ~40 yrs of operation [4].
Gen III reactors	Gen III (and III+) nuclear reactor designs are evolutionary upgrades of current NPP designs (Gen II), focusing on better safety (Gen III+ passive safety systems), longer life (60+ yrs), and standardization [4].
Gen IV reactors	Gen IV reactors are revolutionary, future designs aiming for ultimate safety, sustainability (less waste), efficiency, and new uses like hydrogen, using advanced coolants and designs (e.g., Molten Salt Reactors, Fast Reactors, etc.) not yet commercially deployed [4].
Graded-approach	A structured method where the level of analysis, controls, and documentation required for a process or project is matched to the severity of its potential risks.
Hard-to-abate sectors	Industrial and transport sectors where reducing greenhouse gas emissions is exceptionally difficult or expensive.
Large-scale reactors	Nuclear reactors generating around 1000 MWe or more of electricity per unit are built and constructed on site.
Management System	A set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner [5].
Microreactors	Very small nuclear reactors, typically generating up to 50 MWe [6].
Quality Assurance	A program for the systematic monitoring and evaluation of the various aspects of a project, service, or facility to ensure that standards of quality are being met.
Quality Program	A comprehensive framework that an organization uses to ensure its products, services, and processes consistently meet or exceed established standards.
MWe	Megawatt-electrical, a unit of electrical power used in the electric power industry.
MWth	Megawatt-thermal, a unit used to measure the rate of heat energy produced or consumed by a system.
Qualified Supplier List (QSL)	A list of suppliers formally assessed and approved for a defined scope of work through applicable audits, assessments, document reviews, or other verification activities demonstrating compliance with technical, quality, regulatory, and customer requirements.

Safety significance	The degree to which a system, component, activity, or service affects the safe operation of a nuclear facility or the protection of people and the environment. Higher safety significance generally requires more stringent design, quality assurance, documentation, and oversight.
Small– and Medium-sized Enterprises	Enterprises with 1 to 499 paid employees. More specifically: small businesses have 1 to 99 employees; and medium-sized businesses have 100-499 employees [7].
SMRs	Nuclear reactors generating 300 MWe equivalent or less electricity per unit, designed with modular technology using module factory fabrication [8].
Vendor Supplier List (VSL)	A list of suppliers registered and accepted by a customer for potential procurement based on initial commercial, organizational, and compliance requirements.

Note: While many terms used to describe supply chains—such as tiering, qualification, vendor lists, and quality management systems—are also common in other capital-intensive industries (e.g., oil and gas, mining, defence), their meaning and application within the nuclear sector may differ in important ways. In nuclear projects, seemingly familiar terms are embedded within a regulatory and safety-driven framework that places different expectations on accountability, documentation, traceability, and change control. As a result, direct transfer of terminology or assumptions from adjacent industries without adaptation can lead to misunderstandings regarding supplier roles, qualification pathways, and participation requirements. This is particularly relevant for organizations exploring entry into the nuclear supply chain for the first time.



1. Introduction

1.1. Background

Global energy systems are undergoing a significant transition as governments and industry seek to address climate change, rising electricity demand, grid reliability, and energy security. Within this context, nuclear power is re-emerging as a key component of long-term energy strategies, building on decades of conventional large-scale reactor deployment while responding to new requirements for more flexible and scalable options, including Small Modular Reactors (SMRs).

SMRs represent a new generation of advanced nuclear technologies designed to complement traditional nuclear facilities, especially for smaller power grids. With relatively smaller unit sizes, modular construction, and enhanced safety features, SMRs offer the potential for more flexible deployment across a wider range of locations and applications. Beyond electricity generation, SMRs also present opportunities for industrial and process heat supply, hydrogen production, and the decarbonization of hard-to-abate sectors.

As global interest in nuclear expansion continues to grow, Canada enters this emerging market with significant existing capabilities. Canada is widely recognized as one of the world's leading nuclear countries, with established fuel-cycle capabilities—uranium mining, milling, refining, conversion, and fuel fabrication—combined with proven domestic reactor technology, an innovative research and development ecosystem, and a strong nuclear regulatory reputation.

The Government of Canada has reinforced its commitment to nuclear energy both domestically and internationally, including through support for the objective of tripling global nuclear energy capacity by 2050 and broader net-zero emissions commitments [9]. Initiatives such as Natural Resources Canada's (NRCan) Enabling SMR program have supported SMR development and associated supply chain readiness [10]. Recently, the Nuclear Energy Strategy for Canada, released in June 2026, positions nuclear—large-scale reactors and SMRs



As more provinces consider nuclear energy as part of their decarbonization and economic strategies, there is a growing opportunity to expand and diversify Canada's nuclear supply chain and to strengthen new-build capability across a broader geographic footprint. Saskatchewan is well positioned to participate in this expansion.

alike—as important elements of a reliable, low-emission energy system and strategic contributors to national energy security and economic growth, whilst outlining a broader national ambition for nuclear energy, fuel supply, innovation, and international market participation [3].

Historically, much of Canada's expertise and supply chain have been built around the CANada Deuterium Uranium (CANDU) reactor technology, and is largely concentrated in Ontario and New Brunswick, home to Canada's active nuclear generation fleet. Prior to the recent start of SMR construction at the Darlington New Nuclear Project site, Canada had not built a new domestic nuclear generating unit since the early 1990s [11]. Refurbishments, operations, and export services have somewhat sustained important nuclear capabilities, but some aspects of new-build manufacturing, construction, and project delivery have not been exercised domestically at scale for several decades. With major refurbishment programs continuing alongside planned SMR and potential large-reactor deployments, existing capacity will need to expand to meet increased demand on the local supply chain.

The next phase of nuclear development in Canada will also require the existing supply chain to support a broader range of technologies. In addition to continued CANDU activity, future Canadian nuclear projects may include non-CANDU technologies, such as light-water reactors and advanced reactor designs, many of which introduce new materials, components, delivery models, and fuel types and cycles that differ from those of the CANDU fleet. This diversification introduces new supply security considerations, particularly amid geopolitical uncertainty, while also creating opportunities to develop new Canadian capabilities.

As more provinces consider nuclear energy as part of their decarbonization and economic strategies, there is a growing opportunity to expand and diversify Canada's nuclear supply chain and to strengthen new-build capability across a broader geographic footprint. Saskatchewan is well positioned to participate in this expansion. The province is already central to Canada's nuclear fuel supply through uranium production and has an established industrial base spanning mining, energy, manufacturing, construction, engineering, environmental, logistics, and other resource-sector activities.

Saskatchewan has also demonstrated a high level of public support for nuclear energy in recent years [12], [13]. The *Saskatchewan First Energy Security Strategy and Supply Plan* identifies nuclear as part of the province's future electricity mix, including consideration of both SMRs and large-scale reactors [2], [14]. This interest stems from

rising electricity demand, continued reliance on fossil-fuel generation—currently accounting for approximately 66% of provincial electricity generation [15]—and the need to reduce emissions in the electricity sector toward net zero by 2050 [2].

The provincial utility, SaskPower, is advancing planning for grid-scale SMRs [16], while smaller and advanced reactor technologies are also being explored for industrial, remote, and process-heat applications [2], [14], [17], [18]. Many of these initiatives are anticipated to progress toward deployment and become operational by the mid-2030s, and would represent first-of-a-kind (FOAK) deployments in Western Canada, introducing technologies, delivery models, and geographic contexts that differ from the established CANDU-based ecosystem [19]. These developments position Saskatchewan as a blueprint jurisdiction, demonstrating a credible and replicable pathway for non-nuclear power–producing provinces to transition to nuclear generation and participation in the associated supply chain.

Successfully delivering these current and future projects in any Canadian jurisdiction will depend on developing a qualified, resilient and inclusive supply chain spanning the full nuclear lifecycle from planning and design through construction, operation, maintenance, and eventual decommissioning. These activities present significant economic development opportunities for local suppliers, building on Saskatchewan's strengths in mining, energy, heavy construction and industrial services. At the same time, there is also a significant opportunity to foster Indigenous participation from the outset, ensuring equitable and meaningful involvement in future nuclear developments.

While the potential opportunities associated with future nuclear deployments are considerable, many specific requirements and pathways for supply chain participation may not be entirely clear or well understood, especially for Saskatchewan suppliers who may be new entrants transitioning from adjacent industries. A structured assessment of Saskatchewan's existing capabilities and the requirements for nuclear supply chain participation is therefore essential to enable effective, timely, and competitive participation and to support informed decision-making by industry, government, and other stakeholders as Saskatchewan advances toward potential nuclear deployment.

1.2. Project Mandate, Scope, and Study Structure

1.2.1. Project Mandate and Scope

This study evaluates Saskatchewan's supply chain readiness to participate in the development, deployment, and long-term operation of SMRs within the province, as well as in broader Canadian and international deployments. The study aims to develop a clear understanding of SMR supply chain requirements and to assess how these align with the current capabilities of the Saskatchewan supply chain.

The assessment adopts a technology-agnostic and forward-looking approach over a 15-year horizon, reflecting the range of SMR technologies that may be deployed in Saskatchewan and beyond. It considers multiple reactor classes, including Gen III+, Gen IV, and microreactors, to ensure a range of technical requirements, deployment models, and associated supply chain implications.

At the same time, this assessment represents a snapshot of readiness based on information available during the study period. As nuclear policy, technologies, projects, procurement requirements and supplier capabilities continue to evolve, the findings should be interpreted as a current baseline that may change as the sector develops.

Study Objectives

The study's specific objectives are to:

1. **Assess SMR supply chain participation requirements:** Identify and describe the technical, regulatory, quality assurance, and delivery requirements associated with SMR deployment across four major technical scopes:

Manufacturing, Deployment and Construction, Operations and Maintenance, and Fuel Cycle.

2. **Evaluate Saskatchewan's current supply chain capabilities:** Assess the existing capabilities of Saskatchewan's supply chain relevant to SMR projects, and identify opportunities, gaps, barriers, and potential growth areas for participation.
3. **Advance Indigenous participation:** by identifying capabilities, opportunities, and challenges for Indigenous suppliers.
4. **Develop actionable recommendations:** Provide practical recommendations to address identified gaps and barriers to enhance Saskatchewan's participation in Canadian SMR projects.
5. **Establish a foundation for further case studies:** Provide valuable insights to Saskatchewan suppliers through supply chain assessment findings, with further lessons to be developed through targeted case studies.

While the project mandate focuses on SMRs, several of the supply chain requirements, capabilities, barriers, opportunities and recommendations outlined in this report overlap with those applicable to large-scale nuclear projects and the broader nuclear supply chain. Participation in the SMR supply chain may also serve as a pathway toward future participation in large-scale nuclear projects, subject to technology-, project-, safety-classification- and customer-specific requirements.

1.2.2. Project Delivery Partners and Study Structure

The study is being delivered through a collaborative partnership involving four key partners, established in the original joint proposal submitted to NRCan. As shown in Table 1, the study is led by SIMSA, the overall project lead and coordinator. Delivery partners include March, the Centre, and Westinghouse Electric Canada, each responsible for leading parallel workstreams aligned with their respective expertise.

Recognizing that nuclear readiness encompasses multiple distinct but interconnected domains, the study is structured as a multi-stream program delivered through parallel workstreams:

1. Industrial Supply Chain Readiness:

This workstream, led by March, assesses Saskatchewan's industrial, manufacturing, construction, and service-sector capabilities relevant to SMR deployment. It examines supplier readiness, regulatory and quality requirements, participation pathways, and structural constraints affecting entry into nuclear supply chains.

2. Indigenous Participation and Readiness:

This workstream is led by the Saskatchewan First Nations Natural Resource Centre of Excellence (The Centre) and is

Table 1 - Project Delivery Partners

Project Delivery Partners	Role
Saskatchewan Industrial and Mining Suppliers Association (SIMSA)	Project lead and overall coordinator, project oversight, supplier engagement, and alignment with Saskatchewan's industrial base.
March Consulting LP (March)	Technical leadership across study scopes; supply chain analysis; standards and quality expertise;
Saskatchewan First Nations Natural Resource Centre of Excellence (The Centre)	Indigenous engagement and Indigenous supply chain analysis
Westinghouse Electric Canada (WEC)	SME on nuclear reactor technology, fuel cycle and supply chain development.

supported by March. It examines Indigenous perspectives, priorities, capacity, and opportunities for participation related to SMR development and associated supply chains. Findings from this workstream are documented in a separate companion report.

3. Fuel Cycle Opportunities:

This workstream is led by Westinghouse Electric Canada, with support from SIMSA. It examines Saskatchewan's role in the nuclear fuel cycle, including uranium production, processing, and fuel-cycle-related supply-chain opportunities. Findings are documented in a separate fuel-cycle report (see Appendix C for the executive summary of this report).

Study Phases

The study is being delivered through a two-phased approach:

Phase 1: Supply Chain Assessment (April 2025 – July 2026)

Phase 1 focuses on characterizing the existing Saskatchewan supply chain, identifying gaps and barriers, and assessing opportunities across key SMR technical areas. Phase 1 deliverables include:

- Three parallel assessment reports corresponding to the industry supply chain, Indigenous participation, and fuel-cycle workstreams; and
- An overall summary report—a consolidated set of findings and recommendations from the three workstreams to inform subsequent analysis and decision-making.

Phase 2: Case Studies and Strategic Analysis (August 2026 – March 2027)

Phase 2 will build on the Phase 1 findings by developing targeted case studies to examine selected supply chain opportunities in greater technical and commercial depth and to illustrate practical pathways for Saskatchewan supplier participation.

Note: This report documents the Phase 1 findings of the Industrial Supply Chain Readiness workstream, led by March and supported by the project delivery partners. From this point forward, the analysis, engagement insights, findings and recommendations presented in this document are focused on and structured to support this workstream's scope. Indigenous participation and fuel-cycle considerations are referenced herein only where they provide broader contextual relevance**.**

1.3. Methodology

This section describes the methodological approach used to achieve the study's objectives. It outlines the governance mechanisms, industry engagement processes, and information-gathering methods applied to support Phase 1 objectives. It also describes the roles of the Working Groups (WGs) established to guide the study, ensure technical relevance, and facilitate collaboration with key interested parties.

1.3.1. Project Governance and Delivery Structure

A structured governance and delivery framework was established to guide the execution of both phases of the study, ensure technical credibility, and support collaboration among industry, Indigenous organizations, utilities, academia, and government.

Project Advisory Committee

The study has been supported by a Project Advisory Committee (PAC) composed of representatives from industry, Indigenous organizations, utilities, academia, and government agencies within Saskatchewan (See Appendix A for member list). The PAC serves in an advisory capacity, facilitating coordination amongst the project members, providing strategic guidance on project scope and direction, project reporting and participation, and supporting alignment with the shared goal of nuclear supply chain growth in Saskatchewan. PAC governance includes the identification and management of real, potential, and perceived conflicts of interest, and members are accountable to and report to their respective organizations.

Working Groups

To support detailed technical analysis, four WGs were formed (to align with the four major technical scopes), each focused on a specific segment of the SMR supply chain:

1. Manufacturing
2. Deployment and Construction
3. Operations and Maintenance
4. Fuel Cycle

The WGs included representatives from the industry, Indigenous organizations, government, academia, and other relevant subject-matter experts, ensuring a balanced mix of diverse perspectives. Participants were selected based on demonstrated interest in the SMR supply chain, relevant technical expertise and sector experience, and operational presence or active engagement within Saskatchewan's industrial and energy sectors. Detailed scopes of each working group are provided in Appendix B.

Each WG convened through structured sessions to gather insights, validate findings, and identify opportunities, gaps, and challenges. Outputs from the Working Groups were documented and synthesized to inform the analysis and recommendations presented in this report.

1.3.2. Information Gathering

Information gathering for Phase 1 used a combination of qualitative and quantitative methods to ensure a comprehensive understanding of the SMR supply chain landscape and Saskatchewan's position within it. Information sources were organized by the focus areas of the four WGs to facilitate consistent analysis and synthesis.

Key activities included:

- **Literature Review:** A structured review of publicly available literature, policy documents, and prior SMR and nuclear supply chain studies to establish baseline context, identify best practices, and inform initial assumptions. The literature review covered over 50 related research publications.
- **Targeted industry engagements:** included structured interviews with industry participants, attending industry conferences and forums, hosting workshop sessions, and distributing requests for information (RFIs), surveys and questionnaires. Detailed engagement methods are described in **Section 5**.

1.4. Strategic Considerations

This report addresses the needs of four key stakeholder groups: the Saskatchewan supply chain, nuclear project developers and delivery organizations, government bodies, and supply chain associations. Collectively considering the perspectives and fostering connections among these groups support the establishment of a robust nuclear supply chain ecosystem in Saskatchewan.

1. **Saskatchewan Supply Chain** - For the local supply chain, the primary value of this study lies in providing actionable intelligence on emerging nuclear-related opportunities. Through capability mapping and the translation of high-level nuclear requirements into tangible component, service, and qualification needs, the report enables suppliers to assess market fit, identify capability gaps, and develop informed business cases for entry into the nuclear supply chain.
2. **Nuclear Project Developers and Delivery Organizations** - For nuclear vendors, owners, and project delivery organizations (EPC/EPCMs – Engineering, Procurement, and Construction Management), this report serves as a critical resource for developing high-level localization strategies and identifying capable suppliers in Saskatchewan. It provides the data necessary to navigate the Saskatchewan landscape, enabling buyers to align their procurement frameworks with provincial capabilities effectively.
3. **Government bodies** - From a governance perspective, the findings provide an evidence base to inform targeted policy interventions. The report outlines specific recommendations to bridge capability gaps and to inform potential regulatory actions or support

mechanisms required to facilitate the progression of the Saskatchewan nuclear supply chain toward nuclear-ready capability.

4. **Industry and Supplier Associations -** For organizations such as SIMSA, the Organization of Canadian Nuclear Industries (OCNI), the Centre, and the Indigenous Manufacturing and Contracting Network (IMCN), this analysis identifies systemic gaps in supplier capabilities and qualifications. These support the development of targeted programming and coordinated ecosystem strategies. By understanding these gaps across the broader supply chain, associations can facilitate partnerships between nuclear and non-nuclear entities and support supplier readiness through collaboration, training, and information-sharing initiatives.

1.5. Project Assumptions

This study is based on the following assumptions:

- Saskatchewan will pursue some form of nuclear deployment over the medium term (next 15 years), including one or more grid-scale reactors, and microreactors for remote communities/off-grid applications, consistent with the direction established in the provincial energy security strategy [2]. While specific timelines, technologies, and ownership models remain uncertain, the direction is sufficiently credible to justify early supply chain readiness work.
- Existing industrial capabilities in adjacent sectors may provide a basis for assessing potential transferability to nuclear applications, subject to scope-specific technical, quality, regulatory and customer requirements.
- There is sufficient commonality across nuclear technologies (including Gen III+, Gen IV, and microreactors; see **Section 2** for more technical details) to support a broadly technology-agnostic supply chain assessment at this stage. While certain advanced SMR technologies may ultimately require specialized skills, qualifications, and supplier capabilities beyond those associated with current Gen III+ deployments, the intent of this assessment is to identify broadly applicable components, services, and capabilities rather than optimize for a single vendor or design.
- The Centre leads Indigenous engagement and supply chain analysis through a parallel workstream. It is assumed that early and sustained engagement will support meaningful participation by Indigenous organizations across a range of supply chain roles, rather than being limited to later-stage activities.
- Vendors, utilities, fuel suppliers, and regulators are willing to share sufficient non-proprietary information to enable a credible, aggregated assessment of supply chain needs and opportunities.
- Saskatchewan's existing uranium mining and milling capabilities would support broader participation in the nuclear fuel cycle beyond primary production and therefore warranted consideration within the overall supply chain assessment.
- Saskatchewan's future role in the nuclear supply chain will complement—rather than duplicate—Ontario and New Brunswick's established CANDU-centric supply chain.
- SIMSA can act as a neutral convener, providing a trusted platform for engagement among industry, Indigenous partners, vendors, and governments.

1.5.1. Limitations and Exclusions

This study does not assume or include:

- Selection of a specific nuclear technology, vendor, or reactor design.
- Regulatory approval, licensing success, or construction readiness of any individual nuclear project.
- Development of a fully vertically integrated nuclear supply chain within Saskatchewan or replication of Ontario's nuclear ecosystem.
- Guaranteed participation, investment, or commercial success for any individual supplier, Indigenous business, or sector.

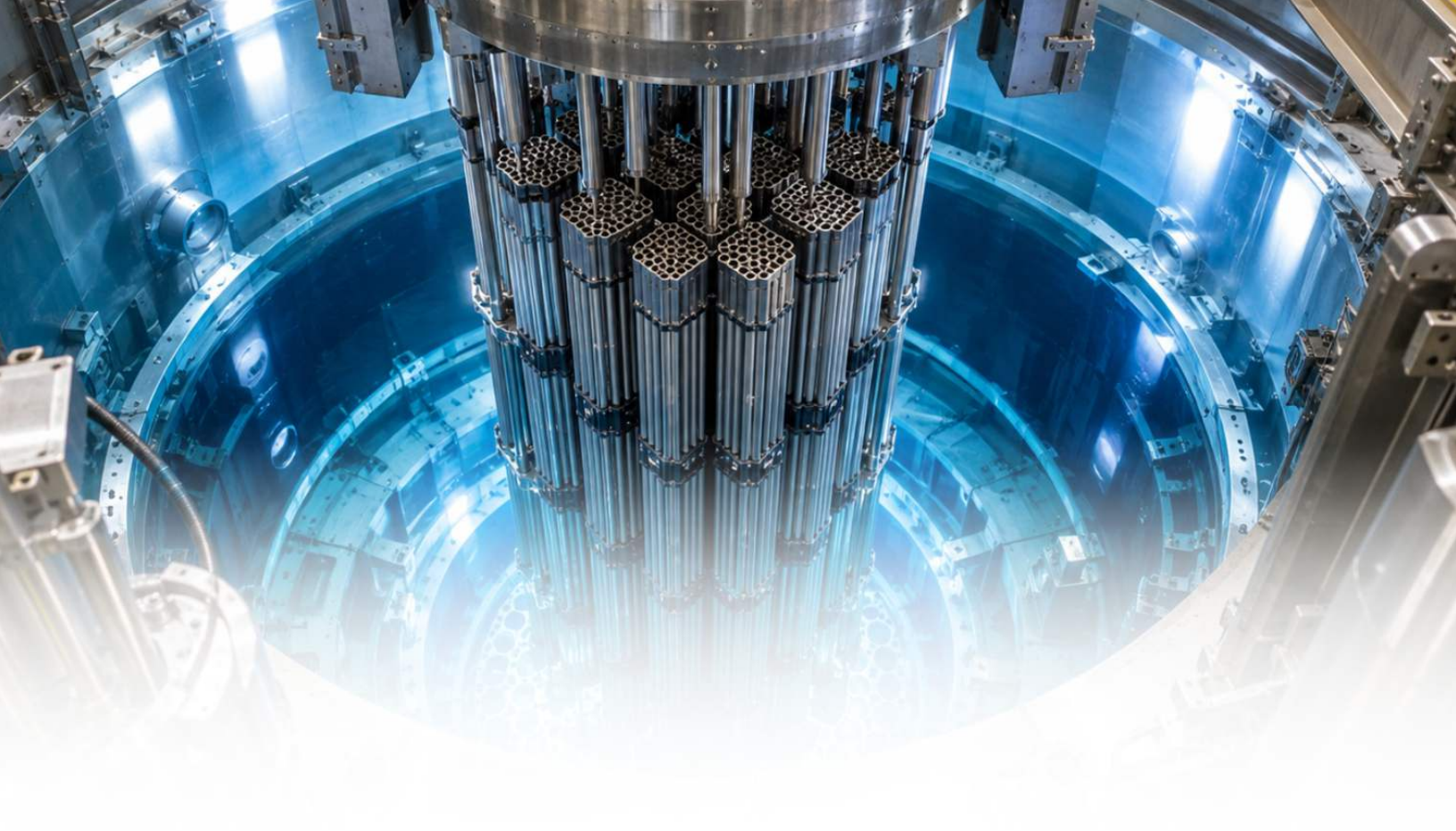
- Quantification or forecasting of supply chain localization outcomes (e.g., percentage of local content).
- Detailed engineering design, safety analysis, plant-specific procurement strategies, or cost-benefit analyses.
- Validation of economic viability for identified opportunities without further business-case development.
- Opportunities for suppliers with no ties to Saskatchewan.
- Workforce development, training, and labour market capacity. These areas are being addressed through parallel initiatives, including those led by the Crown Investment Corporation of Saskatchewan (CIC).
- Fuel supply chain development beyond high-level consideration (e.g., fuel fabrication, enrichment, and back-end fuel management) is outside the scope of this assessment.
- Deep geological storage and broader radioactive waste management at end-of-life (EOL) for SMR spent fuel-related supply chain opportunities.
- Disclosure of proprietary or commercially sensitive information by technology vendors, manufacturers, work group participants, and/or utilities.
- Commitment by governments, technology manufacturers, work group participants, utilities, vendors, or Indigenous organizations to follow-on funding or implementation actions.
- Replacement of future project-specific studies, environmental assessments, procurement processes, or commercial negotiations.
- Technical information presented herein is based on readily available public information from the internet, technical report reviews, webinars, governmental updates, and 2025 approximated Canadian $ amounts as of **June 2026.**

1.6. Report Framework

This report is organized into twelve sections progressing from study context and baseline conditions through engagement findings, analysis, recommendations, and implementation considerations. The report structure is summarized below:

- **Section 1**: outlines the study background, objectives, scope, and methodological approach
- **Section 2**: provides an overview of the SMR technologies in both global and Canadian contexts
- **Section 3**: outlines the criteria for participation in the SMR supply chain, including relevant regulatory and policy frameworks
- **Section 4**: presents Saskatchewan's baseline capabilities, highlighting existing industrial experience and areas of alignment with nuclear supply chain opportunities
- **Section 5**: describes the engagement approach and activities undertaken to inform this report.
- **Section 6**: summarizes insights gathered from engagement activities and working group discussions
- **Section 7**: presents an assessment of Saskatchewan's nuclear supply chain readiness
- **Section 8**: examines structural barriers affecting Saskatchewan supply chain participation
- **Section 9**: outlines recommendations informed by the engagement findings and analysis
- **Section 10**: provides the conclusion of the report.
- **Section 11**: presents the case study framework and the transition to Phase 2 of the project
- **Section 12**: report references

Each section of the report may be used independently. Readers seeking background on SMRs and nuclear supply chain structures may focus on Sections 2 and 3, while those interested in Saskatchewan's industrial capabilities and readiness may focus on Sections 4 through 8. Sections 9 and 10 are intended to support future planning and implementation discussions by outlining the recommendations and a proposed Phase 2 framework.



2. Overview of SMRs

This section provides a technical overview of SMR technologies and deployment context to establish a common reference point for subsequent supply chain analysis. It describes the evolution of nuclear reactor designs, key SMR technology categories, plant architectures, deployment stages, and the current SMR landscape in Canada. Please note that this is not an *exhaustive* nuclear reactor / SMR technical overview.

2.1. Nuclear Renaissance: Evolution of Nuclear Reactor Technology

Nuclear power has played a significant role in global electricity generation over the past six decades. Canada entered the field in 1962 with the Nuclear Power Demonstration (NPD) reactor in Rolphton, Ontario—a 20 MWe facility that marked the country's first grid-connected commercial nuclear plant [20]. This milestone followed earlier deployments in the United States, the United Kingdom, and the former Soviet Union, where nuclear fission had already been demonstrated as a viable source of commercial electricity.

As nuclear programs expanded, reactor technologies evolved from early Generation I designs to the Generation II reactors that formed much of the commercial fleet. Major accidents involving Generation II-era facilities—including Three Mile Island in the U.S. (1979), Chernobyl in Ukraine, the former Soviet Union (1986), and Fukushima in Japan (2011)—led to significant improvements in reactor design, regulatory frameworks, operating practices, emergency preparedness, and nuclear safety culture [21]. These lessons informed the development of Generation III and III+ reactors, which incorporate enhanced passive safety systems, more robust materials, and increasingly standardized engineering approaches [22]. Advanced reactor concepts (Gen IV technologies) aiming to further improve efficiency, fuel utilization, and operational flexibility remain largely under development.

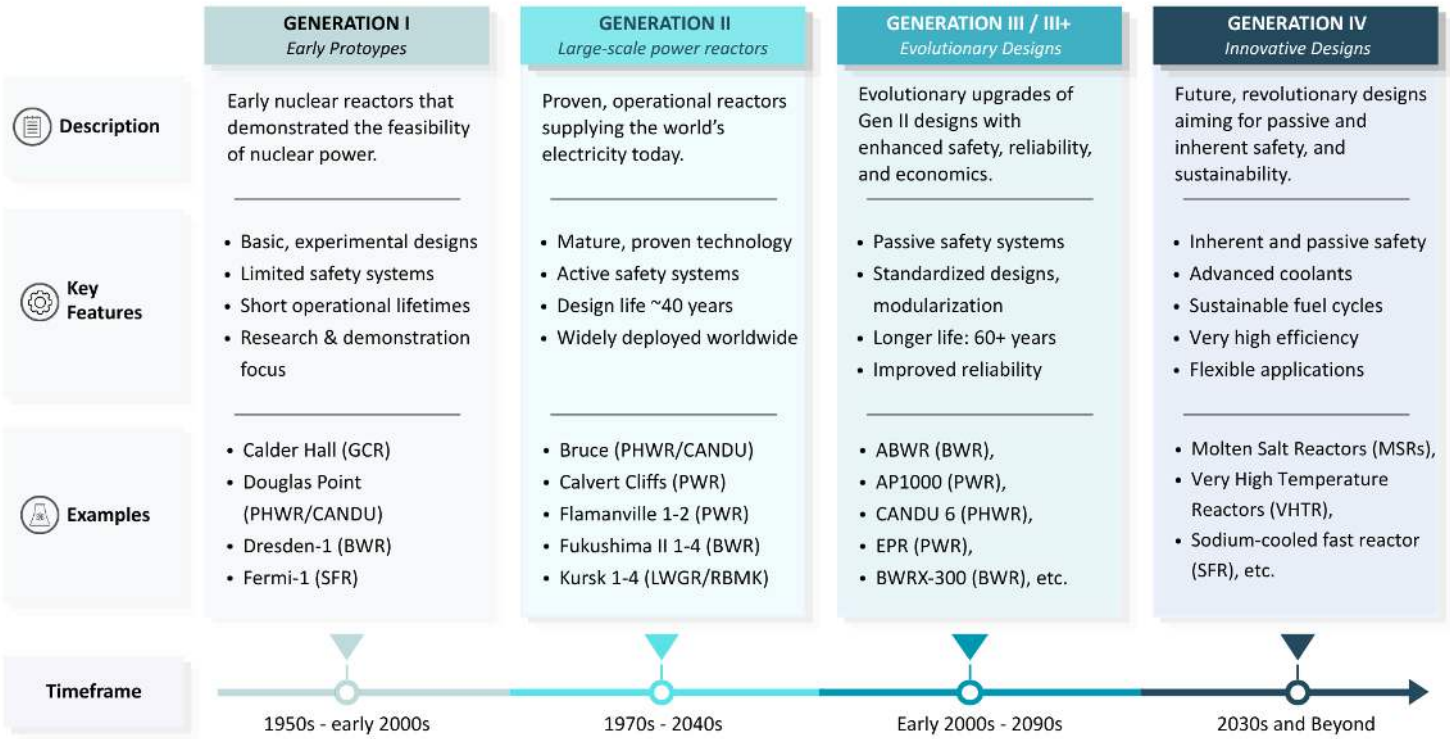


Figure 1 - The Generations of Nuclear Reactor Technologies (Source: IAEA Gen IV Forum [22])

In recent years, several converging pressures have contributed to renewed interest in nuclear energy. Rapid growth in electricity demand—driven by electrification, industrial growth, and emerging technologies such as data centres and AI—has increased the need for reliable, dispatchable power [23]. At the same time, geopolitical disruptions—including sanctions and trade restrictions associated with major conflicts such as Russia-Ukraine and U.S.-Iran—have highlighted the vulnerabilities of energy systems reliant on imported fuels and materials, reinforcing the importance of energy security and supply chain resilience.

In parallel, the urgency of addressing climate change has intensified. Rising greenhouse gas (GHG) emissions from fossil-fuel-based energy production and mounting evidence that global temperatures have risen by 1.5–1.6°C above pre-industrial levels have been a wake-up call for humanity to adopt cleaner energy sources [24]. In response, "net-zero by 2050" targets have become central, government-driven policies in many countries, strengthening demand for reliable low-carbon electricity to support electrification and economic growth [25], [26].

Collectively, these dynamics have contributed to a renewed global momentum for nuclear power. In 2023, at COP28 in Dubai (United Arab Emirates), several countries, including Canada, launched a Declaration to Triple Nuclear Energy, signalling an intent to expand nuclear capacity as part of broader strategies to achieve net-zero by mid-century [27].

In response to these trends, the nuclear industry has increasingly focused on reactor designs that improve deployability, reduce project risk, and enhance economic competitiveness. This has included the continued development of Generation III/III+ reactors as well as the advancement of Generation IV concepts. A key feature across these developments has been the shift toward greater standardization, simplification of plant systems, and the adoption of modular construction approaches [4].

Within this broader evolution, a parallel shift has emerged toward smaller, more flexible reactors, namely SMRs and microreactors, which are intended to complement, rather than replace, conventional large-scale NPPs by enabling additional deployment pathways intended to broaden

market applications, improve constructability, and enable more flexible integration into diverse energy systems [28].

The following section provides an overview of SMRs, including their defining characteristics, technology groupings, and implications for deployment and supply chain participation.

2.2. SMR Technology Overview

The IAEA [8] defines SMRs as:

"Advanced nuclear reactors with a power capacity of up to 300 MWe per unit, approximately one-third of the generating capacity of traditional nuclear power reactors (~1000 MWe)."

SMRs represent a new class of nuclear technologies designed to deliver low-carbon, reliable energy while addressing many of the challenges historically associated with conventional nuclear construction. Their defining characteristics include reduced unit size, modular construction, simplified system designs, enhanced safety features, and increased deployment flexibility [28], [29].

A core distinction between SMRs and traditional large reactors lies in their approach to manufacturing and construction. SMRs are designed to enable a greater degree of factory-based fabrication, where major components or modules are manufactured in controlled environments and transported to site for assembly. Modularization and design standardization create the potential for repeatable manufacturing and learning effects over time. This contrasts with traditional projects that rely heavily on large-scale, site-specific construction. The objective is to improve quality consistency, reduce construction complexity, and deliver more predictable schedules and costs [29].

From a design perspective, many SMRs incorporate simplified plant layouts and passive safety systems that rely on natural physical phenomena such as gravity, natural circulation, and heat dissipation, rather than extensive active systems or operator intervention. These features support inherently safer operation and more compact plant configurations. SMRs span both Generation III+ designs, which build on established light-water reactor technology, and Generation IV concepts that introduce alternative coolants, fuels, and operating conditions [29].

Beyond construction advantages, SMRs offer greater flexibility in deployment and applications. Their smaller unit size enables incremental capacity additions, making them well-suited for regions with smaller grids or phased demand growth. SMRs can be deployed in grid-connected, remote, or off-grid settings, and can integrate with industrial energy systems where conventional nuclear plants would be impractical [29].

In addition to electricity generation, many SMR designs are being developed to support non-electric applications. These include high-temperature process heat for industrial use, combined heat and power, hydrogen production, district heating, desalination, and medical isotope production. This expands the role of nuclear energy beyond traditional baseload generation into more diverse and application-specific use cases [29].

Microreactors[1]

Microreactors**,** on the other hand, are a subset of SMRs distinguished primarily by their much smaller size and capacity, typically in the range of 1-50 MWe [8], [30]. These reactors are generally based on Generation IV concepts and are designed to be factory-built and transportable as modular units to site, and capable of operating for extended periods (typically 4-8 years) without refuelling.

Due to their size and portability, microreactors are particularly well-suited for remote or hard-to-access locations, including northern communities, mining

[1] Microreactors are also commonly referred to as Micro Modular Reactors (MMRs), micro-SMRs or very small modular reactors (vSMRs). For simplicity within this report we are using 'microreactor' or Micro Modular Reactor (MMR).

operations, and critical infrastructure sites where reliable conventional power alternatives may be constrained [29]. Examples include unique microreactor concepts such as the Westinghouse eVinci, which uses heat-pipe technology to remove heat from the core without pumps or high-pressure systems [31].

2.2.1. Types of SMR Technologies

There are several types of SMR technologies under development globally. The Nuclear Energy Agency (NEA) SMR dashboard [32] reports over 74 SMR designs under active development, spanning both Gen III+ and Gen IV reactor concepts. The main categories include [28], [32]:

- **Light Water Reactors (Gen III+):** These designs represent the most mature and lowest-risk options. They are based on established pressurized water reactor (PWR) and boiling water reactor (BWR) technologies, which use light water as both moderator and coolant. They are primarily intended for grid-scale electricity generation and benefit from existing regulatory and operational experience. Examples include BWRX-300 (GE-Vernova Hitachi), AP300 (WEC), RR SMR (Rolls-Royce), NuScale Power Module (NuScale Power), etc.

- **High-Temperature Gas-Cooled Reactors (HTGRs):** These designs typically use gases such as helium as a coolant, graphite as a moderator, and operate at significantly higher temperatures than water-based reactors. They are well-suited for industrial applications requiring high-temperature heat, in addition to electricity generation. Examples include Xe-100 (X-energy), HTR-PM (Tsinghua University Institute of Nuclear and New Energy Technology - INET), HTTR (Japan Atomic Energy Agency -JAEA), etc.

- **Fast Neutron Reactors (FNRs):** These reactors operate on fast neutrons without a neutron moderator and use alternative coolants such as liquid metals. They are designed to significantly improve fuel efficiency and reduce long-term waste, with potential applications in both power generation and advanced fuel cycles. Several are capable of operating on the used fuel from traditional reactors. Examples include Natrium (TerraPower), Aurora (Oklo Inc), etc.

- **Molten Salt Reactors (MSRs):** These designs use molten salts as coolant and, in some cases, as fuel carriers. They offer high-temperature operation and potential advantages in efficiency and fuel utilization, though most remain in earlier stages of development. Examples include IMSR (Terrestrial Energy), SSR-W (Moltex Energy) etc.

- **Sodium-Cooled Fast Reactor (SCFR):** These designs use liquid sodium as a coolant, and metallic uranium alloy fuel rather than fuel dissolved in molten salt. They offer passive heat removal without operator intervention, high heat transfer efficiency, and operate on spent fissile and mixed-oxide (MOX) fuels. Examples include Arc-100 (Arc Clean Technology), Natrium (TerraPower).

While these SMR technologies differ significantly in design and maturity, each introduces distinct implications for materials, component fabrication, fuel supply, construction approach, and qualification requirements. These implications directly affect how and where suppliers may participate—an issue explored in detail in **Section 3**.

2.2.2. SMR Systems - Plant Architecture & Major Components

Despite their smaller size, SMRs retain a similar overall facility structure as conventional large-scale reactors. Systems are typically organized into the nuclear island, turbine (conventional) island, balance of plant (BOP), and associated waste management facilities.

The **Nuclear Island (NI)** includes all systems, structures, and components (SSCs) directly associated with nuclear fission, reactor controls/operation, and radioactive material control.

The **Turbine (Conventional) Island (TI)** includes the SSCs responsible for converting steam—or, in some advanced designs, another heat-transfer medium—into electricity.

The **Balance of Plant (BOP)** encompasses all auxiliary systems, structures, and supporting infrastructure required for plant operation but not directly part of the nuclear or turbine islands.

Additionally, a waste management area, typically located in the BOP, contains facilities that support the handling, storage, and processing of radioactive materials generated during SMR operation. A representative breakdown of major plant systems and components is provided in Table 2.[2]

The functional groupings in Table 2 are broadly applicable across nuclear technologies; however, the specific equipment, system boundaries and component arrangements vary by reactor design. For example, a PWR transfers heat from a high-pressure primary coolant system to a separate secondary steam cycle through steam generators and typically includes components such as pressurizers, reactor coolant pumps and primary-loop piping. In a BWR, steam is generated directly within the reactor vessel and routed to the turbine, eliminating separate steam generators and pressurizers while introducing design-specific components such as steam separators, dryers and recirculation systems.

Despite these design-specific differences, many component and service categories recur across reactor

Table 2 – Representative Major Components and Sub-Components of a NPP[33]

Plant Area	Major SSCs	Typical Sub-Components/Systems
Nuclear Island	Reactor core and pressure boundary systems	Reactor pressure vessel (RPV), internal structures, core internals, polar cranes, steam generators or heat exchangers, primary coolant systems
	Containment and nuclear safety systems	Containment structures and module - civil/structural shell, liners, penetrations, isolation valves, containment HVAC, instrumentation & controls and electrical systems for reactor operations
	Fuel Handling Systems	Refueling machines, storage racks, transfer systems, cranes, 'hot' spent reactor fuel storage
Turbine Island	Power conversion systems	Steam turbine, generator, ancillary support systems
	Heat rejection systems	Condenser, circulating water systems
	Feedwater systems	Heaters, pumps, economizers
Balance of Plant	Electrical systems	Transformers, switchgear, power distribution, emergency power – delivering electricity to the end user
	Mechanical and support systems	Water conditioning, heat rejection, HVAC, fire protection, auxiliary systems
	Instrumentation & Control (I&C)	Sensors, control panels, plant monitoring and control systems
	Civil Structures and site infrastructure	Foundations, buildings (staff offices, maintenance shops, service buildings), roadways, laydown areas, water intake/discharge systems
	Security Systems	Barriers, monitoring equipment, site access controls
Waste Management Area	Waste Management	Solid & Liquid Waste Handling - Waste drums, compactors, filters, tanks, monitoring instrumentation, effluent treatment, packaging, and cooled spent reactor fuel

[2] Groupings in Table 2 are indicative and intended to illustrate typical scope boundaries; specific classifications may vary by nuclear/SMR design. For a more detailed breakdown of representative components of a nuclear power plant, please see this resource [33].

technologies, including pressure-boundary equipment, structural modules, piping, valves, pumps, electrical systems, instrumentation and controls, civil works, and plant-support services. However, the specific materials, dimensions, codes, safety classifications, qualification requirements, and procurement specifications remain technology- and vendor-specific. Section 7.2 identifies these cross-technology opportunity areas and assesses their alignment with Saskatchewan's industrial capabilities.

The reduced physical footprint of SMRs results in a higher degree of system integration. The degree of integration depends on the reactor technology. Some designs maintain a relatively conventional layout on a smaller scale, whereas others integrate major systems into compact structures, as illustrated in Figure 2.[3] The degree of integration influences radiological boundaries, construction strategy, the application of quality requirements, and how suppliers participate across different scopes of work.

Producing SMR components may involve a range of conventional manufacturing processes such as forging, casting, machining, forming, welding, heat treatment, coatings, and specialized inspection and testing, as well as advanced manufacturing processes such as additive manufacturing, cold spray, powder metallurgy-hot isostatic pressing (PM-HIP), electron beam welding, and advanced digital manufacturing and inspection technologies. The applicable manufacturing route is determined primarily by the reactor design, component function, materials, safety classification, quality program, and vendor or customer specifications.

Note: This study adopts a technology-agnostic approach. Accordingly, the information presented in the Table 2 and Figure 2 is intended to provide a generalized representation of SMR and NPP systems and does not reflect any single reactor design or vendor-specific configuration. Component arrangements, plant layouts, and system architectures may vary across reactor technologies and SMR technology vendors.

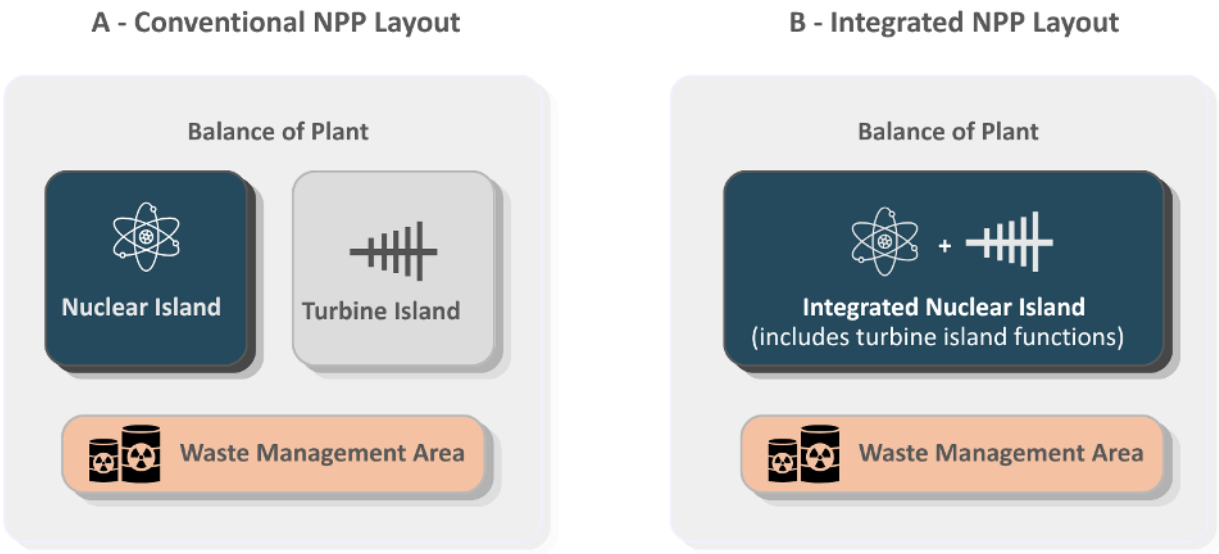


Figure 2 - Example SMR Plant (Technology-Agnostic) Layout Configurations

[3] Figure 2 illustrates how SMR layouts integrate or separate these areas. It does not exhaustively represent all the major SSCs in an NPP and their precise locations within an NPP layout. This NEI resource [33] provides a detailed breakdown of components and their typical safety-related classification.

2.3. Nuclear Deployment Stages

Nuclear projects progress through a complete lifecycle, from early design and licensing through construction, operation, and eventual decommissioning. Figure 3 illustrates this lifecycle and the range of activities that support each stage. From a project and supply-chain perspective, meaningful engagement begins once a technology has been selected for deployment.

Then, projects advance through detailed design and safety assessment to define the plant configuration, followed by site permitting and preparation, which includes environmental assessments, regulatory approvals, and early construction planning.

Once regulatory approvals are in place, projects advance into construction, where major systems, components, and infrastructure are fabricated, transported, and installed. This phase involves a wide range of activities, including engineering services, construction execution, and integration of instrumentation, control, and electrical systems.

Following construction, the plant enters operation, which includes ongoing maintenance, fuel management, security, and waste handling. Over time, facilities are eventually decommissioned through a structured process involving dismantling, site restoration, and long-term monitoring.

Throughout all stages, the nuclear regulator, e.g., the Canadian Nuclear Safety Commission (CNSC), provides regulatory oversight to ensure safety, environmental protection, and compliance.

2.4. SMRs in Canada

This section examines how SMRs are being positioned, regulated, and deployed within Canada. With an established nuclear sector, ambitious decarbonization goals, and growing electricity demand, Canada is emerging as one of the most active countries globally for SMR development.

2.4.1. Federal Leadership and National Strategy

Recent developments indicate that the global SMR landscape is entering a formative decade. Momentum is increasingly shifting from conceptual design toward demonstration and early commercialization, with several FOAK projects now operational or under construction. Countries that move early are likely to shape technology

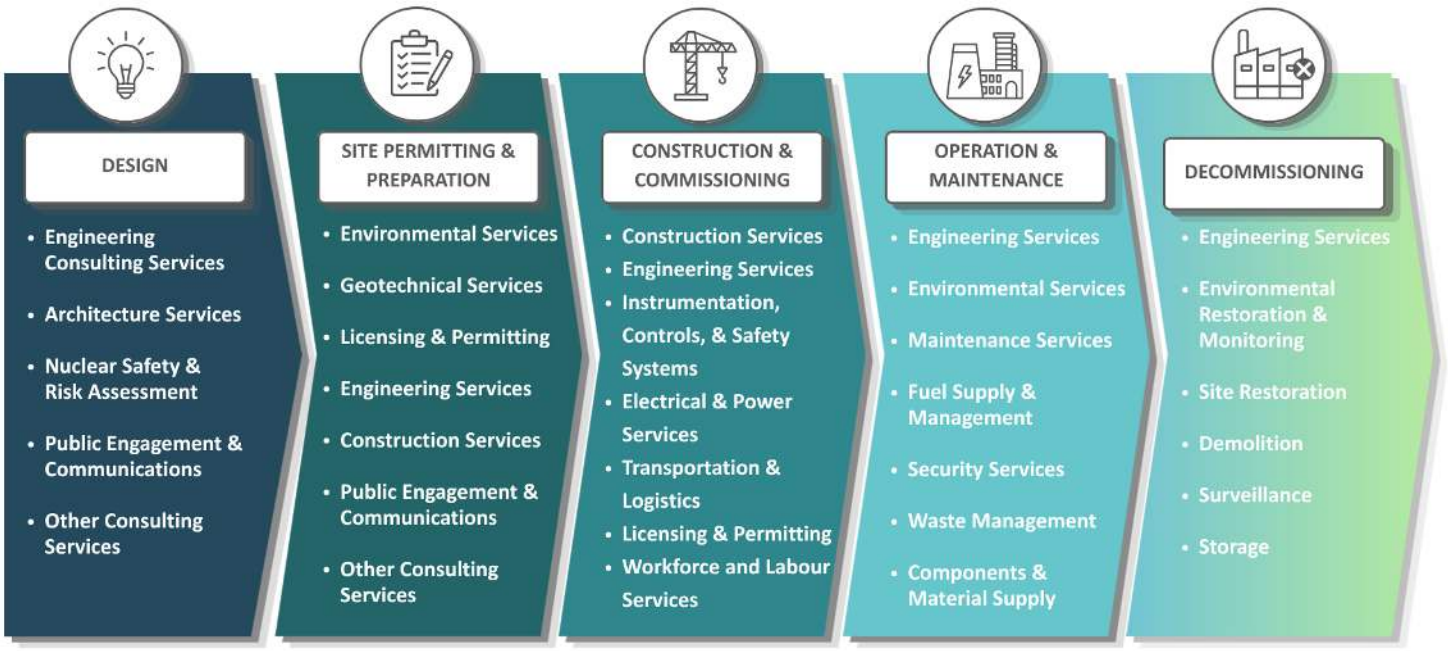


Figure 3 - Stages of Nuclear Development and Associated Activities [35]

selections, supply chain development, and emerging market norms.

Canada is globally known for its well-established nuclear energy industry, with 17 operable CANDU reactors across four nuclear generating stations: Bruce (8), Darlington (4), and Pickering (4) in Ontario, and Point Lepreau (1) in New Brunswick [36]. Nuclear energy plays a significant role in the nation's energy mix, supplying approximately 13% of Canada's electricity demand in 2024 [37], with Ontario in particular relying on nuclear for roughly half (50%) of its electricity generation [38].

Until recently, however, Canada had not undertaken new domestic nuclear construction since the early 1990s. The domestic industry focused primarily on operating, maintaining, and refurbishing the existing CANDU fleet while supporting international nuclear projects. That stance has now shifted as decarbonization goals [26] and growing domestic electricity demand (expected to at least double by 2050 [39])[4] are driving renewed interest in new nuclear development, including both CANDU and non-CANDU technologies.

Canada has also reinforced its nuclear ambitions through international commitments. At COP28, Canada joined partner countries in pledging to work toward tripling global nuclear energy capacity by 2050, creating opportunities for Canadian technology, expertise, uranium, fuel-cycle services, and supply chain capabilities in domestic and international markets [27].

Against this backdrop, Canada has sought to position itself as a global leader in the next wave of nuclear development. Initial federal support placed significant emphasis on SMRs. Through National Resources Canada (NRCan), the federal government developed the Canadian SMR Road Map and SMR Action Plan and introduced programs supporting the development, demonstration, and deployment of SMRs domestically and internationally, with formal engagement underway since 2020 [40]. Canada is now currently the leading G7 country advancing SMR deployment, with new SMR construction ongoing at the Darlington Nuclear Generating Station in Ontario.

Federal policies, combined with strong provincial interests, have accelerated SMR planning nationwide and expanded the geographic scope of Canada's nuclear industry beyond traditional CANDU host provinces. In 2019, Ontario, New Brunswick, and Saskatchewan—together with their respective utilities—signed an interprovincial Memorandum of Understanding (MOU) to coordinate SMR development [41]. Alberta joined the framework in 2021.

Collectively, the provinces published an SMR Feasibility Study outlining three strategic deployment streams, spanning grid-scale reactors, advanced demonstration projects, and microreactors [42]:

- **Stream 1:** Grid-connected SMRs in Ontario and Saskatchewan, beginning with a 300 MWe unit at Darlington by 2028 and subsequent deployment in Saskatchewan in the early 2030s.
- **Stream 2:** Advanced SMR demonstration and commercialization at the Point Lepreau site in New Brunswick, including ARC Clean Energy and Moltex Energy projects.
- **Stream 3:** Microreactor deployment, including a 5 MWe gas-cooled reactor at the Chalk River Laboratories.

In June 2026, the Government of Canada released the Nuclear Energy Strategy for Canada, establishing a broader and more coordinated national framework for nuclear development [43]. The strategy builds on earlier SMR-focused initiatives while expanding federal direction to include large-scale reactors, SMRs, microreactors, CANDU modernization, uranium production, nuclear-fuel development, waste management, exports, workforce

[4] This is a projection based on a "Current Measures" scenario in Canada's Energy Regulator Report: Canada's Energy Future 2026 [39]. This scenario is a traditional baseline scenario often used in energy outlooks. It includes moderate economic growth and energy prices, policies currently in place, and moderate technological progress. See the source for more details.

development, and nuclear innovation. It positions nuclear energy as a strategic contributor to electricity affordability, energy security, national sovereignty and economic growth.

