July 22, 2025

Registrar
Ontario Energy Board
2300 Yonge Street
Toronto

RE: Submissions on Distribution System Operator Capabilities, OEB File No. EB-2025-0060:

The Electricity Distributors Association (EDA) represents Ontario's local hydro utilities, the part of our electricity system closest to customers. Publicly and privately owned utilities, otherwise known as local distribution companies (LDCs), deliver electricity to residential, commercial, industrial, and institutional customers, powering every community in the province. The sector owns over $33 billion in electricity system infrastructure and invests more than $3.1 billion annually in the grid.

Our members are directly impacted by the Ontario Energy Board's (OEB) consultation to consider and define a policy framework to set expectations for electricity distributors regarding the development of Distribution System Operator (DSO) capabilities.

This consultation is occurring at an inflection point in Ontario's energy planning, following significant evolution and advancement in the roles, responsibilities, and expectations on LDCs, starting with implementing smart meters and time-of-use pricing 20-years ago (including recent Ultra-Low Overnight pricing), through the implementing Green Button and providing data access to customers, connecting DERs through various programs, such as net metering, microFIT, and Feed-in Tariff (FIT) initiatives, and delivering conservation and demand management (CDM) programs. More recently, LDCs have modernized through the many OEB DER-enablement and grid modernization activities, including the Non-Wires Solutions (NWS) Guidelines, the Benefit-Cost Analysis Framework for Addressing Electricity System Needs, and the Distribution System Capacity Information Map.

Further, LDCs have been undertaking innovative, forward-looking pilots assessing different LDC models/functions as well as facilitating electrification and the energy transition, such as Alectra's York Region Non-Wires Alternative (NWA) Demonstrations, Essex Powerlines' Distribution System Operator (DSO) Pilot-Powershare Project, Hydro One's Vehicle-to-Home Project; Toronto Hydro's Benefit Stacking Pilot Project, and Hydro Ottawa's Electric Vehicles Everywhere Project.

The above illustrates that over the last two decades, Ontario's LDCs have consistently, continuously and substantially modernized their systems, structures, and expertise in response

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to government policy initiatives, regulatory requirements, and evolving customer preferences. That is to say, ***all of Ontario's LDCs*** have been travelling along the path (although at different speeds) to adopt DSO-functions, which as described in the OEB's materials: "is an entity with advanced capabilities to integrate, manage and optimize DERs for distribution and wholesale market services. DSOs actively manage distribution systems, and the sophistication of their capabilities would evolve as system needs or DER penetration levels increase."

The EDA supports this consultation as it will build on existing capabilities and further advance the current journey of LDCs.

DEFINING OPPORTUNITIES AND OBJECTIVES

The EDA submission will focus on the "Defining Opportunities and Objectives" theme identified by the OEB. Specifically, the EDA will address the foundational and enabling grid modernization investments required by LDCs to evolve towards more advanced capabilities for actively managing their networks, including, but not exclusive to, DSO capabilities. Questions regarding grid modernization were examined in the EDA's 2024 signature policy paper, *Solving Grid-Lock: Our Vision for a Customer-Centric Energy Transition (Solving Grid-Lock)*, which argued that investments in grid enhancements and modernization are necessary to empower LDCs to introduce new programs and services for their customers while effectively managing the increasing uptake of electricity connections from customers and DERs.

To be clear, the EDA believes that grid modernization investments are essential for LDCs to effectively and efficiently manage the distribution system of today and in the future, regardless of when and what type of DSO model(s) emerge in Ontario.

A Regulatory Framework for DSOs

While the EDA does not have a preference regarding a specific DSO model, the EDA believes that this consultation should build on the extensive experience and capabilities of LDCs and focus on providing clear guidance on a regulatory framework and a roadmap that enable the continued evolution of LDCs to DSOs. This will allow the OEB to build on the work that emerged organically in response to customer actions and policy guidance. Key features include:

1. Ensuring institutional roles and responsibilities are fit for purpose: As noted in *Solving Grid-Lock*, a lack of coordination in the energy sector hinders the development of a cohesive approach to DER integration (and electrification more broadly), one which would recognize the value of DERs to the customer, distribution system, and bulk system. Further, there is a need for greater clarity on the division of responsibilities and coordination among stakeholders to advance toward new LDC roles effectively. This is vital and the consultation should establish a roadmap showing how roles and responsibilities, particularly between LDCs and the Independent Electricity System Operator (IESO) need to change to empower LDCs to embrace their evolving roles.

