

Locational Considerations for New Resources

Applies to:
LT1 RFP, Expedited Process and Same-Technology Expansions

August 22, 2022

Introduction

This document specifically applies to the first Long-Term Request for Proposals (LT1 RFP), the Expedited Long-Term Request for Proposals (Expedited Process) and the Same-Technology Upgrades initiative.

These procurements are intended to acquire capacity resources to meet Ontario's emerging resource adequacy needs beginning in 2025. In order to do this effectively, the IESO must ensure that all acquired resources connect to the transmission/distribution system in locations that can accommodate their injections of electricity to the grid (and in the case of storage, withdrawals from the grid). This will be verified as part of the procurement process through Deliverability Tests; one Deliverability Test for the Expedited Process and Same-Technology Expansions, and another for the LT1 RFP. While the resource adequacy need emerging in 2025 is global, there are also local reliability needs forecasted in some areas of the province. As such, there are certain key areas of Ontario where acquired capacity can provide both a local and provincial benefit. This document is intended to:

1. Provide specific information on where these local needs are anticipated (the "preferred areas"). The LT1 RFP and Expedited Process will award rated criteria points to proposals with projects located in these preferred areas.
2. Provide information on transmission circuits where connection will not be allowed.

Section 1 – Preferred Areas

West of Chatham Region (strong preference)

For the purpose of these procurements, the West of Chatham region is a part of the West Zone and defined as the 230 kV and 115 kV high voltage network in western Ontario, stretching from the Municipality of Chatham-Kent to the City of Windsor in the west, exclusive of the interconnection between Michigan and Detroit. It includes the following stations and circuits:

- **230 kV connected stations** – Chatham SS, Malden TS, Keith TS, Lauzon TS, Leamington TS, Kent TS and Lakeshore TS (expected in-service by 2022), South Middle Road TS (expected in-service by 2022/2025);
- **115 kV connected stations** – Crawford TS, Essex TS, Walker TS #1, Walker TS #2, Belle River TS, Tilbury West DS, Tilbury TS, Kingsville TS;
- **230 kV transmission lines**¹ – C43H (C24Z), H54 (C24Z), C42H (C23Z), H53 (C23Z), C64H (C21J), H25J (C21J), C65H (C22J), H26J (C22J), C87H (end of 2025) and C88H (in-service end of 2025);
- **115 kV transmission lines** – J3E/J4E, Z1E/Z7E, K2Z/K6Z; and
- **115 kV transmission cables** – E8F/E9F.

Demand for electricity in this region is growing primarily in the Kingsville-Leamington and Windsor pockets. As such, a balance of supply resources between these two pockets will have the local benefit of minimizing the need for transmission reinforcement between them and will ensure adequate supply to the region as a whole. This section describes in more detail the locational benefits of connecting to various circuits/stations in the Kingsville-Leamington and Windsor pockets and identifies the circuits/stations that do not have capacity for new generation.

Resources connected to the circuits/stations that have capacity in these pockets will have the local reliability benefits described in this section and global benefits up to the limits determined by the Deliverability Test.

¹ Current circuit names in brackets will be obsolete once the Lakeshore TS is in-service in 2022.

