

Delivering Energy Security Through Nuclear Power

**Update to the *Saskatchewan First Energy Security
Strategy and Supply Plan***

Fall 2026

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Overview

Saskatchewan is advancing nuclear power as the central part of the province's commitment to long-term energy security and economic growth. The next phase of Saskatchewan's nuclear agenda is about focus, sequencing and execution.

Over the coming decades, Saskatchewan will need significantly more electricity capacity to support industrial development, major projects, resource development, value-added production and the continued expansion of communities across the province.

Saskatchewan is also preparing to transition from coal-fired generation while maintaining the reliable, affordable and secure power system that households, businesses and industries depend upon.

Saskatchewan continues to plan for nuclear generation, which will be powered by the province's abundant uranium deposits. Nuclear power is also one of the few electricity options capable of providing large-scale, reliable, non-emitting baseload power at the level required to support future growth. Nuclear power in Saskatchewan will not eliminate the need for wind, solar, hydro, natural gas, imports, storage, energy efficiency or emerging technologies, but it will complement these power sources as part of a larger, more resilient electricity system.

The Province's plan for nuclear development is organized around four priorities:

- 1 Building the Electricity Capacity Needed for Long-Term Growth**
- 2 Incorporating Large Nuclear Reactors into Electricity Supply Planning**
- 3 Continuing Nuclear Development in Estevan**
- 4 Building on Nuclear Capabilities Already Established**

Building the Electricity Capacity Needed for Long-Term Growth

Saskatchewan's future prosperity depends on having enough reliable, affordable and competitive electricity to support economic growth, industrial development and community growth.

Electricity demand is expected to rise as communities grow, major industrial projects proceed, resource development expands, businesses invest and households and industries use more power. New mines, processing facilities, manufacturing operations, data infrastructure, transportation systems and emerging industries will all require additional electricity. Saskatchewan's ability to attract investment depends on the province's ability to provide dependable power at competitive rates.

At the same time, Saskatchewan is preparing for a transition away from coal-fired generation over the long-term as nuclear generation is developed. Coal has historically provided reliable and dispatchable electricity to Saskatchewan's grid. As coal-fired generation is reduced and retired, the province will need replacement capacity that provides baseload supply, reliability and confidence during peak demand and system stress.

The introduction of nuclear power into Saskatchewan's electricity grid will not be the only source of new generation that Saskatchewan will pursue. The Province will continue to use and introduce an all-of-the-above electricity mix that includes wind, solar, hydro, natural gas, imports, storage, efficiency and demand-side measures.

The need to introduce new, reliable baseload electricity generation to meet both Saskatchewan's future electricity demands and replace retiring coal-fired generation cannot be understated.

Saskatchewan cannot rely only on intermittent generation or short-duration solutions to meet long-term baseload requirements. A growing province requires generation that is reliable in all seasons, is capable of supporting industrial-scale demand, and creates economic growth.

These are the primary considerations in planning for nuclear power in Saskatchewan. At this time, the province aims to build at least 2600MW of nuclear power by 2050.

Nuclear generation is able to provide large volumes of firm, non-emitting baseload electricity over many decades. Nuclear power can strengthen grid reliability, support the transition away from coal, reduce emissions intensity and continue Saskatchewan's ability to support future economic growth.

Nuclear generation can also strengthen regional energy security by creating opportunities for interprovincial cooperation, electricity trade and shared infrastructure development.

Incorporating Large Nuclear Reactors into Electricity Supply Planning

SaskPower has already started work on the technology selection for large nuclear and is beginning to plan for the potential development of two large nuclear reactors in northwest Saskatchewan. This planning is not a final investment decision. Future decisions will depend on siting, regulatory, commercial and engagement work with local communities and proximate Indigenous peoples.

As part of this process, Saskatchewan will undertake the work required to identify and assess a site that can support large scale nuclear baseload generation with potential for first power by 2042 and an initial goal of over 2000MW of power.

Northwest Saskatchewan provides a strong basis for further large-reactor planning. Previous Bruce Power work examined locations on the North Saskatchewan River and identified potential areas for more detailed study.

SaskPower has acquired data from that work, including initial study of ground conditions and hydrology at eight potential areas. The Bruce Power data gives Saskatchewan an important starting point for further assessment of large reactor siting options in the northwest.

