PEMBINA Institute

Burning Questions

How Saskatchewan's coal extension impacts affordability, reliability and a modern electricity grid

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Recommended citation: Logvin, Nina and Will Noel. Burning Questions: How Saskatchewan's coal extension impacts affordability, reliability and a modern grid. The Pembina Institute, 2026.

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Acknowledgements

The Pembina Institute recognizes that the work we steward and those we serve span the lands of many Indigenous Peoples. We respectfully acknowledge that our organization is headquartered in the traditional territories of Treaty 7, comprising the Blackfoot Confederacy (Siksika, Piikani and Kainai Nations); the Stoney Nakoda Nations (Goodstoney, Chiniki and Bearspaw First Nations); and the Tsuut'ina Nation. These lands are also home to the Otipemisiwak Métis Government (Districts 5 and 6).

These acknowledgements are part of the start of a journey of several generations. We share them in the spirit of truth, justice and reconciliation, and to contribute to a more equitable and inclusive future for all.

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Executive summary

Saskatchewan is at an important juncture in shaping the future of its electricity system. The province and its crown utility, SaskPower, have taken positive steps to diversify their supply mix and reduce electricity emissions while also meeting growing demand, reducing electricity emissions intensity by 35% in the past 15 years. However, in June 2025, the Government of Saskatchewan announced its intention to extend the life of its aging coal-fired generation fleet until 2050 and reversed its plans to achieve significant renewable capacity by 2030.

This decision has been framed as a measure to support affordability, reliability and security; however, our analysis finds it a more expensive option than using its world-class wind and solar resources in addition to storage and energy efficiency, all of which are outcompeting fossil fuel electricity in Canada and around the world. Saskatchewan's decision also sets them apart from the path taken by all other provinces and much of the world, including its fossil-fuel reliant neighbor, Alberta, which successfully phased out coal in 2024 — six years ahead of schedule.

In 2015, SaskPower set a goal to source 50% of its installed capacity from renewable energy. Although the target was later revised to "40–50%", Saskatchewan has made notable strides in meeting this target and has reduced its electricity emissions over the past decade. Coal's share of annual electricity generation had fallen to less than 25% by 2025.

Against this backdrop, the Saskatchewan government's decision to extend the life of coal-fired power plants marks a significant shift in direction. To better understand the implications of this reversal, this report examines the affordability, reliability and emissions implications of extending coal-fired power by an additional 20 years.

Key findings

- Refurbishing and operating Saskatchewan's coal fleet is **estimated to cost roughly $26 to $32 billion** between 2025 and 2050. Alternatively, converting the coal fleet to burn **natural gas costs about $18 to $25 billion**, while expanding **wind and solar capacity** could displace the total 25-years of coal-fired electricity supply for **roughly $12 to $17 billion.** This portfolio of wind and solar could mostly match the output of the coal plants with an additional **$1 billion** worth of batteries.
- Continuing to rely on coal for electricity generation presents, according to a leaked internal SaskPower planning document, **high reliability risks.** Rather than a more resilient and diverse portfolio of technologies that could include wind, solar, natural gas, nuclear and battery storage, a continued reliance on coal increases the risk of disruptions

or outages, especially while one or more large coal plant is down for maintenance (planned or unplanned) or refurbishment.

- Extending Saskatchewan's coal phase-out by an additional 20 years would release **an additional 155 megatonnes of greenhouse gases** (Mt CO_2e), which is comparable to adding the total annual emissions of a mid-sized country such as Netherlands, or roughly twice the annual emissions of New Zealand or Austria.

While Saskatchewan's reliance on fossil fuels contributes to some of the highest electricity costs in Canada, the province also benefits from some of the country's strongest wind and solar resources. Extending the life of coal-fired generation risks both delaying the development of these competitive advantages and locking consumers into higher-cost, higher emissions electricity. With the rapidly falling cost of renewable energy technologies, however, Saskatchewan has a unique opportunity to modernize its electricity system, strengthen energy security, and ultimately, deliver a more affordable, reliable, and cleaner electricity system that can support both a growing economy and rising electricity demand for decades to come.

Recommendations

1. **Get Saskatchewan's electricity transition back on the lowest-cost track.** Saskatchewan should return to the lowest-cost options it was pursuing prior to delaying its coal-phase out and recommit to ending conventional coal-fired generation by 2030. To achieve this, Saskatchewan should prioritize a diversified portfolio of generation technologies and complementary resources that can meet current and future demand reliably while keeping electricity rates affordable.
2. **Put reliability, affordability and emissions at the centre of SaskPower planning.** The province should require SaskPower to model future supply scenarios based on meeting reliability and decarbonization objectives at the lowest cost to ratepayers. This planning should be transparent and include community and stakeholder engagement consistent with SaskPower's 2024 sessions.
3. **Protect the integrity of Canada's coal phase-out in federal-provincial equivalency deals.** The federal government should only pursue an equivalency agreement with Saskatchewan if it contains a clear pathway for phasing out coal generation in the short term, while safeguarding national emissions reduction targets and international climate leadership.

1. Phasing out coal

1.1 The global coal phase-out

In 2025, renewables — including hydroelectric, wind, solar and bioenergy — surpassed coal as the largest source of electricity generation globally, with the cost of wind and solar plummeting over the past decade.[1] While China accounts for over half the coal burned for electricity in the world,[2] it also remains the largest market for renewable energy. Wind, solar, and to a lesser extent nuclear are now eating into coal's market share in China; although the country continues to build new coal plants, these are running at lower capacity factors.[3]

Similar trends have taken shape across the globe as more countries turn to cheaper and lower-carbon energy solutions at a fast pace. The United Kingdom, Portugal, Finland, and Ireland, for example, each phased out coal from their electricity systems in under a decade and have greatly expanded their renewable generation. Coal-fired electricity is also falling rapidly in the United States, with its share dropping from 50% in the early 2000s to roughly 18% in 2025.[4]

1.2 The Canadian coal phase-out

Canada has made significant progress towards eliminating coal-fired power. In 2016, Canada announced its commitment to phasing out unabated coal-fired generation by 2030[5] and since then, provinces across the country have worked toward meeting that objective. Ontario phased out aging, publicly owned coal plants in 2014. Alberta, a province once heavily reliant on coal, eliminated its consumption ahead of schedule in 2024, aided by its industrial carbon pricing system, a transition to natural gas, growing renewables, and contracts with electricity companies. The two provinces' coal phase-outs alone accounted for roughly 80% of Canada's

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[1] Małgorzata Wiatros-Motyka and Kostantsa Rangelova, *Global Electricity Mid-Year Insights 2025* (Ember, 2025), 3. https://ember-energy.org/latest-insights/global-electricity-mid-year-insights-2025/

International Renewable Energy Agency, *Renewable power generation costs in 2025* (2026). https://www.irena.org/Publications/2026/Jul/Renewable-Power-Generation-Costs-in-2025

[2] International Energy Agency, *World Energy Investment 2025* (2025), 219. https://www.iea.org/reports/world-energy-investment-2025/china

[3] International Energy Agency, *Coal 2025* (2025), 13. https://www.iea.org/reports/coal-2025

[4] Ember, "US Electricity Data Explorer." https://ember-energy.org/data/us-electricity-data-explorer/

[5] Canada Energy Regulator (CER), "Market Snapshot: Canadian coal-fired electricity generation is rapidly being replaced by low and non-emitting energy sources," May 15, 2024. https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2024/market-snapshot-canadian-coal-fired-electricity-generation-rapidly-being-replaced-low-non-emitting-energy-sources.html

total emissions reductions between 2005 to 2023.[6] These successes are particularly notable considering both Alberta and Ontario began their coal phase-outs with a coal fleet that was over four times the size of Saskatchewan's today.[7]

Canada's remaining coal-fired generation — now largely concentrated in Saskatchewan, with some generation in Nova Scotia and New Brunswick — all had phase-out plans until the Saskatchewan government's reversal announced last year (see next section).

How federal policy set the stage for Canada's coal phase-out

Canada's coal phase-out has been advanced by strong federal regulation and policy. In 2012, Prime Minister Stephen Harper established a national coal phase-out by setting a performance standard (emissions limit) enforced under the Canadian Environmental Protection Act, which would require coal plants to reduce their emissions to that of an equivalent gas plant by the time they reach 50 years of operation.[8] In 2018, this policy was amended to accelerate the phase-out, requiring coal plants to reach zero emissions by 2030 or after 50 years of their life, whichever comes first.[9] This amendment would set the path for a timely phase-out of the polluting fuel in Saskatchewan, Nova Scotia, and New Brunswick.

Canada's industrial carbon pricing system has also played a valuable role by creating financial incentives for large industrial emitters, including fossil fuel power plants, to reduce their emissions and invest in cleaner technologies. Under this system, provinces and territories can either adopt the federal "backstop" system or choose to develop their own carbon pricing system through equivalency agreements, which must still be assessed and approved by the federal government.[10]

Together, these policies and mechanisms have provided a clear signal to utilities and provinces while also granting them the flexibility to decide on their own pathways to reduce their emissions and phase out coal use.