2. Investment Guidance: The development of a clear and integrated evaluation framework, performance metrics, and filing requirement guidelines for grid modernization investments needed to enable DSO (as well as broader LDC) capabilities is needed from this initiative. Ontario LDCs have a strong regulatory history of developing guidance and corresponding mechanisms for foundational infrastructure, such as the earlier AMI deployment, and now is the opportunity to take that further to support the adoption of foundational investments.

3. LDC Remuneration: The consultation should seek to ensure that LDCs's incentive and compensation frameworks are on evolutionary path to align with achieving DSO capabilities (e.g., incentives to pursue NWS, including local energy markets and/or programs; and, invest in digital technologies, such as cloud computing)

DSOs and Grid Modernization

The role of grid modernization investments in enabling DSO capabilities is recognized in the OEB's Discussion Paper, which, for example, states: "DSO capabilities, enabled through investments in grid modernization, can provide new ways of providing reliable and cost-effective distribution services while also enhancing opportunities for DER/As." (p. 9)

As noted, through this consultation, the OEB should seek to ensure LDCs have the policy and regulatory certainty they need to make the foundational grid modernization investments needed to best serve the emerging and evolving needs of their customers and meet Ontario's energy and economic policy objectives in a cost-effective way.

Specific to DSOs, it is important to note that Ofgem recognized the importance of enabling investments (across technology, data, and workforce) when developing its position on DSOs, noting that:

> "**DSO function delivery will be underpinned by new and extended technology, data and engineering capabilities, and associated advancements**. **The absence of these capabilities would, in the best case, hinder or limit the effectiveness of DSO functions, and in the worst case, would render DSO functions effectively non-functional**. As an example, consider the procurement of flexibility services by a DNO: this requires the technical ability to know where, when and to what degree flexibility is required. This knowledge is based on network modelling and analysis, whilst the processes of procurement and provision includes technical data capture, exchange, information technology use, telecoms, safety analyses, and integration with existing network systems. Clearly, enabling technology, data and engineering are required across these activities."[1] (emphasis added)

The EDA recommends that the OEB carefully assess the experience of the Ofgem's approach to grid modernization and DSOs to determine what learnings can be applied in Ontario,

[1] Ofgem, *Position paper – Distribution System Operation: our approach and regulatory priorities*, 2019: https://www.ofgem.gov.uk/sites/default/files/docs/2019/08/position_paper_on_distribution_system_operation.pdf

keeping in mind that grid modernization investments are required today and needed even more so in the future to manage higher DER penetration, as well as achieve greater reliability, cybersecurity, customer choice, and resilience expectations, regardless of the development of any DSO-specific attributes (e.g., local energy markets).

Foundational Grid Modernization Investments

The United States Department of Energy (DOE) has published a significant amount of research dedicated to modernizing distribution systems and grid modernization investments in order to prepare for the power grid of the future.[2] **The DOE defines foundational systems as those that "are necessary to deploy and use advanced grid solutions", i.e., the green layers (within the dashed rectangle) in the illustration below, excluding physical grid infrastructure.**

