

Coordination and community engagement for a net-zero grid

Pembina Institute comments and recommendations

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Regarding: Barriers & Solutions to Achieving a Net-Zero Grid in Canada

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Recommendation summary

Proactive thinking, provincial- and territorial-coordination, timely and respectful community engagement, and support for Indigenous participation in the electricity system are essential to achieving an equitable transition to a net-zero grid in Canada. The Pembina Institute recommends that the Electricity Advisory Council advise the federal government:

- Recognize that expanded utility regulator mandates are needed and that they must come with cohesive jurisdictional energy plans and related policies.
- Create a set of scenarios, determined through participatory processes, that all provinces and territories should use in their decarbonization pathway analyses and energy planning.
- Encourage pre-planning and construction of enabling transmission and distribution infrastructure, such as transmission lines between demand centres and regions with high renewable generation potential, to increase investment and harness economies of scale.
- Engage with communities early and develop Community Benefit Agreements to facilitate project approval at the local level.
- Provide advance notice of consultation requirements in project calls to developers and Indigenous communities to ensure there is adequate time for relationship building.
- Enact policies such as Independent Power Producer policies, grant programs, loan guarantees, and low interest debt financing to facilitate Indigenous access to capital.
- Encourage revision of the Cost-of-Service utility business model to support innovation.
- Support essential interjurisdictional coordination to balance strengths and weaknesses of neighbouring grids, perhaps through province- and territory-led regional electricity markets, or by joining continental grid initiatives like SPP Markets+.
- Take an intergenerational, future-focused approach to training and education to meet long-term demands for human resources.

Context

The Pembina Institute appreciates the opportunity to support the Electricity Advisory Council's investigation into the barriers and solutions to achieving a net-zero grid in Canada. Rapidly decarbonizing the electrical grid is essential to decarbonizing every other sector of the economy, so we welcome the Council's work. In response to the council's discussion guide, we have prepared recommendations and supporting examples from other jurisdictions. We appreciate the council's focus on legislative and procedural modifications; while they can be challenging to implement, these kinds of systemic changes are required to accelerate the energy transition. Increased coordination between provinces and territories, each with a unique electricity system, will also be needed to achieve the nationwide target of a low carbon grid by 2035.

Responses

Improving planning and oversight of electricity systems

1.1 How might the mandates of regulators, system operators and utilities need to change or expand, to meet net-zero? How could net-zero mandates be implemented and operationalized?

Electricity consumers are beginning to question the narrow economic mandates that govern most Canadian energy regulators. In a 2021 consultation on Ontario's long-term energy planning, stakeholders expressed concern over the lack of GHG emission reduction guidance, or other sustainability-related directives, in the Ontario Energy Board's mandate.¹ Environmental directives should be added to existing regulator mandates so regulators have the authority to make decisions that advance a net zero electricity grid. These expanded mandates must be accompanied by comprehensive energy plans and related policies to ensure that regulators are not making de facto policy decisions through their rulings.²

Massachusetts' 2021 *Act for Creating a Next-Generation Roadmap for Massachusetts Climate Policy* provides an example of how these environmental directives can be added. The act extends the state's Department of Public Utilities (DPU) list of priorities to include both equity and greenhouse gas emissions, allowing the DPU to co-optimize across their mandated

¹ Ontario Ministry of Energy, *Long-Term Energy Planning Reform: Environmental Registry of Ontario (ERO) Consultation* (2021), 7. <https://prod-environmental-registry.s3.amazonaws.com/2022-04/2021-10-29%20%20Long-Term%20Planning%20Reform%20-%20What%20We%20Heard%20EN%20-%20accessible%20v.2.pdf>

² Canadian Climate Institute, *Electric Federalism* (2022), 79. <https://climateinstitute.ca/wp-content/uploads/2022/05/Electric-Federalism-May-4-2022.pdf>

priorities and balance environmental, economic, and social needs.³ This legislation also commits the state to achieve a net-zero economy by 2050 and outlines interim targets every five years.⁴

Electricity and natural gas systems are becoming increasingly intertwined as a result of the energy transition.⁵ Mandates should be updated to include both electricity and natural gas transmission and distribution, allowing regulators to co-manage both energy types. An integrated energy mandate would also allow for new resources like hydrogen to be included more easily as they become viable.⁶ In the United Kingdom, the Office of Gas and Electricity Markets (Ofgem) is exploring this idea through the creation of a Future System Operator (FSO). The FSO uses a holistic energy system perspective to coordinate policies for all energy sources⁷ and has a duty to facilitate net zero.⁸

1.2 How should independent, provincial/territorial pathway to decarbonization assessments be approached and scoped to inform net-zero energy roadmaps and coordinated system planning?

To build buy-in and trust, pathway assessments must be robust. Robustness, a measure of a pathway's performance in varied conditions and uncertainty, can be achieved by developing a strategic set of scenarios that provide an understanding of potential futures and the trade-offs associated with prioritizing different objectives. These scenarios can also be used to evaluate policy options against a set of predetermined metrics.⁹ Creating a set of scenarios aligned with federal climate targets to be used in all provincial and territorial pathways assessments will avoid duplicate work and help coordinate system planning.

Demand-side measures should be included in these scenarios as they are cost-effective sources of much needed non-emitting grid reliability. Pathway to decarbonization assessments should

³ Jessie Ciulla, Dan Cross-Call, Cory Felder, and Aaron Schwartz, *Purpose: Aligning PUC Mandates with a Clean Energy Future* (RMI, 2021), 9.

⁴ Government of Massachusetts, *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*, 2021 Chapter 8. <https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8>.

⁵ Canadian Climate Institute, *Barriers to innovation in the Canadian electricity sector and available policy responses* (2021), 4. <https://climateinstitute.ca/wp-content/uploads/2021/09/CICC-Barriers-to-innovation-in-the-Canadian-electricity-sector-and-available-policy-responses-by-Sara-Hastings-Simon-FINAL-1.pdf>

⁶ *Barriers to innovation in the Canadian electricity sector and available policy responses*, 9.

⁷ National Grid ESO, "Becoming the Future System Operator (FSO)". <https://www.nationalgrideso.com/what-we-do/becoming-future-system-operator-fso>

⁸ Ofgem, "Future System Operation (FSO)". <https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/future-system-operation-fso>

⁹ Anna M. Brockway et al., "Climate-aware decision-making: lessons for electric grid infrastructure planning and operations," *Environmental Research Letters* 17 (2022), 11. <https://iopscience.iop.org/article/10.1088/1748-9326/ac7815>

also be scoped to consider climate adaptation strategies such as dynamic transmission line rating to ensure infrastructure assumptions reflect changing climate and weather events.