[6] Alison Bailie, "How Ontario and Alberta's coal phase-outs led to massive emissions cuts," *440 Megatonnes*, May 8, 2025. https://440megatonnes.ca/insight/how-ontario-and-albertas-coal-phase-outs-led-to-massive-emissions-cuts/

[7] CER, "Canada's Energy Future 2026: Energy Supply and Demand Projections to 2050." https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2026/

[8] Government of Canada, "Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations," September 12, 2012. https://gazette.gc.ca/rp-pr/p2/2012/2012-09-12/html/sor-dors167-eng.html

[9] Government of Canada, "Regulations Amending the Reduction of Carbon Dioxide Emissions from Coal-fired Generation," November 30, 2018. https://gazette.gc.ca/rp-pr/p2/2018/2018-12-12/html/sor-dors263-eng.html

[10] Jason Wang, Ian Sanderson and Will Noel, *Canadian Carbon Pricing Systems: 2025 Review* (Pembina Institute, 2026), 17. https://www.pembina.org/pub/canadian-carbon-pricing-systems-2025-review

1.3 Coal in Saskatchewan

Although the share of coal has been declining in Saskatchewan's supply mix throughout the past decade, the province still has one of the most carbon-intensive grids in Canada, with around 71% of electricity supplied from fossil fuels in 2025 (47% natural gas and 24% coal).[11] Further, their electricity demand is forecast to increase by 40 to 100% by 2050 as sectors electrify and the population grows.[12]

Recognizing these challenges, Saskatchewan has made notable progress on reducing its electricity emissions over the past decade. In 2015, SaskPower (the public utility responsible for the province's electricity generation, transmission and distribution) developed a plan to increase renewables to 50% of installed capacity by 2030.[13] This plan was later revised to 40 to 50% from *non-emitting* sources but included a goal of adding up to 3,000 MW of new wind and solar by 2035.[14]

In 2023, Saskatchewan pledged to reach a net-zero electricity grid by 2050 or sooner.[15] This pledge was complemented by several rounds of community and stakeholder engagement, which found public support for expanding wind, solar, energy storage and nuclear, and retiring coal by 2030 and replacing it with natural gas and imported electricity.[16] In 2024, the provincial auditor said that SaskPower "had effective processes" in place to meet the provinces emissions reductions and renewable energy generation targets.[17]

Despite these developments, the Saskatchewan government announced a significant change in direction in October 2025, releasing its plan to extend coal-fired power plants until 2050 as the

[11] SaskPower, *Annual Report* (2025), 4. https://www.saskpower.com/about-us/our-company/current-reports

[12] Government of Saskatchewan, *Saskatchewan First Energy Security and Supply Plan* (2025), 5. https://www.saskatchewan.ca/government/news-and-media/2025/october/20/government-releases-the-saskatchewan-first-energy-security-strategy-supply-plan

[13] Canadian Press, "SaskPower aims to generate 50 per cent of electricity from renewables by 2030," *CTV News*, November 23, 2015. https://www.ctvnews.ca/regina/article/saskpower-aims-to-generate-50-per-cent-of-electricity-from-renewables-by-2030/

[14] SaskPower, "SaskPower Announces 700 MW of New Renewable Generation for South-Central Saskatchewan," November 7, 2022. https://www.saskpower.com/about-us/media-information/news-releases/2022/saskpower-announces-700-mw-of-new-renewable-generation-for-south-central-saskatchewan

[15] SaskPower, *Annual Report* (2023), 8. https://www.saskpower.com/-/media/saskpower/about-us/reports/past-reports/report-annualreport-2022-23.pdf

[16] SaskPower, "Future Supply Plan – 2030 and Beyond." Available at https://web.archive.org/web/20260114191446/https://www.saskpower.com/our-power-future/creating-a-cleaner-power-future/future-supply-planning/future-supply-plan-2030-and-beyond

[17] Provincial Auditor of Saskatchewan, *2024 Report — Volume 2*, 139. https://auditor.sk.ca/pub/publications/public_reports/2024/Volume%202/ch-14----saskpowertransitioning-to-low-and-non-emitting-energy-sources.pdf

province seeks to build out its nuclear fleet.[18] As shown in Figure 1, **Saskatchewan's new approach stands in stark contrast to the direction taken by the rest of Canada,** where all other provinces have either already eliminated coal within a decade or have established clear pathways to phase it out by 2030.

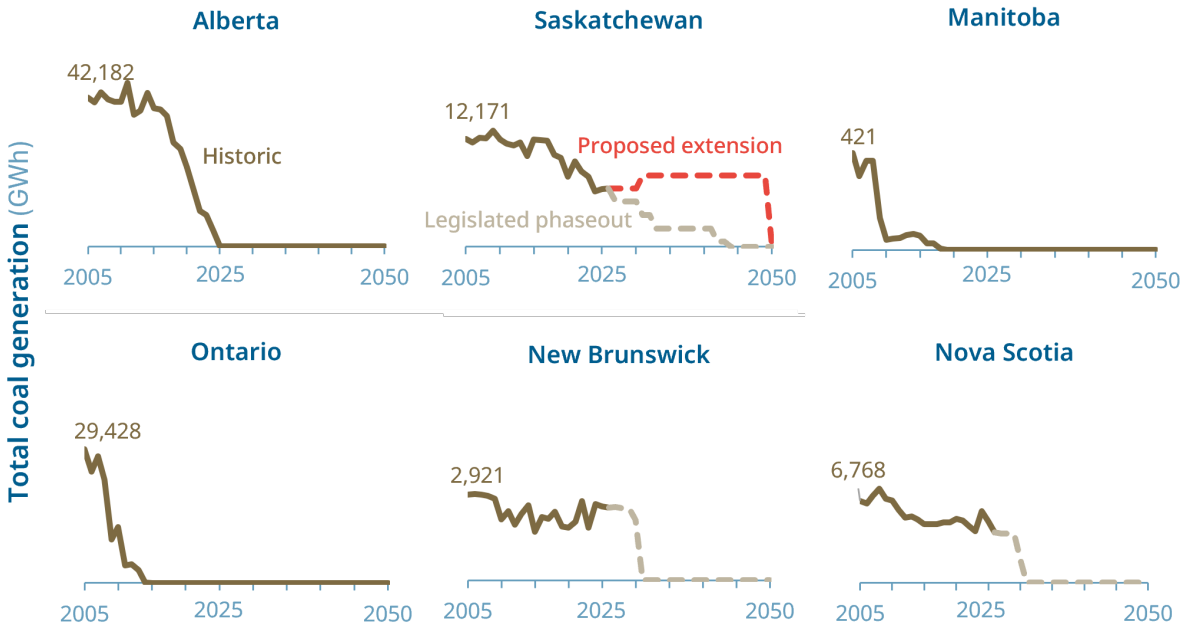

Figure 1. Historic (2005–2024) and future (2025–2050) coal generation across Canada by province

Data sources: ECCC, Pembina Institute, Government of Saskatchewan[19]

1.4 Saskatchewan and federal regulations

Saskatchewan remains subject to federal emissions regulations and/or associated equivalency agreements. However, this direction has implications for two federal climate policies, bringing the province out of line with Canada on three separate accounts:

1. Saskatchewan signed an **equivalency agreement on coal** with the federal government in 2020, recognizing Saskatchewan's GHG Regulations as equivalent to federal regulations and allowing some of its coal-fired power plants to operate beyond

[18] *Saskatchewan First Energy Security and Supply Plan*.

[19] Environment and Climate Change Canada (ECCC), "Canada's Official Greenhouse Gas Inventory," Table A7-4, A7-5, A7-7, A7-8, A7-9, A7-10. https://data-donnees.az.ec.gc.ca/data/substances/monitor/canada-s-official-greenhouse-gas-inventory/

Benjamin Thibault, Binnu Jeyakumar, Grace Brown and Kaitlin Olmstead, *From Coal to Clean: Emissions model* (Pembina Institute, 2021). https://www.pembina.org/pub/coal-clean

Pembina Institute estimates based on data in *Saskatchewan First Energy Security and Supply Plan*, 5.

2030.[20] Refurbishing and extending the life of Saskatchewan's coal plants, however, is a direct breach of this agreement.

2. Saskatchewan has publicly rejected the legitimacy of the **Clean Electricity Regulations**, deeming them unaffordable and unachievable and arguing that electricity systems remain under exclusive provincial jurisdiction.[21] The coal plant extensions would not comply with the Regulations as these prohibit the use of unmitigated coal-fired electricity generation starting in 2035.
3. As of April 2025, Saskatchewan is no longer applying an industrial **carbon price** on consumer electricity bills, which it had been doing since 2023 after introducing its own output-based pricing system (OBPS) deemed equivalent with the federal OBPS.[22]

Failing to comply places Saskatchewan in open conflict with Canada's climate framework, and introduces regulatory, financial and legal risks that threaten a transition to a reliable and affordable energy future.

[20] Government of Canada, "Canada–Saskatchewan equivalency agreement regarding greenhouse gas emissions from electricity producers, 2025," https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/agreements/equivalency/canada-saskatchewan-greenhouse-gas-electricity-producers-2025.html

[21] Government of Saskatchewan, "Saskatchewan Rejects Federal Clean Electricity Regulations," December 18, 2024. https://www.saskatchewan.ca/government/news-and-media/2024/december/18/saskatchewan-rejects-federal-clean-electricity-regulations

[22] SaskPower, *2026 and 2027 Rate Application,* (2026), 6. https://saskratereview.ca/storage/568/01KE0ARJAM51Y27KADGJPMEHH4.pdf

2. Issues with coal

2.1 Cost

In their application to the Saskatchewan Rate Review Panel, SaskPower noted a cost of $2.6 billion, up from a previously announced $900 million,[23] to extend their seven coal-fired generation units until 2050.[24] This February 2026 submission estimated the capital costs for refurbishment based on external consultants and excludes operational costs or sustainment capital expenditures. However, internal SaskPower documents from May 2026 place the *total* cost of extending coal generation at $25.8 billion, including $11.4 billion for a 25-year life extension, $1.4 billion for transmission and $13 billion for fuel costs.[25] They also disclose an "extreme" residual risk profile in the coal refurbishment plan, notably citing reliability risks as well as financial and regulatory concerns, and the cancellation of planned renewable energy projects.[26]

Our analysis finds that **the total cost of refurbishing and continuing to operate Saskatchewan's coal generation until 2050 ranges from $26–32 billion**, including the price of refurbishment, fuel costs, operations and maintenance and financing (Figure 2). This represents the most expensive option compared to alternatives, such as converting Saskatchewan's coal fleet to burn natural gas ($18–25 billion) or expanding Saskatchewan's renewable generation with wind and solar ($12–17 billion). A conversion from coal to gas offers an average cost reduction of 35% while building out wind and solar assets would cut costs by over half, even without a price on emissions. In other words, **renewables could provide the same amount of energy at a lower cost than refurbishing and continuing to operate Saskatchewan's coal fleet — even if these coal plants had no refurbishment (capital and financing) or maintenance costs at all.** This difference in total costs leaves significant headroom for SaskPower to deploy complementary resources (e.g. battery energy storage, demand response or peaking gas) while also expanding and modernizing its grid, to smooth variability and provide backup generation during lulls. In fact, results of our analysis show a mix

[23] Emma Graney, "Saskatchewan budgets $900million to refurbish coal plants, says no gas conversions," *The Globe and Mail,* August 25, 2026. https://www.theglobeandmail.com/business/article-saskatchewan-budgets-900-million-to-refurbish-coal-plants-says-no-gas/

[24] SaskPower, *Complete Responses to Interrogatories from the Saskatchewan Rate Review Panel: 2026 and 2027 Rate Application* (2026), 139. https://saskratereview.ca/rate-reviews/saskpower/saskpower-2026-and-2027-rate-application

[25] Alexander Quon and Katie Swyers, "Price estimate for Sask.'s refit of coal-fired power plants climbs to $26B," *CBC News,* May 7, 2026. https://www.cbc.ca/news/canada/saskatchewan/sask-coal-power-cost-9.7191232

[26] Alexander Quon, "Leaked SaskPower documents show 'extreme' risk in $26B coal refurbishment plan," *CBC News,* May 13, 2026. https://www.cbc.ca/news/canada/saskatchewan/sask-saskpower-coal-refurbishment-9.7198807

of wind and solar would require only $1 billion in additional costs for battery firming.[27] Details of our methodology are described in Appendix A.

