



Preliminary Connection Guidance for the Long-Term 2 Window 2 Requests for Proposals

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Independent Electricity System Operator

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Executive Summary

This document provides preliminary connection guidance information to potential proponents looking to participate in the Second Window of the Energy and Capacity Streams of the Long-Term 2 Request for Proposals, the LT2(e-2) RFP and LT2(c-2) RFP, respectively. Specifically, this guidance is to help inform project siting decisions to maximize the success of projects through the LT2 Window 2 RFP evaluation processes. As these procurements are focused on meeting reliability needs, the IESO aims to ensure that awarded projects can operate with a minimized risk of curtailment and congestion on the system. At its discretion, and in consideration of rules and timing of procurement activities, the IESO will update this document should there be new information or if substantial changes to the procurements are required.

The IESO, with support from Hydro One Networks Inc. (HONI), has prepared the preliminary connection guidance information contained herein that considers both system congestion and system reliability factors, as follows:

1. Zonal energy probabilistic limitations, presented in Section 2;
2. System congestion limitations, presented in Sections 3 and 5;
3. Inverter-Based Resource (IBR) limitations, presented in Section 4;
4. HONI transmission system considerations, presented in Section 6; and
5. Distribution limitations (HONI stations only), presented in Section 7.

Given the structure of the Enhanced Power Purchase Agreement (E-PPA) contract to be used for the LT2(e-2) RFP, the IESO assumed that participating energy resources will have a relatively low capacity factor (below 50%). For resources with higher capacity factors, consultation with IESO staff is recommended as some connection locations may limit the delivery of energy from those resources.

Some locations could be subject to multiple types of limitations. Where multiple limitations apply to a particular location, the most constraining limitation should be used.

Table 1 summarizes the most constraining area limitations identified in this document, indicating the expected maximum amount of new generation that could connect in a given area.

Further below, Figures 1 and 2 identify all of the area limitations for Northern and Southern Ontario, respectively.

Table 1 | Most constraining Area limitations summary

Zone	IBR Limit ¹ (MW)	Area Congestion Limit (MW) ³			Short-Circuit Limited Stations (50 km radius)
		Sub-Zone	Energy ²	Capacity	
Northwest	Northern Ontario = 550 (Northwest = 350)	West of Lakehead	300	200	No limitation observed
		West of Marathon	300	450	
		West of Wawa (Northwest)	550	600	
Northeast		West of Mississagi	850	800	
		East of Widdifield	100	400	
Essa	East of Toronto = 1,400	East of Minden	125	300	No limitation observed
Ottawa		East of Dobbin	275	650	
East		East of Lennox	900	900	
		East of Bowmanville	>1,000	>1,000	
		East of Hinchinbrooke	>1,000	>1,000	
Toronto	N/A ⁵	N/A ⁵			Cherrywood TS Clarington TS Richview TS Manby TS
Niagara ⁴					Allanburg TS Beck 2 TS
Southwest		West of Detweiler	900	>1,000	Trafalgar TS Burlington TS Richview TS Manby TS
		West of Middleport	>1,000	>1,000	
		West of Milton	>1,000	>1,000	
	West of Toronto = 2,400				
Bruce ⁴		See West and Southwest Limits			No limitation observed
West		West of Buchanan	>1,000	>1,000	No limitation observed
		West of Chatham	150	650	

¹ IBR limits apply to inverter-based resources and depend on the size and location of resources. For example, in Northern Ontario, the “North” IBR limit increases if 230 kV circuit connections are limited to 100 MW instead of 200 MW. Notably, the availability of new IBR connections across Northern Ontario is constrained by local system strength and the project’s minimum short-circuit ratio (MSCR) requirements. IBRs capable of operating at lower MSCR levels can generally accommodate higher connection capacity, while higher-MSCR projects face more restrictive limits, particularly in weaker areas of the system. The IBR limits in this table assume the project MSCR = 5.

² Energy Area congestion limits are valid for new resources with capacity factors below 50%. The limits could be further reduced for new resources with a capacity factor above 50%.

³ Area congestion limits are approximations based on maximum generation that could be injected into the station mentioned as the area limit.

⁴ Zonal probabilistic limits for certain technologies in Bruce and Niagara zones are more restrictive – see Section 2 of the document.

⁵ Area congestion and IBR Limits were not determined for Toronto since short-circuit limitations will prevent connections to the entire area for the LT2 Window 2 RFPs.

Figure 1 | Overall Ontario Limitations (Energy)

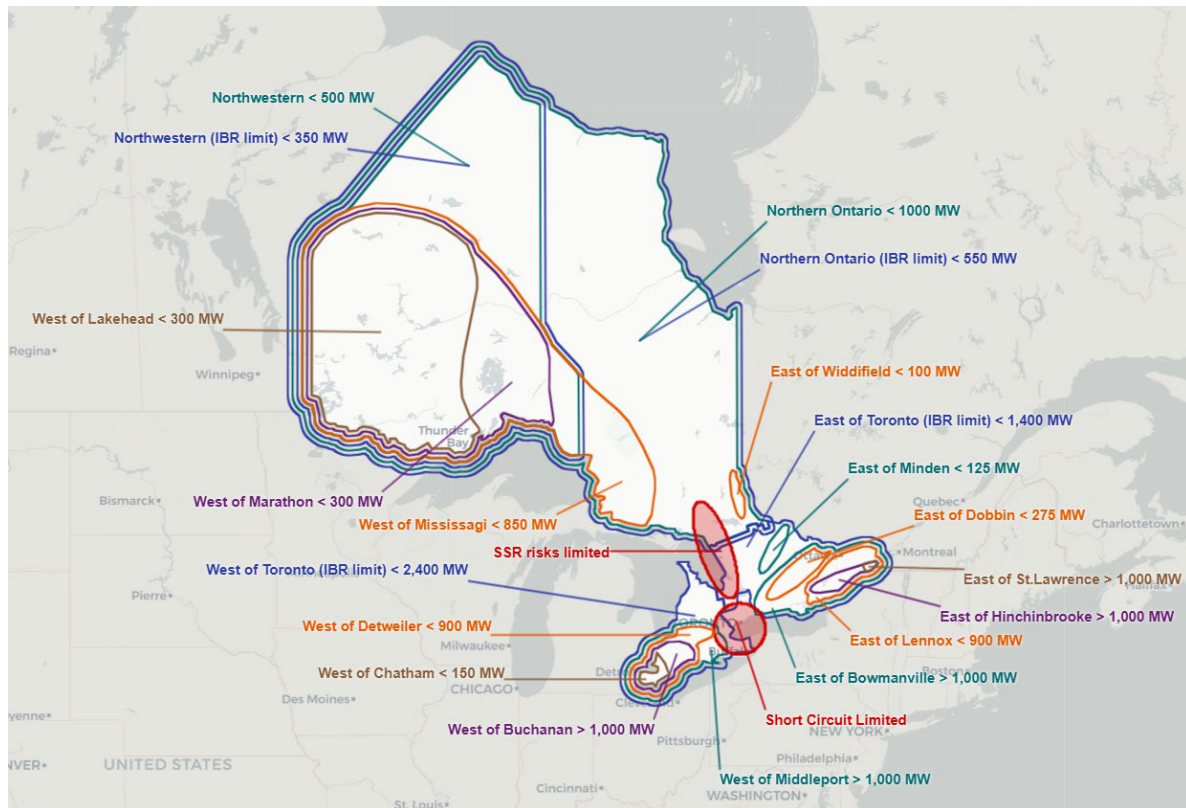
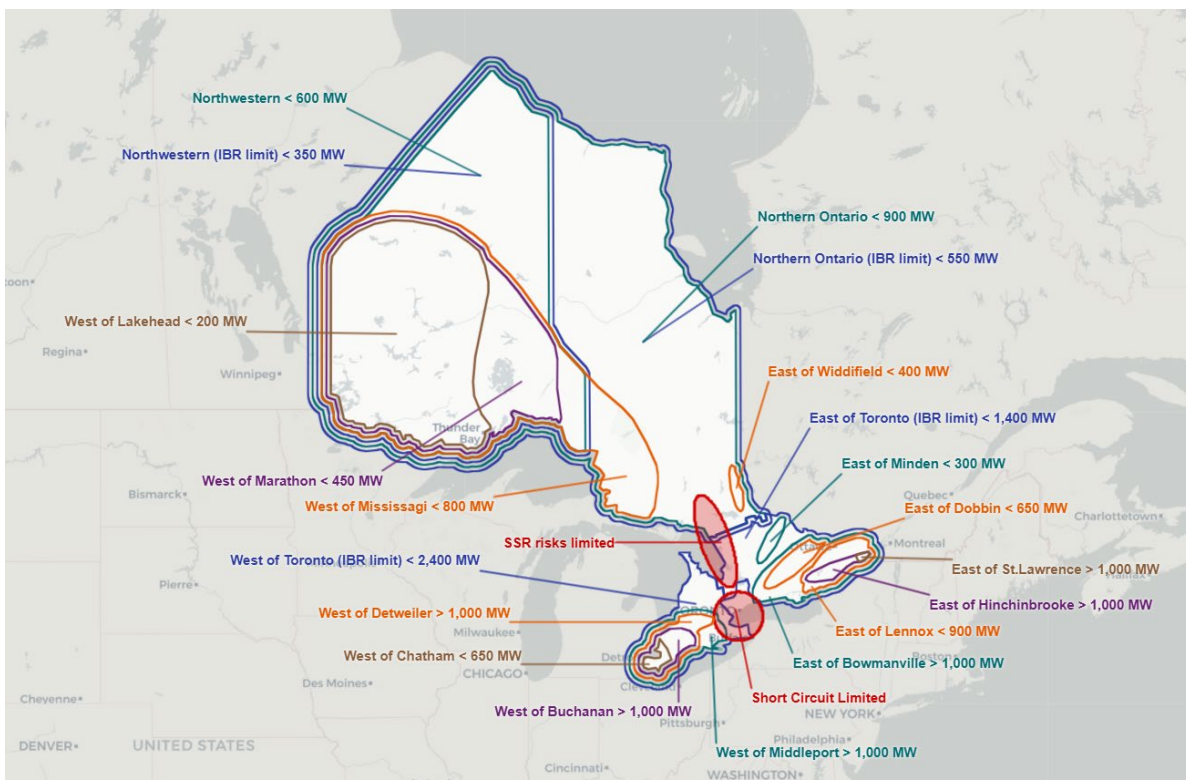


Figure 2 | Overall Ontario Limitations (Capacity)



In addition to the zonal and area limitations above, the maximum amount of any type of resources that can connect directly to a single circuit is 250 MW per project proposal. The maximum amount of IBRs that can connect directly to any single circuit is further limited to the bright-line¹ limits as follows:

- 75 MW per 115 kV circuit in both Northern and Southern Ontario; and
- 200 MW per 230 kV circuit in Northern Ontario.

However, there are circuits that are more limiting than the bright-line limits above, as well as circuits that should be avoided, and circuits where new connections will not be allowed. Appendix B and Appendix C list the availability identified for each transmission circuit, based on the most restrictive limitation, and indicates the area where each circuit belongs.

Section 8 presents Non-Wires Alternatives (NWAs) recommended through IESO regional and bulk system planning studies to support reliability needs. These opportunities inform LT2 Window 2 Rated Criteria assessments and remain subject to the LT2 Deliverability Test. Table 2 summarizes the key requirements.

Table 2 | Non-wires Alternative needs

NWA Need Area	System Need	Resource Type	Capacity (MW)	Key Connection Requirements
Sault Ste. Marie 115 kV System	Supply capacity and reliability support during critical outages	Firm, dispatchable resources	95	• Connect to ALGOMA1/ ALGOMA2/ ALGOMA3, CLERGUE1/CLERGUE2, or LEIGHBY1 • Remain connected and meet contractual obligations during any single element outage • Provide reactive support
North of Sudbury (Kirkland Lake 115 kV System)	Voltage support	Solar or thermal	50	• Connect to circuit K4 • Provide reactive support
Belleville DESN System	Local energy and capacity needs	Solar BESS	10 60	• Connect to Belleville DESN or circuits H23B and T25B • Provide reactive support

The results of the RFP evaluation stage deliverability tests will be highly dependent on the size and location of project proposals, and the results of the Long Lead-Time (LLT) RFP, in the same electrical proximity – proposals may end up competing for the same transmission system availability as determined using the information in this document, during the evaluation stage deliverability test. The IESO also intends to publish updated Connection Guidance after the results of the LLT RFP are available.

¹ Bright-line is a non-objective rule or standard.

While this document considers only the electricity system impacts of project siting, proponents are encouraged to take a fulsome view of where they site their projects and examine other regulatory, permitting, RFP and policy requirements. For example, the Directive contains policy direction on project considerations for siting on agricultural land. Section 9 of this document lists other connection considerations that the users of this guidance should be aware of.

As this document is only providing preliminary connection guidance information, proponents are still free to submit proposals for projects at locations either not assessed in this document or recommended to “avoid”, as well as proposals for project sizes that exceed the Circuit congestion limitations presented in this document. However, there is a higher risk to those proposals during the evaluation stage deliverability test. Proposals for projects that seek to connect to circuits that are “not allowed” will be deemed non-deliverable and not subject to deliverability testing during the evaluation stage deliverability test.

1. Introduction

This document is strictly meant to provide preliminary connection guidance information (“Connection Guidance”) to help project proponents locate energy and capacity projects for the LT2(e-2) RFP and LT2(c-2) RFP.

The 2026 Annual Planning Outlook (APO) [1] was used as the basis for demand, generation, and transmission project assumptions for the Connection Guidance. Projects with expected in-service dates up to and including the anticipated in-service year of the LT2(e-2) RFP and LT2(c-2) RFP projects (2032) are incorporated into the study cases.

The LT2 Window 2 RFP deliverability processes will comprise of the following steps:

1. Provide **preliminary connection guidance** information ahead of proposal submission to help proponents select projects locations that will more likely contribute to addressing emerging reliability needs (this document);
2. Conduct **evaluation stage deliverability tests** for proposals submitted to the LT2(e-2) and LT2(c-2) RFPs, to assess whether submitted projects can contribute effectively to addressing emerging reliability needs.

The LT2(e-2) RFP is designed to address system energy needs throughout the year. Therefore, both the Deliverability Test and Connection Guidance evaluate the ability of resources to be delivered while minimizing the risk of energy curtailment.

The LT2(c-2) RFP is designed to primarily address a capacity reliability need. As such, both the Deliverability Test and Connection Guidance evaluate the ability of resources to be delivered at times of system peak.

This connection guidance takes into account six types of limitations, as follows:

1. Zonal probabilistic limitations – identify the total new generation that could connect into each of Ontario’s electrical zones with a positive contribution to Ontario’s global resource adequacy, by using a probabilistic resource assessment;
2. Area (multi-zonal, zonal, sub-zonal) congestion limitations – identify the total new generation that can connect into an area and result in a minimum risk of energy curtailments by using load-flow simulations;
3. Inverter-based resource limitations – identify the total amount of new inverter-based generation that can connect to a zone or a circuit and minimize the possibility of unwanted sub-synchronous control interactions (SSCI) with other inverter-based resources and sub-synchronous resonance (SSR) with series capacitors;
4. Circuit congestion limitations – identify the total amount of new generation that can connect to a circuit and result in a minimum risk of energy curtailments by using load-flow simulations;

5. HONI transmission system considerations – identify areas where new resources should avoid connecting because short-circuit levels may exceed the capability of the transmission equipment, circuits where new connections may be limited due to protection considerations, sites where there may be capacity/space limitations, as well as ground potential rise considerations; and
6. Distribution asset limitations (HONI stations only) – identify available capacity at distribution level assets.

Some locations could be subject to multiple types of limitations. For example, availability in a distribution system could be further restricted by upstream transmission-level limitations that are applicable to the station, or the area, the distribution system connects to. As well, multiple types of limitations could apply to the transmission connections. Where multiple limitations apply to a particular location, the most constraining limitation should be used.

This Connection Guidance does not take into account any potential reduction of capacity availability due to procurement of on-going or future RFPs. The results of the Long Lead-Time (LLT) RFP will impact connection availability. Any future awarded contracts such as these will be accounted for in the Deliverability Test. The IESO also intends to publish updated Connection Guidance after the results of the LLT RFP are available.

As per subsection 5(k) of the Directive, the IESO will reduce the capacity available for LT2 projects proposing to connect to the 230 kV circuits that connect to Nanticoke TS and/or the Niagara Reinforcement Line between Allanburg Transformer Station and Middleport Transformer Station² by 300 MW. Further, this 300 MW of capacity will be set aside for any renewable energy projects that are owned by, or have majority equity interest from, Six Nations of the Grand River Development Corporation ("SNGRDC Projects"), as applicable under the agreement between Six Nations of the Grand River, Six Nations of the Grand River Development Corporation and the (then) Ministry of Energy that is posted to the website of Six Nations Future ([here](#)). This 300 MW of capacity can be awarded to one or more SNGRDC Projects under the LT2 (e-2) RFP provided they meet all procurement requirements. The set aside capacity will be accounted for during the Deliverability Test.

The following sections of the document present the objective, methodology, assumptions and results for each of the six types of limitations.

² These circuits include: K40M, N20K, N21J, N22J, N37S, N5M, N6M, Q26M, Q35M and S39M.

2. Probabilistic Zonal Energy Limitations

2.1 Objective

The goal of the probabilistic zonal energy assessment performed was to determine the total new capacity that could be added into an electrical zone and have a positive contribution towards provincial resource adequacy. New energy resources in a zone can contribute toward provincial resource adequacy when the energy is not congested at times of system need. The limit on the total capacity for each zone was determined for scenarios with new generation composed of 100% wind, 100% solar, and a solar - wind energy mix. Limitations for other technologies would depend on their respective capacity factors and production profiles.

2.2 Assumptions and Methodology

To calculate the zonal probabilistic limitations, the methodology used for 'perfect capacity' assessments was modified for renewables. The methodology to calculate zonal minimum and maximum capacity values using the zonal constraint curve is outlined in the Annual Planning Outlook: Supply, Adequacy and Energy Outlook Module [2], and is further detailed in Section 3.1 of the Evaluation Stage Deliverability Test Methodologies for the LT2 Window 2 RFP document.

As key inputs required for a full probabilistic assessment were not yet available, preliminary zonal limits were derived using a manual estimation approach. This approach adjusted previously established zonal limits to reflect anticipated changes in demand, supply, and transmission capability for the applicable study year.