The strategy is organized around four pillars:

1. Enabling new nuclear builds across Canada
2. Strengthening Canada's role as a global supplier and exporter
3. Expanding uranium production and nuclear fuel opportunities
4. Advancing nuclear innovation, including both fission and fusion technologies

This latest framework identifies federal roles in project financing, regulatory efficiency, research and development, Indigenous partnership, project coordination and supply chain development, while provinces and territories retain jurisdiction over electricity-generation decisions.

It also emphasizes maintaining sovereign Canadian nuclear capabilities and increasing Canadian participation in projects involving both domestic and foreign reactor technologies. Priorities include strengthening the national supply chain, expanding exports, developing partnerships with allied countries, and leveraging Saskatchewan's uranium resources and broader fuel-cycle potential.

Overall, the new nuclear strategy signals a transition from a primarily SMR-enabling policy framework toward a more integrated, long-term and pan-Canadian nuclear-development agenda. SMRs remain a central component of that agenda; however, they are now positioned within a broader national effort to support new reactor construction, strengthen domestic supply chains, expand uranium and fuel-cycle opportunities and increase Canada's participation in global nuclear markets.

2.4.2. Regulatory Framework and Active SMRs in Canada

Canada's nuclear regulatory regime is overseen by the CNSC, an independent authority responsible for regulating the development and use of nuclear energy and materials. The CNSC establishes regulatory requirements, issues licences, and verifies compliance to protect the health, safety, and security of people and the environment [44].

SMRs are regulated under the same legislative and regulatory framework as conventional large-scaled NPPs. While SMRs differ in size and design, they are subject to the same overarching requirements for safety, security, safeguards, and quality assurance. The CNSC, however, has developed a guidelines document specific to SMR licensing [45], and continues to update and refine its approach, as it learns from its SMR licensing experience and other international agreements and engagements [46], [47]. This is particularly notable given that all reactors historically built in Canada have been CANDU designs, whereas most SMRs under consideration are non-CANDU technologies.

To facilitate early engagement, the CNSC offers a voluntary pre-licensing Vendor Design Review (VDR) process [48]. This process allows SMR developers to assess alignment with Canadian regulatory requirements and identify potential licensing challenges before entering the formal licensing stage. The VDR is conducted in three phases, progressing from:

- **Phase 1:** Assessment of compliance with regulatory requirements
- **Phase 2:** Assessment for potential fundamental barriers to licensing[5]
- **Phase 3:** Follow-up (on certain aspects of unresolved issues from Phase 2)

Once a project proceeds beyond the VDR, SMRs are to be licensed as Class I nuclear facilities through a staged process covering site preparation, construction,

[5] Phase 1&2 of the CNSC VDR process can be combined.

operation, decommissioning, and abandonment. The licensing process includes detailed technical reviews, environmental assessments, and public hearings, providing transparency and stakeholder engagement throughout the project lifecycle [49].

Active SMR Technologies in Canada

As of July 2025, the CNSC had conducted VDRs for six SMR designs, with three technologies having completed Phases 1 and 2 and advanced to Phase 3 [48], a sample of which is presented in Table 3. These projects represent a range of reactor technologies and deployment timelines, reflecting both near-term and longer-term SMR opportunities in Canada.

2.4.3. SMR Progress in Interested Provinces

While federal leadership has established the overall direction, SMR deployment in Canada is being actively advanced at the provincial level, aligned with the three strategic deployment streams described in Section 2.4.1. The overview provided below summarizes key SMR developments across these streams; a more detailed account of SMR progress in Canada is available in this resource [40].

It is important to note that several jurisdictions are now evaluating combinations of grid-scale SMRs, large reactors, microreactors and refurbishment projects. Final technology selection and deployment sequencing will depend on factors such as projected electricity demand, system requirements, project financing, risk allocation and the relative economics of each option within the host electricity system.

Ontario

Ontario remains the most advanced jurisdiction in Canada with respect to SMR deployment, as part of Stream 1. Ontario Power Generation (OPG) selected GE Vernova Hitachi's BWRX-300 technology for deployment at the Darlington site in 2021 and has since committed to a four-unit buildout at the Darlington New Nuclear Project (DNNP) site, which is estimated to cost $20.9 billion in total [55].

Table 3 - Active SMR designs in Canada [48]

Vendor	Reactor Name	Reactor Design (Heat medium)	Output (MWe/ MWth) [48]	CNSC VDR Review Status [48]	CNSC Licensing Status	Earliest/Planned deployments in Canada
GE Vernova Hitachi	BWRX-300	BWR (Light water)	300/870	Phase 1 & 2 completed (March 2023)	CNSC granted License to construct one BWRX-300 at OPG's DNNP site (April 2025) [51]	Ontario - OPG's DNNP first unit is expected to come online in 2030 [52].
X-Energy	Xe-100	HTGR (Helium)	80/200	Phase 1 & 2 completed (Dec 2023)	No licensing activities yet	Alberta - Potential deployment in Alberta (repurposing TransAlta thermal generation site) [53]
ARC Clean Energy	ARC-100	Sodium-cooled	100/286	Phase 1 & 2 completed (July 2025)	License to prepare site application submitted (June 2023) [54]	New Brunswick - Potential deployment at NB Power expected to be operational by mid 2030's.
Moltex Energy	SSR-W300	Molten salt	300/750	Phase 1 completed (May 2021)	No licensing activities yet	New Brunswick – Potential deployment beyond 2040s
Westinghouse Electric Company	eVinci	Heat Pipe/Solid Core	5MWe or 15MWth heat-only config	Phase 2	Assessment in progress	No active planned deployments in Canada.

The Prime Minister of Canada Mark Carney identified the DNNP project as one of five "nation-building" initiatives announced in Fall 2025 [56]. The project has received substantial provincial and federal financial support, including a $1 billion provincial investment through the Building Ontario Fund and a $2 billion federal investment through the Canada Growth Fund [52]. Canada Infrastructure Bank (CIB) also committed $970 million towards the development of OPG's Darlington SMR project [55], [57]. Ontario's SMR projects are estimated to create 18,000 jobs during construction, with 3,700 jobs during operation, while contributing $38.5 billion to Canada's Gross Domestic Product (GDP) over 65 years [52].

The DNNP has progressed through environmental assessment, site preparation, and construction licensing milestones. The CNSC issued OPG a License to Construct for one BWRX-300 reactor at its DNNP site in April 2025 [51]. Construction of the first BWRX-300 unit began in May 2025, with the SMR expected to come online in 2030 [52]. In March 2026, the CNSC lifted the first regulatory hold point (RHP-1)[6], allowing completion of the reactor building foundation in April 2026 [59], [60]. OPG has also applied for a 20-year license to operate DNNP Unit 1 with the CNSC [58].

Ontario is also pursuing a microreactor project at the Chalk River Laboratories as part of Stream 3. However, since August 2024, CNSC staff have paused all work related to the environmental assessment (EA) and License to Prepare Site (LTPS) application review [61], due to the SMR deployment company, Global First Power Ltd. (GFPL), filing for bankruptcy [62].

Saskatchewan

Saskatchewan is emerging as a key jurisdiction in Canada's SMR deployment landscape and is advancing along a similar pathway to Ontario under Stream 1. In June 2022, the provincial utility, SaskPower, announced it had selected the GE Vernova Hitachi BWRX-300 technology for potential deployment in Saskatchewan in the mid-2030s [63]. Although SaskPower will not make a final investment decision (FID) to build an SMR until 2029, it has initiated early site selection work and begun preparatory planning for regulatory engagement, workforce development, and supply chain expansion, so as to keep SMRs as an option for the mid-2030s [63].

In addition, Saskatchewan's mining and resource sectors have also shown increasing interest in SMRs as a pathway to electrification, process heat supply, and deep decarbonization. The International Minerals Innovation Institute (IMII) recently published a report on SMR applications for the Saskatchewan mining and minerals industry, delving into different SMR deployment and integration scenarios for potash and uranium mines in the province [18].

More broadly, Saskatchewan is preserving flexibility regarding its future nuclear generation options. As of January 2026, the province had also begun exploring the role of large-scale reactors as part of its long-term energy planning, reflecting a technology-agnostic approach to future generation needs [14]. This consideration is exploratory and does not displace current SMR-focused activities but signals an interest in preserving optionality as part of broader system-level planning.

To ensure Saskatchewan businesses are positioned to participate meaningfully in these developments, several targeted capacity-building initiatives are advancing. The Saskatchewan Industrial and Mining Suppliers Association (SIMSA) has led the charge in this regard. Most notably, SIMSA secured $2.8 million in funding (this project) through NRCan's Enabling SMRs Program to assess the province's supply chain capabilities—including Indigenous businesses—and identify opportunities, readiness gaps, and strategic pathways for participation in SMR manufacturing, construction, operations, and fuel cycle services [64], to prepare this report. SIMSA also has MOUs for exclusive supply chain development in Saskatchewan with several SMR technology vendors, including GE

[6] OPG holds a construction license for the DNNP Unit-1, with three regulatory hold points (RHPs). The first being the installation of the reactor building foundation, which has been lifted, allowing construction to commence. The next hold point is the installation of the reactor pressure vessel, and the third hold point concerns the fuel-out commissioning [58].

Vernova Hitachi and X-Energy, and the Organization of Canadian Nuclear Industries (OCNI) [65].

Overall, while multiple pathways are being explored, Saskatchewan's progress is characterized by early-stage planning rather than near-term construction commitment, as timelines, technologies, and deployment models continue to evolve. Broader supply chain readiness initiatives associated with these developments are described in **Section 4.3**.

New Brunswick

Since 2018, NB Power has been working with ARC Canada and Moltex Energy to advance stream 2 of the Pan-Canadian small modular reactor (SMR) approach. Stream 2 is Gen IV grid-sized SMR technology. In June 2023, NB Power submitted an environmental impact assessment (EIA) registration document and a License to Prepare Site application to the CNSC [54]. However, both ARC and Moltex have been experiencing uncertainties in timing and funding, prompting concerns about achieving NB Power's initial 2030 deployment target date. As such, NB Power has indicated that they are exploring additional pathways to new nuclear, including the Gen III+ SMRs and even large-scale nuclear reactors [40].

Alberta

Alberta's approach to SMR deployment differs structurally from that of other MOU signatories due to its deregulated electricity market and the absence of a provincial utility. As a result, SMR development in Alberta relies primarily on private-sector investment and commercial viability.

Several site evaluations are underway in the province. In January 2024, Capital Power and OPG announced a joint agreement to assess grid-scale SMR deployment opportunities in Alberta [66]. In March 2025, NRCan announced $13 million in funding to support Capital Power's site evaluation activities [67]. The province has also provided funding to X-energy to conduct feasibility studies for potential SMR deployment [68].

Other Provinces and Territories

Nova Scotia signed an MOU with Ontario to explore the potential of SMRs for its province [69]. Likewise, Yukon signed a partnership agreement with Ontario to leverage nuclear expertise and explore opportunities to collaborate on energy projects and initiatives [70]. Furthermore, Nunavut and the Northwest Territories have participated in initial SMR dialogues to explore the technology's potential to replace diesel use in remote communities [71].

Key Takeaways – Section 2

- SMRs represent an evolution of nuclear technology, designed to improve flexibility, constructability, and deployment through smaller unit sizes and modular approaches.
- While designs vary across Generation III+ and Generation IV technologies, SMRs retain a broadly similar plant structure, including nuclear island, turbine island, and balance-of-plant systems.
- SMR projects progress through well-defined lifecycle stages, from design and licensing through construction, operation, and eventual decommissioning, with different types of supply chain participation emerging at each stage.
- Canada is among the global leaders in SMR development, supported by an established nuclear sector, experienced regulator, federal leadership, and coordinated interprovincial engagement.
- Canada's nuclear regulatory framework has been shaped primarily through experience with CANDU technologies. As non-CANDU SMRs and advanced reactors progress, further regulatory guidance, licensing experience, and process refinement will be required to address technology-specific features and support efficient deployment.
- Active SMR projects and licensing activities in Canada demonstrate a range of deployment timelines, spanning near-term Generation III+ projects and longer-term advanced reactor concepts.
- Ultimately, final reactor technology selection and deployment sequencing will depend on jurisdiction-specific factors, including electricity-demand growth, grid requirements, technology maturity, project financing and risk allocation, and the relative economics of available nuclear options.
- SMR supply chain opportunities vary by technology, plant area, and lifecycle stage, with differing requirements across systems and project phases.
- Section 2 establishes the technical foundation for subsequent supply chain analysis, providing the necessary context to assess industrial capability alignment (Section 4), engagement insights (Section 6), and supply chain readiness (Sections 7 & 8).



3. Nuclear Supply Chain and Participation Requirements

This section establishes the structural, regulatory, and quality requirements that govern participation in the nuclear supply chain. It provides the foundational framework against which Saskatchewan's existing industrial capabilities are assessed in Section 4 and upon which engagement findings and analysis (Sections 6-8) and recommendations (Section 9) are based.

3.1. Nuclear Supply Chain Structure

Nuclear projects rely on a broad network of organizations and activities that provide the equipment, materials, engineering, construction, professional services, workforce, and long-term support required to develop, operate, maintain, and ultimately decommission a nuclear facility. The nuclear supply chain is structured around distinct phases of the project lifecycle, with different organizations and capabilities contributing at each stage. Figure 4 illustrates representative elements of the nuclear supply chain.

What sets the nuclear and nuclear supply chain apart from typical industrial supply chains is its priority hierarchy, in which safety and quality take precedence over schedule and cost. Nuclear projects operate under stringent regulatory oversight and within a defined nuclear safety culture, requiring conservative decision-making, rigorous traceability, and demonstrable compliance with established processes and standards. As such, the capability and competence of the nuclear supply chain play a central role in ensuring the safety, security, and long-term performance of nuclear facilities.

Tiered Supply Chain Models

Within nuclear literature, the supply chain is commonly described using a tiered structure, often represented as a multi-level pyramid as defined by the World Nuclear Association (WNA) and the International Atomic Energy Agency (IAEA), as shown in Figure 5. This structure typically ranges from reactor vendors and system integrators at the top, through major component suppliers and original equipment manufacturers, to

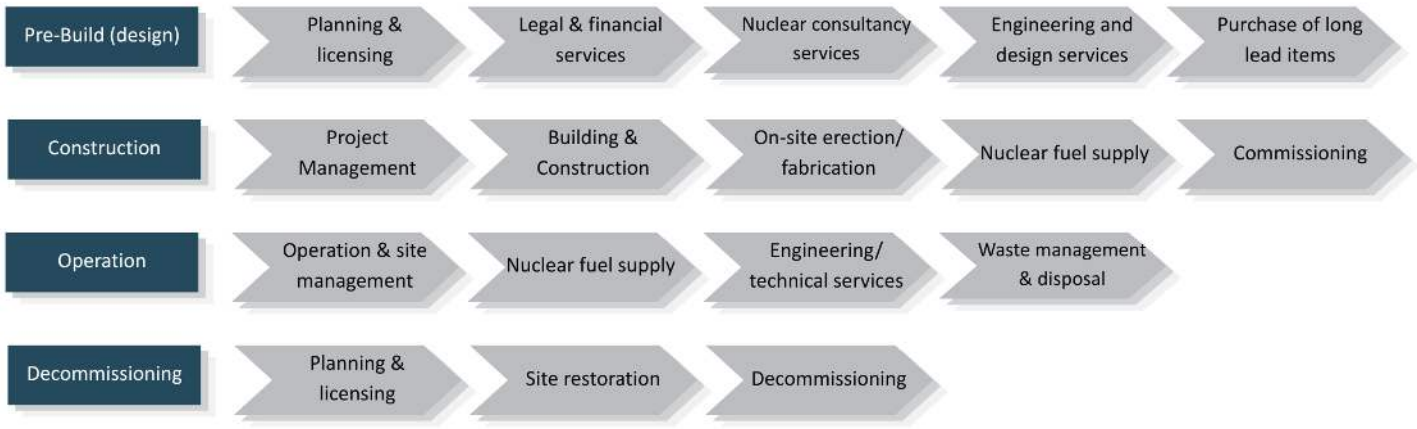


Figure 4 - Elements of a Nuclear Supply Chain [72]

subcomponent manufacturers, fabricators, and raw material providers at the lower tiers. Example goods and services are presented to demonstrate the types of products and capabilities delivered at various tiers.

As suppliers move from Tier 1 toward Tier 6, the number of market participants generally increases, while the degree of technical specialization and direct regulatory interface typically decreases. However, this does not imply a reduction in quality expectations or oversight. Rather, requirements related to quality, documentation, and traceability may be applied in a graded manner based on safety significance and associated risk. Organizations contributing to safety-related functions are expected to demonstrate appropriate quality controls and maintain traceability consistent with nuclear project requirements.

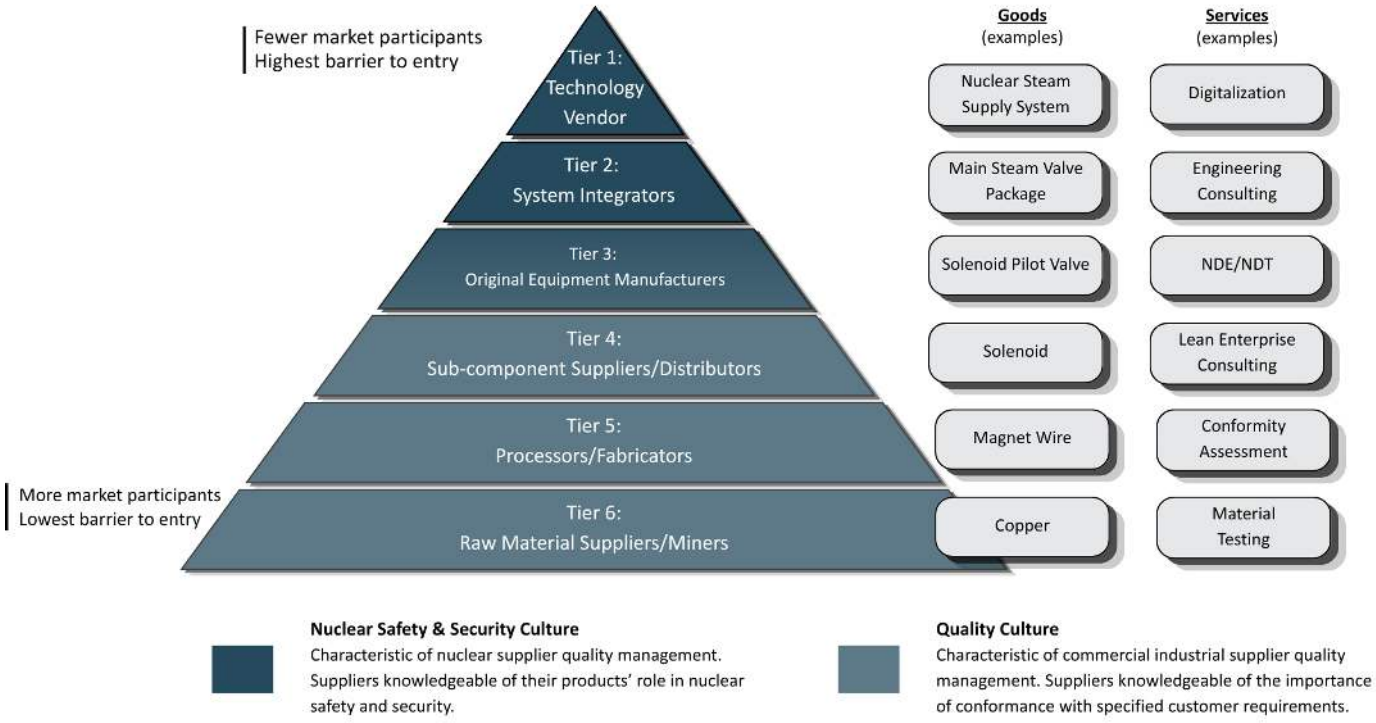


Figure 5 - Typical Nuclear Supply Chain Tiers (WNA) [73]

Figure 5 further highlights the distinction between nuclear safety culture and conventional quality culture, indicating that suppliers operating within the nuclear supply chain are expected to understand and apply additional controls associated with nuclear safety and security.

While the WNA six-tier framework is widely referenced to describe nuclear supply chain structures, tier terminology is not applied consistently across industry and may vary by organization, jurisdiction, and stage of the project lifecycle. In practice, tier definitions differ depending on whether the supply chain is viewed from a new-build project-delivery perspective or an operating-plant and lifecycle-support perspective.

For new-build projects, Tier 1 typically refers to reactor vendors, system integrators, or EPC/EPCM organizations responsible for establishing and managing multi-layered supply chains. In contrast, during plant operations, utilities and owners often interact directly with suppliers providing spare parts, maintenance services, or equipment upgrades, and frequently refer to these firms as “Tier 1” vendors—even though the same suppliers may have been categorized as Tier 3 or Tier 4 within a new-build supply chain hierarchy [74]. Both interpretations are valid, but tier definitions change depending on whether the reference point is project delivery or plant operations.

Because new-build and operational supply chains are closely linked over the lifecycle of a nuclear facility, rigid application of a detailed multi-tier framework can introduce ambiguity when discussing supplier roles, readiness, and participation pathways. While the WNA six-tier model provides valuable detail, this report adopts a simplified three-tier functional model to support clarity and consistency in describing supplier participation (see Figure 6). This simplified structure consolidates tiers into broader groupings aligned with how supply chain roles are commonly discussed in practice and does not replace or reinterpret the WNA framework.

Throughout this report, references to Tier 1, Tier 2, and Tier 3 suppliers should be understood within this simplified framework.

At the top of the supply chain are nuclear vendors, utilities or owners, and system integrators, who are responsible for overall project delivery and performance. These organizations hold accountability for design authority, safety case development, regulatory compliance, and long-term operational outcomes.

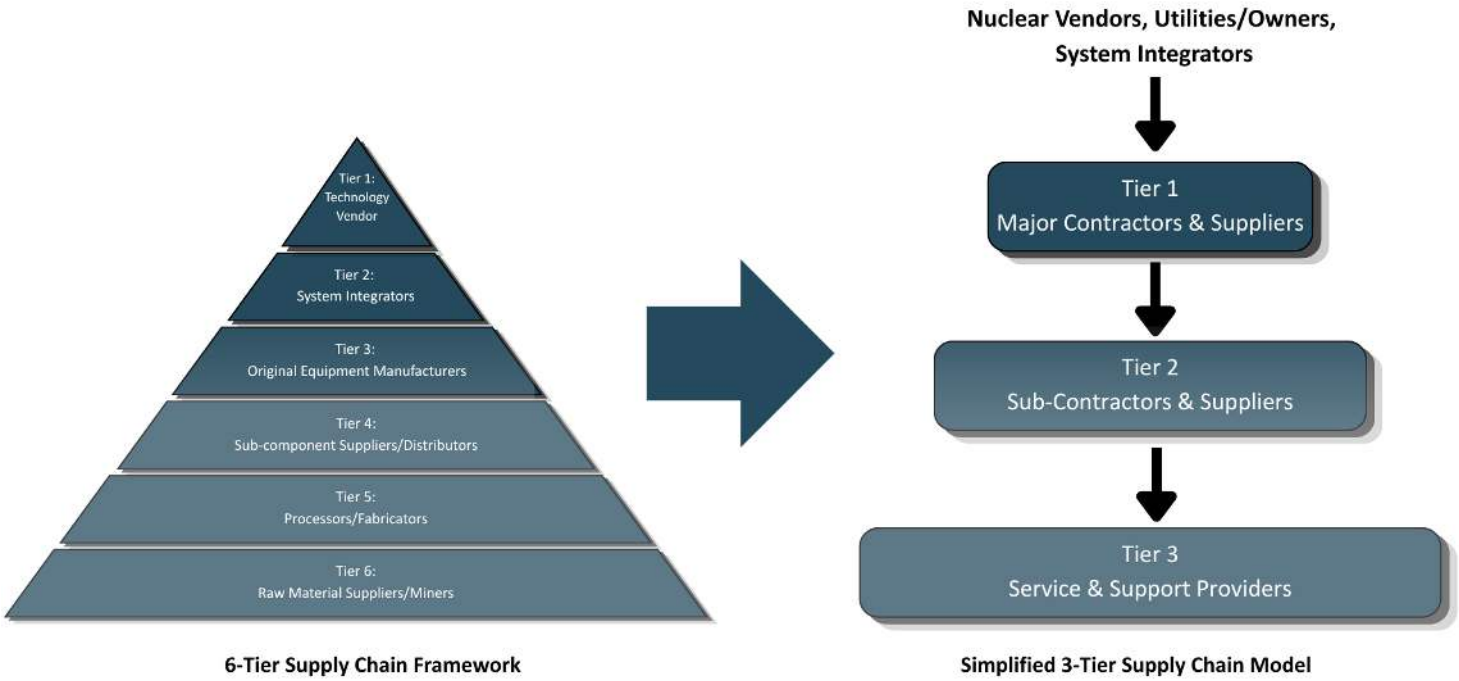


Figure 6 - Simplified Nuclear Supply Chain Framework (Three-Tier Model)

Tier 1 comprises major contractors and suppliers, including engineering, procurement, and construction management (EPCM) firms and original equipment manufacturers. These organizations deliver large or safety-significant components, lead major engineering or construction work packages, and coordinate procurement and integration of complex systems.

Tier 2 comprises subcontractor trades, specialized consulting services, specialized suppliers that manufacture subcomponents or provide technical services in support of Tier 1 organizations. This tier may also include construction subcontractors responsible for discrete scopes of work.

Tier 3 comprises service and support providers, including fabrication support, inspection and testing, logistics, and site services. While these activities may not always be directly safety-classified, they remain subject to defined quality and documentation requirements where they interface with nuclear-related work.

It is important to distinguish between nuclear-specific roles and broader industrial participation within the supply chain. While certain activities require specialized nuclear qualifications and regulatory oversight, a significant portion of manufacturing, construction, and supporting services are performed using established industrial practices. These roles build on existing competencies, supplemented by project-specific quality, documentation, and compliance requirements.

3.1.1. Global Nuclear Supply Chain Landscape

As discussed in **Section 2**, the global nuclear supply chain is undergoing a period of transition following several decades of limited new-build activity [75]. During this period, many traditional original equipment manufacturers (OEMs) and suppliers exited the sector or diversified into other industries. With relatively few projects advancing, there was reduced incentive to maintain nuclear-specific certifications, quality assurance programs, and specialized capabilities. This contributed to skills attrition, consolidation among major suppliers, and limited entry of new participants [75], [76]. These conditions continue to influence the supply chain, resulting in higher procurement costs (less competition), extended lead times, and challenges related to component obsolescence [75].

However, this trend has not been uniform across all regions [11]. China, for example, has continued to expand its nuclear power program and associated supply chain capabilities [77], while Canada's supply chain has been sustained and developed through reactor refurbishment programs, ongoing operations and export activities [78]. Nevertheless, as Saskatchewan and other jurisdictions explore the deployment of SMRs alongside full-scale NPP technologies, the existing nuclear supply chain—both in Canada and globally—will need to scale to levels never previously experienced.

Market and Policy Drivers

Recent climate policies, geopolitics, and energy security developments have renewed global interest in nuclear energy as a firm, dispatchable component of decarbonized energy systems. This shift has been reinforced by international policy signals, including the 2023 COP28 Declaration to Triple Nuclear Energy, which committed participating governments to an aspirational goal of tripling global nuclear capacity from 2020 levels by 2050 [27]. These commitments have increased attention on nuclear supply chain readiness, highlighting the need to scale manufacturing capability, address legacy capacity gaps, and support a broader range of reactor technologies, including SMRs. Achieving these objectives is expected to require sustained, long-term investment to mitigate potential bottlenecks and supply constraints as deployment increases [79], [80].

Structural Constraints and Supply Chain Risks

Despite renewed momentum, the nuclear supply chain continues to face structural constraints rooted in decades of episodic project delivery and underinvestment. A persistent challenge is the misalignment between supply-chain readiness and project demand—often described as a "chicken-and-egg" dynamic—where suppliers are reluctant to invest in new capacity without

firm orders, while project developers do not have firm commitments on orders from owners and also face uncertainty regarding the availability, cost, and readiness of qualified suppliers [81].

This dynamic is particularly acute for early SMR deployments, which are generally considered FOAK projects and are associated with cost and schedule uncertainty arising from ongoing design maturation, licensing processes, early-stage supply-chain development, and recovery of technology development costs.

Workforce constraints further compound these challenges, as experienced personnel retire and fewer new entrants enter the nuclear sector, increasing competition for specialized skills and technical expertise to support expected global nuclear expansion [82].

These factors may influence supplier participation, pricing, and investment decisions, particularly in the absence of sustained market demand.

Technology and Supply Chain Evolution

In parallel, the existing nuclear supply chain is evolving through the adoption of new technologies and approaches. This includes the adoption of digital tools, automation, advanced manufacturing technologies, design standardization and modular construction strategies while maintaining established nuclear regulatory and quality requirements [2], [3].

Commercial and financial models are also evolving to support supplier engagement and manage procurement costs. Approaches such as the increased use of commercially available components are being explored to reduce barriers to entry and expand the supplier base [79].

Project delivery and procurement strategies are likewise evolving. While traditional nuclear projects have typically relied on EPC/EPCM models, alternative approaches are being explored for SMR deployment to address FOAK risk and supply chain integration challenges. For example, Ontario Power Generation's DNNP is applying an Integrated Project Delivery (IPD) model for the first SMR deployment in North America, reflecting efforts to improve collaboration, share risk and stabilize supply chain performance [83].

SMR-Specific Supply Chain Implications

The development and deployment of new reactor designs introduce additional considerations for the supply chain. As discussed in **Section 2**, SMR technologies span a range of designs and maturity levels. Water-cooled SMRs, which build on established BWR, PWR, and PHWR technologies[7], may leverage existing supply chain capabilities.

In contrast, advanced and non-water-cooled designs may require new materials, specialized components, and alternative fuel forms such as high-assay low-enriched uranium (HALEU) and TRISO[8] fuels, necessitating further supply chain development [32], [75]. As a result, supply chain readiness varies across SMR developers. The NEA SMR Dashboard indicates that progress ranges from early-stage MOUs to established procurement agreements and commercial contracts, with technologies more closely aligned to existing reactor designs generally demonstrating high levels of supply chain maturity [6].

Globalization and Localization Trends

At the same time, as additional countries pursue nuclear and SMR programs, the supply chain is becoming increasingly international. New manufacturing and service capabilities are emerging in regions such as Central Europe, the Middle East, Southeast Asia, and parts of Africa. While this diversification may expand sourcing opportunities, it also introduces additional considerations related to traceability, cybersecurity, counterfeiting, logistics, and regulatory alignment.

Geopolitical factors, including trade policies and tariffs, are further influencing supply chain stability and procurement strategies and, in some cases, driving a shift from highly globalized supply chains toward more localized, in-country sourcing models [84]. Although localization may improve supply security and domestic

[7] For more details on these SMR technology types, see Section 2.2.1.

[8] For more details on these fuel types, see Fuel Cycle Report in Appendix C.

capability, it may also increase costs and schedule risk, particularly for FOAK projects where local supplier capacity, qualification experience and production scale may be limited.

Overall, the global nuclear supply chain is expanding but remains uneven in capacity, maturity and geographic distribution. The interaction of renewed demand, legacy constraints, emerging technologies, procurement strategies and localization objectives will shape the availability, cost and qualification requirements of future procurement opportunities. These conditions form the broader market context for the assessment of Canadian and Saskatchewan supply chain readiness presented in the following sections.

3.2. Canadian Nuclear Supply Chain Landscape

Canada's nuclear supply chain plays a central role in determining the feasibility, affordability, and pace of future nuclear deployment, including nuclear, in the country. As provinces advance nuclear initiatives to meet increasing electricity demand associated with electrification and decarbonization, public support for nuclear energy remains an important contextual factor. Survey data indicate generally strong public support for nuclear power in Canada [12], [13], with confidence influenced by perceptions of safety, affordability, and delivery performance [85]. While Canada's nuclear sector has demonstrated strong safety outcomes and operational reliability over decades, the cost and schedule performance of new projects will remain influential in shaping public confidence as new nuclear deployment progresses [85].

Canada possesses a well-established nuclear supply chain built on more than six decades of experience in reactor design, construction, operation, refurbishment, and lifecycle support. This capability has developed primarily around CANDU reactor technology and is concentrated in provinces with operating nuclear facilities, particularly Ontario and New Brunswick. Importantly, the Canadian supply chain can provide a large share of equipment and services for CANDU projects. Around 90% of the supply chain for CANDU reactors is domestic, supporting roughly 89,000 jobs across various professional and skilled trades [86],[87].

Recent CANDU refurbishment programs in Ontario have demonstrated and renewed domestic capability across engineering, project management, manufacturing, construction, skilled trades, commissioning and lifecycle support. Together with ongoing plant operations and export-oriented services, these projects have sustained core supplier capability, workforce continuity and institutional knowledge during a prolonged period of limited new domestic nuclear builds prior to the start of construction at OPG's DNNP SMR in 2025 [88], [89]. However, portions of the supply chain have limited recent experience with repeat new-build execution, serial manufacturing and early-stage project integration. The deployment of SMRs and new nuclear reactor technologies—many of which are based on non-CANDU design—may therefore require existing Canadian supply chain capabilities to be adapted to different reactor designs, materials, component specifications, digital systems, qualification pathways and project delivery models.

The planned nuclear expansion in Canada will increase demand on the local supply chain. Engagement undertaken as part of this study highlighted common considerations, including supplier capacity constraints, manufacturing bottlenecks, workforce availability, and barriers to new market entry. These themes are explored in greater detail in **Section 6**.

Addressing these pressures will likely require broader participation from suppliers across Canada. Although Ontario and New Brunswick remain the primary centers of nuclear activity, a number of companies and organizations located in other provinces currently contribute—albeit to a more limited extent—to areas such as fuel supply, engineering, precision manufacturing, industrial systems, and specialized fabrication that support CANDU operations and refurbishment activities (see Table 4).

Table 4 - Examples of Out-of-Province Companies Participating in CANDU Supply Chain in Ontario

Province	Example Companies	Representative Nuclear Supply Chain Role
Saskatchewan	Cameco	Uranium supply and nuclear fuel services
	SRC	Nuclear materials, research, testing, and supply chain capability development
Quebec	Velan	Nuclear-grade valves and pressure equipment
Manitoba	StandardAero	Precision manufacturing, machining, and quality programs
Alberta	Industrial Water Specialists	Industrial water treatment systems
British Columbia	CIMS Ltd.	Specialized maintenance services, component replacement, and planned outage support

As nuclear deployment progresses across multiple provinces, broader interprovincial participation is becoming increasingly important to expand the available supplier base and support long-term supply chain resilience.

3.2.1. Structure of the Canadian Supply Chain

Canada's nuclear supply chain has been shaped by decades of CANDU reactor operation, refurbishment, and lifecycle support. Traditional Canadian nuclear projects—particularly refurbishment and major component replacement programs—have relied on utility-led delivery models supported by a stable network of qualified engineering firms, constructors, manufacturers, and specialized service providers. These projects are typically characterized by long planning horizons, highly regulated scopes of work, and repeated engagement with experienced suppliers.

Under this model, nuclear utilities such as Ontario Power Generation (OPG), Bruce Power, and NB Power act as owners and operators, retaining overall accountability for nuclear safety, regulatory compliance, and long-term plant performance. Reactor technology vendors (such as Candu Energy Inc. (a subsidiary of AtkinsRéalis), Westinghouse Electric Company, and GE Vernova Hitachi) and major engineering organizations provide design authority, system integration, procurement strategy, and specialist expertise, while large construction and industrial firms execute work at site.

Tier 1 organizations within the Canadian nuclear supply chain typically comprise major contractors and system suppliers responsible for delivering large, complex scopes of work and coordinating multidisciplinary interfaces. These roles are frequently fulfilled through joint ventures (JVs) or consortium arrangements that combine nuclear engineering, construction, and project integration capability. A broad base of Tier 2 and Tier 3 suppliers supports these activities through manufacturing, fabrication, inspection, testing, logistics, and field services.

Ontario's refurbishment programs provide a clear illustration of this structure in practice. OPG's Darlington Refurbishment involved a delivery ecosystem comprising more than 60 companies, including major Tier 1 and Tier 2 suppliers such as BWXT Canada, Black & McDonald, and ES Fox, as well as JV's such as CanAtom Power Group (a consortium comprising AtkinsRéalis and Aecon) [35]. Similar supplier networks have been engaged in Bruce Power's Major Component Replacement (MCR) program, such as the Shoreline Power Group—a joint venture between Aecon, AtkinsRéalis, and United Engineers & Constructors [90], and are expected to play roles in future refurbishment work, such as OPG's Pickering Refurbishment [91]. These projects demonstrate a multi-tiered yet highly integrated supply chain, in which trusted suppliers are repeatedly engaged based on proven performance, nuclear qualification, and capacity.

Within this traditional structure, roles are not static. The same organization may act as a Tier 1 contractor on one

project, a Tier 2 supplier on another, or a specialist service provider during operations and maintenance. Tier definitions are therefore practical and relational rather than rigid, reflecting procurement relationships and scope responsibility rather than organizational size alone. Longstanding participation in refurbishment programs has enabled many Canadian firms to incrementally deepen nuclear expertise, although often within relatively stable and predictable delivery environments.

The transition to SMR and new large reactor deployment is introducing important changes to this established structure. OPG's DNNP—the first new nuclear build in Canada in more than three decades and the first SMR deployment in North America—marks a shift not only in reactor technology but also in project delivery and supply chain integration. To manage FOAK risk and improve coordination across design, construction, and manufacturing activities, OPG has adopted an IPD model for DNNP rather than a conventional EPC/EPCM approach.

Under this integrated framework, OPG, the reactor technology vendor (GE Vernova Hitachi), and major engineering and construction partners—including AtkinsRéalis and Aecon—participate in a shared governance and risk structure. This model emphasizes early alignment on design maturity, constructability, supplier readiness, and execution sequencing. Rather than cascading requirements from a single prime contractor, this approach promotes collaboration among owner, vendor, and constructor teams, directly shaping how Tier 1, Tier 2, and lower-tier suppliers are selected, qualified, and engaged.

For Tier 1 organizations, emerging SMR delivery models place greater emphasis on integration capabilities, including coordination of complex interfaces, management of modularization strategies, and cross-organizational collaboration. Project delivery may be performed by individual firms—such as BWXT Canada and Worley Chemetics in their respective scopes on OPG's DNNP—as well as through JVs, already common in refurbishment programs. JVs and consortium structures are expected to remain central to SMR new-build delivery as a means of pooling nuclear expertise, construction capacity, and risk-management capability.

For Tier 2 and Tier 3 suppliers, SMR delivery models place greater importance on early engagement, demonstrated nuclear performance, and readiness to meet integrated schedules. Suppliers that traditionally entered the nuclear supply chain later in the project lifecycle may face higher barriers unless they align earlier with emerging delivery approaches. At the same time, early participation creates opportunities to influence design-for-manufacture decisions, adopt modular or advanced manufacturing approaches, and position capabilities for repeat deployments over time.

While OPG's delivery approach at DNNP should not be assumed as the sole model for future nuclear deployments, it demonstrates that nuclear project delivery in Canada may differ materially from traditional nuclear models. As additional nuclear projects advance across Canada, delivery approaches may continue to evolve, requiring the Canadian nuclear supply chain and its participants to adapt accordingly.

In addition to commercial suppliers and contractors, Canada's nuclear supply chain is supported by a network of enabling institutions. Research, testing, and verification organizations—such as Canadian Nuclear Laboratories (CNL), Kinectrics, and specialized laboratories—support materials qualification, component testing, and performance validation. Academic institutions also contribute through nuclear research programs, workforce development, and technical training. In Saskatchewan, this includes the University of Saskatchewan, University of Regina, and Saskatchewan Polytechnic, alongside participation in national networks such as the University Network of Excellence in Nuclear Engineering (UNENE).[9] Regulatory oversight provided by the CNSC establishes licensing, safety, and compliance requirements that shape supplier qualification pathways and participation thresholds. While these entities do not function as suppliers in a procurement sense, they play a critical role in enabling readiness, validation, and sustained participation across the supply chain.

[9] UNENE is a national consortium of universities, industry, and research organizations supporting nuclear education, research, and workforce development in Canada. Member institutions include McMaster University, Ontario Tech University, Queen's University, the University of Saskatchewan, the University of Regina and several other Canadian universities with nuclear-related programs [92].

3.2.2. Enabling Institutions and Industry Support Organizations in Canada

Several industry organizations and standardized qualification programs play a critical role in enabling supplier participation and maintaining nuclear safety, quality, and supply chain reliability in Canada. These institutions form part of the enabling infrastructure of the nuclear supply chain, providing mechanisms for supplier engagement, coordination, qualification, and verification of compliance with nuclear regulatory and quality requirements.

The OCNI serves as the primary industry association representing the Canadian nuclear supply chain, with more than 250 member companies active domestically and internationally [93]. OCNI facilitates engagement among suppliers, utilities, vendors, and regulators through supplier days, workshops, and industry forums, trade missions, and supports SMR readiness initiatives, such as Ready4SMR [94], intended to increase supplier awareness and preparedness for emerging nuclear opportunities.

Conexus (formerly the CANDU Owners Group) is a Canadian not-for-profit organization that supports collaboration across utilities, suppliers, and partners through shared operating experience programs, technical working groups, and qualification frameworks [95]. Conexus administers several programs, including an "SMR Program & SMR Vendor Participant" program that allows its members to leverage the CANDU collaboration model to accelerate SMR deployments, and the CANPAC (CANDU Procurement Audit Committee) program, a centralized and standardized nuclear supplier audit initiative designed to reduce duplicative utility-led audits and verify supplier compliance with nuclear quality and regulatory standards [95]. CANPAC enables utilities to qualify vendors for their approved supplier lists and operates in parallel with the Canadian Nuclear Industry Assessment Committee (CANIAC), which focuses on broader supplier assessments, particularly for subcontractors and commercial-grade suppliers [96].

In addition to Canadian-based programs, Canadian utilities participate in the Nuclear Procurement Issues Corporation (NUPIC), a U.S.-based organization that provides centralized supplier audits aligned with U.S. Nuclear Regulatory Commission (NRC) requirements [97]. NUPIC is larger and more comprehensive than CANPAC, offering collaborative audits, shared industry expertise, and standardized qualification requirements. Canadian nuclear operators, including OPG, Bruce Power, and NB Power, maintain membership in both CANPAC and NUPIC, allowing them to leverage international qualification systems while retaining Canadian-specific oversight and regulatory alignment.

Membership in CANPAC and NUPIC has been restricted to organizations that operate NPPs in the past, but that is changing as new NPP projects progress. New and prospective nuclear operators need to participate in these committees to access institutional knowledge, historical supplier performance data, and established peer networks.

For comparison, NIAC (Nuclear Industry Assessment Corporation)—the U.S. counterpart to CANIAC—primarily supports audits of commercial-grade items and is typically used by smaller suppliers or for specialized procurement needs rather than broad utility-wide qualification programs [98]. Unlike CANPAC and NUPIC, utilities do not need to be operating nuclear plants to become members of NIAC or CANIAC; however, membership requires an established (or commitment to establishing) an NRC/CNSC-grade nuclear quality assurance (QA) program and the capability to perform supplier audits. As such, new and prospective nuclear operators would derive significant value from early membership in NIAC and CANIAC as they plan and develop their future nuclear operating programs.

Overall, these organizations and qualification programs shape how suppliers access the Canadian nuclear supply chain and remain relevant, regardless of the nuclear technology deployed, be it SMRs, microreactors, or large-scale reactors.

3.2.3. Canada's Nuclear Supply Chain in a Global Market

While Canada maintains a mature nuclear supply chain, both conventional large-scale reactor projects and emerging SMR deployments operate within a globally integrated nuclear marketplace. International sourcing is a structural feature of nuclear procurement.

Certain components and services—including large forgings, specialty nuclear-grade materials, advanced digital instrumentation and control systems, and selected fuel-cycle and analytical services—are currently supplied by a relatively limited number of qualified global vendors [99]. While some capability exists within North America, capacity remains constrained in several areas, particularly for advanced SMR and Gen IV deployment pathways requiring specialized manufacturing infrastructure, certification pedigree, and nuclear operating experience.

This sourcing dynamic is driven by qualification-driven procurement practices, high capital investment requirements, and economies of scale, as well as capacity constraints that become more pronounced during periods of active refurbishment or new-build activity. As a result, domestic suppliers operate within a competitive global environment where cost, schedule, risk, and demonstrated nuclear performance are central considerations. At the same time, supply chain conditions are not static. Periods of sustained industry growth can strain established suppliers, creating capacity gaps and selective opportunities for new entrants to develop capabilities that were previously sourced internationally.

For Canadian and Saskatchewan-based suppliers, participation in nuclear supply chains will occur within this global context. While selective import substitution may be feasible—particularly where SMR scale, modularization, or fleet deployment reduces historical barriers—certain specialized components and services are likely to remain internationally sourced in the near to medium term. Early nuclear deployments may rely more heavily on established global vendors, with opportunities for greater localization emerging as designs mature and repeat deployments are undertaken.

The introduction of new reactor technologies may further influence participation pathways. In some cases, emerging reactor technologies may require components or manufacturing approaches for which the supplier base is still developing, creating potential entry points for new qualified suppliers. In addition, value-added activities such as local assembly, integration, finishing of internationally supplied components, and establishment of service centers may become viable where transportation constraints, component size, or installation considerations limit full factory assembly, or where ongoing operational requirements support localized execution. For example, GE Vernova Hitachi has announced a $70 million investment to establish an SMR engineering and service centre in Ontario to support deployment and ongoing operation of its BWRX-300 technology [100]. Similar approaches may be considered in other jurisdictions pursuing nuclear deployment.

Emerging advanced manufacturing techniques, including additive manufacturing, are also being explored for select nuclear applications, such as complex geometries, repairs, tooling, and, in limited cases, pressure-retaining or safety-related components, subject to regulatory acceptance. In parallel, digital and automation technologies, including AI and robotics, are gaining attention for their potential to support inspection, quality control, and operational efficiency across the nuclear supply chain. In this context, nuclear deployment may present opportunities to participate in segments of the supply chain that are less mature within existing nuclear programs, particularly where project-specific conditions support localized or innovative solutions.

3.2.4. Fuel Supply Chain

Note: Because the nuclear fuel cycle exhibits unique technical, regulatory, and geopolitical characteristics relative to other elements of the nuclear supply chain, it is addressed separately in this section.

The nuclear fuel supply chain represents a distinct and highly specialized subset of the broader nuclear supply chain, encompassing the processes required to produce, prepare, use, and manage nuclear fuel. This includes

front-end activities such as uranium mining, milling, refining, conversion, enrichment, and fuel fabrication, as well as back-end activities including used fuel storage, potential reprocessing, and long-term disposal.

Within this global fuel supply chain, Canada is a partial participant, by choice, in particular portions of the fuel cycle to suit our domestic needs, and holds a globally significant position. Saskatchewan hosts some of the world's highest-grade uranium deposits and is a major contributor to global uranium production, while Ontario supports key downstream activities such as refining and fuel fabrication. Cameco, headquartered in Saskatchewan, is one of the world's largest publicly traded uranium companies and plays a central role in global fuel supply, including through long-term international supply agreements, such as those with India's Department of Atomic Energy (DAE) [101].

This positions Canada as a critical upstream supplier within the global nuclear fuel market; however, certain stages of the fuel cycle—most notably enrichment—are not currently performed domestically.

As highlighted in the previous section, the transition toward SMR technologies introduces new considerations for the fuel supply chain. While existing CANDU reactors utilize natural uranium and do not require enrichment, many SMR designs—particularly LWRs—require enriched uranium fuels such as low enriched uranium (LEU) or, in some cases, higher-assay fuels such as HALEU. Advanced reactor concepts may also introduce alternative fuel forms, including TRISO or molten salt-based fuels, further expanding the complexity and capability requirements of the fuel supply chain.

Given the technical complexity, regulatory requirements, and capital intensity associated with fuel cycle activities, supply chain participation opportunities differ from those described in the broader nuclear supply chain. While some segments (e.g., mining, transportation, storage, and supporting services) may present opportunities for regional participation, other elements (e.g., enrichment and fuel fabrication) are typically concentrated among a limited number of highly specialized global suppliers (and countries focused on technology/Intellectual Property constraints).

A detailed assessment of fuel supply chain structure, market dynamics, and participation opportunities specific to Saskatchewan and Canada has been developed as part of a parallel workstream effort under this study, led by SIMSA in collaboration with Westinghouse and Cameco. A summary of the key findings and considerations from that workstream is provided in Appendix C to support a broader understanding of fuel cycle opportunities, gaps, and strategic considerations relevant to this assessment.

3.3. Nuclear Supply Chain Quality Expectations in Canada

3.3.1. Regulatory Structure and Quality Assurance Expectations

Canada's nuclear regulatory regime is structured as a hierarchical framework, beginning with federal legislation and extending through regulations, licensing requirements, and supporting regulatory documents and standards. Figure 7 illustrates this structure.

At the top of this hierarchy is the Nuclear Safety and Control Act, which establishes the legal foundation for nuclear regulation in Canada. Under the Act, regulations define the legal and operational requirements applicable to nuclear facilities, including licensing, operational controls, and reporting obligations. These are followed by site-specific licences, which govern activities such as construction, operation, fuel handling, and waste management.

Supporting this framework are CNSC regulatory documents (REGDOCs) and applicable standards, including those published by the Canadian Standards Association (CSA). These documents provide detailed guidance on regulatory expectations and acceptable approaches for demonstrating compliance. Of relevance is REGDOC-2.1.1 [102], which requires a CNSC licensee to

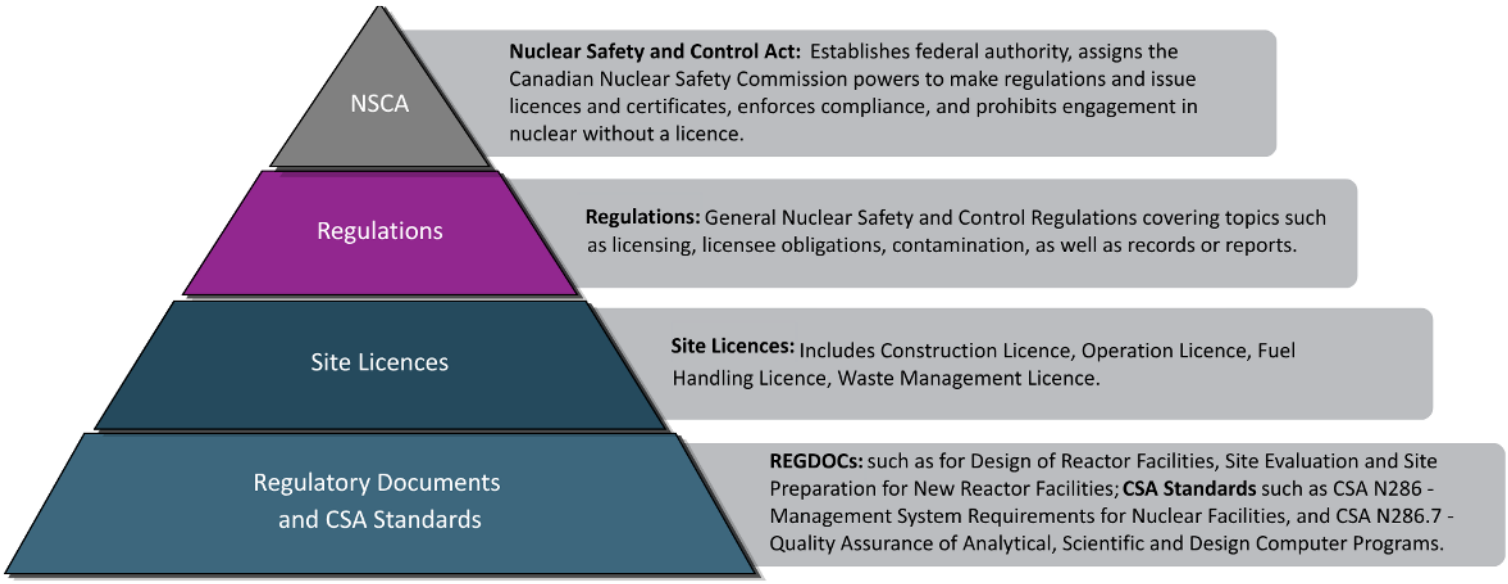


Figure 7 - Hierarchical Nature of Nuclear Regulation in Canada [5]

maintain a management system.[10] While the regulation itself does not mandate a specific standard, it identifies the principles and objectives outlined in CSA N286:12 [103] as the basis for an acceptable management system.[11] This standard [103] integrates quality, health, safety, security, and environmental considerations into a unified framework applicable across all lifecycle phases of nuclear facilities.

Under this regulatory structure, the nuclear facility operator (the licensee) retains overall accountability to the CNSC for all activities conducted under its licence, including work performed by contractors and suppliers. This accountability extends throughout the supply chain. Licensees are therefore responsible for ensuring that all procured items and services meet applicable regulatory, technical, and quality requirements [5].

As a result, suppliers are expected to operate under defined quality programs aligned with the licensee's regulatory obligations. These requirements are typically flowed down through contractual and procurement processes, including those managed by nuclear/SMR technology vendors and EPC/EPCM contractors.