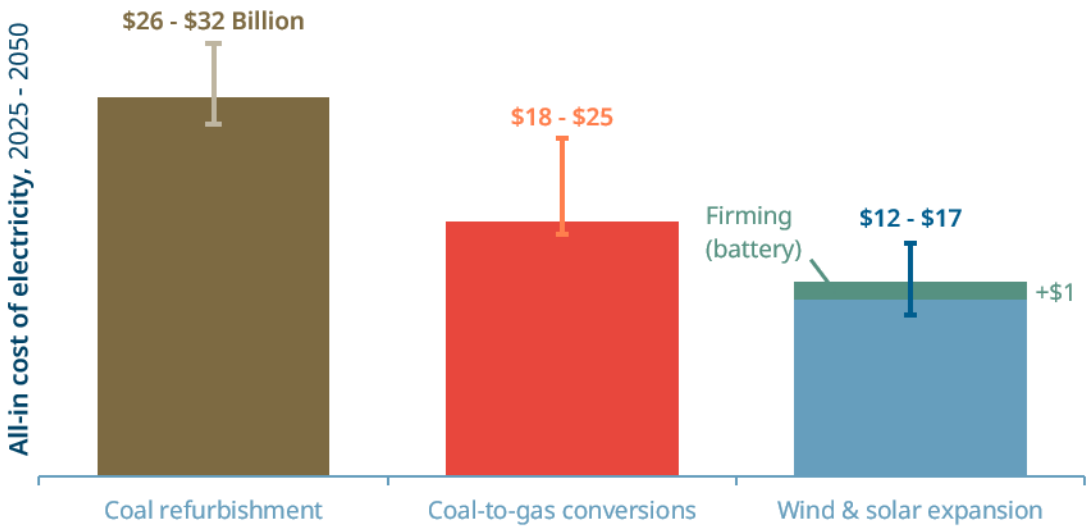

Figure 2. Cost comparison across coal refurbishment, gas conversion and renewables expansion in Saskatchewan (2025–2050)

In their rate application, SaskPower noted that "the decision to extend the life of existing coal-fired generation assets was not driven by a determination that coal life extension represents the lowest-cost generation option. Rather, the decision reflects a strategic policy choice grounded in the principles of energy security, system reliability, affordability, and the need to ensure sufficient electricity supply to support economic growth in Saskatchewan."[28]

Meanwhile, renewables currently rank as the lowest-cost source of new electricity generation in Canada,[29] and are expected to further decrease by 25–50% over the next decade.[30] This trend is well-reflected at home in Saskatchewan where the average bid prices came in at $64/MWh for wind and $90/MWh for solar as part of SaskPower's procurement in May 2025.[31] Even as far

[27] Wind and solar generation are weather-dependent, meaning their output varies based on local weather conditions. In this context, "firming" refers to the process of smoothing out the variability in wind and solar output, typically through the addition of a natural gas power plant or a battery.

[28] *Complete Responses to Interrogatories from the Saskatchewan Rate Review Panel,* 140.

[29] Pembina Institute, "New wind and solar projects outcompete all other electricity options in Ontario energy auction," media release, April 9, 2026. https://www.pembina.org/media-release/new-wind-solar-projects-outcompete-all-other-electricity-options-ontario-energy

[30] BloombergNEF, "Global Cost of Renewables to Continue Falling in 2025 as China Extends Manufacturing Lead," February 6, 2025. https://about.bnef.com/insights/clean-energy/global-cost-of-renewables-to-continue-falling-in-2025-as-china-extends-manufacturing-lead-bloombergnef/

[31] Canadian Renewable Energy Association (CanREA), "An energy solution made in Saskatchewan," June 23, 2025. https://renewablesassociation.ca/an-energy-solution-made-in-saskatchewan/

back as 2018, Potentia Renewables secured a power purchase agreement for the Golden South Wind facility at $43/MWh (around $52/MWh in 2025 dollars) across 29 wind bids.[32]

The significance of these cost advantages becomes even clearer when viewed through the lens of affordability, the issue Saskatchewan residents rank as their highest electricity-system priority.[33] Electricity bills in Saskatchewan are already among the highest compared to other provinces in Canada, with remote communities in Northern Saskatchewan disproportionately affected.[34] Earlier this year, SaskPower filed for two 3.9% rate increases effective February 2026 and February 2027, while internal documents warned of rates nearly doubling by 2040.[35] **Altogether, the return to coal is both the most expensive option for ratepayers *and* the most expensive option for Saskatchewan's energy future.**

Public health costs and impacts of coal pollution

Beyond the coal refurbishment's high system costs, there are significant health impacts of coal-fired generation. Coal-fired power plants rank among the largest stationary sources of air pollution in Canada, releasing fine particulate matter (soot), sulphur oxides, nitrogen oxides and heavy metals.[36] The health consequences of this include asthma episodes, more days of difficult breathing, emergency room visits, and premature deaths, estimated to cost **an additional $160 million** across local communities compared to alternatives without coal. Our *Health Implications of Saskatchewan's Delayed Coal Power Phaseout* discusses these impacts in more detail.[37]

2.2 Emissions

Coal combustion leads the electricity sector in emissions and ranks as the single largest source of CO_2 emissions globally.[38] While coal (almost all from Saskatchewan) is responsible for

[32] CanREA, "An energy solution made in Saskatchewan."

[33] SaskPower, "Future Supply Plan: 2030 and Beyond."

[34] CER, "Market Snapshot: How much do your neighbours across Canada pay for electricity?" March 4, 2026. https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2026/market-snapshot-how-much-do-your-neighbours-across-canada-pay-for-electricity.html

[35] "Leaked SaskPower documents show 'extreme' risk in $26B coal refurbishment plan."

[36] ECCC, "Sources of Pollution: Electricity." https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energyproduction/electricity-generation.html

[37] Will Noel and Nina Logvin, *Health Implications of Saskatchewan's Delayed Coal Power Phaseout* (Pembina Institute, 2026). https://www.pembina.org/pub/health-implications-saskatchewans-delayed-coal-power-phaseout

[38] IEA, *Coal 2025*.

roughly 3% of Canada's electricity generation, it currently accounts for nearly a quarter of national electricity emissions (Figure 3).

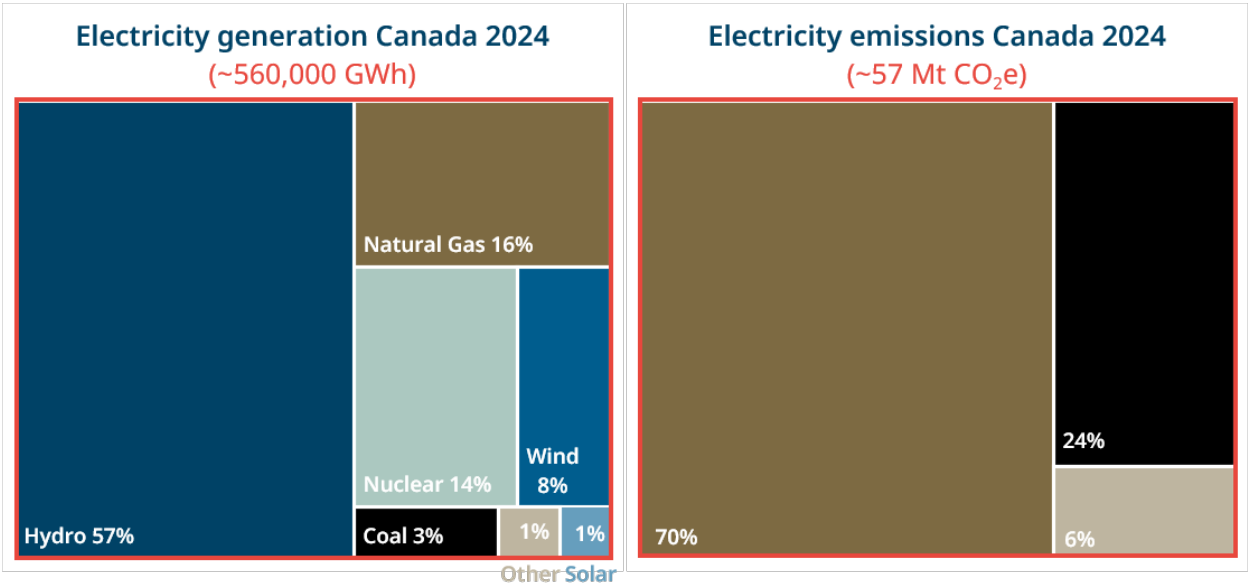

Figure 3. Breakdown of Canada's electricity generation and emissions by source (2024)

Data sources: ECCC, Statistics Canada[39]

By continuing to burn coal, Saskatchewan is delaying its shift to cleaner, more affordable sources of energy while threatening Canada's — and its own — climate ambitions. In fact, by extending their coal phase-out to 2050, Saskatchewan's contribution to Canada's electricity emissions will remain high (or even increase) into the late 2040s, despite the province continuing to represent less than 5% of total electricity generation. This is because electricity emissions from the rest of Canada will decrease significantly, while Saskatchewan's emissions reductions will stagnate, even if it continues to expand its use of renewable energy (Figure 4).

[39] ECCC, "Canada's Official Greenhouse Gas Inventory," Table A7-1.