As a result, the preliminary zonal limits should be considered indicative only and may differ materially from the final values, which will be determined once the results of the LLT RFP are available.

2.3 Results

The preliminary zonal limits IESO established for new generation resources that could contribute to system adequacy needs while avoiding or minimizing energy curtailments within each electrical zone, are presented in Table 3.

Table 3 | Preliminary LT2(e-2) RFP Zonal Capacity Limits

Zone	Solar only Maximum (MW)¹	Wind only Maximum (MW)¹	Mix Solar & Wind Maximum (Solar MW, Wind MW)¹	Other Technologies
Northwest	800	1,000	1,000/500	Zone limits are project dependent
Northeast	1,900	1,300	1,800/900	
East	Maximum Studied	0	N/A	
Ottawa	3,000	Maximum Studied	2,400/1,200	
Essa	Maximum Studied	Maximum Studied	Maximum Studied	
Southwest	Maximum Studied	Maximum Studied	Maximum Studied	
West	2,500	500	2,000/1,000	
Niagara	900	0	N/A	
Bruce	0	0	0	
Toronto	1,550	0	N/A	

¹The studies for each zone have tested up to 2,000 MW of wind and up to 4,000 MW of solar generation (solar has a lower capacity factor than wind), and up to 2,000 MW wind + 4,000 MW solar in the mixed case.

3. Area Congestion Limitations

3.1 Objective

The goal of the area (multi-zonal, zonal, sub-zonal) congestion limitation guidance assessment is to determine the total amount of new energy and capacity resources that can connect into an area and have a minimum risk of curtailment to prevent either voltage violations or thermal overload of the transmission equipment downstream of that area.

3.2 Assumptions and Methodology

The principles and criteria used for the area congestion study align with those that will be used for the deliverability test. The case study assumptions are described in more detail in Section 3.2 of the LT2 Window 2 Methodology [3], and summarized in Table 4.

The assumptions described in Table 4 were used to set up the study cases and operating conditions. The area congestion limitations were determined by injecting new generation at major stations and assessing system performance until pre or post-contingency violations against the study criteria described above were observed. The study criteria are generally aligned with performance criteria outlined in Sections 2.4.2, 2.4.3 and 2.4.8 of the Ontario Resource and Transmission Assessment Criteria³.

The area limits below are approximations based on maximum generation that could be injected into the station. The maximum injection observed at the station was used as an approximation for the number of resources that could connect into the area upstream⁴ of that station. For those scenarios where any upstream transmission circuits were found to have no available capacity (as per Appendix B and Appendix C), new projects may be required to connect directly into the stations.

The contingencies applied are outlined in Sections 2.3.1 and 2.3.3 of ORTAC.

All major transmission projects expected and committed to come into service by 2032 (listed in Table 5), as per the 2026 Annual Planning Outlook and any subsequently published bulk system plans or regional plans, were considered in the cases studied⁵. Bolded projects in Table 5 are new, in comparison to projects considered in connection guidance for the LT2(e-1) RFP and LT2(c-1) RFP.

³ <https://www.ieso.ca/-/media/Files/IESO/Document-Library/Renewed-Market-Rules-and-Manuals/market-manuals/connecting/ieso-ontario-resource-transmission-assessment-criteria.pdf>

⁴ Upstream areas highlighted in Figure 1 and Figure 2. Circuits in upstream areas specified in Appendix B and Appendix C

⁵ Transmission reinforcements forthcoming from in-flight or future plan developments will be considered in subsequent procurements, as appropriate.

Table 4 | Summary of Case Assumptions used for Area Congestion Limitations and Circuit congestion Limitations

Stream		LT2(e-2)		LT2(c-2)		
Scenario	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Demand Forecast (2026)	APO summer 50 th percentile, normal weather demand forecast for sub-system	APO minimum, normal weather demand forecast for sub-system	APO summer normal weather, system coincident peak demand	APO winter normal weather, system coincident peak demand	Avg. 16 off-peak hours of the Summer normal weather coincident peak day	Avg. 16 off-peak hours of the Winter normal weather coincident peak day
	Non-quick-start gas	Maximum operating output	50 th percentile	Maximum or normal operating output		50% rated output
	Quick-start gas	Off				
	Nuclear	Maximum operating output				Maximum operating output
	Run-of-the river Hydro	Maximum operating output		90 th percentile production over summer/winter peak periods	Average output for the sixteen off-peak hours during Ontario’s summer peak demand days	
	Dispatchable Hydro	Minimum output (approximately 50 th percentile production) in May				
	Peaking Hydro	50 th percentile production in May				
	Wind	Zonal 90 th percentile capacity factor in springtime			90% of the sixteen off-peak hours during Ontario’s summer peak demand days	
	Solar				Off	
	Storage	Charging at 50% rated capacity		Injecting at 100% rated capacity	Charging at 50% rated capacity	
Units on Outage	Two Lennox, One Bruce		Atikokan in North of Toronto, One Bruce in West of Toronto, One Lennox in East of Toronto			
Generation Dispatch	Performance Criteria and Control Actions	With all transmission elements in-service: - Flows must be within continuous ratings With one or two transmission elements out: - Flows must be within STE ratings The assessment relies on existing Remedial Action Schemes (RASs).		With all transmission elements in-service: - Flows must be within continuous ratings With one transmission element out: - Flows must be within STE ratings - Flows must be within LTE ratings after re-dispatching 700 MW - Following a subsequent contingency, flows could exceed STE ratings, but must be within LTE ratings after re-dispatching up to: 900 MW for a single contingency 2,700 MW for a double contingency With two transmission elements out: - Flows must be within STE ratings - Flows must be within LTE ratings after re-dispatching 900 MW. The assessment relies on existing and new RASs, provided that the maximum amount of resources rejected does not exceed 2,700 MW in total. New projects may participate in new or existing RASs.		
		Operating Reserve consideration	New connections must not increase the existing 10-minute Operating Reserve limit of 950 MW (representing the largest loss of resources caused by a single element contingency in the province).			

Table 5 | Transmission projects considered in-service for 2032

Transmission Projects	Zone	In-service Date
New 2-CCT 230 kV Transmission Line between Lakehead and MacKenzie (Waasigan Phase 1)	Northwest	2026
New 1-CCT 230 kV Transmission Line between MacKenzie and Dryden (Waasigan Phase 2)	Northwest	2027
*New 2-CCT 230 kV Transmission Line from Dryden to Ear Falls	Northwest	2032
*New 2-CCT 230 kV Transmission Line from Ear Falls to Red Lake	Northwest	2032
*New 1-CCT 230 kV Transmission Line from Nipigon to Aroland First Nation (Greenstone Transmission Line)	Northwest	2032
New 1-CCT 500 kV Transmission Line from Mississagi to Hanmer	Northeast	2029
New 2-CCT 230 kV Transmission Line from Mississagi to Third Line	Northeast	2029
**New 1-CCT 230 kV Transmission Line (built to 500 kV standard) from Porcupine to Wawa	Northeast	2030
*New 1-CCT 500kV Transmission Line from Hanmer to Essa	Essa	2032
New 2-CCT 230 kV Transmission Line from the Clarington to Dobbin	East	2029
*New 2-CCT 230 kV Transmission Line from Napanee to Belleville	East	2032
*New bulk station at Belleville	East	2032
*New 2-CCT 230 kV Transmission Line from St. Lawrence to Merivale	Ottawa	2032
*New dynamic reactive power compensation device at Hawthorne	Ottawa	2032
Richview to Manby Transmission Reinforcement Phase 2	Toronto	2030
*New 1-CCT 500 kV Radial Transmission Line from Claireville to Kleinburg with three 500/230 kV autotransformers at Kleinburg	Toronto	2032
*New 2-CCT 230 kV Transmission Line from Kleinburg to Kirby (north of Vaughan MTS #4)	Toronto	2032
*Bowmanville B - New 500 kV station to connect Small Modular Reactors	Toronto	2032
*New 2-CCT 500 kV Transmission Line from Bowmanville towards Toronto bypassing Cherrywood	Toronto	2032
Essa to Orangeville 230 kV Conductor Upgrade	Southwest	2029
Welland-Thorold Power Line	Southwest	2029
Wellington - New 500/230 kV autotransformer station in Puslinch that will sectionalize and re-terminate 500 kV circuit M585M, from Middleport to Milton and V586M, from Middleport to Claireville.	Southwest	2031
New 2-CCT 230 kV Transmission Line from Wellington to Preston	Southwest	2031
Guelph North - New 500/230 kV autotransformer station	Southwest	2031
New 1-CCT 500 kV Transmission Line from Guelph North to Wellington	Southwest	2031
Buchanan to Middleport 230 kV Conductor Upgrade	West	2026
New 2-CCT 230 kV Transmission Line from Lambton to Chatham	West	2028
New 1-CCT 500 kV Transmission Line from Longwood to Lakeshore	West	2029
*New 2-CCT 230 kV Transmission Line from Lakeshore to Lauzon	West	2032

* While all circuits that have an expected in-service date before December 31, 2032 will be considered in the deliverability assessments, projects will not be allowed to connect to circuits with an in-service date beyond December 31, 2031.

** Connections to this circuit will not be allowed to in order to minimize the risk of procuring new resources that would connect to facilities where the timing of the upgrade to a higher voltage level, associated costs and system needs at the time of the decision to upgrade, remain highly uncertain.

3.3 Results

For Northern Ontario, the following limitations were identified:

Table 6 | Northern Ontario Area Congestion Limits

Area	Area Limit (MW) (Energy)	Area Limit (MW) (Capacity)
West of Lakehead TS	300	200
West of Marathon TS	300	450
Northwest	550	600
West of Mississagi TS	850	800
East of Widdifield SS	100	400
Northern Ontario	1,000	900

In addition, new project connections will not be allowed in certain areas that are prone to transient instability and where congestion is often present, such as North and West of Pinard TS, the 115 kV system North of Lakehead TS and the 115 kV system North of Kenora TS.

For the East and West of Toronto sub-systems, the following area limitations were determined:

Table 7 | East and West of Toronto Area Congestion Limits

Zone	Area	Area Limit (MW) (Energy)	Area Limit (MW) (Capacity)
Essa	East of Minden TS	125	300
East/Ottawa	East of Dobbin TS	275	650
	East of St. Lawrence TS	>1,000	>1,000
	East of Hinchinbrooke SS	>1,000	>1,000
	East of Lennox TS	900	900
	East of Bowmanville SS	>1,000	>1,000
Niagara	West of Detweiler TS	900	>1,000
Southwest	West of Middleport	>1,000	>1,000
	West of Milton SS	>1,000	>1,000
Bruce	See West and Southwest limits		
West	West of Buchanan TS	>1,000	>1,000
	West of Chatham SS	150	650

Figure 3 and Figure 4 show the approximate geographical boundaries and the area congestion limits for the areas described above.

Figure 3 | Area Congestion Limits (Energy)

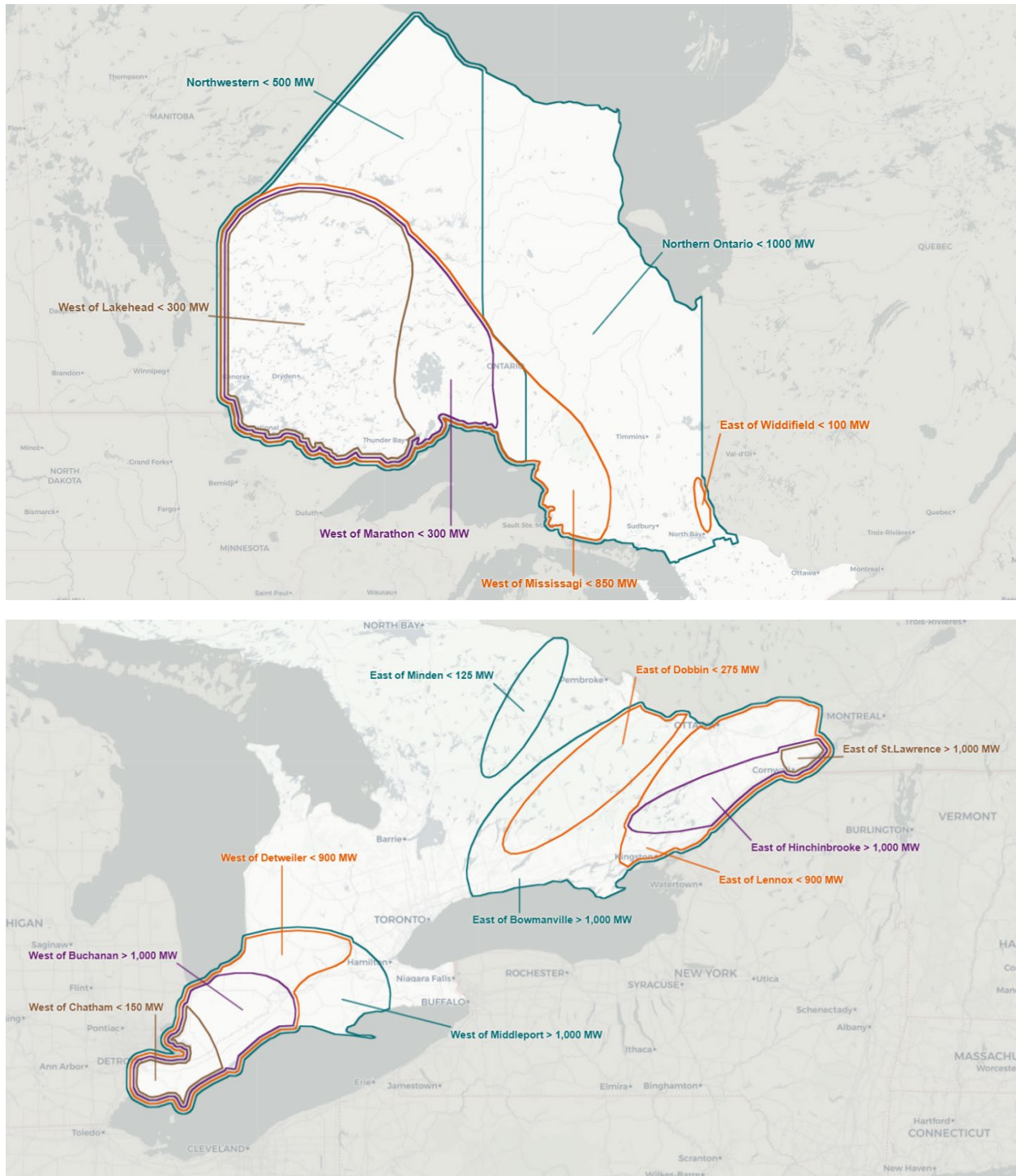
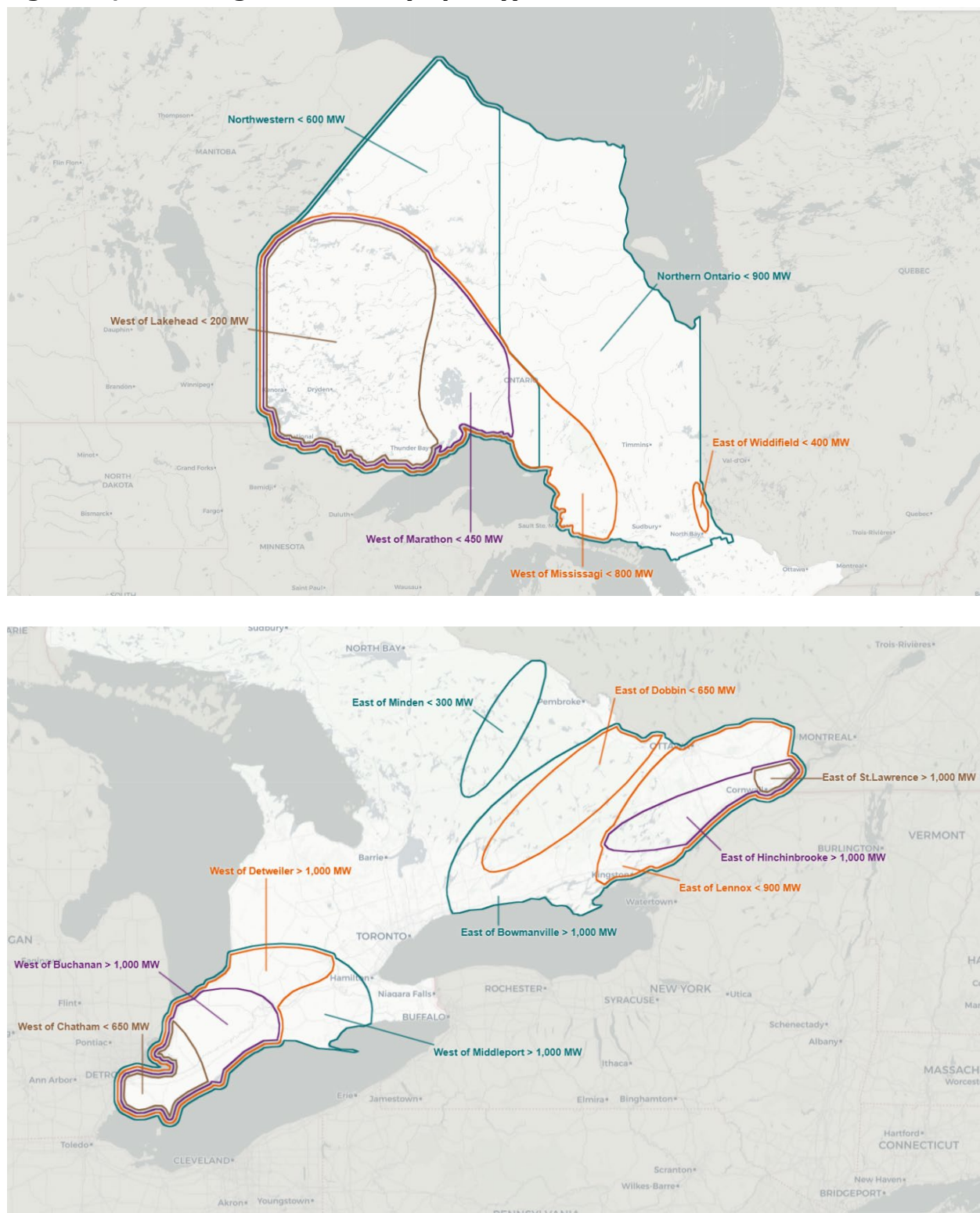


Figure 4 | Area Congestion Limits (Capacity)



New project connections will not be allowed in certain areas that are prone to transient instability and where congestion is often present, such as the 115 kV system bounded by the Barrett Chute, Merivale and Cataraqui stations, as well as a portion of the system east of Dobbin.

