

May 12, 2023

*Submitted electronically through the
Environmental Registry of Ontario*

Mr. Steen Hume
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Dear Assistant Deputy Minister Hume:

The Electricity Distributors Association (EDA) appreciates the opportunity to provide comments on [ERO 019-6647 IESO Pathways to Decarbonization Study](#) (P2D).

The EDA represents local hydro utilities in Ontario, the part of the electricity system that is closest to customers. Ontario's local hydro utilities are on the front lines of power and work to keep our electricity system safe, reliable, and affordable for households, small businesses, farms, commercial, and industrial customers. Because local hydro utilities (or "local distribution companies" or LDCs) are so close to our customers, the EDA is a crucial source of information and helpful advice to governments—and we are essential partners in delivering on energy policy.

The EDA applauds the Government of Ontario's recognition that Ontario's electricity system is evolving and must continue to move towards flexible and non-emitting sources of supply. We support the government's vision for a clean energy grid that promotes electrification, attracts investments, and creates jobs. Our member LDCs are committed to ensuring a safe, reliable, resilient, and affordable distribution system for their customers. The energy transition is underway in Ontario; sectors and systems that traditionally use fossil fuels are actively considering the switch to electricity for powering vehicles, buildings, and industrial processes. Households and businesses are increasingly interested in environmental goals related to beneficial electrification. LDCs are ready and willing to support their customers in this historic endeavour.

The EDA believes that a central no-regrets decision has been overlooked in P2D, namely the investment in Ontario's electricity distribution infrastructure required to support electrification. This is a missed opportunity because most of Ontario's electricity customers are distribution-connected. These end users—homes, farms, and businesses—who are ready, willing, and expected to reduce their carbon emissions by switching to electricity have been, quite literally, left out of the loop.

We recognize that P2D acknowledges that it only considers transmission and generation costs to align with the IESO's scope of the bulk energy system, but doing so renders the study insufficient and incomplete. Not analyzing and consequently not quantifying the impacts of the energy transition on Ontario's distribution infrastructure obscures important upstream impacts of local

non-wires alternatives (NWAs), which could defer or avoid costly capital infrastructure investments in generation and transmission capacity.

We note that P2D’s cost analysis includes a 25% contingency for both capital investment and annual system costs, “to capture out-of-scope costs (e.g., the build-out of distribution infrastructure, which will be considerable under the Pathways scenario.)”¹ Distribution infrastructure investments should not be considered “out-of-scope” when the load is expected to more than double due to electrification. It should instead be contemplated prior to, or at the very least, simultaneously with generation and transmission investments. The technologies for short, medium, and long-term solutions are available at the distribution level today. They have enormous potential, and consequently must be given appropriate consideration to enable investments soonest.

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1. *The IESO’s Pathways Study recommends streamlining regulatory, approval and permitting processes, citing that it can take five to 10 years to site new clean generation and transmission infrastructure.*

What are your thoughts on the appropriate regulatory requirements to achieve accelerated infrastructure buildout? Do you have specific ideas on how to streamline these processes?

Any new clean generation and transmission infrastructure in Ontario would most likely require commensurate expansion of, and/or upgrades to, the province’s distribution system infrastructure. Consequently, we would like to take this opportunity to discuss the appropriate regulatory requirements to accelerate **distribution** infrastructure buildout.

We recognize that the OEB is the economic regulator of Ontario’s electricity distribution sector, and that this consultation on the IESO P2D study focuses on bulk system needs, which is the IESO’s area of jurisdiction. However, the inextricable nature of the transmission and distribution systems, particularly in the context of electrification and the energy transition, requires our responses to this consultation’s questions to include references to the OEB’s regulatory frameworks. Any pathway to decarbonization must include the touchpoint with Ontario’s customers—the vast majority of whom are distribution-connected. Consequently, the discussion of regulatory frameworks requires thoughtful coordination and collaboration across Ontario’s government agencies responsible for bulk and local energy systems, so that regulatory changes are aligned to achieve meaningful outcomes.