3.3.2. Quality Programs in the Nuclear Supply Chain

Several related concepts are used to describe how quality is managed and demonstrated within regulated industries such as the nuclear sector, including quality management systems, quality assurance programs, quality programs, quality assurance, and quality control. These concepts are summarized in Table 5.

Participation in the nuclear supply chain requires suppliers to meet the specific customer requirements and expectations. Specific requirements vary depending on the scope and safety significance of the work, suppliers must be able to demonstrate that their processes are documented, implemented, controlled, and auditable, which can be done through a formal, structured, and demonstrable quality program.

[10] A management system is "a set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner" [5].

[11] It is important to note that it is possible to base a management system on a different standard, as long as the alternate standard meets the intent of the CSA N286:12 standard [5].

Table 5 - Summary of Quality Management Concepts and Their Roles within an Organization's Quality Framework

Element	What It Is	Focus	Scope	Primary Objective	Prevention or Detection
Quality Management System (QMS)	Organization-wide system of policies, processes, and governance	Strategic quality management of an organization's performance.	Entire organization	Provide framework for consistent quality & continuous improvement	Prevention (strategic)
Quality Assurance Program (QAP)	Formal documented system meeting regulatory/ industry QA requirements	Quality requirements for the provision of products or services	Entire procurement life cycle (typical for regulated industries such as nuclear, aerospace, etc.)	Compliance with applicable Quality Assurance standards	Prevention
Quality Program (QP)*	Project-specific application of QMS/QAP	Execution of quality requirements for a specific job	A project, facility, product line, or contract	Define how QMS/ QAP will be applied for the specific scope	Prevention & detection
Quality Assurance (QA)	Process-focused system to assure quality output	Assuring that processes are adequate and complied with.	An organization's, systems, provision of services, or production of equipment or components	Prevent defects by controlling processes	Prevention
Quality Control (QC)	Activities ensuring adequate inspection and testing	Verification that work outputs meet specified requirements	Products and processes involved in their production	Detect defects, verify conformance to specified requirements	Detection

*Note: A Quality Program applies QMS and QAP requirements to a specific project, facility, product line, or contract. It is the tactical, scope specific quality plan for executing work.

In Practice

In the Canadian nuclear sector, utilities, reactor vendors, and major contractors require suppliers to register as preferred vendors on a Vendor Supplier List (VSL) as a prerequisite for providing goods and services for both nuclear and non-nuclear scopes of work. Inclusion on a VSL enables suppliers to establish a commercial relationship while demonstrating compliance with the organization's health, safety, environmental, quality, financial, technical, and regulatory requirements. Qualification typically involves the submission of corporate, insurance, safety, training, and commercial documentation, as well as acceptance of standard contractual terms and conditions.

For nuclear scopes of work that require more stringent quality assurance controls, the supplier qualification process is often further formalized through Qualified Supplier Lists (QSLs). Supplier quality assurance capabilities are verified through formal qualification, audit, and acceptance processes maintained by utilities, reactor vendors, or higher tier contractors. Inclusion on these lists confirms that a supplier's Quality Program (QP) meets the applicable requirements and standards for a defined scope of work and is considered during procurement and contracting decisions. However, inclusion on a VSL or QSL does not guarantee the award of future contracts.

These qualification requirements define how suppliers demonstrate their ability to meet customer quality assurance expectations and regulatory obligations. Depending on the nature of the goods or services provided, suppliers may be required to implement and maintain a quality program aligned with applicable industry standards. Common frameworks include ISO

9001 for non-nuclear scopes and the CSA N299 series for nuclear applications.

CSA N299 Series

The CSA N299 series—Quality Assurance Program Requirements for the Supply of Items and Services for NPPs—is a widely used quality assurance standard for supplying items and services to nuclear facilities in Canada [104]. While not mandated directly by regulation, it is commonly invoked by utilities to meet their obligations under CSA N286:12 [103].

The CSA N299 framework is structured as a graded approach, ranging from Category 4 (least stringent) to Category 1 (most stringent), with requirements determined based on safety significance, complexity, and risk. This allows quality requirements to be aligned with the function and importance of the supplied item or service [104].

This flexible framework allows nuclear operators to specify appropriate quality controls based on the nature and function of each item or service, while allowing suppliers to tailor their quality program to the applicable category aligned with their scope of supply.

Key Takeaway: CSA N299 is not a certification standard. Suppliers are therefore not "CSA N299-certified"; rather, they implement a quality assurance program that meets the applicable N299 requirements as specified by the utility, reactor vendor or major contractor. Acceptance of a supplier's program is determined by the client or licensee, based on demonstrated alignment with project-specific and applicable regulatory expectations.

Table 6 - CSA N299 Series Standards

Categories	Description	Examples of Components/Services
CSA N299.4	Applies to commercial-grade* or low-complexity items that are not important to nuclear safety. These are commonly available, off-the-shelf products procured under conventional industrial standards and commercial QA programs.	Standard structural steel beams supplied for a warehouse building within the balance of plant of a nuclear facility, provided the structure and components are formally classified as non-safety and not credited in the nuclear safety analysis.
CSA N299.3	Applies to moderately complex items and services that are important to nuclear safety but do not involve supplier design responsibility. These items are more complex than commodity procurements and require controlled manufacturing, installation, and functional verification.	Packaged HVAC or ventilation systems credited for control room habitability or equipment cooling, where the system configuration is specified by the owner and must perform reliably under defined operating and accident conditions
CSA N299.2	Applies to items and services important to nuclear safety, for which the supplier is responsible for design. These systems directly support nuclear safety functions and require high reliability, rigorous configuration control, and verified and validated design processes.	Reactor monitoring instrumentation and control systems (e.g., radiation detection or neutron monitoring equipment), where the supplier designs the sensing, signal processing, and system architecture in accordance with nuclear safety requirements.
CSA N299.1	Establishes the highest-level quality assurance program requirements for organizations performing activities important to nuclear safety. It applies where safety-critical or safety-class systems are designed, manufactured, and supplied, requiring rigorous control of design, verification, configuration management, traceability, and regulatory oversight across the full lifecycle.	Design and manufacture of reactor pressure vessels, or design of a reactor core modules, and other safety-class reactor systems.

Note: The term "commercial-grade" in this context refers to items of lower safety significance and should be distinguished from Commercial Grade Dedication (CGD), which is a separate process used to qualify commercial items for nuclear applications.

ISO 9001 and ISO 19443

Not all goods and services supplied to nuclear facilities require a nuclear-specific QAP. Commercial-grade items and services are often provided under ISO 9001:2015 [105], a globally recognized quality management system standard applicable across industries.

Suppliers typically obtain ISO 9001 certification to demonstrate that their organization has implemented a structured QMS framework that supports consistent delivery of quality products and services and continual improvement of processes. It is a baseline standard sufficient for commercial-grade scopes. However, it is not a nuclear-specific standard. This distinction is important for suppliers looking to enter the nuclear supply chain.

For organizations supplying products or services critical to nuclear safety, ISO 19443 [106] builds on ISO 9001 by introducing additional nuclear-sector requirements, particularly regarding safety culture, traceability, and supplier oversight. Although ISO 19443 is more widely adopted in European markets than in Canada, export-oriented suppliers may encounter it when serving international SMR or nuclear projects.

Key Takeaway: ISO 9001 is sometimes informally compared to CSA N299.4; however, they serve distinct roles within a nuclear quality framework. ISO 9001 defines baseline commercial quality management practices, whereas CSA N299.4 applies nuclear-specific controls to ensure that commercially procured, non-safety items are appropriately classified and justified for use in a nuclear facility.

3.3.3. Pressure-Boundary Codes, Standards, and Jurisdictional Oversight

For suppliers seeking involvement in pressure-retaining components—such as pressure vessels, piping, boilers, steam generators, or related supports—the applicable regulatory, technical and quality requirements depend on the item's function, safety classification, service conditions, code boundary, jurisdiction and customer specifications. Accordingly, suppliers must first confirm the applicable classification, code boundary and contractual requirements before determining the required technical qualifications, certifications and quality program.

Not all pressure-retaining equipment within a nuclear power plant is nuclear-classified. Conventional or non-nuclear-safety-related systems may be governed by generally applicable boiler, pressure-vessel and piping requirements, such as CSA B51 [107], ASME BPVC Section VIII [108], or ASME B31.3 [109], together with applicable provincial legislation and customer requirements. Saskatchewan's conventional pressure-equipment framework, for example, includes design registration, inspection and authorization requirements administered by the Technical Safety Authority of Saskatchewan (TSASK).

Pressure-retaining systems, components and supports that perform a nuclear safety function are subject to more stringent requirements commensurate with their classification. In Canada, the CSA N285 series [110] establishes requirements for pressure-retaining systems, components, and supports in CANDU NPPs and references applicable requirements from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), particularly Section III[12], which governs the design and construction of nuclear components. The CSA N285 series provides Canadian-specific requirements, exceptions and supplementary provisions to the rules related to materials, fabrication, installation, inspection, and quality assurance.

[12] ASME BPVC Section III is a widely adopted (non-Canadian standard) that outlines the requirements for the construction of nuclear power plant components, including pressure vessels, piping, and valves [111].

With new reactor technologies being considered for deployment in Canada, CSA N285.0S1:26 [112], *Supplement No. 1 to CSA N285.0:23*, was published in February 2026 to introduce technology-neutral requirements for pressure-retaining systems and components. The supplement extends the applicability of the N285 framework beyond its traditional CANDU context while working in conjunction with the base standard and referenced codes.

Authorized Inspection Agency (AIA) and Jurisdictional Oversight

In addition to meeting applicable codes and standards, suppliers of pressure-retaining equipment must comply with the inspection, registration and authorization requirements applicable to the specific scope of work. The required oversight pathway depends on whether the equipment is governed primarily by provincial pressure-equipment legislation or forms part of a nuclear pressure-boundary program regulated federally by the CNSC.

An Authorized Inspection Agency (AIA) is an independent organization qualified and accredited to perform independent inspections and verification activities required by applicable pressure-equipment codes. Depending on the jurisdiction and regulatory arrangement, an AIA may be a jurisdictional authority, or an insurance-based or qualified third-party inspection organization.

AIAs support manufacturers, fabricators, constructors and installers in obtaining or maintaining Code authorizations[13] and performing pressure-boundary work for a defined scope. However, a supplier's Code authorization does not automatically qualify it for a specific nuclear project; the supplier must also meet the owner or licensee's procurement, qualification and project-specific requirements.

Examples of provincial authorities in Canada responsible for non-nuclear pressure equipment regulation include the TSASK, the Technical Standards and Safety Authority (TSSA) in Ontario, the Alberta Boilers Safety Association (ABSA), Régie du bâtiment du Québec (RBQ), and Technical Inspection Services (TIS) in New Brunswick. These organizations administer applicable provincial legislation and authorization requirements for regulated pressure equipment within their respective jurisdictions.

Nuclear pressure-boundary activities are regulated federally by the CNSC, with licensees maintaining appropriate pressure-boundary programs and AIA arrangements in accordance with applicable CSA N285, ASME and licensing requirements [114],[115].

For Canada's existing operating NPPs, the provincial regulatory authorities in Ontario and New Brunswick perform AIA and authorized nuclear inspector (ANI) duties on behalf of CNSC licensees under service agreements recognized by the CNSC. The availability of nuclear pressure-boundary inspection and authorization pathways in Saskatchewan will be an important readiness consideration for planned deployments in the province. This is further discussed in later sections of this report.

Key Takeaway: Nuclear pressure-boundary oversight.

- CNSC provides federal regulatory oversight;
- CSA N285, ASME Section III and other applicable codes establish technical requirements;
- The AIA provides independent inspection and verification;
- The Supplier or contractor maintains the required Code authorization and quality program for its defined scope; and
- The project licensee maintains the project pressure-boundary program and AIA arrangements and determines project-specific supplier acceptance.

[13] Code authorization refers to formal authorization or Certificates of Authorization (COA) permitting an organization to perform defined activities in accordance with an applicable pressure-equipment code, such as ASME BPVC Section III. The authorized scope may include activities such as manufacturing, fabrication, installation or assembly, depending on the certificate held [113].

3.3.4. International Quality Framework Considerations

Suppliers seeking to participate in nuclear projects outside Canada, or in domestic projects led by international technology vendors, may encounter additional regulatory and QA frameworks beyond those commonly applied in the Canadian market.

In the United States, nuclear quality requirements are governed by Title 10 of the Code of Federal Regulations (10 CFR 50, Appendix C) [116], with quality assurance programs for the supply of items and services typically aligned with ASME NQA-1[14] [117]. U.S. utilities and vendors may require suppliers to demonstrate compliance with NQA-1, or an equivalent standard, as a condition of contract.

In European and other international markets, ISO 9001 is commonly used as a baseline quality management framework, with ISO 19443 applied to organizations supplying products or services important to nuclear safety. ISO 19443 builds on ISO 9001 by introducing additional nuclear-specific requirements, including those related to safety culture, traceability, and supplier oversight.

While there is conceptual alignment across Canadian, U.S., and European nuclear quality frameworks, equivalency is not automatic. Differences in documentation requirements, audit expectations, terminology, and qualification pathways may require suppliers to adapt or supplement their quality programs when serving multiple jurisdictions.

For Saskatchewan suppliers, early consideration of these international frameworks may support participation in projects led by global reactor vendors and enable access to export opportunities. Proactive alignment can reduce the need for reactive modifications to quality programs and support more efficient entry into international nuclear supply chains.

Relevance for Saskatchewan Suppliers

The starting point for nuclear supply chain participation is a clear understanding of the customer's requirements and expectations for the specific item or service they intend to supply. As discussed earlier, these requirements may be defined through procurement specifications, contracts, applicable codes and standards, safety classifications, regulatory obligations, and vendor- or utility-specific processes. They determine the appropriate quality management approach, and whether existing commercial quality practices are sufficient or a formal nuclear quality program is required.

3.4. Nuclear Quality Program Development

As discussed in **Section 3.3**, the quality requirements applicable to a supplier depend on the intended scope of supply, the safety significance and classification of the item or service, and the customer's contractual requirements. This section focuses specifically on suppliers pursuing scopes that require development of a formal nuclear quality program and qualify for inclusion on vendor QSLs.

The maturity of a supplier's existing quality system will influence the effort, associated cost and time required to achieve qualification. Suppliers with established systems, experience in regulated industries, and available resources and organizational capacity may be better positioned to adapt their processes, while less mature organizations may require more extensive development.

3.4.1. Determining Nuclear Quality Program Requirements

Prior to pursuing nuclear qualifications, suppliers typically assess how their quality program should align with the type of work being targeted. Where a formal nuclear quality program is required, a key consideration is whether nuclear quality requirements are incorporated into an existing quality system or managed through a

[14] ASME NQA-1 is the U.S. equivalent of what the CSA N299 is to the Canadian supply chain.

dedicated nuclear-specific program. Where nuclear work represents a limited portion of overall business, a standalone nuclear QAP may provide clearer scope definition and audit boundaries. Conversely, organizations with a significant or sustained nuclear workload may choose to integrate nuclear requirements into their broader quality management system [118].

Establishing this alignment early can help avoid unnecessary cost, over-scoping of quality systems, or misalignment between qualification efforts and actual market opportunities.

3.4.2. Typical Nuclear Quality Program Development Approach

Suppliers progressing toward nuclear qualification typically follow a structured development approach. Common elements observed across new entrants to the nuclear supply chain include scope definition, assessment of existing systems against applicable standards, internal program development, and staged validation prior to external review. At a high level, this process typically include:

- **Business Case and Scope Definition:** Define target markets, customers, investment requirements, customer expectations (e.g., HSE, ESG, quality, training, and certifications), program delivery requirements, and scope of goods and services to be provided. Alignment between the proposed scope and applicable quality assurance requirements is a key input to the investment decision.

- **Investment Decision:** Assess market opportunities, risks, and potential vulnerabilities (e.g., expected duration and repeatability of work), while developing a preliminary understanding of the factors outlined below to establish the basis for return on investment (ROI) before proceeding with further qualification activities.

- **Gap Assessment:** Evaluation of existing quality systems against applicable nuclear standards (e.g., CSA N299) to identify areas requiring development or enhancement.

- **Resourcing and Governance:** Establishment of internal project structure, including leadership, timelines, and resource allocation. Dedicated quality leadership and defined accountability are typically required.

- **Documentation and System Development:** Development or revision of quality documentation, including manuals, procedures, work instructions, and records management systems.

- **Implementation and Training:** Deployment of processes through training, safety culture integration, and demonstrated application within the organization.

- **Internal Audit and Corrective Action:** Internal validation of the quality program, including identification and resolution of gaps prior to external review.

- **External Audit and Qualification:** Assessment by customers or recognized audit bodies (e.g., CANIAC or CANPAC), resulting in qualification for a defined scope of work, typically with a specified validity period.

A more detailed example roadmap adapted from OCNI guidance [118] is provided in Appendix D. In practice, suppliers with established quality systems or prior experience in regulated industries may progress more efficiently, while new entrants may require more extensive development effort.

3.4.3. Cost, Timelines and Program Sustainment

The cost and time required to develop, implement and sustain a nuclear QAP reflect the same factors that shape quality program needs and development pathways. Unlike many industrial certifications, nuclear qualification costs are not transactional or fee-based; they reflect the cumulative effort required to establish disciplined,

auditable processes that are consistent with nuclear safety and regulatory expectations.

Primary Cost Drivers

In practice, cost drivers typically fall into the following areas:

- **Program Definition and Readiness Assessment:** Scope definition, safety classification, and gap analysis against applicable standards, supported by management, engineering, and quality resources.
- **Nuclear Quality System Development and Controls:** Development or enhancement of nuclear QAP documentation and implementing procedures, including document control, records management, nonconformance control, corrective action, and escalation processes.
- **Personnel, Training, and Expertise:** Recruitment or allocation of quality experts, training and qualification of personnel, safety culture integration, engagement of external specialists or Authorized Nuclear Inspectors where required, and increased management oversight during early implementation.
- **Facilities, Processes, and Supplier Control:** Enhancements to inspection, testing, calibration, handling, storage, traceability, and supplier oversight, including flow-down of nuclear requirements to sub-tier vendors.
- **Demonstration, Verification, and Audit Activities:** Process qualification, first-article inspections, trial builds or pilot runs, internal readiness reviews, external audits, and associated corrective action development and closure.
- **Program Sustainment:** Ongoing internal audits, management reviews, training refreshers, documentation updates, and requalification following scope or organizational changes.

For new entrants, nuclear QAP costs are typically front-loaded, with the greatest investment required during initial program development, implementation and initial qualification. As systems mature and nuclear culture becomes embedded, efficiency improves and sustainment costs stabilize.

Indicative Timeline Ranges

Qualification timelines vary significantly depending on the supplier's intended role within the supply chain (e.g., Tier 1 integrator, Tier 2/3 subcontractor), the scope (nuclear vs non-nuclear), baseline maturity, and other external influencing factors. Based on information received from SMR vendors, nuclear operators, and experienced nuclear sector participants (within Ontario), indicative timeline ranges under favourable conditions may include:

- **0–12 months:** Suppliers providing commercial-grade or non-nuclear-equivalent products and services can typically qualify for inclusion on VSLs maintained by utilities, reactor vendors, and major contractors.
- **12-36 months**: Suppliers with existing nuclear experience seeking to provide nuclear and non-nuclear scopes under comparable requirements can typically achieve Qualified Supplier status (inclusion on QSLs) with new utilities, reactor vendors, or projects.

For suppliers pursuing pressure-boundary or higher-safety-class scopes, timelines may extend by an additional 9–18 months or more, reflecting regulatory reviews, procedure qualification, demonstration builds, and third-party inspections.

Ongoing Program Maintenance

In addition to initial qualification, maintaining a nuclear quality assurance program requires ongoing effort and resources. This may include:

- Dedicated personnel responsible for quality program oversight and compliance
- Periodic internal (~yearly) and external (~every 3 years) audits, including requalification or surveillance activities

- Continuous training and competency development for staff
- Ongoing documentation control, record management, and process updates
- Sustained workload to support and maintain program implementation
- These ongoing requirements represent a continuing operational commitment and should be considered alongside initial development costs and timelines.

3.5. Considerations for Participation in the Nuclear Supply Chain

Participation in the nuclear supply chain is shaped by a combination of technical, regulatory, market, and programmatic factors. This section provides an integrated overview of how participation opportunities vary across nuclear deployments and the key considerations suppliers typically evaluate when assessing potential involvement.

This section is intended to provide contextual orientation rather than Saskatchewan-specific analysis or recommendations. The implications of regional participation are assessed later in the report.

3.5.1. Considerations for Supply Chain Opportunities

Supply chain opportunities within nuclear deployment vary across projects and are influenced by multiple dimensions, including reactor technology selection, plant configuration, project lifecycle phase, and delivery strategies adopted by owners and technology vendors. These dimensions shape when opportunities arise, the degree of specialization required, and how accessible different supply chain segments may be to prospective suppliers.

Supply Considerations by Reactor Technology

The characteristics of the selected reactor technology directly influence the structure of supply opportunities. Grid-scale SMRs and microreactors present distinct supply chain profiles, particularly with respect to manufacturing, transportation, and on-site activities.

Grid-scale SMRs generally rely on modular construction approaches in which major components and assemblies are manufactured off-site and assembled on-site. This model supports participation in both factory-based manufacturing and on-site construction, installation, and integration activities, creating more visible regional participation opportunities during these phases.

By contrast, microreactor designs are typically intended to be largely factory-fabricated and delivered as integrated or semi-integrated units. Under this approach, a greater proportion of value is concentrated within specialized manufacturing environments, while on-site scope may be more limited and focused on site preparation, installation, and supporting infrastructure. These differences influence the timing, scale, and nature of supply chain participation and emphasize the importance of understanding technology-specific delivery models when assessing opportunity alignment.

Supply Considerations by Plant Area and Quality Requirements

Participation opportunities also vary by plant area, reflecting differences in system function, safety significance, and associated quality assurance requirements. Functional parts of NPPs (e.g., nuclear island, turbine island, balance of plant, etc.) are described in Section 2.2.2. An important consideration for suppliers is how quality program requirements differ across these areas.

In general, quality requirements are highest for systems performing nuclear safety functions and decrease in a graded manner for systems with lower safety significance. Table 7 provides an indicative mapping between plant areas, typical scopes, and associated quality requirements.

Waste management activities represent a distinct element of the nuclear supply chain. Participation in the management of radioactive waste is typically limited to

Table 7 - Indicative Supply Opportunities by Plant Area and Quality Requirements

Plant Area	Typical Scope	Indicative QA Requirements	Typical Supplier Capabilities / Entry Points
Nuclear Island	Reactor systems, safety-related components	CSA N299.1	Suppliers with established nuclear QAPs, design control, and traceability capabilities
Turbine (Conventional) Island	Turbines, generators, auxiliary systems	CSA N299.2 – N299.3	Suppliers with moderate to advanced QA systems supporting reliability and integration
Balance of Plant (BOP)	Utilities, support systems, infrastructure	CSA N299.4, ISO 9001	Broad supplier base, including commercial and industrial suppliers with structured QMS
Waste Management Area	Waste handling, storage, processing systems	CSA N299.1 – N299.4, ISO 9001	Varies by risk; opportunities for both specialized nuclear suppliers and supporting service providers

Note: This mapping is indicative only. Not all components or services located within higher safety plant areas (such as the nuclear island) necessarily require the highest nuclear QA category. Requirements are applied using a graded approach and depend on the specific function and safety role of the item or service rather than its physical location alone.

licensed operators and specialized organizations with established regulatory approval. Conventional and operational waste streams, however, may offer broader participation opportunities for suppliers providing industrial services, logistics, and environmental management. Fuel cycle and radioactive waste considerations are addressed separately through a parallel SIMSA/Westinghouse fuel cycle workstream, with a summary of key findings provided in (Appendix C).

Supply Considerations Across the Project Lifecycle

Supply chain participation opportunities evolve across the project lifecycle. While the nuclear project lifecycle is described in Section 2, Table 8 provides representative examples of how participation opportunities typically align with different lifecycle stages.

Across the lifecycle, participation tends to shift from early-stage advisory and engineering services to construction and manufacturing activities, followed by sustained service and maintenance opportunities during

Table 8 - Representative Participation Opportunities Across Different Lifecycle Stages

Lifecycle Stage	Indicative Participation Opportunities
Site Evaluation & Early Development	Environmental studies, geotechnical investigations, permitting support, site services, stakeholder and community engagement support
Design & Licensing	Engineering and design support, site adaptation of designs, modelling and analysis
Construction & Installation	Civil and structural works, mechanical and electrical installation, fabrication and manufacturing, logistics
Commissioning	Testing and verification services, calibration, inspection, documentation and training support
Operation & Maintenance	Facilities management, maintenance services, environmental monitoring, consumables and replacement parts
Decommissioning	Planning and regulatory support, dismantling services, materials management, site restoration

operation. Understanding these lifecycle dynamics supports more informed assessment of when participation opportunities are most likely to align with a supplier's capabilities and business model.

3.5.2. Considerations for Participation

Beyond the availability of supply chain opportunities, suppliers typically consider a range of strategic, regulatory, financial, and capability-related factors when evaluating participation in nuclear projects. The following considerations reflect observed industry practices and stakeholder input rather than present Saskatchewan-specific conclusions or prescriptive guidance.

Policy and Program Signals

Policy direction and program signals from governments and utilities often influence participation decisions by shaping long-term demand expectations and investment confidence. These signals may include nuclear energy policy statements, enabling legislation, funding programs, siting activities, technology selection, licensing progress, and program timelines. The clarity, stability, and continuity of such signals may affect the willingness of suppliers and institutions to commit resources.

Industry Intelligence and Market Engagement

Access to reliable technical and commercial intelligence supports informed decision-making. This includes understanding regulatory requirements, qualification pathways, vendor expectations, delivery models, and procurement structures. Engagement through industry associations, conferences, working groups, and vendor outreach supports relationship development and improves awareness of emerging opportunities.

Financing and Investment Readiness

Participation in the nuclear supply chain capabilities may require capital investment in systems, equipment, personnel training, and certification programs. Suppliers may assess the availability and timing of capital relative to anticipated project milestones. Risk-sharing partnerships and access to government support programs may influence the feasibility of participation.

Competitive Positioning

Potential participants commonly assess competitive positioning relative to existing or emerging competitors. Considerations may include price competitiveness, schedule performance, prior nuclear experience, specialization in niche capabilities, and the ability to integrate within larger delivery teams. In some contexts, regional participation objectives or economic development priorities may also influence competitive dynamics and supplier positioning.

Accreditations, Certification, and Quality Readiness

Nuclear projects are governed by stringent regulatory and quality assurance requirements. Entry pathways vary depending on the nature of the goods or services provided, the safety classification of supported systems, and the lifecycle phase addressed. Understanding applicable certification, qualification, and quality program requirements is a foundational consideration for participation.

Education and Training

Capability development may require targeted education and training aligned with nuclear industry expectations. Depending on the scope, this may include safety culture principles, operating experience programs, cybersecurity practices, counterfeit, fraudulent, and suspect item (CFSI) prevention, regulatory compliance awareness, and specialized technical qualifications (e.g., nuclear welding, inspection, nondestructive examination). Quality assurance competency is a particularly important consideration for suppliers providing safety-related goods or services.

Key Takeaways – Section 3

- Canada's nuclear supply chain is mature, built on sustained CANDU operations and characterized by strong regulatory oversight, established supplier networks, and proven delivery models.
- SMRs introduce new considerations. Supply chain needs vary significantly by reactor technology and design philosophy, particularly between light-water reactors and advanced Generation IV concepts that introduce alternative coolants, fuels, and operating conditions.
- For suppliers, nuclear supply chain entry begins with understanding the requirements applicable to the specific item or service, including customer expectations, safety classification, codes, standards and regulatory obligations.
- Supply chain participation is governed not only by capability, but by formal qualification, audit, and approval mechanisms that determine access to the supply chain.
- Canadian nuclear projects operate within a globally integrated market, where international sourcing of specialized components and services remains a structural feature. Opportunities for localization may expand over time.
- Participation in the nuclear supply chain requires a formal, auditable quality program applied using a graded approach. Developing and sustaining a nuclear QAP involves upfront investment and ongoing operational commitment.
- Nuclear supply chain opportunities vary by technology, plant area, and lifecycle stage, with differing requirements across systems and project phases.
- Supplier participation decisions are shaped by a combination of market signals, investment readiness, qualification requirements, access to capital, workforce capacity, and competitive positioning.



4. Saskatchewan's Baseline Capabilities

4.1. Saskatchewan's Nuclear Supply Chain Context

Saskatchewan is at an early stage of participation in the nuclear power supply chain. Unlike Ontario and New Brunswick, the province does not currently host a commercial NPP or an established network of nuclear power project suppliers. Consequently, many Saskatchewan firms have limited direct experience with nuclear power procurement, qualification and project delivery requirements.

However, Saskatchewan is not starting from a blank slate. The province has a longstanding role in Canada's nuclear sector through uranium exploration, mining, milling and transportation. It has also developed relevant institutional and research experience through the operation of the SLOWPOKE-2 research reactor from 1981 to 2019 [119], medical-isotope production at the Saskatchewan Cyclotron operated by the Sylvia Fedoruk Canadian Centre for Nuclear Innovation [120], the Canadian Light Source [121], and the Radiation Safety Institute of Canada's National Laboratories, among others [122]. These activities have contributed to provincial experience with nuclear regulation, radiation safety, safety culture and compliance-driven operating environments.

Beyond these direct nuclear activities, Saskatchewan has a substantial industrial base with potentially transferable capabilities developed in adjacent sectors, as described in the following subsections. The extent to which these capabilities align with nuclear requirements—and the additional qualifications, systems, infrastructure or partnerships that may be required—is assessed throughout this section and in Sections 6 through 8.

4.2. Saskatchewan Industrial Landscape

Economic Landscape

Saskatchewan has a strong industrial economy supported by activity in mining, energy, agriculture, manufacturing,

and construction. In 2024, Saskatchewan's real Gross Domestic Product (GDP) reached approximately $83.6 billion, representing year-over-year growth of 3.1%, exceeding the national average and positioning the province among the fastest-growing economies in Canada [123].

This growth has been accompanied by strong investment levels. In 2025, private capital investment reached approximately $19.7 billion, reflecting continued expansion across key industrial sectors and supporting sustained growth across a wide range of engineering, fabrication, and project delivery capabilities in the province [124].

Resource Development and Large-Scale Project Experience

Saskatchewan's industrial base is anchored in decades of resource development and large-scale project delivery. Long-term investment in mining, oil and gas, and energy systems has supported the development of a supplier network experienced in industrial construction, heavy equipment operation, complex processing environments, and long-term asset management.

This includes participation in potash developments, uranium operations, and energy infrastructure projects—all of which require coordination across engineering, procurement, construction, and operations.

Cyclical, Resource-Driven Economy

The province's resource-based economy is inherently cyclical, which has helped develop both a resilient and adaptable supply chain. Saskatchewan firms are accustomed to fluctuations in demand and have built operational flexibility, cost discipline, and the ability to scale activities in response to changing market conditions.

Regulated Operating Environments

Many of Saskatchewan's core industries also operate within regulated environments, particularly in areas such as uranium mining, oil and gas, and large-scale infrastructure development. Through this experience, suppliers have developed competencies in areas such as precision engineering, hazardous materials handling, high-pressure system operations, and adherence to structured safety and quality frameworks.

Supplier Profile: Small- to Medium-Sized Enterprises

Saskatchewan's industrial supply chain is largely composed of small- and medium-sized enterprises. Many firms operate as specialized service providers, fabricators, or contractors supporting larger industrial projects within defined scopes of work. Firms often develop niche capabilities and operate with lean organizational structures. These small- and medium-sized enterprises are typically engaged as part of broader teams delivering large, multi-scope projects.

Geographic Distribution & Market Access

Industrial activity within Saskatchewan is geographically concentrated. A significant portion of suppliers are located in major urban centres such as Saskatoon and Regina, as well as in regions associated with major mining and energy operations. Notwithstanding, industrial activity routinely engages suppliers across regions as required. Suppliers are mobilized efficiently through

Table 9 - Saskatchewan – Key Economic Indicators

Key Economic Indicator	Value or %	Context
Private Capital Investment (2025)	$19.7 Billion	+13.8% (Highest increase in Canada) [124]
Construction Sector Growth (2024)	+9.8%	Highest percentage change by industry [125]
Manufacturing Productivity (2024)	$87.5 / hour	2nd highest among provinces [126]
Manufacturing Capital Investment (2024)	$1.08 Billion	Record high for the province [126]

established transportation networks, enabling coordination and delivery across project sites within the province.

Saskatchewan's location, in the heart of the Canadian Prairies, also provides strategic access to broader markets. Manufacturers and suppliers can reach a population of over 270 million people within a two-day drive, enabling participation in projects across Canada and the United States [34].

Interprovincial Participation

As a result, Saskatchewan-based firms often contribute to projects across multiple jurisdictions, including providing specialized components, modular assemblies, field services, and long-term operational support.

In practice, external participation often occurs within larger project-delivery structures led by prime contractors, system integrators, or original equipment manufacturers based in other jurisdictions. This distributed model of participation is characterized by:

- Participation within defined segments of the value chain
- Integration with prime contractors and system integrators
- Scaling of involvement based on project phase and demand
- Adaptation to varying regulatory, contractual, and quality requirements

Indigenous Participation[15]

Indigenous participation is an established component of industrial development in Saskatchewan, particularly in mining, energy, and infrastructure sectors. Over time, this has expanded beyond workforce participation to include procurement, business ownership, environmental monitoring, and project engagement.

Organizations such as the Saskatchewan First Nations Natural Resource Centre of Excellence (The Centre) support coordination and capacity development, facilitating Indigenous involvement across the supply chain. Indigenous communities have also played active roles in environmental monitoring and regulatory processes, contributing to project oversight and long-term stewardship.

Overall, Saskatchewan has a well-developed and inclusive industrial ecosystem shaped by resource development, geographic positioning, and participation in multi-jurisdictional project delivery. The capabilities developed in this environment provide a foundation that may be transferable to the emerging nuclear sector within the province.

4.3. SIMSA: A Saskatchewan Supply Chain Industry Association

Saskatchewan's industrial supply chain is supported by organizations that coordinate firms and connect firms with project opportunities. The Saskatchewan Industrial and Mining Suppliers Association (SIMSA) plays a central role in this system.

SIMSA is a Saskatchewan-based industry association representing ~390 supplier companies (and growing) providing goods and services across the industrial, mining, energy, and defence sectors. Its membership spans a wide range of service, supply, and "work" categories, with construction-related services representing the largest segment, as illustrated in Figure 8. Member companies operate across multiple stages of project delivery and contribute to major resource and infrastructure developments both within Saskatchewan and across other jurisdictions.

SIMSA's Saskatchewan Supplier Database

SIMSA also maintains the Saskatchewan Supplier Database, which provides a centralized profile of member companies and their industrial capabilities. The database

[15] Further detail on Indigenous perspectives, priorities, and readiness is provided in the Saskatchewan First Nations Natural Resource Centre of Excellence SMR supply chain report.

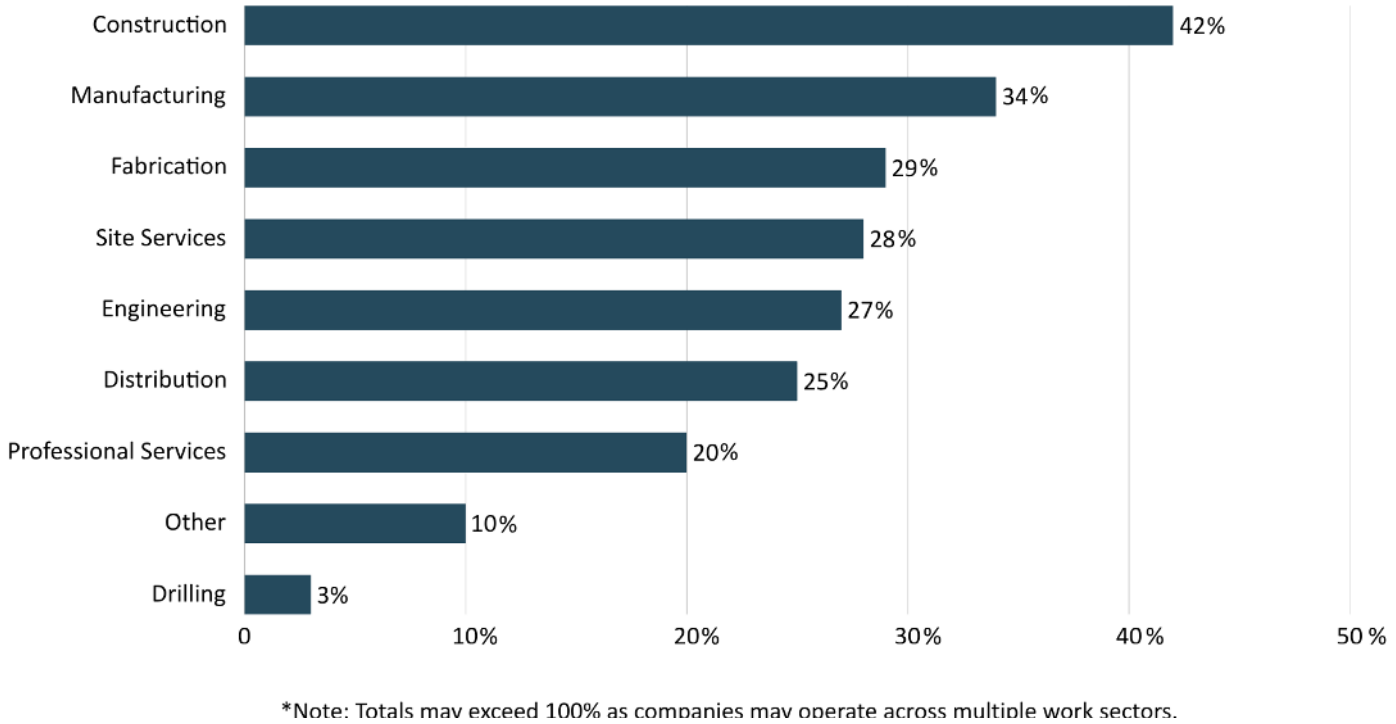


Figure 8 - SIMSA Membership Breakdown of Main Work Sectors (by % involvement)

supports visibility for project proponents, contractors, and other stakeholders seeking to identify Saskatchewan-based suppliers and understand the range of capabilities available within the province.

The database profiles member firms based on:

- **Local Presence:** Confirmation of a physical office and permanent staff within Saskatchewan
- **Technical Capabilities**: Classification by service or trade (e.g., fabrication, machining, environmental services, site support)
- **General Qualifications:** Information such as typical project size and relevant certifications (e.g., health and safety)

The database was also recently expanded to include indicators related to supplier interest in nuclear and SMR opportunities, reflecting evolving engagement with the sector. These include tags for:

- **Nuclear Awareness:** for companies that are "interested in nuclear," indicating they are attending briefing sessions and exploring the sector.
- **Readiness Levels:** tracking the journey of a supplier through categories like "becoming accredited" versus those that are already "accredited.[16]"

A summary of membership and nuclear-related indicators as of June 30, 2026, is provided in Table 10.

The database also includes an AI-enabled search feature that allows users to query supplier information from different sector perspectives, including nuclear, mining, defence and other industries. This functionality improves the accessibility and practical use of the database for supplier discovery and market engagement.

For this study, the database provided an important input to the high-level assessment of Saskatchewan's industrial capabilities and helped identify firms with potentially transferable capabilities and emerging interest in large-scale nuclear and SMR opportunities. As nuclear-specific

[16] "Accredited" refers to member companies that hold recognized nuclear quality certifications or have been audited to certain standards —such as CSA N299 or ASME NQA-1—and maintain an active business presence in Saskatchewan.

Table 10 - SIMSA Members Snapshot – June 2026

SIMSA Members as of June 30th, 2026	~390
Interested in Nuclear	122
Becoming Accredited	28
Accredited Or Audited	12

information continues to be incorporated, the database may also support future supplier engagement, capability development and connections between Saskatchewan firms and nuclear project organizations.

SIMSA Nuclear Supply Chain Readiness & Development Initiatives

In preparation for potential SMR and large-scale reactor opportunities, SIMSA has undertaken targeted engagement activities to increase supplier awareness, strengthen market connections and support supplier readiness. These efforts also provide overlapping benefits to other industrial sectors including, mining, defense, and aerospace.

These activities include hosting supplier information sessions, roundtables, and structured engagement forums with SMR technology developers and nuclear project stakeholders, as well as delivering nuclear quality awareness and transition-focused training cohorts. Through collaboration with organizations such as the OCNI, and as a member of the Canadian Nuclear Association (CNA), SIMSA has also facilitated trade missions, manufacturing facility tours, and business-to-business (B2B) engagements with established nuclear suppliers in jurisdictions such as Ontario and New Brunswick.

SIMSA's approach builds on experience developed through major-project procurement and supplier-development activities in Saskatchewan. In its recent SIMSA Major Project Procurement White Paper [127], SIMSA highlights lessons learned from its support to BHP during the development of the Jansen potash project. These lessons provide a relevant precedent for emerging nuclear projects, particularly where project organizations must identify, engage and develop local supplier capacity. This principle reflects SIMSA's broader supplier-development approach: moving beyond supplier identification toward sustained engagement, feedback and capability development.

In parallel, SIMSA has supported and led a range of supply chain studies and development initiatives related to SMR deployment and advanced manufacturing. These include federally and industry-funded assessments of Saskatchewan's industrial capabilities, supply chain gaps, and participation potential in emerging nuclear and clean-energy sectors. All of these initiatives are contributing to a growing understanding of the steps required to align Saskatchewan's industrial base with nuclear supply chain requirements.

> *"Robust supply chains are built on trust, communication, and consistent, quality supplier debriefs. Without these foundations, we are simply selecting suppliers rather than creating opportunities for learning, continuous improvement, and growth."*
>
> *— Eric Anderson,*
> *Executive Director (SIMSA)*

4.4. Existing Capabilities and Enabling Infrastructure

This section outlines Saskatchewan's existing industrial capabilities and infrastructure. It focuses on capabilities demonstrated in industrial sectors and provides context for the consolidated mapping to representative nuclear supply chain applications presented in Section 4.5. Saskatchewan's supply chain readiness and gaps are addressed in Section 7.

4.4.1. Manufacturing

Saskatchewan's manufacturing sector is an important component of its industrial base, with 2024 sales reaching $21.9 billion—one of the highest levels on record [126]. It comprises several hundred establishments across the province in key subsectors such as fabricated metal products and machinery manufacturing. These firms routinely design and manufacture complex, high-specification equipment for the mining, energy and processing industries. Typical scopes include pressure vessels, structural assemblies, material-handling systems, skid-mounted units, and specialized tooling. These activities require controlled fabrication environments, adherence to codes and standards, and coordination across engineering, quality, and production

4.4.2. Construction and Project Delivery

Saskatchewan-based contractors and EPCMs have experience delivering major projects across its key sectors. Work includes civil construction, mechanical and electrical installation, commissioning, and maintenance. These projects typically require coordination across contractors, regulators, and suppliers, and are characterized by stringent safety requirements, structured quality management systems, and formal change control and documentation practices.

4.4.3. Transportation and Logistics Infrastructure

Saskatchewan's transportation and logistics infrastructure supports the movement of large, heavy, and specialized equipment required for various industrial projects. A key asset is the Global Transportation Hub (GTH), an approximately 1,800-acre trimodal inland port and Foreign Trade Zone located near Regina, with direct access to the Canadian Pacific Railway mainline and major provincial highways, including the Trans-Canada corridor [128].

The GTH is designed to accommodate heavy-haul and oversized loads, with highway-grade, four-lane roadways and oversized shoulders suitable for long-combination commercial vehicles. It can function as a regional logistics and staging hub, supporting receipt of materials (by rail or truck), temporary laydown, consolidation, and transfer to heavy-haul transport for final delivery to project sites. Transport relies on provincial highway systems and permitting for oversized loads.

4.4.4. Environmental Baseline and Monitoring

Saskatchewan has an established environmental baseline and monitoring framework relative to other non-nuclear-power provinces in Canada, supported by longstanding uranium mining activities and regulatory oversight. Key elements of this capability include:

- Long-term regional baselines through programs like the Eastern Athabasca Regional Monitoring Program (EARMP), operating since 2011 and incorporating both technical and community-based monitoring components [129].
- Established CNSC–provincial–industry coordination, with routine environmental assessments, cumulative effects analysis, and public reporting embedded in uranium lifecycle regulation.
- Deep radiological expertise, particularly via the SRC, which has experience remediating 37 abandoned uranium mine and mill sites and conducting compliant radiological surveys, and the Radiation Safety Institute Canada (RSIC) Fergal Nolan National Laboratories in Saskatoon, which plays an important role in radiation safety in Canada [122].
- Indigenous-led and community-based monitoring models that are already trusted, structured, and regulator-recognized—critical for future nuclear siting and licensing.

4.4.5. Regulatory and Assessment Capability

Saskatchewan's regulatory environment includes established experience with environmental assessment processes, including those associated with uranium development and projects subject to CNSC oversight.

- The province regularly manages complex environmental assessments for uranium projects, including greenfield developments approved after multi-year baseline programs.
- Environmental and social review processes already integrate Indigenous Knowledge, cumulative effects assessment, and long-term monitoring commitments, aligning well with SMR requirements.
- The provincial government has publicly committed to nuclear as part of its First Energy Security Strategy, explicitly tying environmental stewardship, Indigenous participation, and supply-chain development together.

4.4.6. Research, Innovation and Workforce Development

Saskatchewan's industrial activity is supported by a network of institutions spanning academia, applied research, and workforce development. These include institutions such as the University of Regina, the University of Saskatchewan, Saskatchewan Polytechnic, SRC, the Sylvia Fedoruk Centre for Nuclear Innovation, the Canadian Light Source (CLS), and the Global Institute for Energy, Minerals and Society (GIEMS). Additional details on institutional capabilities and their key contributions to the emerging nuclear sector are provided in Appendix E.



Figure 9 - Saskatchewan Research and Training Institutions

4.5. Capability Mapping

The capabilities described in Section 4.4 align with functions required across nuclear supply chains. Table 11 provides a high-level mapping between Saskatchewan's existing industrial competencies and representative nuclear supply chain analogues.

This mapping illustrates areas of alignment. It does not indicate qualification or readiness. Participation depends on project-specific requirements, regulatory processes, and procurement structures, discussed in later sections.

Table 11 - Mapping Saskatchewan's Mining & Industrial Competencies to Nuclear Supply Chain Competencies

Industrial Competency	Current Saskatchewan Capability	Nuclear Supply Chain Analogue
Engineering Project Delivery and Technical Services		
Contracting & Project Management	Managing multi-billion-dollar mega-projects, such as the BHP Jansen potash development, uranium mine expansions, and heavy oil upgrader facilities.	Power plant site preparation, EPC management, and fleet rollout coordination.
Engineering Services	Delivering civil, structural, mechanical, electrical, and I&C engineering through local EPCMs for deep underground mining and remote facilities.	Power plant balance-of-plant design, seismic qualification engineering, and systems integration.
Specialty Engineering Services	Delivering geotechnical services, training, and feasibility assessments for industrial projects.	Power plant geotechnical site assessment work and nuclear safety training.
Project Controls Management	Applying cost engineering, scheduling, and risk mitigation to capital-intensive projects.	Schedule, cost, and risk management across SMR lifecycle phases.
Manufacturing, Fabrication, and Component Production		
Fabrication	Manufacturing structural steel, ASME pressure vessels, and large modules for mining/refining sectors.	Fabricating heat exchangers, structural supports, skids, and secondary system vessels.
Machining	Precision and large-scale machining driven by mining and agricultural equipment sectors.	Manufacturing reactor internals, steam turbine and generator components, valves, and nuclear-grade fittings.
Mechanical Equipment	Supplying pumps, compressors, and ventilation systems for underground operations.	Supplying nuclear-grade pumps, ventilation, and cooling systems.
Material Handling	Designing conveyor systems, hoists, and heavy lifting infrastructure.	Reactor fuel handling systems, cranes, and lifting rigs.
Nuclear Container Fabrication	Fabrication of heavy-duty transport and storage vessels to ASME standards.	Manufacturing spent fuel casks and radioactive transport containers.
Construction, Installation, and Asset Management		
Staff Augmentation and Managed Task	Supplying skilled trades and technical personnel for major industrial shutdowns.	Supplying nuclear-qualified trades during construction and outages.
Industrial Maintenance	Executing facility turnarounds and predictive maintenance in oil & gas and potash sectors.	Power plant outage execution and maintenance.
Reverse Engineering and Asset Sustainment Expertise	Replicating and extending life of specialized equipment.	Long-term nuclear asset management and replacement of legacy components.
Digital Systems, Automation, and IT Infrastructure		
Flow of Digital Information	Managing telemetry, communications, and remote operations networks for mining fleets.	Secure telemetry and nuclear control system communications.
Information Technology	Designing resilient enterprise and industrial IT systems for remote operations.	Nuclear plant IT systems and regulatory reporting infrastructure.

Industrial Competency	Current Saskatchewan Capability	Nuclear Supply Chain Analogue
Engineering Project Delivery and Technical Services (continued)		
Process Automation	Implementing SCADA, DCS, and automated control systems for industrial processes.	SMR control rooms, reactor automation, and safety logic systems.
Electrical and Instrumentation and Controls (I&C)	Designing and maintaining electrical grids and instrumentation systems; transformer manufacturing.	Non-safety-related I&C systems and grid integration.
Testing, Inspection, and Qualification		
Calibration & Testing	Calibration of industrial sensors and instrumentation in extreme environments.	Calibration of nuclear instrumentation and safety-critical sensors.
Equipment Qualification	Testing and certifying equipment for extreme conditions.	Qualification of nuclear components to stringent standards.
NDE Services	Ultrasonic, radiographic, and other inspection methods for pipelines and vessels.	Inspection of nuclear vessels, piping, and welds.
Nuclear Fuel and Materials Handling		
Nuclear Fuel (Supply)	Uranium mining and milling in the Athabasca Basin.	Supply of raw material for nuclear fuel fabrication.
Nuclear Fuel (Process and Containers)	Packaging and transport of uranium concentrate.	Transport containers and systems for nuclear fuel.
Environmental, Waste, and Decommissioning Services		
Environmental Services	Environmental assessments, monitoring, regulatory support, and stakeholder engagement.	Environmental monitoring for nuclear regulatory compliance.
Waste Management (Nuclear/ Non-Nuclear)	Managing tailings facilities and hazardous waste streams.	Management of radioactive waste and plant waste systems.
Decommissioning Services	Uranium mine remediation and oil well decommissioning.	Nuclear facility decommissioning and site remediation.
Logistics and Transportation		
Transportation & Logistics	Transport of oversized, hazardous, and industrial materials.	Transport of large nuclear components and regulated materials.

Key Takeaways – Section 4

- Saskatchewan has a mature, diversified industrial base supported by sustained economic growth, high levels of private investment, and decades of project delivery across mining, energy, manufacturing, construction, and infrastructure sectors.
- Strong experience in regulated sectors supports established practices in safety, quality, and compliance.
- The supply chain is predominantly composed of small- and medium-sized firms with specialized capabilities, typically operating within larger project delivery structures.
- Industry coordination and engagement are supported by organizations such as SIMSA, enabling visibility and supplier participation.
- Capabilities across engineering, fabrication, logistics, and environmental services are broad and transferable to emerging sectors.
- The province is at an early stage of positioning for nuclear participation, with initial alignment identified through engagement and capability mapping.



5. Industry Engagement Approach and Execution

Building on the industrial landscape and capability overview in Section 4, engagement activities were undertaken to gather input from industry, government, academia, and other key stakeholders to inform the assessment of Saskatchewan's participation in nuclear supply chains.

These engagements were conducted over approximately fourteen months (April 2025 – May 2026) during Phase 1 and formed the primary basis for the study's findings. They were designed to:

- **Validate:** Confirm the relevance and accuracy of information gathered through literature review, environmental scanning, and early WG discussions, and subsequently validate findings and conclusions with stakeholders prior to Phase 2;
- **Contextualize:** Capture the operational, commercial, and regulatory factors influencing supplier participation; and
- **Generate Insights:** Identify key challenges, opportunities, and enabling conditions for Saskatchewan suppliers

Insights derived from these engagements informed the findings presented in Section 6 and the broader analysis in Section 7.

5.1. Engagement Strategy

The engagement approach was designed to support a coordinated assessment of Saskatchewan's nuclear supply chain readiness across the study's four technical focus areas: Manufacturing, Deployment and Construction, Operations and Maintenance, and Fuel Cycle.

Engagement activities were sequenced to progress from early scoping and baseline information gathering, through structured input gathering, to validation and alignment of findings. Engagement methods included WG Sessions, interviews, surveys, workshops, and participation in relevant industry forums.

5.1.1. Pre-Engagement Preparation and Scoping

Prior to formal engagement, a pre-engagement phase was undertaken to establish a common technical and contextual baseline for participants.

The four WGs formed the primary mechanism for engagement in this study. Therefore, onboarding the WG participants was important. As part of this effort, a "Guidelines for Working Group Participation" document was developed and provided to all participants. This document outlined the project context, objectives, engagement approach, and roles of key organizations, including March, The Centre, and SIMSA. The guidelines are included in Appendix B.

This phase also included gathering baseline information. RFIs were issued to selected SMR vendors and other organizations to obtain relevant technical and supply chain inputs aligned with the study scope.

In parallel, scopes of work were developed for each of the four WGs to define focus areas and guide engagement discussions. These WG scopes are included in Appendix B.

