Reliability Outlook

An adequacy assessment of Ontario's electricity system

April 2025 - September 2026

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Executive Summary

Ontario's electricity system is expected to see increasing demand over the next 18 months and the IESO is planning to meet this with new generation and storage capacity that is expected to connect to the grid during this time.

New Electric Vehicle manufacturing facilities, data centres and electric arc furnaces are all contributing to increasing demand over the Outlook period, and peak demand is expected to increase by about 1,000 MW between summer 2025 and summer 2026. As conditions during summer 2026 are expected to be tight, the IESO will work closely with market participants to coordinate outages. As the Reliability Outlook uses information from a point in time to assess reserves above requirement, risks in summer 2026 are expected to decrease in future publications as a result of updated information and planned actions to secure supply to meet increasing demand.

At the time of the publication of this report, there remains significant uncertainty in the Canada-U.S. trade environment. The best available information at the time of assessment has been used to create the demand forecast. The IESO will continue to co-ordinate with market participants and neighbouring system operators as needed to assess any potential longer-term impacts.

Looking ahead, the IESO expects to connect a considerable amount of storage capacity to the provincial grid over the next 18 months. This includes the 250 MW Oneida Energy Storage project and about 882 MW of storage resources procured through the Expedited Long-Term RFP. Storage will add to the diversity of Ontario's supply mix and help meet capacity needs over the Outlook period. Work continues throughout 2025 through the Enabling Resources Program to better integrate storage into electricity markets.

These timely connections, along with more than 2,100 MW cleared in last year's Capacity Auction for the 2025 summer obligation period, will help meet the projected demand growth forecasted for 2025 as electrification increases throughout the economy. Additionally, system reliability will be further supported by upgraded capacity resources procured via the Same Technology Upgrades Solicitation, which are expected to come online next quarter.

Refurbishment of Ontario's nuclear resources is ongoing, and schedules remain on track, with up to three units on outage at any one time across the Bruce and Darlington facilities. With Pickering "A" now retired, all the units that remain operational at that site – Pickering "B" – will continue operation through to September 2026.

Starting this quarter, the IESO's demand forecasts used in the Reliability Outlook are informed by weather simulations – rather than scenarios based only on historical data. This methodological change reflects industry best practices of employing probabilistic analysis in demand forecast modelling to account for weather. Further, this helps to align the IESO's planning products that addressed recommendations put forward by the Market Surveillance Panel.

This Reliability Outlook also covers the launch of the IESO's Market Renewal Program (MRP) scheduled to go-live in May 2025, which the IESO is well positioned to manage with Market Participants.

As always, the IESO is actively co-ordinating and planning with market participants to maintain reliability. With more overlapping outage requests, some combinations of transmission and/or generation outages could create operating challenges. Generators are advised not to schedule outages during periods when reserves are forecast to be low, and they are strongly encouraged to plan ahead and carefully co-ordinate the timing of outages with IESO staff. Outage requests during periods when reserves fall below the adequacy threshold will be put at risk and further outage co-ordination may be required.

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1. Introduction

This Outlook covers the 18 months from April 2025 to September 2026, and supersedes the Outlook released on December 19, 2024.

The purpose of the 18-month horizon in the *Reliability Outlook* is to:

- Advise market participants of the resource and transmission reliability of the Ontario electricity system
- Assess potentially adverse conditions that might be avoided by adjusting or coordinating maintenance plans for generation and transmission equipment
- Report on initiatives being implemented to improve reliability within this time frame

This Outlook assesses resource and transmission adequacy based on the stated assumptions, following the Methodology to Perform the Reliability Outlook. Due to uncertainties associated with various assumptions, readers are encouraged to use their judgment in considering possible future scenarios.

Additional supporting documents are located on the Reliability Outlook webpage.

Security and adequacy assessments are published on the IESO website on a daily basis and progressively supersede information presented in this report.