Statistics Canada, *Table 25-10-0015-01 Electric power generation, monthly generation by type of electricity*. https://doi.org/10.25318/2510001501-eng

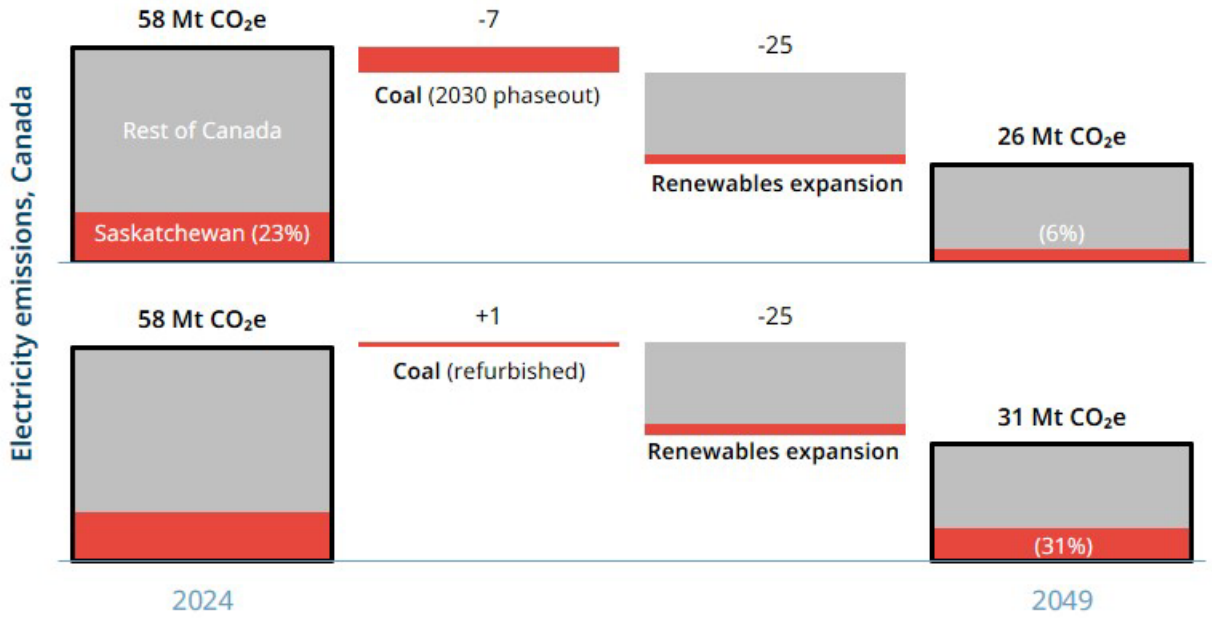

Figure 4. Impact of Saskatchewan coal phase-out on Canada's electricity emissions (2024 and 2049)

Data sources: ECCC, Canada Energy Regulator[40]

The environmental impact of prolonging Saskatchewan's use of coal for electricity generation is not limited to a single year (i.e. 2050). For this reason, the cumulative effect of burning more coal is arguably a more important metric to consider. Our analysis shows that extending Saskatchewan's coal phase-out by an additional 20 years would have a material impact on Canada's electricity emissions, resulting in **155 Mt CO_2e of additional greenhouse gases being released** — a 15% increase in national electricity emissions relative to a 2030 phase-out (Figure 5).

Despite the same endpoint for both pathways in their 2050 electricity emissions, this difference in cumulative emissions is notable: it is **comparable to adding the total annual emissions of a mid-sized country, such as Netherlands, or roughly twice the annual emissions of New Zealand or Austria**.[41] Alternatively, replacing the province's aging coal fleet with natural gas and/or ramping up installations of wind and solar would be demonstrably more affordable for Saskatchewan residents (Figure 2) while producing fewer emissions.

[40] ECCC, "Canada's Official Greenhouse Gas Inventory," Table A7-1, A7-9.

Pembina Institute estimates based on data in CER, "Canada's Energy Future 2026: Data Appendix." https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2026/access-and-explore-energy-future-data.html

[41] European Commission, "GHG emissions of all world countries," 2025. https://edgar.jrc.ec.europa.eu/report_2025#emissions_table

The total greenhouse gas emissions exclude land use, land-use change and forestry.

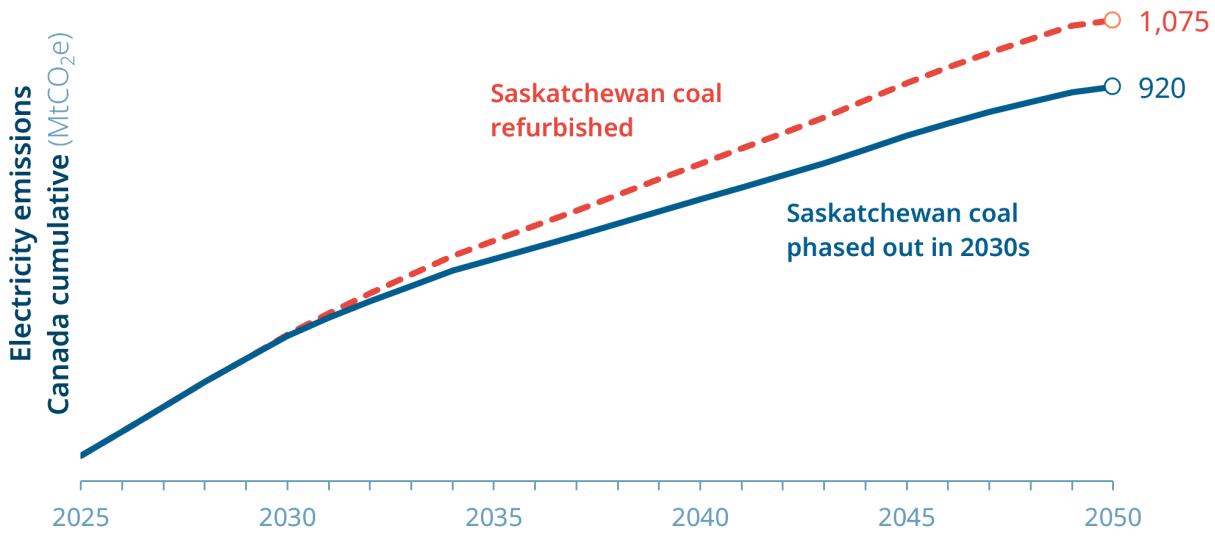

Figure 5. Canada's electricity emissions trajectory with and without a Saskatchewan coal phase-out (2020–2050)

Data source: Canada Energy Regulator[42]

Canada's role as a founding member and co-chair of the Powering Past Coal Alliance positions it as a global leader in accelerating the transition away from unabated coal for electricity generation.[43] However, Saskatchewan's plan to extend its coal fleet until 2050 directly threatens Canada's target of a 2030 coal phase-out and its broader emissions-reductions commitments. The momentum behind rapid clean energy deployment and eliminating coal-fired generation continues to grow worldwide, and adopting alternative pathways in Saskatchewan would both align the province with national objectives and reaffirm Canada's commitments with global decarbonization trends.

[42] Pembina Institute estimates using data from "Canada's Energy Future 2026: Data Appendix."

[43] The Powering Past Coal Alliance is a government-led initiative formed in 2017. It consists of national and sub-national governments, businesses, financial institutions and utilities with the shared goal of accelerating the transition off coal-fired electricity generation.

3. Alternatives to coal

3.1 Other energy sources

Prior to the government's decision to extend coal-fired power, SaskPower was preparing for a transition to cleaner sources of power — including a coal phase-out — well before 2050. During this process, they developed a suite of pathways through which Saskatchewan could significantly reduce its electricity emissions while ensuring continued affordable and reliable electricity supply. In fact, none of the SaskPower scenarios included an extension of conventional coal-fired power past 2030. Notably, these results align with various other third-party modelling studies, all of which include Saskatchewan phasing out conventional coal in the 2030s while significantly ramping up its non-emitting supply, primarily wind and solar. Not only is the Government of Saskatchewan's the only scenario that retains coal, it would actually see coal generation increase (Figure 6).

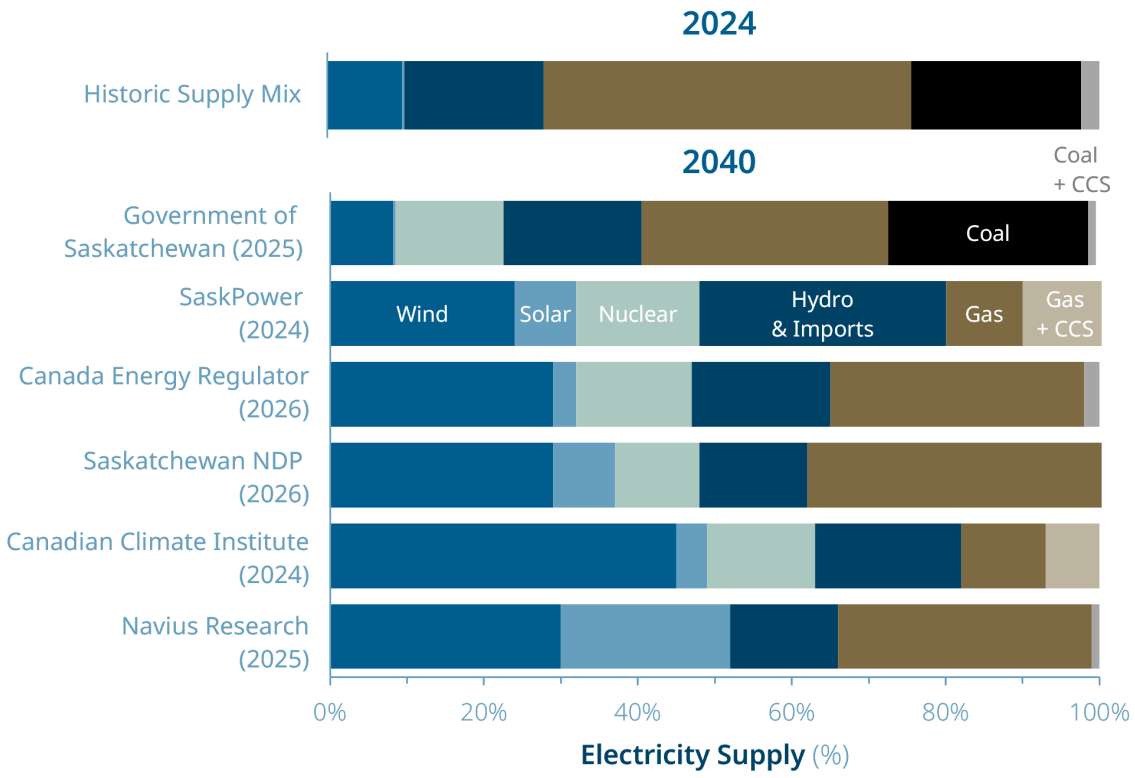

Figure 6. Saskatchewan's current (2024) and potential future electricity supply (2040) from various models

Data sources: Various[44]

[44] Pembina Institute estimates based on data from *Saskatchewan First Energy Security and Supply Plan*, 5-6.

3.2 Maintaining flexibility

Regardless of the path Saskatchewan chooses, it is critical that the electricity system be affordable and reliable. There are numerous pathways to achieve this while also maintaining a coal-free system and enabling a higher build out of renewables, most of which are built around improving grid flexibility.