4. Inverter Based Resource Limitations

4.1 Objectives

The goal of the Inverter Based Resource (IBR) limitations guidance assessment is to provide information on the amounts of IBR generation that could connect to different parts of the grid with minimal risk of introducing sub-synchronous resonance (SSR) with the existing series capacitors located at the Nobel Switching Station (SS), or introducing undesirable sub-synchronous control interactions (SSCI).

4.2 Methodology

IBRs have a history of oscillating under certain system conditions, typically when they are in proximity of other IBRs in weakly connected systems, or when they are radially connected to series compensated transmission circuits.

In order to avoid potential SSR issues with the series capacitors at Nobel SS on circuits X503E, X504E and the new Hanmer to Essa 500 kV circuit, the IESO performed a topology scan and excluded certain connection points that could become radially connected to these series capacitors for credible scenarios.

Potential SSCIs were identified by the IESO based on the calculated Available Fault Level (AFL), using principles and criteria that align with those that will be used for the Deliverability Test, as outlined in Section 3.3 of the LT2 Window 2 Methodology [3]. The IBRs tested assumed to have a MSCR = 5.

The size and locations of IBR injections were assumed as follows:

- Northern Ontario (Northeast + Northwest)
 - Tested up to 1,000 MW of IBRs using the following bright-line connection criteria:
 - Limit IBR 115 kV connections to 75 MW per circuit – the 115 kV network was found incapable of accommodating significant IBR injections in comparison to a stronger 230 kV network;
 - Limit IBR 230 kV connections to 200 MW per circuit; and
 - A maximum of one injection per circuit was assessed.
- Southern Ontario
 - Size and location of IBRs were chosen using the following bright-line connection criteria:
 - Avoid the limiting circuits of a major transmission interface – to avoid reducing the transfer capability of those interfaces that may have an imbalance of flows;
 - Limit IBR 115 kV connections to 75 MW per circuit;
 - Limit IBR 230 kV circuit connections to 250 MW per circuit; and
 - A maximum of one injection per circuit was assessed.
 - West of Toronto case – tested up to 2,400 MW of IBRs, following the criteria above
 - East of Toronto case – tested up to 1,400 MW of IBRs, following the criteria above.

4.3 Results

4.3.1 Sub-Synchronous Resonance

The results of the SSR topology scan identified that the following circuits, listed in Table 8, could end up in a radial connection to the Nobel SS series capacitors for credible contingencies, and as a result, connection of any IBRs would not be allowed.

Table 8 | Circuits Classified as ‘Not Allowed’ due to Potential SSR Issues

Circuits Connected to Hanmer
X503E
X504E
HANMERxESSA500_NEW (New Hanmer to Essa 500 kV circuit)

The approximate region where these circuits are located is illustrated in Figure 5.

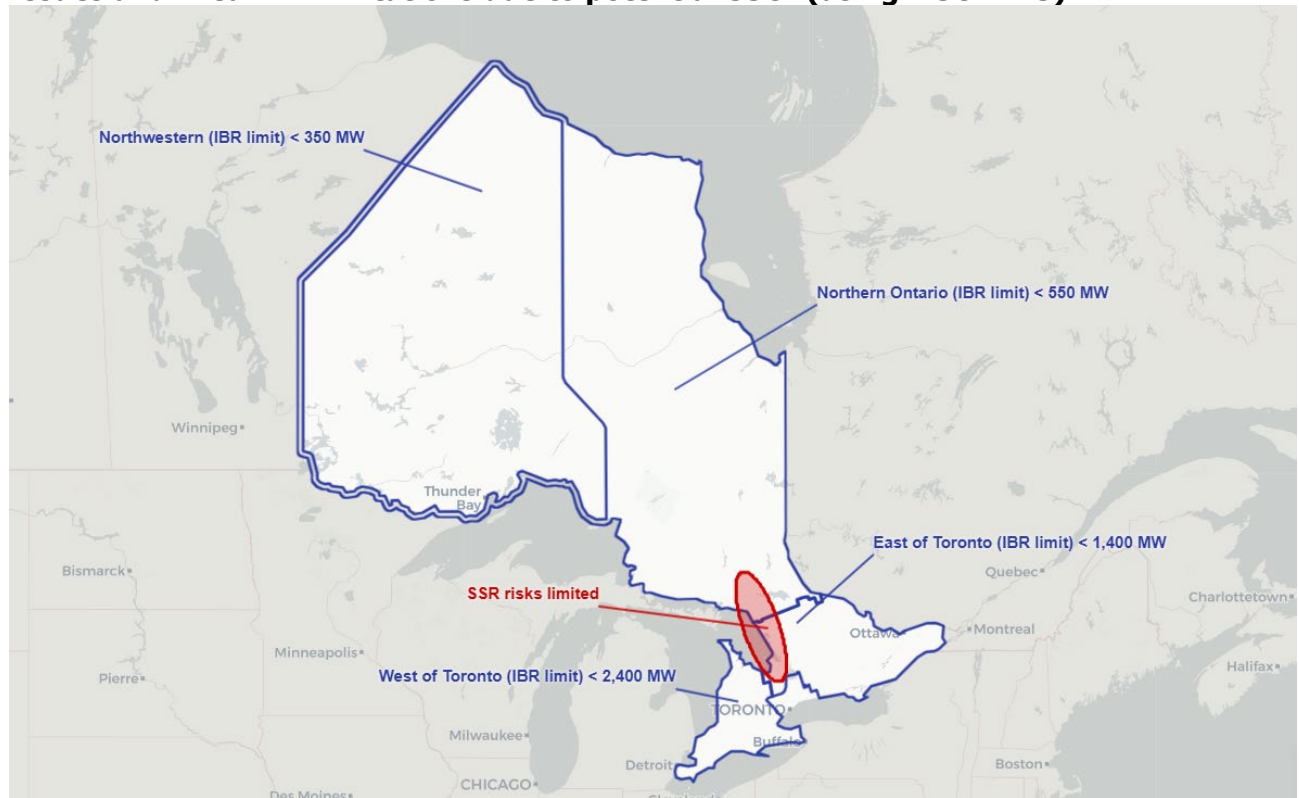
4.3.2 Sub-Synchronous Control Interactions

With consideration of the identified circuits for SSR issues, the remaining circuits were tested to assess SSCI. Out of the 1,000 MW of IBRs that passed the SSR scan in Northern Ontario, where connection sizes to 115 kV circuits are limited to 75 MW and 230 kV circuits are limited to 200 MW per circuit, approximately 550 MW were found to be feasible for connection in Northern Ontario and approximately 350 MW were found to be feasible for connection in Northwestern Ontario due to SSCI.

For both West and East of Toronto cases in Southern Ontario, injections of 2,400 MW and 1,400 MW respectively, were found to be feasible from an SSCI perspective, where connections to 115 kV circuits are limited to 75 MW and 230 kV circuits are limited to 250 MW per circuit.

Figure 5 shows the approximate geographical boundaries and the area IBR limits.

Figure 5 | Approximate Region of Circuits classified as 'Not Allowed' due to Potential SSR Issues and Area IBR limitations due to potential SSCI (using MSCR = 5)



Given the impact of individual IBR connections to the area connection limitations, the maximum amount of IBRs that can connect directly to any single circuit is limited to the bright-line limits as follows:

- 75 MW per 115 kV circuit in both Northern and Southern Ontario;
- 200 MW per 230 kV circuit in Northern Ontario; and
- 250 MW per 230 kV circuit in Southern Ontario.

Furthermore, with the addition of LT2 Window 1 projects, specific regional IBR limitations were also identified. The room available to connect IBRs at various points on the system is dependent on the system strength at the connection point and what the IBR equipment requires for reliable operation.

Figure 6 presents the limitations to connecting IBRs across Northern Ontario assuming the project requires a Minimum Short Circuit Ratio (MSCR) of 5. IBR resources with higher MSCR requirements have less room available at these stations because additional short-circuit strength must be maintained. Conversely, IBR resources capable of operating at lower MSCR levels require less system strength to ensure reliable performance and therefore have more room to connect. Figures 7 and 8 illustrate the room available for IBRs with lower (MSCR of 3) and higher (MSCR of 8) operating requirements, respectively.

The values presented in Figures 6, 7 and 8 represent the maximum amount of IBRs that could connect into a station assuming a single injection into one station at a time. As a result, they do not represent the room available along the circuits connecting to the respective station. The availability along the circuits will depend on the relative impedance and distance from the project to the station. The Figures highlight areas with limited capacity for new IBR connections, as new IBRs may increase the risk of SSCI, as well as areas where IBR resources would benefit from being capable of operating at lower MSCR levels.

Figure 6 | Limitations to connecting IBRs with an MSCR = 5, within proximity of stations in Northern Ontario

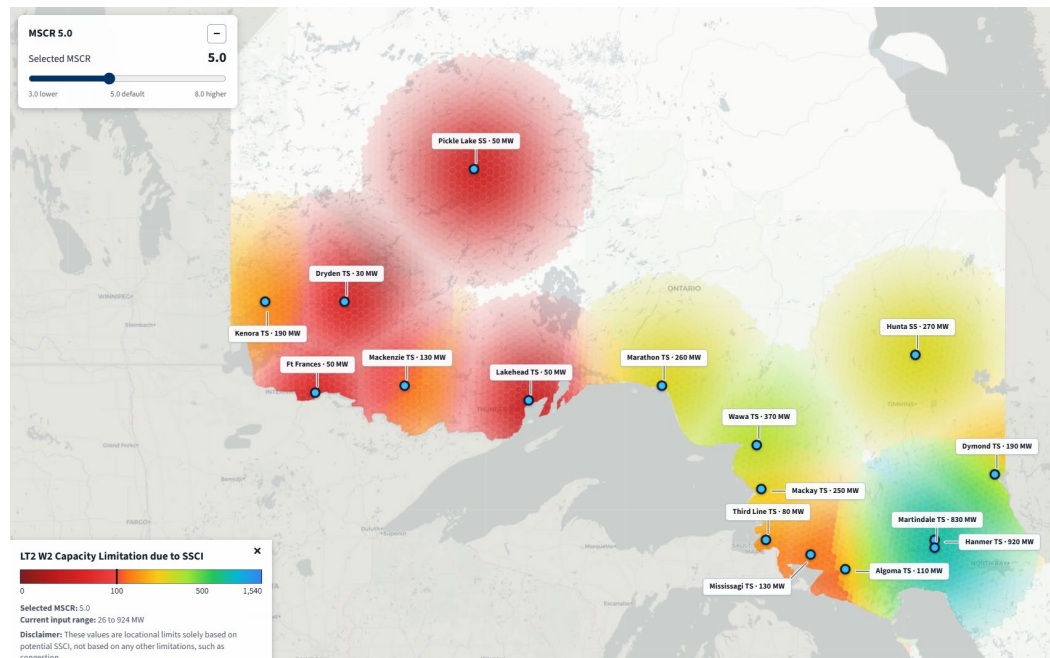


Figure 7 | Limitations for connecting IBRs with an MSCR = 8, within proximity of stations in Northern Ontario

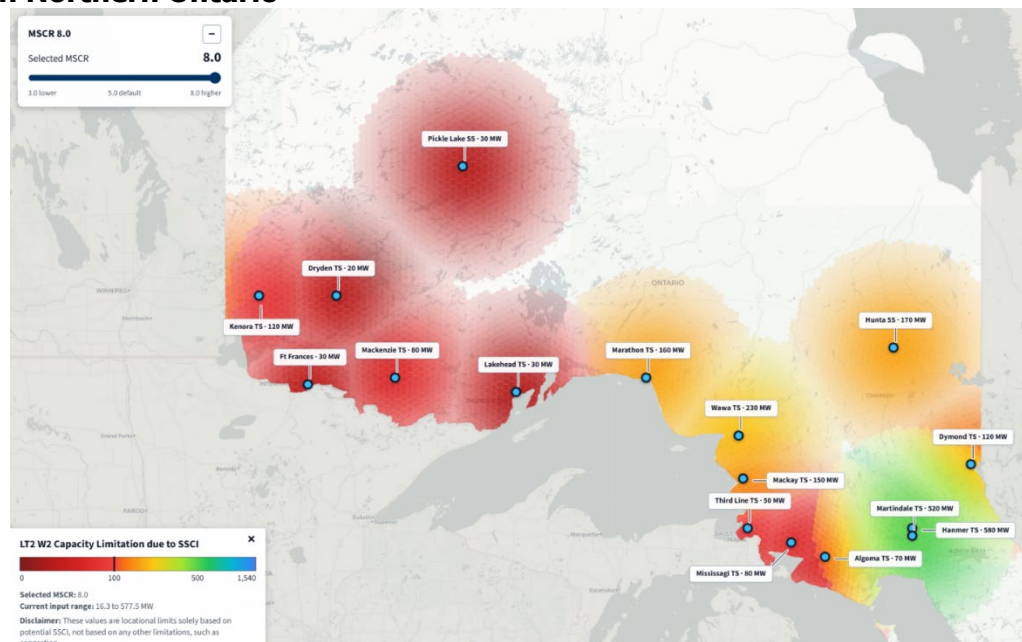
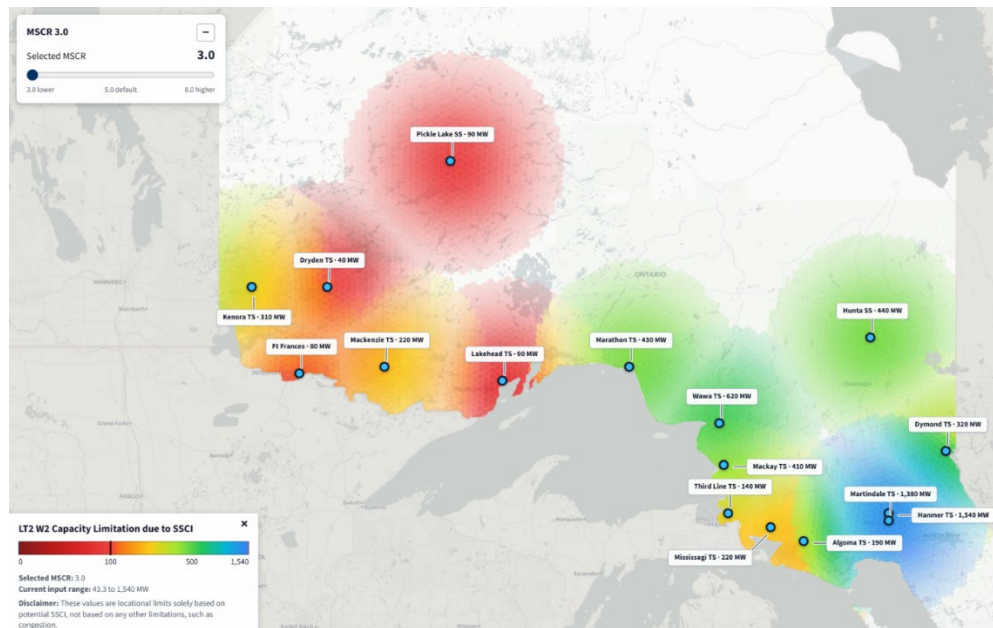


Figure 8 | Limitations for connecting IBRs with an MSCR = 3, within proximity of stations in Northern Ontario



Additional constraints may also arise depending on the type of generation proposing to connect. The constraints will be amplified as more projects are developed near the limited areas.

4.3.2.1 Grid Stability Solutions

These IBR limitations may not be applicable to IBR resources with grid stability solutions enabled, such as Grid Forming (GFM) technology or synchronous condensers. Proponents will be required to identify and describe any grid stability solutions included in their project. The IESO will review this information and determine, at its discretion, the applicability of these limitations.

4.4 Other Considerations

With respect to the above results for guidance, the following must be taken into consideration:

- The analysis is meant to be used for high-level screening purposes only, and is not expected to cover all possible RFP project combinations that may be submitted, as the outcomes of these tests are highly dependent on the size and location of the IBRs modeled;
- A further IBR SSCI assessment will be performed by the IESO during the evaluation stage deliverability test, once the size, location and technical parameters of RFP projects are known. Project-specific assessments will be completed using the parameters submitted by proponents and the assumptions set out in Section 3.3 of the LT2 Window 2 Methodology [3], which may result in limits that differ from those presented in this document;
- As per input from Hydro One, connection of IBRs can introduce voltage unbalance on the transmission system. This issue can be particularly severe for generation connecting to radial circuits. Typically, voltage unbalance will become unacceptable if the product of the line length (in km) and generation (in MW) exceeds 10,000 for 230 kV radial lines (e.g. 100 MW on a 100 km long radial circuit) and 2,500 for 115 kV radial lines (e.g. 50 MW on a 50 km long radial circuit). Proponents will be responsible for mitigating any unacceptable unbalance observed;
- Voltage unbalance can also occur on (non-radial) network circuits; however, it is most likely to only become an issue under outage conditions (e.g. if one-line terminal opens, leaving the generation connected radially to the other terminal). In these scenarios, generation will need to be reduced or curtailed for the duration of the outage to mitigate the issue; and

More detailed SSR, SSCI, voltage unbalance, and additional Electromagnetic Transient (EMT) studies, will be required once detailed models are known, which will most likely occur during the Connection Assessments and Approvals process, as part of a System Impact Assessment (SIA).

5. Circuit congestion limitations

5.1 Objective

The goal of the Circuit congestion limitations guidance assessment is to determine the amount of new energy and capacity resources that could inject into circuits and not require curtailments to prevent thermal overload of the transmission equipment.

5.2 Methodology

The maximum incremental injection into each circuit in each of the areas of study was calculated by determining the remaining capacity between the short-term emergency (STE) thermal rating of the circuit and the post-contingency flow through the circuit following the most limiting recognized contingency, for the most limiting section of the main circuit.

In determining these limits, the following additional criteria was used:

- Where the load-flow study results indicated that a circuit has a capability that exceeds the bright-line connection criteria from the IBR Limitations section, the limit for the circuit was capped at the bright-line level;
- Circuits that were identified to be on the weak path of an interface, to which a direct connection would result in a material reduction in transfer capability, were deemed as “Not Allowed”;
- Available capacity was discounted for circuits on which connecting new resources would have a direct impact on the operability of existing generation units, even those dispatchable. Direct impact could occur if a new resource is located in the proximity of an existing resource and the local transmission capability to evacuate energy is limited, and would significantly inhibit the existing resource to generate, requiring frequent generation redispatch.

