

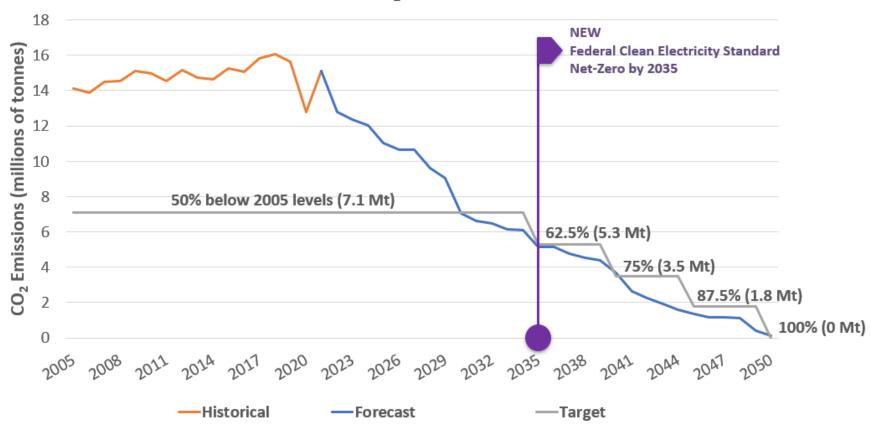
WHY NUCLEAR POWER? WHY NOW?

- Large reactors not feasible
- Today: SMRs advancing, better fit for small grids like Saskatchewan's
- Climate change driving the need to decarbonize energy systems
- Mandated phase out of conventional coal; increasing carbon price on natural gas
- All low and no emissions power sources needed to achieve net zero emissions as quickly as possible



FORECASTED EMISSIONS PERFORMANCE

Annual CO₂ Emissions



AVAILABLE LOW EMISSIONS OPTIONS TO 2035

- SASKATCHEWAN HYDRO
- NATURAL GAS GENERATION
- EXPANDED INTERCONNECTIONS
- RENEWABLES AND STORAGE
- GAS/COAL WITH CCS
- DISTRIBUTED ENERGY RESOURCES
- SMALL MODULAR REACTORS



Natural gas-fired generation is currently the only baseload supply option that can be developed at the scale needed to meet Saskatchewan's needs.

POSSIBLE GENERATION ADDITIONS TO 2035

- 3,000 MW of wind and solar generation
- 1,500 MW of natural gas generation
- 750 MW of transmission intertie capacity
- 300 MW of nuclear SMR generation
- 60 MW of hydro generation
- Non-emitting baseload: TBD
- Battery and other storage: TBD
- Coal to gas conversion: TBD



Nuclear Power in Canada Today

FOOTPRINT OF A LARGE REACTOR FACILITY



REGULATORY RIGOR FOR SAFE, LONG-TERM USED FUEL & WASTE MANAGEMENT



Radioactive Waste Definitions in Canada Today

From CNSC:

https://nuclearsafety.gc.ca/eng /pdfs/infographics/infographicwaste-eng.pdf



Uranium mine and mill waste

Includes tailings and waste rock generated by the mining and milling of uranium ore. Low-level

Intermediate-level radioactive waste radioactive waste

Is more radioactive than clearance levels and exemption quantities allow.



High-level radioactive waste

Contains enough long-lived Is primarily used nuclear fuel, along with small amounts of radionuclides to require isolation and containment. waste that generate significant heat and radioactivity.

Where does it come from?

From mining/milling ore into yellowcake.



Nuclear power plants, research reactors, test facilities, radioisotope manufacturers or users, uranium refining and conversion, and nuclear

fuel fabrication.

Nuclear power plants, prototype and research reactors, test facilities, and radioisotope manufacturers and users.

Nuclear power plants. prototype and research reactors, and test facilities.



Used nuclear fuel that is still

What does it look like?

Tailings have the consistency of fine sand and waste rock, which is simply gravel and broken up rock.



Used equipment, paper, cable, clothing, decommissioned parts, even mops.

Typically, long-lived

low-level waste is stored

above ground at licensed

facilities in bins and bags



Refurbishment waste, ion-exchange resins and some radioactive sources used in radiation therapy.





How is it stored in the interim?

Tailings are placed back into the mined-out pit or tailing containment facilities. Waste rock is stored in piles on the surface.



