

Distribution System Operator Capabilities – Stakeholder Consultation

AMPCO Comments July 22, 2025

Introduction

The Distribution System Operator (DSO) Capabilities consultation will develop and define a policy framework to set expectations for electricity distributors regarding the development of DSO capabilities. This is in response to the Minister of Energy and Electrification’s December 2024 Letter of Direction to the OEB that requested the OEB “develop and assess local and market opportunities for Distributed Energy Resources (DERs), including through alternative energy business models (e.g., Distribution System Operator capabilities).”

The OEB defines a DSO 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. They perform these functions with capabilities that can be considered incremental to those already undertaken by distributors. A DSO can serve multiple distributors, potentially having more opportunities to optimize DER flexibility.¹ These capabilities and activities are incremental to those currently performed by electricity distributors in Ontario.

DERs can include solar photovoltaics, combined heat and power plants, backup generators, energy storage, electric vehicles and consumer devices that can reduce or increase electricity use on demand.

The result of the consultation will be to set out expectations and regulatory requirements regarding the introduction, pacing and scope of new functions at the distribution level, including the roles of electricity distributors.

Recognizing that there are many views within the sector on the approach, form and desirable pace for DSO capability development, the OEB has stated that a priority for this work will be ensuring that the introduction of DSO capabilities and potential evolution of the distribution utility deliver optimal value to customers over time.²

¹ OEB Staff Discussion Paper May 2025 p.12

² January 28, 2025 OEB Stakeholder Consultation Letter p. 2

Background

The OEB issued a Discussion Paper³ and a consultant report by DNV⁴ in May 2025 to support the consultation. A stakeholder symposium was held June 23 and June 24, 2025. AMPCO attended the symposium. Fourteen parties presented their views on the opportunities of DSO at the symposium: Alectra Utilities, DNV Energy Insights, GridSmartCity, Hydro One, Hydro Ottawa, IESO, NODES, Ontario Association of Physical Plant Administrators, OEA, OEB, Power Advisory/PowerShare Group, Transmission-Distribution Coordination Working Group, Toronto Hydro, Uplight.

The OEB is seeking input on steps it can take to facilitate the efficient adoption of DSO capabilities in Ontario. The OEB's work is informed by:

- Expert Analysis and Advice
- Jurisdictional Scan
- Recent and Ongoing OEB initiatives
- Independent Electricity System Operator's Transmission & Distribution Coordination Working Group (IESO TDWG)
- LDC Pilots

In developing a DSO framework it's important to build on the work that's already been done. The IESO's TDWG's overarching objective is to support the IESO in developing conceptual coordination protocol(s) that detail the communications among the IESO, LDCs, and DER participants for participation in the IESO-Administered Markets.

The IESO TDWG has centred on three models for facilitating DER/A participation: Total DSO, Dual Participation DSO and Market Facilitator DSO. The OEB is building upon the work of the TDWG and puts forward these three DSO models as options.

A number of LDCs and energy service providers are testing DSO as a service.⁵

³ **OEB Staff Discussion Paper:** The paper sets out DSO opportunities and policy objectives, discusses the core regulatory considerations that DSO capabilities give rise to, and proposes an approach for moving forward

⁴ **DNV Energy Insights Report:** This report focuses on the core drivers behind the implementation of DSOs, use cases, DSO functionality and architecture.

⁵ For example Alectra, Hydro One, Toronto Hydro, Hydro Ottawa

OEB Staff Discussion Paper

The Discussion Paper proposes six rate-making principles: customer benefit, need, cost-effectiveness, flexibility, practicality, and adaptability.⁶ AMPCO supports OEB's proposed principles. DSO capabilities must promote customer value and be focused on customer benefits.

AMPCO recommends that "affordability" be added as a principle. Although Cost-effectiveness and affordability are related, they are not the same thing. A proposal can be cost-effective (providing good value) but not affordable due to high upfront costs or limited resources. The introduction of DSO capabilities must be affordable for customers.

This proposed additional principle aligns with Ontario's first Integrated Energy Plan ("Plan") - Energy for Generations which outlines the province's long-term strategy to align energy system development with economic growth, affordability and energy security.

The Discussion paper discusses DSO models⁷ defined by three main design features:⁸

1. DER/A Wholesale Market Participation Pathway: DSO role in facilitating DER/A participation in the wholesale electricity market.

Options include:

- Dual participation: no DSO role beyond technical assessments to preserve reliability.
- Market Facilitator: DSO facilitates DER/A participation in wholesale market by relaying DER/A offers to IESO.
- Total DSO: DSO participates in wholesale market by aggregating DER/A & making offers to IESO

2. Distribution Activation Mechanism: i.e., how DER/A are compensated for activation/curtailment.]

Options include:

- Rule-based: Dynamic operating limits sent to DER.
- Program-based: DER/A are compensated using pre-determined approaches or values.

⁶ OEB Staff Discussion Paper p. 50

⁷ DSO models are the possible frameworks that set out the roles, responsibilities, relationships and conduct of actors in the electricity distribution sector.

⁸ OEB Staff Discussion Paper p. 5, OEB Presentation Slide 10

- Market-based: DER/A are compensated through local flexibility markets.

3. Degree of Separation: Degree to which DSO functions are separated from conventional distributor functions.

Options include:

- No separation: DSO functions integrated within distributors.
- Functional separation: separate departments in one entity.
- Legal separation: DSO and conventional functions housed in separate legal entities.
- Ownership separation: DSO and distributor do not share a common owner.