For questions or comments on this Outlook, please contact us at 905-403-6900 (toll-free 1-888-448-7777) or customer.relations@ieso.ca.

2. Updates to this Outlook

2.1 Updates to the Demand Forecast

New as of this quarter, demand is forecasted using probabilistic weather modelling as opposed the previous deterministic approach to align with industry best practices. Continuing from Q4 2024, two demand forecasts are generated to forecast increases in large step loads being proposed in Ontario and their associated uncertainties. The demand models use actual demand, weather and economic data through to the end of December. The latest business intelligence regarding large step loads was incorporated in mid-February. Actual weather and demand data for January and February 2025 are included in the tables. Correspondingly, the Methodology to Perform the Reliability Outlook has also been updated to reflect these new changes, as well as others outlined in this document. New for 2025 Q1, the terms "normal" and "extreme" will now reflect their probabilistic representations.

Normal Weather - this represents a 50/50 distribution of probabilistically modelled data. This means that 50% of observations would exceed the normal value and 50% of observations would fall below the normal value.

Extreme Weather - this represents a 97/3 distribution of probabilistically modelled data. This means that 3% of observations would exceed the extreme value and 97% of observations would fall below the extreme value.

Expected Weather – a subset of all weather data selected through an iterative process used to determine weekly peak demand values for the purposes of calculating Reserve Above Requirement. For more information please refer to the Methodology to Perform the Reliability Outlook.

2.2 Updates to Resources

This *Reliability Outlook* considers planned generator outages over the 18-month period, submitted by market participants to the IESO's outage management system as of February 24, 2025. Market participants are required annually to submit information to enable the IESO to conduct reliability assessments. This information, provided to the IESO through Form 1230, was submitted by April 1, 2024. New as of this quarter, hydroelectric and wind resources are updated to include probabilistic parameters, and is described in the Methodology to Perform the Reliability Outlook, and the reserves above requirement (RAR) are calculated based on a probabilistic "expected" value in place of historically using normal and extreme weather.

2.3 Updates to the Transmission Outlook

This Outlook also considers transmission outage plans that were submitted to the IESO's outage management system by February 18, 2025.

3. Demand Forecast

Forecasted energy demand is expected to grow over this Reliability Outlook period, with a projected increase of 1.0% for 2025 (firm demand) after growing by 1.7% in 2024. With energy demand correlated with economic activity, there is a high degree of uncertainty. Lower interest rates and domestic factors point to increasing economic and energy demand growth. However, any potential trade tensions with Ontario's largest trading partner would have a significant economic impact on the province. Significant load growth over the forecast is attributable to a number of large step loads in the form of electric arc furnaces, electric vehicle (EV) battery manufacturing facilities and data centres. The timing and size of these loads will impact system demand over the forecast period, with greater uncertainty over the latter part of the forecast.

The IESO is responsible for forecasting electricity demand on the IESO-controlled grid. This demand forecast covers the period from April 2025 to September 2026 and supersedes the previous forecast released in December 2024. Tables of supporting information are contained in the 2025 Q1 Outlook Tables.

Weather-adjusted electricity demand increased by 1.7% to 140.4 TWh in 2024. With reduced inflation, the Bank of Canada began lowering interest rates starting this past summer into January 2025 with rates 2% lower than they were in the spring of 2024. Following the analysis in this quarter, BoC reduced rates by another 0.25%. Traditionally, lower rates would stimulate Canadian economic activity. However, economic uncertainty from the spectre of tariffs and countermeasures may outweigh the adjustments to interest rates. Consumer and business confidence has been eroded by the uncertainty of the current trade environment, and its outcomes may have an impact similar to the supply chain disruptions experienced during COVID.

