

Supporting grid infrastructure investments and committing to a net-zero grid

Pembina Institute comments and recommendations

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Regarding: Clean Electricity Investment Tax Credit and Competent Authority

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Summary

- **Investments in grid infrastructure** — including interprovincial transmission, intra-provincial transmission and distribution system infrastructure — are key to achieving a net-zero grid by 2035, and to enable economy-wide decarbonization.
- The Clean Electricity Investment Tax Credit (ITC) and other financing and funding measures currently being rolled out should prioritize grid infrastructure.
- Access to funding and other financing options should be conditional to provincial and territorial governments **committing to a net-zero grid** by 2035 to ensure public funds are utilized to deliver a clean, reliable, and affordable grid.
- Each competent authority should commit to several specific actions such as updating the mandate of its key institutions to demonstrate commitment to net-zero grid.

Context

With Budget 2023, Canada's federal government has taken some important steps toward achieving a net-zero grid. This year's budget announced several initiatives to support clean energy development (Annex 1). These investments will provide a timely boost toward meeting Canada's net-zero grid by 2035 target. Each offers an opportunity to mitigate barriers against the successful attainment of an affordable and reliable net-zero grid.

Grid infrastructure investments

Considerations

As much as 53.02 GW of new wind and solar energy will come online in Canada by 2035.¹ Wind and solar offer the lowest-cost electricity available today and their large-scale deployment will be essential in achieving an affordable electricity grid that can power Canadians while concurrently supporting the widespread electrification of other sectors that is necessary to achieve a 2050 net-zero economy. However, grid infrastructure is critical to enable that power to get to homes and businesses and to be used by those customers optimally. The following three types of grid infrastructure are essential for a net-zero grid:

- **Inter-provincial transmission** to connect regions with different renewable energy resources and support more efficient balancing of resources across larger regions
- **Intra-provincial transmission** to connect renewable energy sources to load centres and minimize energy lost due to grid congestion
- **Distribution system infrastructure** to support distributed energy resources, enabling flexible demand and electrification of sectors such as transportation and building heating.

Transmission and distribution infrastructure will provide several benefits for grid decarbonization, including:

- Reducing the overall total cost of grid decarbonization,² including by reducing the amount of generation and storage capacity required in some regions³
- Improving affordability for ratepayers by allowing a greater penetration of lowest-cost energy sources like wind and solar energy⁴
- Improving reliability by connecting wind and solar regions with hydroelectricity-rich regions that can serve as long-duration storage.⁵

¹ Canada Energy Regulator, *Canada's Energy Future 2023*, Electricity Capacity (appendix), Global Net-zero, 2023. <https://apps.cer-rec.gc.ca/ftppndc/dflt.aspx?GoCTemplateCulture=en-CA>; compared to 2021 capacities for wind and solar.

² Canada Energy Regulator, *Canada's Energy Future 2023*, 81. <https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2023/canada-energy-futures-2023.pdf>

³ *Canada's Energy Future 2023*, 78.

⁴ Jan Gorski, Binu Jeyakumar and Spencer Williams, *Connecting Provinces for Clean Electricity Grids* (Pembina Institute, 2021), 4. <https://www.pembina.org/reports/connecting-provinces-for-clean-electricity-grid.pdf>

⁵ *Connecting Provinces for Clean Electricity Grids*, 4.

Currently, electricity trade between provinces is small,⁶ with Alberta being the least interconnected province based on percentage of electricity load.⁷ This has already led to unsustainable power price volatility, as well as reliability challenges.⁸ Failing to ramp up inter-provincial transmission capacity could have severe consequences for Canada's ability to achieve a net-zero grid as well as economy-wide decarbonization through electrification.

Already, intra-provincial transmission capacity is starting to become a bottleneck for renewable energy development. For instance, renewable energy development has generally outpaced forecasts by the Alberta Electricity System Operator (AESO) – Alberta's authority responsible for ensuring sufficient transmission infrastructure.⁹ This has created a risk of localized congestion, which is expected to undermine investor confidence, slowing renewable energy development.¹⁰ Any renewable energy that is curtailed will be a missed opportunity for displacing emissions¹¹ and providing ratepayers with lowest-cost electricity.

Residential electricity demand will increase significantly as more Canadians switch to electric vehicles and heat pumps, putting strain on the distribution infrastructure. Although some strain and rising demand can be managed through approaches such as smart charging, there will still be a greater load on the distribution infrastructure. Timely investments will be key to ensuring the distribution infrastructure is ready to handle greater loads led by electrification.

