



Chuck Farmer
Vice President, Planning, Conservation and Resource Adequacy
Independent Electricity System Operator
1600-120 Adelaide Street West
Toronto, ON M5H 1T1

May 3, 2024

Dear Chuck,

This submission responds to the Independent Electricity System Operator's (IESO's) invitation for feedback in relation to the Preliminary Connection Guidance document published on April 16, 2024, and the subsequent April 18, 2024, webinar (the "webinar") on the Long-term 2 Request for Proposals (LT 2 RFP).¹

Power Advisory has coordinated this submission on behalf of a consortium of renewable generators, energy storage providers, and the Canadian Renewable Energy Association (CanREA) (the "Consortium"²).

We would like to thank the IESO for the effort and analysis that went into preparing the Preliminary Connection Guidance document ("guidance document"). While the guidance document provides valuable insights into the current limitations and connection restrictions that exist in the Ontario power system for new renewable generation development, the guidance document is not sufficient in meeting the siting needs of the Consortium members.

Based on review and discussion of the guidance document and on the information presented in the webinar we have the following comments on the Preliminary Connection Guidance document and LT 2 RFP procurement process.

No Access to Geographical or System Configuration Data

In terms of readability and layout, the guidance document provides a helpful overview of the methodology and very high-level conclusions of the analysis. However, there is significant missing information that makes the guidance information very limited in its utility.

First, the IESO has not published or provided an ability for proponents to view a complete transmission system map and/or single-line diagram (SLD) for the Ontario power system that includes circuit names and locations. This is an erroneous shortfall and must be remedied immediately. If sharing sensitive information is the concern, the IESO should establish a non-disclosure agreement process that allows registered proponents to access the system data for their analysis and siting requirements. The IESO is an outlier compared to majority of other ISOs including:

- BC Hydro

¹ See <https://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/long-term-rfp/lt2-rfp-20240404-engagement-presentation.pdf>

² The members of the Consortium are: CanREA; Axium Infrastructure; BluEarth Renewables; Boralex; CarbonFree Technology; Connor, Clark & Lunn; Cordelio Power; EDF Renewables; EDP Renewables; Enbridge; ENGIE; Evolugen (by Brookfield Renewable); H2O Power; Kruger Energy; Liberty Power; NextEra Energy Canada; Northland Power; Pattern Energy; Potentia Renewables; RES; and wpd Canada.



- High-level SLD
- Detailed SLD
- Geographic map with circuit and station names - This map allows proponents to determine a site and the surrounding transmission network by name.
- Alberta
 - Grid capability maps for new renewable generation
 - Interactive Transmission Capability Map - This tool includes an ability to click on each individual transmission line and show the circuit name, voltage, and connection capacity estimate.
 - 2022 SLD
- Manitoba
 - Distribution capacity map
- ISO-NE
 - SLD - a higher resolution map is available using CEII access.
 - Geographic map - combined with SLD map, proponents can determine circuit names and locations.
- PJM
 - Detailed interactive system map - requires login for PJM; offers detailed system information for siting and analysis.
- All of US
 - DOE Electricity Infrastructure Map - map shows all generation and transmission infrastructure across the US.

Second, the information is shared only through a single PDF document. There is no database of all transmission circuits and transmission stations for Proponents to assess potential connection capability constraints including circuits that face multiple restrictions. A centralized, accessible, and downloadable tool is needed to support the significant capital deployment that the IESO is expecting from proponents.

Finally, the maps in the guidance document show general areas for short circuit limitations and congestion concerns. It is not clear how close to the shapes on the map a project can be sited before being confronted by the limitations listed by the IESO. An interactive map (similar to the maps used by the Ontario Power Authority during the Feed-In Tariff (FIT) Program) should be provided so proponents can determine exact siting restrictions or limitations.