Stakeholder engagement and transparency in the pathway development process are also required to obtain public acceptance of the road forward. The assumptions used in pathway assessments should be derived from an iterative participatory process that brings together diverse stakeholder groups.¹⁰ To further increase transparency, each independent provincial pathway analysis can be done using the same open-source modelling tool, allowing stakeholders to recreate results. A similar approach was taken by the California Public Utilities Commission to increase rate case transparency; all utilities are required to prepare their Integrated Resource Plans using a publicly available tool called RESOLVE.

1.3 What features should provincial governments build into their net-zero energy roadmaps to enable more effective planning and utility regulation?

Technologies and circumstances are constantly evolving; provincial energy roadmaps should maintain their applicability in a range of potential scenarios by featuring multiple, adaptive pathways that are technologically agnostic. These energy roadmaps should explicitly state emissions reductions targets and interim goals and provide regulators with foundational policies to support their decision making. Such roadmaps provide both crown corporations and private investors in deregulated markets more long-term certainty, especially in grid infrastructure planning that could encourage more private investment.

Implementing mandatory increased data transparency through these roadmaps would also enable more effective planning and utility regulation, similar to European Union Regulation 543/2013, which requires that some electricity generation, transmission, and consumption data be made available to market participants.¹¹

Provincial roadmaps can be supported by the Canadian Electricity Strategy (CES) that will be released in 2024. To be most effective, the CES must define a vision of how the electricity sector will achieve net-zero emissions, and how it will contribute to a net-zero economy by 2050.¹² A federal strategy document would provide a central vision from which provinces and territories can build their own net-zero strategies, creating a more cohesive transition.

¹⁰ Anna M. Brockway et al., “Climate-aware decision-making: lessons for electric grid infrastructure planning and operations,” *Environmental Research Letters* 17 (2022), 11. <https://iopscience.iop.org/article/10.1088/1748-9326/ac7815>

¹¹ European Union, *Commission Regulation (EU) No 543/2013*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R0543>

¹² Electricity Canada, *Build Things Faster* (2023), 6. https://issuu.com/canadianelectricityassociation/docs/ec_sel_frame_-_2023_21_b1a2024679b3b0

1.4 What policy changes are needed to enable accelerated investment in electricity systems and infrastructure, and how does our appetite for risk need to evolve?

Appetite for investment risk must increase to allow for planning and development to occur in anticipation of demand, particularly for enabling infrastructure. Regulators must look farther ahead when considering utility Integrated Resource Plans and approve the “pre” construction of infrastructure that services expected customer needs beyond the rate case window.

Texas’s Competitive Renewable Energy Zones (CREZ) are an example of how pre-built infrastructure can accelerate investment. The Public Utilities Commission of Texas identified five areas with high wind energy generation potential and requested the state’s grid operator to develop transmission plans to connect them to demand centres.¹³ Without transmission access, wind and solar developers typically struggle to secure funding because constructing new high-voltage transmission lines can take more than ten years to complete.¹⁴ The pre-built transmission capacity servicing the CREZ removed a great deal of uncertainty for generation project developers and drew increased private sector investment in wind development.¹⁵

Accelerating investment in cost-effective transition infrastructure, rather than in electricity infrastructure in general, will also require a shift in how utilities are remunerated. Under the Cost-of-Service model, utilities are not incentivized to consider distributed energy resources and the grid services they provide as alternatives to traditional infrastructure like transmission lines. Carbon pricing guarantees, such as contracts for difference, may also help accelerate investment in transition-specific infrastructure by reducing the uncertainty of future benefits.

Lastly, provinces should develop regional plans that consider the need for building new electricity generation and transmission infrastructure to provide guidance to municipalities. These processes should involve local engagement that can help to ensure the rules for development are clear and have local community support, which will greatly improve electricity investment certainty.

¹³ Warren Lasher, *The Competitive Renewable Energy Zones Process*, ERCOT, webinar, August 11, 2014, 4. https://www.energy.gov/sites/prod/files/2014/08/f18/c_lasher_qer_santafe_presentation.pdf

¹⁴ NREL, *Renewable Energy Zones: Delivering Clean Power to Meet Demand* (2016), 1. <https://www.nrel.gov/docs/fy16osti/65988.pdf>

¹⁵ *Barriers to innovation in the Canadian electricity sector and available policy responses*, 14.

1.5 What conditions, if any, should be attached to provincial and territorial receipt of federal supports in order to facilitate a cost-effective decarbonization and build-out of Canadian electricity systems in line with climate goals?

To receive federal supports, a competent provincial or territorial authority should:

- Update the mandate of institutions like system operators, utilities, and other regulators that play a role in the electricity sector to add decarbonization as an objective such that these mandates align with federal emissions reduction targets for 2035 and/or 2050. Expanding mandates will enable electricity system actors to consider climate goals when conducting modelling and planning for system reliability in the short and long term.¹⁶
- Commission independent pathway assessments to determine cost-effective options that provide a reliable and affordable net-zero grid for consumers. Such pathways should also examine the full cost and benefits associated with transmission and demand side management, which has been shown to decrease the total cost of the system.
- Develop provincial/territorial net-zero energy roadmaps to ensure regulators are not responsible for policy making. These roadmaps will be unique to each province and territory given their individual electricity mixes, regulatory structures, and geography.
- Undertake analyses at the grid level to ensure a reliable and affordable net-zero grid. Additional economic analyses should be conducted to ensure grid readiness for the widespread electrification of the whole economy. This is particularly important in the lead up to 2050 when other sectoral net zero requirements will result in greater demand for zero emissions electricity.

Federal support could also be conditional on the provincial or territorial government's participation in interregional working groups or energy markets that advance interprovincial cooperation or transmission capacity.¹⁷

¹⁶ Karambir Singh and Ben Thibault, *Supporting grid infrastructure investments and committing to a net-zero grid* (Pembina Institute, 2023). <https://www.pembina.org/pub/supporting-grid-infrastructure-investments-and-committing-net-zero-grid>

¹⁷ Canadian Climate Institute, *Electric Federalism* (2022), 73. <https://climateinstitute.ca/wp-content/uploads/2022/05/Electric-Federalism-May-4-2022.pdf>

Building electricity infrastructure in a timely manner while creating benefits for Indigenous partners

Improving Project Approvals

2A.1 Is a change to, or clarification of, the mandates of regulators needed to enable net-zero project approvals? If so, how could this be accomplished? If not, what approaches could enable these projects to receive regulator approval?