Technical primers and briefing documents were also developed and distributed to support a common understanding of nuclear technologies, supply chain structure, and nuclear quality program expectations.

5.1.2. Engagement Execution

Stakeholder Participation

Engagement included participants across multiple segments of the nuclear supply chain ecosystem. These stakeholder groups and their roles are summarized in Table 12.

Participants represented varying levels of familiarity with nuclear projects, ranging from established nuclear organizations to firms exploring entry into the sector.

Engagement included both Saskatchewan-based participants and external stakeholders from established nuclear jurisdictions, providing a combination of local insight and benchmarking perspective.

Framework and Thematic Focus

A consistent framework was applied across all engagement activities. Discussions were open-ended and guided by a common set of themes related to nuclear supply chain participation, including:

- Organizational and technical readiness
- Regulatory and quality assurance requirements
- Supply chain structure and market access
- Procurement approaches and supplier qualification pathways
- Partnership and collaboration models
- Workforce availability and skills development
- Investment considerations and risk

Table 12 - Stakeholder Groups Engaged and Roles in the SMR Supply Chain

#	Participant Category	Role in Nuclear Supply Chain
1	**Utilities and Potential Operators**	Project ownership, operations, and long-term asset management
2	**Nuclear Technology Vendors**	Reactor design, technology supply, and system integration
3	**Suppliers and Manufacturers**	Component fabrication, materials supply, and related services
4	**Constructors and EPC/EPCM Firms**	Site construction, installation, and commissioning
5	**Government and Crown Corporations**	Policy development, funding, regulatory interface, and system planning
6	**Academic and Research Institutions**	Workforce development, training pathways, and research

A consistent set of discussion prompts was used to guide engagement activities and support comparability across participant groups. Interview guides and survey instruments are provided in Appendix F.

Engagement Activities

Engagement activities were conducted in a structured manner throughout Phase 1 across the stakeholder groups identified in Table 12.

WG sessions were convened at multiple stages of the study, progressing from early scoping discussions to more focused dialogue on capability gaps, supply chain requirements, and participation pathways.

Interviews were conducted across participants, including a mix of semi-structured and structured sessions. In total, approximately 28 structured interviews were conducted between January and February 2026.

Workshops were used to facilitate broader discussion and cross-sector exchange of perspectives. Two sessions were held:

- Workshop 1: collaborative discussion on supply chain readiness and capabilities;
- Workshop 2: validation of findings and Phase 1 close-out.

Surveys and questionnaires were used to capture input from a wider group of participants and to supplement discussion-based engagement.

In addition to structured engagement activities, project team members participated in relevant industry conferences, workshops, and forums related to nuclear energy, SMRs, and supply chain development. These included events such as the CNA Conference West (October 2025) and the CNA Conference (April 2026), among others.

To support transparency, consistency, and traceability of findings, engagement sessions and interviews were recorded where participant consent was provided. Meeting transcripts and summaries were generated through Microsoft Teams transcription tools and related AI-assisted processing, then reviewed and validated by project team members against meeting notes and participant feedback, where applicable.

Engagement Timeline

An overview of Phase 1 engagement activities, including the timing of each activity and the primary participant groups involved, is provided in Table 13.

Table 13 - Phased Timeline of Phase 1 Engagement Activities

Phase	Timeline	Engagement Activities	Primary Participants
Pre-Engagement & Alignment	Apr – Sept 2025	WG formation and onboarding; RFIs to nuclear vendors; development of WG scopes; release of technical primers and briefing materials	WG participants, Project Delivery Partners, nuclear vendors, government
Core Engagement – Initial Input	Sept – Oct 2025	Semi-structured interviews; nuclear vendor presentations; surveys and questionnaires; initial WG sessions	Suppliers, vendors, operators, constructors, academia, government
Core Engagement – Collaborative Sessions	Oct 2025	Workshop Session 1 (Saskatoon); WG discussions to explore supply chain readiness and capabilities	All participant groups
Core Engagement – Deep Dive & Validation	Jan – Feb 2026	Structured interviews (90 min); follow-up WG sessions; continued participant engagement	WG participants, industry stakeholders
Ongoing Industry Engagement	Sept 2025 – Apr 2026	Participation in conferences, forums, and industry events to gather market intelligence and emerging practices	Project team
Validation & Close-Out	May 2026	Workshop Session 2 to present findings, validate conclusions, and support Phase 2 transition	WG participants, broader stakeholders



6. Engagement Insight

This section presents a synthesis of key insights gathered through the engagement activities described in **Section 5**, reflecting perspectives across the four primary technical scopes of the study: Manufacturing; Deployment and Construction; Operations and Maintenance; and Fuel Cycle.

The insights presented capture stakeholder input and observations during Phase 1 engagement activities, as well as emerging themes identified by the project team through facilitated discussions and validation sessions. This section documents what was heard across engagement activities, and why these issues matter, without prioritizing issues or offering recommendations. Interpretation and analysis are presented in **Section 7** (Findings Analysis).

Section 6.1 summarizes common cross-cutting insights that emerged across the WGs, while Sections 6.2 through 6.4 present WG-specific insights for each technical scope.

Engagement insights related to the fuel cycle scope are covered in the Fuel Cycle report in Appendix C.

In addition to the core findings presented in Sections 6.1 to 6.4, several broader observations were raised during discussions that provide additional context for SMR deployment and supply chain participation. These are summarized in Section 6.5.

6.1. Common Cross-Cutting Insights

Engagement activities were initially structured to capture perspectives specific to the four technical scopes. However, as the engagement process progressed, it became evident that many of the issues raised by participants were not isolated to a single technical scope. Instead, common challenges, opportunities, and information needs consistently emerged across all WGs.

Importantly, participants consistently expressed a strong interest in participating in Saskatchewan's emerging SMR supply chain, while noting that participation will depend on several structural factors described below.

These recurring perspectives reflect the interconnected nature of the SMR supply chain and highlight system-level considerations that influence supplier participation across all tiers. For clarity, these are presented as a set of cross-cutting themes (CCT-#), which provide context for the Working Group–specific insights presented in Sections 6.2–6.4.

6.1.1. CCT-1. Strong Industrial Capability, Limited Clarity on Nuclear Alignment

Across all Working Groups, participants consistently emphasized that Saskatchewan's industrial base, particularly in mining, energy, construction, and heavy manufacturing, provides a strong foundation for potential participation in SMR projects. Many suppliers possess transferable technical expertise, project delivery experience and established quality systems.

At the same time, there was limited clarity on how existing capabilities in the province align with nuclear-specific requirements. While tools such as industry association listings and databases exist to catalogue supplier experience, these are not consistently used or aligned with nuclear-specific requirements. As a result, it is not always clear which suppliers may be capable of supporting SMR projects, at what level, and under what conditions.

Related information gaps

- Alignment of existing supplier capabilities with nuclear classifications and requirements
- Clarity on supplier positioning across different tiers of work

Why participants indicated this matters

Clarity on capability alignment affects how suppliers position themselves, how vendors identify potential partners, and how early engagement with the supply chain is initiated.

6.1.2. CCT-2. Localization Expectations and Scope Realism

Participants across multiple Working Groups frequently distinguished between scopes that could realistically be localized within Saskatchewan and those that are likely to remain controlled by technology vendors or established



nuclear suppliers. Discussions repeatedly emphasized the distinction between balance-of-plant scopes, such as conventional fabrication, construction activities, and supporting services, and nuclear island components, which are typically subject to more stringent technical, regulatory, and vendor qualification requirements.

Participants noted that many SMR vendors maintain closed or established supply chains for nuclear safety-related components, often relying on pre-qualified suppliers with prior nuclear experience, either domestically or internationally. Participants indicated that Saskatchewan firms may face challenges competing directly with established nuclear suppliers in other provinces, particularly those with long-standing experience supporting existing reactor fleets and ongoing SMR builds such as the DNNP. This perceived competitive disadvantage was identified as a barrier to early participation in the absence of clear localization targets.

At the same time, discussions emphasized the importance of accurately characterizing provincial capabilities. While interest in local participation is strong, several stakeholders cautioned against overstating readiness for nuclear-specific scopes without a clear understanding of qualification requirements and vendor procurement strategies.

Related information gaps

- Greater clarity on which SMR systems and components are likely to be open to new suppliers versus vendor-controlled supply chains
- Better understanding of the balance-of-plant versus nuclear island scope boundaries for different reactor designs
- Visibility into vendor qualification pathways for new regional suppliers

Why participants indicated this matters

Realistic expectations regarding localization are essential to maintaining credibility with nuclear vendors and project developers and avoiding misaligned investments. Clear scope definition was viewed as a prerequisite for meaningful and sustainable regional participation.

6.1.3. CCT-3. Nuclear Quality Assurance and Accreditation Remain Key Barriers

Nuclear QA and accreditation requirements were identified across all WGs as one of the most significant barriers to entry. Participants highlighted the complexity, cost, and timelines associated with implementing nuclear QA programs (e.g., CSA N299, ASME NQA-1) and obtaining customer qualification.

Many suppliers indicated that while they have strong commercial quality systems (e.g., ISO 9001), transitioning to nuclear-grade programs requires a substantial organizational, cultural, and financial commitment. Several suppliers expressed concern that nuclear QA upgrades may increase operational overhead, potentially affecting competitiveness in existing non-nuclear markets if projected nuclear opportunities do not materialize within expected timelines.

Related information gaps

Participants identified gaps related to nuclear QA requirements and certification pathways, including:

- Clarity on which standards apply to which scopes of work
- Whether to pursue independent nuclear QA programs or work under a qualified prime contractor
- Uncertainty around if and how to transition from existing commercial or industrial quality systems to nuclear QA programs.

Why participants indicated this matters

Without clearer, more transparent pathways, suppliers expressed concerns about either under-preparing and missing opportunities or over-investing prematurely without a defined project timeline.

6.1.4. CCT-4. Early Project Decisions Shape Access to the Supply Chain

Another cross-cutting insight was that opportunities for supplier participation are significantly influenced by early project decisions made by nuclear vendors and project owners.

Technology selection, plant design maturity, modularization strategies, factory fabrication versus on-site construction models, contracting approaches (e.g., EPC/EPCM and IPD), scope allocation between nuclear island and balance-of-plant systems, and service models all directly affect which suppliers can realistically participate and at which tier.

Participants also highlighted that infrastructure and logistics constraints, such as transportation routes, heavy-haul capacity, module-size limitations, and engineered-lift planning, may influence how modularization strategies are implemented and which fabrication and construction activities can occur locally.

Related information gaps

- Limited visibility into design maturity and configuration decisions
- Uncertainty regarding procurement strategies and contract packaging
- Understanding of transportation, infrastructure, and site logistics constraints that may influence supply chain participation
- Lack of clarity around localization expectations

Why participants indicated this matters

Without visibility into these early decisions, suppliers face difficulty assessing where they fit within the supply chain or determining when and how to invest in capability development. Early alignment between owners, vendors, and the regional supply base was consistently identified as critical to maximizing participation opportunities.

6.1.5. CCT-5. Market Certainty and Long-Term Signals Drive Investment Decisions

Across all Working Groups, participants consistently indicated that investment decisions, whether related to quality system development, facility upgrades, workforce expansion, or strategic partnerships, are strongly influenced by perceptions of market certainty. Two interrelated factors were repeatedly identified as shaping this certainty:

- Clarity around SMR deployment timelines and
- Confidence in sustained government policies and support.

First, participants emphasized the importance of credible project-level signals. Uncertainty regarding deployment schedules, contracting approaches, and the timing of final investment decisions makes it difficult for firms to determine when investments in nuclear readiness would begin to generate returns. Long development timelines and FOAK risks were viewed as particularly challenging for small and medium-sized enterprises, which may lack the financial capacity to sustain readiness over extended periods without near-term work.

Second, participants highlighted the role of government policy and commitment in shaping market confidence. While current provincial and federal support for nuclear energy was acknowledged, concerns were raised about long-term policy continuity (extending beyond electoral cycles) and the availability of support mechanisms for suppliers interested in participating in the nuclear supply chain.

Related information gaps

- Uncertainty around market timing, project timelines and final investment decisions
- Clear policy signals for support extending beyond electoral cycles
- Clarity on how government policies and support translate into defined localization targets,

procurement strategies, and deployment commitments

Why participants indicated this matters

Overall, several participants acknowledged that developing nuclear capabilities could represent a long-term strategic opportunity for regional firms, spanning over several decades. While the participants expressed interest in participating in nuclear projects, they emphasized that significant investments are unlikely without credible project-level timelines and confidence in sustained policy support that opportunities will materialize within a predictable, commercially viable timeframe.

6.1.6. CCT-6. Early Engagement, Visibility and Information Flow Shape Supplier Positioning

Participants emphasized that timely and transparent information flow, both from project stakeholders to suppliers and from suppliers to vendors, will be critical to enabling effective supply chain positioning.

From the supplier perspective, early access to high-level technical specifications, scope definitions, and qualification expectations would allow suppliers to conduct informed gap assessments and make strategic decisions regarding investment, partnerships, and workforce development.

Discussions highlighted that in practice, information related to reactor technologies, potential opportunities and participation requirements is often dispersed across multiple sources, including nuclear vendors, industry organizations, and public materials, making it more difficult for suppliers to access relevant information, understand expectations, and navigate entry pathways into the sector.

From the project stakeholder perspective, early visibility into Saskatchewan's industrial capabilities, capacity constraints, and areas of specialization would support more informed localization strategies and procurement planning.

Related information gaps

- Limited access to early project decisions, preliminary project requirements, detailed technical specification sheets and procurement lists
- Fragmentation of information across multiple sources
- Structured mechanisms to showcase regional capabilities to vendors and EPCM organizations
- Uncertainty regarding how and when suppliers can meaningfully engage in pre-procurement phases
- Procurement timetables

Why participants indicated this matters

Information asymmetry, where suppliers lack visibility into project requirements, and nuclear vendors lack visibility into regional capabilities, may reduce alignment, delay readiness, and limit local participation opportunities.

6.1.7. CCT-7. Staged Entry Pathways and Partnerships are Essential Enablers

Participants broadly recognized that readiness levels vary across scopes of work. While many Saskatchewan firms have experience in regulated and heavy industrial sectors, most have limited direct exposure to nuclear-specific quality programs, regulatory processes, and nuclear safety culture expectations.

As a result, engagements revealed that near-term participation potential is generally higher in non-safety-related and balance-of-plant scopes, whereas immediate readiness for safety-related nuclear island components and services is more limited.

Tiered entry approaches were widely viewed as practical mechanisms to reduce risk and build capability, including:

- Supplying non-nuclear safety-related components or services as an initial step before progressively providing more complex / safety-related goods and services while building trust, accountability and assurance.

- Operating under the quality program of an established nuclear supplier.
- Participating through joint ventures or strategic partnerships both within Saskatchewan (regional clusters) and inter-provincial.

Why participants indicated this matters

Given the limited experience of many Saskatchewan suppliers with the nuclear supply chain, well-structured partnerships and tiered entry pathways can accelerate readiness, reduce investment risks, and support sustainable capability development.

6.1.8. Workforce as a Cross-Cutting Readiness Enabler

Although workforce development was outside the primary scope of this study, workforce availability and capability emerged consistently across all WGs as a foundational dependency that cannot be meaningfully separated from scope definition, deployment timing, or delivery models. Participants emphasized that workforce considerations influence not only whether local participation is feasible, but also whether project schedules, sequencing assumptions, and execution strategies are realistic.

Participants noted that workforce availability is a shared concern across other sectors in the province, and not just the emerging nuclear sector. Discussions highlighted that Saskatchewan's workforce already supports multiple major industrial sectors, including mining, energy, and infrastructure, both within and beyond the province. As a result, workforce availability must be considered alongside competing demands, the timing of peak requirements, and the specific skill sets required at different stages of nuclear deployment and operation. For this reason, workforce development is being examined through targeted initiatives in the province, including studies conducted by the CIC and the CNA [130].

Workforce Nuances Across the Working Groups

While workforce availability is a shared constraint, participants highlighted distinct workforce dynamics across the WGs.

From a manufacturing perspective, workforce readiness was closely linked to the availability of skilled tradespeople, QA/QC personnel, documentation control specialists, and inspectors experienced in operating in highly regulated environments. Participants specifically identified Quality Engineers and Quality Management System (QMS) specialists as potentially constrained resources, particularly for small- and medium-sized enterprises where existing engineering staff may not have the capacity or specialized experience to develop, implement and sustain more rigorous nuclear quality programs. Discussions emphasized that nuclear quality programs introduce additional staffing, training, documentation and audit requirements that may not be readily met within existing organizational structures without targeted planning.

From a deployment and construction perspective, workforce considerations were framed primarily as execution risks. Participants emphasized the challenge of mobilizing skilled trades, experienced field supervisors, procurement engineers, and QA/QC personnel to support highly regulated construction activities. These roles were identified among the more difficult positions to fill, particularly where prior nuclear or major-project experience is required. Readiness was viewed as dependent not only on overall labour availability, but also on realistic work sequencing and effective coordination between trades. Participants highlighted that planning assumptions must account for peak construction demand, with workforce models likely to require supplementing local capacity with rotational or out-of-province labour, consistent with delivery approaches observed on recent large-scale projects in Saskatchewan.

From an operations and maintenance perspective, workforce considerations were defined by their long-term sustainability rather than short-term mobilization. Participants emphasized that O&M workforce needs span multi-decade operating periods and require sustained retention, succession planning, and structured knowledge transfer. Discussions highlighted the importance of skilled operations, maintenance, and technical personnel, as well as the need to adapt skill sets over time as facilities age

and as digital operations, remote monitoring, and predictive maintenance technologies are introduced.

Why participants indicated this matters

Workforce availability and skill alignment affect project scheduling, supplier capacity, and the ability to sustain participation across different phases of nuclear deployment. They noted that workforce planning must begin well in advance of project execution to avoid bottlenecks, mitigate schedule risk, and support realistic deployment strategies.

6.2. Manufacturing Working Group Insights

The Manufacturing WG explored the potential role of Saskatchewan's manufacturing sector in supporting nuclear deployment, with a focus on existing capabilities, readiness constraints, and potential pathways for participation in nuclear supply chains. The following manufacturing-specific themes (MFG-#) summarize key perspectives from manufacturers and WG discussions.

In this context, "manufacturing" is considered broadly and includes a range of supporting activities beyond the manufacturing floor, such as design, inspection, testing, logistics, etc., that may not be classified as manufacturing in isolation but are integral to the overall production process. A more detailed scope of the Manufacturing WG is provided in Appendix B.

6.2.1. MFG-1: Manufacturing Capabilities and Scope Boundaries

Participants consistently emphasized that Saskatchewan has a strong manufacturing base with capabilities aligned with several BOP, modularization, and supporting scopes relevant to nuclear deployment. At the same time, participants noted that the province's manufacturing base is predominantly oriented toward large-scale fabrication, modularization, and heavy industrial components. Capabilities related to smaller, high-precision components and specialized nuclear-grade manufacturing are less prevalent and may require retooling, new partnerships, or external sourcing.

Participants also emphasized the importance of accurately characterizing local manufacturing capabilities when discussing nuclear participation. Several stakeholders cautioned against overstating readiness for nuclear-specific scopes, noting that credibility with nuclear vendors and project developers depends on clearly communicating existing strengths while acknowledging areas requiring further development.

Overall, manufacturing capability was described as scope-dependent rather than binary. While many Saskatchewan firms appear well-positioned to contribute to BOP components and supporting systems, entry into certain nuclear-specific scopes may remain limited due to vendor-controlled supply chains and established supplier networks.

6.2.2. MFG-2: Early Design Visibility and Vendor Dependency Shape Local Participation

Participants repeatedly noted that visibility into detailed reactor design and component specifications can significantly affect the feasibility of local manufacturing participation. Because most SMR deployments remain at the FOAK stage, many designs are still being finalized, and, at the time of writing, detailed technical specifications or procurement packages are not readily available to manufacturers to inform planning decisions. As a result, manufacturing scopes are often described only in broad terms, creating a strong dependence on nuclear vendors and OEMs for access to component-level specifications and system requirements. Without greater clarity on these details, manufacturers indicated that it is difficult to assess product fit, conduct gap analyses, evaluate investment needs, or determine how they could realistically position themselves within emerging nuclear supply chains.

6.2.3. MFG-3: Investment Decisions, Lifecycle Demand, and Risk Exposure

Manufacturing investment decisions were described as highly sensitive to expectations regarding demand, timing, and repeatability of work. Several companies

described the risk of "building capacity with no work" as a major concern, particularly given the long timelines between when investments are required and when they can capitalize on procurement opportunities. Discussions echoed that significant capital investments, including developing necessary quality programs, obtaining necessary certifications and facility upgrades, are unlikely to occur without confidence that manufacturing opportunities will materialize within a reasonable timeframe.

At the same time, discussions highlighted that the nuclear sector offers potential long-term opportunities beyond initial plant construction. These include aftermarket services, replacement components, maintenance support, and other lifecycle manufacturing activities that may occur over multi-decade operating periods.

Participants noted that the nuclear supply chain would ideally not be the sole focus, but part of an advanced industries focus to ensure sustainability. Some manufacturers highlighted that pursuing nuclear-grade qualifications would create opportunities in adjacent sectors, including defence and aerospace, where similar quality standards and manufacturing practices are required.

6.2.4. MFG-4: Partnerships and Regional Collaboration as Entry Enablers

Participants emphasized that partnerships with experienced nuclear manufacturers represent a practical mechanism for Saskatchewan firms to gain experience and integrate into nuclear supply chains. However, several manufacturers noted challenges in maintaining sustained engagement with key vendors beyond initial discussions. As a result, participants suggested facilitated engagements between Saskatchewan manufacturers, nuclear vendors, and established nuclear suppliers in other provinces to help regional firms better integrate into existing supply chains.

Regional collaboration was also highlighted as a potential enabler. Participants noted that Saskatchewan manufacturers have a demonstrated history of collaborating on large industrial projects, even while competing in other contexts. Industry clusters, including potential "manufacturing hubs" or "centres of excellence," were identified as mechanisms that could support knowledge sharing, capability development, and coordinated participation in nuclear supply chains.

6.2.5. MFG-5: Government Support and Localization Policies are Critical Enablers

Participants indicated that clear government policy signals and targeted support mechanisms could play an important role in enabling manufacturing participation in nuclear supply chains. Several companies highlighted the potential value of clear localization signals or policy direction in encouraging project developers to engage regional suppliers where feasible, strengthening the social license, and retaining economic benefits in Saskatchewan.

Participants also noted that financial support mechanisms may be necessary to help companies manage the costs associated with nuclear readiness (e.g., certification costs, R&D, workforce training, technology upgrades. While larger firms may have the resources to begin preparing for nuclear participation independently, smaller manufacturers often require targeted support to ensure readiness. Small and medium-sized enterprises indicated that current grant application processes can be very resource-intensive and often discourage manufacturers from applying, especially when they do not always result in positive outcomes.

6.3. Deployment & Construction Working Group Insights

The deployment and construction WG explored Saskatchewan's capability to support SMR deployment from a construction and project delivery perspective, with a focus on existing capabilities, infrastructure considerations, and factors influencing participation. The following deployment & construction specific themes (DC-#) summarize key perspectives from constructors and WG discussions.

6.3.1. DC-1: Construction Capabilities and Scope Boundaries

Participants noted that Saskatchewan has a strong construction sector, with experience delivering large, complex industrial projects across the mining, energy, and other industrial sectors. Existing capabilities in the province include early works, site preparation, civil construction, concrete placement, structural erection, and site installations. These capabilities were viewed by participants as well aligned with the early-phase, non-nuclear and BOP construction scopes associated with nuclear reactor deployment. Discussions highlighted several subcontracting opportunities and potential for local participation.

However, participants noted that nuclear construction introduces additional procedural and oversight requirements compared to conventional industrial projects. These may include higher quality assurance expectations (e.g., NQA-1, CSA N299) and increased documentation, inspection, and traceability requirements.

Participants in this WG also emphasized the importance of clearly defining capability boundaries to avoid overstating readiness for nuclear-specific construction scopes.

6.3.2. DC-2: Infrastructure, Modularization, and Site Execution Interdependencies

Participants highlighted the strong interdependence between modular construction strategies, infrastructure capacity, and site execution feasibility. Decisions regarding module size, fabrication locations, and transport logistics were identified as key factors influencing construction planning.

Participants emphasized the need to consider transportation constraints, including road and rail capacity, heavy haul requirements, module size and weight limitations, and site access conditions. Additional considerations included laydown space, crane capacity, and engineered lift planning for large modular components.

Modular construction was viewed as offering potential advantages such as improved quality control in controlled manufacturing environments and reduced on-site congestion. However, participants emphasized that modularization shifts complexity upstream and does not eliminate on-site assembly and integration challenges.

Participants also noted that construction input should be incorporated early in the design process to ensure that modularization strategies are compatible with site conditions and infrastructure constraints. Early validation of infrastructure and logistics assumptions was viewed as essential to avoid downstream schedule and cost risks.

6.3.3. DC-3: Contracting Strategy and Risk Allocation Shape Constructor Participation

Participants emphasized that contracting approaches and risk allocation structures strongly influence constructor participation and pricing. FOAK[17] nuclear projects introduce execution and regulatory risks that may differ from those encountered in conventional industrial construction.

Some participants noted that contracting approaches and risk allocation structures could influence constructor participation in nuclear projects. Constructors generally expect to manage risks related to construction execution and site activities but may be reluctant to assume risks associated with reactor technology performance, design uncertainties, or regulatory approval processes. Participants indicated that where contractual structures allocate risks beyond a contractor's ability to manage, constructors may increase contingency pricing or decline to participate.

Participants indicated that contracting strategies should consider both the unique risk profile of early reactor deployments and the capabilities of the regional construction market. Aligning risk allocation with actual

[17] FOAK is used here in a broad project-delivery context. A future Saskatchewan SMR may or may not represent a technology first-of-a-kind, depending on the reactor selected and deployment timing; however, it would represent a new-build nuclear deployment in the province and may involve first-time jurisdictional, regulatory, workforce and supply chain considerations.

control and ensuring that contract structures reflect market realities were viewed as important factors in supporting effective project delivery.

6.3.4. DC-4: Regulatory Clarity and Inspection Frameworks

Participants identified uncertainty regarding the regulatory framework applicable to nuclear construction in Saskatchewan, including which codes and standards will apply and how these will be implemented at the provincial level. Questions were also raised regarding the role and involvement of AIAs in verifying compliance with nuclear construction requirements.

In addition, participants noted that clear technical scopes and specifications from project owners and nuclear vendors are required to support construction planning and contractor qualification.

Clarity in these areas are required for firms to assess readiness, understand compliance expectations, and determine the steps needed to participate in nuclear construction activities.

6.4. Operations & Maintenance Working Group Insights

The operations & maintenance WG examined how Saskatchewan organizations may participate in long-term nuclear reactor operations. Discussions focused on identifying service-based opportunities, operational models, and factors influencing the ability of regional firms to support NPPs over their operating life. The following operations & maintenance specific themes (OM-#) summarize key perspectives from constructors and WG discussions.

6.4.1. OM-1: Existing O&M Capabilities

Participants noted that Saskatchewan already has significant operational and maintenance expertise developed through major industrial sectors such as mining, conventional power generation, and large-scale energy infrastructure. These sectors require many similar operational capabilities relevant to NPPs, including equipment maintenance, plant operations, outage planning, inspection, and long-term asset management.

Participants highlighted that several NPP systems, particularly those associated with the turbine island and conventional balance-of-plant systems, are technologically similar to equipment used in coal- and natural-gas-fired power plants. As a result, regional service providers may already possess relevant operational experience for these systems. However, discussions also acknowledged that O&M activities associated with NPPs, particularly the nuclear island, remain subject to more specialized regulatory, safety, and training requirements, and as such, participation in nuclear-specific operational scopes may require additional qualifications and experience.

Participants noted that O&M opportunities are not expected to emerge until later in the project lifecycle compared to manufacturing or construction activities. As a result, many firms viewed O&M participation as a longer-term opportunity rather than an immediate area of engagement.

6.4.2. OM-2: Operations & Maintenance as a Lifecycle, Service-Based Activity

Participants emphasized that O&M activities span the entire lifecycle of an NPP, often lasting 40–60 years. These activities evolve over time and may include early commissioning support, routine operations and maintenance, outage support, refurbishment activities, obsolescence management, and long-term asset management. Unlike manufacturing and construction roles, O&M activities involve continuous service delivery over multiple decades. Service requirements change as facilities mature, technologies evolve, and operational priorities shift.

Deployment strategies were also identified as an important factor shaping O&M service opportunities. A single reactor unit may require a relatively small operating and maintenance workforce, limiting the scale of local service opportunities. In contrast, fleet-based nuclear

deployment means fleet-based services that could enable shared operational expertise, centralized maintenance, and specialized service providers supporting multiple units. Participants noted that fleet deployment may create stronger opportunities for regional service providers, including the potential establishment of centralized service centres supporting multiple facilities.

Participants noted that assessing O&M readiness requires understanding when different services occur across the plant lifecycle and how service delivery models may evolve over time.

6.4.3. OM-3: Digital Operations, Remote Monitoring, and Predictive Maintenance Shape O&M Models

Participants highlighted the increasing role of digital technologies in shaping modern nuclear operations. Emerging nuclear reactor designs are expected to incorporate digital operations platforms, remote monitoring capabilities, and predictive maintenance systems that support more proactive asset management.

Participants also noted that some O&M functions may be centralized or delivered remotely through vendor-operated control centres or specialized service providers. However, discussions acknowledged that the adoption of these technologies in a nuclear context introduces regulatory acceptance considerations, cybersecurity and data governance requirements, and the conservative safety culture typical of nuclear operations.

The extent to which digital and remote operating models are adopted will influence both local workforce requirements and the scale of regional service opportunities. Greater use of centralized monitoring and remote diagnostics may reduce the need for certain on-site services, while more site-based operating models may create additional opportunities for local service providers.

6.4.4. OM-4: Vendor and Operator Service Models Define Local Participation Potential

Participants noted that O&M service delivery will depend largely on decisions made by plant owners, operators, and nuclear technology vendors. Several stakeholders noted growing interest in vendor-led service models, including long-term service agreements where technology providers remain involved in plant operations.

Participants noted that different reactor technologies may adopt different operating philosophies, which may influence the division of responsibilities between plant operators, technology vendors, and third-party service providers.

Discussions highlighted the importance of early engagement with technology vendors and plant operators to better understand these aspects, as limited visibility into these service models makes it difficult for regional firms to assess readiness, plan investments, or develop relevant capabilities.

6.4.5. OM-5: Waste Handling and Operational Support Services as Tangible Entry Points

Operational (non-radioactive) waste handling and related support services were identified as potential entry points for regional participation in nuclear reactor operations. These activities may include management of filters, resins, general waste streams, containers, and overpacks, as well as associated inspection, documentation, and traceability processes within a controlled site environment.

Participants distinguished these activities from nuclear (radioactive) waste management, which is subject to specialized regulatory oversight and typically performed by licensed and highly qualified organizations.

Operational waste handling activities are closely tied to plant sites and often require local service delivery. As a result, these services may present more accessible opportunities for regional firms compared to specialized reactor operations or radioactive waste management functions.

At the same time, participants noted that these services are still performed within a regulated facility environment and may require adherence to site-specific procedures, environmental regulations, and quality requirements. A clear understanding of scope boundaries and applicable requirements will be important for firms assessing readiness to participate.

6.5. Additional Insights

The following observations reflect additional themes identified through stakeholder engagement activities, project team discussions and workshops, literature reviews, conference participation, and broader industry consultations conducted during Phase 1. These themes extend beyond the primary working group supply chain findings and provide broader context regarding institutional readiness, academia, regulatory considerations, and enabling conditions relevant to nuclear deployment in Saskatchewan.

Industry Association Engagement and Qualification Pathways

Discussions highlighted the role of industry associations such as CANPAC, NUPIC, NIAC, and CANIAC in supporting supplier qualification, vendor auditing, and alignment with nuclear quality requirements. These organizations provide standardized audit frameworks, shared supplier performance data, and established peer networks used by existing nuclear operators.

It was noted during discussions that early engagement with these organizations could be beneficial for prospective nuclear utilities or owners. Potential benefits identified include early exposure to nuclear safety culture, access to established vendor auditing and qualification processes, and insight into regulatory, procurement, and operational practices. Such engagement was viewed as a way to support readiness for nuclear operations and alignment with established industry expectations.



Academic and Workforce Development Readiness

Academic institutions in Saskatchewan are actively developing capabilities to support nuclear workforce readiness, including training programs, applied research, and partnerships with national and international organizations. Existing programs in engineering, trades, and technology provide a foundation for integrating nuclear-relevant content and supporting workforce transition into the sector.

In addition to post-secondary training, the importance of the broader talent pipeline was emphasized, including early engagement at the elementary and high school (K–12) level to support long-term workforce development. Increasing awareness and participation at the secondary school level was identified as a factor influencing future enrolment in post-secondary programs and overall workforce availability.

Several challenges were also noted, including the time required to develop and implement new curriculum, uncertainty related to project timelines and technology selection, and logistical constraints associated with delivering training outside major urban centres. Lessons from existing programs highlighted the importance of partnerships, community trust, and flexible delivery models in supporting effective training and workforce development.

Nuclear Incident and Emergency Preparedness

The topic of nuclear incident and emergency preparedness was raised during discussions as a broader consideration for nuclear deployment in Saskatchewan. While current arrangements support existing nuclear-related activities, it was noted that nuclear reactor deployment would require a more comprehensive and coordinated provincial response framework.

Comparisons to jurisdictions such as Ontario and New Brunswick were referenced, where established, multi-agency emergency response systems support nuclear operations and public safety.

Role of Advanced and Emerging Technologies

Discussions also highlighted the potential role of advanced and emerging technologies—including advanced manufacturing, automation, AI, simulation, and digital engineering tools, and data-driven systems—as enablers of nuclear supply chain development. A recent March-CSA Group study [131] examining advanced manufacturing technologies for SMR and nuclear applications identified increasing interest in these technologies within the Canadian nuclear sector.

Academic and research institutions in Saskatchewan are already engaged in related areas, including additive manufacturing and applied research. These technologies were identified as areas that could support innovation, improve efficiency, enhance quality assurance and inspection activities, strengthen workforce training through simulation-based learning, and improve project execution and operational performance as nuclear reactor deployment evolves.

It was also noted that increasing digitalization and the use of AI-enabled systems may introduce additional requirements related to cybersecurity, digital governance, data management, and workforce skills development, particularly within highly regulated nuclear operating environments.

Cybersecurity and Digital Infrastructure

Cybersecurity and digital infrastructure are becoming increasingly important considerations associated with future nuclear reactor deployment and supply chain participation. Modern reactor technologies are expected to rely heavily on digital systems for plant control, monitoring, automation, data management, remote diagnostics, and operational support, increasing the importance of secure and resilient digital infrastructure.

As a result, organizations seeking to participate in the nuclear supply chain may require additional capabilities related to cybersecurity governance, secure digital systems, software assurance, data management practices, and compliance with applicable nuclear and critical infrastructure requirements. Saskatchewan's existing experience in mining, industrial automation, and remote operations may provide relevant foundational capabilities that could support future nuclear-related digital infrastructure and cybersecurity requirements.

Public Perception and Social Acceptance

Public perception and social acceptance are important enabling considerations for future nuclear reactor deployment in Saskatchewan. Long-term project success may depend not only on technical and economic factors, but also on public confidence related to nuclear safety, environmental stewardship, waste management, and regulatory oversight.

Broader observations from other jurisdictions suggest that transparent communication, early engagement, and accessible public education can play important roles in supporting informed discussion regarding nuclear reactor technologies and their potential applications. The importance of community engagement, including engagement with Indigenous communities and local stakeholders, was also identified as an important consideration throughout future planning and deployment activities.

Key Takeaways – Section 6

- Strong interest exists across Saskatchewan's industrial base to participate in nuclear-related opportunities.
- Suppliers identified limited visibility into timelines, procurement pathways, and qualification requirements as key sources of uncertainty.
- Early engagement, clear information, and relationship-building were consistently identified as critical to effective participation.
- Readiness perspectives vary across firms, with stronger alignment among those experienced in large-scale or regulated projects.
- Participation is influenced not only by capability, but by access to information, entry pathways, and integration into existing supply chains.
- Additional themes highlighted broader system considerations, including institutional readiness, academia and workforce development, and the potential role of enabling advanced technologies.



7. Saskatchewan Nuclear Supply Chain Readiness Assessment

Building on the industrial landscape described in **Section 4** and the engagement insights presented in **Section 6**, this section provides an integrated assessment of Saskatchewan's readiness to participate in the emerging nuclear supply chain.

The assessment synthesizes Saskatchewan's existing industrial capabilities, supplier characteristics, and stakeholder perspectives and considers how these factors align with the structure, requirements and delivery of nuclear reactor projects. It examines how readiness varies across scopes of work, project lifecycle stages, and time horizons, and how provincial capabilities align with key reactor systems, components and services. Structural factors influencing participation and readiness outcomes are examined further in **Section 8**.

A detailed assessment of nuclear fuel cycle readiness and opportunities is presented separately in the Fuel Cycle report and is not addressed in detail within this section, except where relevant to broader supply chain considerations. See Appendix C for Fuel Cycle Report Summary.

7.1. Overview of Saskatchewan's Supply Chain Readiness and Participation Potential

Saskatchewan's supply chain readiness is characterized by the following:

Strong Interest in Nuclear Supply Chain Participation

Engagement findings indicate a high level of interest among Saskatchewan-based suppliers, institutions, and supporting organizations in participating in the emerging nuclear supply chain. This interest reflects both

Saskatchewan's energy transition context and the province's long history of participation in large-scale, regulated industrial projects. Many firms are actively exploring potential roles, attending awareness sessions, and assessing how their existing capabilities could translate to nuclear-related scopes of work.

Strong Tier 2 and Tier 3 Capabilities Alignment; Limited Tier 1 Integration

Saskatchewan's industrial base is currently well-positioned within Tier 2 and Tier 3 levels of the nuclear supply chain. Existing industrial capabilities, particularly in construction, heavy fabrication, logistics, environmental services, project execution, and site-based support, align closely with balance-of-plant systems and other non-safety-related scopes.

By contrast, readiness for nuclear Tier 1 integration roles—including nuclear island systems, turbine island, reactor technology integration, and safety-related components—is more limited. Participation at this level is often tied to prior nuclear experience, formal qualification, and established relationships within vendor-controlled supply networks.

Nuclear Supply Chain Readiness Is Uneven

Readiness across Saskatchewan's industrial base chain is not consistent. While some firms feel well-positioned to participate, others face uncertainty in how their capabilities align with nuclear opportunities.

This variation is most evident between firms with experience in large capital projects or regulated industrial environments and those without. More experienced organizations tend to be better aligned with nuclear requirements and are positioned to engage earlier, particularly in areas that build on their existing capabilities. In contrast, many others show more limited alignment, particularly where participation depends on nuclear-specific requirements, qualification processes, or integration into established supply chains.

This unevenness is also reflected in how readiness is perceived. At the individual firm level, confidence in technical capability is often strong. However, when viewed at the system level—across the broader supply chain—alignment appears less certain.

Participation Is Expected to Evolve Over Time

Participation in the nuclear supply chain is expected to develop progressively over time. Initial engagement is likely to focus on conventional construction, balance-of-plant component manufacturing, site services, logistics, and environmental and operational support functions.

Participation in more specialized or safety-related scopes and vendor-controlled segments of the supply chain is expected to develop over time as suppliers gain experience, build relationships, demonstrate capacity and nuclear quality, and progress through qualification pathways.

Project Definition and Delivery Models Shape Readiness Outcomes

Supply chain readiness is influenced not only by existing capability, but also by project-level decisions. Technology selection, deployment strategy, modularization approach, contracting model, and procurement strategy all affect which suppliers can participate and at what stage.

This study adopts a technology-agnostic approach and does not capture all project-specific considerations. In practice, readiness will depend on the characteristics of individual nuclear reactor projects. A supplier may be well-positioned under one deployment model and less aligned under another. Readiness should therefore be viewed in the context of evolving project definition rather than as a fixed condition.

Summary

Overall, Saskatchewan enters the nuclear supply chain from a position of strong foundational capability and transitional readiness. The province is well-positioned to participate meaningfully in accessible scopes in the near term, while more specialized nuclear roles will require

time, partnerships, and sustained project signals to develop.

This starting position provides a credible basis for participation, but it also underscores the importance of continued dialogue among government, project developers, industry and suppliers regarding localization objectives, project sequencing, and the pace at which readiness can expand across the full nuclear value chain.

7.2. Capability Mapping: Alignment to Nuclear Systems, Components & Services

To assess supply chain readiness in practical terms, Saskatchewan's industrial capabilities were mapped against representative, technology-agnostic nuclear systems, components, and service requirements. This mapping provides a high-level view of where existing capabilities align with anticipated project needs, where alignment is partial, and where capabilities are limited or absent.

The assessment draws on multiple inputs, including the provincial industrial profile (**Section 4**), SIMSA supplier data and classifications, and insights gathered through engagement activities (**Section 6**).

Two summary capability maps are provided for representative nuclear systems and components, as well as nuclear-related service categories in Table 14 and Table 15. These maps are intended to provide a broad indication of potential supply chain alignment and participation pathways and should not be interpreted as formal supplier qualification assessments or project-specific procurement evaluations. Individual supplier capabilities, manufacturing capacity, quality assurance programs, and readiness to perform nuclear work were not independently verified as part of this assessment.

The assessment distinguishes between:

- Industrial/commercial and balance-of-plant applications, and
- Nuclear-regulated and safety-related applications, which are shaded light purple in Table 14 and Table 15.

The readiness ratings reflect the degree to which existing Saskatchewan capabilities appear aligned with anticipated nuclear supply chain requirements:

- **Ready:** Existing capability substantially aligned with anticipated nuclear requirements
- **Near Ready:** Existing adjacent capability exists but would require qualification, investment, partnerships, or nuclear-specific adaptation
- **Development Required:** Significant capability, infrastructure, qualification, or ecosystem development required
- **Not Currently Available (NCA):** Capability not presently identified within Saskatchewan

Localization and export potential were also assessed using the following qualitative indicators:

- **High:** indicates strong potential for participation based on existing capability alignment and anticipated project requirements.
- **Moderate:** indicates conditional or selective participation potential, dependent on factors such as qualification, procurement approach, vendor acceptance, or market conditions.
- **Limited:** indicates relatively constrained participation potential under anticipated deployment conditions.

Table 14 - Nuclear Supply Chain Capabilities – Systems and Components

Component Category	Representative Systems / Components	Saskatchewan Readiness	FOAK Localization Potential	Long-Term Export Potential
Nuclear Steam Supply System (NSSS) Components	Reactor vessel, reactor core internals, control rod systems, containment systems, isolation condenser systems, steam generators, pressurizers	Not Currently Available	Limited	Moderate
Process Equipment & Heat Transfer Systems	Conventional heat exchangers, auxiliary cooling systems, water treatment systems	Near Ready	High	High
	Safety-related heat exchangers, nuclear cooling systems, nuclear-grade demineralizers, evaporators	Development Required	Moderate	Moderate
Steam and Power Conversion Equipment	Steam turbine and generator systems, condensers, moisture separator reheaters, steam jet air ejectors	Near Ready	High	High
Fuel Handling and Refueling Systems	Fuel handling machines, fuel racks, inspection systems, spent fuel handling systems	Development Required	Moderate	Moderate
Pumps, Valves, and Fluid Handling Equipment	Cooling water pumps, condensate pumps, bypass valves, vacuum pumps, displacement pumps, globe valves	Near Ready	High	High
	Reactor coolant pumps, safety-related feedwater pumps, ASME Section III valves, control valves, relief valves	Near Ready	Moderate	Moderate
Electrical Systems and Power Distribution	Transformers, switchgear, MCCs, cable systems, substations, auxiliary electrical systems	Ready	Moderate	High
	Safety-class UPS systems, safety-related switchgear, Class 1E electrical systems, nuclear-qualified transformers	Development Required	Moderate	High
Instrumentation, Controls, and Monitoring Systems	Process instrumentation, industrial controls systems, conventional DCS systems, monitoring equipment	Ready	High	High
	Safety I&C systems, reactor monitoring systems, radiation monitoring systems, nuclear DCS systems	Development Required	Limited	Moderate
Piping Systems and Pipe Supports	Non-ASME piping, HDPE piping, carbon steel piping, pipe supports, piping specialties	Ready	High	High
	ASME Section III piping, seismic pipe supports, safety-related piping specialties	Near Ready	Moderate	High
Structural Steel and Modular Fabrication	Structural steel, skids, platforms, Pre-fabricated/-engineered metal buildings, support assemblies, modular fabrication	Ready	High	High
	Seismic-qualified structural modules, safety-related support assemblies, nuclear structural fabrications	Development Required	High	High

Component Category	Representative Systems / Components	Saskatchewan Readiness	FOAK Localization Potential	Long-Term Export Potential
Tanks, Skids, and Packaged Auxiliary Systems	Chemical skids, surge tanks, packaged process skids, auxiliary storage tanks, off gas skids	Near Ready	Moderate	High
	Safety-related injection skids, nuclear auxiliary process skids, safety-related tanks	Development Required	Moderate	High
HVAC and Building Support Systems	Conventional chillers, auxiliary ventilation systems, industrial HVAC systems	Ready	High	Moderate
	Nuclear ventilation systems, contaminated area HVAC systems, HEPA filtration systems	Development Required	Moderate	Moderate
Construction Support and Lifting Equipment	Cranes, hoists, maintenance lifting systems, temporary lifting equipment	Ready	Moderate	Moderate
Waste Management and Radwaste Systems	Radwaste skids, off-gas systems, radioactive sludge and resin systems	Development Required	Moderate	Moderate

Table 15 - Nuclear Supply Chain Capabilities – Services

Service Category	Representative Services	Saskatchewan Readiness	FOAK Localization Potential	Long-Term Export Potential
Environmental and Site Investigation Services	Environmental permitting, biological/environmental studies, geotechnical investigations, drilling, soil testing, surveying, site mapping	Ready	High	Moderate
Engineering, Technical, and Regulatory Services	Nuclear engineering SMEs, fuel cycle expertise, licensing support, regulatory support, nuclear QA program support, nuclear risk analysis	Development Required	High	High
	Industrial engineering, geotechnical consulting, industrial QA support, industrial risk analysis, conventional power engineering	Ready	High	High
Inspection, Testing, and Calibration Services	Nuclear-qualified NDE/NDT, radiological calibration, radioactive materials testing, nuclear laboratory services	Development Required	High	Moderate
	Industrial NDE/NDT, materials testing, electrical/mechanical calibration, testing laboratories	Ready	High	High
Industrial Maintenance and Field Services	Nuclear maintenance support, outage support, radiation-controlled maintenance, nuclear I&C servicing	Development Required	High	High
	Mechanical maintenance, electrical maintenance, HVAC servicing, turbine/generator maintenance, water treatment servicing	Ready	High	High
Construction, Site Preparation, and Infrastructure Services	Nuclear construction support, safety-related infrastructure support, nuclear QA-controlled field activities	Near Ready	High	Moderate
	Earthworks, site clearing, grading, utilities infrastructure, substations, telecom/fiber infrastructure, temporary structures	Ready	High	Moderate

Service Category	Representative Services	Saskatchewan Readiness	FOAK Localization Potential	Long-Term Export Potential
Transportation, Logistics, and Warehousing Services	Radioactive materials transport, nuclear logistics coordination, regulated materials handling	Ready	High	High
	Heavy haul, road access, rail logistics, warehousing, spare parts storage, material transport	Ready	High	Moderate
Health, Safety, and Emergency Response Services	Radiological protection, nuclear emergency response, radioactive PPE handling, nuclear medical response support	Ready	High	Moderate
	Conventional PPE services, occupational safety support, industrial medical services, emergency response support	Ready	High	High
Security and Cybersecurity Services	Nuclear security force support, nuclear cybersecurity, nuclear security training, protected site security systems	Near Ready	Moderate	Moderate
	Physical security, electronic security, industrial cybersecurity, access control systems	Ready	High	High
Workforce, Training, and Operational Support Services	Nuclear simulator training, nuclear quality program training, nuclear workforce qualification programs	Near Ready	High	High
	Industrial safety training, HR support, accommodations, camp services, staffing support	Ready	High	Moderate
Digital Systems and IT Services	Reactor IT systems, nuclear cybersecurity systems, nuclear operations software applications	Not Currently Available	Moderate	Moderate
	IT systems, telecom/data systems, industrial software applications, business network support	Ready	High	High
Site Operations and Facility Support Services	Catering, custodial, groundskeeping, temporary offices, workforce accommodations	Ready	High	Limited

The following sections synthesize the broader patterns emerging from the capability mapping exercise by examining areas of strong alignment, conditional readiness, limited alignment, and broader readiness constraints influencing supply chain participation.

7.2.1. Areas of Strong Alignment

NPP Systems and Components

There is strong alignment between Saskatchewan capabilities and NPP requirements in non–reactor-critical manufacturing, fabrication, and modular support components. Mature alignment is evident in:

- Electrical infrastructure and balance-of-plant equipment, including transformers, substations, switchgear (non-Class 1E), bus duct, and bulk electrical materials rated ISO / commercial or N299.4.
- Structural steel, tanks, heat exchangers, and mechanical modules, particularly those fabricated to ASME Section VIII or lower nuclear classes, including large tanks, shell and tube heat exchangers, cooling tower structures, and intake works.
- Cranes, material handling, and lifting equipment (excluding reactor polar cranes), where local suppliers are "Near Ready" or "Ready" for turbine building, balance of plant, and auxiliary facilities.

- Piping systems and supports, including non-ASME and select ASME III piping, pipe supports, flanges, and underground systems where fabrication, coating, and modularization capability exists.

These areas align well because they closely resemble conventional power, mining, and industrial fabrication work already present in Saskatchewan, with manageable nuclear QA upgrades and limited vendor design encumbrance.

Services

Service alignment is notably strong across the full NPP lifecycle, particularly in:

- Construction, civil works, site preparation, transportation, and logistics, including heavy haul, rail access, camps, and workforce movement.
- Inspection, testing, and quality services, such as NDE/NDT, concrete and steel testing, and conventional QA/QC oversight.
- Engineering, project management, IT/telecom, cybersecurity, and environmental services, many of which are already operating at multi-industry regulatory standards.
- Health & safety, PPE supply, custodial, catering, and facilities support, which are already fully deployable for construction and operations.
- Services benefit from low vendor lock-in, limited IP sensitivity, and adaptability to nuclear requirements through training rather than capital investment.

7.2.2. Areas of Partial Alignment and Conditional Readiness

NPP Systems and Components

Partial alignment exists in nuclear-adjacent systems where Saskatchewan capability is technically feasible but constrained by QA classification, licensing, or vendor acceptance, including:

- Heat exchangers, pumps, valves, and skidded process systems that require ASME Section III, CSA N299.1, or nuclear pedigree traceability.
- Electrical equipment supporting safety-related systems (Class 2/3), including batteries, UPS, load centres, inverters, and penetration assemblies.
- Mechanical modules and prefabricated assemblies that could be localized but are often vendor-designed or supplied in integrated packages.
- Components for steam turbines and generators.

In these categories, suppliers are typically assessed as "Near Ready" or "Development Required", with success dependent on:

- Early engagement with nuclear vendors,
- Pre-qualification to nuclear QA programs,
- Willingness of OEMs (e.g., GE Vernova Hitachi, Westinghouse) to accept regional suppliers beyond their established global supply chains.

Services

Conditional readiness is most evident in nuclear-specific professional and operational services, including:

- Radiological protection, nuclear simulator training, CNSC licensing support, and nuclear quality program training.
- Radioactive waste handling, transport, and emergency response services, which require additional regulatory certification and specialist staffing.
- Nuclear security forces and response training, where programs exist nationally but would need localization.

These services are not absent but require formalization, certification, and integration into nuclear operating models.

7.2.3. Areas of Limited or No Current Alignment

NPP Systems and Components

There is limited or no current alignment in reactor-critical and vendor-IP-protected systems, including:

- Reactor pressure vessels, core internals, integrated head packages, control rod drive mechanisms, and primary containment systems.
- Safety-Class 1 instrumentation and digital I&C platforms, including reactor protection systems and core monitoring hardware.
- Large turbine-generator packages and proprietary balance-of-plant systems supplied as OEM black boxes.

Services

Service gaps persist where direct operator authority, regulator control, or proprietary expertise is required, including:

- Direct CNSC inspection services,
- Operator-led nuclear medical response units, and
- Vendor-owned reactor IT and control software platforms.

These areas are currently not available due to:

- Extreme QA and licensing requirements,
- Limited global supplier base,
- Vendor reluctance to qualify new manufacturers for first-of-a-kind or early fleet nuclear deployments.

7.2.4. Summary of Capability Alignment and Readiness

Overall, the assessment indicates that Saskatchewan is well-positioned to participate in several areas of the emerging nuclear supply chain, particularly in conventional plant systems, construction, industrial services, logistics, engineering support, and balance-of-plant manufacturing activities. Readiness becomes more conditional in nuclear-regulated applications requiring enhanced quality assurance, qualification, and vendor integration, while participation in reactor-critical systems and highly specialized nuclear scopes remains more limited during early deployment phases.

Together, the findings suggest that Saskatchewan's most realistic near-term participation pathway lies in progressively expanding from existing industrial strengths into more specialized nuclear supply chain roles over time. Table 16 summarizes the overall readiness position across key capability areas identified throughout the assessment.

Several areas currently assessed as "developing" are demonstrating increasing momentum through ongoing industry engagement, academic initiatives, supplier-readiness activities, and broader nuclear deployment efforts underway in Saskatchewan and across Canada.