A flexible electricity system is one that can withstand large shocks caused by a sudden imbalance of supply and demand (e.g. a large power plant tripping offline or sudden spikes in electricity demand). Flexible resources can quickly ramp up (or down) to return this balance and keep things running smoothly in a way that is equivalent to firm, baseload power. Conveniently, a flexible electricity system is also one that is able to integrate higher levels of wind and solar into the mix, as it can react to the variable nature of these technologies.

Figure 7 compares the grid flexibility of Saskatchewan and Alberta to six jurisdictions leading in wind and solar integration. Notably, these other jurisdictions have improved the flexibility of their grids through a variety of methods, with different combinations of energy storage, transmission interconnections (interties), demand response programs, and hydroelectric and peaking gas facilities. For example, Denmark has built out an extensive network of interties with its neighbours while South Australia uses flexible gas generation and energy storage to complement its high renewable energy penetration.[45] Despite the common misconception that variable generation from solar and wind compromises grid reliability, these jurisdictions are proof that flexibility allows for easier integration of large amounts of renewables — all while delivering strong, reliable electricity grids. More information on this analysis can be found in Appendix A.

As Saskatchewan plans for its future grid, it should explore options to improve its flexibility while also increasing its wind and solar fleet. This would both strengthen system reliability and ensure a seamless transition to a coal-free electricity system. For example, Saskatchewan's recent announcements of expanding interties with Manitoba and Alberta as well as enhancing connections to the United States offer flexible and resilient pathways to balance supply and

SaskPower, *Annual Report* (2025), 4;

SaskPower, "Future Supply Plan – 2030 and Beyond."

Saskatchewan New Democrats, *Grid & Growth Plan* (2026), 14. https://gridandgrowth.ca/

CER, "Canada's Energy Future 2026: Data Appendix."

Navius Research, "Canada Energy Dashboard." https://www.canadaenergydashboard.com/index.html

[45] David Pickup, Gurprasad Gurumurthy and Scott MacDougall, *Powering On: Examining Ontario's Integrated Energy Plan* (Pembina Institute, 2025), 14. https://www.pembina.org/pub/powering

demand.[46] Battery costs have also dropped over 90% in the past decade and are expected to decline further, presenting an affordable option for the province.[47] Ultimately, Saskatchewan has a wide range of tools and technologies to choose from, allowing it to build a tailored portfolio of energy assets that best meets its needs while delivering a reliable, affordable and decarbonized grid.

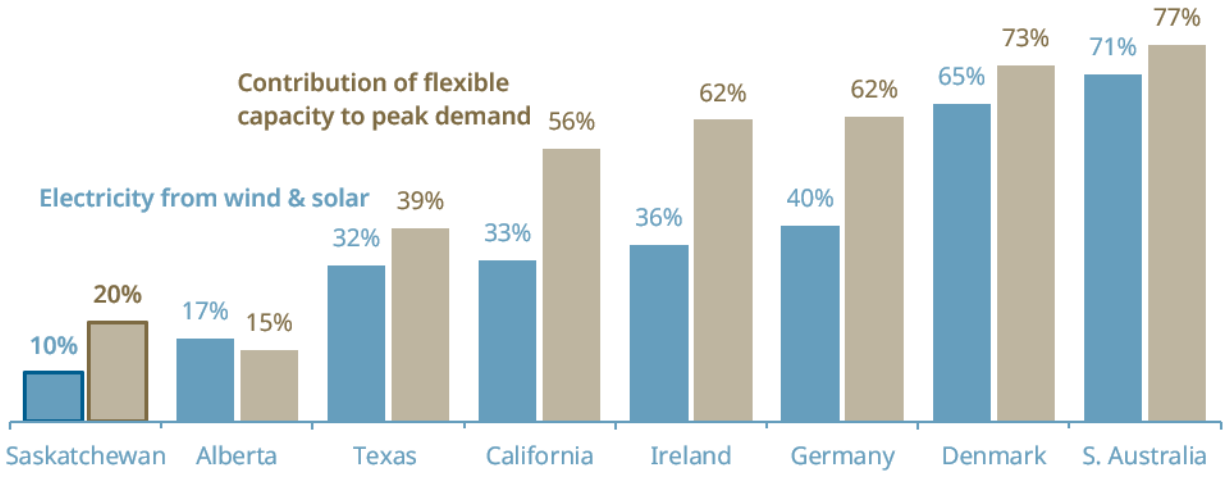

Figure 7. Flexibility (energy storage, interties, demand response, hydroelectric and flexible gas) and renewable penetration of select electricity grids (2024)

Data sources: Various[48]

[46] Government of Canada, "Canada takes action to advance a stronger grid and increase reliable, affordable energy," June 26, 2026. https://www.canada.ca/en/natural-resources-canada/news/2026/06/canada-takes-action-to-advance-a-stronger-grid-and-increase-reliable-affordable-energy.html

Daniel Reech, "SaskPower receives approval for international power line project," *CTV News,* July 2, 2026. https://www.ctvnews.ca/regina/article/saskpower-receives-approval-for-international-power-line-project/

[47] Rachel Layne, "Falling Battery Storage Costs Are Quietly Reshaping Electricity Markets," *Harvard Business School*, January 23, 2026. https://www.library.hbs.edu/working-knowledge/falling-battery-storage-costs-are-quietly-reshaping-electricity-markets

[48] SaskPower, *Annual Report* (2025).

Alberta Electric System Operator (AESO), "Annual Market Statistics Report," Tableau, September 22, 2025. https://public.tableau.com/app/profile/market.analytics/viz/AnnualStatistics_16161854228350/Introduction

Arne Olson et al., Restructured Energy Market Report (Energy+Environmental Economics, 2025), 14. https://rb.gy/6xd5z8

Australian Energy Market Operator, "Market Data NEMWEB," Archive Reports. https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/market-data-nemweb

California ISO, 2024 Summer Loads and Resources Assessment (2024), 6 and 19. https://www.caiso.com/documents/2024-summer-loads-and-resources-assessment.pdf

EirGrid, "Interconnection." https://www.eirgrid.ie/industry/interconnection

What about baseload?

The term "baseload" stems from how electrical grids used to be designed; it is not a physical requirement for keeping the lights on.

Baseload generation often refers to inflexible steam power plants, such as coal and nuclear, that are designed to run at steady state throughout the year (except for the few weeks when they are offline for scheduled annual maintenance). Historically, these plants tended to have high capital costs and lower operating costs, so it made economic sense to try to run them as much as possible once they were built. While this may have been true in the mid-to-late 20th century when other supply types were more expensive, these large, centralized facilities are becoming more of a liability in modern electricity grids as their inflexibility limits a system's ability to integrate and dispatch low-cost renewables.

Additionally — like all power plants — units designed to operate as baseload still require backup and system redundancy, not just for annual maintenance but also to cover unexpected outages. For instance, Saskatchewan's Poplar River Power Station, which accounted for roughly 10% of the province's grid capacity, flooded in 2023, causing it to be partially offline for months.[49] Similarly, in July 2017, Alberta lost a third of its coal capacity (equivalent to 20% of demand) due to high temperatures, leading to skyrocketing electricity prices and the need to reduce non-essential electricity loads.[50] And, in a recent assessment of North America's grid reliability, Saskatchewan was shown to have a high risk of grid issues

Electric Reliability Council of Texas, "Resource Adequacy," Capacity changes by fuel type charts. https://www.ercot.com/gridinfo/resource

Ember, "Electricity Data Explorer." https://ember-climate.org/data/data-tools/data-explorer/

Ember, "Electricity interconnection in Europe – data tool." https://ember-energy.org/latest insights/breaking-borders-europe-electricity-interconnectors/electricity-interconnection-in-europe-data tool/

Energy Charts, "Net installed electricity generation capacity in Germany in 2024." https://www.energy-charts.info/charts/installed_power/chart.htm?l=en&c=DE

Energy Storage Ireland, *Charged Horizons: Exploring the energy storage landscape and workforce potential in Ireland* (2023), 44. https://www.energystorageireland.com/wp content/uploads/2024/01/Charged-Horizons-Report-Compressed.pdf

Government of Southern Australia, "Our electricity supply and market." https://www.energymining.sa.gov.au/consumers/energy-grid-and-supply/our-electricity-supply-and-market

Grid United, *Pecos West Intertie: ERCOT Regional Planning Meeting* (2022), 16. https://www.ercot.com/files/docs/2022/07/15/Pecos%20West%20Intertie%20ERCOT%20RPG%2020220719.pdf

[49] Will McLernon, "One of SaskPower's largest generation plants partially offline for more than 2 months," *CBC News*, August 16, 2023. https://www.cbc.ca/news/canada/saskatchewan/one-of-saskpower-s-largest-generation-plants-hasn-t-been-fully-functioning-for-more-than-2-months-1.6938360

[50] Sara Hastings-Simon and Binnu Jeyakumar, "Baseload myths and why we need to change how we look at our grid," *Pembina Institute,* August 3, 2017. https://www.pembina.org/blog/baseload-myths-why-we-need-change-how-we-look-our-grid

during winter periods, especially when its large generating units are offline and electricity demand reaches its seasonal peak.[51]

The historic design and approach to grid operations is not a necessity in modern electricity systems. Grid resiliency comes from a diverse portfolio of complementary generating resources, including shares of wind, solar, natural gas, nuclear and/or hydro, further bolstered by energy storage, demand response and transmission interties that will provide far more resilience than an overreliance on a small number of large, inflexible generators (Figure 8). As Canada looks to increase demand for electricity, it is system flexibility, not baseload, that will keep the lights on.