We agree with Electricity Canada’s *Back to Bonbright* report’s finding from interviewees that, “without clear and consistent policy direction no entity, be it a regulator or utility, is empowered to take the actions necessary to facilitate net zero.”¹⁸ In their 2022 Letter of Direction, the Ontario Ministry of Energy recognized that the Ontario Energy Board (OEB) “cannot make substantive changes to its regulatory approach without a legislative amendment.”¹⁹ Some U.S. states have already legislated mandate changes for their electricity regulators and granted them authority to evaluate proposals based on their contribution to net-zero goals. For example, Massachusetts’ 2021 *Act for Creating a Next-Generation Roadmap for Massachusetts Climate Policy* extended the state’s Department of Public Utilities (DPU) list of priorities to include both equity and greenhouse gas emissions. Adding sustainability objectives to regulator mandates requires jurisdictions to also put in place comprehensive energy plans and supporting policies to ensure that regulators do not become de facto policy makers.²⁰

In some scenarios, expanding regulator mandates may be challenging. Alternative methods that enable regulators to consider environmental concerns include redefining the public interest to include the health and environmental benefits of emissions reduction (e.g., Colorado’s Senate Bill 19-236)²¹ and leveraging existing energy planning documentation to codify jurisdictional emissions reduction targets (e.g., Connecticut’s Climate Change Planning and Resiliency Act).²²

Regulators with confidence in their authority can also use their decisions to set a precedent for future proceedings. For example, the 2022 Letter of Direction also stated that the OEB should

¹⁸ Electricity Canada, *Back to Bonbright* (2023), 32.

https://issuu.com/canadianelectricityassociation/docs/ec_sel_frame_-_2023_21_

¹⁹ Todd Smith, Ontario Minister of Energy, letter to the Ontario Energy Board, October 21, 2022. Available at <https://www.oeb.ca/sites/default/files/letter-of-direction-from-the-Minister-of-Energy-20221021.pdf>

²⁰ Jessie Ciulla, Dan Cross-Call, Cory Felder, and Aaron Schwartz, *Purpose: Aligning PUC Mandates with a Clean Energy Future* (RMI, 2021), 9.

²¹ State of Colorado, *Senate Bill 19-236* (2019), 9. https://leg.colorado.gov/sites/default/files/2019a_236_signed.pdf

²² State of Connecticut, *An Act Concerning Climate Change Planning and Resiliency* 2018, Public Act No. 18-82. <https://www.cga.ct.gov/2018/ACT/pa/pdf/2018PA-00082-R00SB-00007-PA.pdf>

“not wait until it has been provided with additional legislative authority before it begins to consider these reforms.”²³ Recently, the OEB rejected Enbridge Gas Inc.’s proposed capital spending plan on the basis that the energy transition increases the risk that gas assets will be stranded and Enbridge did not adequately assess this risk when developing their proposal.²⁴ It remains to be seen how this decision will impact future proceedings.

2A.2 What are the most effective approaches to enabling federal, provincial and territorial governments to cooperate to streamline project assessment, approval and permitting, and how can those approaches be quickly operationalized?

The One Project, One Approval framework discussed in Budget 2023 is an important step towards streamlining approval and permitting processes. There are currently several federal agencies and departments involved in approval and permitting decisions; consolidating these components into a single federal office would give project proponents a single contact point and reduce the delays and duplicate efforts inherent in multi-office processes. Considering provincial and territorial assessments as equivalent to federal ones would also reduce unnecessary duplication so long as appropriate consultation and FPIC processes are followed.²⁵ To help develop a national permitting framework, federal funding for the energy transition could be conditional on provincial and territorial participation in a working group dedicated to the task.

2A.3 What changes are required to help facilitate project approvals at the municipal and local levels, in line with federal and provincial policy? How can the federal government support and convene municipal governments in project approvals?

Early engagement with local governments, community members, and other stakeholders is critical for obtaining approval. This engagement should provide stakeholders with an understanding of the project's purpose in terms of both local and regional grid benefits. If local stakeholders are consulted only after a plan is in place, they do not have the opportunity to become part of the decision-making process and therefore have limited buy-in.

Community Benefit Agreements (CBAs) are a tool that can be used to bring communities into the conversation and ensure that the benefits of new electricity infrastructure are shared

²³ Todd Smith, Ontario Minister of Energy, letter to the Ontario Energy Board, October 21, 2022. Available at <https://www.oeb.ca/sites/default/files/letter-of-direction-from-the-Minister-of-Energy-20221021.pdf>

²⁴ Ontario Energy Board, *OEB issues decision on remaining Phase 1 issues in Enbridge Gas Inc.’s 2024-2028 Rates Proceeding (2023)*, 1. <https://www.oeb.ca/sites/default/files/backgrounder-EGI-EB-2022-0200-20231221-en.pdf>

²⁵ Electricity Canada, *Build Things Faster (2023)*, 4. https://issuu.com/canadianelectricityassociation/docs/ec_sel_frame_-_2023_21_b1a2024679b3b0

fairly.²⁶ These agreements, which are negotiated between project proponents and communities, can help secure community buy-in and make approval processes more efficient. CBAs are already common practice in British Columbia for public sector infrastructure projects.²⁷

Working with municipalities to designate pre-approved areas for development, called Competitive Renewable Energy Zones (CREZs), would streamline the approval of future projects. This approach creates leadership opportunities for communities and or regional economic development entities to become involved in the electricity system. CREZs must be accompanied by plans for electricity transmission infrastructure that connects them to demand centres.

2A.4 How can existing solutions and processes such as those provided by Natural Resource Canada’s Major Projects Management Office (MPMO) and the Impact Assessment Agency of Canada (IAAC), among others, provide benefits to project proponents in advancing project approvals?

The IAAC is required by the Impact Assessment Act (IAA) to develop a permitting plan for a designated project. The plan is provided to the proponent, participants, and Indigenous groups, and it provides a brief description of each permit, license and authorization as well as other resources. This was a positive development under the IAA as it helps to streamline the permitting and planning process, which can help reduce overall costs of projects by reducing the lead time. The IAAC can further build on this by providing greater coverage of the permitting and licensing process at the provincial level.

The focus placed by the IAA and the SACC on the positive (and negative) impacts of new development projects could help advance clean energy projects and infrastructure by carefully considering their downstream positive impacts during the impact assessment process.