Bidirectional power flows

To harness more of the economic potential of vehicle-to-building, vehicle-to-grid, and vehicle-to-X (V2B/G/X) DERs identified in the IESO’s [DER Potential Study](#), **the OEB would need to update its policies, codes, and guidance to include two-way power flows**. Enabling V2G would require additional distribution infrastructure investment and planning to enable two-way power flows, since the current system is designed for one-way power flows.

¹ Pathways, page 17.

Updating financing mechanisms and investment rules for LDCs, to keep pace with new technologies and business models

Currently, some LDCs may encounter challenges in accessing capital, which is needed to fund the infrastructure upgrades and expansions to accommodate the energy transition, in addition to status quo needs. LDCs need current regulatory frameworks to be updated, allowing them to invest in infrastructure to support increased demand in their service areas, and in grid resilience against climate change. Current application processes in Ontario are rife with uncertainty due to intervenor and OEB staff's primary focus on cost containment.

For example, **LDCs in Ontario do not have the regulatory approval or mandate from the OEB to invest in EV-charging infrastructure.** Section 71 of the OEB Act limits distributors' business activity to distributing energy. Consequently, EV-charging initiatives, if conducted, must be done outside the regulated business of an LDC. We note that the OEB's Electric Vehicle Integration Initiative is underway, with three workstreams to inform subsequent work to remove barriers to the integration of EVs with the electricity system.²

For LDCs to access this exception as described by the OEB's July 2016 bulletin,³ **the OEB would need to update its policies, codes, and guidance to include two-way power flows. A revisiting of the OEB Act may be a legislative approach** to provide LDCs with the flexibility and authority to own and operate EV charging infrastructure.

Resiliency needs

The resiliency of Ontario's distribution system must be considered in examining any pathway to decarbonization. As more systems and processes fuel-switch to electricity, the ability of the distribution system to withstand and recover from high-impact weather events of relatively low (but increasing) frequency becomes particularly relevant.

LDCs are on the front lines of electricity and the first call that customers make when there is an unscheduled power outage. Besides taking the responsibility of communicating to their customers very seriously, LDCs also bear the financial responsibilities related to extreme weather events. Unlike other sectors further upstream in the electricity industry, LDCs' revenues are not contracted, making them liable for the entire electricity bill (including all other participants in the sector) regardless of whether the customer pays. We note that the OEB consultation on [Distribution Sector Resilience, Responsiveness & Cost Efficiency](#) is underway, and we look forward to new approaches in addressing the financial impacts to LDCs due to extreme weather.

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- 2. The IESO's Pathways Study recommends beginning work on planning and siting for new resources like new long-lived energy storage (e.g., pump storage), nuclear generation and waterpower facilities.*

² <https://engagewithus.oeb.ca/ev-integration>

³ https://www.oeb.ca/oeb/Documents/Documents/OEB_Bulletin_EV_Charging_20160707.pdf

What are your expectations for early engagement and public or Indigenous consultations regarding the planning and siting of new generation and storage facilities?

We have no comments to provide on this question at this time.

- 3. The IESO's Pathways Study shows that natural gas-fired generation will need to continue to play an important role in the system for reliability in the short to medium term. The IESO's assessment shows that most of the projected Ontario demand in 2035 can be met with the build out of non-emitting sources, but some natural gas will still be required to address local needs and provide the services necessary to operate the system reliably.*

Do you believe additional investment in clean energy resources should be made in the short term to reduce the energy production of natural gas plants, even if this will increase costs to the electricity system and ratepayers? What are your expectations for the total cost of energy to customers (i.e., electricity and other fuels) as a result of electrification and fuel switching?

Additional investment in conservation and demand management (CDM) should be made as soon as possible, as a long-term enduring component of energy planning in Ontario. This will not increase costs to the electricity system at the rate that natural gas plants or other types of generation and storage would. CDM programming led by LDCs can be activated more quickly, delivering energy savings to address the supply gap sooner than new energy infrastructure projects could deliver energy. LDCs have delivered CDM results on time and on budget for over a decade.