5.3 Results

The criteria for the results of the Circuit congestion assessments are detailed in Appendix A. The results of the Circuit congestion assessment are included in the tables presented in Appendix B and Appendix C.

5.4 Other Considerations

- Any connection to HONI transmission circuits will need to comply with [Hydro One Transmission Generation Interconnection Requirements](#) document;
- Connection to circuits forming a parallel transmission path may require a configuration that balances the flows on all circuits in the path; and
- All Battery Energy Storage System (BESS) connections in the proximity to any HONI transmission infrastructure/facilities will need to comply with setback requirements in [Hydro One’s BESS Fire Protection Risk & Response Assessment Standard](#).

6. HONI Transmission System Considerations

6.1 Objective

The goal of this section is to identify the considerations that may limit new connections to Hydro One's transmission system.

The short-circuit limitations guidance assessment is to identify areas where the short-circuit levels are close to, or exceed, the short-circuit capability of the transmission equipment, and there are no feasible solutions recommended to be implemented before year 2032; therefore, those areas should be avoided by the potential proponents in the RFP.

Potential constraints to connect new projects due to line protection, site limitations and ground potential rise are also discussed.

6.2 Constraints Due to Short-Circuit Capabilities

6.2.1 Assumptions and Methodology

HONI has identified transmission stations and equipment with short-circuit capabilities that could be close to their limits or exceeded by 2032 considering the committed generation and transmission projects expected to be in-service prior to the connection of the LT2 Window 2 RFP projects, as specified by the IESO.

Because any addition of generation resources will increase the short-circuit levels in the proximity of their connection, HONI has recommended that proposals should avoid to connect within a radius of 50 km (electrical) from a station with short-circuit limitations.

A short-circuit assessment will be performed for all proposals in the evaluation stage deliverability test, regardless of their location.

6.2.2 Results

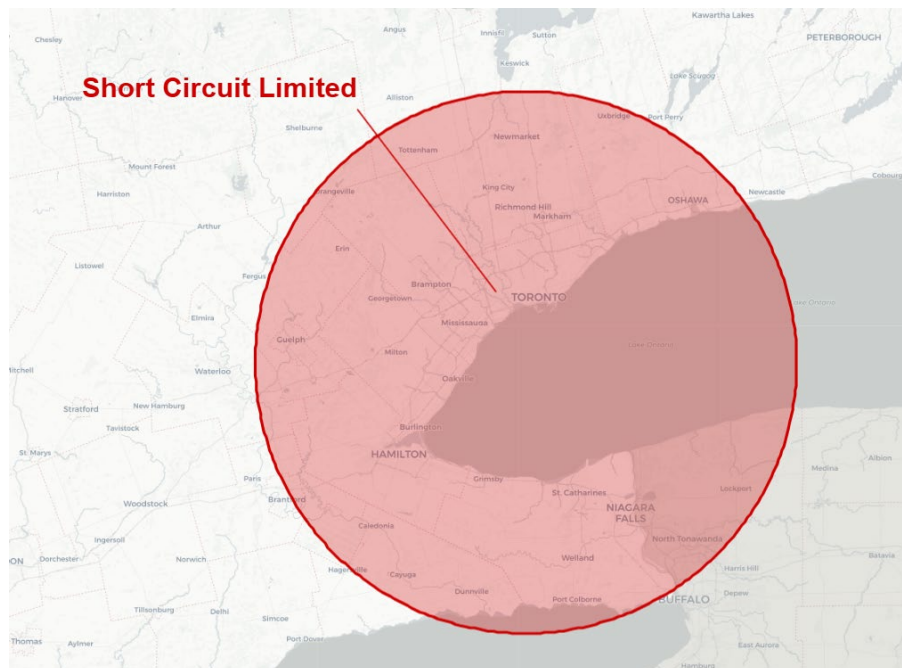
The following table presents HONI's transmission stations with known short circuit limitations. Stations identified as 'limited room' have limited capacity for new generation nearby as short-circuit levels at these stations are approaching maximum equipment capabilities.

Table 9 | Stations with Short-Circuit Limitations (HONI)

Station	Limiting Issue
Allanburg	Strain bus
Beck #2	Breaker rating and Transmission System Code (TSC) limit
Burlington	Breaker rating and TSC limit
Cherrywood	Breaker rating
Manby	Station grounding
Richview	Breaker rating
Trafalgar (limited room)	Breaker rating
Hearn	Breaker rating and TSC limit
Leaside	Breaker rating and TSC limit

Other limitations due to station grounding, skywires, strain buses and cable sections will be identified after the size and connection point of the proposed generators are known. Additional constraints may also arise depending on the generation proposing to connect. Although HONI had indicated that the approximate distance to avoid was 50 km (electrical), to give the reader a rough geographical context, Figure 9 illustrates the approximate regions to avoid by drawing a 50 km radius around each of the stations identified in Table 9.

Figure 9 | Approximate Regions to Avoid Due to Potential Short-Circuit Limitations



6.3 Constraints Due to Protection

The total resource capacity and number of taps that could connect into a circuit may be limited due to line protection considerations. For example, protection may not reliably detect a circuit fault with a new generator connection on the circuit if the circuit is supplied by stations with low short-circuit levels. This determination can be made only after generator parameters and connection points are known.

Connecting into circuits protected by line differential may introduce major complexities and costly solutions, from installing sectionalizing breakers and new protection elements, to installing a full switching station at the connection point. It is, therefore, recommended to avoid connecting into these circuits.

A list of circuits recommended to avoid connecting new generation due to these issues, are shown in Table 10. Please note that constraints due to protection adequacy may not necessarily apply to distribution connected projects or projects wishing to connect to existing tap lines to transmission connected customer facilities.

Table 10 | HONI Owned Circuits to avoid due to line protection constraints

Circuit	Voltage (kV)	Reason	Circuit	Voltage (kV)	Reason
B4V	230	Too many taps	M32W	230	Too many taps
B5C	115	Too many taps	M33W	230	Too many taps
B5V	230	Too many taps	N20K	230	Line differential
B6C	115	Too many taps	N37S	230	Line differential
F11C	115	Too many taps	Q23BM	230	Line differential
F12C	115	Too many taps	Q24HM	230	Line differential
J3E	115	Line differential	Q25BM	230	Line differential
J4E	115	Line differential	Q26M	230	Line differential
J20B	230	Line differential	Q28A	230	Line differential
K21C	230	Line differential	Q29HM	230	Line differential
K23C	230	Line differential	Q30M	230	Line differential
L25V	230	Line differential	Q35M	230	Line differential
L27V	230	Line differential	R24C	230	Line differential
L28C	230	Line differential	S39M	230	Line differential
L20H	230	Too many taps	S47C	230	Line differential
L21H	230	Too many taps	V41N	230	Line differential
L22H	230	Too many taps	V43N	230	Line differential
M20D	230	Too many taps	W44LC	230	Line differential
M21D	230	Too many taps	W45LS	230	Line differential
M31W	230	Too many taps			

Hydro One typically applies distance protection on most transmission circuits. A T-tap connection, subject to conditions, may only be feasible if the impedance between Hydro One's terminal station(s) and the customer's low voltage bus is sufficiently high. A fault on the secondary side of the interfacing transformer should not cause operation of the instantaneous zone 1 distance protection element of the high voltage line to which it is connected and should meet Hydro One protection practice/requirements.

6.4 Site Connection Constraints

Certain transmission stations may have limited capacity or space constraints that could restrict the ability of new projects to connect. In addition, there may be physical, technical, operational, or equipment-related limitations at specific transmission stations, including but not limited to land availability, bus configuration constraints, outage requirements, and station sizing/expansion feasibility. The availability of connection opportunities may also be affected by existing/expected commitments and planned system upgrades. Proponents are encouraged to engage with the applicable Transmitter early in the development process to discuss stations of interest, understand site-specific constraints and potential steps that may be taken to mitigate those constraints, and assess the feasibility of interconnection options having regard to both the initial interconnection and the maintenance of that connection throughout the contractual term.

6.5 Ground Potential Rise Considerations for New Connections

An issue identified through LT1 RFP project execution is that new facilities, particularly Battery Energy Storage System (BESS) with a small footprint, may not have a sufficiently large ground grid capable of reducing ground potential rise (GPR) to below 5 kV, as required by the Ontario Electrical Safety Code. This challenge is exacerbated by high soil resistivity conditions and the absence of multiple distribution neutral connections that are commonly available at conventional station sites. Proponents should undertake appropriate studies to have sufficient footprint and design the ground grid to reduce GPR to below 5 kV.

In assessing grounding performance, Hydro One overhead shield wires (skywires) should not be relied upon to reduce GPR at a BESS facility. A skywire may become disconnected during a fault event due to conductor (skywire) failure, resulting in the BESS ground grid being electrically isolated from the Hydro One grounding network. Consequently, the facility grounding system should be self-sufficient, designed to independently satisfy all applicable GPR and grounding requirements without relying on the continued availability of Hydro One skywires.

7. Distribution Asset Limitations (only HONI stations)

Available capacity at the HONI distribution assets can be found using HONI's Station and Feeder Capacity Calculator, located [here](#). This list shows an approximate amount of generation that can be added at each bus or station owned by HONI.

Please note that upstream restrictions on the high voltage stations may limit the number of resources connecting at the distribution level. Transmission connected resources near a station will increase the fault level in the distribution system of that station, and will therefore compete for the available capacity. Connections to distribution stations will not be allowed if they are directly connected to any circuits deemed "Not Allowed" for connection in Appendix B and Appendix C.

This document does not provide guidance regarding any limitations or availability for connections to the distribution systems owned by Local Distribution Companies (LDCs) beyond the available capacity at distribution level stations supplied from Hydro One stations. Interested proponents are recommended to contact the LDCs operating the distribution system they intend to connect to.

8. Non-Wires Alternatives

The Non-Wires Alternatives (NWA) identified herein are based on the recommendations outlined in the IESO's Regional and Bulk System Plans, as referenced in the sections below. Multiple projects may collectively contribute toward meeting the NWA recommendations described.

The NWA solutions identified below are identified for purposes of informing Rated Criteria Points under Stage 3 of the LT2 Window 2 RFPs and do not guarantee the project will be deliverable; this remains subject to the LT2 Deliverability Test.

8.1 Sault Ste Marie 115 kV Supply Capacity Need

As described in Section 6.3.3, 6.4 and Section 7.3.3 of the East Lake Superior IRRP [5], there is a 95 MW supply capacity need in the Sault Ste. Marie 115 kV system expected to emerge in the near term and requires a solution to maintain system reliability. The recommended action is to pursue a cost-effective resource that is dispatchable and available to provide support, in particular during critical outages in the area, and capable of sustained operation for the duration of the outage condition.

In order to address this need:

1. Projects must be capable of providing firm, dispatchable, and sustained performance;
2. Projects must connect to circuits in the Sault Ste. Marie 115 kV system (i.e. ALGOMA1, ALGOMA2, ALGOMA3, CLERGUE1, CLERGUE2, or LEIGHBY1);
3. Projects must remain connected and meet contractual obligations during any single element outage or following the sequential loss of both autotransformers at Third Line TS;
4. Projects must have the capability to provide reactive services, up to 33% of the rated active power of the facility, to the IESO-controlled grid at all times while not on outage, regardless of its actual active power output level;
5. Projects must be submitted to the LT2(c-2) RFP. Connections to circuits in the Sault Ste. Marie 115 kV system are not allowed under the LT2(e-2) RFP.

8.2 North of Sudbury Voltage Needs

As described in Section 7.3 of the North of Sudbury Bulk Plan [6], there is a need for supply resources capable of providing voltage control in the Kirkland Lake 115 kV system. As part of the study analysis, demand and generation conditions suggested it may be a prime location for transmission-connected solar facilities capable of providing voltage support at all hours.

In order to address this need:

1. Projects must be either solar or thermal generation and connect to transmission circuit K4;
2. Projects must have the capability to provide reactive services, up to 33% of the rated active power of the facility, to the IESO-controlled grid at all times while not on outage, regardless of its actual active power output level.

Up to 50 MW of capacity is available on circuit K4, as per Appendices B and C.

8.3 Belleville Energy and Capacity Needs

As described in Section 6.2 and Section 7.4 of the Eastern Ontario Bulk Plan [7], there are energy and capacity needs at Belleville DESN. The recommended action is to pursue at least 10 MW of solar and 60 MW of BESS. Achieving either of these procurement targets would be considered acceptable, with procurement of both technologies preferred where feasible.

In order to address this need:

1. Projects must be distribution connected to Belleville DESN, or have a dual transmission connection to circuits connecting into Belleville DESN (H23B and T25B);
2. Solar projects must be submitted to the LT2(e-2) RFP and energy storage projects must be submitted to the LT2(c-2) RFP.
3. All projects must have the capability to provide reactive services, up to 33% of the rated active power of the facility, to the IESO-controlled grid at all times while not on outage, regardless of its actual active power output level.

9. General Considerations

The preliminary connection guidance provided in this document is intended to only be used in the context of the procurement of energy or capacity under the LT2(e-2) and LT2(c-2) RFP, as applicable, and only addresses electrical transmission system availability and energy deliverability limitations. Proponents are encouraged to take a fulsome view of where they site their projects and examine other regulatory, permitting, RFP and policy requirements.

In making use of this guidance document, there are several considerations and limitations, in addition to those detailed in other sections, that are important to consider. They are listed as follows:

- The connection guidance provided in this document for energy-producing resources is valid for resources with lower capacity factors (below 50%). For resources with higher capacity factors, consultations with IESO staff is recommended as some connection locations may limit the delivery of energy from those resources;
- Some locations could be subject to multiple types of limitations. Where multiple limitations apply to a particular location, the most constraining limitation should be used;
- The conclusions of this document are highly dependent on the size and location of RFP proposals in the same electrical proximity. For example, the total amount that could be injected into a multi-circuit line or corridor could be less than the sum of the maximum single circuit injection value. As a result, proposals in the RFPs may compete for the same transmission system availability during the evaluation stage deliverability test. Also, as it is expected that the LT2(e-2) RFP will happen before the LT2(c-2) RFP and, then, any successful LT2(e-2) projects will be accounted for in the LT2(c-2) deliverability test;
- The assumptions and methods used to provide this guidance document are reflective of a limited number of historical and forecasted operating scenarios. At the time of the evaluation stage deliverability test, there may be other scenarios, methods and changes to forecasts to consider, which could provide different results;
- Direct connections into a transmission station were not assessed for possible limitations due to physical space available, future expansion, auto-transformer rating and other operability issues at the station beyond the limitations described in this document;
- In order to avoid a situation where a connection configuration turns out to be infeasible, impractical or too costly, applicants are encouraged to have discussions with transmitters and LDCs prior to making a submission into the RFPs. Connection configurations must meet the transmitter's or LDC's connection requirements;
- The IESO strongly recommends that proponents with proposed projects connecting to the transmission system, or proposed projects larger than or equal to 10 MW connecting to the distribution system, delay their SIA applications until the results of the procurement are announced. If an applicant chooses to apply for an SIA, it is important to note that the SIA may need to be updated or restarted after the results of the procurement are announced, as an SIA completed earlier would not have included all successful projects in the assessment; and

- Potential proponents considering projects for future procurements, including potential future LT2 RFP windows, should be aware that the outcomes of the LT2(e-2) RFP and LT2(c-2) RFP, as well as the purpose of the procurement (e.g., acquisition of energy or capacity), will make the information in this document inadequate for purpose of siting those projects.

10. References

- [1] IESO, "[2026 Annual Planning Outlook Report](#)", March 2026.
- [2] IESO, "[Annual Planning Outlook: Supply, Adequacy and Energy Outlook Module](#)", March 2026.
- [3] IESO, "Evaluation Stage Deliverability Test Methodologies for the Long-Term 2 Window 2 Requests for Proposals", October 2026.
- [4] CIGRE Working Group B4.62, "Connection of wind farms to weak AC networks", December 2016.
- [5] IESO, "[East Lake Superior Integrated Regional Resource Plan](#)", July 2026.
- [6] IESO, "[North of Sudbury Bulk Plan](#)", August 2026.
- [7] IESO, "[Eastern Ontario Bulk Plan](#)", August 2026.

11. Appendix A: Criteria for Transmission Circuit Capacity Tables

The tables list the incremental generation that could connect into each circuit based on the assessments performed in Section 5 for both the energy (Appendix B) and capacity (Appendix C) streams. All of the known limitations associated with a particular circuit are also identified in the tables for comparison, and the most limiting should be used.

However, the actual capacity that can connect into each circuit may be further restricted by different or other limitations identified through the assessments described in the other sections of the document. The actual capacity that can be connected to a specific location on a circuit will be determined by evaluation stage deliverability test.

The following criteria is common among the energy and capacity streams, and was used to determine if a circuit was classified as “Avoid” or “Not Allowed”:

- A circuit is classified as “Not Allowed” if the circuit⁶ is:
 - In an area with existing stability issues;
 - Part of an intertie connected to a neighboring transmission system. Connections to intertie circuits are not allowed to maintain intertie transfer capability with neighboring system operators;
 - At a higher risk of potential SSR issues;
 - Identified to be on the weak path of an internal interface;
 - A new circuit with an in-service date of December 31, 2031 or later. This is to minimize the risk of procuring new resources that may not be able to connect due to potential delays with the new transmission projects; or
 - A circuit designed and constructed to accommodate future operation at a higher voltage level than its present or expected near-term planned operating voltage. This is to minimize the risk of procuring new resources that would connect to facilities where the timing of the upgrade to a higher voltage level, associated costs and system needs at the time of the decision to upgrade, remain highly uncertain.
- A circuit is classified as “Avoid” if the circuit is:
 - A 500 kV circuit. Capacities on these circuits are currently listed as ‘n/a’ as in the unlikely scenario that connection to the 500 kV system is feasible in terms of timeline and cost, the capacity of connection to a 500 kV is highly dependent on connection configuration;

⁶ The ‘Not Allowed’ classification would also apply to distribution system connections to the transmission circuit.

- Identified to have less than 10 MW of capacity available based on the congestion analysis performed;
- Identified to have potential protection limitations; or
- Identified to be within 50 km of a short-circuit limited station (partial or fully).

Proposals for projects that seek to connect to circuits that are “Not Allowed” will be deemed “non-deliverable” in the evaluation stage deliverability test and not subject to further testing.