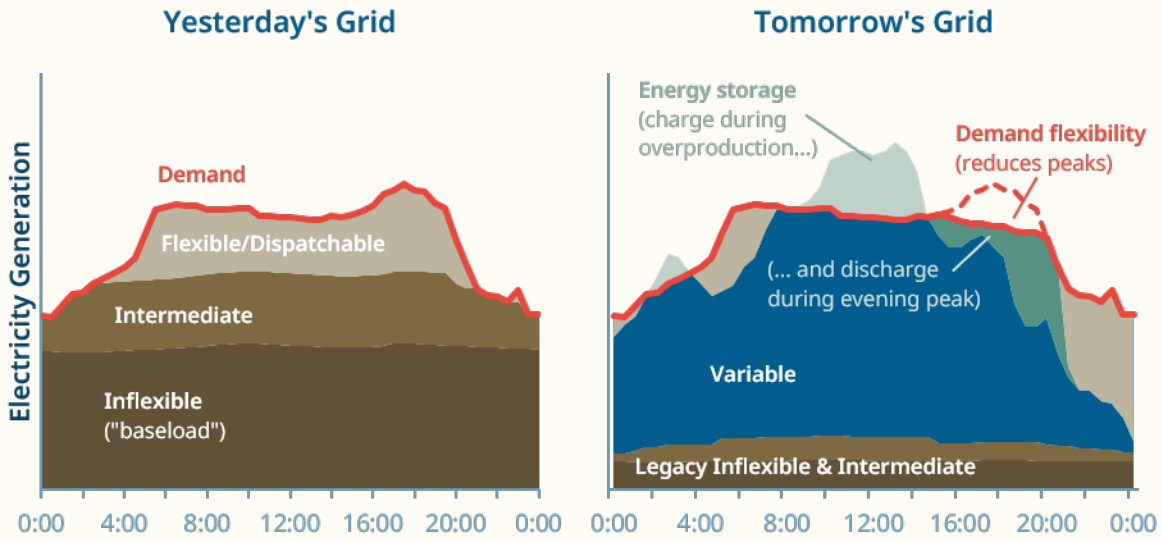

Figure 8. Illustrative example of historic (left) versus modern (right) electricity systems

[51] North American Electric Reliability Corporation, *2025-2026 Winter Reliability Assessment* (2025), 19. https://www.nerc.com/globalassets/our-work/assessments/nerc_wra_2025.pdf

4. Recommendations

Saskatchewan, like the rest of Canada, is confronting important questions about how it will build and strengthen its electricity system. With some of the best wind and solar resources in Canada, the province is uniquely positioned to meet this task without compromising on affordability, reliability, and resilience. Key to meeting all these ambitious goals, however, is a sustained and thorough commitment to building a modern and flexible electricity system that includes a diverse mix of energy sources, including renewables and storage. Our analysis suggests this approach can help the province avoid significant long-term costs, strengthen reliability, and ultimately, better position the province to deliver an affordable electricity system for all Saskatchewan residents.

We propose three recommendations that support the development of a reliable, affordable, and future-ready energy grid for Saskatchewan:

1. **Get Saskatchewan's electricity transition back on the lowest-cost track.** Saskatchewan should return to the lowest-cost options it was pursuing prior to delaying its coal-phase out and recommit to ending conventional coal-fired generation by 2030. To achieve this, Saskatchewan should prioritize a diversified portfolio of generation technologies and complementary resources that can meet current and future demand reliably while keeping electricity rates affordable.
2. **Put reliability, affordability and emissions at the centre of SaskPower planning.** The province should require SaskPower to model future supply scenarios based on meeting decarbonization and reliability objectives at the lowest cost to ratepayers. This planning should be transparent and resume community and stakeholder engagement similar to SaskPower's 2024 sessions.
3. **Protect the integrity of Canada's coal phase-out in federal-provincial equivalency deals.** The federal government should only pursue an equivalency agreement with Saskatchewan if it contains a clear pathway for phasing out coal generation in the short term, while safeguarding national emissions reduction targets and international climate leadership.

By harnessing its abundant natural advantages and building a more diversified electricity mix, Saskatchewan can ensure that present and future generations have access to the cheapest and lowest-carbon electricity solutions on offer both today and long into the future.

Appendix A. Methodology

A.1 Cost of coal refurbishment

The cost of refurbishing and continuing to operate Saskatchewan's coal fleet was estimated using a simple cashflow model. Where possible, inputs were taken from Saskatchewan-specific sources, with any gaps being filled in using data from Alberta, Canada and the United States, in that order. The model includes considerations of capital costs and financing, operating and maintenance costs and fuel costs.

Table 1 shows the estimated refurbishment costs and schedule for Saskatchewan's three coal plants: Boundary Dam, Shand and Poplar River.

Table 1. Refurbishment schedule and costs for Saskatchewan coal power plants (2025–2050)

Coal plant / unit	Installed capacity (MW)	Year refurbished	Capital cost ($million)		
			Principal	Interest[a]	Total
Boundary Dam 3	110	2034	241 – 964	95 - 381	336 – 1,345
Boundary Dam 4	150	2035	251 – 1,002	169 - 676	420 – 1,680
Boundary Dam 5	150	Phase 1: 2028 Phase 2: 2036	95 – 378	32 - 129	127 - 507
Boundary Dam 6	300	2030	192 – 766	97 - 391	289 – 1,157
Shand 1	300	2032	173 – 692	91 - 366	264 – 1,058
Poplar River 1	300	2033	178 – 712	104 - 414	282 – 1,126
Poplar River 2	300	2031	187 – 748	90 - 360	277 – 1,108
Total	**1,610**	**-**	**1,316 – 5,262**	**679 – 2,719**	**1,995 – 7,981**

Data sources: SaskPower, Government of Saskatchewan[52]

[a] Calculated assuming an 8% weighted-average cost of capital[53] and 20-year cost recovery period

[52] SaskPower, *Complete Responses to Interrogatories from the Saskatchewan Rate Review Panel: Round 1* (2026), 138-139. https://saskratereview.ca/storage/593/01KKM0BHATXEX2B6X2G7V4121Q.pdf

Saskatchewan First Energy Security and Supply Plan, 5.

[53] National Laboratory of the Rockies, "Annual Technology Baseline: Financial Cases and Methods," (2024). https://atb.nlr.gov/electricity/2024/financial_cases_&_methods

Fuel costs per unit of electricity produced were estimated using the most recent SaskPower annual report,[54] dividing the total cost of purchased coal ($313 million) by the gross electricity supplied by coal plants (6,245 GWh). The cost of fuel was assumed to escalate by 5.5% each year following historic trends, rising from around $50/MWh in 2025 to $204/MWh in 2050 (before accounting for inflation).

Operating and maintenance costs, both fixed ($/kW) and variable ($/MWh), were taken from the U.S. Energy Information Administration's 2025 Annual Energy Outlook.[55]

For the purpose of this study, we assume that coal plants operate at an average capacity factor of 60% in alignment with the most recent SaskPower data,[56] and that each refurbishment takes a full calendar year to complete, meaning a facility will not generate any electricity in the year it is being worked on.

Figure 9 shows the breakdown of the total cost of refurbishing and operating Saskatchewan's coal fleet out to 2050, with all values shown in 2025 Canadian dollars (C$2025).

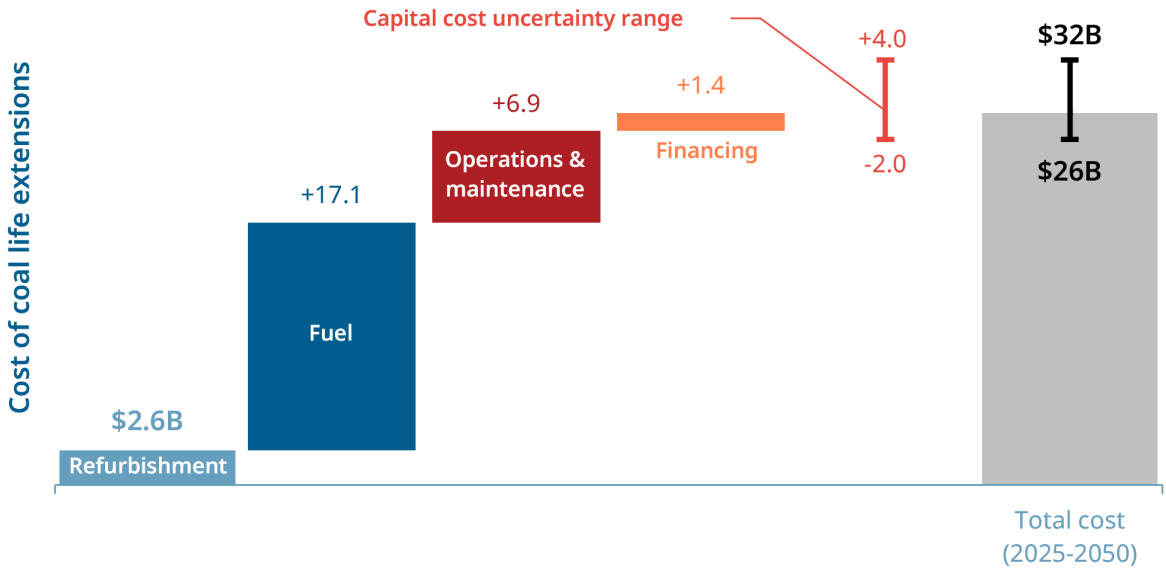

Figure 9. Total of refurbishing and continuing to operate Saskatchewan's coal power plants (2025-2050)

[54] SaskPower, *Annual Report* (2025), 5.

[55] Values were converted to Canadian dollars assuming a conversion rate of 0.73.

U.S. Energy Information Administration (EIA), *Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies* (2024), iii.
https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2025.pdf

[56] Canadian Centre for Energy Information, "High-Frequency Electricity Data: Visualization Tool (Beta)."
https://energy-information.canada.ca/en/resources/high-frequency-electricity-data

A.2 Cost of converting to natural gas power plants

The cost of converting Saskatchewan's coal fleet to burn natural gas was estimated using a similar methodology as the coal refurbishment cashflow model. Here, the only major difference is the inclusion of the cost of expanding fuel infrastructure (i.e. pipelines) to the facilities. It was also assumed that conversions would not be operationalized until 2030, and so the cost of operating the facilities as coal plants from 2025 to 2030 was included in the estimates.

As demonstrated in Alberta, there are two general ways in which a coal plant can be converted to fire with natural gas:

1. A **gas-fired steam** power plant simply replaces the old coal boiler with a similarly sized natural gas one, allowing operators to continue to use the remaining steam plant infrastructure — pipes, turbines, pumps, etc. This configuration has a relatively low upfront cost but higher operating costs and low operational flexibility.
2. A **combined cycle** power plant replaces the coal boiler with a gas turbine and heat recovery steam generator. The gas turbine generates electricity, exhausting hot flue gases into the heat recovery system to generate steam which passes through the existing steam turbine to extract more energy. Due to the increased complexity, this configuration has a higher upfront cost but benefits from lower operating costs and greater flexibility.