2A.5 Should electricity projects with strategic importance to net-zero be provided faster approval processes and, if so, how? How should strategic importance to net-zero be defined?

Strategic importance should be defined based on the magnitude of the emissions reduction or avoided system cost (compared to the base case alternative) attributable to the project or to future developments that the project enables. Examples of infrastructure that could have

²⁶ Megan Gordon and Alex Callahan, *A Sustainable Jobs Blueprint, Part II: Putting workers and communities at the centre of Canada’s net-zero energy economy* (Pembina Institute, 2023), 89. <https://www.pembina.org/pub/sustainable-jobs-blueprint-part-ii>

²⁷ British Columbia Office of the Premier, “New framework ties major projects to benefits for workers and communities,” media release, July 16, 2018. <https://news.gov.bc.ca/releases/2018PREM0057-001406>

strategic importance to net-zero include transmission lines, storage capacity, grid-enhancing technologies,²⁸ and smart grid technologies. These projects could be prioritized such that “low regret” options progress through the queue first.

To help achieve faster approval processes, regulators should be provided with standards for new technologies so they can focus on their mandated duties rather than the technical merit of a proposal.²⁹

Standing regulatory exemptions for specific project types can also be used to fast-track priority actions. The Ontario Energy Board currently has the authority to grant limited exemptions from license requirements for innovative pilot programs, and they want to expand this authority to allow for generic exemptions to projects of a specified type that are eligible for funding outside of rates.³⁰ The OEB believes generic exemptions will decrease utility uncertainty about what types of projects will be approved and accelerate the adoptions of innovative solutions.³¹

2A.6 What initiatives for accelerating project approvals should the Council look to for learning or to source best practices, either in Canada or internationally?

In response to Russia’s attacks on Ukraine, the European Commission adopted a temporary emergency regulation called *Laying Down a Framework to Accelerate the Deployment of Renewable Energy*. The goals of the regulations were to reduce natural gas demand, increase grid resilience, and help the European Union achieve their renewable energy targets. The basis of the act is that renewable energy generation is of “overriding public interest,” and permit delays must be reduced by setting strict approval timelines. The act only applies to projects with low environmental risk such as rooftop solar, collocated storage, heat pumps, and repowered renewable plants.³²

²⁸ United States Office of Electricity, “DOE Study Shows Maximizing Capabilities of Existing Transmission Lines through Grid-Enhancing Technologies (GETs) Can Reduce Transmission Investment and Increase Renewable Integration,” April 20, 2022. <https://www.energy.gov/oe/articles/doe-study-shows-maximizing-capabilities-existing-transmission-lines-through-grid>

²⁹ *Build Things Faster*, 5.

³⁰ Government of Ontario, *Further Reducing Barriers to Innovation 2023*, Proposal Number 23-ENDM028. <https://www.ontariocanada.com/registry/view.do?postingId=45690&language=enB>

³¹ Ontario Energy Board, *Report of the Ontario Energy Board to Ontario’s Electrification and Energy Transition Panel (2023)*, 22. <https://www.oeb.ca/sites/default/files/uploads/documents/reports/2023-07/oeb-report-EETP-20230630-en.pdf>

³² European Union, *Laying down a framework to accelerate the deployment of renewable energy (2022)*, Council Regulation (EU) 2022/2577. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32022R2577>

Moving to the Pacific, Australia employs a different approach to regulation to accelerate project approval processes. Under their proposed-response method, rather than the quasi-judicial process applied in Canada and the United States, utilities are made aware of the conditions against which their application will be evaluated before they prepare it. This increased clarity for utilities and reduced uncertainty and delays.³³

Creating benefits for Indigenous partners

2B.1. What are the information and awareness gaps that, if filled, would help specific stakeholders understand the Indigenous context in Canada to more effectively advance projects in partnership with Indigenous communities, and what mechanisms could be used to address those gaps?

There are a number of responsibilities, legislations, and calls to action that all levels of government, the energy industry, and the private sector must examine and uphold to effectively advance projects in partnership with Indigenous communities. They include:

- Treaty obligations
- The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)
- The federal UNDRIP Act, the British Columbia Declaration on the Rights of Indigenous Peoples Act, and the Northwest Territories UNDRIP Implementation Act
- The Royal Commission on Aboriginal People
- The Truth and Reconciliation Commission and its Calls to Action
- The National Inquiry into Missing and Murdered Indigenous Women and Girls and its Calls for Justice
- Canadian case laws that set a precedent for the recognition of Indigenous rights and title³⁴

From these resources, the electricity sector must pay particular attention to UNDRIP and how it pertains to Free, Prior and Informed Consent (FPIC), economic development, and the development of Indigenous lands and of Indigenous resources. Developers and industry associations must prioritize and build knowledge on how to build successful, mutually-beneficial relations with Indigenous communities. Utilities and regulators must be more proactive in building relationships with Indigenous communities to enable their full participation in project development. Relationship building and meaningful participation can be facilitated through evaluating and forming practices for implementing relationship building and FPIC in operations, dedicated funding for Indigenous intervenors (such as the BCUC

³³ *Build Things Faster*, 15.

³⁴ Bridget Doyle, Dean Jacobs, and Cory Jones, *Decarbonizing Electricity and Decolonizing Power: Voices, Insights, and Priorities from Indigenous Clean Energy Leaders* (David Suzuki Foundation, 2022), 21. <https://davidsuzuki.org/wp-content/uploads/2022/05/DSF-CPP-Indigenous-Engagement-Report-2022.pdf>

Indigenous Intervener Capacity Fund),³⁵ modifying internal policies and procedures to reflect the objectives of reconciliation, and including Indigenous people in both staff and executive roles.

Before energy sector actors begin engaging with communities, it is important that they understand the time and resource constraints that many communities face. To prevent burdening communities with over engagement and consultation, non-community entities must form processes to coordinate their engagement efforts and avoid duplication.

2B.2. What is necessary to enable proponents to engage earlier with Indigenous communities as active participants in project development, and conversely, what is necessary to enable Indigenous communities to fully engage with proponents in advancing projects quickly, effectively and with full participation, both early on and throughout the project implementation lifecycle?