In the context of decarbonization, CDM is a unique resource because it is the only tool that truly eliminates carbon from the system, without needing to replace a non-clean energy source with a clean one. "The cheapest generation to build is the generation we don't have to build," in Minister Smith's words. From an economic competitiveness perspective, the ability to prudently use energy in the face of electrification will put Ontario in a much more attractive position for foreign direct investment, further bolstering Ontario's clean manufacturing advantage.

For more details on CDM, please see our answer to question 6 below.

- 4. The IESO's Pathways Study highlights emerging investment needs in new electricity infrastructure due to increasing electricity demand over the outlook of the study. The IESO pathway assessment illustrates a system designed to meet projected demand peaks almost three times the size of today by 2050, at an estimated capital cost of \$375 billion to \$425 billion, in addition to the current system and committed procurements. Please see supporting materials for illustrative charts on capacity factor and cost by resource type.*

Are you concerned with potential cost impacts associated with the investments needed? Do you have any specific ideas on how to reduce costs of new clean electricity infrastructure?

We are concerned that these potential cost impacts (in the range of \$375 billion to \$400 billion) do not include the needs of the distribution system. Given that load is expected to more than double due to electrification, significant LDC planning and investments will be necessary, and need to be costed beyond a line item within the 25% cost contingency.⁴ Although the IESO's mandate is centred on bulk system needs, Ontario distribution infrastructure investments need to keep pace with the energy transition and electrification, so that Ontario's homes, farms, businesses can access the outputs of additional generation and transmission. Although there are some customers that are directly connected to the transmission system (e.g., large industrial facilities), most of Ontario's customers get their electricity through their LDC. Optimizing Ontario's distribution infrastructure through non-wires alternatives (NWAs) would defer or avoid upstream capital investments.

Some of our specific ideas on reducing costs of bulk and distribution systems' infrastructure upgrades to support additional energy use resulting from electrification include:

- A common set of assumptions provincewide about the load impacts of electrification, to prevent over- or under-building of distribution system infrastructure, which LDCs could then use as a consistent starting point to quantify the costs and timelines investments needed to accommodate the energy transition in their service area, including rate impacts, plus funding and/or other support for LDCs to carry out those studies.
- IESO and OEB coordinating to align on CDM policy, including revisiting the OEB's Conservation and Demand Management Guidelines for Electricity Distributors (OEB CDM Guidelines). Currently the guidelines are very limited and do not permit LDCs to meaningfully undertake CDM projects as a non-wires alternative (NWAs), which they are required to explore. This is because the OEB CDM Guidelines:
 - Have a high materiality threshold
 - Do not account for provincial/bulk system benefits
 - Provide LDCs to be reimbursed when they rebase, which only happens every ~5 years, thus resulting in cashflow implications.
- Explore the potential of optimizing behind-the-meter (BTM) generation, to harness the potential of DERs and their aggregations by fully considering and implementing the Total Distribution System Operator (TDSO) Model, allowing DERs to participate as a resource in the IESO Administered Markets (IAMs). For more details, please see our response to question 9.

5. *The IESO's Pathways Study recommends that for a zero-emissions grid by 2050, investment and innovation in hydrogen (or other low-carbon fuels) capacity could be required to replace the flexibility that natural gas currently provides the electricity system.*

Do you have any comments or concerns regarding the development and adoption of hydrogen or other low-carbon fuels for use in electricity generation? What are your thoughts on balancing the need for investments in these emerging technologies and potential cost increases for electricity consumers?

⁴ Pathways, page 17.