Figure 1: Map of Southwest Ontario

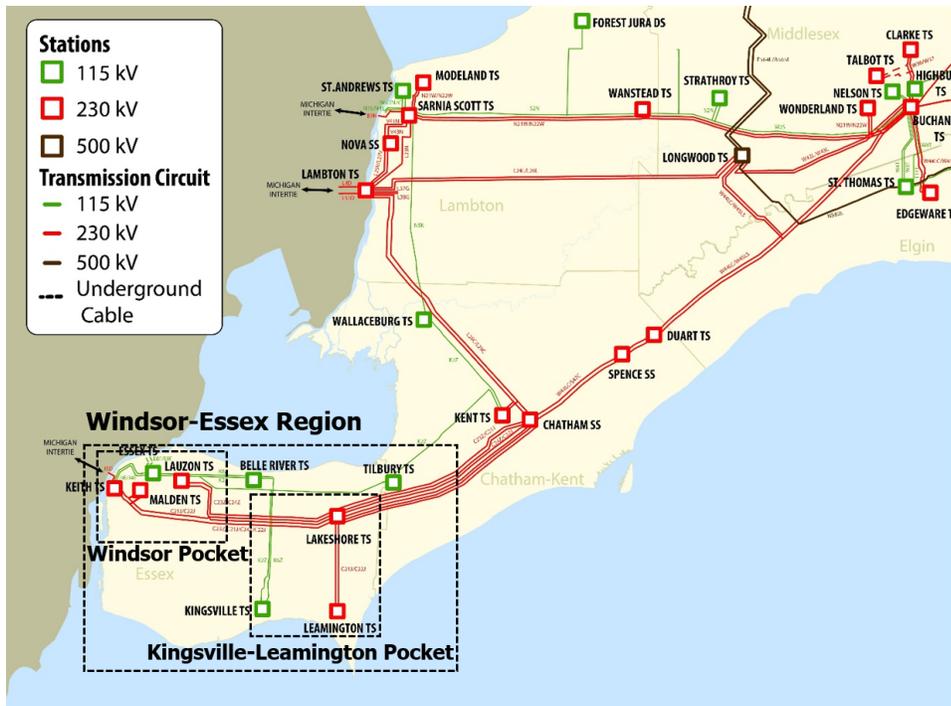
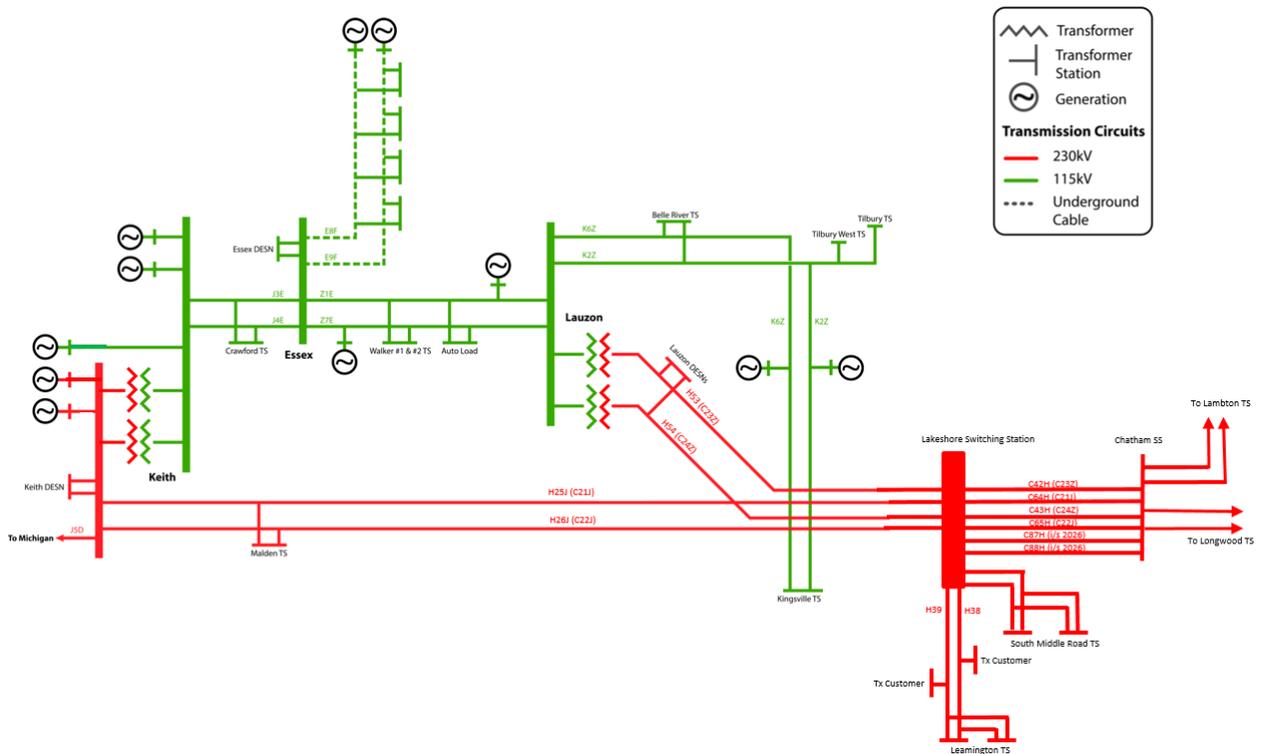