The cost to convert a Saskatchewan coal power plant to gas-fired steam was estimated based on TransAlta's conversion of its Alberta-based Keephills facility. Here, the conversion of the 400 MW facility, plus additional maintenance and fuel infrastructure, cost $96.2 million — approximately $125 million in today's dollars or $313/kW.[57] Similarly, Capital Power invested $1.35 billion to convert its Genessee 1 and 2 units (466 MW each) to combined cycle natural gas.[58] Note that due to a significant increase in demand for gas turbines, driven primarily by the growth of Artificial Intelligence and associated data centres, the cost of combined cycle natural gas plants has increased significantly in Saskatchewan[59] and elsewhere[60] — this, combined with the age of Saskatchewan's coal fleet, is the driver of the high end of the uncertainty range in Figure 10. Due to the lack of a gas turbine in their design, a gas-fired steam configuration would not be subject to the same level of cost escalation. Similar to coal refurbishments, we assume an

[57] Larry MacDougal, "TransAlta completes second of three planned Alberta plant conversions to natural gas" July 19, 2021, *CBC News*. https://www.cbc.ca/news/canada/calgary/transalta-coal-gas-conversion-keephills-1.6108023

[58] Capital Power, "Genesee: The heart of Alberta's decarbonized future." https://www.capitalpower.com/genesee-the-heart-of-albertas-decarbonized-future/

[59] "Saskatchewan budgets $900 million to refurbish coal plants, says no gas conversions."

[60] Phil Besuner, *The New Reality of Power Generation: An analysis of increasing gas turbine costs in the U.S.* (GridLab, Energy Futures Group and Halcyon, 2025), 5. https://halcyon.io/hubfs/GridLab_Halcyon_Gas-Turbine-Costs-Report.pdf

8% weighted average cost of capital to estimate financing costs for both natural gas configurations.[61]

Fuel costs were estimated using the SaskPower annual report, dividing total natural gas purchases ($316 million) by gross electricity generated by natural gas (12,426 GWh).[62] This was converted into a natural gas price (around $3.18/GJ) assuming an average heat rate of 8 GJ/MWh (45% thermal efficiency) for SaskPower's current gas fleet, which closely aligns with their hedged and forward market prices ($2.80–$3.15/GJ).[63] From here, a cost per unit of electricity production can be estimated using an assumed heat rate of 10.9 GJ/MWh for gas-fired steam and 7.3 GJ/MWh for combined cycle.[64] These costs are assumed to escalate by 2% per year (nominally).

Similar to coal, operating and maintenance costs, both fixed ($/kW) and variable ($/MWh), were taken from the U.S. Energy Information Administration's 2025 Annual Energy Outlook.[65]

Finally, the cost of connecting the natural gas power plants to an existing pipeline network — either the Alliance Pipeline between Regina and Elmore, or the Foothills System near Monchy.[66] We estimate that the existing coal plants, located in Estevan and Coronach, would require a pipeline between 75 and 160 km to connect. With an assumed construction cost of $4.16 to $8.43 million per km,[67] a weighted average cost of capital of 8.27%,[68] and a cost recovery period of 20 years, connecting the repowered natural gas plants would cost somewhere between $648 million and $2.8 billion.

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[61] "Annual Technology Baseline: Financial Cases and Methods."

[62] SaskPower, *Annual Report*, 5.

[63] SaskPower, *Annual Report,* 89.

[64] Note that values were originally published as btu/kWh.

EIA, "Average Tested Heat Rates by Prime Mover and Energy Source, 2014-2024." https://www.eia.gov/electricity/annual/html/epa_08_02.html

EIA, "Natural gas combined-cycle power plants increased utilization with improved technology," November 20, 2023. https://www.eia.gov/todayinenergy/detail.php?id=60984

[65] U.S. Energy Information Administration, *Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies*, iii.

Values were converted to Canadian dollars assuming a conversion rate of 0.73.

[66] CER, "Natural Gas Pipeline Transportation System." https://www.cer-rec.gc.ca/en/data-analysis/facilities-we-regulate/canadas-pipeline-system/2021/natural-gas-pipeline-transportation-system.html

[67] Values were converted to 2015 Canadian dollars assuming a conversion rate of 0.73, then converted to 2025 dollars using the Bank of Canada Inflation Calculator.

Global Energy Monitor, "Oil and Gas Pipeline Construction Costs." https://www.gem.wiki/Oil_and_Gas_Pipeline_Construction_Costs

Bank of Canada, "Inflation Calculator." https://www.bankofcanada.ca/rates/related/inflation-calculator/

[68] Washington State Department of Revenue, *Cost of Capital Study: Appendix C*, 1. https://dor.wa.gov/sites/default/files/2023-06/2023COCPipelines.pdf

To ensure a fair comparison to the cost of refurbishing the coal plants, we assume that the repowered natural gas plants would be sized to provide similar installed capacity and annual energy needs as are currently met by coal. Figure 10 shows the breakdown of the total cost of replacing Saskatchewan's coal fleet with natural gas out to 2050 (in C$2025).

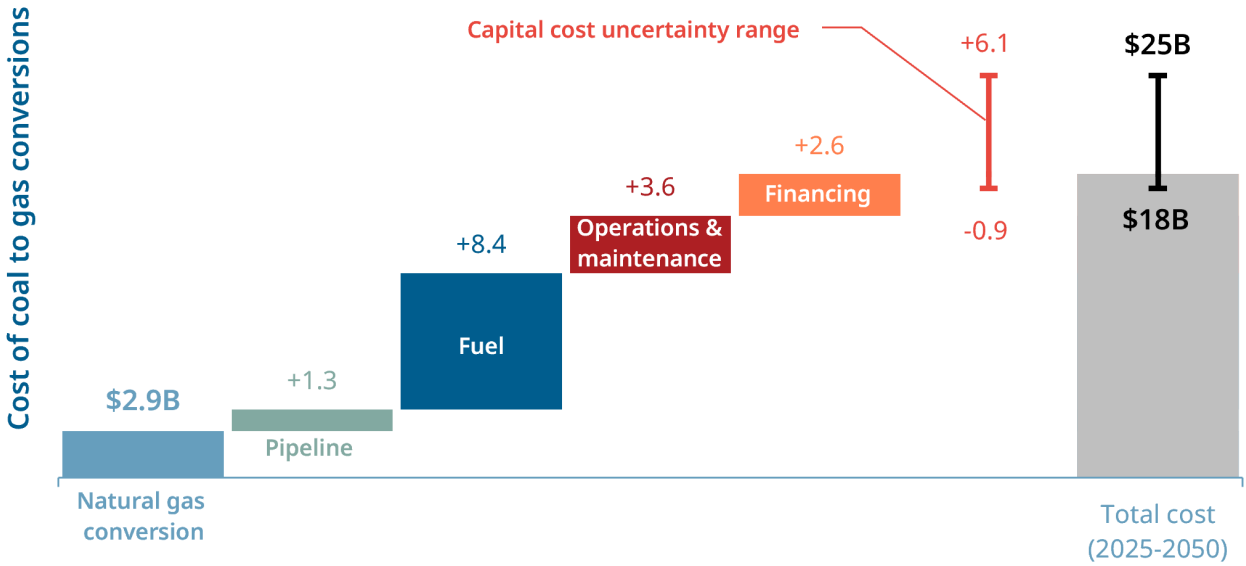

Figure 10. Total cost of converting Saskatchewan's coal power plants to natural gas (2025–2050)

A.3 Cost of expanding renewable energy capacity

The cost of expanding Saskatchewan's wind and solar generation, including battery firming, was estimated using a combination of sources:

- Power purchase agreement **contract prices** are based on recent SaskPower contracts signed in 2025, specifically $90/MWh for 100 MW of solar and $64/MWh for 200 MW of wind.[69] These contract prices are assumed to gradually decline over time, following the trajectory that has been seen historically across Canada.[70]
- Transmission **interconnection costs** are based on data published by the Alberta Electric System Operator,[71] dividing the total cost of wind and solar interconnections ($)

[69] CanREA, "An energy solution made in Saskatchewan."

[70] Note that the decline between 2025 and 2050 will be more gradual than has been seen to date. For example, we assume a decline of 12% over the next decade, whereas contract prices nearly halved between 2015 and 2025.

David Pickup and Will Noel, "Canadian solar and wind project costs plummet: Renewables are now most affordable new generation, as costs are halved," *Pembina Institute,* January 28, 2026. https://www.pembina.org/blog/canadian-solar-wind-project-costs-plummet

[71] AESO, "Transmission Costs: Cost benchmarking tools." https://www.aeso.ca/grid/grid-planning/transmission-costs/

by the installed capacity of those projects (MW). We estimate a connection cost range of $21/kW to $257/kW, with a median cost of $79/kW.[72]

- Battery **firming costs** are based on a recently installed 4-hour battery energy storage system in Ontario, dividing the total cost ($700 million) by the storage capacity (1,000 MWh), resulting in an overnight capital cost of $700/kWh.[73] Applying a 7% weighted average cost of capital and 20-year payback period, this results in a (nominal) capital cost of $1,322/kWh.

Wind and solar costs are based on the installed capacity of renewables required to deliver the same **total energy** as coal would over the next 25 years (around 208,000 GWh). Note that in this case, renewables would be delivering less than coal would early on, but more than coal closer to 2050 and beyond. Here, we assume an average capacity factor of 40% wind and 22% for solar, with capacity being added in equal sized tranches every three years starting in 2027. We consider three different scenarios, where added capacity is:

- entirely wind (4,375 MW)
- two-thirds wind (3,400 MW) and one-third solar (1,700 MW)
- one-half wind (2,818 MW) and one-half solar (2,818 MW)

Finally, to ensure a fair comparison between coal and gas (both of which are dispatchable) versus wind and solar (both of which are variable), we estimate the required battery energy storage capacity to deliver close to the same *hourly* energy as coal has historically in Saskatchewan, with a target of 90% of hours matched. In the two scenarios that include both wind and solar, this target is met using a 4-hour 250 MW battery energy storage fleet, with most of the hourly matching being achieved by the complementary wind and solar generation profiles (i.e. without the battery). On the other hand, a build-out solely of wind would require a much larger (1,100 MW) battery. Figure 11 shows a five-day representative illustration of our analysis, highlighting the ability of a hybrid wind, solar and battery fleet to roughly match the historic output of Saskatchewan's coal fleet, with remaining gaps being met by other generators (e.g. hydroelectric and natural gas) and imports.

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[72] Transmission financing costs are estimated based on a weighted average cost of capital of 6.2% and a cost recovery period of 30 years.