In January 2021, we responded to ERO 019-2709 “Ontario’s Low-Carbon Hydrogen Strategy Discussion Paper.” [Our comments:](#)

- expressed our support for the development of Ontario’s first-ever hydrogen strategy.
- proposed slight revisions to the vision statement, highlighting the need to work in partnership with Ontario’s energy sector stakeholders and improving the reliability and affordability of Ontario’s electricity system.
- emphasized hydrogen’s potential to be used as an energy storage resource, with the ability to help balance electricity supply with the use of hydrogen energy storage technologies as a definition and measure of success.
- explained that hydrogen storage can be a part of the solution to alleviate some of the anticipated capacity shortfall.
- identified cost-effective way to support hydrogen in Ontario by harnessing surplus energy being produced from existing industrial processes and power generation facilities.
- indicated our support for hydrogen as an alternative fuel source for buses.

6. *The IESO’s Pathways Study recommends greater investment in new non-emitting supply, including energy efficiency programs.*

Following the end of the current 2021-2024 energy efficiency framework how could energy efficiency programs be enhanced to help meet electricity system needs and how should this programming be targeted to better address changing system needs as Ontario’s demand forecast and electrification levels grow?

CDM and energy efficiency (EE) are a reliable and effective non-emitting resource in Ontario’s energy toolbox.

In October 2022, the EDA released a position paper on CDM, [The Power of Local Conservation](#), which recommended that “LDCs be provided access to funding that enables their direct, self-initiated contribution to customers’ energy and climate goals, where cost-effective and support of provincial, regional, or local electricity supply needs.” It reviewed LDCs’ extremely successful track record of delivering CDM in Ontario for over a decade, including during the Conservation First Framework which was the most cost-effective CDM framework in Ontario’s history. “In the first three years of the framework, needed savings were achieved by Ontario’s families and businesses, while reducing peak demand by 648 MW—enough to supply power to 100% of London Hydro’s customers on the hottest day of the year.⁵ It is also equivalent to the capacity of the Halton Hills gas generation station, one of the largest gas fleets in Ontario, at a fraction of the operating costs.⁶

The position paper included a proposal for LDC-led CDM which would result in a 1,934 MW reduction of power from the grid, with a budget of \$2 billion over 10 years—representing a rate that is 10% less than the IESO’s Local Initiatives Program (LIP) currently in market.

⁵ Data provided in OEB 2019 yearbook of electricity distributors.

⁶ OEB Regulated Price Plan Price Report November 1, 2021 to October 31, 2022 identifies that gas-generators contribution to RPP is 12.5¢/kWh

In February 2023, the IESO and 11 LDC representatives formed a CDM Working Group (CDM WG). We are optimistic that this timely dialogue will yield positive outcomes for LDCs to have a foundational role in Ontario's CDM programming.

We envision LDC-led CDM programming to be:

- An enduring component of Ontario's energy mix, without short-lived horizons that characterized previous CDM frameworks, and consequently stunted deeper and more meaningful retrofits of commercial and industrial customers.
 - Centred on a LDCs' key strength, which is their longstanding relationships with, and detailed knowledge and understanding of, their customers of all types (residential, commercial, industrial).
 - Recognized and remunerated for its local, regional, and bulk system benefits. As mentioned earlier, DERs and NWA— which includes CDM— have trickle-up benefits by deferring or eliminating poles and wires investments at the transmission and generation levels.
 - Streamlined and cost-effective, with minimal administrative burden for LDCs and government agencies alike, to maximize the availability of programs to electricity customers provincewide.
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7. *The IESO's Pathways Study includes a scenario for over 650 MW of new large hydroelectric capacity to meet system needs in 2050.*

A recently released assessment estimates that there may be potential to develop 3,000 to 4,000 megawatts of new hydroelectric generation capacity in northern Ontario and 1,000 megawatts in southern Ontario.

What are your thoughts on the potential for development of new hydroelectric generation in Ontario by private-, Indigenous- and government-owned developers?

While the capital costs for hydroelectric generation may be higher than nuclear, wind, solar, and natural gas, do you support investing in large scale hydroelectric assets that may operate for over a hundred years?

We have no comments to provide on this question at this time.