2000+MW

an initial goal of over 2000MW of power from large nuclear

2042

potential for first large scale nuclear power by 2042

NW SK

potential reactor sites in northwest Saskatchewan

Incorporating Large Nuclear Reactors into Electricity Supply Planning

Evaluation of sites for large reactors in northwest Saskatchewan will account for at least five major considerations:

Water Supply: Nuclear power plants require access to a water body that can enable sustainable operations for cooling requirements, environmental obligations and long-term resilience under changing climate, regulatory and water-use conditions. The North Saskatchewan River region provides a basis for more detailed hydrological, environmental and social assessment.

Site Stability and Scale: A site that can accommodate at least two reactors needs stable ground conditions as well as ample space for construction and eventually common operational infrastructure. Early siting work and later site characterization must account for plant structure, site security and emergency planning. Sufficient space is required for laydown areas, material transportation and workers during construction.

Transmission Capacity: Large reactors require a transmission strategy that matches their output. A single large reactor can add 1,000 megawatts or more of generation to the system. Planning for two reactors in northwest Saskatchewan must proceed alongside transmission reinforcement, intertie planning and broader grid reliability work.

Regional Energy Opportunities: Depending on final project design, transmission capacity and commercial arrangements, nuclear generation in Saskatchewan could support provincial demand and strengthen regional energy security. Large nuclear generation also creates opportunities to support neighbouring jurisdictions and participate more actively in interprovincial or export electricity markets.

Economic Opportunity: The development of large reactors can create long-term opportunities in construction, skilled trades, engineering, manufacturing, professional services, Indigenous economic reconciliation, procurement, operations and regional development. Nuclear development can also create new opportunities for Saskatchewan companies to participate in nuclear supply chains.

Continuing Nuclear Development in Estevan

Saskatchewan will continue planning nuclear energy deployment in the Estevan area.

The Estevan planning process has helped Saskatchewan move from early nuclear exploration to regulated nuclear development. Through the Estevan work, SaskPower has gained experience in nuclear siting, public engagement, Indigenous engagement and consultation, regulatory preparation, nuclear project management, and corporate governance structures for nuclear. Saskatchewan will structure a final investment decision for nuclear deployment based on reactor design readiness, proven capital costs, partnerships and risk sharing structures.

Between 2021 and 2026, SaskPower moved from a provincial review of potential nuclear options to a regional assessment between Elbow and Estevan, and then to a specific site near Rafferty Reservoir to enable an application for a Licence to Prepare a Site. The process to get to a single site at Rafferty Reservoir embodies significant nuclear project development knowledge and has positioned SaskPower to move from the pre-development stage toward regulatory oversight and application.

Estevan remains strategically important because the region is an established energy-producing area directly affected by the transition away from coal-fired generation. Estevan has an experienced energy workforce, existing electricity infrastructure, strong community interest and a direct economic stake in the future of Saskatchewan's power system. Engagement to date has shown strong local interest in nuclear planning and future energy development.

Continued planning for the development of nuclear power in the Estevan region will also support the province's intention to preserve energy security in the phased transition from coal to nuclear. It will also help maintain Estevan's role in Saskatchewan's long-term energy future, support workforce transition planning, sustain community engagement and preserve future investment potential.

Saskatchewan's approach gives the province focus and flexibility. Northwest Saskatchewan will be the planning area for two large nuclear reactors and long-term baseload generation. Estevan will remain a nuclear planning area for small modular reactor technology deployment, with the ultimate goal of generating at least 600MW of nuclear power at the Rafferty Site.

600 MW

the goal for small modular reactor generation at the Rafferty site near Estevan

Building on Nuclear Capabilities Already Established

Saskatchewan has already completed substantial work to prepare for nuclear development, creating a strong foundation for the next phase of planning.

Public and Indigenous Engagement

Saskatchewan has developed a strong base of public and Indigenous engagement experience. Saskatchewan consistently polls as the province with the highest public support for nuclear. The Province's experience with uranium mining and milling, resource development, research institutions, industrial capacity and its practical interest in reliable power form a foundation for the development of nuclear power in Saskatchewan.