EIA, *Levelized Costs of New Generation Resources in the Annual Energy Outlook 2022* (2022), 6. https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

[73] Northland Power, "Commercial Operations at Oneida Energy Storage Project – Canada's Largest Battery Storage Facility Delivered Ahead of Schedule and Below Budget," July 5, 2025. https://northlandpower.com/northland-power-announces-commercial-operations-at-oneida-energy-storage-project-canadas-largest-battery-storage-facility-delivered-ahead-of-schedule-and-below-budget/

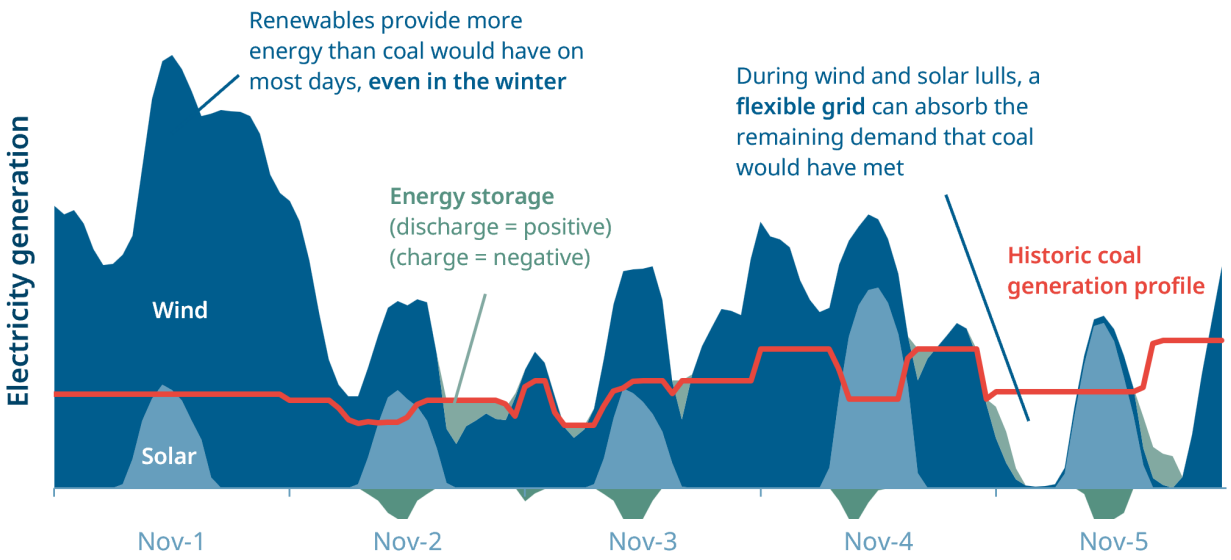

Figure 11. Representative illustration of Pembina Institute electricity dispatch model

Figure 12 shows the breakdown of the total cost of replacing the cumulative energy that Saskatchewan's coal fleet would have generated between 2025–2050 with wind and solar. While we find that a build-out of only wind is likely the lowest-cost option, a combination of wind and solar would better fit the demand profile of Saskatchewan due to their complementary generation profiles (i.e. it is sunny during the day and in the summer, and windy overnight and in the winter). This is reflected in the large difference in battery firming cost between a hybrid wind and solar fleet (around $1 billion) versus one based entirely on wind energy (around $6 billion). This analysis is not intended to be prescriptive on the amount and ratio of wind and solar that should be built to meet Saskatchewan's future electricity needs.

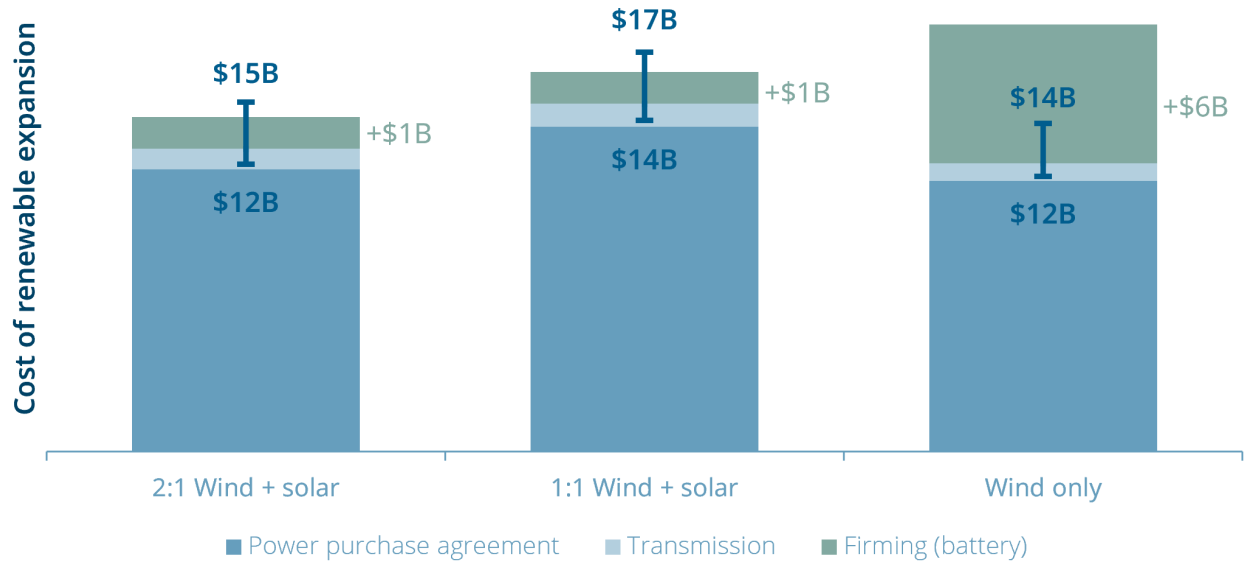

Figure 12. All-in cost of replacing cumulative coal generation with wind and solar (2025–2050)

A.4 Estimating flexible capacity

The flexibility of Saskatchewan's grid compared to jurisdictions leading in wind and solar deployment was determined using the same methodology as our previous work comparing Alberta and Ontario to those jurisdictions.[74] It was also adopted by the Canadian Climate Institute in their recent *Power Play* report.[75]

Here, we estimate each grid's "effective flexible capacity" by multiplying the installed capacity of all flexible power plants (peaking gas, hydroelectric and energy storage), interties and demand response capacity with an effective capacity multiplier. These multipliers are a combination of historic data[76] and modelling,[77] and are assumed to be constant across all jurisdictions. The total effective flexible capacity is then divided by the peak demand of each respective grid. Table 2 summarizes this calculation for Saskatchewan.

Table 2. Saskatchewan's effective flexible capacity (2024)

Resource	Installed capacity (MW)	Effective capacity multiplier (%)	Effective capacity (MW)
Peaking gas	479	70%	335
Hydroelectric	865	67%	580
Energy storage	21	95%	20
Interties	725	50%	363
Demand response	0	50%	0
Total	**2,090**	**-**	**1,298**

[74] Will Noel, Lia Codrington and Scott MacDougall, *I'll Have What They're Having: Lessons learned from six jurisdictions leading in wind and solar deployment* (Pembina Institute, 2024), 5-6. https://www.pembina.org/pub/what-theyre-having

Pembina Institute, *Powering On*, 14.

[75] Kate Harland et al., *Power Play: Technical Report* (Canadian Climate Institute, 2026), 14. https://climateinstitute.ca/wp-content/uploads/2026/05/Power-Play-Technical-Report.pdf

[76] AESO, "Annual Market Statistics Report," Tableau, June 11, 2026. https://public.tableau.com/app/profile/market.analytics/viz/AnnualStatistics_16161854228350/Introduction

[77] Arne Olson et al., *Restructured Energy Market Report* (Energy+Environmental Economics, 2025), 14. https://aesoengage.aeso.ca/42905/widgets/197800/documents/153990

Appendix B. Cost of emissions

As of April 1, 2025, the Government of Saskatchewan paused the application of the federal carbon tax in the province, meaning that fossil fuel electricity generation is no longer subject to emissions costs.[78] If a price on emissions is reinstated — either by the Government of Saskatchewan or through the imposition of the federal backstop[79] — the cost of operating natural gas and especially coal power plants will increase substantially. For example, if the Government of Saskatchewan were to re-implement its own emissions pricing system, we estimate that the cost of refurbishing and operating its existing coal fleet would increase by nearly $14 billion (51%) over the next 25 years. Over the same timeframe, the cost of coal-to-gas refurbishments would increase by $10 billion (56%), with over half of the cost increase coming from continuing to burn coal during the transition to natural gas. The cost of wind and solar expansion would remain unchanged (Figure 13).

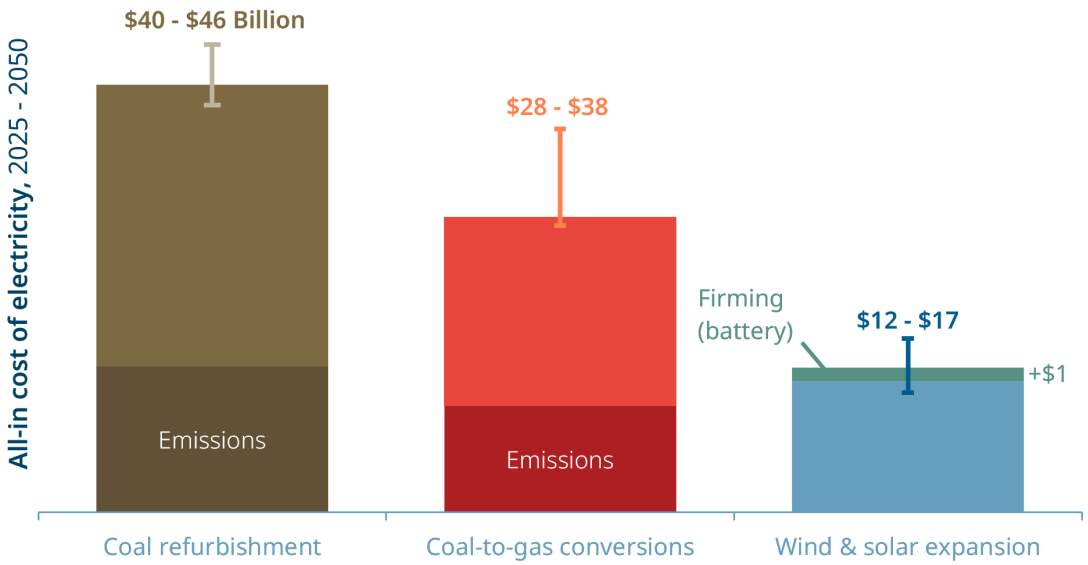

Figure 13. Cost comparison across coal refurbishment, gas conversion and renewables in Saskatchewan including emissions (2025–2050)

[78] SaskPower, "Federal Carbon Tax." https://www.saskpower.com/accounts/power-rates/federal-carbon-tax

[79] Pembina Institute, *Canadian Carbon Pricing Systems 2025 Review*, 17.

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