Table 16 - Overall Nuclear Supply Chain Readiness

Area of Capability	Overall Readiness Position
Uranium & Fuel-Cycle Expertise	World-Class
Transportation and Logistics Infrastructure	Strong
Industrial Construction and Site Services	Strong
Environmental and Engineering Services	Strong
Manufacturing and Fabrication Capability	Strong
Workforce and Technical Services	Developing
Nuclear Quality Assurance and Qualification	Developing
Nuclear-Regulated Manufacturing and Services	Developing
Reactor-Critical Systems Participation	Limited

Through its coordinated policy, industrial capability, and workforce-readiness initiatives, Saskatchewan is establishing a demonstrable blueprint for how non–nuclear–power–producing provinces and territories can build a nuclear supply chain and transition into the nuclear power sector.

7.3. Evolution of Saskatchewan Nuclear Supply Chain Participation Across the NPP Lifecycle

Building on the capability assessment presented in Section 7.2, this section examines how Saskatchewan's participation in the nuclear supply chain is expected to evolve across different project lifecycle stages and deployment time horizons. The assessment highlights where participation is most likely to occur in the near term and where opportunities may expand as capabilities, experience, and project conditions develop.

This progression is expected to be influenced by several factors, including the pace of nuclear deployment, project sequencing and repeat builds, vendor procurement strategies, qualification requirements, workforce availability, and long-term market visibility.

For the purposes of this assessment:

- **Near-term** (0-5 years) participation generally reflects FOAK and early deployment activities
- **Mid-term** (5-10 years) participation reflects repeat builds and early fleet deployment conditions
- **Long-term** participation reflects sustained deployment and mature operating fleet conditions

In the near term, participation is expected to be concentrated in non-safety-related scopes that align with existing capabilities, including engineering support, environmental services, site preparation, construction, and balance-of-plant fabrication.

Over the medium term, participation may expand into more complex scopes as suppliers gain experience and invest in capability development, including modular fabrication, specialized manufacturing, and selected technical services.

In the long term, there is potential for broader participation in higher-value and more specialized segments, including advanced manufacturing, nuclear-qualified services, and sustained operations and maintenance activities.

The lifecycle stages considered include pre-planning and project development, manufacturing and construction, operations and maintenance, and fuel cycle activities.

Pre-Planning and Development

Existing provincial strengths in environmental services, engineering support, infrastructure planning, and project development activities align well with early-stage nuclear project planning and enabling work. Participation in these areas is expected to emerge early and expand progressively as deployment activity, project coordination requirements, and long-term infrastructure planning needs increase.

Construction and Installation

Construction and installation activities are among the strongest near-term participation pathways identified via the capability assessment. Existing industrial construction and infrastructure experience aligns most closely with conventional and balance-of-plant scopes, while participation in nuclear-regulated construction activities is expected to develop more gradually through qualification, project experience, and repeat deployment activity.

Manufacturing

The capability assessment indicates that Saskatchewan's manufacturing participation is expected to be strongest in conventional and balance-of-plant systems that align with existing fabrication, modularization, and industrial manufacturing capability. Participation in nuclear-regulated and reactor-critical manufacturing scopes is expected to evolve more gradually and remain more dependent on qualification progression, vendor integration, and long-term deployment visibility.

Operations and Maintenance

Operations and maintenance activities may become an increasingly important participation pathway as NPPs transition into long-term operation. Early participation is expected to concentrate in conventional operational support and industrial service activities, with more specialized nuclear technical and operational roles likely to expand progressively as workforce capability and operational experience mature locally.

Fuel Cycle (Upstream and Supporting Activities)

Saskatchewan's established role in uranium production positions the province as a key contributor to the upstream portion of the nuclear value chain. Additional opportunities may exist in supporting services such as logistics, material handling, and waste-related activities; however, more specialized fuel cycle stages remain outside the scope of this section and are addressed separately in Appendix C.

Table 17 - Saskatchewan Nuclear Supply Chain Opportunities by Lifecycle Stage and Time Horizon

Lifecycle Stage	Near-Term (FOAK / Early Deployment)	Mid-Term (Repeat Builds / Early Fleet)	Long-Term (Mature Fleet & Operations)
Pre-Planning & Development	• Site preparation and enabling works • Environmental assessment and permitting support • Engineering and project support services • Indigenous and community engagement support	• Expanded project planning and coordination for multiple units • Early supply chain integration and scheduling support	• Site expansion planning and replication for additional deployments • Long-term infrastructure planning and upgrades
Construction & Installation (Non-Nuclear)	• Site preparation, excavation, grading, underground services, and utility and infrastructure works • Concrete foundations and structural works • Structural steel erection • Mechanical and electrical installation • Balance-of-plant construction, instrumentation & controls • Subcontracting roles under EPCM/prime contractors	• Increased local participation in construction scopes • Standardized assembly, module integration, and repeatable construction execution support • Workforce scaling and repeat project execution	• Refurbishment and upgrade projects • Construction support for additional units (fleet expansion) • Long-term decommissioning support (future phase)
Construction & Installation – Nuclear / Safety- Related	• Limited participation under vendor, utility, or EPC supervision • Select QA-controlled subcontracted activities	• Increased participation in qualified installation activities, inspection and testing support, and nuclear-regulated construction scopes	• Expanded participation contingent on qualification maturity, certification, and accumulated project experience

Lifecycle Stage	Near-Term (FOAK / Early Deployment)	Mid-Term (Repeat Builds / Early Fleet)	Long-Term (Mature Fleet & Operations)
Manufacturing – Balance-of-Plant (Non-Nuclear)	• Structural steel utility infrastructure, and conventional balance-of-plant fabrication • Mechanical modules • Tanks, piping systems, and non-pressure components • Conventional plant equipment and skids • Heavy fabrication for industrial components	• Expanded fabrication scope with improved tolerances • Qualified component manufacturing for conventional systems • Increased participation in standardized reactor construction and integration into nuclear vendor supply chains	• Repeat manufacturing and supply contracts • Replacement components and aftermarket supply • Potential progression to higher-spec components (case-dependent)
Manufacturing – Nuclear / Safety-Related Components	• Limited participation • Vendor-controlled supply chains • Reliance on pre-qualified nuclear suppliers	• Entry through partnerships or joint ventures with established suppliers • Tier 2 / Tier 3 supply roles • Initial qualification and capability development	• Expanded participation contingent on certification and experience • Select involvement in higher-spec nuclear components (project- and vendor-dependent)
Operations & Maintenance – Site Services (Non-Nuclear)	• Site services (cleaning, janitorial, waste handling) • Security and access control • Snow clearing and groundskeeping • Catering and workforce services • Facilities management • Environmental monitoring and compliance[60] • Engineering consulting	• Expanded service contracts across multiple units • Integrated facility and site service delivery models • Increased coordination across operating assets	• Long-term service agreements • Regional service providers supporting multiple facilities • Consolidated or centralized service delivery (fleet-based)
Operations & Maintenance – Technical / Nuclear	• Limited direct participation in nuclear operations • Select commissioning, startup, engineering, and technical support roles • Vendor-led operational activities and specialized oversight • Early participation in simulation, digital systems, software support, and operational readiness activities	• Maintenance, inspection, engineering, and technical support services under vendor/operator supervision • Increased participation in outage planning, operational support, and asset management activities • Expanded use of simulation, digital tools, automation, robotics, and data-driven maintenance systems • Progressive workforce qualification and capability development	• Full lifecycle technical and operational support services (maintenance, inspection, outage management, engineering support) • Asset management, reliability, and long-term operational performance programs • Specialized service providers supporting robotics, automation, digital systems, simulation, and advanced inspection technologies • Centralized or regionalized maintenance and technical support hubs supporting multiple facilities

Lifecycle Stage	Near-Term (FOAK / Early Deployment)	Mid-Term (Repeat Builds / Early Fleet)	Long-Term (Mature Fleet & Operations)
Fuel Cycle & Waste (High-Level)	• Uranium supply and processing (existing provincial strength) • Logistics, transportation, and material handling support • Limited additional participation in early deployment	• Early waste handling and packaging services (project-dependent)	• Waste management services • Long-term storage and monitoring support • Operational waste handling and compliance services

Note: Opportunities are indicative and subject to project-specific design decisions, vendor supply chain structures, qualification requirements, procurement strategies and market conditions. Expected progression across deployment horizons should not be interpreted as guaranteed or uniform across all SMR projects.

7.4. Export Opportunities and Influencing Factors

Beyond participation within Saskatchewan, engagement findings indicate potential for Saskatchewan suppliers to engage in interprovincial and international SMR and large-scale nuclear markets as well as established CANDU supply chains. Early participation in provincial projects can help firms gain experience, establish relationships with vendors, and demonstrate their capabilities within nuclear supply chains. In time, established nuclear experience and credentials opens the potential for supply to areas of nuclear outside of a commercial power plant, such as for nuclear medicine, nuclear research and testing, or decommissioning and waste processing.

Nuclear deployment activity is increasing across Canada. Provinces such as Ontario, New Brunswick, Alberta, and Manitoba are advancing or exploring nuclear deployment pathways. Ontario, in particular, is entering a period of sustained nuclear activity, driven by refurbishment programs and new-build projects, including the ongoing construction of the BWRX-300 unit at Darlington [60]. Engagement with Ontario vendors and project stakeholders indicated that supply chain demand is expected to remain high, with some stakeholders noting that additional suppliers may be required to support ongoing and future work.

> *"There is plenty of work to go around in Ontario right now, and we are actively looking for suppliers to help ease the burden on the supply chain…"*
>
> *— SMR project delivery partner in Ontario*

Saskatchewan may also have pathways into other domestic and international nuclear markets through existing provincial connections to major nuclear-sector organizations. Cameco, headquartered in Saskatoon, holds a significant ownership interest in Westinghouse Electric Company, whose AP1000 reactor technology is being considered for new nuclear deployment in Canada and is also being advanced in several international markets. Cameco and Westinghouse have indicated that expansion of Canadian manufacturing and supply chain capacity associated with future AP1000 projects could also support subsequent global reactor builds. This relationship may create opportunities for qualified Saskatchewan suppliers, to participate in Westinghouse-led projects beyond the province, particularly where capabilities align with identified Canadian supply chain needs [132], [133].

Beyond Canada, nuclear deployments are also being pursued across multiple international regions, providing opportunities for Saskatchewan firms to participate in these emerging markets, particularly where similar

technologies and delivery models are adopted. The RBC Climate Action Institute estimates that the emergence of a successful SMR industry in Canada could create a $3 billion to $10 billion annual export opportunity for Canadian expertise by 2040 [134].

However, these opportunities must be considered within the broader context of localization expectations and competitive supply chain dynamics. Stakeholder engagement indicates that nuclear project developers and delivery organizations generally support localization where it aligns with project objectives related to cost, schedule, and quality. At the same time, procurement strategies and localization targets are typically established by the project owner and may be influenced by government policy, particularly where public investment or strategic economic objectives are involved.

Many countries pursuing nuclear deployment are actively seeking to maximize local economic participation by prioritizing domestic content. For example, in Ontario, a significant portion (~80%) of project spending for new nuclear projects is expected to be directed toward Ontario-based suppliers [135]. Similarly, international nuclear programs have emphasized high levels of domestic content as part of broader industrial strategies (e.g. Rolls-Royce SMR's expectations of up to 78% local content in the UK [136]). These localization trends suggest that Saskatchewan export opportunities will depend on demonstrated capability, qualification and access to established nuclear supply networks.

The geographic proximity of a nuclear project to established manufacturing and service hubs may influence supplier competitiveness, particularly where nearby incumbent suppliers can meet project demand efficiently. Conversely, concurrent project activity and capacity constraints within those established supply chains may create opportunities for qualified suppliers from other jurisdictions, including Saskatchewan.

In addition to localization dynamics, trade conditions, procurement frameworks, and regional agreements may influence access to these opportunities. Evolving global trade conditions and supply chain pressures may encourage project stakeholders to prioritize local and regional supply chains to reduce risks to project schedules and costs.

As announced in September 2025, the Government of Canada launched the "Buy Canadian Policy" to protect and strengthen Canada's domestic economy in response to recent U.S. tariffs and trade pressures [137]. While it specifically applies to federal departments and agencies, this policy may also influence sourcing decisions in nuclear projects, giving priority to Canadian suppliers wherever possible, especially when federal funding is involved.

At the provincial level, several provinces have recently taken steps towards removing interprovincial trade barriers. Some provinces have been advancing legislation and agreements to facilitate more open trade between jurisdictions [6], [138], [139]. For example, Ontario signed separate MOUs with Saskatchewan, Alberta, Manitoba, and PEI [138]. Existing frameworks, such as the Canadian Free Trade Agreement (CFTA) [140] and the New West Partnership Trade Agreement (NWPTA) in Western Canada [139], may also support increased supplier mobility and participation across provinces, particularly where supply chain gaps exist.

Overall, while interprovincial and international opportunities may exist, they will be shaped by competitiveness, localization expectations, and broader market conditions. Saskatchewan suppliers should therefore approach these opportunities with a clear understanding of these constraints and view export opportunities as a potential extension of local participation, rather than a primary driver of entry into the nuclear supply chain.

Key Takeaways – Section 7

- Saskatchewan has a credible foundation to participate in nuclear supply chains, but primarily in accessible, non-nuclear scopes in the near term.
- Near-term participation will depend more on project clarity and procurement visibility than on technical capability alone.
- Opportunities are most immediate in balance-of-plant, construction, and support services, with limited access to vendor-controlled nuclear scopes.
- Participation opportunities are not limited to in-province deployment; interprovincial and broader market opportunities may emerge where Saskatchewan capabilities align with external project needs.
- Progression into higher-value roles will require time, qualification, and integration into established supply chains.



8. Structural Gaps Affecting Saskatchewan Supply Chain Readiness

While Saskatchewan demonstrates strong alignment with several segments of the nuclear supply chain, engagement findings indicate that participation is constrained by a set of structural gaps that affect the ability of suppliers to enter and scale within nuclear projects.

These gaps are less about capability and more about the fit between existing strengths and the specific requirements, timelines, and delivery models of nuclear deployment. In many cases, these constraints are systemic in nature and relate to market conditions, the timing and risk of capital investment, qualification pathways, procurement structures, and project delivery considerations.

These structural gaps influence both the pace and extent of participation and help explain why involvement may be concentrated in certain segments of the supply chain and more limited in others.

8.1. Timing, Market Uncertainty and Investment Misalignment

Market uncertainty remains one of the most significant barriers to Saskatchewan supplier participation. At its core, the issue is a mismatch between when suppliers need to invest and when clear, bankable opportunities actually emerge.

"It's not that we're not interested…it's that we don't know when the work is actually coming…"

"We will do our best to stay abreast of progress in the sector and attend industry events, but real capital investment will depend on clearer market signals, timelines, and actual purchase orders…"

—Saskatchewan manufacturers

For Saskatchewan businesses, this manifests through a series of practical considerations that directly influence

investment decisions. These include whether and when a project will proceed; the timing and scale of demand; the availability of detailed technical specifications required to conduct informed gap assessments; the procurement strategy and contracting structure; and the potential for follow-on work beyond initial deployment.

"We (SK suppliers) have sat in multiple meetings and conferences in recent times where nuclear opportunities have been talked about 10x or 100x, but there hasn't been one meeting where somebody was sitting across the room and be able to say, well, this is the kind of stuff I'm looking for, this is when I'll be ordering, or these are the specifications of what we will be ordering soon."

— Saskatchewan manufacturer

These factors determine whether investments in nuclear readiness, such as quality systems, workforce training, certification, and business development, can be justified.

Several system-level factors drive this dynamic. SMRs are still in the early stages of commercial deployment globally, and FOAK projects carry cost, schedule, and regulatory uncertainty. As a result, project owners tend to phase decisions cautiously, limiting early visibility. At the same time, evolving SMR design specifications, vendor confidentiality, and competitive dynamics restrict access to the detailed technical information suppliers need to assess readiness and make investment decisions.

Regulatory and financing dynamics also contribute to market signals. Procurement visibility typically improves only after key licensing milestones, and capital tends to flow once projects demonstrate near-term execution. In practice, both emerge gradually, often after suppliers are expected to have already prepared.

As outlined in **Section 3**, while Canada's SMR policy and investment landscape reflects strong long-term ambition, this has not yet translated into a consistent pipeline of near-term, procurement-ready projects.

Recent analysis by the RBC Climate Action Institute indicates that achieving net-zero objectives could require significant nuclear deployment and investment [134]; however, current investment funding is not yet at the required levels and remains concentrated in a limited number of early-stage projects [40]. As a result, near-term market visibility for suppliers remains limited.

The contrast with more advanced jurisdictions highlights the importance of these signals. In Ontario, for example, OPG's SMR program has progressed through key regulatory, construction and procurement milestones, including obtaining a licence to construct a GE Vernova Hitachi BWRX-300 reactor at the DNNP site, commencement of construction, completion of the first regulatory hold point (reactor building foundation), procurement of long-lead equipment, and an application for a licence to operate the DNNP Unit 1 [51], [58], [60].

The project is supported by significant federal and provincial commitments, including being designated as one of several key nation-building projects and by funding from the Canada Infrastructure Bank and other public financing mechanisms, totalling up to $4.025 billion[18][56], [40]. Together, these conditions provide stronger, more credible demand signals to suppliers, enabling earlier investment decisions and more confident supply chain mobilization.

In contrast, Saskatchewan is at an earlier stage of the project lifecycle. SaskPower's SMR program is currently in a multi-year planning phase, with a potential final investment decision around 2029 and in-service timelines in the mid-2030s [63]. While these timelines provide some high-level overview of SaskPower's SMR roadmap, they remain subject to change as planning, siting, and regulatory processes evolve.

For Saskatchewan suppliers, access to reasonable and credible project timelines is critical to make informed business decisions, including whether to enter the sector, when to invest in readiness, and how to align qualification and capacity-development activities with anticipated procurement needs.

[18] As of March 2026.

"One of our biggest concerns is that we are still talking about a make-believe plant (referring to SaskPower's final investment decision in 2029), and as you know, things can change quickly…. This industry could shut down in a millisecond with a change of government. But I do believe that nuclear is coming. The issue is when? When will construction begin? When will POs be issued? And how far away are we from the first deployment? We need this information and more certainty to aid our business analysis."

— Saskatchewan manufacturer

This mismatch between timing of supplier investment and availability of firm project and procurement information creates a structural challenge for Saskatchewan businesses. Firms are expected to invest early in readiness through certification, training, system upgrades, and business development while project timelines, procurement pathways, and demand signals are still evolving. In practice, this creates a "wait and risk" dynamic: investing too early can strain cash flow and borrowing capacity, while investing too late can mean missing prequalification windows and early supplier relationships that often determine who gets called when contracts finally roll out.

The implications extend beyond individual firms to the broader development of the provincial nuclear supply chain. Uncertainty delays investment, which in turn limits local readiness. Lower readiness reduces confidence in local procurement, leading project developers to rely on established suppliers, sometimes outside the province, particularly in early phases. Over time, this reduces opportunities for Saskatchewan firms to gain experience, build relationships, and scale their capabilities, reinforcing dependence on external supply chains.

Participation is both time-sensitive and relationship-driven for Saskatchewan suppliers. Firms that engage early, despite uncertainty, may secure initial positioning, while others may face increasing barriers as procurement pathways become more defined.

8.2. Nuclear Certification and Qualification Pathways

One of the cross-cutting themes that emerged from industry engagements was that nuclear certification and qualification requirements are critical structural barriers to Saskatchewan supplier participation in SMR supply chains. Many Saskatchewan suppliers expressed uncertainty around applicable nuclear standards, documentation requirements, and qualification processes.

While Saskatchewan's industrial base demonstrates strong capabilities across adjacent industries, participation in nuclear projects, particularly for safety-related components and services, requires adherence to specialized quality assurance programs such as CSA N299 (or ASME NQA-1). As outlined in **Section 3**, these requirements are scope-dependent, and some non-safety-related scopes may be accessible under broader non-nuclear quality frameworks such as ISO 9001.

"It's not that we can't meet the requirements, it's getting there without a clear pathway that is the challenge…we need to know which requirements for which scope of work…we can't prepare without this information."

— Saskatchewan supplier

Although nuclear quality requirements follow a graded approach, many Saskatchewan suppliers understand this concept only at a high level. While several industry events and reports have introduced the different categories within standards, such as CSA N299 series, there remains a gap in understanding the specific requirements within each category and how they align with different scopes of work.

The challenge is not only in understanding the standards themselves, but also what it takes to implement and maintain them. Establishing a nuclear-quality program (or any formal quality program) involves upfront investment in systems, process controls, documentation, workforce training, and third-party audits, along with ongoing

administrative and compliance requirements. For many suppliers, particularly small and medium-sized enterprises, this creates a significant financial and operational burden.

"We have no issue obtaining qualifications and certifications if it enhances our capabilities and competitiveness, and if there is work to justify the upgrade. But every certification we have gotten, from when we first got ISO to our recent upgrade to ASME, has removed our ability to compete for certain local jobs we used to do. ISO 9001 alone priced us out of some of our existing work…"

— Saskatchewan manufacturer

While some suppliers indicated that they apply their QMS selectively to specific projects or business lines to manage costs and remain competitive in lower-margin work, this approach can introduce operational complexity and may limit their ability to scale or compete for a broader range of opportunities.

This challenge is further compounded by the current baseline of certification across the provincial supply base. A relatively small proportion (2%) of SIMSA suppliers currently hold nuclear-specific accreditations, and in many cases, most suppliers are not formally certified to ISO 9001. This does not necessarily reflect a lack of quality practices; rather, for most suppliers, formal certification has not been required in many markets they currently serve. However, in the nuclear context, formal certification is a prerequisite for participation, creating an additional barrier to entry.

Even for Saskatchewan suppliers that are ISO 9001-certified and interested in Tier 2 scopes, there is a challenge in fully understanding how to scale from commercial to nuclear-quality systems. There are no clear, established pathways for such suppliers.

Alternative pathways to participation do exist. In some cases, suppliers may work under the quality programs of utilities or prime contractors, reducing the need to immediately establish standalone nuclear quality assurance systems. While this approach can lower the initial barrier to entry, it may also introduce additional risk considerations for the prime contractor and does not fully address the need for suppliers to develop independent nuclear-qualified capabilities over time.

In parallel, project-specific qualification processes established by utilities, nuclear vendors, and prime contractors further shape access to the supply chain. Entry into nuclear scopes is typically governed by prequalification processes that favour suppliers with prior nuclear experience, established certifications, and demonstrated performance on similar projects. As a result, Saskatchewan firms without existing nuclear track records may face challenges accessing the initial opportunities needed to build that experience.

"We can apply what we currently do to nuclear, but no one was willing to give us an opportunity. The project vendors say, 'You need to get certified first, and then we'll talk.' So, we went ahead and obtained the necessary qualifications and are now certified, but there's still no work…We are currently facing the issue of 'You need experience to get in', but then you need to get in to gain experience."

– Saskatchewan EPCM

This creates a well-known entry challenge: suppliers must demonstrate nuclear readiness to access work, but require access to work to build that readiness. In practice, this limits early participation to lower-tier or non-safety-related scopes, while higher-value and safety-critical work remains concentrated among established nuclear suppliers.

Overall, participation in nuclear supply chains is not solely a function of technical capability but also of formal qualifications and demonstrated performance within nuclear regulatory frameworks. Progression into higher-value scopes is likely to be incremental, requiring staged participation, partnerships with qualified suppliers, and deliberate investment in certification and capability development over time.

8.3. Regulatory and Institutional Gaps

An important structural consideration for Saskatchewan's future nuclear supply chain is the absence of an established provincial pathway for nuclear pressure-boundary inspection, registration and authorization. Saskatchewan currently has conventional pressure-equipment oversight through TSASK; however, TSASK does not currently have nuclear pressure boundary inspection and verification capability. Currently, for Saskatchewan suppliers to provide nuclear pressure boundary equipment or services, they must be an ASME certificate holder, and must operate through an ASME-authorized AIA (typically from another qualified provincial jurisdiction), and use their ANIs, commissioned by the National Board, for related inspection services. TSASK has nevertheless identified potential nuclear responsibilities as an emerging area of interest and has begun preparatory activities, including participation in provincial and national discussions, reviewing nuclear supply chain requirements, and preparing for potential future capability development in this area [141], [142].

In parallel, the arrangements required to support nuclear pressure-boundary work under the applicable CNSC, CSA N285 and ASME framework have not yet been formally established for a future Saskatchewan nuclear project. Under CSA N285 and the CNSC licensing framework, the nuclear licensee is responsible for establishing an appropriate pressure-boundary program and associated AIA service agreements [114],[115]. These arrangements are not necessarily limited to any particular AIA or provincial regulatory authority, but must be acceptable within the applicable licensing, code and project-specific framework.

However, the availability, capacity and accessibility of qualified inspection resources will influence how efficiently Saskatchewan suppliers can obtain the inspections, authorizations and Code-related verification required for applicable nuclear pressure-boundary work.

TSASK has the potential to support Saskatchewan's emerging nuclear sector given its existing mandate for boilers, pressure vessels and pressure piping in the province. However, the eventual model will depend on decisions by the Provincial government, the future nuclear licensee (e.g., SaskPower) and the CNSC, as well as the nuclear-specific capabilities and authorizations required of the selected AIA.

At present, no formal Saskatchewan-specific arrangement has been established. This becomes increasingly relevant as SaskPower advances toward a potential SMR deployment decision and associated long-lead procurement activities. Continued reliance on out-of-province nuclear inspection resources may remain workable, but could introduce additional coordination, travel and scheduling requirements and create bottlenecks in supplier qualification, inspection and approval processes, particularly if nuclear new-build activity increases across Canada and existing external inspection capacity becomes constrained.

Establishing a clear AIA and pressure-boundary oversight pathway sufficiently in advance of major procurement would provide greater certainty to suppliers considering nuclear pressure-boundary work and clarify the inspection, authorization and qualification requirements applicable to future Saskatchewan projects. Developing local capacity in this regard would improve the efficiency of supplier qualifications by enabling more timely access to inspection and certification services and reduce reliance on external jurisdictions.

8.4. Vendor Procurement and Delivery Models – Limited Integration into Established Supply Chains

Vendor procurement and delivery models also represent a significant barrier to Saskatchewan supplier participation in nuclear supply chains. Access to work is shaped not only by capability and readiness, but by how procurement is structured and controlled across nuclear projects.

Nuclear projects are typically delivered through vendor-led and prime-contractor-driven models, in which key procurement decisions are made by reactor vendors, utilities, and EPC / EPCM contractors. These entities often rely on established supply chains, prequalified vendors, and existing commercial relationships to manage project risk, particularly in FOAK deployments. As a result, procurement pathways are often more controlled than they may appear, with limited open competition in many areas.

This dynamic is particularly pronounced for nuclear island and safety-related scopes, where vendor-controlled supply chains are common. However, engagement findings suggest that similar patterns can extend into certain balance-of-plant and construction scopes, particularly where quality, integration, or schedule risks are significant. In these cases, suppliers outside established networks may face barriers to entry, even when capability exists.

"The potential of us (Saskatchewan suppliers) manufacturing a pump or valve and selling that to an SMR vendor is highly unlikely...those are already engineered and in place…"

"The centre of our sector (manufacturing) is in Ontario, and they have a long head start in nuclear manufacturing… the truth is, we (Saskatchewan suppliers) will most likely be second- or third-in-consideration among these established suppliers…"

"The concern for a lot of Saskatchewan contractors is that the knowledge and capacity of the existing builders out in Ontario are just going to come out here and assert their will…"

– Saskatchewan suppliers

Limited visibility into procurement structures further complicates supplier positioning. In many cases, suppliers lack clarity on how work packages will be defined, who will hold procurement authority across different scopes, and how responsibilities will be split between utilities, vendors, and EPCM contractors, including the regulatory responsibilities of the CNSC and the AIA / ANI. This makes it difficult to determine where to engage, which relationships to prioritize, and how to align capabilities with project needs.

"We need to understand where we fit before those opportunities are locked in…"

– Saskatchewan suppliers

Contracting strategies and risk allocation also influence participation. FOAK nuclear projects carry elevated uncertainty, and project developers often adopt conservative contracting approaches as a result. In some cases, risks related to design maturity, schedule, or regulatory requirements may be allocated downstream. Where these risks are not aligned with the party best positioned to manage them, local suppliers may be less inclined to participate, or may price in additional contingencies, particularly where prior nuclear project experience is limited.

Early project decisions further shape participation in ways that are not always visible to suppliers. Choices related to design standardization, modularization strategies, and make-versus-buy decisions influence where work is performed and which suppliers are engaged. These decisions are typically made well in advance of open procurement and may favour existing established suppliers, limiting opportunities for new regional entrants.

For Saskatchewan suppliers, participation in nuclear projects is shaped as much by access to procurement pathways and positioning within vendor and contractor networks as by capability and qualification. Procurement structures, early project decisions, and established supply chain relationships collectively influence which suppliers are able to participate and at what stage. As a result, entry into nuclear supply chains is not solely determined by technical readiness, but by the ability to align with and access these procurement frameworks.

8.5. Market Visibility and Access to Information

Limited market visibility and fragmented access to information constrain how effectively Saskatchewan suppliers can participate in the nuclear supply chain. The issue extends beyond access to information and reflects the absence of a clear and consistent understanding between project stakeholders and the regional supply base.

From the supplier perspective, visibility into nuclear projects remains limited. Many suppliers do not have access to detailed technical specifications, defined work packages, procurement timelines, or clear points of engagement across utilities, vendors, and EPCM contractors. In practice, information related to reactor deployment opportunities is often distributed across multiple sources—including vendors, utilities, government initiatives, and industry platforms—making it difficult to form a consolidated view of project requirements, timelines, and engagement pathways.

This limits the ability of suppliers to assess where their capabilities align, when to invest in readiness, and how to position within the supply chain.

In addition, some suppliers also face challenges identifying the appropriate organizations to engage, while others encounter limited responsiveness when attempting to initiate those connections.

"Half the challenge is figuring out whom to talk to and where to start…"

"You meet vendors and project stakeholders at many events, and everyone's polite, saying, 'if you need anything, call us…' and then you call them and get crickets…"

"It's been difficult making inroads and finding the business opportunities to invest…"

– Saskatchewan suppliers

Recent SIMSA–OCNI trade missions have begun to address this gap by facilitating direct engagement among Saskatchewan suppliers, nuclear buyers and technology vendors. However, participants noted that it remains unclear to what extent these engagements translate into tangible outcomes, such as qualified supplier relationships, inclusion in VSLs, or participation in active procurement processes.

The effectiveness of these initiatives will need to be evaluated based on measurable indicators—such as follow-on engagement, progression through qualification processes, and successful participation in project opportunities—to better understand their impact on supplier access to the nuclear market.

At the same time, project developers, vendors, and prime contractors may not have a clear or standardized view of Saskatchewan's supplier capabilities. While tools such as the SIMSA supplier database provide a useful starting point, they may not capture the level of detail required to support sourcing and qualification decisions. As a result, existing capabilities are not always fully visible or considered in procurement processes.

"A lot of Saskatchewan firms can do the work, we just don't always get seen easily."

– Saskatchewan supplier

In the absence of clear visibility on both sides, supplier selection tends to rely more heavily on existing relationships than on a broad assessment of capability. In practical terms, "who you know" can become more decisive than "what you can do," particularly in early project phases where uncertainty is high and procurement pathways are still evolving.

For Saskatchewan suppliers, this gap reduces the effectiveness of readiness efforts and limits the extent to which existing capabilities are recognized or utilized. It also makes early engagement with vendors and prime contractors more difficult, which can influence access to future opportunities.

8.6. Financial Constraints

Engagement findings also revealed that financial constraints may limit the ability of Saskatchewan suppliers to both prepare for and execute work in nuclear supply chains.

At the readiness stage, suppliers are required to invest upfront in certification and qualification programs, workforce development, process upgrades, audit preparation, and business development, often in advance of near-term revenue. This creates a financing gap, a standing capital investment, where costs are incurred well in advance of confirmed opportunities.

"…we've received conflicting information about the cost of implementing a nuclear quality program. In some cases, we've heard some suppliers cite investments up to $1 million without securing any project work with the program; not many organizations in Saskatchewan can afford this level of investment without an immediate ROI in sight and still be in business today…

– Saskatchewan manufacturer

The challenge extends into execution. For many suppliers, particularly those with smaller balance sheets, participation in nuclear projects also requires the capacity to finance contract execution. This may include funding for materials procurement, hiring and retaining specialized personnel, managing extended payment cycles, and absorbing project risks associated with schedule, quality, and performance requirements. Larger work packages may require bonding, working capital, or access to credit facilities, which may not be readily available to all firms.

While funding programs and support mechanisms exist, access to these resources may be uneven and resource-intensive, particularly for smaller firms. In some cases, support may be more accessible at the project level than at the supplier level.

Overall, financial capacity is a key determinant of participation for Saskatchewan suppliers. Firms must be able to fund both readiness and execution, often over extended timelines and under uncertain market conditions. This influences both whether suppliers can enter the nuclear supply chain, but also how far they can progress within it.

8.7. Infrastructure and Project Delivery Constraints

Infrastructure and project delivery conditions influence where and how nuclear-related work is executed. In Saskatchewan, the issue is not the absence of infrastructure, but how transportation limits, site conditions, and delivery strategies interact to shape what work can realistically be performed and how it is delivered within the province.

As a landlocked province, Saskatchewan relies primarily on road transportation for the movement of large components, with rail potentially available in certain cases, depending on routing and project requirements. While over-dimensional transport is feasible through permitting systems, bridge-clearance controls, and route planning, these movements are highly route-specific and conditional on permitting and infrastructure constraints. As a result, transportability becomes an early design and planning consideration, rather than a downstream logistics issue.

Transportation constraints, particularly on module size and weight, affect how components are fabricated, moved, and installed. Where these limits are restrictive, certain fabrication activities may need to occur closer to the project site or within established manufacturing hubs outside the province.

While some suppliers have experience transporting large components across Saskatchewan, reactor modules may introduce additional complexity. Suppliers noted that without detailed specifications, it remains difficult to assess whether existing capabilities can be applied directly or what adjustments may be required to support nuclear-related scopes.

These conditions have direct implications for how participation is structured within the province. Saskatchewan's manufacturing capacity is distributed across centres such as Regina, Saskatoon, and Prince Albert, and to some extent, Estevan, while current siting work is focused in the Estevan area [19]. This geographic separation influences how fabrication, transport, and site integration are coordinated, particularly where manufacturing capacity is distributed across multiple centres and project siting is focused in a specific region.

Site-specific factors further shape delivery. Requirements for laydown space, heavy lifting capacity, and construction sequencing must be considered early, as they affect how modules are received, stored, and installed. These factors influence scheduling, workforce deployment, and overall project efficiency.

These constraints are best understood as part of an interconnected delivery system rather than standalone limitations. Transportation and site conditions influence upstream decisions on module sizing, fabrication location, and the balance between off-site manufacturing and on-site assembly. These decisions, in turn, shape the extent and nature of local participation.

8.8. Workforce and Training Capacity

Workforce availability and training capacity were identified as supporting considerations influencing Saskatchewan's ability to participate in nuclear supply chains. While workforce development was not a primary focus of this study, participants noted that the transition to nuclear introduces additional requirements related to safety culture, quality assurance practices, and specialized technical competencies.

Saskatchewan's existing industrial workforce, particularly in mining, power generation, and construction, provides a strong foundation of transferable skills relevant to nuclear deployment. However, participation in nuclear projects may require targeted upskilling, certification, and familiarity with nuclear-specific standards and practices.



Workforce depth in nuclear engineering, licensing, and plant operations is still developing, despite new investments such as the University of Regina SMR Safety, Licensing, and Testing Centre [143].

Participants highlighted the importance of accessible and coordinated training pathways, including the role of post-secondary institutions, technical training providers, and industry-led programs in supporting workforce readiness. The development of supportive education and training frameworks may influence the pace at which suppliers can build and sustain the workforce required for nuclear participation.

In addition, Saskatchewan's industrial workforce is already in demand across multiple sectors, creating a competitive labour environment in which SMR projects may need to compete with established industries for skilled workers. In this context, workforce availability is influenced not only by training capacity but also by project timing, compensation structures, and long-term employment certainty. For suppliers, this dynamic may affect decisions to allocate personnel toward nuclear opportunities, particularly in early project phases where demand signals remain uncertain.

It was also observed that broader federal and provincial infrastructure and "nation-building" initiatives—including major resource, energy, defence, transportation, utility, and industrial development projects occurring across Saskatchewan and Canada—may create overlapping demand for skilled labour, contractors, suppliers, and capital. These competing demands could influence workforce availability, project costs, and supplier participation decisions associated with future SMR deployment. In response, future nuclear projects may encourage greater adoption of automation, robotics, AI-enabled tools, advanced manufacturing approaches, and workforce upskilling initiatives intended to improve productivity, optimize labour utilization, and support long-term workforce sustainability.

Overall, while workforce constraints are not expected to be the primary limiting factor in early supply chain participation, they may become increasingly relevant as projects progress toward construction and operations phases, where demand for skilled labour and nuclear-qualified personnel is expected to increase.

8.9. Conditions for Meaningful Supplier Participation

Engagement findings indicate that meaningful participation in nuclear supply chains is influenced by a set of enabling conditions that shape suppliers' responses to the structural gaps identified in Sections 8.1–8.8.

Key conditions identified include:

- Clear and credible market signals, including visibility into project timelines, procurement sequencing, and sustained demand
- Early and structured engagement, enabling improved information flow, relationship development, and visibility of supplier capabilities
- Accessible and staged qualification pathways, allowing suppliers to progressively enter the nuclear supply chain
- Collaboration and coordinated capability development, including partnerships and regional clustering to address scale and capacity limitations
- Targeted financial and readiness support, aligned with the timing and scale of supplier investment requirements
- Alignment of project delivery strategies with regional conditions, including infrastructure, logistics, and modularization considerations

These conditions provide a practical lens through which the structural gaps identified in this section can be understood and addressed. They also inform the recommendations presented in **Section 9**.

Key Takeaways – Section 8

- Supply chain gaps are driven less by lack of capability and more by misalignment between supplier readiness and project conditions.
- Uncertainty around timelines, procurement, and quality pathways limits supplier willingness to invest.
- Access to nuclear supply chains is constrained by vendor-controlled networks and established supply chain relationships.
- Financial, workforce, and coordination challenges reinforce uneven participation across the supply chain.
- These barriers point to a set of enabling conditions required for participation, including clearer market signals, accessible qualification pathways, structured engagement, and alignment between project delivery approaches and regional capabilities.



9. Recommendations

This section presents a targeted set of recommendations intended to address the structural gaps and constraints identified in Section 8 and support greater participation of Saskatchewan suppliers in nuclear supply chains.

The recommendations are organized across four key stakeholder groups identified in Section 1:

1. Saskatchewan Suppliers,
2. Nuclear Project Developers & Delivery Organizations (e.g., SaskPower, reactor vendors, EPC/EPCM contractors, and OEMs),
3. Government & Public Institutions (federal and provincial), and
4. Industry and Supplier Associations (e.g., SIMSA, OCNI, and IMCN)

Each recommendation identifies the rationale for action, relevant stakeholders, indicative implementation actions, timing and intended outcomes. The recommendations are directional rather than prescriptive, recognizing that nuclear deployment and supply chain development are long-term activities requiring flexibility and continued alignment as projects progress.

While Indigenous participation is an important consideration for future nuclear development, this report does not provide specific recommendations in this area. These considerations are being addressed through parallel workstreams, including work led by the Saskatchewan First Nations Natural Resource Centre of Excellence.

Timing and Phasing of Recommendations

Saskatchewan's nuclear development pathway is expected to unfold over multiple phases and technologies. SaskPower is currently advancing an SMR program, with a potential final investment decision later in the decade and initial deployment targeted for the mid-2030s, while the province has also indicated interest in longer-term consideration of larger-scale nuclear generation.

These timelines provide an important reference point for supply chain planning, but readiness actions must occur at different stages of the project lifecycle. Activities such as supplier qualification, quality program development, workforce preparation and relationship building need to begin well before procurement and construction, while other actions such as large capital investments in capacity expansion or execution-phase contracting, generally become appropriate only as project definition, scope and procurement pathways mature.

Accordingly, the recommendations are characterized by timing, priority and level of effort:

- **Timing** indicates when actions are most relevant within the nuclear project lifecycle.
  - **Immediate (0–2 years):** Actions supporting early positioning, coordination, and readiness planning
  - **Near-term (2–5 years):** Actions aligned with project definition, supplier qualification, and early procurement
  - **Medium-term (5–10 years):** Actions supporting construction phase participation and scaling of capabilities
  - **Long-term (10+ years):** Actions supporting sustained participation during operations, maintenance, and future deployments
  - **Ongoing:** Actions spanning multiple phases and requiring continuous attention
- **Priority** reflects the relative importance of an action in addressing key barriers to supplier participation.
  - **High:** Critical to foundational or early participation
  - **Medium:** Supports capability development and improved participation over time
  - **Low:** Enhances or optimizes participation but is not immediately required
- **Level of effort** reflects the relative coordination, investment and implementation effort required.
  - **High:** Significant multi-party coordination, regulatory alignment, funding or long-term implementation
  - **Medium:** Moderate coordination and investment achievable through focused collaboration
  - **Low:** Primarily communication, engagement or incremental process improvements

This framework provides a consistent basis for sequencing recommended actions and understanding their relative priority and implementation effort across the project lifecycle.

Recommendation Structure

The recommendations progress broadly from establishing enabling market and qualification conditions, through supplier readiness and project participation, to longer-term collaboration and capability development. They address:

- market signals and participation expectations;
- qualification, regulatory and inspection pathways;
- supplier engagement and visibility;
- financial and capability development;
- procurement and project-delivery alignment; and
- collaboration and long-term capability building.

These areas are interdependent, recognizing that early clarity on market signals, qualification pathways, and regulatory expectations enables more effective engagement, supplier investment, and participation in project execution. No single recommendation operates in isolation; coordinated action across the supply chain ecosystem will be required to achieve meaningful outcomes.

Stakeholder Roles and Responsibilities

Each recommendation identifies the primary stakeholders expected to lead implementation, and supporting stakeholders whose involvement is necessary to enable or reinforce delivery. Recommended actions are structured

to reflect this relationship, flowing from primary to supporting stakeholders to support coordinated implementation.

For ease of interpretation, colour-coded stakeholder tables are used throughout this section, with primary stakeholders shown in purple and supporting stakeholders in grey.

Relevance to Phase 2 and Subsequent Work

The recommendations provide direction for near- and longer-term supply chain development and also inform subsequent project work. The Phase 2 case studies will examine selected recommendations and participation pathways in greater detail.

Recommendation 1: Strengthen Market Signals and Clarify Participation Expectations

Statement	Provide clear, credible, and sustained market signals that translate long-term SMR policy intent into visible project pipelines, procurement timelines, and defined participation opportunities (including localization expectations) for Saskatchewan suppliers.
Priority	High
Timing	Immediate to Near-term (0 – 5 years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

As identified in Section 8.1, one of the most significant structural constraints on supplier participation is the misalignment between long-term nuclear demand signals and the availability of near- to mid-term market visibility. Nuclear supply chains require early, often irreversible investments in quality systems, workforce development, and capability enhancement, yet suppliers face limited clarity about when and how opportunities will materialize.

In the absence of sustained and credible signals, suppliers delay readiness investments or disengage altogether, hence, reinforcing reliance on established external supply chains during early project phases. It is important to note that strengthening market signals is not about accelerating procurement activities prematurely, but about reducing uncertainty, enabling staged planning, and aligning supplier readiness with realistic project milestones.

Clear articulation of participation expectations, particularly where local or regional involvement is feasible, supports alignment between supplier investment and project needs and increases the likelihood that Saskatchewan suppliers are positioned to participate when procurement occurs.

Recommended Actions

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, and relevant federal departments and agencies*

- **R1.1.** Develop and maintain a Saskatchewan nuclear supply chain participation framework that defines provincial objectives for local supplier participation, early engagement, localization planning and capability development, while recognizing project cost, schedule, quality, and safety requirements. This should be informed by Saskatchewan supply chain capability assessments. ***Near-term (2–5 years)***
- **R1.2.** Begin aligning existing funding, training, infrastructure and supplier development programs with identified capability gaps and anticipated project needs, and formalize this alignment

through the participation framework as it is developed. ***Immediate and Ongoing***

- **R1.3.** Establish a mechanism for periodic reporting and coordination among government, SaskPower, project developers, industry associations, Indigenous organizations, and training institutions on supplier readiness and participation progress. ***Near-term and Ongoing***
- **R1.4.** Continue to provide consistent policy and program signals regarding nuclear deployment timelines, funding commitments and long-term program intent . ***Ongoing***

Nuclear Project Developers and Delivery Organizations: *SaskPower, Nuclear vendors, EPC/ EPCM contractors*

- **R1.5.** Publish and periodically update indicative project and procurement roadmaps showing major milestones, procurement sequencing and anticipated scope breakdowns, including detailed technical specifications for reactor components and services where feasible. ***Immediate (0–2 years)***
- **R1.6.** Define and communicate expected areas of local participation by project phase and supply chain tier. ***Near-term (2–5 years)***
- **R1.7.** Provide early visibility into anticipated procurement approaches, qualification routes and supplier entry points across different tiers of work . ***Immediate to Near-term (0–5 years)***
- **R1.8.** Maintain consistency in communicated project timelines, and provide transparent updates where changes occur to support supplier confidence and planning . ***Immediate and Ongoing***

Industry and Supplier Associations: SIMSA, OCNI, IMCN

- **R1.9.** Provide regular supplier-focused market intelligence that consolidates and interprets project updates, procurement signals, anticipated timelines and qualification information into practical implications for supplier readiness, investment and timing. Information should be disseminated to suppliers in a structured and accessible manner. ***Ongoing***
- **R1.10.** Facilitate early engagement sessions, recurring supplier briefings, industry days and information-sharing sessions that improve supplier understanding of upcoming participation opportunities . ***Ongoing***

Saskatchewan Suppliers:

- **R1.11.** Monitor evolving project signals and align internal investment and readiness planning with anticipated opportunities. ***Ongoing***
- **R1.12.** Engage early with project developers, vendors and major contractors to understand qualification requirements, procurement pathways and potential areas of fit. ***Immediate (0–2 years)***

Expected Outcomes

- Improved supplier confidence in project timing and market demand
- Earlier and more informed investment in readiness activities (e.g., certification, workforce, partnerships)
- Increased alignment between supplier capability development and project needs
- Reduced risk of late supply chain mobilization during early project phases
- Increased Saskatchewan participation in future nuclear supply chains

Recommendation 2: Establish Clear Qualification and Nuclear Readiness Pathways

Statement	Establish clear, accessible, and staged nuclear readiness and qualification pathways that enable Saskatchewan suppliers to understand requirements, identify realistic entry points and progressively enter the nuclear supply chain
Priority	**High**
Timing	Immediate to Near-term (0 – 5 years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

As discussed in Section 8.2, participation in nuclear supply chains is not only governed by technical capability but also by formal qualification, certification, and demonstrated performance within nuclear regulatory frameworks. Many Saskatchewan suppliers exhibit transferable industrial capabilities but face uncertainty about which standards apply, how qualification pathways vary by scope, how progression into nuclear supply chains operates in practice, and how to access the initial opportunities required to build nuclear experience.

This lack of clarity creates a structural barrier to entry: suppliers may delay or avoid readiness investments due to uncertainty, while project developers continue to rely on established nuclear suppliers with established credentials. Without defined and staged pathways, opportunities for participation remain difficult to access.

Navigating nuclear qualification and readiness requirements should not be left to individual Saskatchewan firms' initiative, existing relationships, or prior nuclear exposure, to avoid a situation of "winners and losers." More structured and accessible readiness pathways may help reduce barriers to participation, particularly for suppliers and small and medium-sized enterprises seeking to transition into nuclear markets for the first time.

Clear qualification pathways enable suppliers to progress deliberately, align investment with realistic entry points, and reduce the risk of premature or misaligned certification efforts. This may include phased quality assurance development approaches, opportunities to participate under existing quality programs, and clearer visibility into progression requirements across different tiers of work.

Engagements also highlighted the role of established industry audit and qualification networks in supporting early alignment with nuclear supply chain expectations.

Recommended Actions

Nuclear Project Developers and Delivery Organizations: *SaskPower, Nuclear vendors, EPC/ EPCM contractors*

- **R2.1.** Define and communicate qualification expectations across different tiers of work (e.g., non-safety, safety-related, and nuclear-grade scopes). ***Immediate (0 – 2 years)***
- **R2.2.** Communicate detailed technical specifications and supply quality requirements for NPP components and services needed for suppliers to make informed decisions (where feasible). ***Immediate (0 – 2 years)***
- **R2.3**. Provide suppliers with guidance on applicable nuclear standards, quality requirements, and qualification expectations aligned with specific scopes of work and supply chain tiers. ***Immediate to Near-term (0 – 5 years)***

- **R2.4.** Develop and communicate supplier onboarding pathways with clear qualification stages, participation requirements, and points of contact. This should define pathways to inclusion on approved supplier and vendor lists, including applicable document reviews, audits, assessments and other verification activities. ***Immediate (0 – 2 years)***
- **R2.5.** Identify opportunities for suppliers to perform work under existing customer or prime-contractor quality programs where appropriate, with clear definition of responsibilities and controls. ***Immediate to Near-term (0–5 years)***
- **R2.6**. Future owners should explore participation in established nuclear industry associations (e.g., Connexus) and qualification and audit networks (e.g., CANPAC, NUPIC, NIAC, CANIAC), where accessible, to gain early exposure to nuclear safety culture, established vendor auditing and qualification processes, and insight into regulatory, procurement, and operational practices. ***Immediate (0 – 2 years)***

Industry and Supplier Associations: SIMSA, OCNI, IMCN

- **R2.7.** Develop and disseminate practical toolkits, guidance materials, and readiness resources that translate nuclear quality requirements into supplier-relevant pathways. ***Immediate (0–2 years)***
- **R2.8.** Deliver recurring training, workshops and advisory support focused on nuclear quality requirements, documentation, certification, supplier onboarding and qualification progression. ***Immediate and Ongoing***
- **R2.9.** Facilitate supplier exposure to experienced nuclear organizations and supply chains (e.g., in Ontario) through mentorship, site visits, work-shadowing, and partnership or subcontracting opportunities that support knowledge transfer and experience building related to nuclear qualification. ***Immediate and Ongoing***

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, and relevant federal departments and agencies*

- **R2.10.** Continue to support development of structured qualification initiatives through funding, programming, and coordination with industry partners. ***Immediate and Ongoing***
- **R2.11.** Support the development of provincial nuclear readiness programs that assist suppliers in preparing for qualification and participation activities. ***Near-term (2 – 5 years)***
- **R2.12.** Align provincial and federal supplier-development programs to reduce duplication and provide staged funding or financing linked to defined readiness milestones, such as gap assessments, quality-program development, certification, training and customer qualification. ***Immediate to Near-term (0–5 years)***
- **R2.13.** Align workforce development and training programs with identified nuclear quality, inspection, documentation and qualification resource needs. ***Near-term (2–5 years)***

Saskatchewan Suppliers:

- **R2.14.** Complete formal readiness and gap assessments against the requirements of targeted nuclear scopes before committing to major certification or capital investments. ***Immediate (0–2 years)***
- **R2.15.** Develop staged qualification plans linked to defined target customers, scopes of work and applicable requirements. ***Immediate to Near-term (0–5 years)***
- **R2.16.** Use partnerships, subcontracting and work under established quality programs, where available, to build practical nuclear experience and progress toward more advanced qualification. ***Near-term and Ongoing***

- **R2.17.** Explore adjacent nuclear and highly regulated markets, such as research, isotope production, waste management, fuel-cycle activities and laboratory services, as complementary pathways to build relevant quality, documentation and execution experience and diversify the business case for nuclear readiness investment, recognizing that qualification requirements remain customer- and scope-specific. ***Immediate and Ongoing***

Expected Outcomes

- Improved clarity and transparency of qualification requirements across supply chain tiers
- Increased supplier participation in early-stage and lower-tier scopes of work
- More effective progression from commercial to nuclear-qualified capabilities
- Expanded pool of Saskatchewan suppliers with relevant nuclear experience and certifications
- Reduced barriers to entry for small–and medium - sized enterprises

Recommendation 3: Strengthen Nuclear Inspection, Certification, and AIA Capability

Statement	Support the development of, or access to, nuclear inspection, certification, and AIA capabilities to enable efficient supplier qualification and compliance within Saskatchewan.
Priority	**Medium - High**
Timing	Immediate to Near-term (0 – 5 years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

As identified in Section 8.3, supplier readiness alone is insufficient without access to enabling inspection and certification infrastructure. Demonstrating compliance with nuclear codes and standards, particularly for nuclear pressure-boundary components, requires timely access to qualified inspection services.

To support a mid-2030s deployment timeline in Saskatchewan, long-lead items may enter fabrication in the late 2020s. Practical access to inspection and certification services must be established in advance of these activities to support supplier qualification, component registration and approval, and avoid bottlenecks.

At present, Saskatchewan does not have an established provincial pathway for nuclear pressure boundary design registration, inspection, or certification. In the absence of in-province capacity, suppliers may need to rely on out-of-province inspection bodies or externally coordinated certification processes. This can introduce additional costs, extend timelines, and create dependencies on external capacity.

Strengthening access to these capabilities, whether through development of local capacity, partnerships with qualified organizations, or improved access to external providers, can support more efficient qualification processes and improve overall supply chain readiness.