Since 2021, SaskPower has hosted more than 140 community engagement events and more than 80 Indigenous-specific engagement events related to nuclear development. Polling shows 73 per cent of Saskatchewan residents supported adding nuclear power.

Indigenous engagement has been central to nuclear planning to date. Four First Nations as well as Métis Nation locals are proximate to the Estevan site. They have all expressed interest in partnership, learning, economic benefits and long-term investment opportunities.

Saskatchewan has also encouraged potential Indigenous equity participation in nuclear projects and has engaged with the First Nations Natural Resources Centre of Excellence on province-wide Indigenous interests.

Siting and Technical Assessment

SaskPower has developed practical nuclear siting experience. This includes selecting regions, establishing criteria, public awareness and engagement campaigns, contracting geo-technical and hydrological examination, report analysis, third-party methodological reviews, and decision making.

The Estevan and Rafferty Reservoir process has allowed SaskPower to build knowledge that few non-nuclear utilities possess. Saskatchewan also has early information related to large-reactor siting through historical Bruce Power work on the North Saskatchewan River. SaskPower's access to that data gives the province a useful starting point for examining potential areas in northwest Saskatchewan.

73%

of Saskatchewan residents supported adding nuclear power

140+

community engagement events since 2021

80+

Indigenous-specific engagement events since 2021

Building on Nuclear Capabilities Already Established

Regulatory Readiness

Nuclear development must proceed through environmental assessment and nuclear licensing. Saskatchewan has advocated for a clearer and more efficient federal regulatory process, including consolidation of nuclear regulation under the Canadian Nuclear Safety Commission. A single-regulator model would improve clarity for proponents, but it would not remove the information, assessment or licensing requirements that a nuclear proponent must satisfy.

SaskPower is positioned to submit an Initial Project Description for the Rafferty Reservoir project and transition from pre-development into the development stage of project management. Following this submission, the site requires evaluation and characterization before licences for site preparation and construction can be obtained. This work is also required before engineering, construction and reactor technology commercial partnerships can be contracted, more detailed cost estimates can be developed and a final investment decision can be made.

The regulatory experience gained through the Rafferty Reservoir process helps SaskPower, SaskNuclear, Crown Investments Corporation (CIC) and the Government of Saskatchewan understand what steps are required to initiate a similar process in northwest Saskatchewan. Large nuclear will require additional work on reliability and grid integration preparation.

Governance and Institutional Capacity

Saskatchewan has begun to establish the governance structures required for nuclear power.

SaskPower created SaskNuclear as the management entity to be responsible for conducting regulated activities ultimately leading up to and including construction and hand-over to operations. SaskPower is currently developing a transition plan to discern what nuclear-specific functions in areas such as management systems, data, cyber security, labour and contracting will transition to SaskNuclear. SaskPower has already created a separate management system for nuclear activities, beginning with site evaluation and licensing.

Government-wide nuclear capacity is also being developed. CIC has established an Energy Security Division with a dedicated nuclear policy branch. The Saskatchewan Public Safety Agency is establishing provincial systems for nuclear-level emergency planning in coordination with CIC and SaskPower. The government and SaskPower will require requisite advisory and oversight capabilities to ensure project-level cost and schedule delivery as well as adherence to a culture of nuclear safety.

Building on Nuclear Capabilities Already Established

Transmission and Grid Integration

Saskatchewan has begun aligning nuclear planning with long-term transmission planning. Nuclear generation will require a transmission system capable of moving large volumes of firm electricity to customers and managing the reliability requirements associated with large generating units.

In 2026, Saskatchewan released *Strengthening Saskatchewan's Grid: Transmission to Power Communities and Growth*. Federal investment in the McNeill Converter Station and the Regina-Winnipeg Corridor projects supports broader work to strengthen electricity transmission and interprovincial connections. Those investments are not specific to nuclear development, but they are complementary to the transmission planning required for future nuclear generation.

Grid integration will remain a central part of Saskatchewan's nuclear agenda. SaskPower will continue due diligence in evaluating how to integrate large nuclear units into the provincial grid, contingency requirements, and strengthening interties to support regional reliability and economic opportunities.

Workforce, Supply Chain and Partnerships

Saskatchewan has begun building the workforce, supplier relationships and external partnerships required for nuclear development. Internal to SaskPower, expertise will need to be maintained and expanded in nuclear licensing, commercial negotiations, construction scheduling, engineering oversight, fuel contracting, quality assurance, project financing, cybersecurity, Indigenous engagement, public engagement, emergency planning and operational readiness.

