Memorandum

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To: **Strategic Advisory Committee**

From: Beverly Nollert, Director, Transmission Planning

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Re: IESO Business Update – Transmission Planning

This memo provides an update to members of the Strategic Advisory Committee (SAC) on the development of IESO's transmission plans. Collectively, these plans will ensure Ontario's transmission system is poised to maintain reliability, enable growth and economic development, connection of supply resources and a changing supply mix, through recommendations for additional infrastructure.

Summary:
The IESO's Annual Planning Outlook, released in April, identifies in-flight and forthcoming transmission plans based on known bottlenecks on the high-voltage transmission system[1] that require resolution to enable growth, connection of supply resources and a changing supply mix (the "planning drivers"). Six of these transmission plans are underway, and focus on large swaths of the province, including Northern, Central, Eastern and Southwestern Ontario. An additional bulk plan will be initiated in Q3 this year focusing on the Niagara area given prospective demand growth. Four of these plans will be published in 2025 and the remainder in 2026. Refer to Table 1 for details on the timing and scope of these plans.

The IESO continues to make progress on these plans, with technical findings starting to form a vision for how the Ontario transmission system will evolve. The IESO shared updates on these plans at a public engagement webinar on May 29, together with a set of future-ready

[1] These are called Bulk Transmission Plans.

transmission reinforcements which form a common backbone in various portfolios of transmission options under evaluation to enable planning drivers. This includes:

- One 500 kV transmission line between Sudbury (Hanmer TS) and Barrie (Essa TS) to support economic growth and enable supply resource connections in Northern Ontario, as well as development work for a second 500 kV transmission line between Sudbury and Barrie that may be required in the future to accommodate higher growth scenarios. This recommendation is being implemented through the Integrated Energy Plan.
- Upgrade existing 230 kV lines between Barrie (Essa TS) and Orangeville (Orangeville TS) by replacing the conductors on the transmission line with advanced conductors capable of transmitting more power to further enhance transmission capacity between Northern and Southern Ontario. This recommendation is being implemented through the Integrated Energy Plan.
- Two double-circuit 500 kV lines from the Bruce C site to Barrie (Essa TS) and to west of London near Strathroy (Longwood TS). These reinforcements are critical to enable Bruce C, improve deliverability of supply resources located in the southwest in future procurements, and support load growth in Northern Ontario when paired with the previous recommendations for new 500 kV transmission from Sudbury to Barrie.
- One double-circuit 500 kV line from Bowmanville (Bowmanville SS) to Markham (Parkway TS) to enable the Darlington SMR project and improve deliverability of supply resources located in eastern Ontario in future procurements.
- One 500 kV line from Barrie (Essa TS) to Kleinburg (Kleinburg TS). This line is flexible in supporting different future scenarios, including demand growth in Northern Ontario, driven by mining and economic development, and in the GTA. This line also removes an additional bottle neck to enabling deliverability further supply resources in the North.
- New or expanded transformer capacity at various stations including Essa TS, Longwood TS, Kleinburg TS and Parkway TS to enable demand growth serviced by these stations.
- New transmission in the western GTA including one 230 kV double-circuit line between Meadowvale TS and Hurontario TS, and another between Oakville TS and Trafalgar TS, alongside associated station expansion work and new transformation at Milton TS. These reinforcements support growth in the western GTA and the City of Toronto and prepare the system to manage decreased reliance on local gas fired generation.

These transmission reinforcements are shown as the grey corridors in Figure 1.

Figure 1: Future-Ready Transmission Reinforcements

The IESO also has a number of transmission plans underway to enable growth and economic development in specific regions across Ontario[2] by resolving bottlenecks on the local transmission systems that supply them. The IESO is active in various phases of planning in 13 of Ontario's 21 regions. The IESO has four such plans that will be published in 2025, including those for Greater Ottawa, North of Dryden, Toronto, and York regions (refer to Table 2 for additional details).

[2] These are termed Regional Plans, or more formally, Integrated Regional Resource Plans (IRRPs).

- The Greater Ottawa regional plan will be published in August. In June, the IESO presented draft plan recommendations including various new supply stations and circuits, upgraded circuits and eDSM to enable demand growth in the region.
- The North of Dryden regional plan will be published in September. In May the IESO presented three transmission options, including reinforcements between Dryden and Ear Falls, for feedback and input.
- The Toronto regional plan will be published in October. In July the IESO presented the categories of options under consideration to meet Toronto's electricity needs, including the three large-scale transmission options announced by the Minister of Energy and Mines on June 4. In August, the IESO will report back to the Minister on its evaluation of the large-scale transmission options and make a recommendation for the preferred option based on technical and cost considerations as well as input from engagement.
- The York regional plan will be published in October. In July the IESO presented the categories of options under consideration to meet York region's electricity needs, including wires and wires integrated with eDSM.