Although there are capacities listed for circuits classified as “Avoid”, there is a higher risk that a project of that size will not be successful in the deliverability test in the evaluation stage of the RFP.

As a further limitation, the maximum amount of IBRs that can connect directly to any single circuit is further limited to the bright-line limits as follows:

- 75 MW per 115 kV circuit in both Northern and Southern Ontario; and
- 200 MW per 230 kV circuit in Northern Ontario.

In sum, Proponents may submit proposals for projects for that:

- Are at locations either not assessed in this document or on circuits recommended to “Avoid”;
- Exceed the Circuit congestion limitations presented in the tables below; and
- Exceed the IBR bright-line limits if they are not an IBR.

However, there is a higher risk to those proposals during the evaluation stage deliverability test.



12. Appendix B: LT2(e-2) Transmission Circuit Capacities

The following tables list the circuits in each of the three sub-systems studied. The tables list the incremental generation that could connect into each circuit based on the assessments performed in Section 5 for the energy stream. Note the details listed in Appendix A.

Table 11 | Transmission Circuit Capacities and Limitations for North of Toronto (Energy)

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
15M1	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
29M1		75	115	Northwest		y		IBR bright-line limit
56M1	Not Allowed	0	115	Northwest		y		Existing stability issues ⁸
57M1	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
A1B	Avoid	0	115	Northwest		y		Circuit congestion
A3M		75	115	Northwest		y		IBR bright-line limit
A4L	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
A5A	Avoid	0	115	Northwest		y		Circuit congestion
A6P	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
A7L	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
A8L	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
B14		75	115	Northwest		y		IBR bright-line limit
B15		75	115	Northwest		y		IBR bright-line limit
B5		50	115	Northwest		y		Circuit congestion
B6M		25	115	Northwest		y		Circuit congestion
C1A	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
C2A	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
C2M		25	115	Northwest		y		IBR bright-line limit
C3A	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
C3W	Not Allowed	0	115	Northwest		y		IBR bright-line limit
D5D		50	115	Northwest		y		Circuit congestion
E1C		25	115	Northwest		y		Circuit congestion
E2R		25	115	Northwest		y		Circuit congestion
E4D		25	115	Northwest		y		Circuit congestion
F1B		0	115	Northwest		y		Circuit congestion. Proximity to other IBRs
F2B		0	115	Northwest		y		Circuit congestion. Proximity to other IBRs
F3M	Not Allowed	0	115	Northwest		y		Intertie Circuit
K2M	Not Allowed	0	115	Northwest		y		Existing stability issues ⁸
K3D		25	115	Northwest		y		Circuit congestion
K4W	Not Allowed	0	115	Northwest		y		Existing stability issues ⁸
K5W	Not Allowed	0	115	Northwest		y		Existing stability issues ⁸
K6F		25	115	Northwest		y		Circuit congestion
K7K		50	115	Northwest		y		Circuit congestion
L3P		75	115	Northwest		y		IBR bright-line
L4P		75	115	Northwest		y		IBR bright-line limit

⁷ 115 kV system North of Kenora TS

⁸ 115 kV system North of Lakehead TS

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
M1M		25	115	Northwest		y		Circuit congestion
M1S		10	115	Northwest		y		Circuit congestion
M2D		75	115	Northwest		y		IBR bright-line limit
M2W	Avoid	10	115	Northwest		y		Circuit congestion
M3E		30	115	Northwest		y		Circuit congestion
P1T		75	115	Northwest		y		IBR bright-line limit
P3B		75	115	Northwest		y		IBR bright-line limit
P5M		50	115	Northwest		y		Circuit congestion
P7B		75	115	Northwest		y		IBR bright-line limit
R1LB	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
R2LB	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
R9A	Not Allowed	0	115	Northwest		y		Existing stability issues ⁷
S1C		50	115	Northwest		y		Circuit congestion
S1H	Avoid	0	115	Northwest		y		Circuit congestion
S1K		75	115	Northwest		y		IBR bright-line limit
SK1	Not Allowed	0	115	Northwest		y		Intertie Circuit
T1M	Avoid	0	115	Northwest		y		Circuit congestion
W2		50	115	Northwest		y		Circuit congestion
W3C	Not Allowed	0	115	Northwest		y		Existing stability issues ⁶
A21L		0	230	Northwest		y		Proximity to other IBRs
A22L		200	230	Northwest		y		IBR bright-line limit
A30L		200	230	Northwest		y		IBR bright-line limit
A31L		200	230	Northwest		y		IBR bright-line limit
D26A		200	230	Northwest		y		IBR bright-line limit
D32A		200	230	Northwest		y		New circuit - MacKenzie to Dryden. IBR bright-line limit
DRYDEN_EARF_230_NEW1	Not Allowed	0	230	Northwest		y		New circuit - Dryden to Ear Falls. IBR bright-line limit
DRYDEN_EARF_230_NEW2	Not Allowed	0	230	Northwest		y		New circuit - Dryden to Ear Falls. IBR bright-line limit
F25A		75	230	Northwest		y		Circuit congestion. Proximity to other IBRs.
K21W	Not Allowed	0	230	Northwest		y		Intertie Circuit
K22W	Not Allowed	0	230	Northwest		y		Intertie Circuit
K23D		10	230	Northwest		y		Circuit congestion. Proximity to other IBRs
K24F		25	230	Northwest		y		Circuit congestion. Proximity to other IBRs
M23L		175	230	Northwest		y		IBR bright-line limit
M24L		200	230	Northwest		y		IBR bright-line limit
M37L		200	230	Northwest		y		IBR bright-line limit
M38L		200	230	Northwest		y		IBR bright-line limit
N93A	Avoid	0	230	Northwest		y		Circuit congestion
R46R	Avoid	0	230	Northwest		y		Proximity of other IBRs

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
REDL_EARF_230_N EW1	Not Allowed	0	230	Northwest		y		New circuit - Red Lake to Ear Falls. IBR bright-line limit
REDL_EARF_230_N EW2	Not Allowed	0	230	Northwest		y		New circuit - Red Lake to Ear Falls. IBR bright-line limit
W21M		125	230	Northwest		y		IBR bright-line limit
W22M		200	230	Northwest		y		IBR bright-line limit
W23K		200	230	Northwest		y		IBR bright-line limit
W35M		200	230	Northwest		y		IBR bright-line limit
W36M		200	230	Northwest		y		IBR bright-line limit
W54W		200	230	Northwest		y		IBR bright-line limit
A4H	Avoid	0	115	Northeast		y		Circuit congestion
A5H	Avoid	0	115	Northeast		y		Circuit congestion
A7V	Not Allowed	0	115	Northeast		y		Existing stability issues ⁹
A8K	Avoid	0	115	Northeast		y		Circuit congestion
A9K	Avoid	0	115	Northeast		y		Circuit congestion
ALGOMA1		0	115	Northeast		y		Specific need identified in IRRP to be addressed in LT2(c-2)
ALGOMA2		0	115	Northeast		y		Specific need identified in IRRP to be addressed in LT2(c-2)
ALGOMA3		0	115	Northeast		y		Specific need identified in IRRP to be addressed in LT2(c-2)
B3E		75	115	Northeast		y		IBR bright-line limit
B4B		75	115	Northeast		y		IBR bright-line limit
B4E		75	115	Northeast		y		IBR bright-line limit
C1C	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
C1L		75	115	Northeast		y		IBR bright-line limit
C2C		75	115	Northeast		y		IBR bright-line limit
CLERGUE1		0	115	Northeast		y		Specific need identified in IRRP to be addressed in LT2(c-2)
CLERGUE2		0	115	Northeast		y		Specific need identified in IRRP to be addressed in LT2(c-2)
D2H	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
D2L	Avoid	0	115	Northeast		y		Circuit congestion. Proximity to other IBRs
D3H	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
D3K	Not Allowed	0	115	Northeast		y		Weak path of an interface
D4	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
D4Z	Not Allowed	0	115	Northeast		y		Intertie Circuit
D6T	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
F1E	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
GARTSHO1	Avoid	0	115	Northeast		y		Circuit congestion
GARTSHO2	Avoid	0	115	Northeast		y		Circuit congestion
GARTSHO3	Avoid	0	115	Northeast		y		Circuit congestion
GL1	Avoid	0	115	Northeast		y		Circuit congestion

⁹ North or West of Pinard TS

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
GL4	Avoid	0	115	Northeast		y		Circuit congestion
H2N	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
H4Z	Not Allowed	0	115	Northeast		y		Intertie Circuit
H4Z	Not Allowed	0	115	Northeast		y		Intertie Circuit
H6T		25	115	Northeast		y		Circuit congestion
H7T		25	115	Northeast		y		Circuit congestion
H9K	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
HARRIS1		75	115	Northeast		y		Circuit congestion
HIGHFAL1		25	115	Northeast		y		Circuit congestion
HIGHFAL2		50	115	Northeast		y		Circuit congestion
HOGG1		50	115	Northeast		y		Circuit congestion
K2	Avoid	0	115	Northeast		y		Circuit congestion
K3G		75	115	Northeast		y		Circuit congestion
K4		50	115	Northeast		y		Circuit congestion
K5A	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
L1S		75	115	Northeast		y		IBR bright-line limit
L5A		75	115	Northeast		y		IBR bright-line
L7S	Avoid	0	115	Northeast		y		Proximity of other IBRs
L8L	Avoid	0	115	Northeast		y		Circuit congestion
LEIGHBY1		0	115	Northeast		y		Specific need identified in IRRP to be addressed in LT2(c-2)
M19M		25	115	Northeast		y		Circuit congestion
M1R		75	115	Northeast		y		IBR bright-line limit
M31		75	115	Northeast		y		Circuit congestion
M3K	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
M9K	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
MACKAY1	Avoid	0	115	Northeast		y		Circuit congestion
MACKAY2	Avoid	0	115	Northeast		y		Circuit congestion
MAGPIE1		50	115	Northeast		y		Circuit congestion
MISSION1		75	115	Northeast		y		IBR bright-line
NORTHRN1		75	115	Northeast		y		IBR bright-line limit
P13T		75	115	Northeast		y		IBR bright-line limit
P15T		75	115	Northeast		y		IBR bright-line limit
P7G		50	115	Northeast		y		Circuit congestion
S2B		25	115	Northeast		y		Circuit congestion
S5M		75	115	Northeast		y		IBR bright-line limit
S6F		75	115	Northeast		y		IBR bright-line limit
STEEPHL1		75	115	Northeast		y		Circuit congestion
T1B	Avoid	0	115	Northeast		y		Circuit congestion
T2R		75	115	Northeast		y		IBR bright-line limit
T61S		75	115	Northeast		y		IBR bright-line limit
T7M	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
T8M	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
W2C		50	115	Northeast		y		Circuit congestion
W4H		50	115	Northeast		y		Circuit congestion
W6CS	Not Allowed	0	115	Northeast		y		Existing stability issues ⁸
A23P		50	230	Northeast		y		Circuit congestion. Proximity to other IBRs
A24P		200	230	Northeast		y		IBR bright-line limit
D23G	Not Allowed	0	230	Northeast		y		Existing stability issues ⁸
H20PP		0	230	Northeast		y		Proximity of other IBRs
H22D	Not Allowed	0	230	Northeast		y		Existing stability issues ⁸
H23S		50	230	Northeast	y	y		Circuit congestion
H24S		125	230	Northeast	y	y		Circuit congestion
K24G		150	230	Northeast		y		Circuit congestion
K38S	Not Allowed	0	230	Northeast		y		Existing stability issues ⁸
L20D	Not Allowed	0	230	Northeast		y		Existing stability issues ⁸
L21S	Not Allowed	0	230	Northeast		y		Existing stability issues ⁸
P21G		0	230	Northeast		y		Proximity to other IBRs
P22G		200	230	Northeast		y		IBR bright-line limit
P23G		200	230	Northeast		y		New circuit - Mississagi to Third Line. IBR bright-line limit
P24G		200	230	Northeast		y		New circuit - Mississagi to Third Line. IBR bright-line limit
P25W		125	230	Northeast		y		Circuit congestion
P26W		150	230	Northeast		y		Circuit congestion
P91G		200	230	Northeast		y		IBR bright-line limit
R21D	Not Allowed	0	230	Northeast		y		Existing stability issues ⁸
S21N		200	230	Northeast		y		IBR bright-line limit
S22A		50	230	Northeast		y		IBR bright-line limit
T27P	Avoid	0	230	Northeast		y		Circuit congestion
T28P	Avoid	0	230	Northeast		y		Circuit congestion
W71D		200	230	Northeast	y	y		IBR bright-line limit
WAWA_PORC_230_NEW	Not Allowed	200	230	Northeast		y		New circuit - Wawa to Porcupine; Circuit built with 500 kV towers
X23N		200	230	Northeast		y		IBR bright-line limit
X25S		200	230	Northeast		y		IBR bright-line limit
X26S		200	230	Northeast		y		IBR bright-line limit
X27A		200	230	Northeast		y		IBR bright-line limit
X29S		200	230	Northeast		y		IBR bright-line limit
X74P	Not Allowed	0	230	Northeast		y		Circuit built with 500 kV towers and currently operating at 230 kV; circuits may be upgraded in the future.
D501P	Avoid	n/a	500	Northeast		y		500 kV Circuit
HANMER_ESSA_500_NEW	Not Allowed	n/a	500	Northeast		y		New circuit - Hanmer to Essa. 500 kV circuit
HANMER_MISS_500_NEW	Avoid	n/a	500	Northeast		y		New circuit - Hanmer to Mississagi. 500 kV circuit

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
P502X	Avoid	n/a	500	Northeast		y		500 kV Circuit
X503E	Not Allowed	n/a	500	Northeast		y		500 kV Circuit. Potential SSR Issues.
X504E	Not Allowed	n/a	500	Northeast		y		500 kV Circuit. Potential SSR Issues

Table 12 | Transmission Circuit Capacities and Limitations for East of Toronto (Energy)

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of St. Lawrence (E: 200 MW C: 100 MW)	East of Hinchinbrooke (E: >1,000 MW C: 400 MW)	East of Minden TS (E: 125 MW C: 300 MW)	East of Dobbin TS (E: 275 MW C: 650 MW)	East of Bowmanville SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
D6		75	115	Essa			y				IBR bright-line limit
B88H	Avoid	150	230	Essa						y (partial)	Circuit congestion
B89H	Avoid	150	230	Essa						y (partial)	Circuit congestion
D1M		100	230	Essa			y				Circuit congestion
D2M		100	230	Essa			y				Circuit congestion
D3M		75	230	Essa			y				Circuit congestion
D4M		75	230	Essa			y				Circuit congestion
D5H	Not Allowed	0	230	Essa							Weak path of an interface
E20S		250	230	Essa							IBR bright-line limit
E21S		250	230	Essa							IBR bright-line limit
E26	Avoid	0	230	Essa							Proximity of other IBRs
E27	Avoid	0	230	Essa							Proximity of other IBRs
E28		250	230	Essa							IBR bright-line limit
E29		250	230	Essa							IBR bright-line limit
E8V	Not Allowed	0	230	Essa							Weak path of an interface
E9V	Not Allowed	0	230	Essa							Weak path of an interface
H82V	Avoid	125	230	Essa						y	Circuit congestion
H83V	Avoid	150	230	Essa						y	Circuit congestion
M6E		25	230	Essa							Circuit congestion
M7E		100	230	Essa							Circuit congestion
M80B		150	230	Essa							Circuit congestion
M81B		150	230	Essa							Circuit congestion
E510V	Avoid	n/a	500	Essa						y (partial)	500 kV Circuit
E511V	Avoid	n/a	500	Essa						y (partial)	500 kV Circuit
79M1	Not Allowed	0	115	Ottawa							Intertie Circuit
A2		75	115	Ottawa							IBR bright-line limit
A3RM		75	115	Ottawa							IBR bright-line limit
A4K		75	115	Ottawa							IBR bright-line limit
A5RK		75	115	Ottawa							IBR bright-line limit
A6R		75	115	Ottawa							IBR bright-line limit
A8M		75	115	Ottawa							IBR bright-line limit
F10MV		75	115	Ottawa							IBR bright-line limit
H9A	Not Allowed	0	115	Ottawa							Intertie Circuit
L2M		25	115	Ottawa	y				y		Circuit congestion
L2M (north)		75	115	Ottawa	y				y		North of Chesterville. IBR bright-line limit
M1R		75	115	Ottawa	y				y		IBR bright-line limit
M4G		75	115	Ottawa							IBR bright-line limit

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of St. Lawrence (E: 200 MW C: 100 MW)	East of Hinchinbrooke (E: >1,000 MW C: 400 MW)	East of Minden TS (E: 125 MW C: 300 MW)	East of Dobbin TS (E: 275 MW C: 650 MW)	East of Bowmanville SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
M5G		75	115	Ottawa							IBR bright-line limit
S7M	Not Allowed	0	115	Ottawa							Existing stability issues ⁹
V12M		75	115	Ottawa							IBR bright-line limit
X2Y	Not Allowed	0	115	Ottawa							Intertie Circuit
A41T	Not Allowed	0	230	Ottawa							Intertie Circuit
A42T	Not Allowed	0	230	Ottawa							Intertie Circuit
B5D	Not Allowed	0	230	Ottawa	y				y		Intertie Circuit
C3S		0	230	Ottawa							Proximity of other IBRs
D5A	Not Allowed	0	230	Ottawa	y						Intertie Circuit
L24A		225	230	Ottawa	y				y		Circuit congestion
M30A	Avoid	250	230	Ottawa							Connection difficulties; Discuss options with transmitter
M31A	Avoid	250	230	Ottawa							Connection difficulties; Discuss options with transmitter
M32S		250	230	Ottawa							IBR bright-line limit
X522A	Avoid	n/a	500	Ottawa					y		500 kV Circuit
X523A	Avoid	n/a	500	Ottawa					y		500 kV Circuit
B1S	Not Allowed	0	115	East							Existing stability issues ¹⁰
B5QK	Not Allowed	0	115	East					y		Existing stability issues ⁹
C7BM	Not Allowed	0	115	East							Existing stability issues ⁹
L1MB	Avoid	0	115	East	y				y		Circuit congestion
L5C	Not Allowed	0	115	East	y						Intertie Circuit
P3S		75	115	East				y			IBR bright-line limit
P4S		75	115	East				y			IBR bright-line limit
Q3K		75	115	East					y		IBR bright-line limit
Q3M6		75	115	East					y		IBR bright-line limit
Q6S		25	115	East					y		Circuit congestion
W3B	Not Allowed	0	115	East							Existing stability issues ⁹
X6	Not Allowed	0	115	East							Existing stability issues ¹¹
B31L	Not Allowed	0	230	East	y				y		Intertie Circuit
C25H		150	230	East							Circuit congestion
C27P		150	230	East				y			Circuit congestion
DOBB_CLRNGTN_230_NEW1	Avoid	150	230	East						y	New circuit – Dobbin to Clarington

