Response to the Request for Information from the Canada Electricity Advisory Council

January 24, 2024

Efficiency Canada

Carleton University

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Re: Request for Written Submissions to the Canada Electricity Advisory Council, December 7 2023

The Canadian Electricity Advisory Council (CEAC) was established in May 2023 with a 12-month mandate to provide independent advice to the Minister of Energy and Natural Resources in order to accelerate investment in and promote sustainable, affordable, and reliable energy systems.

After a series of nearly 60 consultation sessions, the CEAC issued an interim report with preliminary findings in December 2023. The interim report highlights five recommendations:

1) Greater flexibility in the Clean Electricity Regulations (CERs)
2) Adjusting conditions for Investment Tax Credits (ITCs) to focus on decarbonization by 2050
3) Extending ITCs to investments in interprovincial transmission assets
4) A national Indigenous loan guarantee program
5) Rapid launch of a process to address labour and supply chain concerns

Coincident with the release of the interim report, the CEAC also issued a request for written submissions on five key themes which roughly mirror the Council's initial working groups:

1) How to improve planning and oversight of electricity systems to support net-zero

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2) How to build electricity infrastructure in a timely manner while creating benefits for Indigenous partners

3) How to attract capital investments and maintain electricity affordability through the transition

4) How to enhance regional cooperation to take advantage of efficient, low-cost pathways to net-zero

5) How to enable electricity sector innovations that can reduce the costs and risks of the energy transition while maintaining grid reliability and resiliency

Within each theme, the CEAC provided a list of questions for respondents to consider in their written submission. The following letter responds to questions raised in themes 1, 3, and 5.

Response to CEAC key themes

It is imperative that the federal government approach the challenge of electrification and decarbonization in provincial utility systems from an integrated resource standpoint. The history of integrated utility resource planning demonstrates the importance - particularly during times of high uncertainty - of an "all in" approach to resource planning and development.[1] Demand-side resources possess unique reliability and affordability-related characteristics that will help to de-risk the broader transition, but only if they are treated on par with supply-side

[1] See Northwest Power Planning Council (1983) "Northwest Conservation and Electric Power Plan", Portland, OR, Chapter 1; available from https://www.nwcouncil.org/reports/1983-northwest-conservation-and-electric-power-plan/; Dyson, Mark, Lauren Shwisberg, Katerina Stephan, (2023) "Reimagining resource planning", *Rocky Mountain Institute*, 2023, available from https://rmi.org/insight/reimagining-resource-planning/

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and other capital investment projects.[2] While the federal government has taken action to facilitate investment in demand-side resources (e.g., Greener Homes), these efforts appear siloed from and unconnected with supply-side-oriented initiatives. A truly integrated approach to electrification and decarbonization would embed demand-side solutions in all related federal policy and programs.

1) How to improve planning and oversight of electricity systems to support net-zero

Working group #1 of the CEAC focused on planning and utility oversight. Interim findings highlighted the need to add a vital pillar – the attainment of climate goals – to the existing mandates of reliability and affordability which govern utility regulators, system operators, and Crown utilities. The Council also noted the importance of independent pathway assessments and provincial/territorial net-zero energy roadmaps as tools for providing guidance and resources in the identification of cost-effective pathways to net-zero. These are sound recommendations.

The proposed questions for response focus largely on the implementation and operationalization of these recommendations. We submit the following for consideration:

- Mandates

  Ongoing research at Efficiency Canada suggests that few if any provinces/territories are following existing best practices for consideration

[2] Frick, Natalie, Tom Eckman, Greg Leventis, and Alan Sanstad (2021) "Methods to Incorporate Energy Efficiency in Electricity System Planning and Markets." *Ernest Orlando Lawrence Berkeley National Laboratory*, Berkeley, CA

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of demand-side resources, let alone emerging opportunities in demand flexibility. No province/territory requires utilities to pursue all cost-effective energy efficiency as identified in potential studies, and only Manitoba and Quebec have provincial target-setting mechanisms somewhat akin to an energy efficiency resource standard (EERS) characteristic of leading US states.[3] As a consequence, the potential of demand-side resources to facilitate cost-effective and resilient transitions to net zero is not being fully evaluated in utility planning efforts or captured by DSM portfolio design.