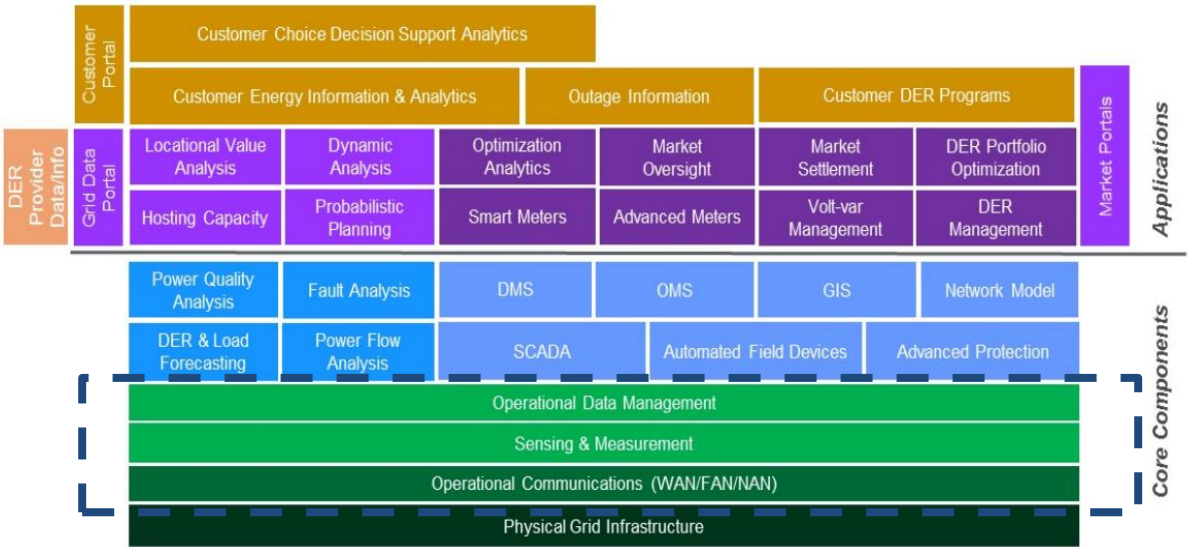

Figure 1. Department of Energy, Modern Distribution Grid, Vol. IV, June 2020, p. 59.

1. Communications Technologies

Strong, reliable, and secure communication infrastructure is required to enable reliable data transfer (information and control) across devices and systems across the distribution network (as well as between the transmitter and system operator). Infrastructure technology used typically involves a mix of various choices includes optical fibre, wireline, and wireless technologies.

A strong communication network not only allows the increasing amount of devices (in front of and behind the meter) to communicate, but also, facilitates timely communication because there are many "technology applications where time-sensitive coordination and control across

[2] For example, see: Grid Modernization Initiative: https://www.energy.gov/gmi/grid-modernization-initiative; and, Modern Distribution Grid Project: https://gridarchitecture.pnnl.gov/modern-grid-distribution-project.aspx

many devices is an important element of system function."[3] Foundational communications technologies are needed for functional networks.[4]

The DOE has stated that "Relative to other investments in grid modernization, ***operational communication networks represent the fundamental enabling technology required by all the capabilities*** described in [the] Modern Distribution Grid [series];"[5] (emphasis added) such as Dynamic Line Rating (DLR), Volt/VAR Optimization (VVO), Power Factor Correction, Advanced Distribution Management Systems (ADMS), Advanced Fault Location, Isolation, Service Restoration (FLISR), and Distributed Energy Resource Management Systems (DERMS).

2. System Digitization and Visualization

These systems, which require the underlying communications network above, includes both sensing and measurement technologies (i.e., situational awareness and system automation solutions) that detect environmental and system conditions as well as improve visibility of the existing grid and automate key processes, by providing granular data on grid conditions (including real-time data), such as Geographic Information System (GIS), Substation Automation and Digitization, Environmental sensors, Assets and Line sensors, AMI 2.0 and Advanced Supervisory Control and Data Acquisition (SCADA) systems.

This category also contains system digitization and visualization investments "that create digital replicas of physical grid components and system interactions based on inputs from advanced sensors and communications networks."[6] (For example, the Government of Ontario's Digital Twin initiative)

3. Data Management Systems

These investments relate to technologies (e.g., ADMS, AI, Outage Management Systems (OMS)) that enable systems and devices (e.g., AMI 2.0 and SCADA systems) to measure, observe, and assess the status of the distribution grid, delivering value to the grid. A utility's data management system must have the capability (i.e., a data and analytics platform) to receive and synthesize the large volume of data from the various parts of the network into usable information to support decision-making (e.g., real-term operations, control, planning, and forecasting). Data management systems also include the capability to store and retrieve historical system data.