¹⁰ 115 kV system bounded by Barrett Chute, Merivale, and Cataraqui stations

¹¹ System East of Dobbin

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	East of St. Lawrence (E: 200 MW C: 100 MW)	East of Hinchinbrooke (E: >1,000 MW C: 400 MW)	East of Minden TS (E: 125 MW C: 300 MW)	East of Dobbin TS (E: 275 MW C: 650 MW)	East of Bowmanville SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
DOBB_CLRNGTN_230_NEW2	Avoid	150	230	East						y	New circuit - Dobbin to Clarington
E34M	Avoid	0	230	East							Proximity of other IBRs. Protection adequacy
H23B		150	230	East							Circuit congestion
H27H		125	230	East							Circuit congestion
L20H	Avoid	100	230	East		y			y		Proximity of other IBRs. Protection adequacy
L21H	Avoid	100	230	East		y			y		Proximity of other IBRs. Protection adequacy
L22H	Avoid	0	230	East		y			y		Proximity of other IBRs. Protection adequacy
L33P	Not Allowed	0	230	East	y				y		Intertie Circuit
L34P	Not Allowed	0	230	East	y				y		Intertie Circuit
NAPNE_BELVLE_230_NEW	Not Allowed	250	230	East							New circuit – Napanee to Belleville
P15C	Avoid	150	230	East						y (partial)	Circuit congestion
STLAWR_MERIVL_230_NEW1	Not Allowed	250	230	East	y	y		y	y		New Circuit – St. Lawrence to Merivale
STLAWR_MERIVL_230_NEW2	Not Allowed	250	230	East	y	y		y	y		New Circuit – St. Lawrence to Merivale
T22C	Avoid	125	230	East						y (partial)	Circuit congestion
T25B	Avoid	250	230	East						y (partial)	
T31H	Avoid	150	230	East						y (partial)	
T32H	Avoid	225	230	East						y (partial)	Circuit congestion
T33E	Avoid	150	230	East						y (partial)	
X1H		250	230	East		y			y		IBR bright-line limit
X1P	Not Allowed	0	230	East				y			Existing stability issues ¹⁰
X21		250	230	East					y		IBR bright-line limit
X22		250	230	East					y		IBR bright-line limit
X2H		250	230	East		y			y		IBR bright-line limit
X3H		250	230	East		y			y		IBR bright-line limit
X4H		250	230	East		y			y		IBR bright-line limit
X520B	Avoid	n/a	500	East					y	y (partial)	500 kV Circuit
X521B	Avoid	n/a	500	East					y	y (partial)	500 kV Circuit
X526B	Avoid	n/a	500	East					y	y (partial)	500 kV Circuit
X527B	Avoid	n/a	500	East					y	y (partial)	500 kV Circuit
X534N	Avoid	n/a	500	East					y		500 kV Circuit
X538N	Avoid	n/a	500	East					y		500 kV Circuit

Table 13 | Transmission Circuit Capacities and Limitations for West of Toronto (Energy)

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: 900 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
A36N	Avoid	75	115	Niagara						y	IBR bright-line limit
A37N	Avoid	75	115	Niagara						y	IBR bright-line limit
A6C	Avoid	75	115	Niagara						y	IBR bright-line limit
A7C	Avoid	75	115	Niagara						y	IBR bright-line limit
C2P	Avoid	75	115	Niagara						y	IBR bright-line limit
D10S	Avoid	75	115	Niagara						y	IBR bright-line limit
D1A	Avoid	75	115	Niagara						y	IBR bright-line limit
D3A	Avoid	75	115	Niagara						y	IBR bright-line limit
D9HS	Avoid	75	115	Niagara						y	IBR bright-line limit
Q11S	Avoid	75	115	Niagara						y	IBR bright-line limit
Q12S	Avoid	75	115	Niagara						y	IBR bright-line limit
Q2AH	Avoid	75	115	Niagara						y	IBR bright-line limit
Q3N	Avoid	75	115	Niagara						y	IBR bright-line limit
Q4N	Avoid	75	115	Niagara						y	IBR bright-line limit
BP76	Not Allowed	0	230	Niagara						y	Intertie Circuit
PA27	Not Allowed	0	230	Niagara						y	Intertie Circuit
PA301	Not Allowed	0	230	Niagara						y	Intertie Circuit
PA302	Not Allowed	0	230	Niagara						y	Intertie Circuit
Q10P	Avoid	0	230	Niagara						y	Circuit congestion
Q21P	Avoid	0	230	Niagara						y	Circuit congestion
Q22P	Avoid	0	230	Niagara						y	Circuit congestion
Q23BM	Avoid	125	230	Niagara						y (partial)	Protection adequacy
Q24HM	Avoid	100	230	Niagara						y (partial)	Protection adequacy
Q25BM	Avoid	125	230	Niagara						y (partial)	Protection adequacy
Q26M	Avoid	225	230	Niagara						y (partial)	Protection adequacy
Q28A	Avoid	75	230	Niagara						y	Protection adequacy
Q29HM	Avoid	125	230	Niagara						y (partial)	Protection adequacy
Q30M	Avoid	150	230	Niagara						y (partial)	Protection adequacy
Q35M	Avoid	225	230	Niagara						y (partial)	Protection adequacy
B10	Avoid	75	115	Southwest						y (limited)	IBR bright-line limit
B11	Avoid	75	115	Southwest						y (limited)	IBR bright-line limit
B12BL	Avoid	0	115	Southwest						y (partial)	Circuit congestion
B13BL	Avoid	0	115	Southwest						y (partial)	Circuit congestion
B2	Avoid	0	115	Southwest						y (limited)	Circuit congestion
B3	Avoid	25	115	Southwest						y (partial)	Circuit congestion
B4	Avoid	75	115	Southwest						y (partial)	IBR bright-line limit
B5C	Avoid	25	115	Southwest						y (partial)	Protection adequacy
B6C	Avoid	25	115	Southwest						y (partial)	Protection adequacy

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: 900 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
B7	Avoid	75	115	Southwest						y (partial)	IBR bright-line limit
B8	Avoid	50	115	Southwest						y (partial)	IBR bright-line limit
C12	Not Allowed	75	115	Southwest				y		y (limited)	IBR bright-line limit
C9	Not Allowed	75	115	Southwest				y		y (limited)	IBR bright-line limit
D10H		75	115	Southwest			y	y	y		IBR bright-line limit
D11K		75	115	Southwest			y	y			IBR bright-line limit
D12K		75	115	Southwest			y	y			IBR bright-line limit
D1W		75	115	Southwest			y	y			IBR bright-line limit
D7F		75	115	Southwest			y	y			IBR bright-line limit
D8S		75	115	Southwest			y	y			IBR bright-line limit
D9F		75	115	Southwest			y	y			IBR bright-line limit
F11C	Avoid	75	115	Southwest			y	y			Protection adequacy
F12C	Avoid	50	115	Southwest			y	y			Protection adequacy
H5K	Not Allowed	0	115	Southwest						y (limited)	Short cables
H6K	Not Allowed	0	115	Southwest						y (limited)	Short cables
HL3	Avoid	75	115	Southwest						y (limited)	IBR bright-line limit
HL4	Avoid	75	115	Southwest						y (limited)	IBR bright-line limit
K12		75	115	Southwest				y			IBR bright-line limit
K7		0	115	Southwest				y			Proximity of other IBRs
M18		0	115	Southwest			y	y			Proximity of other IBRs
S2S		25	115	Southwest					y		Circuit congestion
B18H	Avoid	175	230	Southwest						y	Circuit congestion
B20H	Avoid	175	230	Southwest						y	Circuit congestion
B22D		150	230	Southwest			y	y			Circuit congestion
B23D		125	230	Southwest			y	y			Circuit congestion
B40C	Avoid	250	230	Southwest						y	IBR bright-line limit
B41C	Avoid	250	230	Southwest						y	IBR bright-line limit
B4V	Avoid	50	230	Southwest					y		Protection adequacy
B5V	Avoid	125	230	Southwest					y		Protection adequacy
D4W		225	230	Southwest			y	y			IBR bright-line limit
D5W		225	230	Southwest			y	y			IBR bright-line limit
D6V		0	230	Southwest					y		Proximity of other IBRs.
D7V		200	230	Southwest					y		Circuit congestion
K40M	Avoid	225	230	Southwest				y		y (limited)	Circuit congestion
M20D	Avoid	125	230	Southwest				y		y (limited)	Protection adequacy
M21D	Avoid	125	230	Southwest				y		y (limited)	Protection adequacy
M27B	Avoid	200	230	Southwest						y (partial)	Circuit congestion
M28B	Avoid	200	230	Southwest						y (partial)	Circuit congestion
M31W	Avoid	200	230	Southwest				y		y (limited)	Protection adequacy
M32W	Avoid	200	230	Southwest				y		y (limited)	Protection adequacy

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: 900 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
M33W	Avoid	250	230	Southwest				y		y (limited)	Protection adequacy
M34H	Avoid	250	230	Southwest						y (partial)	IBR bright-line limit
N20K	Avoid	250	230	Southwest				y			Protection adequacy
N21J		250	230	Southwest				y			IBR bright-line limit
N22J		250	230	Southwest				y			IBR bright-line limit
N37S	Avoid	250	230	Southwest				y			Protection adequacy
N5M	Avoid	100	230	Southwest				y		y (limited)	Circuit congestion
N6M	Avoid	225	230	Southwest				y		y (limited)	Circuit congestion
S24V	Avoid	0	230	Southwest							Circuit congestion
S39M	Avoid	50	230	Southwest				y		y (limited)	Proximity of other IBRs. Protection adequacy
T36B	Avoid	250	230	Southwest						y	
T37B	Avoid	225	230	Southwest						y	
T38B	Avoid	175	230	Southwest						y	Circuit congestion
T39B	Avoid	175	230	Southwest						y	Circuit congestion
B501M	Avoid	n/a	500	Southwest					y	y (partial)	500 kV Circuit
B502M	Avoid	n/a	500	Southwest					y	y (partial)	500 kV Circuit
M572T	Avoid	n/a	500	Southwest						y	500 kV Circuit
M573T	Avoid	n/a	500	Southwest						y	500 kV Circuit
M585M	Avoid	n/a	500	Southwest					y	y (partial)	500 kV Circuit
N580M	Avoid	n/a	500	Southwest				y		y (partial)	500 kV Circuit
N581M	Avoid	n/a	500	Southwest				y		y (partial)	500 kV Circuit
N582L	Avoid	n/a	500	Southwest				y		y (limited)	500 kV Circuit
V586M	Avoid	n/a	500	Southwest					y	y (partial)	500 kV Circuit
61M18		0	115	Bruce							Proximity of other IBRs
A1BTS		0	115	Bruce							Proximity of other IBRs
BTS1P		0	115	Bruce							Proximity of other IBRs
CP1J		0	115	Bruce							Proximity of other IBRs
J1BTS		0	115	Bruce							Proximity of other IBRs
B20P	Avoid	0	230	Bruce					y		Circuit congestion
B24P	Avoid	0	230	Bruce					y		Circuit congestion
B27S	Avoid	0	230	Bruce							Proximity of other IBRs. Circuit congestion
B28S	Avoid	0	230	Bruce							Proximity of other IBRs. Circuit congestion
A565L	Avoid	n/a	500	Bruce							500 kV Circuit
B561M	Avoid	n/a	500	Bruce					y	y (partial)	500 kV Circuit
B562E	Avoid	n/a	500	Bruce							500 kV Circuit
B563A	Avoid	n/a	500	Bruce							500 kV Circuit
B569B	Avoid	n/a	500	Bruce					y		500 kV Circuit
E564L	Avoid	n/a	500	Bruce							500 kV Circuit

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: 900 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
E578P	Avoid	n/a	500	Bruce							500 kV Circuit
E8F	Avoid	0	115	West	y	y		y			Circuit congestion
E9F	Avoid	0	115	West	y	y		y			Circuit congestion
H9W	Avoid	0	115	West		y		y			Proximity of other IBRs
J1B	Avoid	0	115	West	y	y		y			Circuit congestion
J2N	Avoid	0	115	West	y	y		y			Circuit congestion
J3E	Avoid	0	115	West	y	y		y			Protection adequacy
J4E	Avoid	0	115	West	y	y		y			Protection adequacy
K2Z	Avoid	0	115	West	y	y		y			Proximity of other IBRs
K6Z	Avoid	0	115	West	y	y		y			Proximity of other IBRs
N1S		75	115	West	y	y		y			IBR bright-line limit
N4S		75	115	West	y	y		y			IBR bright-line limit
N5K		50	115	West							Circuit congestion
N6C		75	115	West	y	y		y			IBR bright-line limit
N7C		75	115	West	y	y		y			IBR bright-line limit
S2N	Avoid	0	115	West	y	y		y			Circuit congestion
W12		75	115	West		y		y			IBR bright-line limit
W14	Avoid	0	115	West		y		y			Proximity of other IBRs, Circuit congestion
W1W	Avoid	0	115	West		y		y			Circuit congestion
W2S		50	115	West		y		y			Circuit congestion
W5N		75	115	West		y		y			IBR bright-line limit
W6NL		75	115	West		y		y			IBR bright-line limit
W7		75	115	West		y		y			IBR bright-line limit
W8T	Avoid	0	115	West		y		y			Proximity of other IBRs
W9L		75	115	West		y		y			IBR bright-line limit
WT1A	Avoid	0	115	West		y		y			Proximity of other IBRs, Circuit congestion
WT1T	Avoid	0	115	West		y		y			Proximity of other IBRs, Circuit congestion
Z1E	Avoid	0	115	West		y		y			Circuit congestion
Z7E		75	115	West		y		y			IBR bright-line limit
B3N	Not Allowed	0	230	West	y	y		y			Intertie Circuit
C31	Avoid	0	230	West	y	y		y			Proximity of other IBRs
C42H		225	230	West	y	y		y			Circuit congestion
C43H		100	230	West	y	y		y			Circuit congestion
C64H		250	230	West	y	y		y			IBR bright-line limit
C65H		250	230	West	y	y		y			IBR bright-line limit
C87H		250	230	West	y	y		y			IBR bright-line limit
C88H		250	230	West	y	y		y			IBR bright-line limit
H25J		200	230	West	y	y		y			Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: 900 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
H26J		200	230	West	y	y		y			Circuit congestion
H38		250	230	West		y		y			IBR bright-line limit
H39		250	230	West		y		y			IBR bright-line limit
H53Z		250	230	West	y	y		y			IBR bright-line limit
H54Z		225	230	West	y	y		y			Circuit congestion
H56Z	Not Allowed	0	230	West							New circuit - Lakeshore to Lauzon. IBR bright-line limit
H57Z	Not Allowed	0	230	West							New circuit - Lakeshore to Lauzon. IBR bright-line limit
H75		250	230	West	y	y		y			IBR bright-line limit
H76		250	230	West	y	y		y			IBR bright-line limit
J20B	Avoid	0	230	West	y	y		y			Circuit congestion. Protection adequacy
J5D	Not Allowed	0	230	West	y	y		y			Intertie Circuit
L23N		250	230	West	y	y		y			IBR bright-line limit
L24L		150	230	West	y	y		y			Circuit congestion
L25V	Avoid	250	230	West	y	y		y			Protection adequacy
L26L		150	230	West	y	y		y			Circuit congestion
L27V	Avoid	250	230	West	y	y		y			Protection adequacy
L28C	Avoid	250	230	West	y	y		y			Protection adequacy
L29C		125	230	West	y	y		y			Circuit congestion
L34C		250	230	West		y		y			New circuit - Lambton to Chatham. IBR bright-line limit
L35C		250	230	West		y		y			New circuit - Lambton to Chatham. IBR bright-line limit
L4D	Not Allowed	0	230	West		y		y			Intertie Circuit
L51D	Not Allowed	0	230	West		y		y			Intertie Circuit
N21W	Avoid	0	230	West	y	y		y			Circuit congestion
N22W	Avoid	0	230	West	y	y		y			Circuit congestion
N6S		100	230	West	y	y		y			Circuit congestion
N7S		100	230	West	y	y		y			Circuit congestion
S47C	Avoid	150	230	West		y		y			Protection adequacy
V41N	Avoid	200	230	West	y	y		y			Protection adequacy
V43N	Avoid	200	230	West	y	y		y			Protection adequacy
W36		150	230	West		y		y			Circuit congestion
W37		150	230	West		y		y			Circuit congestion
W42L		100	230	West		y		y			Circuit congestion
W43L		100	230	West		y		y			Circuit congestion
W44LC	Avoid	50	230	West		y		y			Protection adequacy
W45LS	Avoid	0	230	West		y		y			Proximity of other IBRs. Protection adequacy
LNGWD_LKSHR_500_NEW	Avoid	n/a	500	West		y		y			New circuit - Longwood to Lakeshore. 500 kV circuit



13. Appendix C: LT2(c-2) Transmission Circuit Capacities

The following tables list the circuits in each of the three sub-systems studied. The tables list the incremental generation that could connect into each circuit based on the assessments performed in Section 5 for the capacity stream. Note the details listed in Appendix A.