- Pathway studies

Recent work by The Transition Accelerator[4] and ongoing research at Efficiency Canada has found that many existing government, utility, and third-party pathway assessments either do not treat demand-side management (DSM) as a resource at all or do not do so transparently and explicitly. A potential consequence of this is that projected energy and capacity requirements are highly uncertain - they may be over or underestimated. The former leads to more costly than necessary transitions; the latter likely leads to transition failure.

- Risk

Without comprehensive modelling of demand-side resources, particularly in how they interact with – or impact the need for and risk associated with –

[3] See James Gaede, Alyssa Nippard, Brendan Haley, Annabelle Linders (2022) "2022 Canadian Energy Efficiency Scorecard: Provinces and Territories", *Efficiency Canada*, Ottawa ON, pp 65-66, available at https://www.scorecard.efficiencycanada.org/; Alyssa Nippard, James Gaede (2023) "Benchmarking 2021 Canadian province/territory and American state energy efficiency program savings and spending", *Efficiency Canada*, Ottawa ON, available at https://www.efficiencycanada.org/comparison/

[4] Nick Martin (2023) "Putting Canadian Deep Decarbonization Electricity Modeling Studies to Use: Interpreting and Improving Deep Decarbonization Electricity Modeling Studies", *Electrifying Canada - An Initiative of The Transitions Accelerator.*

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large-scale capital investment, risks to core transition objectives (e.g., affordability, reliability, and decarbonization) increase.[5] Current regulatory practices may not be allocating risk fairly or effectively. There is a need to de-risk investments in certain infrastructure or demand-side resources presently lacking a prudent investment case (e.g., EV charging infrastructure), while ensuring ratepayers are not on the hook for stranded assets which are prudent today, but unlikely to be part of a future, electrified and decarbonized energy system.

Based on these considerations, Efficiency Canada submits the following recommendations to Working Group #1.

- Introduction of best practice energy efficiency target policy (e.g., an EERS, or an "all cost-effective" mandate) should be established as conditions for federal support of cost-effective decarbonization. A relevant example is the European Union, where Member States recently agreed to increase the energy savings required in the Energy Efficiency Directive (EED).[6] This update increased the mandatory energy savings targets to 1.5% annually from 2024 to 2030.
- Third-party pathway/decarbonization studies should seek to incorporate energy efficiency and other demand-side solutions as "selectable" resources in their modelling, not simply as assumptions subtracted from energy demand forecasts while recognizing the unique risk-related

[5] Frick, et al., (2021)

[6] (2023) "Directive of the European Parliament and of the Council on Energy Efficiency", https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en

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characteristics of these resources (e.g., construction lead time, market/fuel price risk, scheduling flexibility, etc).

- The federal government can play a role in shaping resource planning efforts by supporting research and development of models and data necessary to fully incorporate the role of demand-side resources. This could include open-source models or estimates of demand-side resource potential, particularly for next-step demand flexibility solutions (e.g., virtual power plants).

3) How to attract capital investments and maintain electricity affordability through the transition

Interim findings

The CEAC Interim findings report found that, on this issue, Canada embarks on the transition from a position of strength, but that the costs and benefits of investments will be distributed differently between regions and customers. Submissions to the process highlighted that federal recognition of the need for the tax base to share some costs of net-zero electricity with the rate base (e.g., through ITCs and other programs) would be welcome. The working group is continuing to research impacts on ratepayers and affordability, as well as the role demand-side management and other initiatives play in mitigating impacts.

