Saskatchewan Environmental Society

A TAKE ON THE 'SASKATCHEWAN FIRST ENERGY SECURITY STRATEGY AND SUPPLY PLAN'

By R.A. Halliday, Vice President
Saskatchewan Environmental Society
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On October 20, 2025, the Government of Saskatchewan released its plan for a "reliable and affordable" power future for the province. The plan represents a dramatic change from SaskPower's previous approach as exemplified by a recent two years of public consultation. The key change is to operate SaskPower's coal-fired power stations as late as 2050, even to re-certifying a closed unit at Boundary Dam Power Station. A second change was an all-in commitment to nuclear power from small modular reactors (SMRs). Previously SMRs were seen as a possible, even likely, way forward but the firm commitment was lacking. The plan fails to demonstrate how Saskatchewan would achieve hydrocarbon-free power production by 2050.

You can view the Press Release announcing the 'Saskatchewan First Energy Security Strategy and Supply Plan,' and the plan itself, on the Government of Saskatchewan's website. This commentary is a review of the plan. The headings are those in the plan.

Overview

The Overview can be interpreted positively. Unfortunately, what follows raises many questions.

Authority to Decide

This section accurately quotes the constitutional provision concerning provincial jurisdiction for the generation and production of electrical energy. It fails to mention that that jurisdiction is not unfettered. In 2021 the Supreme Court (2021 SCC 11) upheld the federal *Greenhouse Gas Pollution Pricing Act* deeming climate change as a national concern requiring a national approach.

An All-of-the-Above Approach

This section makes a passing reference to hydro-electric generation facing future power shortfalls. This perhaps refers to operations during drought. The required mitigation measure is complementary operation with wind and solar, something that B.C. Hydro, Manitoba Hydro, and Quebec Hydro are all undertaking. The document states SaskPower is "heavily invested in hydro-electric generation," an exaggeration.

This section also points out the vulnerability of SaskPower to natural gas price volatility, something the Saskatchewan Environmental Society (SES) pointed out over a decade ago (Halliday, 2013). The document also states that 80 per cent of the province's natural gas is imported. (Other sources indicate 90 per cent.) This increases vulnerability. It is also possible that Saskatchewan is experiencing some element of sticker shock related to the cost of gas-fired power stations. A 370 MW station completed near Moose Jaw in 2024 cost $825 million while a similar one now under construction near Lanigan is estimated to cost $1.7 billion.

Power Pools

Power pools are cooperative arrangements across North America aimed at improving reliability of electricity grids and enhancing bulk electrical power transmission. Saskatchewan, Manitoba, and North Dakota are part of the Eastern Interconnection while Alberta is part of the Western Interconnection.

The section then goes on to laude SaskPower for its renewable generating capacity. In fact, SaskPower lags far behind many jurisdictions in its adoption of renewable power. Bragging rights would be in order if the corporation had about 1,000 MW of wind capacity and a like amount of solar capacity. (The Southwest Power Pool from which SaskPower intends to purchase power beginning in 2027 obtained 38 per cent of its power — not capacity — from renewable sources in 2024.)

The document states that wind and solar power is less reliable. As a non-dispatchable source of electricity, this is true to a point. At best wind and solar facilities will produce power up to about 75 per cent of rated capacity. It then goes on to say that wind and solar power requires large amounts of land to develop and could impede the availability of productive farmland. A similar observation has never been made concerning oil field operations. In other jurisdictions contaminated sites, former coal-fired power stations sites and parking lots have been used as solar power station sites. In 2025, Alberta municipalities received $70 million in revenue from wind and solar operations (Public News, 2025).

The document fails to mention agri-energy opportunities. These are usually agrivoltaic in nature where land at an industrial-scale solar site provides power to the farm and land continues to be used for crop cultivation or livestock grazing (Barron-Gafford et al., 2019).

Coal as a Bridge to Nuclear

Saskatchewan proposes to refurbish its coal-fired power stations and continue operations until as late as 2050. This action would include 1,281 MW of conventional coal now in service, recertifying the 139 MW Unit 4 at Boundary Dam Power Station that has been shut down, and continuing to operate the 110 MW Unit 3 equipped with carbon capture and storage technology. The actions related to traditional coal are in defiance of *Canadian Environmental Protection Act* regulations initiated in 2012 which require the phase-out of conventional coal-fired power by December 31, 2029. It is also not in conformity with the Clean Electricity Regulations that affect all fossil-fuel power generation starting in 2035.