CNSC inspectors monitor mine sites during operation and long after closure.



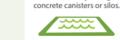
Because the decay of



Low-level waste is monitored at licensed facilities that are inspected by the CNSC.



Used fuel is stored at the Currently, this waste is stored reactor site in reinforced, in shielded above-ground or in-ground storage silos at leak-proof cooling pools for 7 to 10 years, and then can be licensed waste facilities. transferred to dry storage in



The CNSC inspects and licenses all intermediate waste management facilities.



The CNSC and the International Atomic Energy Agency monitor used nuclear fuel.



How long will it be radioactive?

Who monitors it?

natural uranium is so slow, it can take billions of years to reach the earth's normal background level of radiation.



Some short-lived waste can decay within hours or days and then be disposed of like regular waste. Longer-lived waste may need isolation for up to a few hundred years.



long-lived radionuclides that require isolation beyond several hundred years (300 to 500 years).



This waste generally contains The radioactivity of irradiated, used nuclear fuel starts high but decreases quickly (by 99% in the first 10 years). It then takes about 1 million years to decrease to the original level of natural uranium.

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SMR Technology



SMRs ARE A GOOD FIT FOR SMALLER GRIDS

Small = 50-300 MWe per unit	Better fit for smaller grids/ serve incremental load
Lower capital cost	Reduces financial risk
Modular construction	Should result in less risk to project cost/schedule
Strong safety case	Emerging designs, enhanced safety features





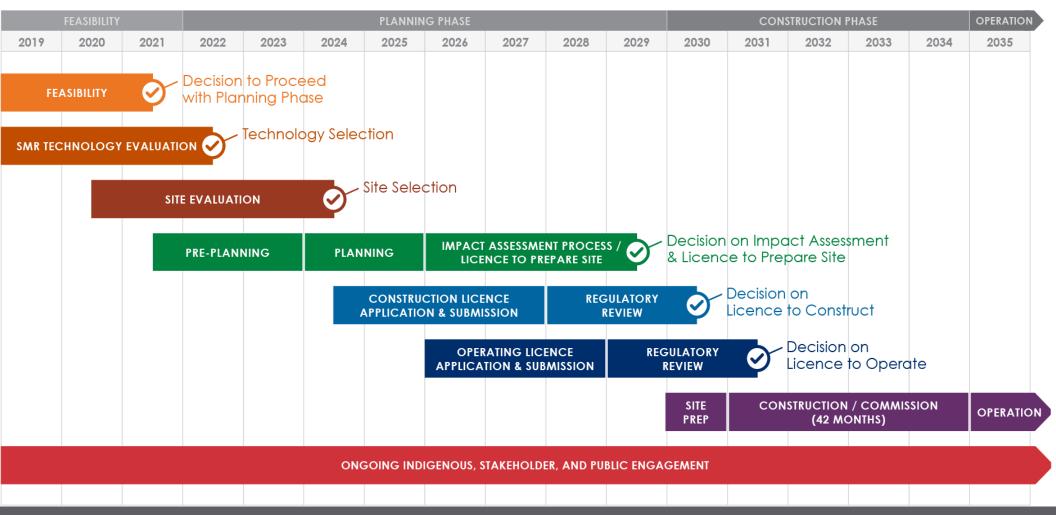
KEY REQUIREMENTS FOR SMR DEVELOPMENT IN SASKATCHEWAN

- Fleet-based deployment in Canada
- Utility partnerships
- Successful first-of-a-kind deployment in Canada
- Indigenous participation
- Federal risk sharing
- Competitive supply option



SaskPower SMR Development Project

SASKPOWER SMR PROJECT SCHEDULE, MILESTONES AND KEY DECISIONS



SMR SITE SELECTION – KEY CRITERIA

- Availability of cooling water
- Proximity to electrical infrastructure & regional demand for power
- Access to emergency services and road infrastructure
- Workforce availability
- Land use, proximately to airports, major populations
- Indigenous Knowledge & Public feedback



SASKPOWER'S SMR TECHNOLOGY EVALUATION CRITERIA:

- Safety Performance & Features
- Fuel Supply Chain Security
- Plant Physical Parameters
- Timelines (Technology Readiness)

- Waste Management
- Modes of Operation & Services beyond Electricity Production
- Financial LCOE, Owner's Cost
- Economic Impact to Saskatchewan



QUESTIONS