Figure 2: Single Line Diagram of West of Chatham Map of Southwest Ontario



Locational Considerations – Kingsville-Leamington Pocket

For local reliability, Lakeshore TS is the optimal connection point for new resources within the Kingsville-Leamington pocket. The locational benefits of connecting to the different circuits/stations within the pocket are as follows:

- **Lakeshore TS:** This is the best location for connecting new resources within Windsor-Essex. However, the total amount of resource connections may be limited due to short circuit concerns at Leamington TS and Lakeshore TS, as well as capacitor breaker limitations at Lakeshore TS.
- **Chatham SS:** Resources connected to Chatham SS would provide an interim local reliability benefit for the period after the recommended Chatham to Lakeshore line is in-service (end of 2025) and before the recommended Lambton to Chatham line is in-service (2028).
- **Chatham-to-Lakeshore circuits (C42H, C64H, C43H, C65H, C87H, C88H):** Connection to these circuits between Chatham and Lakeshore provides similar benefits to connecting at Chatham SS, but consideration of balancing generation connections among the four parallel paths is required when proposing individual circuit connections. Currently there are wind resources connected to these circuits - approximately 420 MW on C43H (C24Z), 300 MW on C42H (C23Z), 80 MW on C64H (C21J), no generation connected to C65H (C22J), and no generation connections on the new Chatham-to-Lakeshore circuits (C87H and C88H).
- **Leamington TS:** There is limited room for additional generation connecting to this station due to short circuit limitations.
- **Kingsville TS:** There is limited room for additional generation connecting to this station due to short circuit limitations.

Locational Considerations– Windsor Pocket

Given that the demand for electricity is also forecasted to increase in Windsor, it would be beneficial to acquire new capacity in the Windsor area. The locational benefits of connecting to the different circuits/stations within the pocket are as follows:

- **Lauzon TS:** Resources connected directly to Lauzon TS 115 kV bus would help alleviate the Lauzon 115 kV sub-system capacity needs and voltage concerns.
- **Circuits K2Z, K6Z, Z1E, Z7E, E8F, E9F:** Resources connected to these circuits would help alleviate the Lauzon 115 kV sub-system capacity needs, voltage concerns, and Keith-to-Essex thermal concerns. Since these are 115 kV circuits, smaller (approximately 50-80 MW each) resources are preferred, to stay within the thermal capability of the circuits. It would also be beneficial to balance generation connections among the four parallel paths. This is largely balanced currently, with the exception of the 115 kV circuits between Lauzon-to-Essex (Z1E and Z7E), which has 130 MW (mix of gas and solar) connected to Z1E and no resources connected to Z7E.

- **Circuits J3E and J4E:** No further resource connections are recommended to these circuits due to the existing thermal constraints.
- **Lakeshore-to-Lauzon (H53, H54)/Lakeshore-to-Keith (H25J, H26J) circuits:** There is capacity to connect some resources on the circuits west from Lakeshore. The maximum amount would be limited by thermal constraints on these circuits. There may be additional advantages to connect on the Lakeshore-to-Lauzon circuits, as that would maintain supply to a greater amount of industrial loads in Windsor and not exacerbate the Keith-to-Essex thermal limitations. In terms of existing loading, currently there is 100 MW of unbalanced wind resources on H53 (C23Z) with no resources on H54 (C24Z).