OEB staff is of the view that legislative changes would likely be required if Ontario were to:

- Implement a Total DSO model, where an electricity distributor, as DSO, would adopt a commercial position with respect to the aggregation of DERs for participation in the wholesale market.
- Require a separate entity to serve as a DSO, distinct from today's electricity distributor; in such a case, a new regulatory regime would likely be required to provide oversight of this new class of entities.

AMPCO's Submissions

Most AMPCO members are directly connected to the high voltage transmission system controlled by the IESO and participate directly in the wholesale market. AMPCO recognizes that DSO capabilities in addition to local benefits, have the potential to provide system-wide benefits that all customers value such as meeting system capacity and reliability needs. To unlock this value, AMPCO's view is that the pace and scope of the work needs to be commensurate with the level of DERs which currently varies across the province, and customer interest and participation to avoid funding investments ahead of need and overinvesting. DNV notes that there have been challenges in European jurisdictions where market-based approaches have seen limited success, primarily due to low customer interest.⁹

The cost of a DSO model is not a fixed number. The cost will vary across LDCs depending on the model, scope, complexity, size and specific needs of the distribution system. It is not a one-size fits all. Modelling tools and software, specialized software, data collection and integration, massive data analysis and coordination, integrating the DSO model with existing systems such as SCADA, ongoing maintenance and upgrades to the DSO, staff

⁹ OEB Staff Discussion paper p. 6

training and new staffing will all add to the costs which could be significant. DNV provided a qualitative comparison of the costs and benefits of a representative set of archetypical DSO models.¹⁰ The DSO model may deliver higher or lower benefits depending on the structure of the DSO design features and functionalities.

AMPCO has concerns regarding affordability and the potential cost and impact on ratepayers if the scope of implementation at the outset is too broad, the pace is too fast, and the costs and customer benefits have not been fully assessed. AMPCO submits further quantitative evidence on costs and benefits of implementing DSO capabilities is required.

OEB Staff View

OEB Staff is of the view that Ontario can take low-regret steps to support evolving DSO models as DERs increase.¹¹

OEB Staff proposes a graduated approach to adopting DSO capabilities in Ontario. The OEB's proposal begins with DSO model design choices that reflect the existing regulatory framework, anticipated system conditions and foreseeable DER penetration levels.

OEB Staff proposes a 3-step approach:

1. Standardize the method by which distributors assess the need for DSO capabilities as a means of using DERs to help address distribution system needs.
2. Develop a simplified DSO model suitable for most circumstances expected in the nearer term.
3. Explore and develop advanced models that address more complex needs as warranted, including the development of service models where a distributor contracts for DSO services from another entity.

AMPCO strongly supports OEB Staff's evolutionary approach to developing DSO capabilities appropriate for Ontario. OEB Staff proposes a pace that addresses the timing complexity and aligns the need with predictable DER penetration levels. The current legislative framework in Ontario allows for various DSO models and DER procurement mechanisms. In AMPCO's view, the OEB does not need to choose a preferred model at this point in time or move forward with legislative changes. More upfront work is required to assess the technical requirements and establish a clear regulatory framework that defines

¹⁰ DNV Report pp. 54-62

¹¹ OEB Presentation Slide 2

the roles and responsibilities of DSOs and other stakeholders, as well as address potential conflicts of interest. This approach allows for the potential development of more advanced DSO models over time in step with increasing DER penetration levels and customer interest, needs and participation.

The views of DNV and the IESO align with OEB Staff's proposed approach.

DNV View

DNV is of the view:¹²

- The rationale for DSO capabilities would depend on system characteristics and DER penetration levels within a given area, both of which vary across the province.
- There are low-regret steps that Ontario can take to facilitate DSO capability adoption and provide a foundation for more advanced DSO models to evolve as DER penetration levels increase.

IESO View

With respect to DSO capabilities, the IESO is supportive of the development of DSO capabilities and associated grid modernization investments required to enhance the planning, procurement, and operation of DERs for distribution system services (i.e., DERs as distribution non-wires solutions). The IESO is committed to collaborating with DSOs to enable pathways for these DERs to also provide and be compensated for additional services to the bulk system (e.g. energy, capacity, transmission deferral, etc.) where appropriate.¹³

With respect to the OEB's graduated approach to adopting DSO capabilities, the IESO supports the OEB's proposal beginning with a simplified model that reflects the existing regulatory framework.

The IESO also states that the distribution-level procurement mechanism and the administrative costs should be commensurate with the value of service provided; and there is room for continuous innovation; functions associated with more complex DSO models can be implemented as DER penetration grows, DSOs mature, and as the value propositions of more complex capabilities are validated.¹⁴

¹² OEB Discussion Paper p. 7

¹³ IESO Presentation Slide 10

¹⁴ Ibid. Slide 11

Conclusion

DSOs help integrate DERs. AMPCO recognizes that DSOs have the potential to offer benefits like improved grid stability, increased DER integration, and a more customer-centric experience. However, there are also potential challenges, including costs associated with implementing a new model and ensuring fair compensation for DERs.

OEB Staff (supported by the IESO) propose a graduated pace to implement DSO capabilities in Ontario building on the work that has already been done. AMPCO is supportive of the OEB's approach provided the regulatory framework focuses on delivering affordable customer benefits, maximizes value for customers and protects the interests of ratepayers.

AMPCO recommends that "Affordability" be added as a rate-making principle for DSOs.