Recommended Actions

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, relevant federal departments and agencies, and applicable regulatory and technical-safety authorities such as the CNSC and TSASK*

- **R.3.1.** Define and establish a clear provincial approach to providing authorized inspection agency services for nuclear pressure boundary equipment, aligned with federal regulatory requirements. ***Immediate to Near-term (0 – 5 years)***

- **R.3.2.** Assess options to strengthen access to nuclear inspection capability in Saskatchewan, including the potential development of local capacity where feasible. ***Near-term (2 – 5 years)***
- **R.3.3.** Facilitate partnerships or service arrangements with existing qualified provincial inspection body(ies) to support timely access to required services. ***Immediate to Near-term (0 – 5 years)***
- **R.3.4.** Support coordination between provincial regulatory bodies, project developers, and certification organizations to align inspection readiness with anticipated project timelines, long-lead procurement, and supplier development activities. ***Near-term (2 – 5 years)***

Nuclear Project Developers and Delivery Organizations: *SaskPower, Nuclear vendors, EPC/ EPCM contractors*

- **R.3.5.** Identify and communicate applicable inspection, registration, hold-point, documentation and authorization requirements for relevant scopes of work, including through technical specifications, procurement documents and supplier qualification processes. ***Immediate to Near-term (0–5 years)***
- **R.3.6.** Establish project-specific AIA and inspection arrangements in accordance with the applicable CNSC licensing and code framework, with sufficient capacity to support planned procurement and construction activities. ***Near-term (2 – 5 years)***
- **R.3.7.** Provide prospective suppliers with clear guidance on inspection responsibilities, interfaces, required documentation and expected approval timelines during procurement and qualification activities. ***Immediate to Near-term (0–5 years)***

Industry and Supplier Associations: *SIMSA, IMCN, OCNI*

- **R3.8.** Maintain and disseminate supplier-facing guidance on nuclear inspection and authorization pathways, including available service providers, typical process steps and key points of contact. ***Immediate and Ongoing***
- **R3.9.** Facilitate direct engagement between Saskatchewan suppliers and qualified AIAs, inspection organizations and certification bodies through technical briefings, workshops and supplier-development activities. ***Immediate and Ongoing***

Saskatchewan Suppliers:

- **R3.10.** Incorporate inspection, certification, documentation, and compliance requirements into readiness planning activities. ***Immediate to Near-term (0 – 5 years)***
- **R3.11.** Engage early with applicable customers, AIA/inspection organizations and certification bodies to understand requirements, responsibilities and timelines. ***Immediate to Near-term (0 – 5 years)***

Expected Outcomes

- Clear access to nuclear inspection and certification services
- Reduced dependence on constrained external inspection capacity, where local or alternative arrangements are practical
- Shorter timelines for supplier qualification and component approvals
- Improved efficiency and predictability of compliance processes

- Increased competitiveness of Saskatchewan-based suppliers within Canadian nuclear supply chains
- Enhanced confidence among project developers in local supply chain capability

Recommendation 4: Improve Supply Chain Engagement, Visibility, and Information Access

Statement	Establish structured, accessible supply chain engagement mechanisms that improve visibility into project information and Saskatchewan supplier capabilities, to enable more effective and timely participation in SMR supply chains.
Priority	**High**
Timing	Immediate to Near-term (0 – 5 years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

As identified in Section 8.5, supplier participation is influenced not only by technical readiness, but also by access to information, relationships, and early engagement pathways. Information relevant to nuclear opportunities is often fragmented across multiple sources, while suppliers lack clarity on how and when to engage with project developers, vendors, and EPCM organizations.

This information asymmetry can favour suppliers already embedded in existing networks and limit the visibility of regional capabilities during early project phases, when supplier positioning and relationship development are often most influential. Late-stage engagement reduces the likelihood of participation, regardless of technical capability or industrial experience.

In the absence of centralized and accessible supplier visibility mechanisms, regional capabilities may remain difficult for project developers, vendors, and EPC/EPCM organizations to identify during early project planning and procurement activities. At the same time, suppliers may face uncertainty about procurement processes, qualification expectations, participation pathways, and points of contact for engagement.

Structured engagement mechanisms and improved information access reduce reliance on informal networks, support broader and more transparent consideration of suppliers, and enable suppliers to align readiness activities with project realities. Early engagement, particularly in project development phases (e.g., pre-FEED and FEED – Front-End Engineering Design), is critical given the long lead times associated with nuclear qualification and procurement.

Recommended Actions

Nuclear Project Developers and Delivery Organizations: *SaskPower, Nuclear vendors, EPC/EPCM contractors*

- **R4.1.** Establish a formal supplier engagement process with defined points of contact, recurring engagement opportunities and clear routes for supplier inquiries and follow-up. ***Immediate to Near-term (0 – 5 years)***
- **R4.2.** Provide structured project and procurement information through recurring industry days, technical briefings, reverse trade shows and similar forums, including anticipated scopes, procurement processes and participation opportunities where feasible. ***Immediate to Near-term (0–5 years)***
- **R4.3.** Create defined opportunities for early supplier involvement in activities such as pre-FEED/FEED engagement, vendor qualification, pilot work and demonstration initiatives where these can support capability validation and experience building. ***Immediate to Near-term (0–5 years)***

- **R4.4.** Participate in coordinated B2B matchmaking and supplier-integration forums to connect Saskatchewan suppliers with relevant project organizations, vendors and major contractors. ***Immediate and Ongoing***

Industry and Supplier Associations: *SIMSA, OCNI, IMCN*

- **R4.5.** Organize and facilitate vendor–supplier engagement sessions (e.g., B2B matchmaking, industry days, technical briefings). ***Immediate and Ongoing***
- **R4.6.** Develop and maintain a centralized nuclear supplier information resource that consolidates project updates, procurement guidance, qualification pathways, engagement contacts and other information relevant to supplier participation. ***Immediate to Near-term (0–5 years)***
- **R4.7.** Develop and maintain a nuclear-relevant supplier capability registry that identifies supplier capabilities, certifications, relevant experience and readiness indicators, building where practical on existing supplier databases and proven international models like the "Fit4Nuclear" database in the UK [144], [145], [146]. ***Immediate and Ongoing***
- **R4.8.** Establish a process for periodic validation and updating of supplier capability information to maintain accuracy and usability for project stakeholders. ***Ongoing***

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, and relevant federal departments and agencies*

- **R4.9.** Support the development and continued operation of supplier engagement and information sharing mechanisms through funding, program alignment and coordination with industry organizations. ***Near-term (2–5 years)***
- **R4.10.** Support interoperability and information-sharing between Saskatchewan-based supplier resources and broader Canadian nuclear supplier platforms to improve consistency, visibility and market access. ***Near-term (2–5 years)***

Saskatchewan Suppliers:

- **R4.11.** Maintain current, evidence-based capability profiles that clearly identify relevant services, certifications, facilities, nuclear or regulated-sector experience and readiness status. ***Immediate and Ongoing***
- **R4.12.** Participate actively in supplier databases, industry briefings, B2B sessions and other structured engagement channels to improve visibility and maintain awareness of evolving opportunities. ***Immediate and Ongoing***
- **R4.13.** Maintain active registration and participation in relevant nuclear and industry associations and supplier networks to access market intelligence, training, engagement opportunities and connections with project organizations and established nuclear suppliers. ***Immediate and Ongoing***
- **R4.14.** Use formal engagement channels to build direct relationships with project developers, vendors and major contractors and validate realistic areas of fit before making significant readiness investments. ***Immediate to Near-term (0–5 years)***

Expected Outcomes

- Improved access to clear, consolidated, and up-to-date information on SMR opportunities
- Enhanced visibility of Saskatchewan supplier capabilities to project developers and vendors
- Better matching of supplier capabilities to project needs

- Reduced reliance on informal networks and "who you know" dynamics
- Earlier and more strategic supplier positioning within SMR project lifecycles
- Broader and more inclusive participation of Saskatchewan suppliers in nuclear supply chains

Recommendation 5: Support Supplier Readiness Through Financial and Capability Development Mechanisms

Statement	Support Saskatchewan suppliers in preparing for participation in SMR supply chains through targeted financial, technical, and capability development mechanisms that address barriers related to certification, capital investment, and project execution readiness.
Priority	**High**
Timing	Immediate to Near-term (0 – 5 years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

Financial constraints represent a key barrier to supplier readiness. As analyzed in Section 8.6, nuclear supply chain participation requires significant upfront investment well before revenue realization. Even where qualification pathways are clear, suppliers may still lack the financial capacity, internal resources, or technical capability to make the required investments.

Suppliers may also face challenges in financing larger or more complex scopes of work. For small– and medium-sized enterprises in particular, limited balance sheet capacity and access to financing can limit readiness and execution capacity.

Targeted financial and capability-development mechanisms help align supplier investment timing with nuclear project milestones, mitigate risk, and enable broader participation. Where support also enables the adoption of advanced technologies—such as automation, advanced manufacturing techniques, and digital systems for quality management and traceability—it can enhance productivity and competitiveness across nuclear and adjacent markets.

Recommended Actions

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, and relevant federal departments and agencies*

- **R5.1.** Continue to develop and expand supplier readiness funding programs, with particular focus on Tier 2 and Tier 3 suppliers and small- and medium-sized enterprises, requiring support for quality system implementation, certification, workforce development, technical qualification, equipment upgrades, and other demonstrated readiness needs. ***Immediate to Near-term (0 – 5 years)***
- **R5.2**. Provide targeted financial support and risk-sharing mechanisms (e.g., catalyst capital, grants, cost-sharing programs, loan guarantees, bridge financing) to reduce the burden of early-stage supplier readiness investments. ***Immediate to Near-term (0 – 5 years)***
- **R5.3.** Align funding eligibility criteria, timing, and approval processes with anticipated nuclear project milestones and supplier readiness pathways. ***Immediate to Near-term (0 – 5 years)***
- **R5.4.** Improve accessibility of funding programs by streamlining application processes, reducing administrative burden, and increasing transparency in evaluation and approval criteria. ***Immediate to Near-term (0 – 5 years)***

- **R5.5.** Support investment in advanced technologies, digital tools, and innovation (e.g., automation, advanced manufacturing, 3D printing, modelling and simulation) through targeted funding programs and partnerships with academic and research institutions . ***Near-term (2 – 5 years)***
- **R5.6.** Consider targeted incentives or programs to support partnerships between experienced nuclear suppliers (e.g., Ontario-based nuclear suppliers) and Saskatchewan-based companies. ***Immediate to Near-term (0 – 5 years)***

Nuclear Project Developers and Delivery Organizations: *SaskPower, Nuclear vendors, EPC/ EPCM contractors*

- **R5.7.** Provide early visibility into potential scopes of work, qualification requirements and anticipated timing to support credible supplier business cases and supplier investment and financing decisions. ***Immediate to Near-term (0 – 5 years)***
- **R5.8**. Where feasible, identify opportunities for supplier development support, co-investment, pilot work or other mechanisms that reduce the financial risk of early capability development. ***Near-term (2–5 years)***

Industry and Supplier Associations: *SIMSA, OCNI, IMCN*

- **R5.9.** Support supplier awareness of available funding programs and financial support mechanisms. ***Immediate and Ongoing***
- **R5.10.** Facilitate access to advisory support for funding applications, certification planning, financing and readiness-related business case development. ***Immediate and Ongoing***
- **R5.11.** Collect and communicate supplier needs and recurring funding barriers to government and program administrators to improve alignment between program design and industry requirements. ***Near-term and Ongoing***

Saskatchewan Suppliers:

- **R5.12.** Develop internal business cases for certification, quality system development, equipment upgrades, and workforce development, linked to defined target markets, customers and anticipated opportunities. ***Immediate to Near-term (0 – 5 years)***
- **R5.13.** Evaluate readiness investments in alignment with anticipated nuclear opportunities and strategic positioning. Suppliers should use staged investment approaches where practical, progressing from lower-cost readiness activities toward larger capital commitments as market visibility and qualification progress improve. ***Immediate to Near-term (0–5 years)***
- **R5.14.** Explore financing options, partnerships, and collaborative models to support capital-intensive investments. ***Immediate to Near-term (0 – 5 years)***
- **R5.15.** Evaluate and adopt advanced technologies and digital tools that enhance productivity, quality, and traceability, where supported by a clear business case and aligned with anticipated SMR requirements. ***Near-term to Medium (2 – 10 years)***
- **R5.16.** Collaborate with academic, research, and testing institutions to support the development and application of advanced technologies, including prototyping, testing, and validation, and to address industry-driven challenges through applied research and innovation. ***Ongoing***

Expected Outcomes

- Increased ability of Saskatchewan suppliers to invest in readiness, nuclear certification, capability development, and infrastructure
- Improved access to financing and funding for readiness-related activities
- Enhanced competitiveness of Saskatchewan suppliers in nuclear and adjacent markets

- Greater participation of small– and medium-sized enterprises in early-stage and mid-tier supply chain opportunities
- Strengthened foundation for long-term supply chain development within the province

Recommendation 6: Align Procurement, Contracting, and Project Delivery Models

Statement	Align procurement strategies, contracting approaches, and project delivery models with the capabilities and readiness of Saskatchewan suppliers to enable practical and scalable participation in SMR projects.
Priority	**Medium - High**
Timing	Near-term – Medium-term (2 – 10 years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

Supplier participation is influenced not only by capability and readiness, but also by how work is structured, packaged, and procured. As identified in Section 8.4, even where capable suppliers exist, misalignment between procurement approaches and regional capabilities can limit access to opportunities.

Nuclear projects are typically delivered through complex contracting models (e.g., EPC, EPCM, or integrated delivery approaches), where procurement decisions are often centralized and influenced by vendor-specific requirements, established supply chains, and risk considerations. In this context, opportunities for new or regionally based suppliers may be constrained if procurement strategies favour large, pre-qualified vendors or bundle work into scopes that exceed local capacity.

In addition, project delivery strategies, such as modularization, off-site fabrication, and standardized designs, can influence where work is performed and how suppliers participate in Saskatchewan (see Section 8.7). These approaches can improve efficiency and quality but may also shift work toward established manufacturing hubs unless they are aligned with regional capabilities.

Aligning procurement and delivery approaches with supplier readiness can help ensure Saskatchewan suppliers can access appropriate entry points, particularly for early- and mid-tier scopes of work, while maintaining project efficiency and risk management objectives. At the same time, regional participation objectives should be considered alongside cost, schedule, quality, safety, and project-risk requirements, particularly during early deployments.

SIMSA's *Major Project Procurement White Paper* [127] identifies valuable lessons from major-project procurement in Saskatchewan that can provide a practical starting point for planning nuclear procurement and supplier-engagement approaches.

Recommended Actions

Nuclear Project Developers and Delivery Organizations: SaskPower, Nuclear vendors, EPC/ EPCM contractors

- **R6.1.** Structure procurement strategies to enable participation across different tiers of work, including smaller or modularized work packages aligned with supplier capabilities. Use early supplier and capability assessments to identify where scopes can be appropriately sized, separated or modularized to create realistic participation opportunities without compromising project objectives. ***Near-term (2 – 5 years)***

- **R6.2.** Avoid over-bundling of contracts where feasible, particularly where it limits participation of capable regional suppliers. ***Near-term (2 – 5 years)***
- **R6.3.** Clearly define procurement pathways, including how suppliers can access opportunities through prime contractors, subcontracting, or vendor-led supply chains, including where responsibility for procurement and qualification sits. ***Near-term (2 – 5 years)***
- **R6.4.** Establish structured supplier integration and onboarding mechanisms that support participation of regional suppliers within Tier 1 delivery and subcontracting frameworks. ***Near-term (2 – 5 years)***
- **R6.5.** Align project delivery strategies (e.g., modularization, off-site fabrication) with realistic assessments of regional capability where feasible. ***Near-term to Medium (2 – 10 years)***

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, and relevant federal departments and agencies*

- **R6.6.** Encourage procurement approaches that support regional participation through policy guidance, funding conditions, or partnership frameworks. ***Near-term (2 – 5 years)***
- **R6.7.** Support alignment between project delivery strategies and regional economic development objectives. ***Near-term to Medium (2 – 10 years)***
- **R6.8**. Support initiatives that facilitate integration of Saskatchewan suppliers into broader Canadian and international nuclear supply chains. ***Near-term to Medium (2 – 10 years)***

Industry and Supplier Associations: *SIMSA, IMCN, OCNI*

- **R6.9.** Develop practical supplier guidance on nuclear procurement models, contracting structures, tiered supply chain roles and likely entry pathways. ***Immediate and Ongoing***
- **R6.10.** Facilitate structured engagement between suppliers and prime contractors, vendors and EPC/ EPCM organizations to support subcontracting, teaming and supplier-integration opportunities. ***Near-term and Ongoing***
- **R6.11.** Use lessons from Saskatchewan major-project procurement and other nuclear jurisdictions to inform supplier engagement, work packaging and procurement planning discussions. ***Immediate and Ongoing***

Saskatchewan Suppliers:

- **R6.12.** Position capabilities to align with likely procurement pathways (e.g., subcontracting, partnerships, niche scopes). ***Immediate to Near-term (0 – 5 years)***
- **R6.13.** Explore collaborative approaches (e.g., joint ventures, consortium models) to pursue larger or more complex scopes of work. ***Near-term to Medium (2 – 10 years)***
- **R6.14.** Develop an understanding of project delivery models and associated expectations for quality, schedule, and execution. ***Immediate to Near-term (0 – 5 years)***

Expected Outcomes

- Improved alignment between procurement strategies and regional supplier capabilities
- Increased access to entry points for Saskatchewan suppliers across different tiers of work
- More effective participation in subcontracting and partnership-based delivery models
- Reduced barriers associated with contract size, bundling, and centralized procurement

- Greater integration of Saskatchewan suppliers into nuclear project delivery

Recommendation 7: Strengthen Supplier Collaboration and Strategic Partnerships

Statement	Strengthen collaboration among Saskatchewan suppliers and support strategic partnerships with established nuclear supply chains in other jurisdictions to support knowledge transfer, supplier integration, capability development, and long-term participation in Canadian and global nuclear supply chains.
Priority	**Medium**
Timing	Near-term – Long-term (2 – 10+ years)
Stakeholders	Saskatchewan Suppliers
	Nuclear Project Developers
	Government & Public Institutions
	Industry & Supplier Associations

Why it matters

As identified in Section 8.9, many Saskatchewan suppliers have strong individual capabilities but may face limitations in pursuing larger or more complex nuclear opportunities independently. At the same time, the fragmented nature of the supply base can make it more difficult for project developers and vendors to identify integrated and scalable regional solutions.

Collaboration among suppliers—through partnershzzips, joint ventures, or coordinated delivery models—can help address these challenges by enabling the bundling of complementary capabilities, sharing of resources, and collective pursuit of larger scopes of work. Where supported by demonstrated demand, coordinated supplier groupings, shared-service models or regional clusters (e.g., manufacturing hubs, centres of excellence, etc.) may further improve the visibility and scalability of Saskatchewan capabilities.

In addition, limited prior experience in nuclear projects presents a challenge for suppliers seeking to meet qualification and performance expectations. Strategic partnerships with established nuclear suppliers in jurisdictions with active projects (e.g., Ontario) can provide opportunities to gain practical experience, understand nuclear requirements, and build relationships within existing supply chains.

Shared training, testing, and demonstration capabilities may provide another pathway for practical experience, particularly in a jurisdiction without an operating commercial nuclear power fleet. Depending on demonstrated need, these could include mock-up facilities, test loops, research reactors, demonstration facilities, or partnerships with existing Canadian nuclear institutions, supporting experience development in areas such as nuclear quality, inspection, operations, maintenance, and regulated work practices.

Over time, coordinated approaches to collaboration and partnership can support the development of a more integrated, visible, and competitive Saskatchewan-based supply chain by improving visibility, reducing duplication of effort, enabling shared learning, and strengthening alignment between industry, government, academia, and supporting organizations.

Recommended Actions

Industry and Supplier Associations: *SIMSA, IMCN, OCNI*

- **R7.1.** Facilitate structured collaboration and partnership opportunities between Saskatchewan suppliers and experienced nuclear organizations across Canada and internationally. ***Immediate and Ongoing***
- **R7.2.** Support B2B engagement sessions, supplier networking activities, reverse trade missions, and collaborative forums that strengthen relationship

development and supplier integration. ***Immediate and Ongoing***

- **R7.3.** Facilitate development of coordinated capability groupings, shared-capability networks, or regional supplier clusters where these align with project needs. ***Near-term to Medium (2 – 10 years)***
- **R7.4.** Develop structured pathways for Saskatchewan suppliers to gain experience through participation in active nuclear projects outside the province, including observation, subcontracting, teaming and defined scopes of work. ***Near-term and Ongoing***
- **R7.5.** Identify supplier and workforce needs that could be addressed through shared training, testing, or demonstration infrastructure and support coordination with relevant institutions. ***Near-term (2–5 years)***

Saskatchewan Suppliers:

- **R7.6.** Explore collaborative approaches, including partnerships, joint ventures, and consortium models, to pursue larger or more complex scopes of work. ***Near-term to Medium (2 – 10 years)***
- **R7.7.** Participate in mentorship, shared learning and capability development initiatives where appropriate to improve collective regional competitiveness. ***Near-term and Ongoing***
- **R7.8.** Pursue strategic partnerships with experienced nuclear suppliers to gain practical experience and market access. ***Near-term and Ongoing***

Nuclear Project Developers and Delivery Organizations: *SaskPower, Nuclear vendors, EPC/ EPCM contractors*

- **R7.9.** Consider coordinated regional supplier groups or clusters where these provide an efficient and credible delivery solution | **Near-term to Medium (2 – 10 years)**
- **R7.10.** Support integration of Saskatchewan suppliers into broader supply chains through subcontracting and partnership opportunities. ***Near-term to Medium (2 – 10 years)***
- **R7.11.** Participate in collaborative engagement activities that support supplier integration and long-term relationship development. ***Immediate and Ongoing***

Government and Public Institutions: *Government of Saskatchewan, provincial Crown corporations, and relevant federal departments and agencies*

- **R7.12.** Support collaborative supply chain development initiatives through funding programs and policy alignment. ***Near-term to Medium (2 – 10 years)***
- **R7.13.** Facilitate interprovincial collaboration and partnerships to support supplier development and market access. ***Near-term and Ongoing***
- **R7.14.** Explore the need for shared nuclear training, testing, and demonstration capabilities, including partnerships with existing Canadian research and training institutions, to support practical experience development for suppliers and specialized personnel. ***Near-term to Long-term (2–10+ years)***

Expected Outcomes

- Improved coordination and integration of Saskatchewan supplier capabilities
- Increased ability to participate in larger and more complex scopes of work
- Enhanced visibility of Saskatchewan's supply chain as a cohesive and scalable offering
- Increased access to nuclear experience through external partnerships

- Strengthened long-term competitiveness of Saskatchewan suppliers in nuclear and adjacent markets

9.1. Recommendation Summary

Table 18 summarizes the primary stakeholders, supporting stakeholders, and relative priority associated with each recommendation. It provides a clear, at-a-glance view of where action is required and how responsibilities are distributed across stakeholder groups.

Collectively, these recommendations are intended to address the key structural constraints identified in **Section 8** and support more effective participation of Saskatchewan suppliers in nuclear supply chains. Their value will ultimately depend on how they are applied within real project contexts and evolving nuclear deployment conditions.

9.2. Implementation Priorities and Coordination Considerations

While the recommendations presented are intended to support long-term supply chain development, certain actions emerge as particularly important in the immediate to near-term period given their influence on supplier readiness, qualification progression, early engagement, and alignment with anticipated SMR deployment timelines.

In addition to individual actions, successful implementation will depend on broader coordination, timing, sequencing, and sustained engagement across stakeholders. This section highlights key near-term priorities and implementation considerations that may influence execution of the recommendations presented in this report.

Table 18 - Recommendation Summary Matrix

Recommendation	Government	Developers / Vendors / EPCM	Suppliers	Associations	Priority	Timing	Suggested Level of Effort
1. Strengthen Market Signals and Clarify Participation Expectations	Primary	Primary	Supporting	Supporting	High	[I – N]	Medium
2. Establish Clear and Staged Qualification Pathways	Supporting	Primary	Supporting	Primary	High	[I – N]	Medium- High
3. Strengthen Regulatory Clarity, Inspection Capacity, and Infrastructure	Primary	Primary	Supporting	Supporting	Medium–High	[I – N]	High
4. Improve Engagement, Visibility, and Information Access	Supporting	Primary	Supporting	Primary	High	[I – N]	Low
5. Support Supplier Readiness (Financial & Capability Development)	Primary	Primary	Supporting	Supporting	High	[I – N]	High
6. Align Procurement, Contracting, and Delivery Models	Supporting	Primary	Supporting	Supporting	Medium–High	[N – M]	Medium-High
7. Strengthen Collaboration, Clustering, and Partnerships	Supporting	Supporting	Primary	Primary	Medium	[N – L]	Medium

Timing Indicator Description: *[I] - Immediate (0–2 years); [N] – Near-term (2–5 years); [M] – Medium-term (5–10 years); [L] - Long-term (10+ years); [O] – Ongoing*

9.2.1. High-Priority Near-Term Actions

Across the recommendations presented in this section, several actions emerge as particularly critical in the immediate to near-term (0–5 years), given their influence on supplier readiness and alignment with anticipated nuclear project timelines.

These actions focus on establishing the foundational conditions required for supply chain participation, including:

1. Improving visibility into anticipated procurement opportunities, participation expectations, and realistic scopes of work suited to Saskatchewan suppliers (Recommendations 1 and 6)
2. Improving clarity of qualification requirements, readiness expectations, and supplier onboarding pathways, including defined progression toward vendor approval processes (e.g., VSLs and QSLs) (Recommendation 2)
3. Establishing clear access to nuclear pressure-boundary inspection, AIA/ANI services, and associated authorization pathways required to support supplier qualification and authorized nuclear pressure boundary work (Recommendation 3)
4. Initiating detailed readiness assessment against nuclear requirements for Saskatchewan suppliers (Recommendation 4)
5. Enabling early and structured supplier engagement, including participation in B2B engagements, pre-FEED/FEED activities, vendor qualification programs, and pilot or demonstration initiatives (Recommendation 4)
6. Supporting supplier readiness through accessible funding and risk-sharing mechanisms, including improved access to existing programs (Recommendation 5)

These near-term actions are interdependent and should be advanced in parallel to support effective supplier positioning prior to formal procurement and construction phases.

9.2.2. Cross-Cutting Implementation Considerations

Effective implementation of the phase 1 recommendations depends not only on individual actions, but on alignment across stakeholders, timing, and execution approaches. Several cross-cutting considerations were identified as critical to success:

Alignment of Timing and Sequencing

Nuclear supply chain readiness is highly sensitive to timing. Supplier investments in certification, workforce development, and capability expansion must align with project and procurement milestones. Delays in clarifying requirements or engagement pathways can compress timelines and limit supplier participation.

Early Engagement and Visibility

Early engagement among project developers, vendors, and major contractors helps suppliers understand requirements, align capabilities, and position themselves for future opportunities. Late-stage entry can significantly reduce participation potential.

Clarity and Transparency of Requirements

Clear articulation of regulatory requirements, qualification pathways, procurement processes, and participation expectations is essential to support informed supplier decisions and reduce uncertainty.

Coordination Across Stakeholders

Implementation will require coordinated action across government, project developers, industry associations, suppliers and supporting institutions. Some of the recommended actions may already be underway through existing programs, studies, funding mechanisms, supplier-development initiatives or stakeholder activities. Where this is the case, implementation should build on and continue effective existing efforts rather than create parallel or duplicative initiatives. Greater coordination, information-sharing and clarity of roles can help align

ongoing activities, identify remaining gaps and improve the efficient use of available resources.

Scalability and Long-Term Program Development

Nuclear supply chain development should be approached as a long-term program rather than a single-project effort. Sustained participation will require continued investment, consistent market signals and opportunities for suppliers to build experience across successive project phases.

9.2.3. Implementation Governance and Next Steps

Effectively implementing the recommendations outlined in Section 9.1 will require sustained coordination across government, project developers, industry associations, suppliers, Indigenous organizations, academia, and supporting institutions. While individual organizations can advance actions within their respective mandates, the recommendations are interconnected and would benefit from coordinated implementation.

As a next step, relevant provincial and federal organizations, Crown corporations, industry representatives, and other key stakeholders should develop a Saskatchewan Nuclear Supply Chain Action Plan that translates the recommendations in this report into a coordinated implementation program.

The Action Plan should:

- Define lead and supporting organizations for each priority action, including clear roles, responsibilities and decision-making interfaces.
- Establish implementation timelines and milestones across immediate, near-, medium- and longer-term horizons, aligned with anticipated project and procurement schedules.
- Map existing programs, initiatives and funding mechanisms to identify where current efforts can be continued, expanded, coordinated or consolidated.
- Identify outstanding gaps and required new actions, including areas requiring policy support, funding,

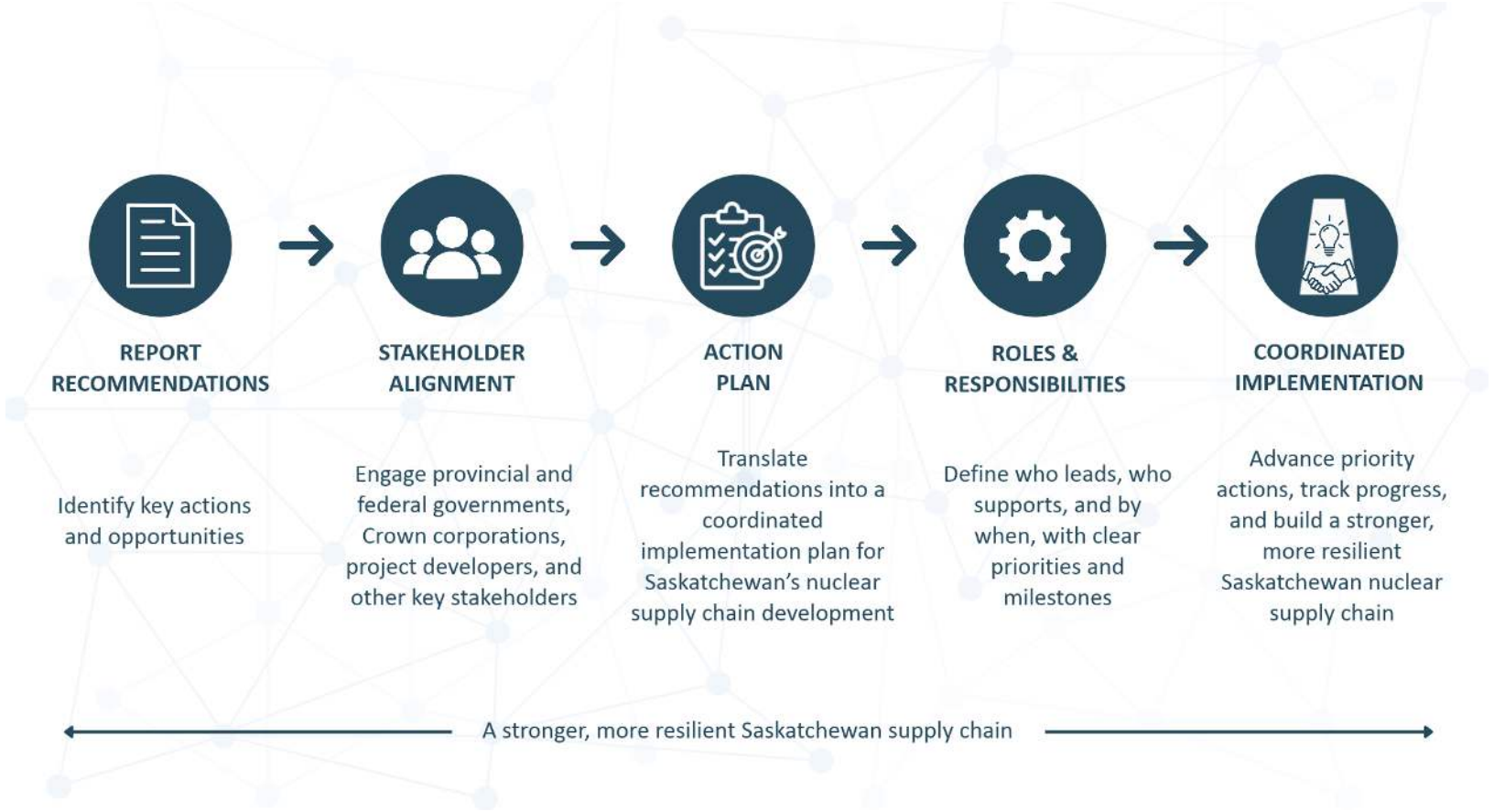


Figure 10 -Recommendations to coordinated implementation.

technical assistance, workforce development or supplier engagement.

- Link supplier development activities to project needs, including qualification timelines, anticipated procurement packages, vendor requirements and workforce demand.
- Establish coordination mechanisms across provincial and federal organizations, Crown corporations, industry associations, project developers and other participating institutions.
- Define measurable indicators and reporting mechanisms to track implementation progress, supplier readiness, participation outcomes and emerging constraints.
- Provide for periodic review and adjustment of the Action Plan as project timelines, technologies, market conditions and supplier capabilities evolve.

A multi-stakeholder coordinating or convening function could support implementation of the Action Plan by maintaining alignment among participating organizations, tracking progress, facilitating information sharing and identifying emerging gaps or duplication.

Implementation should remain flexible and scalable, recognizing that nuclear deployment timelines, project structures, technologies and supply chain conditions will continue to evolve.

9.3. Alignment with Canada's Nuclear Energy Strategy

Canada's *Nuclear Energy Strategy*, released in June 2026, establishes a national framework for expanding nuclear capacity, strengthening Canada's domestic nuclear value chain, increasing participation in global markets, securing fuel-cycle capabilities, and advancing nuclear innovation [3].

The recommendations developed through Phase 1 of this study were based primarily on Saskatchewan-specific supply chain findings and stakeholder engagement. Following release of the federal Strategy, the Phase 1

Table 19 - Alignment of Phase 1 Recommendations with Canada's Nuclear Energy Strategy

Nuclear Energy Strategy Pillar	Alignment with Saskatchewan supply chain Assessment	Relevant Phase 1 Recommendations
Pillar 1 – Enabling New Builds Across Canada	Strongest area of alignment. The recommendations address key enabling conditions for new nuclear builds, including market certainty, supplier qualification, inspection capacity, financing, procurement readiness and supplier integration.	R1 Market Signals; R2 Qualification & Readiness Pathways; R3 Inspection/AIA Capability; R4 Engagement & Visibility; R5 Financial & Capability Development; R6 Procurement & Delivery Models; R7 Collaboration & Partnerships
Pillar 2 – Being a Global Supplier and Exporter of Choice	Developing qualified and competitive Saskatchewan suppliers can broaden Canada's nuclear supply base and support participation in domestic and, over time, international projects.	R2 Qualification & Readiness Pathways; R4 Engagement & Visibility; R5 Financial & Capability Development; R6 Procurement & Delivery Models; R7 Collaboration & Partnerships
Pillar 3 – Expanding Uranium Production and Nuclear Fuel Opportunities and Supporting World-Class Long-Term Nuclear Waste Management	Saskatchewan already occupies a significant position in Canada's uranium sector. Detailed assessment of uranium, nuclear fuel and associated waste-management opportunities is addressed primarily through the companion Fuel Cycle Report.	Primarily addressed through the Fuel Cycle Report, with selected interfaces across the Phase 1 recommendations
Pillar 4 – Developing New Canadian Nuclear Innovations	Recommendations supporting advanced manufacturing, digital technologies, applied research partnerships, shared training and testing capabilities, and practical nuclear experience contribute to development of a stronger innovation ecosystem	R5 Financial & Capability Development; R7 Collaboration & Strategic Partnerships

recommendations were reviewed against its four strategic pillars to identify areas of alignment and demonstrate how Saskatchewan supply chain development may contribute to broader Canadian nuclear objectives. As summarized in Table 19, the recommendations align most directly with **Pillars 1, 2 and 4**, while the objectives of **Pillar 3** are addressed more substantively through the companion Fuel Cycle Report.

The strongest alignment is with Pillar 1 – Enabling New Builds Across Canada. The federal Strategy identifies financing, regulatory efficiency, workforce capacity and supply chain readiness as important conditions for future nuclear deployment and specifically calls for assessment of supply chain requirements and coordinated workforce development. The Phase 1 report recommendations address these objectives from a provincial supply chain perspective by identifying actions needed to improve supplier visibility, qualification, inspection capability, investment readiness, procurement integration and access to project opportunities.

Alignment with Pillar 2 – Being a Global Supplier and Exporter of Choice reflects the longer-term opportunity for Saskatchewan suppliers to participate beyond provincial deployment. The Strategy specifically seeks to position Canadian suppliers for participation in both CANDU and non-CANDU large-reactor and SMR projects and establishes an objective of achieving significant Canadian supply chain participation in international non-CANDU projects. Development of qualified Saskatchewan suppliers, stronger relationships with established nuclear organizations, and integration into broader vendor and project-delivery networks therefore support both domestic readiness and Canada's export ambitions.

The connection to Pillar 4 – Developing New Canadian Nuclear Innovations is more targeted. The Strategy emphasizes increased nuclear R&D investment, development of research infrastructure and demonstration of advanced reactor technologies. Recommendations in this study related to advanced manufacturing, digital capability, applied research partnerships, and shared training, testing or demonstration capabilities provide complementary pathways for Saskatchewan suppliers and specialized personnel to build practical experience and participate in the wider Canadian innovation ecosystem.

Overall, this alignment demonstrates that Saskatchewan supply chain development can contribute to broader national objectives for nuclear deployment, industrial participation, exports and innovation.



Key Takeaways – Section 9

- Although the first nuclear deployment in Saskatchewan is targeted for the mid-2030s, supply chain readiness actions must begin now due to long nuclear qualification and engagement lead times.
- Early clarity on market signals, qualification pathways, and regulatory expectations is the most critical near-term enabler of meaningful supplier participation.
- Early, structured engagement among governments, project developers, suppliers, and industry associations is essential to implementing these recommendations effectively and to avoid misalignment between readiness investments and project needs.
- No single stakeholder can enable readiness in isolation. Coordinated action across the supply chain ecosystem is required for meaningful participation outcomes.
- Timing is important. Actions taken in the next 1–3 years will significantly influence whether Saskatchewan suppliers are positioned to participate when procurement windows open.
- A Saskatchewan Nuclear Supply Chain Action Plan would provide a practical next step by translating the recommendations into defined actions, responsibilities, milestones, coordination mechanisms and progress reporting.
- The recommendations align closely with Canada's Nuclear Energy Strategy, particularly its objectives related to enabling new builds, strengthening domestic and export-oriented supply chains, and advancing nuclear innovation.

10. Conclusion

This study was undertaken to assess Saskatchewan's readiness to participate in emerging nuclear supply chains by identifying relevant participation requirements, evaluating the province's existing industrial capabilities, and identifying key opportunities, gaps, and barriers to participation across manufacturing, deployment and construction, operations and maintenance, and the fuel cycle.

The assessment found that Saskatchewan possesses a substantial industrial base with capabilities that are relevant and potentially transferable to nuclear projects. Existing strengths in areas such as mining, construction, fabrication, engineering, logistics, environmental services, and large-project delivery provide a credible foundation for participation. However, readiness is not uniform across suppliers or scopes of work, and participation in nuclear projects introduces additional requirements related to qualification, quality, inspection, procurement, regulatory compliance, and integration into established nuclear supply chains.

Accordingly, Saskatchewan's current position is best characterized as one of strong foundational capability and developing nuclear readiness. Some suppliers may be positioned to participate in accessible scopes with limited additional development, while others will require further qualification, capability development, partnerships, or experience before pursuing more specialized nuclear work. The extent and timing of participation will also depend on project-specific factors such as technology selection, delivery model, procurement strategy, localization objectives, and deployment timing.

The recommendations developed through this study are intended to support the progression from existing industrial capability toward greater nuclear supply chain readiness by addressing the principal enabling conditions identified through the assessment. These include market visibility, qualification pathways, inspection capability, supplier engagement, financial and capability-development support, procurement alignment, and collaboration with established nuclear supply chains.

A mature and adaptable Saskatchewan nuclear supply chain can serve as an important enabler of future nuclear deployment within the province and across Canada, while also supporting broader objectives of Canada's Nuclear Energy Strategy related to new-build delivery, domestic supply chain capacity, exports, and innovation. Ultimately, alignment across suppliers, project developers, government, industry associations, and supporting institutions will be important to the coordinated development of Saskatchewan's nuclear supply chain ecosystem.

The study represents a snapshot of Saskatchewan's readiness at the time of assessment. Nuclear policy, technologies, project plans, supplier capabilities, and market conditions continue to evolve, and readiness should therefore be periodically reassessed as project definition advances.

Phase 2 will build on this foundation through targeted case studies intended to test selected participation pathways and implementation considerations in greater detail.





11. Phase 2 Transition and Case Study Framework

This report marks the completion of Phase 1 of this study (see **Section 1**). The next phase of the project transitions from assessing Saskatchewan's nuclear supply chain readiness to demonstrating practical implementation pathways through a focused portfolio of case studies.

For the purposes of this study, a case study is defined as:

A structured, evidence-based examination of a realistic supply chain participation pathway within the nuclear ecosystem, designed to demonstrate how a specific capability, opportunity, or constraint may be addressed, implemented, and scaled in practice.

The case studies are intended to:

- Translate validated Phase 1 findings into practical applications;
- Demonstrate practical supply chain participation pathways;
- Examine implementation requirements, risks, and enabling conditions.
- Support supplier capability development and readiness advancement.
- Generate lessons learned and scalable approaches relevant to future nuclear deployment activities.

This section summarizes the Phase 2 approach and overall project timeline, case study development and selection process, selected case studies, and implementation considerations.

11.1. Phase 2 Overview

Phase 2 is expected to run from June 2026 through March 2027. The work will be undertaken collaboratively by the project delivery partners and participating utilities, technology vendors, and members of the project Working Groups and Project Advisory Committee.

Activities in this phase are organized into three broad stages:

- **Pre-planning and case study selection,** including development of the Case Study Framework, development and selection of candidate case studies, and project planning;
- **Execution of the selected case studies,** including stakeholder engagement, data collection, analysis, pathway development, and validation; and
- **Reporting, validation and project close-out**, culminating in an integrated Phase 2 report and recommendations for future implementation.

Figure 11 presents the overall Phase 2 roadmap.

11.2. Case Study Development and Selection Process

To ensure a consistent and rigorous approach, the project delivery partners developed and agreed on a structured Case Study Framework. The framework established a common definition of a case study and provided consistent guidance for case study development, management, evaluation, and execution. Figure 12 outlines the case study development and selection process.

Nine candidate case studies were initially developed by the project team based on the findings of Phase 1. These were reviewed by the Project Delivery Partners prior to the Phase 1 Validation Workshop held in May 2026 (see Appendix F). During the workshop, participants identified five additional opportunities (CS-10 to CS-14) for consideration, increasing the portfolio to fourteen candidate case studies.

Following the workshop, the project partners undertook a comprehensive technical review of all candidate case studies. This review included refinement, consolidation of overlapping concepts, and integration to create three new case studies (CS-15, 16, and 17), resulting in a final portfolio of seventeen candidate case studies.

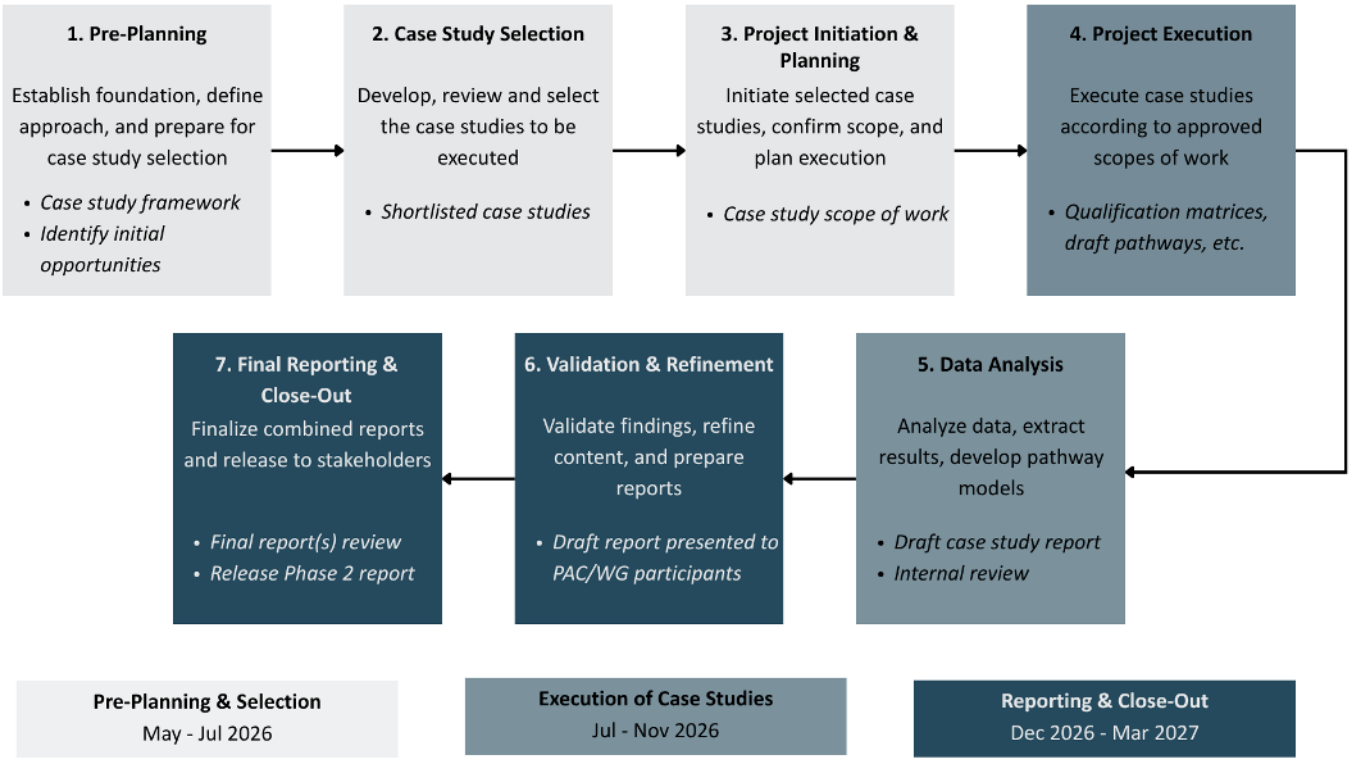


Figure 11 - Phase 2 Overall Process and Timeline

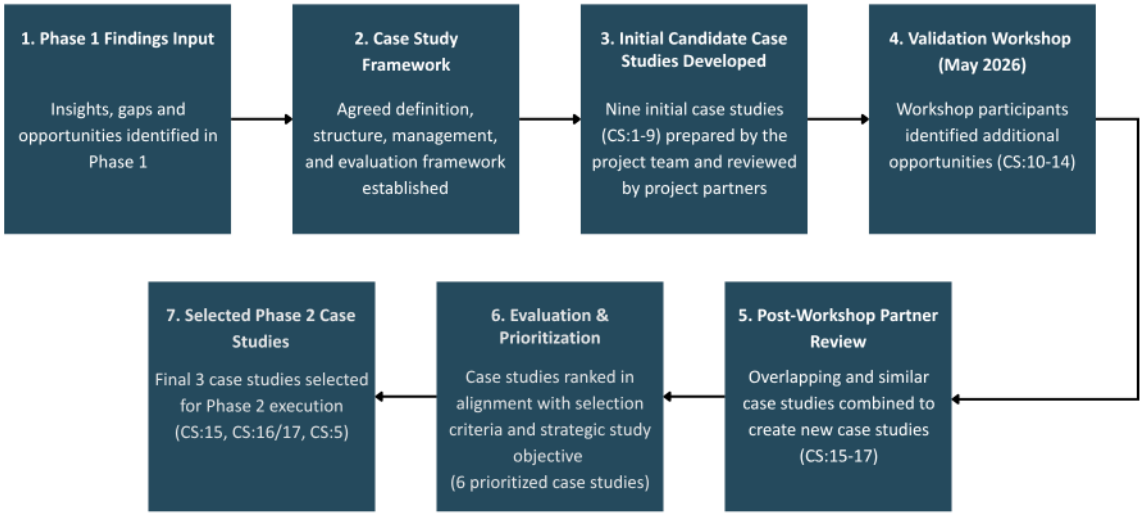


Figure 12 - Case Study Development and Selection Process

The refinement process was guided by several key principles:

- Alignment with the approved Case Study Framework;
- Clear distinction between core, supporting, and optional case studies;
- Elimination of duplication and conceptual overlap; and
- Emphasis on implementation, measurability, scalability, and alignment with Phase 1 priorities.

The complete portfolio of candidate case studies was subsequently evaluated against agreed selection criteria, including strategic relevance, implementation feasibility, stakeholder value, resource requirements, project schedule, and anticipated impact. This process led the project delivery partners to agree on the final selection of four top case studies for execution during Phase 2.

The 17 candidate case studies evaluated for Phase 2 are listed below (selected case studies highlighted in bold):

CS-1: Nuclear Quality Program Implementation Pathway

CS-2: N299.4 Qualification Pathway (incl. Desktop Review)

CS-3: Equipment Transportation & Logistics to SMR Site

CS-4: Capability Transfer: Saskatchewan Industrial Firms to Nuclear Applications

CS-5: Nuclear Plant Modular Fabrication & Localization Test Case

CS-6: Nuclear Supply Chain Capability Database (Targeted Prototype)

CS-7: UF6 Cylinder Fuel Cycle Packaging & Transport

CS-8: B2B Market Entry / Partnerships (Ontario)

CS-9: Documenting Existing Supplier Pathways (Current / Past Experiences)

CS-10: Utility QSL Qualification Pathways

CS-11: Nuclear Technology Vendor Supplier Qualification Pathways

CS-12: End-to-End Qualification & Selection Pathway (combination of CS-10 and CS-11)

CS-13: CGD and Nuclear Qualification of Components Using Saskatchewan Testing Infrastructure

CS-14: N299.4 Supplier Qualification via Desktop Review (ISO 9001-Based Pathway, a variation of CS-2)

CS-15: Integrated Qualification & Supplier Entry Pathway (combination of candidate CS-1, CS-2, CS-10, CS-11, CS-12, CS-14)

CS-16: Capability Transfer & Supplier Readiness Pathway (combination of candidate CS-4 + CS-9)

CS-17: Market Access & Partnership Pathways (Ontario Integration) (combination of candidate CS-8 + CS-11)

A detailed discussion of the Case Study Framework, evaluation criteria, candidate development process, and selection rationale is provided in the Phase 2 report.

11.3. Selected Phase 2 Case Studies

Table 20 presents an overview of the top (4) selected case studies approved by the project delivery partners and the final SIMSA decision for Phase 2 on June 10, 2026. These case studies represent the highest-priority implementation initiatives arising from the Phase 1 readiness assessment. Together, they address several of the most significant barriers affecting supplier participation, including:

- Nuclear quality assurance (QA) readiness,
- Market access and qualification pathways,
- Supply chain visibility and capability transfer, and
- Localization opportunities.

Although four priority case studies were identified through the evaluation process (Table 20), the approved Phase 2 mandate remains the delivery of three case study workstreams. Accordingly:

- March will lead CS-15 as one case study,
- WEC will lead CS-5 as one case study, and
- The CoE will deliver CS-16 and CS-17 as a single integrated case study workstream.

11.4. Key Implementation Consideration

Successful delivery of the Phase 2 case studies will depend on continued collaboration among the Project Delivery Partners and active participation from industry stakeholders. The following considerations will influence the scope and execution of each case study:

Table 20 - Selected Phase 2 Case Studies

Case Study	Purpose	Phase 1 Finding Addressed	Expected Outcomes	Lead Org.
CS-15: Integrated Qualification & Supplier Entry Pathway	Develop an end-to-end supplier qualification pathway from ISO 9001 through utility approval.	Unclear qualification requirements and supplier entry pathways.	Clear roadmap, timelines, costs, and decision points for supplier qualification	March
CS-16: Capability Transfer & Supplier Readiness	Demonstrate how existing Saskatchewan industrial capabilities can transition to nuclear applications.	Strong industrial capability but limited understanding of nuclear requirements.	Defined transition pathways, gap analysis, and readiness roadmap for suppliers	CoE
CS-17: Market Access & Partnership Pathways	Develop practical approaches for supplier participation through partnerships and established nuclear supply chains.	Limited market access and early engagement opportunities.	Practical pathway for supplier integration into existing nuclear supply chains	CoE
CS-5 Modular Fabrication & Localization Feasibility	Assess the feasibility of localizing selected SMR manufacturing activities in Saskatchewan.	Uncertainty regarding realistic localization opportunities.	Evidence-based assessment of what can realistically be localized	WEC

- **Timeframe for completion** – The case studies are expected to be completed within an approximately six-month execution period (July 2026 to mid-January 2027), requiring focused scopes and efficient project execution.

- **Stakeholder participation and availability** – Successful delivery will rely on sustained participation from suppliers, utilities, technology vendors, Indigenous organizations, Working Group members, and other subject matter experts throughout planning, engagement, validation, and review activities.

11.5. Transition to Phase 2

With Phase 1 complete, the project has transitioned into Phase 2 implementation. Over the next six months, the selected case studies will be undertaken in collaboration with project partners and industry stakeholders to validate practical pathways for Saskatchewan suppliers to participate in the nuclear supply chain. Draft findings will be reviewed with the Working Groups in early February 2027, with the final case study reports and overall Phase 2 recommendations to be presented to SIMSA, NRCan, and project participants by mid- to late March 2027.