There are several other barriers standing in the way of sufficient grid development in Canada:

- **Cost:** Transmission and distribution infrastructure costs are generally shouldered by ratepayers and can vary by geography. In Alberta, rural and northern regions pay significantly higher transmission and distribution costs than urban centres.¹² Consequently, decision-makers may delay building transmission infrastructure to avoid putting more burden on ratepayers. However, delaying building transmission has

⁶ *Connecting Provinces for Clean Electricity Grids*, 5.

⁷ Alberta Chamber of Commerce, *Strengthening Alberta's Electricity Transmission Intertie Infrastructure* (n.d.), 1. <https://www.abchamber.ca/wp-content/uploads/2022/02/Strengthening-Albertas-Electricity-Transmission-Intertie-Infrastructure.pdf>

⁸ Alberta Electricity System Operator (AESO), *Most Severe Single Contingency Impacts on Alberta Balancing Authority Area Operations: Observation and Information Sharing*. <https://www.aeso.ca/assets/Uploads/Most-Severe-Single-Contingency-MSSC-document-for-ARC-June2015.pdf>

⁹ Sara Hastings-Simon, Andrew Leach, Blake Shaffer, and Tim Weis, "Alberta's Renewable Electricity Program: Design, Results, and Lessons Learned," *Energy Policy* 171 (2022), p. 23.

¹⁰ Alberta Electricity System Operator, *Request for Feedback: 2023 Long-term Outlook June 8 – June 22, 2023*, 14. https://www.aesoengage.aeso.ca/forecasting-insights?tool=survey_tool#tool_tab

¹¹ Likeleli Seitlheko and Mekdes Gebreselassie, *The Electrification Puzzle: How to Decarbonize the Grid and Manage Rising Electricity Costs* (TD Economics, 2023). 2. <https://economics.td.com/esg-electricity-costs>

¹² Alberta Chamber of Commerce, *Alberta's Electricity System: A Balanced and Fair Playing Field for All Customers* (2022), 28. <https://www.abchamber.ca/wp-content/uploads/2022/09/Albertas-Electricity-System.pdf>

downstream effects. It may limit investments into affordable energy solutions like wind and solar, which could turn into a vicious cycle. As transmission is further constrained, consumers could get locked in to expensive energy sources like natural gas, instead of being able to access lowest-cost affordable energy like wind and solar.

- **Regulatory barriers:** The deployment of grid infrastructure continues to face regulatory and social challenges. One study found an average of 38 months approval time for transmission projects at the federal level.¹³ The Independent Electricity System Operator (IESO) has found that existing gas will be needed in Toronto and York regions beyond 2035 because new transmission or existing transmission expansion required to replace gas could not be built by 2035.¹⁴ In addition, large projects may face opposition from communities and interest groups.
- **Competing priorities:** While more grid investments are needed, provinces are also dealing with a pressing need to upgrade current transmission infrastructure to increase resilience against extreme weather events.¹⁵ For instance, the AESO curtailed capacity of Alberta–British Columbia and Montana–Alberta interties after a lightning strike caused rolling blackouts in Alberta. The curtailment caused Alberta ratepayers an estimated \$300 to \$500 million in additional annual costs.¹⁶

These barriers create near-term political and economic risks for provincial decision-makers and regulators when pursuing additional grid investment. The long-term benefits clearly outweigh the near-term risks, but only if these actors are confident in the transition and net-zero grid outcome. Grid investments serving non-emitting technologies will not be seen as necessary or in ratepayers’ interests if a probability discount is applied to the net-zero scenarios based on, for instance, political risk. In developing the suite of federal policies and programs to meet a 2035 net-zero Canadian grid, there is a compelling rationale for the federal government to de-risk grid investments through direct funding.

Recommendations

- At the highest level, the forthcoming governing policy should ensure that inter-provincial transmission, intra-provincial transmission, and distribution systems can access as many incentives outlined under this year’s budget as possible. Allowing

¹³ Jonathan Drance, Glenn Cameron and Rachel Hutton, “Federal Energy Project Reviews: Timelines in Practice,” *Energy Regulation Quarterly* 6 (2018).

¹⁴ IESO, *Pathways to Decarbonization* (2022), 23. <https://www.ieso.ca/en/Learn/The-Evolving-Grid/Pathways-to-Decarbonization>

¹⁵ *The Electrification Puzzle: How to Decarbonize the Grid and Manage Rising Electricity Costs*.

¹⁶ *Strengthening Alberta’s Electricity Transmission Intertie Infrastructure*, 1.

critical transmission projects a greater ability to stack incentives will further help advance grid infrastructure development by maximizing investor certainty.