It is important to note that many project proponents are often themselves Indigenous communities, especially in remote and northern jurisdictions. Non-Indigenous proponents should be required to partner and share equity ownership with Indigenous communities, and Indigenous communities should be provided with the funding and resources to pursue the resulting opportunities. For example, B.C. Hydro's spring 2024 Call for Power includes a minimum First Nations ownership in the project and is in the process of developing Indigenous economic participation requirements including "partnerships, project procurement opportunities, benefits-sharing agreements, and appropriate evaluation criteria for Indigenous participation."³⁶ This Call for Power was also accompanied by \$140 million in funding for the B.C. Indigenous Clean Energy Initiative.³⁷ Equity ownership is another important component of the Call for Power; B.C. Hydro requires a minimum equity ownership stake of 25% for participation in the call.³⁸ In contrast, Hydro One's Equity Partnership Model offers First Nations a "50 per cent equity stake in all new, future large-scale capital transmission line projects with a value exceeding \$100 million."³⁹

³⁵ British Columbia Utilities Commission, "Indigenous Engagement." <https://www.bcuc.com/AboutUs/IndigenousEngagement>

³⁶ British Columbia Ministry of Energy, Mines, and Low Carbon Innovation, "Clean power to electrify B.C.'s future," media release, June 15, 2023. <https://news.gov.bc.ca/releases/2023EMLI0036-000941>

³⁷ "Clean power to electrify B.C.'s future."

³⁸ BC Hydro, *BC Hydro 2024 Call for Power: November Engagement*, 23. <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/independent-power-producers/cfp-november-2023-engagement-package-b.pdf>

³⁹ Hydro One, "Hydro One Indigenous Partnerships." <https://www.hydroone.com/about/regulatory/hydro-one-indigenous-partnerships>

Advance notice that participation is required as part of an upcoming call for proposals gives developers and communities the opportunity to begin building relationships and co-developing project scope. Project, proposal, and funding timelines should factor in time at the beginning of the process to seek collective agreement between proponents and partner communities and implement all aspects of UNDRIP’s Free Prior and Informed Consent requirement; governments, regulators, and utilities should participate in these early-stage conversations as well to reduce approval timelines once this consensus is reached.

Communities must also be provided with the resources needed to engage with developers when they are approached, which could look like funding earmarked for community capacity building, legal support, or dedicated clean energy project positions within community governments and/or regional Indigenous organizations. The PLACE model, based on community development approaches in Fogo Island, Newfoundland,⁴⁰ is a framework that can be applied in renewable energy development partnerships to engage community leadership, incorporate local knowledge, build capacity, evaluate available community resources, monitor and report shared project benefits, and connect communities with the business side of the project to align objectives throughout the process.⁴¹

2B.3. What mechanisms are most effective at ensuring Indigenous communities can fully participate in financing and equity ownership of electricity projects in their territories, and what gaps are there in existing policies, programs, and other mechanisms?

Lending institutions can be unfamiliar with Indigenous business models and financial behaviour and therefore consider lending to remote communities as higher risk. As a result, Indigenous governments and businesses often receive high-interest loans, creating barriers to access to capital.⁴² Policies that can address these barriers include:

- **Independent Power Producer (IPP) policies** that define how power purchase agreement (PPA) rates are set, helping communities secure fair rates that strengthen their business case and demonstrate to lenders that the project will provide guaranteed cash flow.

⁴⁰ Natalie Slawinski and Wendy Smith, “Rebuilding community through social innovation,” *Cambridge Social Innovation Blog*, February 6, 2019. <https://socialinnovation.blog.jbs.cam.ac.uk/2019/02/06/rebuilding-community-through-social-innovation-a-place-model/>

⁴¹ Curtis Whelan, *Community Benefit Sharing Study: Final Report* (Nunavut Nukkiqsautiit Corporation, 2022), 3. https://static1.squarespace.com/static/5f3d74b4a9dcb80048638a3f/t/6244b4de59d73e373f24c28f/1648669948168/2022-03-30_NNC+Community+Partnership+Study.pdf

⁴² Katarina Savic, *The case for investing in clean energy in remote communities* (Pembina Institute, 2022), 5. <https://www.pembina.org/reports/case-for-investing-in-clean-energy-in-remote-communities.pdf>

- **Grants**, such as through the Wah-ila-toos program, are essential for funding capacity building, research, project development and construction. These programs must continue to be supported in future budgets. Grants provide essential equity funding and can also be leveraged to access other financial sources such as market capital, individual investors, or government loans.
- **Indigenous loan guarantees** where government steps in to make lenders whole in case of a default. Such a program was promised in the fall economic statement and announced in Budget 2024, but the details are still unclear.
- **Low interest debt financing** provided by the government to increase access to private capital.

Even with these potential solutions, some gaps remain.

2B.4. What additional organizations or initiatives should the Council look to for learning or to source best practices, either in Canada or internationally?

Nunavut Nukkiksautiit Corporation’s “Community Benefit Sharing Study”⁴⁵ and Indigenous Clean Energy’s “Waves of Change” report⁴⁴ provide valuable insights. These organizations should be looked to for best practices. The Pembina Institute’s Renewables in Remote Communities resources,⁴⁵ particularly *The case for investing in clean energy in remote communities* report⁴⁶ and the Fair and Inclusive Rates (FAIR)⁴⁷ initiative, may also be of use.

⁴⁵ Curtis Whelan, *Community Benefit Sharing Study: Final Report* (Nunavut Nukkiksautiit Corporation, 2022), 3. https://static1.squarespace.com/static/5f3d74b4a9dcb80048638a3f/t/6244b4de59d73e373f24c28f/1648669948168/2022-03-30_NNC+Community+Partnership+Study.pdf

⁴⁴Indigenous Clean Energy, *Waves of Change* (2022). <https://indigenoucleanenergy.com/wp-content/uploads/2022/06/ICE-report-ENGLISH-FINAL.pdf>

⁴⁵ Pembina Institute, “RIRC Resources.” <https://www.pembina.org/rirc/resources>

⁴⁶ Katarina Savic, *The case for investing in clean energy in remote communities* (Pembina Institute, 2022). <https://www.pembina.org/reports/case-for-investing-in-clean-energy-in-remote-communities.pdf>

⁴⁷ Pembina Institute, “Fair and Inclusive Rates.” <https://www.pembina.org/rirc/fair>

Attracting capital investments to clean electricity projects and maintaining affordability for consumers

3.1 What are the policy, regulatory, and other conditions that would lower the capital costs (including risk capital) for clean electricity projects?