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Appendix A: Project Advisory Committee

The Project Advisory Committee supported the study by providing strategic guidance and industry perspectives throughout Phase 1. Table A-1 lists the participating organizations and representatives

Table A-1: Selected Phase 2 Case Studies

Name	Title	Organization	Representative Type
Brett Paquin	Director, Nuclear Policy	CIC Saskatchewan	Government of Saskatchewan
Corrie Atkinson	Manager, Nuclear Commercial	SaskPower	SaskPower Utility
David Tanel	Vice President, Sales	WEC	Project Delivery Partner
Eric Anderson	Executive Director	SIMSA	Project Delivery Partner
Gordon More	Executive Director	Southeast Technology Hub	Academia
James Bulmer	Manager of Member Services	SIMSA	Project Delivery Partner
June Verhelst	Senior Vice President	Graham Group	SIMSA Supplier - Construction
Karina Irving	Executive Director	IMCN	IMCN Supplier
Lisa McBride	National Executive, Country Lead, Canada	GE Vernova Hitachi	Nuclear Technology Vendor
Erin Taman-Athmer	Associate Vice-President, Stakeholder Management, Nuclear	SRC	SIMSA Supplier
Moe Al-Mahdawe	Manager, Corporate Development	Cameco	Fuel Supplier
Natalie Alderson	Director, Customer Relationship Management	X-Energy	Nuclear Technology Vendor
Pascal Zulow	Account Manager	Westinghouse	Project Delivery Partner
Ritu Malhotra	President & CEO	March	Project Delivery Partner
Sheldon Wuttunee	President & CEO	The Centre	Project Delivery Partner
Tom Foster	President & CEO	Industrial Machine and Manufacturing	SIMSA Supplier
Tom Kishchuk	Executive Director	Global Institute for Energy; Minerals and Society Inc. (GIEMS)	Academia

Appendix B: Working Groups (WGs)

Four technical WGs were established to support the Phase 1 assessment: Manufacturing, Deployment and Construction, Operations and Maintenance, and Fuel Cycle. The guidelines for participation, scopes of work, and participants for each WG are presented below.

B-1 Guidlines for WG Participation

B-1.1 Formation and Structure of WGs

The WGs were formed to:

- Concentrate on key segments of the nuclear supply chain where targeted investigation can yield actionable insights.
- Bring together subject matter experts from industry, Indigenous organizations, government, academia, and other stakeholders
- Ensure the assessment process captures a diverse range of perspectives, operational realities, and regional opportunities.

All participants — including those from the IMCN — were identified by the SIMSA based on:

- Relevant expertise and sector experience.
- Demonstrated interest in participating in the nuclear supply chain.
- Ability to contribute meaningfully within limited time availability.
- Alignment with the scope and focus of the assigned working group.

B-1.2 Roles and Responsabilties

The WGs were established with clearly defined roles to ensure coordinated engagement and quality outputs. Each participant understood their role and actively contributed within their area of responsibility. All participants were asked to be constructive, respectful, and to value differing perspectives in all discussions.

Table B-1: Roles and Responsibilities for WG Participants

Roles	Responsibiltiy
Technical Lead – WGs	• Provide overarching guidance and ensure consistency across all WGs. • Set technical objectives, monitor progress and address cross-cutting issues. • Support and approve the engagement methods to be used by each group, including structured interviews, questionnaires, workshops, and other information-gathering approaches. • Facilitate the interpretation of complex technical information, ensuring it is clearly summarized and accessible to all participants, regardless of their technical background. • Review working group outputs before integration into the Phase 1 Report. • Act as the main liaison with the Project Manager and SIMSA.
Working Group Lead	• Manage the day-to-day activities and deliverables for their WG. • Plan and facilitate meetings, workshops, and reviews. • Lead the preparation of the group's summary report, ensuring it is complete, accurate, and aligned with project requirements. • Coordinate with SMEs and the Researcher / Report Compiler to ensure formatting and consistency.
Researcher / Report Compiler	• Support all working groups by collecting, organizing, and cataloguing relevant materials. • Participate in interviews, meetings and workshops. • Analyze key study themes and findings • Maintain version control and integrate WG outputs into the consolidated Phase 1 Report.
Subject Matter Experts (SMEs)	• Contribute specialized technical knowledge in their area of expertise. • Facilitate understanding of complex technical topics, ensuring participants can engage meaningfully in discussions. • Review information packages, identify gaps, and validate technical assumptions. • Provide targeted recommendations and help ensure the accuracy and credibility of findings. • Participate in discussions, workshops, and document reviews as required. • Provide section content to the Phase 1 Report, participate in reviews and structure.
Participants	• Bring practical experience, industry knowledge, and informed perspectives to the working group. • Review provided materials in advance of meetings, identify gaps, and share relevant insights from their organization or sector. • Respond to surveys, questionnaires, or targeted requests for information in a timely manner. • Engage constructively in interviews, meetings and workshops, and help validate recommendations and proposed actions. • Highlight gaps, risks, opportunities, and relevant examples from own experience or sector • Act as a conduit between the working group and their own networks to ensure broad-based, informed input.

This project was designed to make the most of the participants' expertise while respecting their limited time. To achieve this, engagements included:

- Pre-packaged and structured materials clearly organized, classified, and accompanied by concise synopses to guide review.
- Logically sequenced activities, which built on one another (e.g., questionnaires before workshops) to avoid duplication and reinforce earlier inputs.
- Well-facilitated interviews, meetings, and workshop sessions, led by the WG Lead to keep discussions on track and ensure all voices are heard.
- Tracked and documented feedback recorded for transparency and traceability.

Findings and recommendations from WG discussions were incorporated into this Phase 1 Report and used to guide the selection of Phase 2 case studies

B-2 WG Scopes of Work

Each WG was provided with a scoping memorandum defining its purpose, areas of inquiry, key inputs and expected outputs. The tables below consolidate these scopes for reference. The detailed WG memoranda were used as engagement guides and are not reproduced in full in this report.

B-2.1 Manufacturing WG

Table B-2 provides the scope of work for a list of focus areas with their intended output for the Manufacturing WG.

Table B-2: Manufacturing WG Scope of Work

Focus Area	Scope of Work	Intended Output
Component Demand Forecast	Assess representative nuclear component requirements, with emphasis on BOP/supporting systems, recurring replacement needs and potential Saskatchewan manufacturing opportunities	Priority component/ opportunity profile; OEM replacement opportunities
Supplier Capability Mapping	Assess supplier experience, facilities, certifications, skills and manufacturing techniques to produce key NPP components	Supplier capability and skills matrix
Nuclear-Grade Manufacturing Feasibility	Assess feasibility of higher-grade nuclear manufacturing, access level of interest and barriers to entry	High-grade manufacturing opportunity profile; feasibility roadmap
Readiness and QA Assessment	Review QA, certification and supplier-entry requirements and readiness; highlight pathways to readiness and participation	Supplier maturity and qualification pathway summary
Infrastructure & Logistics	Assess facilities, transport, heavy lift and modular-fabrication requirements to support participation; consider alignment with long-term investment strategies	Infrastructure readiness profile
Market and Investment Opportunity Assessment	Identify opportunities from a market maturity, investment readiness, and global export perspective	Market-readiness index; investment opportunity map
Vendor Engagement and Procurement Insight	Engage vendors and utilities to understand procurement timelines, localization preferences, and preferred delivery models	Procurement insights; vendor qualification guide
Market Access & Partnerships	Identify how Saskatchewan suppliers can enter or expand within existing vendor pools; explore partnership opportunities with established Canadian nuclear suppliers, including joint ventures and shared QA frameworks.	Market access / partnering insights
Barrier and Risk Identification	Identify key barriers to entry for new or underqualified suppliers; propose actionable mitigation strategies	Barrier matrix and proposed mitigation actions
Strategic Feasibility Assessment	Identify the opportunity for a follow-up case study for phase 2 of the project	Recommendation report and phase 2 case study opportunity

B-2.2 Operations and Maintenance WG

Table B-3 provides the scope of work for a list of focus areas with their intended output for the Operations and Maintenance WG.

Table B-3: Operations adn Maintenance WG Scope of Work

Focus Area	Scope of Work	Intended Output
Lifecycle O&M Mapping	Identify key operations and maintenance services across the NPP lifecycle, including plant monitoring, outage support, BOP maintenance, obsolescence management and long-term asset reliability	Lifecycle O&M opportunity matrix
Capability Mapping	Assess Saskatchewan O&M capabilities, including utilities, trades, service providers and technology organizations, considering technical competencies, certifications and relevant experience	O&M capability and gap matrix
Readiness Assessment	Assess supplier readiness against applicable regulatory, quality, safety-culture and workforce requirements for NPP operations	Readiness and QA alignment profile
Digital Operations & Remote Monitoring	Assess opportunities related to digital monitoring, predictive maintenance, and data analytics, automation and remote O&M support	Digital service capability assessment
Waste Handling & Support Services	Assess Saskatchewan capabilities to support operational waste handling, storage, transportation and related consumables and services	O&M support-service opportunity summary
Vendor/Operator Engagement	Interface with nuclear vendors and nuclear operators to understand contracting approaches, service models, procurement timing and supplier expectations	O&M procurement strategy and market insights.
Partnering Pathways	Identify opportunities for Saskatchewan organizations to partner with plant operators, OEMs, and integrated service providers to deliver O&M services	Partnership opportunity map.
Barrier & Risk Identification	Identify structural, technical, and market-entry barriers to Saskatchewan firms' participation in O&M delivery and propose mitigation strategies	Risk matrix and recommended enablers.
Strategic Feasibility Assessment	Identify the opportunity for a follow-up case study in phase 2 of the project	Recommendation report and phase 2 case study opportunity.

B-2.3 Deployment and Construction WG

Table B-4 provides the scope of work for a list of focus areas with their intended output for the Deployment and Construction WG.

Table B-4: Deployment and Construction WG Scope of Work

Focus Area	Scope of Work	Intended Output
Deployment and Construction Scope	Define representative NPP construction scopes and major work packages, including nuclear island, turbine island, BOP, civil works and electrical infrastructure, with emphasis on areas relevant to Saskatchewan suppliers	Construction scope and work-package breakdown
Local Capability Assessment	Assess Saskatchewan contractor capabilities in construction delivery, construction trades, logistics and other nuclear-aligned services	Supplier capability matrix and workforce readiness matrix
Modular Construction & Logistics	Assess opportunities and requirements for modular fabrication, transportation, load-out, heavy lift and on-site assembly	Modularization and logistics readiness summary
Skilled Trades & Labour Assessment	Assess skilled trade workforce availability, alignment with nuclear labour needs, and readiness of training pathways; build on existing labour assessments (e.g., CIC)	Labour market analysis and workforce planning inputs
Construction Delivery Models	Review preferred contracting strategies, implications for SIMSA members, and potential for local subcontracting under Tier 1 constructors.	Delivery-model insights and supplier entry pathways
Site Selection & Evaluation Support	Assess opportunities for Saskatchewan organizations to support geotechnical investigations, environmental surveys, permitting, field services, and other site development activities	Early site-work and service opportunity profile
Regulatory & QA Readiness	Review regulatory interface and quality-program expectations applicable to construction activities and assess alignment with Saskatchewan capabilities	Regulatory and qualification pathway summary
Partnerships with Experienced Constructors	Identify partnership, subcontracting, mentorship and teaming opportunities with experienced nuclear constructors	Partnership and knowledge-transfer opportunities
Remote/Northern Deployment Feasibility	Assess logistical, labour, and constructability considerations associated with remote or off-grid SMR deployment	Remote deployment opportunities and constraints
Gap Analysis & Entry Barriers Assessment	Identify key certification, experience, security, technical and market-entry barriers and potential pathways to address them	Gap analysis and proposed enabling actions
Strategic Feasibility Assessment	Identify the opportunity for a follow-up case study in phase 2 of the project	Recommendation report and phase 2 case study opportunity.

B-2.4 Fuel Cycle WG

Table B-5 provides the scope of work for a list of focus areas with their intended output for the Fuel Cycle WG.

Table B-5: Fuel Cycle WG Scope of Work

Focus Area	Scope of Work	Intended Output
SMR Fuel Cycle Mapping	Identify representative SMR fuel types, enrichment levels, fabrication needs and transportation requirements across selected reactor technologies	Fuel specification and requirements matrix
Fuel Demand Forecasting	Assess potential Saskatchewan and regional demand for enriched and fabricated fuel over the study horizon, informed by utilities, fuel-cycle organizations and reactor vendors	Fuel-demand forecast and indicative facility-sizing inputs
Capability Mapping	Assess Saskatchewan capabilities across uranium mining, processing, research, logistics and nuclear material transportation	Fuel-cycle capability and gap matrix
Peripheral Fuel Services Analysis	Identify opportunities related to fuel handling, storage, transportation, refuelling, packaging, inspection and associated site-level equipment and services	Fuel-service opportunity profile
Regulatory & Trade Considerations	Review licensing, security, and international trade requirements for importing/exporting enriched fuel and nuclear materials	Summary of regulatory barriers and trade protocols.
Vendor Engagement & Supply Models	Assess vendor-led fuel-supply approaches, including supply and take-back models, and identify interfaces for Saskatchewan and Canadian supplier participation	Vendor supply chain and participation insights
Barriers & Risk Identification	Identify key quality, regulatory, licensing, intellectual-property and market-entry barriers affecting participation in fuel-cycle activities	Barrier and risk matrix with potential mitigation approaches
Strategic Feasibility Assessment	Identify opportunities for follow-up case studies examining Saskatchewan participation in selected fuel-cycle activities during Phase 2	Recommendation report and Phase 2 case study opportunity.

Note: Detailed findings, outcomes, and recommendations related to Saskatchewan's fuel-cycle capabilities and participation opportunities are presented in the companion Fuel Cycle Report.

B-3 WG Participants

Table B-6 lists the Manufacturing WG participants, their titles and the organizations they represent.

Table B-6: Manufacturing WG Participants

Name	Title	Organization	Representative Type
Perry Steel	Sr. Project Manager	March	WG Lead
Glen Crawford	Subject Matter Expert	March	Subject Matter Expert
James Bulmer	Manager of Member Services	SIMSA	Project Delivery Partner
Guy Bruce	Consultant, The Centre	The Centre	Project Delivery Partner
Delee Charette	Centre's Representative	The Centre	Project Delivery Partner
Steven Rowe	Strategic Engagement Coordinator	The Centre	Project Delivery Partner
Vincent Sabatine	Procurement Strategy Manager	Westinghouse	Project Delivery Partner
Michael Schneider	Lead – Structural Module Team	Westinghouse	Project Delivery Partner
Brian Schmidt	Canada Project Procurement Senior Manager	Westinghouse	Project Delivery Partner
James (Jim) Zeh	NA Region Sourcing Leader BWRX-300	GE Vernova Hitachi	Nuclear Technology Vendor
Talha Riaz	Supply Chain Executive	GE Vernova Hitachi	Nuclear Technology Vendor
Jesse Walker	VP- Supply chain	X-Energy	Nuclear Technology Vendor
David Simms	Director, Supply Chain Strategy	X-Energy	Nuclear Technology Vendor
Natalie Alderson	Director, Customer Relationship Management	X-Energy	Nuclear Technology Vendor
Moe Al-Mahdawe	Manager, Corporate Development	Cameco	Fuel Supplier
Kristin Cuddington	Director, Community and Indigenous Engagement	Cameco	Fuel Supplier
Corrie Atkinson	Manager, Nuclear Commercial	SaskPower	Potential Operator
Abby Ojo	Nuclear Business Analyst	CIC	Government of Saskatchewan
Adam Logue	CEO	JNE Welding	IMCN Supplier
Rob Williamson	Sr. Quality Director	Graham Group Ltd.	SIMSA Supplier
Tom Foster	President & CEO	Industrial Machine and Manufacturing	SIMSA Supplier
Alan Ritchie	President	Frisch Engineered Products Inc.	SIMSA Supplier
Chris Lanteigne	Commercial Director	Frisch Engineered Products Inc.	SIMSA Supplier
Dr. Graeme Drysdale	Research Chair - Sustainable Energy Solutions	Saskatchewan Polytechnic	Academia Representative
Joseph Banini	Supply Chain and Procurement Executive	Saskatchewan Polytechnic	Academia Representative
Jason Young	General Manager	Standard Machine	WG Participant
Bill Shenckels	Vice President	Sunny Corner	External WG Participant
Brett Paquin	Director, Nuclear Policy	CIC	Government of Saskatchewan
June Verhelst	Senior Vice President	Graham Group Ltd.	SIMSA Supplier - Construction

Table B-7 lists the Deployment and Construction WG participants, their titles and the organizations they represent.

Table B-7: Deployment and Construction WG Participants

Name	Title	Organization	Representative Type
Sarah Kennedy	Electrical Designer	March	Working Group Lead
Brent Smith	Subject Matter Expert	March	Subject Matter Expert
James Bulmer	Manager of Member Services	SIMSA	Project Delivery Partner
Guy Bruce	Consultant, The Centre	The Centre	Project Delivery Partner
Sheldon Wuttunee	President/CEO	The Centre	Project Delivery Partner
Vincent Sabatine	Procurement Strategy Manager	Westinghouse	Project Delivery Partner
Robert Croft	Deputy Director	Westinghouse	Project Delivery Partner
Pascal Zulow	Customer Account Manager	Westinghouse	Project Delivery Partner
James (Jim) Zeh	NA Region Sourcing Leader BWRX-300	GE Vernova Hitachi	Nuclear Technology Vendor
Talha Riaz	Supply Chain Executive	GE Vernova Hitachi	Nuclear Technology Vendor
Steve Livingstone	Specialist, Nuclear Engineering, Construction & Project Delivery	SaskPower	Potential Operator
Dan Irvine	Director of Procurement	SaskPower	Potential Operator
Phil Rees	Associate Vice President	SRC	Potential Operator
Jim Rawlings	Regional Director	Bird Construction	IMCN Supplier
Mike Yousif	Supply Chain Manager	Bird Construction	IMCN Supplier
Jean Sylvester	Technical Director, Nucle3ar & Future Energy	Bird Construction	IMCN Supplier
Rob Williamson	Sr. Quality Director	Graham Group Ltd.	SIMSA Supplier
Shaun Howdle	President & CEO	STC Industrial	SIMSA Supplier
Justin Lasnier	Associate Dean, Trades & Industrial	Saskatchewan Indian Institute of Technologies (SIIT)	Academia Representative
Scott Missens	Program Coordinator	SIIT	Academia Representative
Sonja Basson	Saskatchewan Market Development Lead Natural Resources	Accenture	SIMSA Supplier
Barrett Nielsen	Ram Steel Representative	Ram Steel	SIMSA Supplier
James Montgomery	Chief Design Engineer – Novel Nuclear	Rolls Royce AMR	External Participant
Tom Erskine	Business Development Lead	Rolls Royce AMR	External Participant
Joseph Banini	Supply Chain and Procurement Executive	Sask Poly Tech	Academia Representative
Sheldon Felix	Managing Partner	EEP Sask	WG Participant
Sunil Madhar	Saskatoon Metal Representative	Saskatoon Metal	WG Participant
David Simms	Director, Supply Chain Strategy	X-Energy	Nuclear Technology Vendor
Natalie Alderson	Director, Customer Relationship Management	X-Energy	Nuclear Technology Vendor
Bill Shenckels	Vice President	Sunny Corner	External WG Participant
Mike Staines	Vice President, District Manager	PCL Construction	WG Participant

Table B-8 lists the Operations and Maintenance WG participants, their titles and the organizations they represent.

Table B-8: Deployment and Construction WG Participants

Name	Title	Organization	Representative Type
Sohael Fotouhi	Mechanical Engineer	March	WG Lead
Brent Smith	Subject Matter Expert	March	Subject Matter Expert
Grant Cherkas	Nuclear Specialist	SIMSA	Project Delivery Partner
Guy Bruce	Consultant, The Centre	The Centre	Project Delivery Partner
Sheldon Wuttunee	President/CEO	The Centre	Project Delivery Partner
Steven Rowe	Strategic Engagement Coordinator	The Centre	Project Delivery Partner
Vincent Sabatine	Procurement Strategy Manager	Westinghouse	Project Delivery Partner
Nicholas Bachmann	Director, Nuclear Fuel Product Management	Westinghouse	Project Delivery Partner
Pascal Zulow	Customer Account Manager	Westinghouse	Project Delivery Partner
Zachary Franiewski	Lead Product Engineer	Westinghouse	Project Delivery Partner
Brian Schmidt	Canada Project Procurement Senior Manager	Westinghouse	Nuclear Technology Vendor
James (Jim) Zeh	NA Region Sourcing Leader BWRX-300	GE Vernova Hitachi	Nuclear Technology Vendor
Ranil Jayasundera	Principal Consultant, Nuclear Safety and Licensing	SRC	Potential Operator
Michelle Townsend	Integrated Management Systems Specialist	SRC	Potential Operator
Jeff Spence	President	Mainstay Engineers & Owner Reps Ltd.	IMCN Supplier
Jim Wilson	President and CEO	Wil-Tech	SIMSA Supplier
Sonja Basson	Saskatchewan Market Development Lead, Natural Resources	Accenture	SIMSA Supplier
Dr. Arthur Situm	Assistant Professor, Energy Systems Engineering Program	University of Regina	Academia Representative
Dan Irvine	Director of Procurement	SaskPower	External Participant
Jim Rawlings	Regional Director (Regina)	Bird	WG Participant
Tyler Gore	District Manager	GFL	SIMA Supplier
Barrett Nielsen	Ram Steel Representative	Ram Steel	SIMSA Supplier
Lance Goodick	Director, Nuclear	March	WG Lead
Grant Cherkas	Nuclear Specialist	SIMSA	Subject Matter Expert
Guy Bruce	Consultant, The Centre	The Centre	Project Delivery Partner
Delee Charette	Centre's Representative	The Centre	Project Delivery Partner
Steve Rowe	Strategic Engagement Coordinator	The Centre	Project Delivery Partner
Vincent Sabatine	Procurement Strategy Manager	Westinghouse	Project Delivery Partner
Nicholas Bachmann	Director, Nuclear Fuel Product Management	Westinghouse	Project Delivery Partner

Table B-9 lists the Fuel Cycle WG participants, their titles and the organizations they represent.

Table B-9: Fuel Cycle WG Participants

Name	Title	Organization	Representative Type
Pascal Zulow	Customer Account Manager	Westinghouse	Project Delivery Partner
James (Jim) Zeh	NA Region Sourcing Leader BWRX-300	GE Vernova Hitachi	Nuclear Technology Vendor
Moe Al-Mahdawe	Manager, Corporate Development	Cameco	Fuel Supplier
Kristin Cuddington	Director, Community and Indigenous Engagement	Cameco	Fuel Supplier
Steve Livingstone	Specialist, Nuclear Engineering, Construction & Project Delivery	SaskPower	Potential Operator
Abby Ojo	Nuclear Business Analyst	CIC	Government of Saskatchewan
Robin Dalshug	Regional Operations and Fleet Manager	Northern Resource Trucking	SIMSA Supplier
Brent Wirachowsky	Nuclear Analyst	Calian	SIMSA Supplier
Jafar Soltan	Associate Dean, Research & Partnerships	University of Saskatchewan	Academia Representative
Rana Mustafa	PhD Research Facilitator	University of Saskatchewan	Academia Representative
Arthur Situm	Assistant Professor	University of Regina	Academia Representative
Tyler Gore	District Manager	GFL Environmental Inc.	SIMSA Supplier
Jason Young	General Manager	Standard Machine	WG Participant
Brett Paquin	Director, Nuclear Policy	CIC	Government of Saskatchewan
Zachary Franiewski	Lead Product Engineer	Westinghouse	Nuclear Technology Vendor

Appendix C: Fuel Cycle Report Summary

This section summarizes a separate Fuel Cycle Report which details the current uranium supply chain market structure, market forces, and potential opportunities for Saskatchewan to expand its participation in the nuclear fuel supply chain. This participation is enabled through response to the projected growth in domestic and global nuclear power generation deployment through to the year 2045. The report considers current Canadian capabilities, future reactor fuel requirements, global market constraints, and potential areas where Canadian suppliers could support fuel supply chain development. This report highlights where Saskatchewan based companies can participate in the supply of nuclear reactor fuel.

Canada is already a major participant in the front end of the nuclear fuel cycle through uranium mining, milling, refining, conversion, and CANDU reactor fuel fabrication. Saskatchewan plays an important role in this system as Canada's primary uranium-producing jurisdiction. However, when viewed holistically, Canada's fuel supply chain remains incomplete for many reactor technologies, particularly those requiring enriched uranium. As new nuclear projects move toward deployment, fuel supply security, domestic capability, and Canadian supply chain participation will become increasingly important.

The study finds that near-term opportunities are strongest where Saskatchewan and Canada can build on existing industrial strengths. These include uranium production, conversion capacity expansion, transportation and logistics services, nuclear-qualified container manufacturing, supplier qualification, and fuel fabrication. More capital-intensive opportunities, such as domestic enrichment, may be strategically important over the long term but are not currently recommended as an immediate economic development priority. Canadian government policy and geopolitical considerations will play a significant role in decisions related to the development of domestic enrichment capability.

C-1. Background

Global interest in nuclear energy has increased due to rising electricity demand, decarbonization objectives, grid reliability needs, energy security concerns, and industrial growth. At the same time, geopolitical events highlight vulnerabilities in global nuclear fuel supply chains.

Canada is well positioned in the nuclear fuel cycle because of its uranium resource base, established nuclear industry, mature regulatory regime, and experience supporting CANDU reactor design, construction, and operation. Saskatchewan is central to this position because it hosts major uranium mining and milling operations, supplying uranium into both domestic and international markets. Downstream fuel cycle activities occur (e.g., conversion and non-enriched fuel manufacturing) occur domestically but outside Saskatchewan, and some key capabilities (e.g., enrichment and enriched fuel manufacturing) do not currently exist in Canada.

Future nuclear deployments in Canada may include CANDU reactors, large light-water reactors, light-water SMRs, and potentially advanced reactor technologies. Many of these technologies require enriched fuel or specialized fuel forms that Canada does not currently produce at a commercial scale. This creates both a strategic challenge and an economic opportunity for Canada and Saskatchewan.

C-2. Purpose of the Study

The purpose of this study is to identify realistic potential opportunities for Saskatchewan to participate in the nuclear fuel supply chain from 2026 to 2045. This report examines current and forecast supply chain needs, identifies structural gaps, and evaluates where domestic or localized capability could provide economic, strategic, or energy security benefits.

The objectives of the study are as follows:

- **Supply Chain Assessment:** Identify key gaps and structural deficiencies in the Canadian and global nuclear fuel supply chain.
- **Market Forecast:** Assess the implications of future Canadian nuclear deployment scenarios on uranium, conversion, enrichment, fabrication, transportation, and container requirements.
- **Identify Canadian Opportunities:** Identify high-value opportunities for Saskatchewan and Canadian industry to participate in fuel-related supply chains.
- **Analyze Opportunities:** Evaluate which opportunities are near-term and commercially executable, and which require long-term policy, regulatory, or strategic support.
- **Next Steps:** Recommend actions and timelines to support supply chain readiness, localization, and future investment decisions.

C-3. Opportunities

The study identifies several opportunities for Saskatchewan and Canada to expand participation in the nuclear fuel supply chain. These opportunities include:

- **Mining and Milling:** The most immediate opportunity is to strengthen Saskatchewan's existing role in uranium mining and milling. Global uranium demand is expected to significantly increase, and supply gaps in U3O8 are predicted as early as the mid-2030s. The supply of U3O8 is constrained by existing mining capacity as existing mines deplete, while demand for uranium continues to accelerate as new nuclear plants deploy globally. Saskatchewan can support this demand by increasing exploration for new uranium ore locations, continuing production at existing sites, advancing new mine projects, re-opening mines currently in 'Care and Maintenance', and expediting exploration and feasibility work for future high-grade deposits.

- **Conversion:** A second opportunity is to expand Canadian conversion capacity. Conversion is a constrained segment of the open market global supply chain, and Canada already has established capability through Cameco's existing facilities. Incremental expansion of conversion capacity may allow Canada to capture additional value while supporting non-Russian fuel supply diversification. Due to sanctions, Russian uranium conversion is currently largely excluded as a supplier for fuel manufacturing on the global open market, but if UF6 from Russian conversion facilities is permitted to enter the market, there is a potential for the global UF6 constraints to be removed.

- **Transportation and Containers:** A third opportunity is the development of transportation and container manufacturing capability. There is demand for IP-2, IP-3, Type 30B, and Type 48Y containers, as well as logistics needs associated with Class 7 radioactive material transportation. Saskatchewan industrial and mining service base are well suited to support this area, particularly if suppliers can meet nuclear quality and certification requirements.

- **Fuel Fabrication:** A fourth opportunity is a phased enriched fuel fabrication localization strategy. Rather than attempting enrichment and enriched fuel fabrication immediately, Canada could pursue a staged approach beginning with final assembly activities using components and sealed enriched fuel rods supplied by an original equipment manufacturer. Over time, this could expand into additional localized fabrication steps if a sufficient fleet of common reactor technology is deployed.

Additional opportunities exist in supplier development, supporting services, supplier qualification, quality assurance, inspection, testing, handling, storage, and logistics. These areas may provide a more accessible entry points for Saskatchewan and Western Canadian companies than large-scale fuel manufacturing infrastructure investment.

C-4. Challenges

Several challenges limit Saskatchewan and Canada's ability to capture additional fuel supply chain opportunities.

- **No Domestic Enrichment:** The first challenge is the absence of domestic enrichment capability. Enrichment is extremely capital-intensive, technologically challenging, highly regulated, political, and subject to international non-proliferation requirements. Current analysis suggests that a Canadian enrichment facility would only become economically reasonable under specific conditions, including a large domestic fleet of reactors requiring enriched fuel, long-term demand certainty, government support, geopolitical support, and access to proven technology.

- **No Advanced Fuel Fabrication:** The second challenge is limited Canadian capability in advances fuel fabrication. Canada has a mature and well supported CANDU fuel fabrication capability, but it does not currently have commercial-scale capability for enriched fuel manufacturing.

- **Nuclear Quality Program Adoption:** The third challenge is supplier qualification. Many Saskatchewan and Western Canadian companies have strong industrial capabilities, but they do not yet poses nuclear quality programs or experience in their implementation to support nuclear fuel manufacturing. This creates a gap between general industrial capability and immediately deployable nuclear supply chain capability.

- **Existing Facility Geographic Locations:** The fourth challenge is geographic and structural fragmentation. Saskatchewan supplies uranium and milling, but downstream processing, conversion and fabrication occurs outside the province, while enrichment occurs outside Canada. This limits Saskatchewan's ability to capture additional value and creates dependencies on external infrastructure and international supply chains.

Other challenges include long regulatory and licensing timelines, uncertainty in reactor deployment schedules, market volatility, and potential re-entry of Russian or Chinese supply into open markets, transportation limitations, insurance barriers for Class 7 rail shipments, and the need for sustained demand signals before suppliers can justify investment.

C-5. Recommendations and Next Steps

The report recommends that Saskatchewan and Canada focus first on near-term opportunities that build on existing capabilities. Specifically:

- **Invest in Mining:** Saskatchewan should continue to support new uranium exploration in general, uranium mining and milling growth by evaluating increased production at existing operations, assessing the conditions required to re-open

mines currently in 'Care and Maintenance,' advancing near-term mine development projects, and expediting pre-feasibility, feasibility, and exploration work for future deposits.

- **Incremental Expansion of Conversion Facilities:** Canada should evaluate incremental expansion of conversion capacity, particularly through feasibility studies focus on Cameco's Port Hope facility and other existing nuclear sites. These studies should assess timing, scale, regional economics, regulatory pathways, and market risks.

- **Container Manufacturing Feasibility Study:** Saskatchewan suppliers should assess the feasibility of manufacturing nuclear material transport containers, including IP-2 and IP-3 drums for uranium concentrates and Type 30B and Type 48Y containers for UF6 transport. This opportunity should be evaluated against domestic and global demand, certification requirements, manufacturing capability, and cost competitiveness.

- **Reduce Barriers to Radioactive Materials Transportation:** Canada should develop a practical framework to enable radioactive material transportation by rail, including legal, regulatory, insurance, and standards-related actions. This would improve transportation flexibility and support future supply chain growth. This extends to the transportation of reactor fuel elements, fuel bundles and fueled microreactors.

- **Enriched Uranium – Short Term Imports with Potential Long Term Domestic Supply:** Canada should monitor reactor technology selection over the next several years before making major commitments to enrichment or advances fuel fabrication. If future deployment produces a large fleet requiring enriched fuel, Canada should then evaluate enrichment technology transfer, licensing options, regulatory gaps, and the level of government support required. Geopolitical support will be necessary for the deployment of enrichment technologies in Canada, and the Government of Canada should peruse international support from our allies.

- **Phased Localization of Enriched Fuel Fabrication:** Domestic enriched reactor fuel fabrication, if determined to be desired, should be pursued through a phased localization approach once reactor technology selection and fleet size are clearer. Initial domestic assembly or enriched fuel elements may provide a lower-risk entry point, with further localization considered as deployment scale increases.

- **Canadian Supplier Nuclear Quality Program Support:** Saskatchewan and Western Canada should support supplier quality program development, as well as supplier qualification programs to accelerate industrial suppliers to transition into nuclear-qualified suppliers. This includes quality assurance program development, training, certification supporting services, nuclear procurement readiness, and alignment with nuclear operating organizations, technology vendors, and Tier 1 suppliers.

- **Domestic Supply Chain Diversification and Capacity Development:** Implementation of Western Canada Innovation Clusters (also known as technology hubs) will support the diversification of the Canadian nuclear supply chain and maturing of the Western Canada nuclear supplier capability and capacity. Further investigation into these possibilities is needed to support potential emerging nuclear markets in Western Canada. Spatial clustering of distinct but economically related industries or businesses in the same geographic area enable sharing of knowledge, labor, and their supply chains. Sharing these resources leads to co-agglomeration and the accelerated development of regional supply chains along with corresponding economic development.

Appendix D: OCNI Roadmap to Becoming a Nuclear Supplier

This appendix summarizes OCNI's roadmap to becoming a qualified nuclear supplier in Canada, released in 2021 [118]. The roadmap contains two pamphlets, providing guidelines for the development and implementation of:

- a nuclear management system for the supply of items and services to the nuclear industry, and
- a Quality Assurance Program that meets the Canadian Requirements for the Nuclear Pressure Boundary

D-1. Guideline for the Development and Implementation of a Nuclear Management System that meets the Canadian Requirements for the Provision of Items and Services to the Canadian Nuclear Industry

By: 1 WAG QA Services Canada Inc.

Summary:

- This document provides a roadmap for non-nuclear suppliers aiming to become qualified to supply items and services to the Canadian nuclear industry.
- This qualification is based on implementing either a Quality Assurance Program (CSA N299 QA Program) or a Management System (CSA N286 Management System), both referred to as a Nuclear Management System (NMS) unless stated individually.
- The "level of attention to detail" and the "culture change" required for nuclear qualification sets it apart from other industries.
- The qualification discussions in this doc only address the implementation of one or a combination of the following nuclear quality standards:
  - CSA N299-16 – QA program requirements for the supply of items and services for nuclear power plants, category 1, 2, 3 or 4.
  - CSA N286-12 – Management system requirements for nuclear facilities
  - CSA N286.7-16 – Quality assurance of analytical, scientific and design computer software.
- The nuclear customer (customer) in this document can be a nuclear utility or Tier 1, 2 or 3 nuclear supplier, depending on the item or service being provided.

This pamphlet discusses 8 steps to qualification:

1. **Need and timeline**
   - The first step is understanding the need for a Nuclear Management System (NMS). This decision could be driven by either the customer or the supplier.

- Suppliers need to determine whether they will integrate the NMS into an existing commercial quality program or create a standalone system.
- If nuclear work represents less than 40% of the business, a separate NMS is recommended.
- Developing and implementing the NMS typically takes 8–18 months, depending on the complexity of the existing quality system.

2. **Current quality system status**
   - Suppliers need to conduct a gap analysis to determine the required scope of work. This involves populating a Requirements Compliance Matrix (RCM) for the required NMS standard.
   - If a supplier currently provides nuclear items and services to USA and/or international customers under an NQA-1 / 10 CFR50 App B program, they should discuss the requirements for acceptance of that program directly with the customer.
3. **Resource and budget**
   - This process should be executed like any other project. Clearly defined schedules, deliverables, resources, and budget must be established.
   - Two key resources - QA Manager and process owners.
4. **Nuclear quality system development (documentation)**
   - The NMS is structured as a hierarchy of documents. The system starts with a QA manual (Tier 1), followed by procedures to implement the manual's requirements (Tier 2), and finally, instructions, standards, and forms (Tier 3).
   - The NMS must undergo customer qualification in two phases:
     - Phase A: Acceptance of supplier's NMS documentation.
     - Phase B: Qualification on the condition of a successful on-site implementation.
5. **Roll out and implementation**—Suppliers must introduce employees to the NMS documentation and train them in the required processes. This ensures staff are fully aware of their responsibilities within the NMS. For standards like CSA N299 (Categories 1, 2, 3) and CSA N286, this also includes indoctrination in safety culture principles.
6. **Independent internal audit** – A qualified Lead Auditor must conduct an independent internal audit. Any deficiencies identified during the audit must be addressed through the supplier's corrective action process.
7. **Customer qualification audit**
   - If the customer is a nuclear utility, they can perform the audit themselves or engage a CANPAC (Candu Procurement Audit Committee) to audit the supplier.
   - A non-nuclear utility customer can contract the Candu Industry Assessment Committee (CANIAC) to perform the audit on their behalf.
8. **Customer Qualification** - Once all steps are complete, the supplier will receive a qualification letter from the customer. This letter will define the scope of the qualification, any restrictions or conditions, and the qualification's expiration

e—typically three years from the audit date. The supplier is responsible for informing the customer of any changes to their NMS during this period.

D-2. Guidelines for the Development and Implementation of a Quality Assurance Program that meets the Canadian Requirement for the Nuclear Pressure Boundary

By: ANRIC Enterprises Inc.

Summary

This document outlines the phases of developing and implementing a Quality Assurance Program (QAP) that meets Canadian standards for nuclear pressure boundary equipment. Obtaining a Certificate of Authorization for constructing pressure boundary equipment in the nuclear industry is significantly more complex than in non-nuclear industries. The timeline for accreditation can range from 9 months to 1.5 years, depending on various factors such as scope, culture change, management support, and budget.

Concept and Standards

- In Canada, the design and construction of nuclear pressure boundary equipment is governed by CSA Standard N285.0, which incorporates over 90% of the technical requirements from Section III of the ASME Boiler and Pressure Vessel Code (BPVC).
- Provincial regulatory bodies (e.g., TSSA in Ontario, ABSA in Alberta) oversee accreditation, and the Canadian Nuclear Safety Commission (CNSC) recognizes these authorities.
- For commercial (non-nuclear) components, CSA Standard B51 applies.

Quality Assurance Requirements

- Clause 10 of CSA N285.0 specifies that the QAP for nuclear pressure boundary equipment must align with NCA-4000 of ASME Section III, but no ASME stamping is required.
- In Canada, organizations like TSSA and ABSA take on ASME's role in overseeing QAP accreditation for pressure boundary equipment. These regulatory bodies ensure that suppliers comply with Canadian nuclear standards.

The Process of Accreditation

1. Preparation

Before applying for certification, suppliers should:

- Review information from certification bodies (e.g., TSSA or ASME).
- Decide the scope of work for certification.
- Obtain the required standards and contract an Authorized Inspection Agency (AIA) for inspection services.
- Develop a quality manual detailing the quality program and associated procedures.

- Train personnel and prepare a demonstration item (prototype) to showcase compliance.
- Conduct an internal audit of the demonstration item and associated QA program activities.

2. Application

To apply for certification, the supplier must:

- Submit a completed application form and required fees.
- Provide a company-approved Quality Assurance Manual (QAM).
- Include supporting documentation such as agreements with an AIA.

3. Assessment

During the assessment, regulators review the supplier's quality program and demonstration item. The process involves:

- A survey (similar to an audit) of the entire QAM and its implementation.
- Evaluation of objective evidence produced during the development of the demonstration item.
- An internal audit to verify compliance with standards (CSA N285.0 and ASME Section III).

4. Certification

After a successful assessment, the regulator issues a Certificate of Authorization, which is valid for three years. Renewal applications must be submitted at least three months before expiration. In ASME's case, the Committee on Nuclear Certification (CNC) reviews the assessment reports before authorizing certification.

Additional Information

Depending on the item being manufactured, nuclear applicants may also need to implement a QAP compliant with CSA N299 standards. These additional requirements should be included as a supplement to the QAM for the pressure boundary program but are not subject to the approval signature of the nuclear inspector supervisor for pressure boundary equipment.

Appendix E: Research, Innovation and Workforce Development Institutions in Saskatchewan

There are several Saskatchewan institutions that contribute to applied research, testing, and workforce development relevant to nuclear and energy-related supply chains. Key institutions include:

University of Saskatchewan:

As a member of the U-15 Group of Canadian research-intensive universities, the University of Saskatchewan contributes significantly to Saskatchewan's research and workforce development ecosystem through education, applied research and specialized technical facilities, including in the nuclear sector [147]. The University supports the Nuclear Energy Management School, delivered in collaboration with the IAEA, which provides participants with exposure to nuclear-sector management, policy, and technical considerations while supporting relationship-building across the industry [148].

The University also hosts the Plasma Physics Laboratory (STOR-M Tokamak research reactor), established in 1959, which offers training and programs in plasma science, fusion-related technologies, and plasma-assisted materials science [149]. The contributions of this laboratory are recognized internationally. In addition, the Power and Energy Conversion Laboratory provides advanced research infrastructure and expertise in energy systems and power conversion, with capabilities that may support broader energy-sector research and innovation relevant to future nuclear development [150].

University of Regina (U of R):

Announced in January 2026 with combined federal and provincial funding, the University of Regina is establishing Western Canada's first SMR Safety, Licensing and Testing (SMR-SLT) Centre [151]. The facility will house advanced SMR "test loops" that simulate the high-pressure, thermal-hydraulic conditions of a water-cooled reactor without using nuclear fuel. This allows local manufacturers and researchers to test the durability, corrosion resistance, and safety of locally fabricated components (such as valves, pumps, and piping) under reactor-like conditions before pursuing rigorous nuclear qualification.

Saskatchewan Research Council:

The SRC is Canada's second-largest research and technology organization and has been officially designated by the provincial government as the lead agency for microreactor development. With 38 years of experience safely operating a SLOWPOKE-2 nuclear research reactor and operating the world's largest uranium analytical laboratory, the SRC provides deep expertise in nuclear licensing, site preparation, and radiation safety [119]. For the supply chain, the SRC acts as a vital bridge for industrial and mining companies looking to integrate off-grid microreactors into remote operations.

Sylvia Fedoruk Canadian Centre for Nuclear Innovation:

Governed by the University of Saskatchewan (USask), the Fedoruk Centre is the province's central hub for funding and advancing nuclear R&D, having invested millions into local academic and industrial partnerships. The Centre funds critical supply chain research, such as the University of Saskatchewan's ongoing development of new, highly efficient, and accident-tolerant uranium fuels for SMRs. The Fedoruk Centre also operates specialized nuclear-handling facilities (such as

the Saskatchewan Cyclotron Facility) and leads vital research in the social sciences of nuclear deployment, including community engagement and Indigenous supply chain integration [120].

Canadian Light Source:

Located on the University of Saskatchewan campus in Saskatoon, the Canadian Light Source (CLS) is Canada's national synchrotron light source facility. It produces incredibly bright, highly focused light (millions of times brighter than the sun) by accelerating electrons to nearly the speed of light. For the nuclear supply chain, the CLS provides unparalleled capabilities in materials testing and non-destructive examination (NDE) at the molecular level [121].

Saskatchewan Polytechnic:

As the province's premier institution for applied technical education, Saskatchewan Polytechnic is the primary engine for industrial workforce development. In late 2025, it launched the Western Canadian Nuclear Training Centre to directly address the skilled labour demands of provincial SMR deployment. Saskatchewan Polytech bridges the gap between theoretical research and factory-floor execution [152]. Through an exclusive Canadian partnership with the UK's National Skills Academy for Nuclear (NSAN) and the University Network of Excellence in Nuclear Engineering (UNENE), it delivers targeted upskilling for the local industrial base [153]. For manufacturers transitioning to the nuclear sector, Saskatchewan Polytech provides crucial compliance support—including ISO 9001 and Controlled Goods Program (CGP) training—alongside applied courses in nuclear safety culture, regulatory readiness, and advanced manufacturing techniques. This ensures that local welders, machinists, and QA managers can meet the rigorous standards required to secure nuclear contracts.

Global Institute for Energy, Minerals and Society:

Established in 2025, the Global Institute for Energy, Minerals and Society (GIEMS) is a formal, non-profit research and development partnership equally owned by the University of Regina, the University of Saskatchewan, and Saskatchewan Polytechnic [154]. GIEMS functions as the central coordinating hub for Saskatchewan's energy transition. Rather than duplicating services, it aligns the resources of academia, government, and industry to eliminate competition, secure large-scale funding, and ensure shared access to critical infrastructure (like the U of R's SMR test loops). A major supply chain benefit is its role in brokering international partnerships. For instance, in January 2026, GIEMS and the SRC signed a landmark agreement with the Emirates Nuclear Energy Company (ENEC) to collaborate on SMR technology evaluation, waste management, and the application of AI and robotics in nuclear energy [155]. This provides local suppliers with a direct pipeline to international nuclear expertise and emerging global markets.

Appendix F: Engagement Activities

F-1. May 2026 workshop Summary

F-1.1 Wokshop Overview

The Saskatchewan SMR Supply Chain Readiness Study Validation Workshop was held on May 26, 2026, at March Consulting Limited Partnership (March Consulting LP) in Saskatoon as part of the Phase 1 engagement and validation process.

The workshop brought together 35 representatives (23 in-person and 12 online) from industry, government, Indigenous organizations, academia, utilities, SMR vendors, and supply chain organizations to review and validate the Phase 1 findings, analyses, recommendations, and proposed Phase 2 case studies.

The workshop focused on four areas:

- Engagement Findings – “What we heard”
- Analysis & Key Findings – “What it means”
- Recommendations – “What should be done”
- Phase 2 Case Studies – “What should be tested next”

Prior to the workshop, participants were provided with briefing materials summarizing the project, previous engagement activities, and draft report findings.

F-1.1.1 Workshop Format and Objectives

The workshop was designed to be highly interactive. It consisted of four facilitated validation sessions supported by presentations and engagement tools and methods, including live SLIDO polling and ranking exercises, table discussions, and open discussions to capture real-time feedback.

Participants were asked to:

- Validate findings and conclusions
- Assess practicality of recommendations
- Identify gaps and refinement opportunities
- Prioritize actions and future areas of focus
- Provide input on Phase 2 case study direction

Workshop handouts, polling results, and links to supporting materials are provided in the Appendix

Notes:

1. To support workshop discussions, detailed findings, recommendations, and working group outputs from the Phase 1 report were consolidated into a smaller number of validation themes. These themes were intended to capture the substance of the report while allowing participants to focus on key issues and priorities during workshop discussions.

2. The number of responses shown in the polling results may vary between activities, as participants were not required to respond to every activity.

3. This summary memo is intended to document the feedback, perspectives, and observations shared during the workshop. While the project team will consider all inputs received, not all comments or suggestions will necessarily be incorporated into the final report. Proposed changes will be evaluated based on their relevance, supporting evidence, alignment with the study objectives, and consistency with the broader body of engagement findings.

F-1.2 Session 0 - Opening Perspectives

As part of the workshop opening, participants were asked to share their initial perspectives on Saskatchewan's readiness for SMR deployment and for participation in the supply chain.

F-1.2.1 Results and Discussion Summary: Saskatchewan Readiness Perspective & Factor Ranking

When participants were asked to identify the first word that came to mind when considering Saskatchewan's readiness for SMRs, the word cloud results were dominated by the term opportunity, with other recurring themes including exciting, manufacturing, collaboration, growth, and supply chain development, suggesting a generally positive outlook toward Saskatchewan’s potential role in the sector.

At the same time, responses such as timelines, accreditation, complicated, challenge, and daunting highlighted recognition of the effort and coordination required to achieve readiness.



Figure F-1: Participants’ Perspectives on SK Readiness Word Cloud Results

When asked to rank the factors most likely to influence participation in the SMR supply chain, participants identified investment certainty, nuclear QA readiness, and visibility into opportunities as the highest priorities, as shown in Figure F-2.

Access to Tier 1 suppliers/OEMs and supply chain capability ranked lower, indicating that participants generally viewed market certainty, qualification requirements, and opportunity awareness as more immediate considerations than underlying industrial capability. The findings align closely with themes that emerged throughout the broader engagement

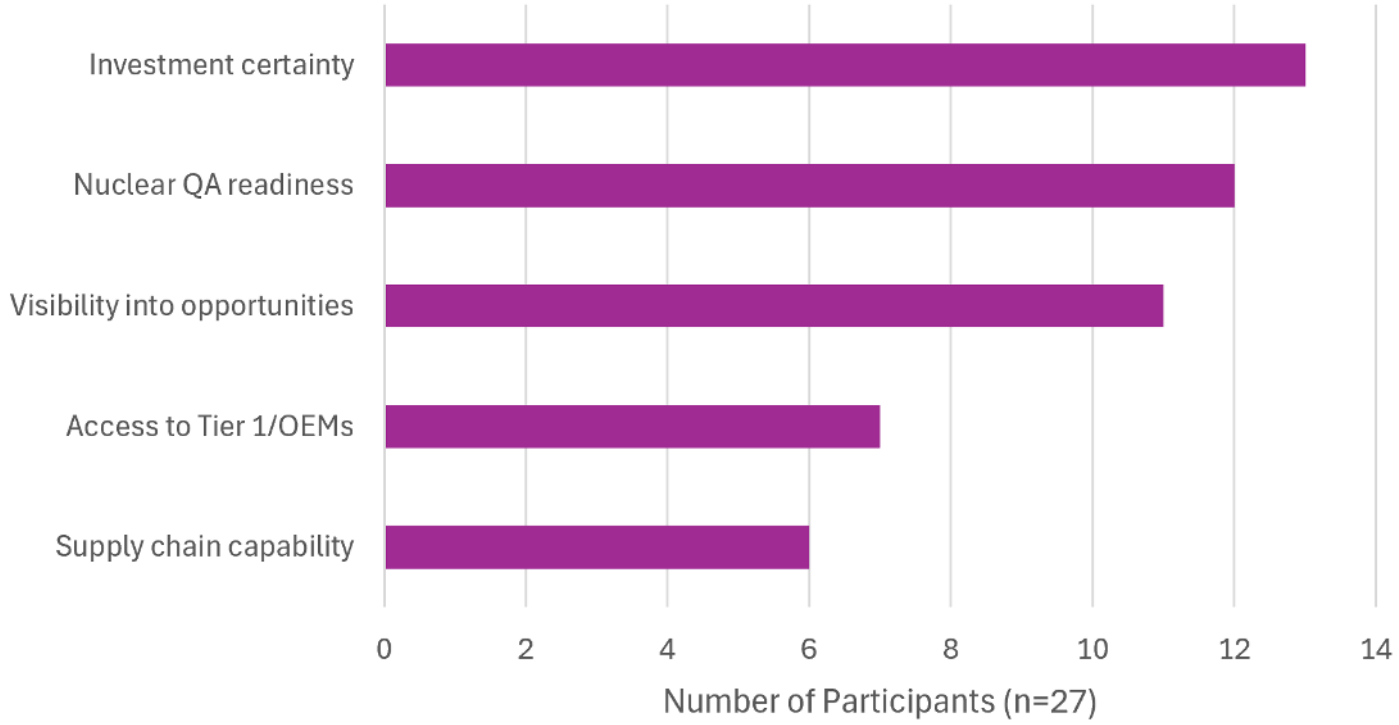


Figure F-2: Ranking of Key Readiness Factors

process as discussed in the subsequent sections.

F-1.3 Session 1 - Engagement Findings Validation

This session focused on validating the key themes that emerged from Phase 1 engagement activities. Participants were asked to assess whether the findings reflected current industry realities, identify any missing considerations, discuss areas of agreement or disagreement, and rank themes by relative importance.

The engagement findings presented were consolidated into four validation themes:

- **Supply Chain Readiness is Uneven** – Readiness levels vary across sectors and companies, with some firms better positioned for nuclear participation than others.
- **Barriers to Entry Limit Participation** – Regulatory, quality assurance, and qualification requirements can be difficult to navigate, particularly for firms without prior nuclear experience.

- **Interest is High, but Pathways to Participation are Unclear** – Many organizations are interested in SMR opportunities but lack visibility into participation requirements and entry points.
- **Capability Exists but is Fragmented** – Saskatchewan possesses relevant industrial capabilities, but these capabilities are not always visible, connected, or integrated within the emerging SMR ecosystem.