East of FETT but west of Cherrywood TS (preference)

Transmission Security Need east of the Flow East Towards Toronto (FETT) interface

The supply security need for the area east of the FETT interface results from the retirement of Pickering GS by the end of 2025 and the expiring Lennox GS contract. This need has been addressed by a new contract for Lennox GS for continued operation until 2029 and increasing the FETT interface capacity. The FETT upgrade project is scheduled to be in-service by spring 2026 for the summer 2026 need. This plan addressed the FETT security need until 2029, as reported in 2020 Annual Planning Outlook (APO).

However, due to the higher Ontario demand forecast in the 2021 APO compared to the 2020 APO, the 2021 APO identified a FETT security need of about 400 MW appearing once in 2026. The IESO has a one-time option to obtain 500 MW of summer capacity from Quebec under the 2015 Hydro Quebec Capacity Sharing Agreement. The plan is to exercise this option to meet the 2026 Ontario summer peak demand, and in doing so, the FETT security need will be addressed.

Based on current projections, there isn't a specific need to locate new resources east of FETT before 2029. The IESO is, however, identifying the east of FETT region as a preferred area to address a potential longer term need arising as contracts for large gas-fuelled generation begin to expire in 2029.

Transmission Limitation east of the FETT interface

There is a limitation on the transmission system east of Cherrywood TS for westbound transfers into Cherrywood TS. This limited capacity would be used by any new resources connecting east of Cherrywood, including potential firm imports from Quebec and Small Modular Reactors located at the Darlington GS site. Therefore, there is a preference for resources located east of the FETT interface to connect west of Cherrywood TS. Pickering GS connects to Cherrywood - there are also gas fuelled generating stations with expiring contracts located in this pocket. It is generally good practice to replace the resources where the demand is instead of transferring into the load centre. In addition, local generation provides reactive power support which is important for voltage stability. Locating new resources in this pocket will provide some of the lost capability from the retiring Pickering GS units.

Preferred area definition

The preferred area east of the FETT interface encompasses the entire Toronto Zone, excluding the transmission system east of Cherrywood TS.

In addition to the Toronto Zone, it would also include the 230 kV circuits H82V, H83V, B88H, B89H that connect Holland TS, Armitage TS and Brown Hill TS. This pocket is located in the Essa Zone but is mainly supplied by Claireville TS, which is in Toronto Zone. York Energy Center GS is located in this pocket and is critical for local supply.

Short circuit concerns in this preferred area

Currently there is limited capacity to add new resources in this preferred area due to short circuit concerns. There will be a significant improvement to this situation once Pickering GS retires by the end of 2025. The Deliverability Test will take this into account. Projects submitted to for the Expedited Process (which requires a May 2025 in-service date) may encounter challenges in this regard.

Section 2 – Transmission circuits where connection will not be allowed

1. All 500 kV circuits
 - a. 500 kV circuits are critical to security of the Ontario electricity system.

2. The set of 230 kV circuits that comprise part of critical transmission interfaces:
 - a. Flow East Towards Toronto (FETT): R14T, R17T, R19TH, R21TH, E8V, E9V
 - b. Buchanan London Input (BLIP): D4W, D5W, M31W, M32W, M33W
 - c. Flow North (FN): D5H
 - d. Queenston Flow West (QFW): Q25BM, Q23BM, Q24HM, Q29HM, Q30M, Q26M, Q35M
 - e. Flow into Ottawa (FIO): C3S, ~~M29C~~ T33E, L24A, B5D
 - f. East West Tie (EWT): W21M, W22M, W35M, W36M

Connection to critical interface circuits can materially unbalance the transfer path and lead to penalizing the transfer capability of the entire path.

3. All interconnection circuits.

Connection to interface circuits can lead to penalizing the transfer capability of the interconnections.