As the electricity system grows to facilitate electrification, so do opportunities for cost savings through economy of scale. The best way to harness these savings is through the development of Competitive Renewable Energy Zones (CREZ): areas with high renewable energy potential serviced by high-capacity transmission lines. The Texas CREZ initiative, begun in 2005 and completed in 2014, is a good example of how forethought and planning can reduce both cost and risk for investors. The Public Utilities Commission of Texas identified five areas as CREZ and requested the state’s grid operator to develop transmission plans to connect them.⁴⁸ With transmission capacity already built, developers could secure funding for generation projects more easily, and the concentration of generation in specified areas increased economies of scale by minimizing the need to build many, smaller transmission lines.

Policies enabling organizations to directly purchase clean energy from suppliers can drive down the overall cost of projects by aligning sustainability goals with renewable energy development. As of January 2024, over 400 organizations have committed to using 100% renewable energy.⁴⁹ In jurisdictions like Alberta, these organizations are able to purchase wind and solar energy directly from suppliers through long-term power purchase agreements (PPAs) at a fixed unit price, thereby securing a supply of clean energy. In turn, these long-term commitments provide developers with secure, stable revenue that can unlock favourable project financing. As of January 2024, over 3.3 GW of renewable energy capacity has been purchased through PPAs in Alberta.⁵⁰ Currently, however, direct procurement is only possible in Alberta. While some other provinces have progressed towards allowing it, including Nova Scotia through the Green Choice Program, expanding policy structures to more jurisdictions will help drive low-cost clean energy development across Canada.⁵¹

⁴⁸ Warren Lasher, *The Competitive Renewable Energy Zones Process*, ERCOT, webinar, August 11, 2014, 4. https://www.energy.gov/sites/prod/files/2014/08/f18/c_lasher_qer_santafe_presentation.pdf

⁴⁹ Climate Group RE100, “RE100 Members”. <https://www.there100.org/>

⁵⁰ Business Renewables Centre-Canada, “Deal Tracker”. <https://businessrenewables.ca/deal-tracker>

⁵¹ Nova Scotia Green Choice Program. <https://novascotiagcp.com/>

3.2 What can governments do to support creating a competitive investment climate for the electricity grid in Canada and attract sufficient private capital to fund the electricity grid's decarbonization and expansion?

Virtual Power Purchase Agreements (vPPAs) have helped to accelerate RE development and bring in private capital, having drawn almost \$6 bn in Alberta since 2019. Many U.S. States follow this approach, and other provinces in Canada can do similarly. Nova Scotia recently launched the Green Sleeve Program and Ontario's PPA Pilot are notable examples. B.C., Quebec, and Saskatchewan would benefit from enabling vPPAs as they all seek to grow their wind and solar generation assets.

Currently, electricity generation is included in the federal Output-based Pricing System (OBPS) and other industrial carbon pricing systems despite not being necessarily emissions-intensive nor trade-exposed. Electricity should be fully exposed to the carbon price in order to make investment in non-emitting electricity generation more competitive. This exposure could be accomplished by removing electricity from industrial carbon pricing systems across the country or by reducing electricity's emissions intensity benchmarks to 0 t/MWh by 2035.

The CREZ concept mentioned previously can also support a competitive investment climate. Transmission is often the most time-consuming part of a generation project in terms of regulation, planning, and construction. Having transmission already in place to service CREZ reduces the timeline of generation projects and therefore reduces investor uncertainty.

Contracts for difference, or some other guarantee on future carbon prices, would also increase investor confidence in the Canadian energy sector. Contracts such as those offered by the Canada Growth Fund should be expanded to more projects. However, more federal and provincial/territorial collaboration on carbon contracts for differences, or similar, is needed given their shared jurisdiction over industrial carbon pricing. Canada also urgently needs to follow through on its proposed investment tax credits that are relevant to electricity, especially for clean electricity generated by public and private entities, clean technology implementation, and CCUS.

3.3 What policies, programs, or other structural changes would support affordable and competitive electricity rates for all Canadians and businesses?

Increasing intertie capacity between jurisdictions would help balance the strengths and weaknesses across the provinces. The benefits of these connections are especially high between regions with high coal and natural gas use and those with hydro resources.⁵² For example, more British Columbia–Alberta interties would support increased investment in wind and solar in Alberta and increase grid reliability by balancing variable energy generation with dispatchable, non-emitting power from hydro resources like Site C. Alberta would also benefit from reduced overall system costs by avoiding the need to build more peaking capacity. British Columbia would earn money from exports during peak periods and get the opportunity to purchase cheap wind power from Alberta during other times.⁵³ Dividing the costs of these kinds of interties should be done such that each province or territory’s contribution reflects their share of the project’s benefits. Additional market and regulatory design strategies may also be needed to compensate investors in deregulated markets whose economic prospects are affected by new intertie development.

Changes to the utility business model would also support affordable and competitive rates. Currently, utilities using the Cost-of-Service business model are incentivized to favour new infrastructure with high capital costs to earn a rate of return, and a lack of data transparency in ratemaking procedures can make it difficult for regulators to evaluate the utility’s assessment of alternative options. The cost of this infrastructure is then passed on to customers through rates. Alternative models like performance-based regulation that encourage utilities to pursue cost-effective outcomes that align with regulator priorities – whether those priorities are reliability-based, emissions reduction-based, financial, or social – can help lower rates.

Regulations could also be updated to allow utilities to collect payment from other utilities when they invest in solutions that benefit multiple service areas. Many new technologies can provide wider scale benefits, and their costs should be shared amongst all ratepayers who receive them. Incentivizing benefit sharing prevents grid overbuild and therefore keeps rates affordable. The Ontario Energy Board has already called for shared services to be made permissible non-distribution activities in provincial legislation.⁵⁴

⁵² Jan Gorski, Binu Jeyakumar, and Spencer Williams, *Connecting provinces for clean electricity grids* (Pembina, 2021), 5. <https://www.pembina.org/reports/connecting-provinces-for-clean-electricity-grid.pdf>

⁵³ Mark Jaccard and Blake Shaffer, “Opinion: Bridging the electricity gap between Alberta and B.C. makes perfect climate sense,” CBC.ca, December 27, 2020. <https://www.cbc.ca/news/canada/calgary/road-ahead-alberta-bc-electricity-bridge-interties-1.5848042>

⁵⁴ Ontario Energy Board, *Report of the Ontario Energy Board to Ontario’s Electrification and Energy Transition Panel* (2023), 23. <https://www.oeb.ca/sites/default/files/uploads/documents/reports/2023-07/oeb-report-EETP-20230630-en.pdf>

3.4 How can governments address the cost impact inequalities across and within electricity user groups (residential, commercial, and industrial) and provinces/territories?