Further, six additional regional plans have recently been initiated that are due for completion in 2026; this includes plans for GTA West, London, Kitchener-Waterloo-Cambridge-Guelph, East Lake Superior, Peterborough-Kingston and GTA East regions, three of which were initiated ahead of schedule due to high-growth. All these plans will recommend new regional transmission lines and load supply stations to proceed in the near and medium-term, alongside targeted deployments of non-wires solutions. Over the long-term, each plan looks to set out pathways for how each area's long-term electricity needs can be met under different load growth scenarios.

Additional details regarding these transmission planning activities can be found on the IESO's Planning and Forecasting website.

Table 1: Bulk Transmission Plans

Area	Plan Name	Start - End (Estimate)	Scope / Considerations
South and Central Ontario (including the GTA)	South and Central Ontario Bulk Plan (*Powering Ontario's Growth* plan)	2024–Q4 2025 (ongoing)	This study was initiated to review the capability of the bulk system to support future generation connections and demand growth in key areas throughout southern and central Ontario, including the GTA, to enable a decarbonized power system in the future. This study includes several considerations: • Sufficiency of the bulk transmission supply to the GTA given future growth in electrical demand, and reduced reliance on existing local natural gas-fired generation; • Expansion for the 500 kV transmission system between Cherrywood TS and Bowmanville to enable continued expansion of generation, including small modular reactors, in eastern Ontario; • Continuing the assessment of the bulk transmission system between the Hamilton and Windsor areas to understand future transmission needs that could result from further economic development; and • Transmission needed to enable expansion of the Bruce NGS. This work also considers opportunities to preserve new or expanded corridors for future transmission development. Two new corridor studies, in addition to the ongoing northwest GTA corridor work, have recently been recommended as early outcomes of this work.
Southern Ontario (including the GTA)	Niagara Bulk Plan	2025–2026	This study is proposed to review the capability of the bulk transmission system to continue to support economic development in the Niagara region, with consideration of the future role of the area's intertie with New York.
Northern Ontario	Ontario-Manitoba	2022–2025 (ongoing)	This study was initiated to proactively plan for the end of life of critical transmission intertie equipment on the Ontario-Manitoba interconnection. This is a joint study

Area	Plan Name	Start - End (Estimate)	Scope / Considerations
	Intertie Joint Study		between the IESO, Hydro One Networks, Manitoba Hydro and Minnesota Power.
Northern Ontario	Northern Ontario System Bulk Plan (*Powering Ontario's Growth* plan)	2024–Q3 2025 (ongoing)	This study was initiated to review the capability of the bulk transmission system to facilitate additional power flows from northern Ontario to southern Ontario and vice versa, and to support future generation connection and demand growth to enable a decarbonized system. The bulk plan is ongoing and will continue to assess the medium- and long-term needs. This includes consideration of opportunities to preserve new or expanded corridors for future transmission development.
Northern Ontario	North of Sudbury Bulk Plan	2025–2026 (ongoing)	This study will examine the capability of the bulk transmission system's ability to supply additional increasing levels of demand in the areas surrounding Timmins, Kirkland Lake, and Pinard. The study will also look at creating opportunities to potentially locate new non-emitting resources and opportunities for new or upgraded interconnections with Quebec.
Northern Ontario	Northern Ontario Connection Study	2024–2025 (ongoing)	This study will evaluate transmission options for enabling connection of remote First Nations and prospective mining developments in remote northwestern Ontario.
Eastern Ontario (including Ottawa)	Eastern Ontario Bulk Plan	2024–2026 (ongoing)	This study will examine if the bulk transmission system is sufficient to reliably supply the demand growth expected in eastern Ontario and explore opportunities to improve the transmission system's capability to deliver new resources located in eastern Ontario and the capacity transfers to and from Quebec.

Table 2: Regional Plans to be Completed in 2025

Region	Plan Name	Start - End (Estimate)	Scope / Considerations
Greater Ottawa	Greater Ottawa IRRP	Q1 2023 – Q3 2025 (ongoing)	To ensure a reliable supply of electricity, and support local growth and economic development, regional electricity planning has commenced for the City of Ottawa.
Northwest (North of Dryden Sub-Region)	North of Dryden Addendum	Q3 2024 – Q3 2025	To ensure emerging growth in the North of Dryden sub-region a local electricity infrastructure study has been initiated to address emerging local needs to ensure a reliable supply of electricity that supports local growth and economic development.
Toronto	Toronto IRRP	Q1 2023 – Q4 2025	To ensure a reliable supply of electricity to the City of Toronto, and to reduce reliance on Portlands Energy Centre in meeting electricity needs.
GTA North	York IRRP	Q4 2023 – Q4 2025	To ensure a reliable supply of electricity to York Region and to support growth and electrification. The plan will include a scenario to investigate the region's needs with reduced reliance on York Energy Centre.