- Grid infrastructure should be prioritized under each of the financing and funding programs that the federal government is rolling out as part of the overall suite toward a net-zero grid, particularly in the near term, as grid investments have high upfront capital costs and face some of the longest development timelines.
- Similarly, to hedge against high upfront cost, transmission projects may require additional incentives beyond what is outlined under this year's budget. The federal government should undertake studies to evaluate the impact of incentives outlined under this year's budget on grid infrastructure development. Depending on the study's findings, the government should consider offering extra incentives for high-value and critical grid infrastructure projects through targeted programming.

Competent authority

Considerations

Budget 2023 outlines that a competent authority in each province and territory must comply with several conditions, including a commitment to a net-zero grid by 2035, to access the clean electricity ITC. This is an important consideration as no province or territory in Canada has yet committed to achieving a net-zero grid by 2035.

The federal government shares jurisdiction with provinces with respect to emissions outcomes for electricity systems. Where grid planning, development and operations are concerned, the jurisdiction lies primarily with the provinces. However, because grids are key to realizing the net-zero emissions outcome, the federal government has a clear interest in incenting net-zero-compliant grid planning and development.

As with other areas of primarily provincial jurisdiction where the federal government has used budgetary allocations to achieve public policy objectives — particularly health care and childcare — it is reasonable to have the funding tied to provincial commitments to achieve the desired outcomes. This is appropriate if the government targets public funds to achieve policy outcomes. It is only reasonable and prudent then, that those funds are contingent on both provincial commitments and tangible actions to achieving the outcomes. The electricity sector investments supported by the federal incentives could be ineffective if they are made in provinces that manage their grids in a manner that undermines or renders impossible the net-zero 2035 outcome.

Recommendations

The question of competent authority has two components: 1) who should be considered a competent authority; and 2) the actions a competent authority needs to take to ensure they achieve a net-zero grid. The Pembina Institute offers the following recommendations:

- The federal government should proceed with having requirements of competent authorities. Competent authorities should be the provincial and territorial governments. This will ensure that the federal government plays its part in incentivizing the decarbonization of the electricity sector without impeding on the provincial or territorial jurisdiction of electricity.
- As the provincial and territorial governments are extended competent authority status, it will remain critical for Indigenous communities, governments, and organizations to be adequately consulted and engaged to advance self-determination and Indigenous-led clean energy development in regions across Canada, including in remote Indigenous communities.
- As part of a net-zero grid commitment, a competent authority should:
 - Update the mandate of institutions like the system operators, utilities, and other regulators that play a role in the electricity sector to include a commitment to net-zero grid. Currently, most of these institutions in most provinces are mandated to ensure safe, reliable and affordable access to electricity but do not have a mandate for a net-zero grid. Adding a commitment to a net-zero grid to their mandate will extend their role and responsibility, enabling them consider net-zero grid needs when conducting modelling and planning for system reliability in the short and long term.¹⁷
 - Require key institutions like system operators to model cost-effective pathways that provide reliable and affordable net-zero grid for consumers. Such pathways should also examine the full cost and benefits associated with transmission, which has been shown to decrease the total cost of the system. Where needed, the federal government should offer assistance in modeling net-zero grid for each province.
 - Undertake analyses at the grid level to ensure a reliable and affordable net-zero grid. Additional analyses should be conducted at the economy level to ensure grid readiness for the widespread electrification of the whole economy.
- Publicly share analyses and modelling to inform the public about different pathways possible — in terms of both technologies and cost — to achieving a net-zero grid. The requirement to commit to a net-zero grid by 2035 should also apply to other significant sources of funding targeted to achieving a net-zero grid, such as Smart Renewables and

¹⁷ Jason Dion, “Four Conditions for the new Clean Electricity Investment Tax Credit,” *Policy Options*, June 22, 2023. <https://policyoptions.irpp.org/magazines/june-2023/clean-electricity-tax-credit/>

Electrification Pathways Program, Canada Infrastructure Bank, and all ITCs that are used for electricity.

Annex 1

Highlights of clean electricity related incentives and associated amounts announced under Budget 2023¹⁸

Incentive	Amount Committed
Clean Electricity: 15% investment tax credit for clean energy technologies like solar, wind, hydro, natural gas with carbon capture and storage, storage including batteries and pumped hydro, and transmissions infrastructure	\$25.7 billion (until 2035)
Canada Infrastructure Bank financing: Clean Power priority area Green Infrastructure priority area (will be used for funding major projects like the Atlantic Loop)	\$10 billion for each priority area
Renewal of Smart Grid program and recapitalization of the Smart Renewables and Electrification Pathways Program	\$3 billion (until 2035)

¹⁸ Government of Canada, *Budget 2023: A Made in Canada Plan (2023)*, 79-81.
<https://www.budget.canada.ca/2023/pdf/budget-2023-en.pdf>