The document states that electricity demand in Saskatchewan will increase by 40 to 100 per cent by 2050. Aside from this being a very broad range requiring different actions at each end of this range, no information is provided as to how those figures were derived. There is no mention of the assumptions underpinning the range.

This section provides a list of assumptions concerning wind and solar power and battery storage that are accurate as far as they go. A reasonable question at this point is what other

options exist for Saskatchewan to replace 1,400 MW of coal-fired electricity? The estimated cost of the coal refurbishment was $900,000 over a four-year period (Globe and Mail, 2025b). Current estimates place the cost at $2.6 billion (Saskatchewan Rate Review Panel, 2026) One can assume there will be further significant cost overruns in refurbishing end-of-service power stations. The refurbishment of Boundary Dam Power Station Unit 3 for carbon capture and storage was in part responsible for the significant cost overrun of that project.

SaskPower has many options for replacing its fleet of coal-fired power stations at a reasonable cost. One could involve converting the relatively new Shand Power Station to natural gas operation. This could be attractive considering that TransAlta converted three power stations to natural gas in 2019–2021 at a cost of $295 million (Globe and Mail, 2025b). This action would not conform to the federal Clean Electricity Regulations (CER) however. Other options exist.

There are two cogeneration power stations in the province having a net capacity of 438 MW. Cogeneration is the simultaneous production of heat and electricity from a single fuel source such as natural gas. The heat is used to support industrial processes while excess electricity can be delivered to the electrical grid. A 62 MW addition to cogeneration capacity is under development at the K+S Bethune potash mine. Other opportunities exist in Saskatchewan, provided CER requirements can be met.

Staying with gas-fired power, a power station equipped with CCS is a possibility, but such stations are complex and are in the early stages of development. They will prove to be very expensive and energy intensive.

The least expensive power available is the power that is saved through demand-side management (DSM). SaskPower has not been very aggressive in pursuing DSM opportunities. SaskPower easily met a 150 MW target some years ago and it would be reasonable to expect the utility could meet a 300 to 500 MW target.

For more than a decade, SES has advocated for a robust electrical interconnection between SaskPower and Manitoba Hydro, with a 1,000 MW connection being mentioned. Several years ago, the estimated cost of such an interconnection was $2 billion so the cost of refurbishing Saskatchewan's coal-fired power stations, including further cost overruns will be well over the cost of such an interconnection. It would be a reasonable ask of the federal government to have them pay for the other half.

Currently, Manitoba seems willing to consider such a mutually beneficial request as the province has signed an MOU with Ontario to that effect (Winnipeg Free Press, 2025).

A significant investment in wind and solar power by Manitoba would help drought proof the system and allow for complementary operation with the Lake Winnipeg Reservoir. Other opportunities lie in the one-hour summer time difference. As well, Manitoba experiences

peak summer demand in the winter while Saskatchewan is now experiencing capacity constraints in the summer.

An increase in wind power stations and a commitment to utility grade solar power stations combined with complementary operation of Lake Diefenbaker is another approach SaskPower could take. In general, replacing a dispatchable power supply with ephemeral sources requires a 30 per cent excess in capacity (Ueckerdt and Kempener, 2015) so an additional 1,800 MW of capacity. SaskPower recently completed a 200 MW wind farm at a cost of $340 million, and an estimate for a 300 MW solar project in Alberta is $415 million. On that basis an additional 1,800 MW of wind and solar power in Saskatchewan could cost in the order of $2 to $3 billion dollars. These projects would not incur ongoing fuel costs and maintenance costs are low. The ability to rapidly deploy such facilities would enable the corporation to match energy supply to demand very effectively.

The availability of transmission lines from Estevan and Coronach make those communities very desirable locations for solar power stations. This would also create some employment opportunities for former coal-related workers. At present, much of SaskPower's wind generation is in the southwest portion of Saskatchewan. Increased reliance on wind energy would make it necessary to distribute wind generation facilities over a much larger footprint.

There is one remaining potential hydroelectricity generating site on the Saskatchewan River downstream of The Forks. The site has a capacity of about 250 MW and would, like all of the power stations downstream of Lake Diefenbaker, be essentially run-of-the river. Development of the site would require concurrence of First Nations.

Saskatchewan also has opportunities in distributed power generation, largely roof or ground-mounted solar panels. These could be single user installations or arrayed in microgrids with battery backup for intraday smoothing. SaskPower's Descharme Lake microgrid replaced an aging powerline with solar panels with one-day battery backup. Diesel generators provide the ultimate winter back-up, usually running for a period of time every second day.