Table 14 | Transmission Circuit Capacities and Limitations for North of Toronto (Capacity)

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
15M1	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁶
29M1		50	50	115	Northwest		y		Circuit congestion
56M1	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
57M1	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
A1B		25	25	115	Northwest		y		Circuit congestion
A3M		75	125	115	Northwest		y		IBR bright-line limit. Circuit congestion
A4L	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
A5A		25	25	115	Northwest		y		Circuit congestion
A6P	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
A7L	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
A8L	Not Allowed	0	0	115	Northwest		y		Existing stability issues
B14		75	200	115	Northwest		y		IBR bright-line limit
B15		75	100	115	Northwest		y		Circuit congestion
B5		50	50	115	Northwest		y		Circuit congestion
B6M		25	25	115	Northwest		y		Circuit congestion
C1A	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
C2A	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
C2M		25	25	115	Northwest		y		Circuit congestion
C3A	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
C3W	Not Allowed	0	0	115	Northwest		y		Circuit congestion
D5D		50	50	115	Northwest		y		IBR bright-line limit. Circuit congestion
E1C		75	100	115	Northwest		y		Circuit congestion
E2R		25	25	115	Northwest		y		Circuit congestion
E4D		25	25	115	Northwest		y		Circuit congestion
F1B	Avoid	0	0	115	Northwest		y		Circuit congestion
F2B		75	100	115	Northwest		y		IBR bright-line limit. Circuit congestion
F3M		75	75	115	Northwest		y		Circuit congestion
K2M	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁶
K3D		25	25	115	Northwest		y		Circuit congestion
K4W	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁶
K5W	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁶
K6F		25	25	115	Northwest		y		Circuit congestion
K7K		50	50	115	Northwest		y		IBR bright-line limit. Circuit congestion
L3P		75	125	115	Northwest		y		Circuit congestion
L4P		75	75	115	Northwest		y		IBR bright-line limit. Circuit congestion
M1M		25	25	115	Northwest		y		Circuit congestion
M1S		25	25	115	Northwest		y		Circuit congestion
M2D		75	100	115	Northwest		y		IBR bright-line limit. Circuit congestion
M2W		10	10	115	Northwest		y		Circuit congestion
M3E		50	50	115	Northwest		y		Circuit congestion
P1T		75	75	115	Northwest		y		IBR bright-line limit. Circuit congestion
P3B		75	100	115	Northwest		y		Circuit congestion
P5M		75	100	115	Northwest		y		IBR bright-line limit. Circuit congestion
P7B		75	100	115	Northwest		y		IBR bright-line limit. Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
R1LB	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
R2LB	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
R9A	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁷
S1C		50	75	115	Northwest		y		Circuit congestion
S1H	Avoid	0	0	115	Northwest		y		Circuit congestion
S1K		75	75	115	Northwest		y		IBR bright-line limit. Circuit congestion
SK1	Not Allowed	0	0	115	Northwest		y		Intertie Circuit
T1M		25	25	115	Northwest		y		Circuit congestion
W2		50	50	115	Northwest		y		Circuit congestion
W3C	Not Allowed	0	0	115	Northwest		y		Existing stability issues ⁶
A21L		0	100	230	Northwest		y		Proximity of other IBRs
A22L		150	150	230	Northwest		y		Circuit congestion
A30L		200	225	230	Northwest		y		IBR bright-line limit
A31L		200	225	230	Northwest		y		IBR bright-line limit
D26A		125	125	230	Northwest		y		IBR bright-line limit
D32A		125	125	230	Northwest		y		New circuit – MacKenzie to Dryden
DRYDEN_EARF_230_NEW1	Not Allowed	0	0	230	Northwest		y		New circuit - Dryden to Ear Falls. IBR bright-line limit
DRYDEN_EARF_230_NEW2	Not Allowed	0	0	230	Northwest		y		New circuit - Dryden to Ear Falls. IBR bright-line limit
F25A		50	50	230	Northwest		y		IBR bright-line limit
K21W	Not Allowed	0	0	230	Northwest		y		Intertie Circuit
K22W	Not Allowed	0	0	230	Northwest		y		Intertie Circuit
K23D	Avoid	0	0	230	Northwest		y		Proximity of other IBRs. Circuit congestion
K24F		50	200	230	Northwest		y		Proximity of other IBRs. Circuit congestion
M23L		100	100	230	Northwest		y		Circuit congestion
M24L		100	100	230	Northwest		y		Circuit congestion
M37L		200	250	230	Northwest		y		IBR bright-line limit
M38L		200	250	230	Northwest		y		IBR bright-line limit
N93A	Avoid	0	0	230	Northwest		y		Circuit congestion
R46R		200	250	230	Northwest		y		
REDL_EARF_230_NEW1RED_EAR_1	Not Allowed	0	0	230	Northwest		y		New circuit – Red Lake to Ear Falls. IBR bright-line limit
REDL_EARF_230_NEW2RED_EAR_2	Not Allowed	0	0	230	Northwest		y		New circuit – Red Lake to Ear Falls. IBR bright-line limit
W21M	Avoid	0	0	230	Northwest		y		Circuit congestion
W22M		75	75	230	Northwest		y		Circuit congestion
W23K		200	250	230	Northwest		y		IBR bright-line limit
W35M		200	250	230	Northwest		y		IBR bright-line limit
W36M		200	250	230	Northwest		y		IBR bright-line limit
W54W		200	250	230	Northwest		y		IBR bright-line limit
A4H	Avoid	0	0	115	Northeast		y		Circuit congestion
A5H	Avoid	0	0	115	Northeast		y		Circuit congestion
A7V	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
A8K		50	50	115	Northeast		y		Circuit congestion
A9K		50	50	115	Northeast		y		Circuit congestion
ALGOMA1		75	100	115	Northeast		y		Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
ALGOMA2		50	50	115	Northeast		y		Circuit congestion
ALGOMA3		50	50	115	Northeast		y		Circuit congestion
B3E		75	75	115	Northeast		y		IBR bright-line limit. Circuit congestion
B4B		75	100	115	Northeast		y		IBR bright-line limit. Circuit congestion
B4E		75	100	115	Northeast		y		IBR bright-line limit. Circuit congestion
C1C	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
C1L		75	150	115	Northeast		y		Circuit congestion
C2C		75	75	115	Northeast		y		Circuit congestion
CLERGUE1		75	100	115	Northeast		y		Circuit congestion
CLERGUE2		75	100	115	Northeast		y		Circuit congestion
D2H	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
D2L	Avoid	0	0	115	Northeast		y		Proximity of other IBRs. Circuit congestion
D3H	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
D3K	Not Allowed	0	0	115	Northeast		y		Weak path of an interface
D4	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
D4Z	Not Allowed	0	0	115	Northeast		y		Intertie Circuit
D6T	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
F1E	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
GARTSHO1	Avoid	0	0	115	Northeast		y		Circuit congestion
GARTSHO2	Avoid	0	0	115	Northeast		y		Circuit congestion
GARTSHO3	Avoid	0	0	115	Northeast		y		IBR bright-line limit. Circuit congestion
GL1		50	50	115	Northeast		y		Circuit congestion
GL4		50	50	115	Northeast		y		Circuit congestion
H2N	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
H4Z	Not Allowed	0	0	115	Northeast		y		Intertie Circuit
H4Z	Not Allowed	0	0	115	Northeast		y		Intertie Circuit
H6T	Avoid	0	0	115	Northeast		y		Circuit congestion
H7T	Avoid	0	0	115	Northeast		y		Circuit congestion
H9K	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
HARRIS1		75	75	115	Northeast		y		Circuit congestion
HIGHFAL1		50	50	115	Northeast		y		Circuit congestion
HIGHFAL2		75	75	115	Northeast		y		Circuit congestion
HOGG1		50	50	115	Northeast		y		Circuit congestion
K2	Avoid	0	0	115	Northeast		y		Circuit congestion
K3G		75	250	115	Northeast		y		Circuit congestion
K4		50	50	115	Northeast		y		Circuit congestion
K5A	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
L1S		75	100	115	Northeast		y		IBR bright-line limit. Circuit congestion
L5A		75	100	115	Northeast		y		Circuit congestion
L7S		25	25	115	Northeast		y		Proximity of other IBRs. Circuit congestion
L8L		75	100	115	Northeast		y		Circuit congestion
LEIGHBY1		75	125	115	Northeast		y		IBR bright-line limit. Circuit congestion
LINE#2		75	175	115	Northeast		y		Circuit congestion
M19M		25	25	115	Northeast		y		Circuit congestion
M31		75	100	115	Northeast		y		Circuit congestion
M3K	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
M9K	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
MACKAY1	Avoid	0	75	115	Northeast		y		Circuit congestion
MACKAY2	Avoid	0	75	115	Northeast		y		Circuit congestion
MAGPIE1		50	50	115	Northeast		y		Circuit congestion
MISSION1		75	75	115	Northeast		y		Circuit congestion
NORTHRN1		75	125	115	Northeast		y		IBR bright-line limit. Circuit congestion
P13T		75	75	115	Northeast		y		IBR bright-line limit. Circuit congestion
P15T		75	100	115	Northeast		y		IBR bright-line limit. Circuit congestion
P7G		50	50	115	Northeast		y		IBR bright-line limit. Circuit congestion
S2B		25	25	115	Northeast		y		Circuit congestion
S5M		75	75	115	Northeast		y		IBR bright-line limit. Circuit congestion
S6F		75	100	115	Northeast		y		IBR bright-line limit. Circuit congestion
STEEPHL1		75	75	115	Northeast		y		Circuit congestion
T1B		10	10	115	Northeast		y		Circuit congestion
T2R		75	75	115	Northeast		y		IBR bright-line limit. Circuit congestion
T61S		75	100	115	Northeast		y		IBR bright-line limit. Circuit congestion
T7M	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
T8M	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
W2C		50	75	115	Northeast		y		Circuit congestion
W4H		50	50	115	Northeast		y		Circuit congestion
W6CS	Not Allowed	0	0	115	Northeast		y		Existing stability issues ⁸
A23P		50	100	230	Northeast		y		Proximity of other IBRs. Circuit congestion
A24P		200	225	230	Northeast		y		IBR bright-line limit
D23G	Not Allowed	0	0	230	Northeast		y		Existing stability issues ⁸
H20PP		200	250	230	Northeast		y		IBR bright-line limit
H22D	Not Allowed	0	0	230	Northeast		y		Existing stability issues ⁸
H23S	Avoid	0	0	230	Northeast	y	y		Circuit congestion
H24S		75	75	230	Northeast	y	y		Circuit congestion
K24G		200	200	230	Northeast		y		IBR bright-line limit
K38S	Not Allowed	0	0	230	Northeast		y		Existing stability issues ⁸
L20D	Not Allowed	0	0	230	Northeast		y		Existing stability issues ⁸
L21S	Not Allowed	0	0	230	Northeast		y		Existing stability issues ⁸
P21G		0	250	230	Northeast		y		Proximity to other IBRs
P22G		200	250	230	Northeast		y		IBR bright-line limit
P23G		200	250	230	Northeast		y		New circuit - Mississagi to Third Line. IBR bright-line limit
P24G		200	250	230	Northeast		y		New circuit - Mississagi to Third Line. IBR bright-line limit
P25W		75	75	230	Northeast		y		IBR bright-line limit. Circuit congestion
P26W		100	100	230	Northeast		y		IBR bright-line limit. Circuit congestion
P91G		175	175	230	Northeast		y		IBR bright-line limit. Circuit congestion
R21D	Not Allowed	0	0	230	Northeast		y		Existing stability issues ⁸
S21N		200	250	230	Northeast		y		IBR bright-line limit
S22A		50	225	230	Northeast		y		Proximity of other IBRs. Circuit congestion
T27P		90	75	230	Northeast		y		Circuit congestion
T28P		75	75	230	Northeast		y		Circuit congestion
W71D	Avoid	150	150	230	Northeast	y	y		Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of Widdifield (E: 100 MW C: 400 MW)	Northern Ontario (IBR: 550 MW)	< 50 km of Short Circuit Limited Station?	Notes
WAWA_PORC_230_NEW	Not Allowed	0	0	230	Northeast		y		New circuit - Porcupine to Wawa. Circuit built with 500 kV towers
X23N		200	250	230	Northeast		y		IBR bright-line limit
X25S		200	250	230	Northeast		y		IBR bright-line limit
X26S		200	250	230	Northeast		y		IBR bright-line limit
X27A		200	250	230	Northeast		y		IBR bright-line limit
X29S		200	250	230	Northeast		y		IBR bright-line limit
X74P	Not Allowed	0	0	230	Northeast		y		Circuit built with 500 kV towers and currently operating at 230 kV; circuits may be upgraded in the future.
D501P	Avoid	n/a	n/a	500	Northeast		y		500 kV Circuit
HANMER_ESSA_500_NEW	Not Allowed	n/a	n/a	500	Northeast		y		New circuit – Hanmer to Essa. 500 kV Circuit
HANMER_MISS_500_NEW	Avoid	n/a	n/a	500	Northeast		y		New circuit – Hanmer to Mississagi . 500 kV Circuit
P502X	Avoid	n/a	n/a	500	Northeast		y		500 kV Circuit
X503E	Not Allowed	n/a	n/a	500	Northeast		y		500 kV Circuit. Potential SSR Issues.
X504E	Not Allowed	n/a	n/a	500	Northeast		y		500 kV Circuit. Potential SSR Issues.

Table 15 | Transmission Circuit Capacities and Limitations for East of Toronto (Capacity)

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of St. Lawrence (E: 200 MW C: 100 MW)	East of Hinchinbrooke (E: >1,000 MW C: 400 MW)	East of Minden TS (E: 125 MW C: 300 MW)	East of Dobbin TS (E: 275 MW C: 650 MW)	East of Bowmanville SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
D6		75	100	115	Essa			y				Circuit congestion
B88H	Avoid	75	75	230	Essa						y (partial)	Circuit congestion
B89H	Avoid	150	150	230	Essa						y (partial)	Circuit congestion
D1M		100	100	230	Essa			y				Circuit congestion
D2M		75	75	230	Essa			y				Circuit congestion
D3M	Avoid	0	0	230	Essa			y				Circuit congestion
D4M	Avoid	0	0	230	Essa			y				Circuit congestion
D5H	Not Allowed	0	0	230	Essa							Weak path of an interface
E20S		250	250	230	Essa							
E21S		250	250	230	Essa							
E26		0	175	230	Essa							Proximity of other IBRs
E27		0	175	230	Essa							Proximity of other IBRs
E28		250	250	230	Essa							
E29		250	250	230	Essa							
E8V	Not Allowed	0	0	230	Essa							Weak path of an interface
E9V	Not Allowed	0	0	230	Essa							Weak path of an interface
H82V	Avoid	75	75	230	Essa						y	Circuit congestion
H83V	Avoid	150	150	230	Essa						y	Circuit congestion
M6E	Avoid	0	0	230	Essa							Circuit congestion
M7E		50	50	230	Essa							Circuit congestion
M80B	Avoid	75	75	230	Essa							Circuit congestion
M81B		150	150	230	Essa							Circuit congestion
E510V	Avoid	n/a	n/a	500	Essa						y (partial)	500 kV Circuit
E511V	Avoid	n/a	n/a	500	Essa						y (partial)	500 kV Circuit
79M1	Not Allowed	0	0	115	Ottawa							Intertie Circuit
A2		75	80	115	Ottawa							IBR bright-line limit, Circuit congestion
A3RM		75	75	115	Ottawa							Circuit congestion
A4K		50	50	115	Ottawa							Circuit congestion
A5RK		75	75	115	Ottawa							IBR bright-line limit. Circuit congestion
A6R	Avoid	75	100	115	Ottawa							Circuit congestion
A8M		50	50	115	Ottawa							Circuit congestion
F10MV		75	75	115	Ottawa							IBR bright-line limit. Circuit congestion
H9A	Not Allowed	0	0	115	Ottawa							Intertie Circuit
L2M		25	25	115	Ottawa	y				y		Circuit congestion
L2M (north)		75	75	115	Ottawa	y						North of Chesterville
M1R		75	75	115	Ottawa	y				y		IBR bright-line limit. Circuit congestion
M4G		75	100	115	Ottawa							IBR bright-line limit. Circuit congestion
M5G		75	125	115	Ottawa							IBR bright-line limit. Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of St. Lawrence (E: 200 MW C: 100 MW)	East of Hinchinbrooke (E: >1,000 MW C: 400 MW)	East of Minden TS (E: 125 MW C: 300 MW)	East of Dobbin TS (E: 275 MW C: 650 MW)	East of Bowmanville SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
S7M	Not Allowed	0	0	115	Ottawa							Existing stability issues ⁹
V12M		75	100	115	Ottawa							Circuit congestion
X2Y	Not Allowed	0	0	115	Ottawa							Intertie Circuit
A41T	Not Allowed	0	0	230	Ottawa							Intertie Circuit
A42T	Not Allowed	0	0	230	Ottawa							Intertie Circuit
B5D	Not Allowed	0	0	230	Ottawa	y				y		Intertie Circuit
C3S	Avoid	0	0	230	Ottawa							Proximity of other IBRs. Circuit congestion
D5A	Not Allowed	0	0	230	Ottawa	y						Intertie Circuit
L24A		250	250	230	Ottawa	y				y		Circuit congestion
M30A	Avoid	250	250	230	Ottawa							Connection difficulties; Discuss options with transmitter
M31A	Avoid	250	250	230	Ottawa							Connection difficulties; Discuss options with transmitter
M32S		250	250	230	Ottawa							
X522A	Avoid	n/a	n/a	500	Ottawa					y		500 kV Circuit
X523A	Avoid	n/a	n/a	500	Ottawa					y		500 kV Circuit
B1S	Not Allowed	0	0	115	East							Existing stability issues ⁹
B5QK	Not Allowed	0	0	115	East					y		Existing stability issues ⁹
C7BM	Not Allowed	0	0	115	East							Existing stability issues ⁹
L1MB		25	25	115	East	y				y		Circuit congestion
L5C	Not Allowed	0	0	115	East	y						Intertie Circuit
P3S		50	50	115	East				y			Circuit congestion
P4S		50	50	115	East				y			Circuit congestion
Q3K		50	50	115	East					y		IBR bright-line limit. Circuit congestion
Q3M6		75	75	115	East					y		Circuit congestion
Q6S		25	25	115	East					y		Circuit congestion
W3B	Not Allowed	0	0	115	East							Existing stability issues ⁹
X6	Not Allowed	0	0	115	East							Existing stability issues ¹⁰
B31L	Not Allowed	0	0	230	East	y				y		Intertie Circuit
C25H		25	25	230	East							Circuit congestion
C27P		50	50	230	East				y			Circuit congestion
DOBB_CLRNGTN_230_NEW1	Avoid	125	125	230	East						y	New circuit – Dobbin to Clarington
DOBB_CLRNGTN_230_NEW1	Avoid	125	125	230	East						y	New circuit – Dobbin to Clarington
E34M	Avoid	0	100	230	East							Proximity of other IBRs. Protection Adequacy, Circuit congestion
H23B		100	100	230	East							Circuit congestion
H27H		75	75	230	East							Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	East of St. Lawrence (E: 200 MW C: 100 MW)	East of Hinchinbrooke (E: >1,000 MW C: 400 MW)	East of Minden TS (E: 125 MW C: 300 MW)	East of Dobbin TS (E: 275 MW C: 650 MW)	East of Bowmanville SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
L20H	Avoid	0	75	230	East		y			y		Proximity of other IBRs. Protection adequacy (Too many taps)
L21H	Avoid	0	125	230	East		y			y		Proximity of other IBRs. Protection adequacy (Too many taps)
L22H	Avoid	0	125	230	East		y			y		Proximity of other IBRs. Protection adequacy (Too many taps)
L33P	Not Allowed	0	0	230	East	y				y		Intertie Circuit
L34P	Not Allowed	0	0	230	East	y				y		Intertie Circuit
NAPNE_BELVLE_230_NEW	Not Allowed	250	250	230	East							New circuit – Napanee to Belleville
P15C	Avoid	125	125	230	East						y (partial)	Circuit congestion
STLAWR_MERIVL_230_NEW1	Not Allowed	250	250	230	East	y	y		y	y		New Circuit – St. Lawrence to Merivale
STLAWR_MERIVL_230_NEW1	Not Allowed	250	250	230	East	y	y		y	y		New Circuit – St. Lawrence to Merivale
T22C	Avoid	0	0	230	East						y (partial)	Circuit congestion
T25B	Avoid	250	250	230	East						y (partial)	Circuit congestion
T31H	Avoid	100	100	230	East						y (partial)	Circuit congestion
T32H	Avoid	75	75	230	East						y (partial)	Circuit congestion
T33E	Avoid	125	125	230	East						y (partial)	Circuit congestion
X1H		250	250	230	East		y			y		Circuit congestion
X1P	Not Allowed	0	0	230	East				y			Existing stability issues ¹⁰
X21		250	250	230	East					y		Circuit congestion
X22		250	250	230	East					y		Circuit congestion
X2H		225	225	230	East		y			y		Circuit congestion
X3H		250	250	230	East		y			y		Circuit congestion
X4H		225	225	230	East		y			y		Circuit congestion
X520B	Avoid	n/a	n/a	500	East					y	y (partial)	500 kV Circuit
X521B	Avoid	n/a	n/a	500	East					y	y (partial)	500 kV Circuit
X526B	Avoid	n/a	n/a	500	East					y	y (partial)	500 kV Circuit
X527B	Avoid	n/a	n/a	500	East					y	y (partial)	500 kV Circuit
X534N	Avoid	n/a	n/a	500	East					y		500 kV Circuit
X538N	Avoid	n/a	n/a	500	East					y		500 kV Circuit