F-1.3.1 Results and Discussion Summary

1. **Validation Ratings & Priority Ranking Results**

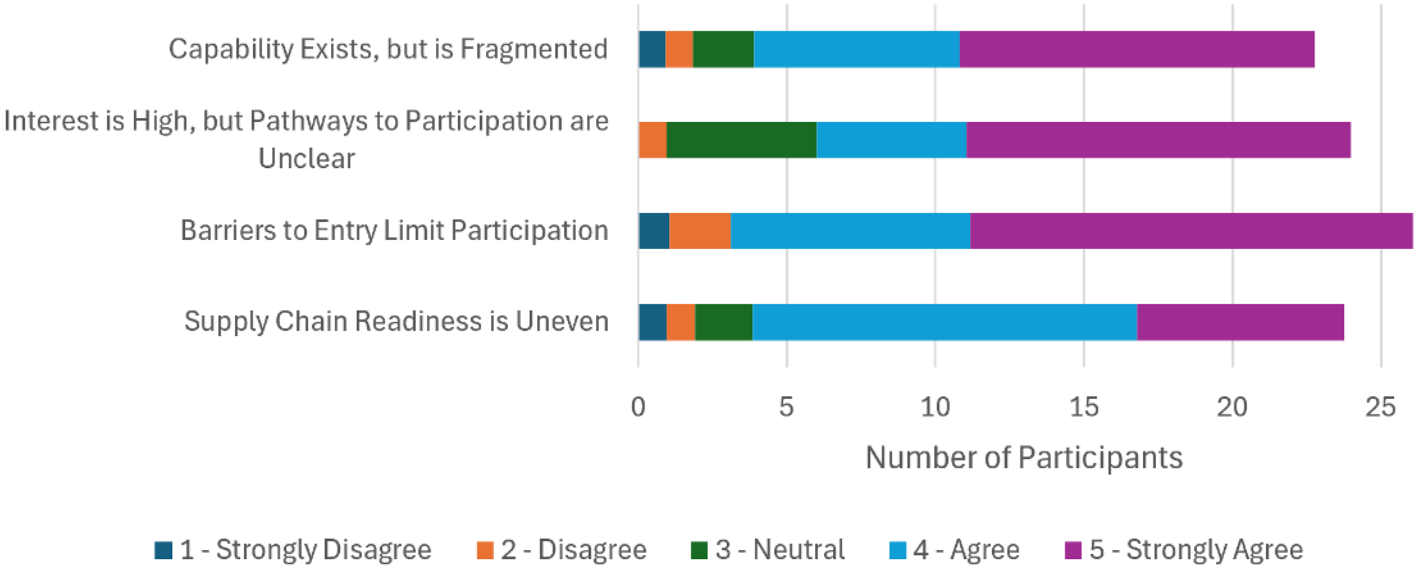


Figure F-3: Engagement Findings Theme Validation Ratings

Overall, participants agreed that the engagement findings accurately reflected many of the challenges and opportunities facing Saskatchewan suppliers. The polling results in Figure F-3 indicated broad agreement across all four themes.

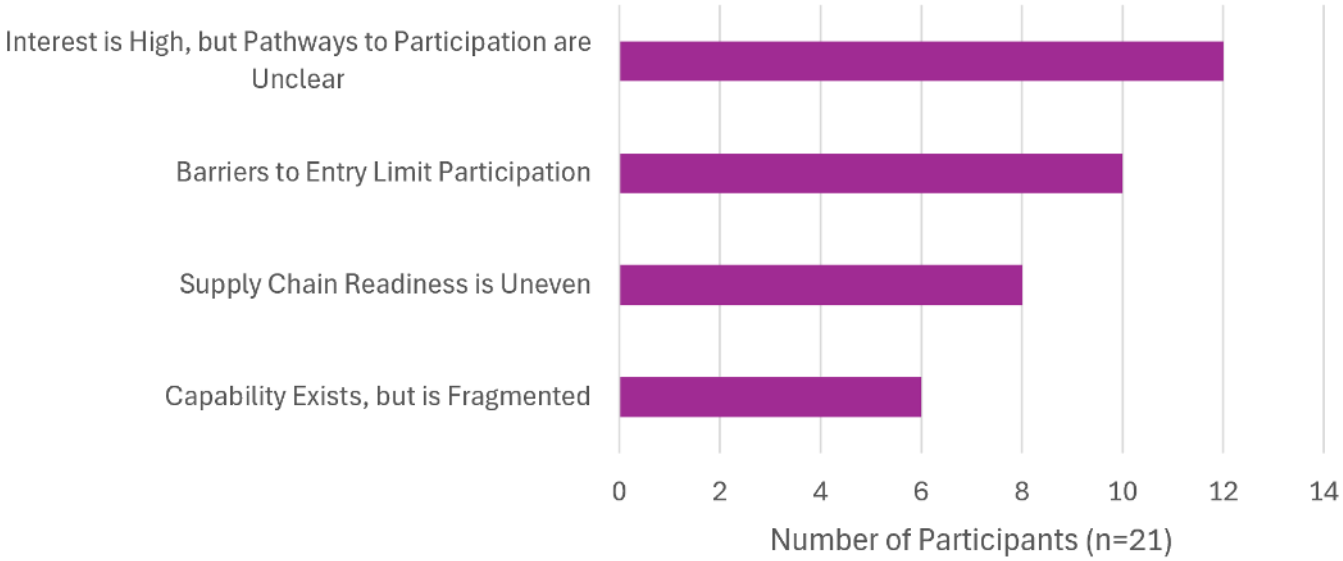


Figure F-4: Ranking of Most Critical Themes to Address

Strongest agreement was observed for themes related to barriers to entry and unclear participation pathways, also reflected in the priority ranking results in Figure F-4.

2. Missing Considerations Results

Participants were also asked to identify elements they felt were missing or underrepresented within the four themes using SLIDO word cloud exercises. Recurring concepts across the responses included: visibility, coordination, clear participation pathways, certainty, experience, and integration.

Participants emphasized the need for better visibility into opportunities, clearer guidance on how suppliers can enter the nuclear market, reduced uncertainty around qualification and readiness requirements, improved coordination among stakeholders, and greater certainty regarding timelines and investment decisions. Several responses also highlighted the importance of experience-building opportunities, mentorship, leadership, and stronger integration of existing Saskatchewan capabilities into the broader nuclear supply chain ecosystem.

Notably, the considerations identified through this exercise closely aligned with the recommendations and implemented priorities discussed later in the workshop, particularly those related to visibility, qualification pathways, coordination, supplier integration, and investment certainty.

3. Additional Points Raised

Several additional observations for consideration were raised, including:

- Saskatchewan readiness should be solely assessed within the context of Saskatchewan's industrial base, capabilities, and opportunities, with less bias via the lens of established nuclear jurisdictions like Ontario.
- Greater emphasis should be placed on identifying where specific gaps exist within the broader Canadian nuclear supply chain to better understand realistic participation opportunities for Saskatchewan suppliers.
- It was noted that not all Saskatchewan companies participated in the study and that some larger organizations may be taking a wait-and-see approach until greater market certainty emerges. As a result, the findings should not be interpreted as a comprehensive assessment of the readiness or capabilities of all firms operating within Saskatchewan.
- Acknowledge in the report that the study reflects the perspectives of participating organizations.

F-1.4 Session 2 - Analysis & Key Findings Validation

This session focused on validating the project team's interpretation of engagement findings and assessing whether the resulting conclusions accurately reflected industry realities. Participants were presented with key analysis results from the Phase 1 report draft, organized into three main categories:

- **Access & Integration:** Saskatchewan firms possess relevant capabilities, but participation is often limited by access to Tier 1 delivery structures and qualification requirements.
    - Capability exists, but it's not effectively connected to SMR delivery structures
    - Qualification requirements act as a structural barrier to entry
- **Visibility & Investment:** Limited visibility into future opportunities and engagement pathways can constrain supplier investment and readiness decisions.

- Limited demand visibility is constraining investment and readiness
- Early-stage participation pathways are unclear or not well communicated

- **System Readiness:** Broader supply chain readiness challenges, including nuclear QA requirements and coordination across stakeholders, continue to influence participation.
  - Nuclear QA readiness is a systemic gap across the supply chain
  - Fragmentation is limiting coordination and scalability (See Discussion Summary feedback with respect to "fragmentation")

Afterwards, participants were asked to rate six thematic findings and rank them by their expected impact.

F-1.4.1 Results & Discussion Summary

Overall, participants agreed that the project team's interpretation of the engagement findings reflected current industry

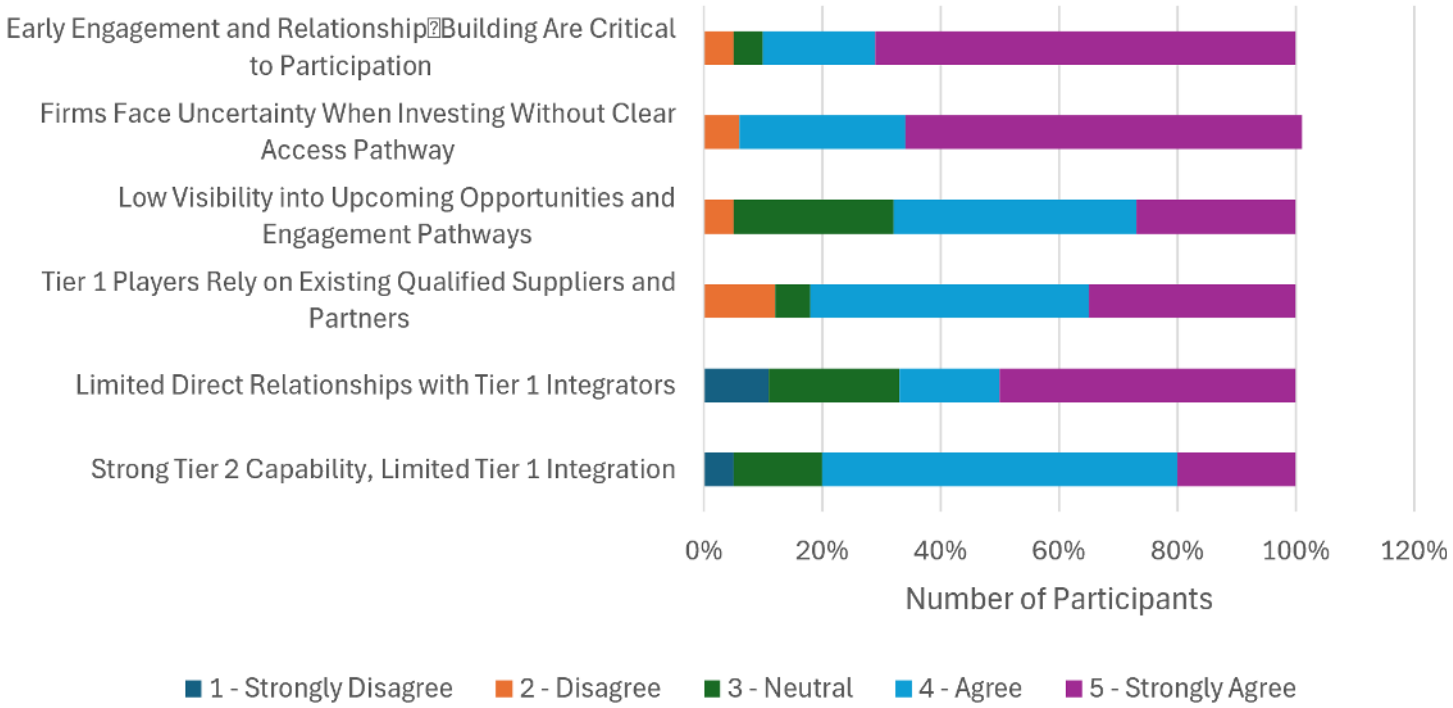


Figure F-5: Key Findings Validation Results

realities. Participants generally agreed that Saskatchewan possesses significant industrial capability and that the primary challenge is not capability itself, but rather how firms connect to SMR delivery structures, access opportunities, and navigate qualification requirements.

Polling results in Figure F-5 indicated broad agreement across all six findings, with particularly strong support for findings related to investment uncertainty, early engagement, supplier qualification barriers, and Tier 1 integration. Participants also expressed a high degree of confidence in the findings overall.

When asked to identify the findings likely to have the greatest impact on Saskatchewan's participation in the SMR supply chain, participants ranked uncertainty limiting investment decisions as the most significant issue, followed by access to Tier 1 delivery structures and limited direct relationships with Tier 1 organizations.

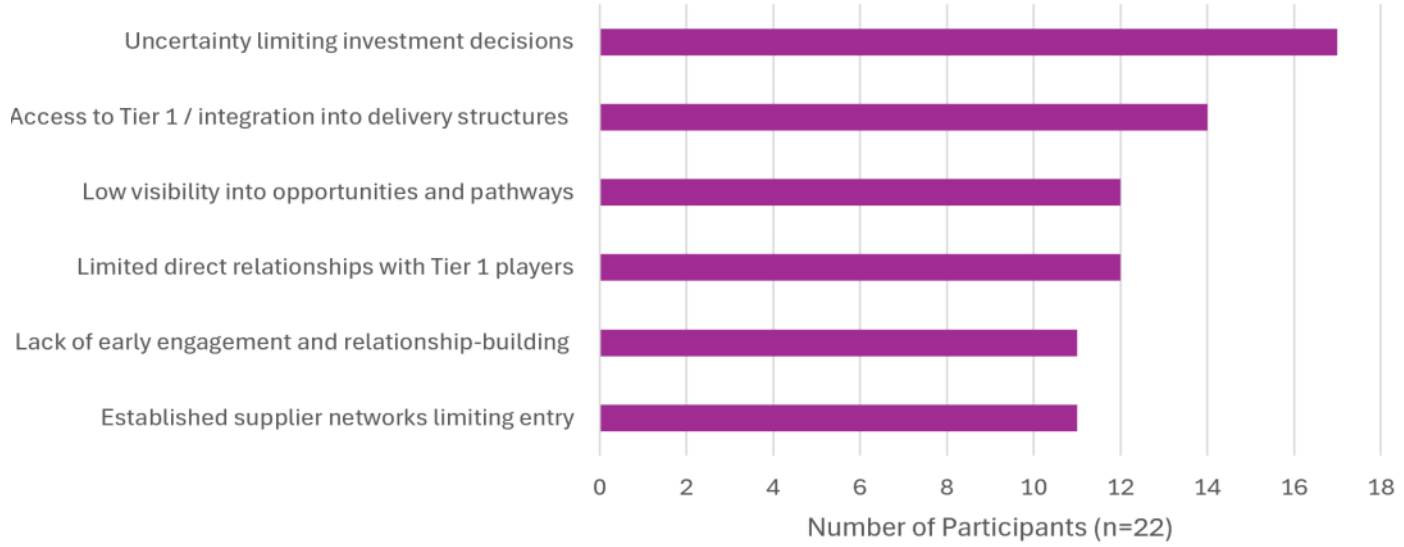


Figure F-6: Highest Impact Ranking

These results reinforce the view that participation challenges are driven not only by technical capability, but also by access, visibility, timing, and integration within established delivery networks.

When asked to identify the findings likely to have the greatest impact on Saskatchewan's participation in the SMR supply chain, participants ranked ***uncertainty limiting investment decisions*** as the most significant issue, followed by ***access to Tier 1 delivery structures and limited direct relationships with Tier 1 organizations.***

These results reinforce the view that participation challenges are driven not only by technical capability, but also by access, visibility, timing, and integration within established delivery networks.

Discussion Summary

1. Industrial Collaboration vs. Nuclear Integration

The finding related to supply chain fragmentation generated the most discussion. Several stakeholders from Saskatchewan disputed the characterization of the provincial supply chain as “fragmented,” contending that it is more accurately described as “integrated,” given that Saskatchewan firms regularly collaborate on large industrial projects and maintain well-established working relationships. Similarly, participants from New Brunswick noted that the “integrated” supply chain ecosystem in SK is similar to that observed in NB, with NB firms frequently collaborating on large-scale initiatives while continuing to compete in other areas of the market.

Note: The term “fragmented” was not used to describe the Saskatchewan supply chain in the report. The intent of the statement “Fragmentation is limiting coordination and scalability,” in the presentation was to highlight that, from a Saskatchewan perspective, awareness of and access to the SMR (nuclear) supply chain are currently fragmented. This fragmentation affects both understanding of how the supply chain operates and local firms' ability to engage with it effectively.

Other participants emphasized that while an integrated supply chain may be prevalent in Saskatchewan’s existing industries, it is not necessarily the case in the approach to the nuclear industry. Discussions echoed the challenge is not a

lack of collaboration, but rather how to apply that collaborative approach to nuclear projects, where quality assurance, traceability, supplier oversight, and accountability requirements are more stringent.

2. Access and Integration Challenges

Participants emphasized that access to SMR opportunities is often influenced by established supplier networks, existing performance history, qualification requirements, and the cost of onboarding new suppliers. Discussion highlighted the importance of early engagement, partnerships, and experience-building opportunities as pathways for new entrants. Participants also noted that many Tier 1 organizations continue to rely on existing supplier relationships and, in some cases, are seeking to consolidate rather than expand their supplier base.

Discussion also highlighted challenges in understanding the current supplier landscape, including uncertainty regarding the number and composition of Tier 1 organizations operating within Canada's nuclear sector. Representatives from OCNI noted that work is underway in Ontario to improve supplier visibility by enhancing its existing database, which could provide a foundation for similar initiatives in other jurisdictions.

3. Long-Term Capacity Growth Will Require Knowledge Transfer and Supplier Development

Participants noted that Canada's planned nuclear expansion will place increasing demands on the existing supply chain. Discussions highlighted a potential challenge in knowledge transfer and supplier development, with some participants noting that several Tier 2 organizations are often reluctant to invest in developing future competitors without any incentives.

Discussion emphasized that continued reliance on a relatively concentrated supplier base may limit Canada's ability to support multiple concurrent nuclear projects in the future. Expanding supply chain capacity beyond traditional nuclear jurisdictions was identified as an important consideration for the sector's long-term growth. Several participants highlighted the importance of supplier development, knowledge transfer, mentoring, and capability-building initiatives in emerging jurisdictions such as Saskatchewan to support national supply chain resilience and competitiveness.

4. Visibility and Market Certainty are Important Enablers

Greater visibility into upcoming opportunities, participation pathways, and project timelines was identified as important to support supplier readiness and investment planning. Discussions highlighted the importance of improving visibility in both directions. While suppliers require greater visibility into future opportunities, procurement timelines, and participation pathways, Tier 1 organizations and project developers also require better visibility into Saskatchewan's capabilities and available suppliers. Several participants noted that recent engagement activities involving industry associations, utilities, vendors, and supply chain organizations represent positive steps toward improving this visibility.

5. Additional Points Raised

Several additional points for consideration were raised, including:

- Reconsider the use of the term "fragmentation" when describing Saskatchewan's existing (non-nuclear) supply chain and explore alternative language focused on visibility, integration, coordination, or market connectivity.
- Clarify terminology related to supplier qualification and approved supplier programs in the report, recognizing that different organizations may use different terms (e.g., VSL (Vendor Suppliers List, ASL (Approved Suppliers List), QSL (Qualified Suppliers List), or equivalent vendor qualification processes).

- Recognize the role of experience-building opportunities, including participation in related nuclear activities, research facilities, medical isotope projects, and other highly regulated industries, as pathways for supplier development. Opportunities also exist for Saskatchewan firms to participate in projects outside the province, including in Ontario and the US.
- Consider the role of government, industry associations, and established nuclear suppliers in supporting knowledge transfer, supplier development, and capability expansion in emerging jurisdictions.

F-1.5 Session 3 - Recommendations Validation

This session focused on validating the draft recommendations developed from the engagement findings and analysis presented in the report. To facilitate discussion, the detailed recommendations were consolidated into five implementation themes:

1. **Define and Enable Clear Entry Pathways:** Improve clarity around qualification requirements, participation pathways, and supplier onboarding processes.
2. **Strengthen Nuclear QA Readiness:** Support supplier understanding and implementation of nuclear quality assurance requirements and qualification expectations.
3. **Improve Supply Chain Visibility and Market Opportunity Awareness:** Increase visibility into opportunities, procurement pathways, and Saskatchewan supplier capabilities.
4. **Strengthen Supplier Integration and Partnerships:** Facilitate relationships, partnerships, and engagement between Saskatchewan suppliers, Tier 1 organizations, and technology vendors.
5. **Strengthen System Coordination:** Improve coordination, alignment, and communication among key stakeholders supporting supply chain development.

The project team presented each recommendation alongside draft actions, highlighting key stakeholders/action owners, as well as the potential timing of actions.

F-1.5.1 Results and Discussion Summary

Overall, participants indicated that all five recommendation themes were practical and relevant to supporting Saskatchewan's participation in SMR supply chains. Validation scores were relatively consistent across all recommendations, suggesting broad agreement with the overall direction of the proposed actions; see Figure F-7

When asked to identify factors that could hinder the successful implementation of the recommendations, participants' responses varied across recommendation themes. Several recurring concerns included:

- Funding and resource requirements associated with readiness activities, certification, and program implementation;
- Coordination and accountability among stakeholders responsible for implementation;
- Inconsistent interpretation of qualification and quality requirements;
- Limited participation or buy-in from key stakeholders, including suppliers, Tier 1 organizations, and project proponents; and

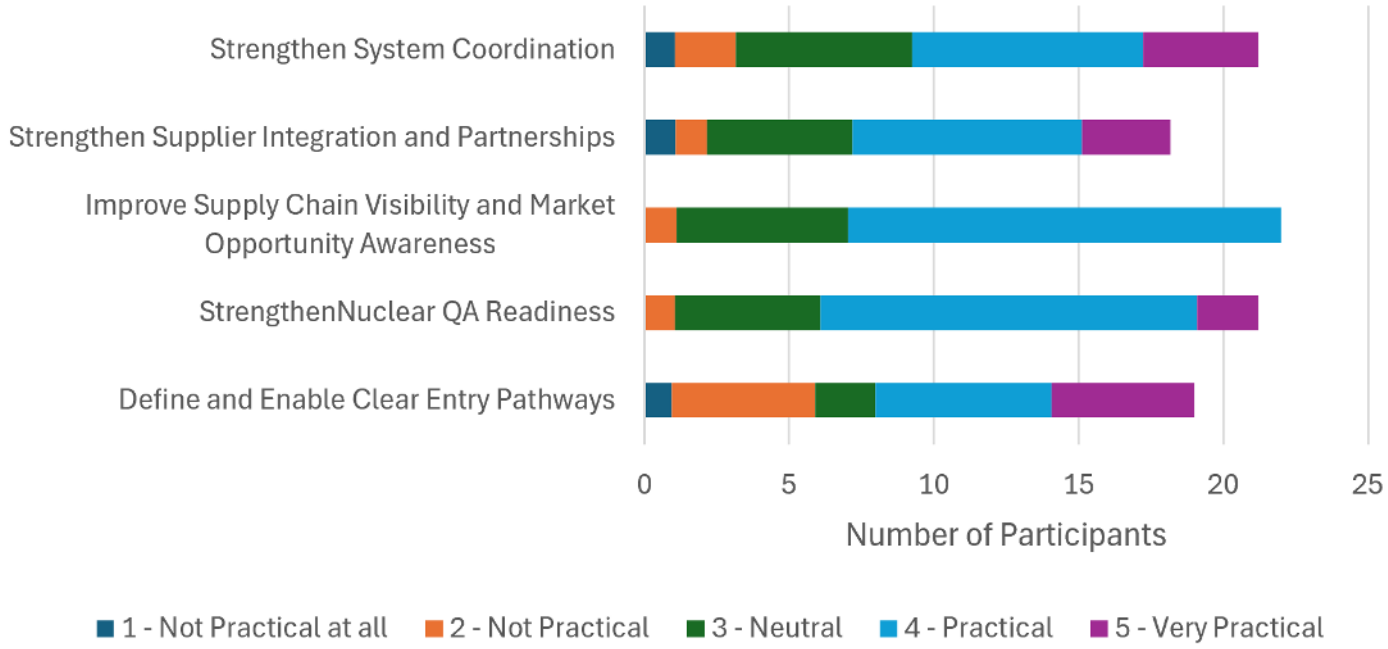


Figure F-7: Recommendation Practicality Validation Results

- Uncertainty regarding project timelines, opportunity visibility, and long-term market demand.

When asked to identify factors that could hinder the successful implementation of the recommendations, participants' responses varied across recommendation themes. Several recurring concerns included:

- Funding and resource requirements associated with readiness activities, certification, and program implementation;
- Coordination and accountability among stakeholders responsible for implementation;
- Inconsistent interpretation of qualification and quality requirements;
- Limited participation or buy-in from key stakeholders, including suppliers, Tier 1 organizations, and project proponents; and
- Uncertainty regarding project timelines, opportunity visibility, and long-term market demand.

Discussion Summary

1. Clear Entry Pathways and Qualification Consistency

Discussion reinforced the importance of providing suppliers with clearer participation pathways and a better understanding of qualification requirements. Participants noted that inconsistent interpretation of qualification requirements, audit expectations, and quality program requirements can create uncertainty for suppliers attempting to enter the nuclear sector.

The discussion also covered supplier audits and qualification processes. Participants noted that duplicate audits and inconsistent qualification methods could hinder readiness and involvement. Some participants see value in a centralized qualification and audit system, suggesting that Canada adopt standardized practices used in the U.K. and the U.S. There was a question on whether Connexus / CANIAC / CANPAC could be leveraged to achieve this. While there was interest in more uniform and standardized procedures, it was also acknowledged that utilities, technology vendors, and Tier 1 firms typically maintain their own qualification processes based on project-specific requirements and risk considerations.

2. Nuclear QA Readiness and Common Understanding of Requirements

Participants generally agreed that nuclear quality assurance readiness remains a significant challenge for new entrants. Discussion highlighted the need for a common understanding of CSA N299 requirements, improved training opportunities, practical implementation guidance, and continued industry support.

Participants noted that industry efforts are already underway to address some of these challenges. For example, CSA Group is developing a CSA N299 training program, scheduled for later this year, following a recent industry assessment that identified gaps in understanding and application of the standard. This was viewed as positive alignment between current industry initiatives and the findings of this study.

However, some participants also raised concerns regarding awareness and accessibility of such initiatives. It was noted that information often reaches established nuclear suppliers before emerging participants, potentially creating knowledge gaps for new entrants. Participants emphasized that future training and readiness initiatives should be designed to support both existing nuclear suppliers and organizations seeking to enter the sector for the first time.

3. Visibility, Participation Pathways, and Market Signals

Participants emphasized that supplier investment decisions are closely tied to visibility into future opportunities, project timelines, and participation pathways. Improving visibility into opportunities and clearly communicating where Saskatchewan suppliers may realistically participate were identified as important enablers of readiness and investment.

At the same time, several project proponents noted that a degree of uncertainty is expected at this stage of SMR development in Saskatchewan. As projects advance through planning, licensing, and procurement, additional information and greater clarity on participation opportunities are expected to emerge. Participants emphasized that while not all questions can be answered today, suppliers should continue to position themselves based on currently available information and pursue readiness activities to enable participation as opportunities become more clearly defined.

4. Supplier Integration and Partnerships

Participants supported the emphasis on supplier integration, partnerships, and relationship-building as mechanisms for increasing participation. Discussion noted that many of these activities are already occurring through industry organizations, supplier events, trade missions, and networking initiatives. Participants also highlighted the importance of continuing these efforts and ensuring that future activities build upon existing programs rather than duplicating them.

5. Coordination, Accountability, and Implementation

Discussion highlighted the importance of implementation coordination and accountability. Participants raised questions regarding who should lead implementation activities and how recommendations should be prioritized over time. Several comments emphasized that successful implementation will require coordinated action among government, industry associations, project developers, suppliers, and supporting organizations. Participants also noted that timing is important and that implementation activities should be aligned with evolving SMR project schedules and market conditions.

6. Additional Points Raised

Several additional points for consideration were raised, including:

- Acknowledge ongoing industry initiatives already supporting supplier readiness, including training programs, workshops, trade missions, networking activities, and supplier development efforts.
- Strengthen the discussion on implementation timing, priorities, coordination, and accountability to support the execution of the recommendations. Recommended actions should be realistic.

F-1.6 Session 4 - Phase 2 Case Studies

This session focused on validating the proposed Phase 2 case study framework and identifying case studies that would provide the greatest value to Saskatchewan suppliers.

Candidate case studies included:

- N299 QA Program Implementation Pathway (Construction / Manufacturing / Services)
- Capability Transfer: Saskatchewan Industrial Firms to Nuclear Applications
- ISO 9001 to N299.4 Qualification Pathway – Phased Market Entry
- Documenting Existing Supplier Pathways (Current / Past Experiences)
- Equipment Transportation & Logistics to SMR Site
- SMR Modular Fabrication & Localization Test Case
- B2B Market Entry / Partnerships (Ontario)

Participants also received a presentation from Westinghouse Electric Company (WEC) describing supplier development activities in Poland (Speaker: Brian Schmidt), as an example of how the 'SMR Modular Fabrication & Localization Test Case' case study could be performed.

Note: Results from this validation exercise will inform the evaluation of the final case studies for Phase 2. However, the final decision on the three case studies for Phase 2 will be made by the project delivery partners using the proposed framework and evaluation criteria.

F-1.6.1 Results and Discussion Summary

Overall, participants saw value across all candidate case studies and generally agreed that the proposed case study framework addresses many of the key barriers and opportunities identified throughout the study. While no single case study emerged as a clear outlier, participants showed the strongest preference for case studies related to SMR Modular Fabrication and Localization, Capability Transfer from Saskatchewan Industrial Sectors to Nuclear Applications, and CSA N299 Quality Assurance Implementation and Qualification Pathways. These results suggest a strong interest in practical case studies that help suppliers understand how existing capabilities can be transferred to nuclear applications and what actions are required to progress toward participation.

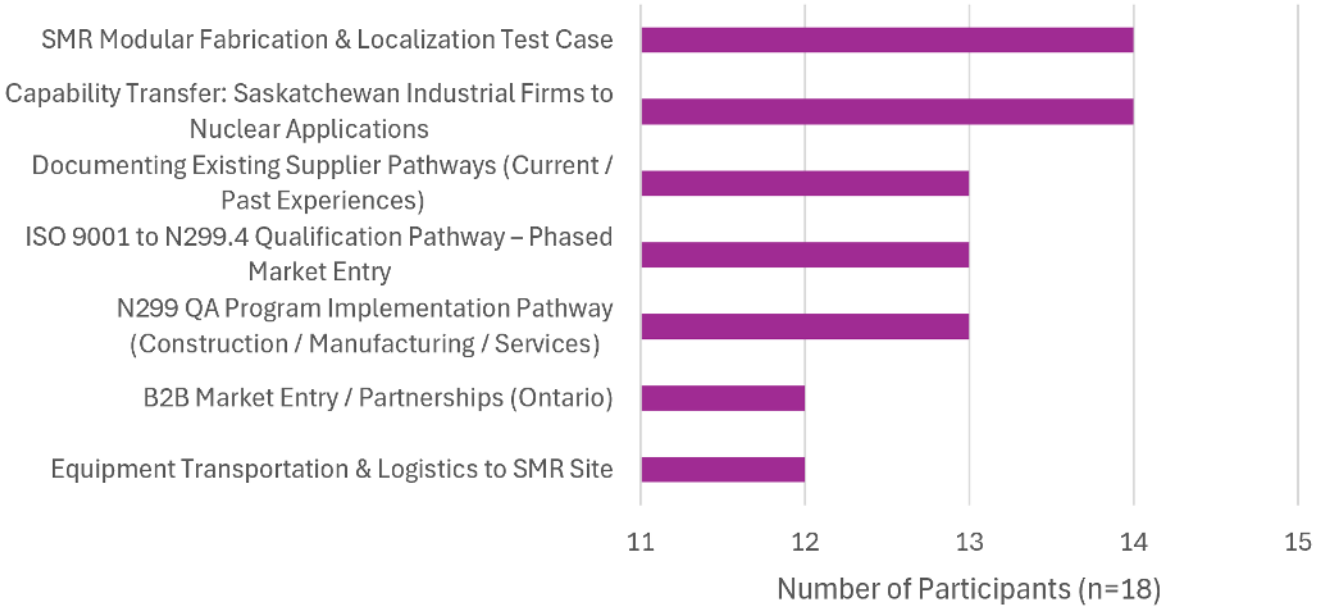


Figure F-8: Case Study Priority Ranking

Additional Case Study Ideas

Participants were also asked to identify any missing case study opportunities. Suggested additions included:

- N299.4 Supplier Qualification via Desktop Review;
- Component qualification, testing, and verification pathways;
- Commercial-grade dedication and nuclear qualification of components;
- Workforce development and nuclear skills readiness; (of note workforce activities are outside the project scope)
- Supplier visibility and capability databases; and
- Funding and investment mechanisms to support readiness activities.

A participant proposed combining the “Component Qualification, Testing, and Verification Pathways” and “Commercial-Grade Dedication and Nuclear Qualification of Components” case studies, highlighting Saskatchewan’s existing capabilities in component qualification and testing—such as thermal cycling, vibration, corrosion testing, and supporting research infrastructure.

Another participant presented the “N299.4 Supplier Qualification via Desktop Review” case study, where ISO 9001:2015–certified suppliers can be assessed through desktop audits by Tier 1 companies to evaluate their capability to meet CSA N299.4 requirements for supplying goods and services.

Discussion Summary

1. Transferable Capabilities and Workforce Readiness

Participants emphasized the importance of recognizing transferable capabilities already present within Saskatchewan's industrial base, including uranium mining, processing, manufacturing, construction, and other highly regulated sectors. Related discussion highlighted that workforce development requirements may be more closely tied to nuclear-specific quality assurance, safety culture, and regulatory training than to entirely new technical skill sets.

2. Feasibility and Project Scope Considerations

Participants noted that some candidate case studies may present implementation challenges within the timelines of Phase 2. For example, based on WEC's supplier development experience in Poland, a modular fabrication and localization test case could take several years to execute and may extend beyond the current project's scope and schedule. While participants viewed this as an important case study to explore, feasibility and implementation timelines were identified as factors to consider in the final case study selection.

3. Understanding Participation Pathways

Discussion reinforced the importance of clearly identifying where participation opportunities exist throughout different phases of SMR development. Participants noted that opportunities available during planning, siting, environmental assessment, engagement, and readiness activities may differ significantly from opportunities available during construction and operations, where work is often delivered through Tier 1 contractors, EPC organizations, and major suppliers.

4. Lessons From Other Jurisdictions

Some participants noted that many of the study findings and candidate case studies align closely with work undertaken in other emerging nuclear jurisdictions, particularly in New Brunswick, through initiatives led by the NSMTC (North Shore Mi'kmaq Tribal Council) and WNNB (Wolastoqey Nation in New Brunswick). Discussion highlighted the opportunity to compare lessons learned across jurisdictions and identify common approaches that could support broader supply chain development efforts across Canada.

F-1.7 Workshop Conclusions

Overall, the workshop provided strong validation and alignment of the study findings, analysis, recommendations, and proposed Phase 2 direction. Participants generally agreed that the engagement findings and readiness assessment reflect current industry conditions and that the recommended actions address many of the key barriers affecting Saskatchewan's participation in the SMR supply chain.

While several refinements were identified—including the use of terminology such as "fragmentation," clarification of qualification pathways, greater emphasis on transferable capabilities, and improved recognition of existing industry initiatives—these comments were largely focused on strengthening and refining the report rather than challenging its overall conclusions.

The workshop also reinforced several recurring themes that emerged throughout the study, including the importance of:

- visibility into opportunities,
- clear participation pathways,
- nuclear QA readiness,
- supplier integration, and
- coordinated stakeholder action.

These insights will be incorporated into the final report and used to refine the recommendations and implementation considerations. Feedback on the proposed case studies confirmed the value of implementation-focused activities that

demonstrate practical participation pathways for Saskatchewan suppliers and will inform the final selection of Phase 2 case studies.

F-2 Engagement Interview Questionnaires

Suppliers & Manufacturers

1. Current Relationship with the Nuclear Market

- Have you supplied products/services to nuclear or other highly regulated industries (e.g., aerospace, medical devices, oil & gas pipelines)? If yes, please list.
- If no direct nuclear experience, which of your existing capabilities are most adaptable to nuclear standards (e.g., traceability, special processes, cleanliness levels)?
- What nuclear-related events, associations, or supplier days have you participated in (e.g., SMR vendor days, SIMSA events)?
- How familiar are you with nuclear market opportunities?
- How familiar are you with SMR/Tiered supply chain roles and onboarding requirements for Tier 1/Tier 2 primes?
- What early steps have you taken (e.g., gap assessment, QA upgrades, training, client engagement)?
- How advanced is your pursuit of this market?

2. Product Market Fit

- Which specific SSCs/sub-components/services do you propose for SMR programs (include materials, processes, and nominal production volumes)? (SSC – structures, systems, or components)
- List special processes and tolerances you can meet (e.g., welding to CWB/ASME, NDE, heat treatment, surface finish, cleanliness, dimensional tolerances, etc.).
- Which supplier tier(s) do you typically work with today? (Consider which Tier 1/Tier 2 assemblies; would your parts integrate into the SMR (SMR island, turbine island, BOP, and operation & maintenance)?
- Which parts of a nuclear facility interest you most (consider SMR technology vendors, SMR island, turbine island, balance of plant, and operational & maintenance activities)?
- How prepared for Nuclear are your documentation and quality management systems? (Has your company considered the need for material certs, lot/batch traceability, calibration records, First Article Inspection? As these are important requirements to comply with quality assurance records)
- What is the competitive landscape (local, national, global) for these offerings, and where do you have a niche advantage?
- What technology transfer opportunities from other industries can you leverage (e.g., aerospace quality to nuclear, medical cleanroom practices)?
- What information/signals do you need from vendors/utilities/government to commit (e.g., volume forecasts, localization targets, qualification pathways)?

- Can your offerings replace imported components with Canadian alternatives, and what barriers exist?
- How compatible are your products with modularization/offsite assembly (packaging, kitting, documentation, delivery milestones)?
- Are localization quotas important for your success?

3. Market Development & Relationships

- Do you have or do you feel that you will be able to establish the client relationships necessary to promote your products and services?
- Which Tier 1/Tier 2 primes or OEMs are you targeting or already engaged with? List any prequalification status or NDAs.
- What supply chain partnerships do you seek (e.g., machining/fabrication partners, NDE labs, heat treaters, logistics providers)?
- What onboarding requirements are you prepared to meet (e.g., CSA N299, ASME, EDI/ERP integration, cyber requirements)?
- What steps are needed to grow in this market?
- What is your competitive advantage (unique processes, lead times, cost position, proximity, Indigenous partnerships, sustainability credentials)?
- What deployment volumes (provincial, national, export) would sustain growth, and how will you ramp capacity (shift patterns, equipment, staffing, subcontracting)?
- What other areas of nuclear supply might you have to develop to establish and sustain supply to the SMR market?
- How does the global market factor into your plans (export readiness, Controlled Goods/ITAR considerations, international standards)?

4. Risks and Benefits

- What major risks have you identified (e.g., certification cost/effort, QA overhead, schedule uncertainty, raw material availability) and how will/have you mitigate them?
- How might nuclear expansion affect your core business (positively/negatively)? Include potential resource conflicts with other sectors.
- What are short-, mid-, and long-term benefits and challenges of entering SMR supply?
- Have you identified potential spinoffs from developing SMR supply (e.g., process upgrades benefiting other clients)?

5. Investments

- What capital, tooling, metrology, or facility upgrades are required to meet nuclear requirements?
- Are you willing and able to invest if opportunities arise? (Consider sustainability needs/volumes for success)
- What are your biggest challenges to funding expansion (cash flow, ROI uncertainty, grant access, lender requirements)?

- Do you have or can you obtain required expertise (QA specialists, welding supervisors, NDE technicians, documentation control)?
- What timing constraints affect investment decisions (design maturity, firm orders, qualification lead-times)?
- Would a staged investment approach (pilot lots → qualification runs → full-rate production) work for you?

6. Barriers and Enablers

- Any resource conflicts with other business areas? (Consider potential resource loading conflicts/challenges with other industry business areas)
- What key barriers exist (QA maturity, regulatory clarity, market timing, access to primes, manpower, training, material certs/traceability)?
- Which enablers would help (targeted training, quality mentorship, market intelligence, matchmaking with primes, pilot funding)?
- How can this project support your pursuit in the SMR supply chain (gap assessments, vendor days, specification libraries, template procedures)?

7. Business Logistics

- What infrastructure upgrades are needed (power, cranes, HVAC/clean areas, storage, secure IT)?
- What process/system/technology improvements are required (ERP, document control, calibration, NCR/CAPA workflows)?
- Which certifications/quality programs do you hold or plan to pursue (ISO 9001/14001/45001, CSA N299, ASME, CWB, *CGSB/NRCan NDT)? [* NRCan non-destructive testing certification; CAN/CGSB-48.9712-2022.]
- Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712:2021, IDT)
- Do you manage special processes per standard (welding/B31.1/B31.3, pressure boundary per ASME, NDE procedures/ Level II/III)?
- What are your focus areas (operational experience (OPEX), cybersecurity (e.g. baseline IT controls), advanced manufacturing (additive/CNC/robotics), measurement system analysis (MSA)?

8. Government and Regulatory

- Is government commitment sufficient for you to invest? If not, what additional signals or programs are needed?
- What regulatory or utility/vendor constraints affect decisions (qualification pathways, documentation expectations, audit frequency)?
- What training or education programs would most benefit your team (QA, welding/NDE, documentation control, nuclear awareness)?

9. Additional Thoughts

- Are there any other insights or recommendations for NRCan's SMR Supply Chain Readiness project?

Government and Crown Corporations

Canada-Specific Market and Regulatory Insights

1. **Organizational Policy & Strategy**

- What is your organization's current policy or program for supporting SMR/nuclear power development in Saskatchewan and across Canada
- How do you expect these policies or programs to evolve?
- Are there future plans or investments to strengthen SMR supply chains in Saskatchewan?

2. **Government Policy & Incentives**

- How do federal and provincial policies or incentives influence your organization's involvement in the SMR/nuclear supply chain?
- What policy or regulatory changes would enable greater engagement?
- What measures could ensure fair treatment of smaller suppliers and help de-risk investment and certification costs?

3. **International & Geopolitical Factors**

- Do international policies or programs impact your SMR/nuclear strategy?

4. **Collaboration & Roadmap Participation**

- Is your organization involved in the Canadian SMR Roadmap? If so, what is your role and do you see value in it?
- Who should coordinate supply chain readiness and qualification for Saskatchewan companies?

5. **Supply Chain Readiness & Localization**

- How familiar is your organization with SMR supply chain capabilities in Saskatchewan, Ontario, and New Brunswick?
- Could Saskatchewan play a greater role in supplying services/components for projects in other provinces?
- What policies could ensure prioritization of local content in future SMR deployments?

6. **Impact Areas**

- Where can your organization make the biggest impact in supporting the SMR supply chain in Saskatchewan? Please consider our 4 project workgroup areas in your answer
    - Manufacturing
    - Deployment & Construction
    - Operations & Maintenance
    - Nuclear Fuel Cycle

7. **Future Outlook**

- Considering potential changes in government leadership, do you anticipate major shifts in SMR deployment or supply chain readiness?
- Will nuclear builds continue under these scenarios?

Partnership and Collaboration Models

1. **Expectations from Supply Chain Participants**

- What are your expectations from SMR technology providers, academia, utilities, private industry, and R&D institutions?

2. **Collaboration Opportunities**

- Is your organization open to collaborations with these stakeholders in Saskatchewan or other jurisdictions?
- Are you involved in out-of-province collaborations (e.g., Ontario-Saskatchewan)? Who should coordinate these partnerships?

3. **Future Vision**

- Does your organization envision a nuclear technology hub in Saskatchewan?
- How do you foresee transitioning Saskatchewan's existing industrial base (mining, heavy fabrication, advanced manufacturing, etc.) into SMR supply chain readiness?

Workforce, Data & Additional Insights

1. **Skills & Training**

- Does your organization have plans to influence mobility, trades training, and accreditation at a provincial level?

2. **Labour Market Data**

- Can you provide insights or sources for up-to-date labour force data in Saskatchewan?

3. **Enablers & Lessons Learned**

- Are there potential enablers outside your current plans that could benefit SMR supply chain readiness?
- Can you share lessons learned from other sectors that may apply to SMR supply chain development?

4. **Open Feedback**

- Are there any additional insights or recommendations you would like to share with the NRCan SMR Supply Chain Readiness project team?

Constructors

1. **Understanding Constructor Role & Subcontracting**

- Which services or areas of construction do you currently subcontract to other constructors?
- Do you currently subcontract out of province or out of country companies?
    - Are there any changes in your company's policies or practices that would be required to enable local subcontracting specific to nuclear projects.
- Do you have a local workforce that has nuclear experience?
- Do you or would you aspire to do all site pressure boundary work that may be required
- Theoretically, what could be subcontracted to local constructors for nuclear sites?

- Which type of internal/external training would be required for your company to have a Saskatchewan-based nuclear-qualified workforce?
- In what instances would a subcontractor work under your QA program
- If not under your program, what QA programs do you require for what kinds of subcontracts

2. Current Relationship with the Nuclear Market

- Have you constructed sites for nuclear or other highly regulated industries (e.g. oil & gas pipelines, Mining, Utilities) if yes please list.
- If no direct nuclear experience: Which of your existing capabilities are most adaptable to nuclear standards (e.g., traceability, special processes)?
- What nuclear-related events, associations, or supplier days have you participated in (e.g., SMR vendor days, SIMSA events)?
- How familiar are you with nuclear opportunities?
- What early steps have you taken (e.g., gap assessment, QA upgrades, training, client engagement)?
- How advanced is your pursuit of this market?

3. Relationships

- Do you have or do you feel that you will be able to establish the client relationships necessary to promote your services?
- What partnerships do you seek?
- What policy changes would enable greater subcontracting or collaboration?
- What steps are needed to grow in this market?
- What deployment volumes (provincial, national, export) would sustain growth, and how will you ramp capacity (shift patterns, equipment, staffing, subcontracting)?
- What geopolitical issues concern you most regarding Canada's supply chain?

4. Risks and Benefits

- What major risks have you identified and how will you mitigate them?
- How might nuclear expansion affect your core business (positively/negatively)?
- What are short-, mid-, and long-term benefits and challenges of entering SMR site construction?
- What trades or professional roles are in greatest shortage?
- What are biggest barriers for construction companies expanding into nuclear site builds?

5. Investments

- What capital, tooling are required to meet nuclear requirements?
- Are you willing to invest if opportunities arise?

- What are your biggest challenges to funding expansion?
- Do you have or can you obtain required expertise?
- What timing constraints affect investment decisions?

6. Barriers and Enablers

- Any resource conflicts with other business areas?
- What key barriers exist (e.g. access to loan guarantees/credit/federal financing for provincial project vs international or federal)?
- Which enablers would help?
- How can this project support your pursuit in the SMR supply chain (gap assessments, vendor days, specification libraries, template procedures)?

7. Business Logistics

- What equipment upgrades are required?
- What process/system/technology improvements are required (Emergency Response Plan, document control)?
- Which certifications/quality programs do you hold or plan to pursue?
- Would you typically operate as a prime contractor, a subcontractor, or in some sort of partnership of joint venture

8. Government and Regulatory

- Is government commitment sufficient for you to invest? If not, what additional signals or programs are needed? How do you ensure quality, safety, and compliance?
- What regulatory or utility/vendor constraints affect decisions?
- What training or education programs would most benefit your team (QA, documentation control, nuclear awareness)?

9. Additional Thoughts

- Are there any other insights or recommendations for NRCan's SMR Supply Chain Readiness project?

Academia

Resources and Skills

1. Education Readiness

- Does your institution have a nuclear supply chain education readiness program or plan in progress?

  Probing: If yes, can you share details on resources, timelines, support needed, and challenges or gaps?

  Follow-up: What critical learnings have emerged regarding workforce preparation for SMR deployment?

2. Training Needs

- What training would you anticipate requiring to initiate nuclear-specific programs at your institution?

3. Enablers & Lessons Learned

- Are you aware of any potential enablers outside your current plans that could benefit SMR supply chain readiness?
- Can you share lessons learned from other sectors that may apply to SMR readiness?

4. Industrial Sector Linkages

- Are there upcoming projects or expansions in Saskatchewan or Canada that you're involved in?

  Probing: Could these initiatives bridge and support SMR supply chain readiness? Are they linked to SMR deployment or nuclear power growth?

Canada-Specific Market & Regulatory Insights

1. Geopolitical Concerns

- What geopolitical issues concern you most regarding Canada's nuclear supply chain?

2. Policy Impact

- How do federal and provincial policies or incentives impact partnerships for your institution?
- What policy changes would enable greater academic-industry collaboration?

Supply Chain Structure & Opportunities

1. Workforce Influence

- Where do you see your institution making the biggest impact on workforce readiness for SMRs?

  Probing: What initiatives would you prioritize?

2. Facilities & Capabilities

- What shop capabilities (e.g., simulators, labs, classroom space) would you need for nuclear manufacturing training programs?

3. Timeline

- When do you anticipate initiating SMR or nuclear engineering programs?

Partnerships & Collaboration Models

1. Partnership Types

- What types of partnerships do you typically engage in (e.g., joint ventures, mentorships)?

  Probing: Are you exploring partnerships with other academic institutions?

2. Expectations from Stakeholders

- What are your expectations from SMR technology providers, academia, utilities, private industry, and R&D institutions?

3. Collaboration Opportunities

- Is your institution open to collaborations with these stakeholders in Saskatchewan or other jurisdictions?

- Are you involved in out-of-province collaborations (e.g., Ontario-Saskatchewan)? Who should coordinate these partnerships?

4. Nuclear Hub Vision

- Does your institution envision a nuclear technology hub in Saskatchewan? Can you share insights?

Growth, Innovation & Risk Management

1. Innovation in Education

- What innovations are you pursuing in SMR education?
- What trends (e.g., advanced manufacturing, AI, 3D printing) do you see shaping Canada's nuclear supply chain?

  Probing: Will your curriculum prioritize these trends?

2. Transitioning Industrial Base

- How do you foresee transitioning Saskatchewan's industrial educational base into SMR readiness?

  (Consider transferable skills from mining, fabrication, logistics, advanced manufacturing, uranium production.)

2. Labour Mobility & Data

- Does your institution have plans to influence labour mobility, trades training, and accreditation provincially?
- Can you provide insights or sources for up-to-date labour force data?

Additional Thoughts

1. Gaps & Insights

- Are there gaps in your understanding of Saskatchewan's SMR supply chain that are significant for developing training programs?
- Any other insights or recommendations for NRCan's SMR Supply Chain Readiness project?

Future Operators

1. Organizational Readiness

- Can your company provide an update on SMR deployment program? (resources, timelines, training programs).
- What challenges or gaps are you addressing and can share with us?
- What workforce requirements do you anticipate for SMR participation?
- Key lessons learned so far?

2. Licensing & Regulatory

- Can you provide an update on your CNSC licensing process (if not already done so above)?
- Can you share any lessons learned so far?

- Can you identify the key CNSC regulatory requirements that must be flowed down to your supply chain? (please frame your response around our four project focus groups: Manufacturing, Construction and Deployment, Operations and Maintenance, and Nuclear Fuel Supply chain).

o Are there any that your organization feel will be a challenge to potential SK suppliers?

- Please share insights on how your team is addressing these requirements. (please frame your response around our four project focus groups: Manufacturing, Construction and Deployment, Operations and Maintenance, and Nuclear Fuel Supply chain)

3. Supply Chain & Opportunities

- Which trades or professionals are anticipated in highest demand within your SMR supply chain?

o Does your company have a criticality safety officer/team?

- What are your insights on how Saskatchewan's industrial base can transition to nuclear readiness?

o Is transportation costs and logistics a significant factor to you in selecting suppliers/supply locations?

- What does your company anticipate being the opportunity(ies) or main roles for SK suppliers and manufacturers to support your company in terms of SMR construction and operation? (please consider these areas)

o Manufacturing

o Deployment & Construction

o Operations & Maintenance

o Nuclear Fuel Cycle

o Local content contribution wrt future SMR site locations

o Prairie based company % contribution to SMR deployment

4. Operations & Maintenance

- Does your company foresee the need service support to train and/or provide the following wrt owner/operation of future SMRs:

o Reactor operations

o Plant monitoring and control

o Emergency response

o Maintenance (preventive, corrective, predictive)

- Considering the above question, does your company look to partner or engage local/regional companies to supply these services / programs?

o Consider which areas offer the best opportunity for external service providers?

o Can you share information about this for the purposes of the report?

5. Partnerships & Collaboration

- What partnership models does your company have experience with and prefer (JV, subcontracting, mentorship, long term service contracts) when engaging supply chains?
- Are you open to R&D collaborations with Canadian institutions? If yes, please share any initiatives already been implemented.

6. Procurement & Quality

- Please share your company's supply chain program (key criteria), and qualification process used to select suppliers?
  - Do you have a centralized procurement team, or is it site/project-specific?
  - What specific criteria are different from Canada and the US?
  - Do you foresee any specific differences between provinces?
- Does your company have any current experiences qualifying Canadian suppliers to your program? Please share insights and lessons learned.
- What are your organization's plans to implement and maintain a CSA N286-12 program? Considering the Canadian market requiring compliance with CSA N286-12 for the SMR owner/operator.
  - How does your company foresee engaging Saskatchewan (and Canadian) suppliers to meet the anticipated N299 QAP requirements of the owner/operator for the delivery of the SMR?
- Does your company have Key Performance Metrics or benchmarks for evaluating performance?
  - How does this work and what is your program for evaluating performance?
  - What oversight do you apply to your company's supply chain?
  - How do you ensure quality, safety, and compliance across your supply chain?
- Can you share examples of successful supply chain partnerships in Canada?

7. Growth, Innovation, and Risk Management

- What innovations and trends do you see shaping the future of nuclear manufacturing supply chain in Canada to support your company in operating a future nuclear reactor? (e.g. advanced manufacturing, AI, 3D printing…)
- What innovations are you pursuing in the supply chain?
- Is your company looking to focus on prioritizing manufacturers with these future trends in mind?

8. Additional Thoughts

- Are there any other insights or recommendations for NRCan's SMR Supply Chain Readiness project?