Overly Conservative Analysis

The guidance document appears to be overly conservative on the assessment of connection challenges and limitations for new renewable generation development under LT2. For example, the analysis only considers minimum demand in 2030 as part of the analysis; however, the facilities will be operating for 20 years under contract and potentially another 10-15 years further post-contract. For area and circuit congestion this is short-sighted and could eliminate cost-effective projects due to early year congestion limitations. Another example is the assumption of significant gas-fired generation being dispatched under minimum loading conditions and high renewable generation output. This assumption seems illogical particularly given the amount of installed hydroelectric generation in the province. Yet another example is the lack of any estimate of connection capability for new transmission circuits expected to come into service by 2030. The IESO has initiated over \$7 billion of bulk transmission expansion of which none is available for connection from new resources. While the guidance document is helpful in showing the conservative viewpoint, the development of new resources requires an understanding of the scale and spectrum of connection risks and therefore a less conservative view is required that demonstrates how proponents could balance connection risks, and their associated costs, with other project components (e.g., resource potential, community design considerations, etc.).

Need to Consider System Upgrades and Expansions with Connection of New Resources

The guidance document does not seem to consider investments by new generation to upgrade, reinforce, or expand the existing transmission system as part of their project development. The IESO is seeking 2,000 MW of new renewable capacity through LT2. This capacity procurement represents ~5% increase in the installed capacity in Ontario. When considering E-LT/LT1/LT2/LT3/LT4, a roughly 25% increase in installed capacity is anticipated within a 5-year timeframe. That significant change in new resources connected to the Ontario power system will require investment in the transmission system; some of which will be incorporated into project economics and funded by the project proponent.

A critical part of the IESO's procurement processes is assessing a project's overall cost to the system and determine the optimal mixture of transmission investment, resource costs and community support. By taking the approach that proponents will not fund any transmission system expansion or upgrades, the IESO is increasing the odds that higher costs and less community support for projects. Overall, attempting to jam new resources into only existing connection capability in the transmission system severely limits the competitiveness and cost-effectiveness of the Long-Term procurements.

Unreasonable circuit connection limits

The IESO has stated expected limitations on circuits by transmission operating voltage (e.g., 30 MW for 115kV circuit, 100 MW per 230 kV circuits in the north, and 150 MW for 230 kV network circuits in the south). These values are significantly below industry norms and would result in many undersized projects throughout the province. This would lead to higher costs for Ontario ratepayers through less economies of scale and higher proportional connection costs. Given the size of the LT2 procurement target and the desire to secure cost-effective new resources; the IESO must consider how larger sized projects can connect to the Ontario power system.

The circuits to avoid list in the guidance document includes over 150 transmission circuits. There are no details on the severity of each circuit relative to others on

the list. Further, there is no discussion on what is the constraining element of the circuit that could be addressed as part of a project's connection process. Many of the circuits listed stretch for over 50 km and may not be as restricted at all points along the line. The IESO needs to provide more granularity on each circuit limitation particularly for long network circuits that cover a large area.

Risk of Extreme Concentration of Projects in Certain Locations and Communities

With the conservative assessment process and identified issue areas, the IESO is encouraging many proponents to develop projects in a limited number of small pockets in the province. This will likely overwhelm the communities in those areas and may lead to backlash and difficulties developing projects for LT2. For the IESO, this will challenge the ability to meet its energy adequacy requirements and could strain public engagement for new energy infrastructure.

The potential for additional agricultural land restrictions may limit development in many areas of the provinces and result in even further concentration of projects. The LT2 procurement process and any connection assessment process must recognize and balance those restrictions.

Clear Linkages of Connection Guidance, Procurement Process and LT2 Contract

Connection is a major component of new generation development; however, it must be balanced with other challenges such as community engagement and resource potential assessment. The IESO must work with proponents to help them balance complexity of connection with other issues.