The EDA notes that the discussion above is intended to illustrate the many examples of grid modernization investments needed as the energy system evolves and is not meant to be an exhaustive examination of what may constitute a foundational grid modernization investment in Ontario nor does it address the essential workforce development investments (i.e., any

[3] Department of Energy, Pathways to Commercial Liftoff: Innovative Grid Deployment, April 2024, p. 74.
[4] For greater detail on these different types of networks see: Department of Energy, Modern Distribution Grid, Vol. II, November 2019 (Version 2.0).
[5] Department of Energy, Modern Distribution Grid, Vol. III, June 2017, p. 57.
[6] Department of Energy (April 2024), p. 13.

necessary skills and capabilities acquisition) associated with foundational and more advanced grid modernization investments.

FURTHER SUBMISSIONS

The release of Ontario's Integrated Energy Plan (IEP), *Energy for Generations*, and the implementation directive to the OEB has provided much-needed clarity regarding the definition[7] and desired outcomes of grid modernization, which were two primary policy recommendations in *Solving Grid-Lock*. The OEB now has an opportunity to keep moving forward with greater clarity and certainty on the grid modernization investments LDCs are expected to make (e.g., Policy Recommendations (3)[8] and (4)[9] in *Solving Grid*-Lock) to meet the evolving needs of their customers.

In closing, the EDA supports the OEB's work to date on DSOs. However, the proposal and process would benefit from clarification in light of the release of the IEP and the associated implementation directive, so that a clear process, including timelines for next steps, for how the OEB will approach the government's expectations for DSOs, DERs, NWSs, and grid modernization is articulated. This is necessary given that a number of directives (including defining a roadmap for DSO capabilities) have a quickly approaching December 31, 2025 report back date, making it critical that processes contain (1) adequate opportunities for LDCs and other stakeholders to provide meaningful input (including comments on the draft report backs to the Ministry) and (2) time for the OEB to consider feedback fully, enabling the OEB to provide a more effective roadmap and greater regulatory clarity going forward.

Whether the OEB decides to integrate the various items or proceed with a parallel process, the EDA recommends that the OEB ensure that its approach does not result in siloed consultations and analysis. The process should be designed such that the work in all of these initiatives be done such that the DSO consultation is informed by the other policy initiatives/government directives and that the work on those initiatives is informed by the DSO consultation.

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[7] *The Integrated Energy Plan (Energy for Generations)* defines grid modernization as "The paced, prudent, and cost-effective use of technologies and solutions that improve the efficiency, resilience, reliability, and capacity of electricity distribution systems. The purposes of said investments are twofold: to lower long-term costs for ratepayers and to better manage the availability of electricity to meet growing demand".

[8] *Solving Grid-Lock*, recommendation #3, states, "… the Ministry of Energy should provide the OEB additional clarity on its role in advancing grid modernization to enable LDCs to move forward with achieving grid modernization and electrification objectives and their associated foundational investments. This could occur through letters of direction, regulation, and/or amendments to the OEB Act (including Section 71 of the Act, which restricts LDC business activities, and which could, for example, be amended to explicitly allow for LDCs' ownership and operation of DERs such as EV charging infrastructure and load control devices, as well as to remove the 10 MW limit for LDC ownership of renewable generation facilities). Similarly, the Ministry of Energy should provide the IESO additional clarity regarding its role in advancing grid modernization as it relates to LDCs achieving grid modernization and electrification objectives, such as enabling DER participation in the wholesale market."

[9] *Solving Grid-Lock* recommendation #4, states, "The Ministry of Energy and OEB to define clear criteria/ path for moving beyond successful grid modernization pilots to system-wide deployment (i.e., access to sustained government (federal and/or provincial) funding or rate base eligibility for next adopters)."

According to EDA's Public Opinion Research, 85% of respondents said it was important to maintain and invest in local electricity distribution grids to meet current and future demand. Views were consistent across regions of Ontario. Overall, the EDA believes the approach must recognize the critical and indispensable role of Ontario's LDCs for developing DSO capabilities, making essential grid modernization investments, facilitating DERs, and empowering customers to participate in a reliable, efficient, and affordable energy system.

Thank you for the opportunity to comment on this important matter. We look forward to continued engagement with the OEB. If you have any questions, please contact Rudra Mukherji, Senior Regulatory Affairs Advisor, at rmukherji@eda-on.ca.

Sincerely,

Teresa Sarkesian
President & Chief Executive Officer