Efficiency Canada reiterates a point made in its earlier presentation to the CEAC: electricity saved is clean electricity (regardless of its source). Saving electricity through energy efficiency not only improves system reliability and affordability, and reduces risks associated with system expansion, it also frees up more electricity to be used for the purpose of electrification. According to the International Energy

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Agency, energy efficiency is one of the most important, currently available solutions for putting energy systems on a path toward net zero.[7]

Our research has found that Canadian low-income homeowners and renters face unique challenges in accessing energy efficiency programs in Canada.[8] Access and/or willingness to take on debt to cover up-front capital investments may be limited, for example. Current provincial/territorial programs are also not generally designed to achieve deep savings per household, to promote fuel switching/electrification, to make required non-energy upgrades, or to undertake more sophisticated targeting of those most in need.

To support affordability, federal funding to support low-income energy efficiency should focus on these gaps, encouraging more provincial low-income energy efficiency through utility systems in alignment with the recommendations above regarding conditions for federal support. For example, sub-targets within an EERS could include minimum budgets spent on low-income, Indigenous populations and other under-resourced communities.

5) How to enable electricity sector innovations that can reduce the cost and risk of the energy transition while maintaining grid reliability and resiliency

Interim findings of the CEAC note that, to maintain current reliability levels, grids will need to evolve with a greater range of low-carbon flexibility solutions, such as distributed energy resources (DERS), demand-side management, and energy

[7] International Energy Agency, "Net Zero by 2050: A Roadmap for the Global Energy Sector," May 2021, 55, https://www.iea.org/reports/net-zero-by-2050.

[8] Kantamneni, Abhilash, Brendan Haley, (2022) "Efficiency for all: A review of provincial/territorial low-income energy efficiency programs with lessons for federal policy", *Efficiency Canada*, Ottawa, ON

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efficiency. These resources may be hindered by market structures, funding models, regulator requirements that impose costs on ratepayers, or government funding supports favouring certain technologies or lacking coordination with provincial goals/programs. Absent regulatory frameworks to support innovation, "pilot paralysis" may arise without reforms to bring emerging solutions to scale.

The potential of demand-side resources to contribute to grid capacity and flexibility and achieve GHG reductions is significant. A recent report by the Lawrence Berkeley National Laboratory in the U.S. found that demand-side solutions like energy efficiency, demand flexibility, and electrification could lead to over 90% reduction in building CO2 emissions and generate up to $107 billion in annual power systems cost savings by 2050.[9] A separate study by the U.S. Department of Energy suggests considerable cost-effective potential may also be found in the aggregation of distributed energy resources and demand-side interventions, i.e., "virtual power plants" (VPPs). The study estimates that tripling the current capacity of VPPs in the U.S. could contribute approximately 10-20% of peak demand, saving around $10 billion annually in grid operation costs.[10]

The federal government can play an important market transformation role to facilitate innovation and adoption of demand-side low-carbon flexibility solutions. Options include:

- Explore the use of appliance and equipment standards as a policy vehicle to incorporate required technological components in certain appliances to facilitate grid interactivity. For example, specifications requiring

[9] Langevin, Jared, et al., (2023) "Demand-side solutions in the U.S. building sector could achieve deep emissions reductions and avoid over $100 billion in power sector costs", *One Earth*, 6(8): 1005

[10] Dowling, Jennifer, et a., (2023) "Pathways to commercial liftoff: Virtual power plants", *U.S., Department of Energy*, Washington, DC., available from https://liftoff.energy.gov/vpp/

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components installed in new electric water heaters to allow grid operators to manage demand.

- Support for research and development through funding for demonstration and pilot programs, the development of modelling and planning tools to integrate demand-side resources fairly into resource planning, and creating learning opportunities between utilities in different provinces. Additionally, the federal government should support research into demand-side resource potential in each province/territory.

- Conditions for federal funding support for grid development that provincial/territorial resource planning practices include demand-side resources (including VPPs) as selectable resources, with full and accurate representation of their unique characteristics vis-a-vis other energy and capacity resources (e.g., non-energy benefits, lower risk profiles, provision of ancillary services).

- Incorporate demand flexibility into mandates that require utilities to pursue “all cost-effective” energy efficiency and demand flexibility. Incent this provincial policy change through federal funding conditions.

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