With the energy transition comes a constantly shifting landscape; federal, provincial, and territorial governments should commit to jointly monitoring and ensuring electricity reliability and affordability is maintained, especially for the most vulnerable consumers. An important first step is for governments to define a threshold for unacceptable energy burden as a percentage of energy spending relative to a household's income. Currently, this threshold ranges from 6 to 10%. When providing subsidies, governments must also consider the unique situations in each household. Some households may be forgoing energy use to budget for other essentials such that they fall outside the threshold for energy poverty. For example, single-income households or those with many dependents may be at a higher risk of energy poverty. Other ways to address cost impact inequalities in residential users may include support for energy efficiency upgrades and building retrofits or reformulating bill composition with income-based rates or distribution charges.

Governments can also address cost impact inequalities between residential ratepayers by shifting some of the potential financial burden of the transition to taxpayers rather than ratepayers. While this burden may not exist if the transition is well managed and technology costs continue to drop, committing to cover some of the expense through public funds from something like the Canada Growth Fund or the Canada Infrastructure Bank will reduce perceived risk.⁵⁵ Because taxes are collected progressively, paying for some of the transition with public funding rather than through rates distributes the cost more equitably among Canadians in different tax brackets. Well-designed investment in the transition from federal public funds can also act as an equalizer across provinces facing high transition costs.⁵⁶

⁵⁵ *Electric Federalism*, 81.

⁵⁶ *Electric Federalism*, 84.

Enhancing regional cooperation to take advantage of efficient, low-cost pathways to a net-zero grid

4.1 Do you think an improvement in regional integration and cooperation is required to meet electrification and decarbonisation targets? If so, what are the advantages and/or risks of deepened regional cooperation?

Cooperation between provinces and territories is essential to meeting decarbonization targets. According to Canada Energy Regulator modeling, achieving a net zero economy in Canada by 2050 will require an additional 3.5 to 5 GW of inter-provincial transmission capacity by 2035.⁵⁷ These modelled scenarios rely heavily on carbon capture, utilisation, and storage (CCUS) technologies; intertie capacity needs will be even higher in scenarios with limited CCUS use. Increasing intertie capacity between jurisdictions would help balance the strengths and weaknesses across the provinces.

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⁵⁷ Canada Energy Regulator, “Total inter-provincial transmission capacity (Canada total)”, spreadsheet, July 2023. Received by email.

⁵⁸ Jan Gorski, Binu Jeyakumar, and Spencer Williams, *Connecting provinces for clean electricity grids* (Pembina, 2021), 5. <https://www.pembina.org/reports/connecting-provinces-for-clean-electricity-grid.pdf>

⁵⁹ Mark Jaccard and Blake Shaffer, “Opinion: Bridging the electricity gap between Alberta and B.C. makes perfect climate sense,” CBC.ca, December 27, 2020. <https://www.cbc.ca/news/canada/calgary/road-ahead-alberta-bc-electricity-bridge-interties-1.5848042>

4.2 What general approach do you think could help advance regional integration and collaboration in Canada to meet electrification needs and goals?

The federal government can use its convening powers to bring provinces with complementary electricity grids, like British Columbia and Alberta, to the negotiating table. The federal government could also support interprovincial/territorial working groups and create space for nation-wide collaboration towards decarbonizing Canada's many electricity grids. A data sharing directive similar to European Union Regulation 543/2013, which requires that some electricity generation, transmission, and consumption data be made available,⁶⁰ would also help uncover potential areas for collaboration between provinces and territories.

4.3 What specific Canadian regional planning activities would advance the ability of provinces and territories to meet electricity needs and net-zero goals? What steps are required to foster dialogue among key system stakeholders to ultimately advance these actions/solutions? What challenges would need to be overcome?

One opportunity to build cooperation among provinces and territories and support both decarbonization and electrification is through a regional grid structure, driven by member jurisdictions and supported by the federal government, and an associated regional electricity market. Regional Transmission Organizations (RTOs) are already in use in the United States, and reliability councils like the Northeast Power Coordinating Council set a framework for cross-border coordination.

Australia, where electricity is also a state rather than federal jurisdiction, adopted a National Energy Market (NEM) in response to a Commonwealth Government inquiry into improving the productivity and efficiency of the electricity industry. The market, along with its associated regulatory, commission, and operational bodies, was created over 20 years ago.⁶¹ The NEM is overseen by the Council of Australian Governments' Energy Council, which is made of Energy Ministers from each State Government as well as the Commonwealth Minister.⁶² While called the "national" electricity market, Western Australia and the Northern Territory are not connected due to their distance.⁶³

⁶⁰ European Union, *Commission Regulation (EU) No 543/2013*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52013R0543>

⁶¹ New South Wales Government, *National Electricity Law*, No 20a 1997. <https://legislation.nsw.gov.au/view/html/inforce/current/act-1997-20a#sec.5>

⁶² Paul Simshauser, *Lessons from Australia's National Electricity Market 1998-2018: the strengths and weaknesses of the reform experience* (2019), 2. <https://www.eprg.group.cam.ac.uk/wp-content/uploads/2019/08/1927-Text.pdf>

⁶³ *Lessons from Australia's National Electricity Market 1998-2018*, 3.

A similar approach could be taken in Canada, beginning with a pair of neighbouring complementary grids such as Quebec and New Brunswick, and expanding the “national” market to other provinces and territories over time. Investigating the magnitude of financial and emissions reduction benefits of implementing a regional electricity market in Canada — for both hydro-rich provinces and those with more wind and solar potential — would help motivate provincial and territorial governments to participate. These benefits include improved power reliability, lower energy costs, lower decarbonization costs, improved permitting processes, and faster displacement of emitting generation.⁶⁴

4.4 What existing or new organisation/institution(s) are best placed to advance regional integration and cooperation amongst provinces and territories, and why?

Like each provincial grid system, a regional grid structure would require a commission, a system operator, and a regulator as well as an overseeing authority. These province and territory-driven organizations would be well positioned to facilitate cooperation between participating jurisdictions as each member’s benefits are tied to the market’s shared success.

⁶⁴ Daniel Sosland and Frédéric Côté, *The Northeast Grid Planning Forum: A collaborative dialogue for enhanced coordination between the power grids of Northeast North America*, 6.

Enabling electricity sector innovations that can reduce the cost and risk of the energy transition while maintaining grid reliability and resiliency

5.1 How could federal measures (including funding) support the development of new market capabilities, regardless of the local electricity market structure? What measures should be implemented in the short, medium, and long term to drive local system changes to enhance innovation uptake at the distribution system level?