8. *The IESO's Pathways Study suggest that significant transmission capacity will be needed to help balance intermittent sources of electricity (e.g., wind and solar) and to ensure cost-effective supply can be delivered to meet growing demands from electrification and economic growth.*

Transmission will also be required to balance intermittent supply with dispatchable supply (such as natural gas and energy storage) and meet demand in regions with retiring assets.

What steps should be taken to ensure that transmission corridors can be preserved and lines can be built as quickly and cost effectively as possible?

We have no comments to provide on this question at this time.

9. *Do you have any additional feedback on the IESO's "no-regret" recommendations?*

New business models for LDCs to control and operate DERs

We believe that the IESO's second group of "no-regret" recommendations regarding investing in future infrastructure and innovation is missing a reference to DERs, given that the IESO's [DER Potential Study](#) identified a large opportunity. Specifically, the IESO should continue to work with stakeholders to identify the best approach for Ontario's electricity system. We acknowledge and look forward to continuing collaboration with the IESO on the Transmission-Distribution Working Group (TDWG) and embarking on the work related to a fulsome exploration of the TDSO approach—including fully fleshing out coordination protocols.

We believe that the TDSO model represents the future state of LDCs in Ontario. Distributed energy resources represent new solutions for LDCs as NWAs to traditional distribution system investments. They are capable of providing bulk system benefits in the form of services and products such as demand-side management resources (e.g., load control, EV smart charging, etc.), distributed generation, or energy storage. A distributed model lends well to customers participating in real time markets with real pricing signals, thereby creating an environment which will promote market efficiency. **Changes to the regulatory framework are required to ensure that LDC ownership of DERs, revenues and incentives are appropriately aligned with respect to the treatment of capital and non-capital investments.** Currently in Ontario, LDCs are limited in the types of DERs they may own (e.g., an energy storage facility, or a renewable energy generation facility that does not exceed 10 megawatts.⁷) **Removing this size threshold of 10 MW would enable DERs to be scaled-up to distribution system NWAs.**

The IESO has identified significant achievable potential of DERs, specifically, that "there is ample cost-effective DER capacity to meet or exceed all incremental system needs" and that "DERs are able to satisfy a material portion of the province's energy needs—from 1.3 to 4.3 GW of peak summer demand by 2032."⁸

Given customer adoption of DERs and deployment of DERs as NWAs, the role of LDCs is expanding to include:

- Integrated distribution system planning to enable customer connections and evaluate grid expansion investments.
- New operation protocols to coordinate DERs in the distribution system.

⁷ Ontario Energy Board Act, 1998, 71 (3) (c), <https://www.ontario.ca/laws/statute/98o15#BK103>.

⁸ <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/DER-Potential-Study>, page ES-2.

These roles are similar to the functions the IESO performs at the bulk system level. The IESO is responsible for planning and procurement of resources, as well as the dispatch and operations of resources to meet real-time needs. **Therefore, to provide effective distribution services, LDCs are naturally positioned to take on the functions of a local network operator, through models such as the fully integrated network orchestrator (FINO) or TDSO.**

The TDSO model would position LDCs operating as the market facilitator in its service territory, serving as the main point of contact between DER aggregators (DER(A)s) and the IESO. This configuration would best ensure reliability and effective maintenance of the local distribution grid, while maintaining visibility at the transmission node. The TDSO model reduces the complexity of managing DERs by contracting between a TDSO and DERs/DER(A)s, while enabling DER stacking value in local distribution and wholesale markets. The hypothetical potential for a conflict of interest, or any other challenges, could be overcome through governance and oversight.

Thank you for the opportunity to comment on this proposal. We look forward to continued engagement with the IESO and other stakeholders on pathways to decarbonization in Ontario, by offering valuable LDC feedback. If you have any questions, please contact Tina Wong, Senior Policy Advisor at twong@eda-on.ca or (905) 265-5334.

Sincerely,



Teresa Sarkesian
President and CEO