It is not clear how the guidance document will link with the LT2 procurement process and with the LT2 contract provisions. For example, the IESO has not yet provided insight into how restrictive they expect the deliverability assessment test for LT2 to be. Further, the IESO has not discussed how much flexibility projects will be allowed to adjust their connection arrangement and project design during development process following contract award. The overall pictures must be shared so that proponents can understand how best to approach siting, community engagement and project design.

Potential Options for Enhancements to the Connection Guidance and Deliverability Assessment in LT2

The Consortium recognizes the challenge the IESO faces in trying to avoid awarding too many contracts in a small region of the province. For proponents, any assessment process must be simple and replicable so that a clear understanding can be determined on the potential success of each of their potential projects in the LT2 competitive procurement. The following are potential recommendations for improvement:

1. Regional Pockets for Simplified Deliverability Assessment

The Consortium recommends that the Deliverability Assessment process in LT2 divide the Ontario power system into small manageable pockets where the IESO can assign a maximum procurement target to. When awarding contracts, the IESO will offer only contracts up to that procurement target pocket limit. For example, if a pocket has

a procurement target of 300 MW, and a 120 MW project is awarded a contract, only 180 MW more can be offered to other projects in the LT2 procurement. By limiting project awards within a pocket, the IESO can ensure that the overall award group is spread across the province limiting congestion and other system limitations are not violated. Pockets that have severe connection restrictions can offer no procurement target. The guidance document, along with any further information released by the IESO, can be used by proponents to help assess the connection costs and complexity for each connection point.

2. Pre-Submission Feasibility Assessment

To appropriately incorporate the potential cost of connection and transmission system enhancements to allow a project to optimize its value to Ontario customers, a detailed feasibility study or deliverability assessment would provide critical insight into potential connection costs, design limits and fatal flaws for projects. In BC Hydro's 2024 Call for Power, there is a Competitive Energy Acquisition Process (CEAP) that includes a detailed feasibility study for each proposed projects.³ Under the CEAP process, proponents submit project information and connection location for BC Hydro to perform a feasibility study for the project. The proponent must fund the feasibility study with estimates ranging from \$40,000 to \$50,000. The results of the feasibility study are shared with the proponents prior to bid submission (~4-6 weeks prior at this point) allowing the proponent to determine which of their projects are viable and allows for the proponent to properly incorporate connection costs into the final bid price. Given the available time before the LT2 procurement is expected to operate, a similar process should be offered by the IESO to provide valuable detailed insight for proponents. While the cost of the feasibility study is higher than other preliminary assessments, it should act as a reasonable barrier to excessive requests from proponents and ensure that the IESO is not wasting resource committed to the process.

3. Conduct a Smaller Initial Procurement Earlier

A review of the guidance document indicates the potential that the IESO may not be able to incorporate all 2,000 MW into the Ontario power system when considering other restrictions such as enhanced agricultural land analysis and welcoming communities. As discussed, the IESO will also have to consider transmission system expansions and upgrades to incorporate the LT1, LT2, L3 and LT4 procurements. The IESO may be able to acquire the full 2,000 MW, but the cost could be prohibitive if attempted only using the existing transmission system capacity.

Conducting a smaller procurement earlier (e.g., submissions due end of 2024) would provide valuable information for the IESO and reduce the risk that costly projects are procured. Projects submitted and their associated prices would allow the IESO to understand what areas offer the best opportunity to extract value for customers through strategic transmission investments. Further, the lower amount of

³ <https://app.bchydro.com/accounts-billing/electrical-connections/transmission-generator-interconnections/request-ceap.html>



generation procured would limit the potential of congestion since the IESO could focus the next procurements in areas with less development or higher demand growth. Overall, an initial smaller procurement in 2024 or early 2025 offers critical benefits to Ontario and the IESO that should not be rejected at this time.

We will be pleased to meet with IESO about this submission at a mutually convenient time.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Chee-Aloy", positioned to the left of a vertical line.

Jason Chee-Aloy
Managing Director
Power Advisory

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