Insufficient grid infrastructure, including both transmission and distribution, is becoming a bottleneck that will only get worse as service upgrades are required to meet the demands of electrification. Federal funding should support the development of grid infrastructure in all jurisdictions. Distribution-level innovation in the short term could include standardized voluntary demand-side management programs like the emergency grid alert received by Albertans on January 13th during an extreme cold event. In response to the alert, Albertans reduced their electricity consumption by approximately 400MW. In the medium term, federal funding can support distribution-connected batteries, DERs, and smart metering. Long term innovation could include the creation of a distribution system operator and an automatic demand side management program that uses batteries and smart metering.

5.3 Where are the biggest gaps in electricity sector regulatory structures and policy levers in driving the development of technology innovation? Where would be effective points of intervention for the federal government?

Industrial carbon pricing systems across the country, including the federal Output-based Pricing System, currently include electricity generation. However, electricity should be fully exposed to the carbon price by removing it as a product from these pricing systems or electricity's emissions intensity benchmark should decline to 0 t/MWh by 2035. Electricity is neither necessarily emissions-intensive nor trade-exposed. Future carbon pricing equivalency assessments should also consider electricity separately from other covered sectors. By fully pricing pollution in the electricity sector, a broad price signal is sent for business decisions, including innovation agendas, that reduce electricity system greenhouse gas emissions.

Regulators need to have decarbonization goals and milestones built into their mandates. The emphasis on economics and reliability in regulator mandates, and regulators' resulting low appetite for risk, creates uncertainty for utilities whether proposals for new technologies will be approved. The common Cost-of-Service business model, which favours investment in traditional infrastructure with high capital costs, also disincentivizes utilities from pursuing innovative solutions and technologies. In provinces where regulators have implemented sandbox programs to support innovation, many of the pilot projects struggle to scale up after they leave the sandbox.

The federal government can also help to promote mission-oriented innovation in this space by helping to establish planning standards. For example, both technology deployment and climate vulnerability (e.g., severe weather impacts) are marked by uncertainty. More guidance on best practices for addressing these uncertainties through robust and adaptive planning approaches can help to accelerate innovation development and deployment.⁶⁵ These planning activities can also support regulators as they begin to consider longer-term decision making towards 2050 emissions targets.

5.4 What methods, policies, and programs should be implemented to support greater customer participation in the electricity grid (including by local and Indigenous communities), and foster social license for and ensure benefits from electricity investments in Canada’s net-zero transition?

Community Benefit Agreements (CBAs) can be used to support greater customer participation in the electricity grid and ensure the benefits of electricity investments are shared fairly with the communities impacted by them.⁶⁶ CBAs, which are negotiated between project proponents and communities, can help secure community buy-in and foster social license for developments. In British Columbia, the Community Benefit Agreement Framework stipulates that public sector infrastructure projects include Community Benefits Agreements that create provisions to maximize apprenticeship opportunities, focus on priority hiring of women, Indigenous peoples and community residents, coordinate worker access to training programs, create hiring flexibility for contractors, and put in place prevailing wage requirements for employees to promote good working standards.⁶⁷ These provisions give community members the opportunity to become involved in their local electricity system.

Implementing demand response programs along with smart metering and providing electricity customers with the tools and knowledge to take advantage of them is another way to incentivize participation in the grid, while also securing valuable flexibility resources.

⁶⁵ Anna M. Brockway et al., “Climate-aware decision-making: lessons for electric grid infrastructure planning and operations,” *Environmental Research Letters* 17 (2022), 11. <https://iopscience.iop.org/article/10.1088/1748-9326/ac7815>

⁶⁶ Megan Gordon and Alex Callahan, *A Sustainable Jobs Blueprint, Part II: Putting workers and communities at the centre of Canada’s net-zero energy economy* (Pembina, 2023), 89. <https://www.pembina.org/pub/sustainable-jobs-blueprint-part-ii>

⁶⁷ British Columbia Office of the Premier, “New framework ties major projects to benefits for workers and communities,” media release, July 16, 2018. <https://news.gov.bc.ca/releases/2018PREM0057-001406>

5.5 What innovative approaches to working should be adapted to enable our scarce resources to deliver on the energy transition objectives. How do we create practitioners in all the needed skills in a reliable, rapid, and scalable manner? How do we organize our currently siloed expertise to be able to better capture and imbed learnings into subsequent projects?

As noted in the EAC’s interim recommendations, job shortages and demand for workers in clean electricity create dual challenges when it comes to right-sizing the future workforce for jobs needed to facilitate grid decarbonization. Workers are needed to support power generation, installation, and construction of transmission infrastructure, and to work in utilities and systems operations and we expect increased demand for electricians and other electrical workers.

Youth moving throughout elementary, middle, and high school will be the workers of tomorrow – and they need to understand what options are available to them and how to enter education pathways that lead to decent, sustainable jobs. Electricity Human Resources Canada notes that most core occupations in the electricity sector require at least grade twelve math and sciences. Thus, maintaining interest in these subjects from a young age is critical to ensuring current and future skills demands are met. An intergenerational, future-focused approach to training and education is required to meet human resources demands in the electricity sector over the long term.

Regulations like the CER are essential in driving the clean electricity transition. However, Canada is missing a plan for workers. Alongside new regulations like the CER, clear labour market data is needed regarding the number of trained electricians, powerline technicians, construction tradespeople, operators, and other specific jobs required to enable a clean energy grid. Policymakers must also consider the kind of complementary policy measures needed to realize the potential for clean economy jobs to be good, unionized jobs, and ensure training pathways and resources are available so Canada’s workforce is able to implement new projects safely and efficiently. The Pembina Institute’s recent [Sustainable Jobs Blueprint](#) provides further insight into the leadership role the federal government can take to bolster workforce development plans.

Conclusion

In closing, we would like to express our gratitude for the opportunity to share our recommendations with the Electricity Advisory Council. Decarbonization-aligned provincial and territorial energy roadmaps, interjurisdictional grid connection and coordination, early public engagement, and respectful consultation and relationship building with Indigenous communities will support nationwide progress towards a net-zero economy by 2050. Revising of the Cost-of-Service utility business model and the exclusion of the electricity sector from industrial carbon pricing systems will also help to drive investment and innovation towards low-carbon solutions. Thank you for the opportunity to provide written comments on the barriers and solutions to a net-zero grid in Canada. We look forward to continued engagement in this issue.