Nuclear Power as the Future

This section of the plan identifies three possible nuclear options for Saskatchewan: two 300 MW SMRs at Estevan, large-scale reactors (approximately 1,000 MW) for industrial purposes, and micro-reactors (5–15 MW) for small scale applications. The proposed GE-Hitachi BWRX-300 installation is the main focus of this commentary.

There are several persistent environmental, economic, and public policy criticisms of nuclear energy and SES has long considered it an inappropriate choice for Saskatchewan. In the current context, quite simply, nuclear power will be expensive and it will be late.

Ontario Power Generation is constructing the world's first BWRX installation consisting of four units at Darlington. The cost of the first unit has already ballooned to $6.1 billion and the cost of the entire project is now stated as $20.9 billion 2024 dollars (Globe and Mail, 2025a). The total cost is comprised of the cost of the first unit, $1.6 billion in common infrastructure and $13.3 billion for the remaining three units. Given the history of the nuclear industry one can expect these costs to substantially increase before the units are operational (Sovacool et al., 2014). The first unit is scheduled for completion in late 2028 or 2029. There is little expectation that the schedule will be met.

In a Saskatchewan context, one can assume that the province's first SMR could be completed by the mid-2030s at a cost of about $5 billion dollars. If the Saskatchewan government's projection of an at least 40 per cent increase in electricity demand is taken as a baseline, some 5,400 MW of carbon neutral electricity capacity would be necessary by 2050. This would require adding 17 more SMRs or perhaps a smaller number of large units at a cost of approximately $90 billion over a 15-year period. SaskPower's current debt load, which is considered onerous, is currently about $10 billion.

In considering large nuclear reactors, two possibilities exist: Canada's 1,000 MW Candu Monark and the Westinghouse AP1000. The Candu reactor is yet to be built and while the AP1000 is touted to cost US$6.8 billion, a two-unit installation in the United States came in at $34 billion (NuclearNewswire, 2022). (The original estimate was $14 billion.) Ontario Power Generation is considering both reactors.

Aside from cost and schedule, another limiting factor for nuclear power in Saskatchewan is the availability of cooling water. Cooling a power station that uses heat to generate electricity can be accomplished by once-through systems as for Saskatchewan's coal-fired power stations or by evaporative systems using cooling towers. The cooling water requirements for a BWRX are not readily available but, in general, operating temperatures of a nuclear power station are higher than those for a coal-fired power station so significant cooling requirements can be anticipated. During the 1980s drought, SaskPower used a pumped aquifer to cool the Boundary Dam Power Station. The water level in the aquifer still has not recovered (van der Kamp & Maathuis, 2012).

Finally, a 2050 target for carbon neutral electricity is inadequate, considering that society as a whole must be net-zero by 2050.

Transmission Infrastructure

This is a curious section for two reasons. First, much is made of connections with Alberta while the real opportunity for Saskatchewan lies with a beefed-up interconnection with Manitoba and the U.S. Southwest Power Pool (scheduled for 2027). The text is factually incorrect, as shown in the table and the map, in saying the Alberta interconnection is "the only tie between the west-east systems in Canada." As well, the connection with the United States is

largely for the import, not export, of power. Alberta is in a different power pool than Saskatchewan so the cost of making interconnections is increased. A further complication is that Alberta operates an open market so there is much bidding, buying, and selling by many players. This adds complexity to any contractual arrangements while contracting with Manitoba Hydro is straightforward. In addition, Alberta has the same challenges as Saskatchewan in reducing greenhouse gas emissions from electricity generation. While Manitoba can tout its clean power, Alberta cannot.

Aside from the errors noted above, this section is reasonably good as far as it goes. The curious element is the failure to even mention smart grids, smart meters, microgrids, and other elements required for a flexible and adaptable transmission system.

People and Partnerships

This section is a promo for retaining coal-fired electricity generation while going all-in on nuclear. Other opportunities exist and are not discussed.

The section makes no mention of the need to transition workers in Estevan and Coronach away from coal-fired power (Fisher et al., 2018). The previously-made grants to assist that are not mentioned.

It seems unlikely that the federal government would pay 75 per cent of the cost of an SMR in Saskatchewan when it has only contributed $2 billion to the $20 billion Ontario Power Generation project. Asking the federal government to contribute half the cost of an interconnection with Manitoba would be a good ask. Note that the federal government has agreed to support the SaskPower North-South Interconnection by contributing $18 million for planning and design.

Industries driven by economic possibilities, investor and consumer demand, and government regulation are increasingly seeing advantages in clean power (Beck, 2025). Canada has a competitive advantage in clean, reliable, low-cost electricity. Saskatchewan is at a competitive disadvantage in that regard.

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