Table 16 | Transmission Circuit Capacities and Limitations for West of Toronto (Capacity)

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: >1,000 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
A36N	Avoid	75	125	115	Niagara						y	IBR bright-line limit. Circuit congestion
A37N	Avoid	75	75	115	Niagara						y	IBR bright-line limit. Circuit congestion
A6C	Avoid	75	100	115	Niagara						y	IBR bright-line limit. Circuit congestion
A7C	Avoid	75	100	115	Niagara						y	Circuit congestion
C2P	Avoid	75	75	115	Niagara						y	IBR bright-line limit. Circuit congestion
D10S	Avoid	50	50	115	Niagara						y	Circuit congestion
D1A	Avoid	75	75	115	Niagara						y	IBR bright-line limit. Circuit congestion
D3A	Avoid	75	100	115	Niagara						y	Circuit congestion
D9HS	Avoid	50	50	115	Niagara						y	Circuit congestion
Q11S	Avoid	75	100	115	Niagara						y	IBR bright-line limit. Circuit congestion
Q12S	Avoid	75	100	115	Niagara						y	IBR bright-line limit. Circuit congestion
Q2AH	Avoid	75	100	115	Niagara						y	Circuit congestion
Q3N	Avoid	10	10	115	Niagara						y	Circuit congestion
Q4N	Avoid	25	25	115	Niagara						y	Circuit congestion
BP76	Not Allowed	0	0	230	Niagara						y	Intertie Circuit
PA27	Not Allowed	0	0	230	Niagara						y	Intertie Circuit
PA301	Not Allowed	0	0	230	Niagara						y	Intertie Circuit
PA302	Not Allowed	0	0	230	Niagara						y	Intertie Circuit
Q10P	Avoid	0	0	230	Niagara						y	Circuit congestion
Q21P	Avoid	0	0	230	Niagara						y	Circuit congestion
Q22P	Avoid	0	0	230	Niagara						y	Circuit congestion
Q23BM	Avoid	75	75	230	Niagara						y (partial)	Protection adequacy (Line differential)
Q24HM	Avoid	25	25	230	Niagara						y (partial)	Protection adequacy (Line differential)
Q25BM	Avoid	50	50	230	Niagara						y (partial)	Protection adequacy (Line differential)
Q26M*	Avoid	225	225	230	Niagara						y (partial)	Protection adequacy (Line differential)
Q28A	Avoid	75	75	230	Niagara						y	Protection adequacy (Line differential)
Q29HM	Avoid	50	50	230	Niagara						y (partial)	Protection adequacy (Line differential)
Q30M	Avoid	100	100	230	Niagara						y (partial)	Protection adequacy (Line differential)
Q35M*	Avoid	225	225	230	Niagara						y (partial)	Protection adequacy (Line differential)
B10	Avoid	75	125	115	Southwest						y (limited)	IBR bright-line limit. Circuit congestion
B11	Avoid	75	150	115	Southwest						y (limited)	IBR bright-line limit. Circuit congestion
B12BL	Avoid	25	25	115	Southwest						y (partial)	Circuit congestion
B13BL	Avoid	25	25	115	Southwest						y (partial)	Circuit congestion
B2	Avoid	0	0	115	Southwest						y (limited)	Circuit congestion
B3	Avoid	25	25	115	Southwest						y (partial)	Circuit congestion
B4	Avoid	75	100	115	Southwest						y (partial)	Circuit congestion
B5C	Avoid	50	50	115	Southwest						y (partial)	Circuit congestion
B6C	Avoid	25	25	115	Southwest						y (partial)	Circuit congestion
B7	Avoid	75	75	115	Southwest						y (partial)	Circuit congestion
B8	Avoid	50	50	115	Southwest						y (partial)	Circuit congestion
C12	Avoid	25	30	115	Southwest				y		y (limited)	Circuit congestion
C9	Avoid	25	30	115	Southwest				y		y (limited)	Circuit congestion.
D10H		75	100	115	Southwest			y	y	y		Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: >1,000 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
D11K		75	75	115	Southwest			y	y			Circuit congestion
D12K		75	75	115	Southwest			y	y			IBR bright-line limit. Circuit congestion
D1W		75	75	115	Southwest			y	y			IBR bright-line limit. Circuit congestion
D7F		75	100	115	Southwest			y	y			IBR bright-line limit. Circuit congestion
D8S		75	75	115	Southwest			y	y			IBR bright-line limit. Circuit congestion
D9F		75	100	115	Southwest			y	y			IBR bright-line limit. Circuit congestion
F11C	Avoid	75	75	115	Southwest			y	y			Protection adequacy, Circuit congestion
F12C	Avoid	50	50	115	Southwest			y	y			Protection adequacy, Circuit congestion
H5K	Not Allowed	0	0	115	Southwest						y (limited)	Short cables
H6K	Not Allowed	0	0	115	Southwest						y (limited)	Short cables
HL3	Avoid	75	100	115	Southwest						y (limited)	IBR bright-line limit. Circuit congestion
HL4	Avoid	75	100	115	Southwest						y (limited)	IBR bright-line limit. Circuit congestion
K12		75	100	115	Southwest				y			IBR bright-line limit. Circuit congestion
K7	Avoid	0	125	115	Southwest				y			Proximity of other IBRs. Circuit congestion
M18	Avoid	0	50	115	Southwest			y	y			Proximity of other IBRs, Circuit congestion
S2S		10	10	115	Southwest					y		Circuit congestion
B18H	Avoid	150	150	230	Southwest						y	Circuit congestion
B20H	Avoid	125	125	230	Southwest						y	Circuit congestion
B22D		175	175	230	Southwest			y	y			Circuit congestion
B23D		175	175	230	Southwest			y	y			Circuit congestion
B40C	Avoid	250	250	230	Southwest						y	
B41C	Avoid	250	250	230	Southwest						y	
B4V	Avoid	100	100	230	Southwest					y		Protection Adequacy, Circuit congestion
B5V	Avoid	150	150	230	Southwest					y		Protection Adequacy, Circuit congestion
D4W		250	250	230	Southwest			y	y			Circuit congestion
D5W		250	250	230	Southwest			y	y			Circuit congestion
D6V		50	200	230	Southwest					y		Proximity of other IBRs. Circuit congestion
D7V		200	200	230	Southwest					y		Circuit congestion
K40M*	Avoid	250	250	230	Southwest				y		y (limited)	
M20D	Avoid	0	0	230	Southwest				y		y (limited)	Protection adequacy (Too many taps)
M21D	Avoid	0	0	230	Southwest				y		y (limited)	Protection adequacy (Too many taps)
M27B	Avoid	150	150	230	Southwest						y (partial)	Circuit congestion
M28B	Avoid	150	150	230	Southwest						y (partial)	Circuit congestion
M31W	Avoid	0	0	230	Southwest				y		y (limited)	Protection adequacy (Too many taps)
M32W	Avoid	125	125	230	Southwest				y		y (limited)	Protection adequacy (Too many taps)
M33W	Avoid	0	0	230	Southwest				y		y (limited)	Protection adequacy (Too many taps)
M34H	Avoid	250	250	230	Southwest						y (partial)	Circuit congestion
N20K*	Avoid	250	250	230	Southwest				y			Protection adequacy (Line differential)
N21J*		250	250	230	Southwest				y			
N22J*		250	250	230	Southwest				y			
N37S*	Avoid	250	250	230	Southwest				y			Protection adequacy (Line differential)
N5M*	Avoid	150	150	230	Southwest				y		y (limited)	Circuit congestion
N6M*	Avoid	250	250	230	Southwest				y		y (limited)	
S24V	Avoid	0	0	230	Southwest							

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: >1,000 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
S39M	Avoid	50	250	230	Southwest				y		y (limited)	Proximity of other IBRs. Protection adequacy (Line differential)
T36B	Avoid	175	175	230	Southwest						y	
T37B	Avoid	150	150	230	Southwest						y	
T38B	Avoid	150	150	230	Southwest						y	
T39B	Avoid	125	125	230	Southwest						y	
B501M	Avoid	n/a	n/a	500	Southwest					y	y (partial)	500 kV Circuit
B502M	Avoid	n/a	n/a	500	Southwest					y	y (partial)	500 kV Circuit
M572T	Avoid	n/a	n/a	500	Southwest						y	500 kV Circuit
M573T	Avoid	n/a	n/a	500	Southwest						y	500 kV Circuit
M585M	Avoid	n/a	n/a	500	Southwest					y	y (partial)	500 kV Circuit
N580M	Avoid	n/a	n/a	500	Southwest				y		y (partial)	500 kV Circuit
N581M	Avoid	n/a	n/a	500	Southwest				y		y (partial)	500 kV Circuit
N582L	Avoid	n/a	n/a	500	Southwest				y		y (limited)	500 kV Circuit
V586M	Avoid	n/a	n/a	500	Southwest					y	y (partial)	500 kV Circuit
61M18		50	50	115	Bruce							Circuit congestion
A1BTS		75	250	115	Bruce							IBR bright-line limit
BTS1P		50	50	115	Bruce							Circuit congestion
CP1J		75	175	115	Bruce							Circuit congestion
J1BTS		25	25	115	Bruce							Circuit congestion
B20P	Avoid	0	0	230	Bruce					y		Circuit congestion
B24P	Avoid	0	0	230	Bruce					y		Circuit congestion
B27S	Avoid	0	200	230	Bruce							Proximity of other IBRs. Circuit congestion
B28S	Avoid	0	200	230	Bruce							Proximity of other IBRs. Circuit congestion
A565L	Avoid	n/a	n/a	500	Bruce							500 kV Circuit
B561M	Avoid	n/a	n/a	500	Bruce					y	y (partial)	500 kV Circuit
B562E	Avoid	n/a	n/a	500	Bruce							500 kV Circuit
B563A	Avoid	n/a	n/a	500	Bruce							500 kV Circuit
B569B	Avoid	n/a	n/a	500	Bruce					y		500 kV Circuit
E564L	Avoid	n/a	n/a	500	Bruce							500 kV Circuit
E578P	Avoid	n/a	n/a	500	Bruce							500 kV Circuit
E8F		25	25	115	West	y	y		y			Circuit congestion
E9F		75	100	115	West	y	y		y			Circuit congestion
H9W	Avoid	75	150	115	West		y		y			Proximity of other IBRs
J1B	Avoid	0	0	115	West	y	y		y			IBR bright-line limit. Circuit congestion
J2N	Avoid	0	50	115	West	y	y		y			Circuit congestion
J3E	Avoid	50	50	115	West	y	y		y			Protection adequacy (Line differential)
J4E	Avoid	25	25	115	West	y	y		y			Protection adequacy (Line differential)
K2Z	Avoid	0	10	115	West	y	y		y			Proximity of other IBRs
K6Z	Avoid	50	50	115	West	y	y		y			Proximity of other IBRs
N1S		75	100	115	West	y	y		y			IBR bright-line limit. Circuit congestion
N4S		50	50	115	West	y	y		y			IBR bright-line limit. Circuit congestion
N5K		50	50	115	West							Circuit congestion
N6C		50	50	115	West	y	y		y			IBR bright-line limit. Circuit congestion
N7C		50	50	115	West	y	y		y			IBR bright-line limit. Circuit congestion

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: >1,000 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
S2N		25	25	115	West	y	y		y			Circuit congestion
W12		75	100	115	West		y		y			IBR bright-line limit. Circuit congestion
W14		75	125	115	West		y		y			Proximity of other IBRs
W1W		0	175	115	West		y		y			Proximity of other IBRs, Circuit congestion
W2S		25	25	115	West		y		y			Circuit congestion
W5N		75	100	115	West		y		y			IBR bright-line limit. Circuit congestion
W6NL		75	100	115	West		y		y			IBR bright-line limit. Circuit congestion
W7		75	100	115	West		y		y			IBR bright-line limit. Circuit congestion
W8T		50	50	115	West		y		y			Proximity of other IBRs
W9L		75	100	115	West		y		y			IBR bright-line limit. Circuit congestion
WT1A	Avoid	0	75	115	West		y		y			Proximity of other IBRs, Circuit congestion
WT1T	Avoid	0	25	115	West		y		y			Proximity of other IBRs, Circuit congestion
Z1E	Avoid	0	0	115	West		y		y			Circuit congestion
Z7E		75	75	115	West		y		y			Circuit congestion
B3N	Not Allowed	0	0	230	West	y	y		y			Intertie Circuit
C31	Avoid	0	175	230	West	y	y		y			Proximity of other IBRs, Circuit congestion
C42H	Avoid	0	250	230	West	y	y		y			Proximity of other IBRs, Circuit congestion
C43H		150	150	230	West	y	y		y			Circuit congestion
C64H	Avoid	0	250	230	West	y	y		y			Proximity of other IBRs, Circuit congestion
C65H		250	250	230	West	y	y		y			Circuit congestion
C87H		250	250	230	West	y	y		y			
C88H		250	250	230	West	y	y		y			
H25J		100	100	230	West	y	y		y			Circuit congestion
H26J		100	100	230	West	y	y		y			Circuit congestion
H38		250	250	230	West		y		y			
H39		250	250	230	West		y		y			
H53Z		250	250	230	West	y	y		y			
H54Z		225	225	230	West	y	y		y			Circuit congestion
H56Z	Not Allowed	0	0	230	West							New circuit - Lakeshore to Lauzon. IBR bright-line limit
H57Z	Not Allowed	0	0	230	West							New circuit - Lakeshore to Lauzon. IBR bright-line limit
H75		250	250	230	West	y	y		y			
H76		250	250	230	West	y	y		y			Circuit congestion
J20B	Avoid	0	0	230	West	y	y		y			Protection adequacy (Line differential)
J5D	Not Allowed	0	0	230	West	y	y		y			Intertie Circuit
L23N		250	250	230	West	y	y		y			
L24L		200	200	230	West	y	y		y			Circuit congestion
L25V	Avoid	250	250	230	West	y	y		y			Protection adequacy (Line differential)
L26L		200	200	230	West	y	y		y			Circuit congestion
L27V	Avoid	250	250	230	West	y	y		y			Protection adequacy (Line differential)
L28C	Avoid	225	225	230	West	y	y		y			Protection adequacy (Line differential)
L29C		175	175	230	West	y	y		y			Circuit congestion
L34C		250	250	230	West		y		y			New circuit - Lambton to Chatham
L35C		250	250	230	West		y		y			New circuit - Lambton to Chatham

Circuit	Avoid / Not Allowed	Availability (MW) (IBR)	Availability (MW) (Sync Gen)	Voltage (kV)	Zone	West of Chatham SS (E: 150 MW C: 650 MW)	West of Buchanan TS (E: >1,000 MW C: >1,000 MW)	West of Detweiler TS (E: >1,000 MW C: >1,000 MW)	West of Middleport TS (E: >1,000 MW C: >1,000 MW)	West of Milton SS (E: >1,000 MW C: >1,000 MW)	< 50 km of Short Circuit Limited Station?	Notes
L4D	Not Allowed	0	0	230	West		y		y			Intertie Circuit
L51D	Not Allowed	0	0	230	West		y		y			Intertie Circuit
N21W		25	25	230	West	y	y		y			Circuit congestion
N22W		25	25	230	West	y	y		y			Circuit congestion
N6S		100	100	230	West	y	y		y			Circuit congestion
N7S		100	100	230	West	y	y		y			Circuit congestion
S47C	Avoid	175	175	230	West		y		y			Protection adequacy (Line differential)
V41N	Avoid	200	200	230	West	y	y		y			Protection adequacy (Line differential)
V43N	Avoid	150	150	230	West	y	y		y			Protection adequacy (Line differential)
W36		175	175	230	West		y		y			Circuit congestion
W37		100	100	230	West		y		y			Circuit congestion
W42L		75	75	230	West		y		y			Circuit congestion
W43L		75	75	230	West		y		y			Circuit congestion
W44LC	Avoid	0	0	230	West		y		y			Protection adequacy (Line differential)
W45LS	Avoid	0	0	230	West		y		y			Proximity of other IBRs. Circuit congestion. Protection adequacy (Line differential)
LNGWD_LKSHR_500_NEW	Avoid	n/a	n/a	500	West		y		y			New circuit - Longwood to Lakeshore. 500 kV circuit

– End of Document –

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