To this end, Saskatchewan has built relationships with experienced nuclear jurisdictions and organizations.

SaskPower has partnered with Ontario Power Generation to learn from the Darlington New Nuclear Project, has a memorandum of understanding with New Brunswick Power, and has engaged with the Tennessee Valley Authority, Orlens-Synthos, and the broader North American nuclear community through the Institute of Nuclear Power Operations.

SaskPower has also cooperated with Bruce Power on large reactor technology assessment and historical large-reactor siting data and is open to exploring a strategic partnership to accelerate and enhance delivery on large reactor development.

Plan and Timeline

2026-2027:

In the near term, Saskatchewan will finalize large nuclear technology selection and undertake planning direction for two large reactors in northwest Saskatchewan and continue to advance planning and siting in the Estevan region. This phase will include:

- Confirming northwest Saskatchewan as a planning area for two large nuclear reactors.
- Completing the Large Reactor Technology Assessment.
- Reviewing and analyzing historical Bruce Power data related to potential sites on the North Saskatchewan River.
- Developing a detailed northwest Saskatchewan siting work plan.
- Completing and submitting the initial project description for the Rafferty Reservoir project.
- Starting site evaluation and characterization at Rafferty Reservoir.
- Establishing the Indigenous engagement and consultation approach for new project work.
- Continuing province-wide public engagement and doing proximate community engagement at Estevan and along the North Saskatchewan River.
- Advancing transmission analysis related to large-reactor development.

2027-2030: Advance Siting, Engagement and Development Readiness

From 2027 to 2030, Saskatchewan will move into more detailed siting, engagement and development readiness. Saskatchewan will determine which locations in northwest Saskatchewan allow for at least two large reactors to be licensed, constructed, and operated, and for southeast Saskatchewan what commercial, financing, and market conditions need to be satisfied to create a business case for a final investment decision.

For northwest Saskatchewan, the work will include identifying and comparing potential large-reactor sites:

- Conducting preliminary geotechnical and hydrological investigations.
- Assessing water availability, environmental resilience and long-term site suitability.
- Evaluating transportation access for major components and construction needs.
- Assessing proximity to transmission routes and potential interties.
- Undertaking Indigenous engagement and consultation planning.
- Engaging local communities and regional stakeholders.
- Developing a transmission integration strategy for large reactors.
- Preparing federal regulatory submissions, including to the Major Projects Office.

Plan and Timeline

For southeast Saskatchewan, the work will include continuing project advancement at the Rafferty Reservoir site:

- Site evaluation to complete more detailed geo-technical, environmental, and social analysis.
- Steps to protect Indigenous heritage and cultural artifacts.
- Engagement with Indigenous and local communities on economic benefits.
- Engagement with Ontario Power Generation and following the Darlington New Nuclear Project as well as global developments in BWRX-300 deployments.
- Monitoring local and province-wide public sentiment.
- Partnering with engineering and construction firms for project delivery.
- Applying for nuclear regulatory licences, such as a Licence to Prepare a Site.

2030 and Beyond: Prepare for Licensing, Financing and Final Project Decisions

Nuclear development is a multi-decade undertaking and Saskatchewan is planning accordingly.

For reference, Bruce Power's Bruce C project illustrates the complexity of large-reactor development. Bruce Power submitted its initial project description in 2024, is working toward a licence to prepare site in 2028, anticipates a long construction period for 4,800 MW of generation and expects first power in the early-to-mid 2040s.

Saskatchewan will advocate for the federal government to accelerate nuclear projects as major projects, create conditions for financing and investment, and ensure the pace of nuclear regulatory processes.

Without regard to the location or technology for a nuclear project, Saskatchewan will need to:

- Engage with federal institutions key to project financing such as the Canada Infrastructure Bank, Canada Growth Fund, and Major Projects Office.
- Negotiate a commercial arrangement for engineering and construction.
- Determine the commercial and governance structure for construction and operations.
- Determine potential approaches to Indigenous equity investment.
- Optimize provincial systems for rate structures and debt management to minimize the cost-of-capital.