Despite the near-term uncertainty, the longer-term trends continue. Additionally, data centres and generative artificial intelligence is a growing sector with an appetite for low emissions electricity. For 2025, the firm and planned demand forecasts are very similar; that is to say uncertainty grows over time. As such, the forecasts diverge over the first half of 2026 as the planned scenario adds another 0.7 TWh to the firm forecast. The demand forecast faces significant uncertainties in both the economic outlook and in terms of new loads on the system. Geopolitical events will dominate the foreseeable future, impacting both economic growth and energy demand.

3.1 Demand Forecast Assumptions

As both firm and planned demand scenarios have been created for this quarter, weekly demand forecasts have been moved from this report into the Reliability Outlook Data Tables to save space. However, summaries for forecast energy demand and forecast seasonal peaks have been updated below to indicate the results of the planned demand scenario.

- The **planned scenario** demand forecast includes loads that are less certain to reach commercial operation in this forecast period but are large enough to warrant considering their impact on grid operations.
- The **firm scenario** demand forecast includes future loads with a high probability of reaching commercial operation in this forecast period.
- The **normal weather** simulation represents a 50/50 distribution of probabilistically modelled data. This means that 50% of observations would exceed the normal value and 50% of observations would fall below the normal value.
- The **extreme weather** simulation represents a 97/3 distribution of probabilistically modelled data. This means that 3% of observations would exceed the extreme value and 97% of observations would fall below the extreme value.

Table 3-1 | Forecast Energy Demand Summary

Year	Normal Weather Energy Firm Scenario (TWh)	% Growth in Energy Firm Scenario	Normal Weather Energy Planned Scenario (TWh)	% Growth in Energy Planned Scenario
2024	140.4	1.69%	140.4	1.69%
2025	141.7	0.96%	141.7	0.97%

Table 3-2 | Forecast Seasonal Peaks

Season	Firm Normal Weather Peak (MW)	Firm Extreme Weather Peak (MW)	Planned Normal Weather Peak (MW)	Planned Extreme Weather Peak (MW)
Summer 2025	23,487	25,733	23,488	25,733
Winter 2025-26	22,847	23,688	22,849	23,690
Summer 2026	24,390	26,719	24,473	26,807

Table 3-3 | Large Step Load Impacts, Firm and Planned Demand

	Firm		Planned	
Demand Forecast	**Energy (GWh)**	**Peak (MW)**	**Energy (GWh)**	**Peak (MW)**
Summer 2025	594	146	594	147
Winter 2025-26	1623	399	1677	442
Summer 2026	2272	488	2649	575

Notes on Table 3-3:

"Large step loads" are a category of potential load growth consisting of new facilities that intend to connect to Ontario's power system. The capacity required from the grid and expected timing of connection present uncertainty in the demand forecast. As such, they are treated as large *step* increases in demand and are incremental to the underlying demand growth from economic activity and population growth. The Firm forecast includes those large loads that are highly likely to proceed on time. The Planned forecast includes large loads that are less certain in timing.

4. Supply Forecast

Ontario's power system is entering a period in which generation and transmission outages will be even more difficult to accommodate. The IESO expects these conditions to persist for the foreseeable future. Market participants are strongly encouraged to plan ahead and co-ordinate with the IESO to prepare the system and ensure planned outages can be appropriately scheduled..

The IESO expects to have sufficient reserves for the both the summer and winters of 2025 under the firm scenario and expected weather conditions. However, results this quarter show that during the summer of 2026 Ontario may have to rely on up to 2,000 MW of supply from other jurisdictions and/or additional operating actions in order to ensure reliability. The IESO will work closely with market participants to co-ordinate outages during this period.

In Q2 2025, outcomes from the Medium Term 2 RFP are expected to be available, which may help to alleviate shortfalls in summer 2026. The planned scenario considering expected weather indicates sufficient reserves for the entirety of the outlook period.

This section assesses the adequacy of resources to meet the forecast demand. Resource adequacy is one of the reliability considerations used for approving generation and transmission outages. When reserves are below required levels, with potentially adverse effects on the reliability of the grid, the IESO may require deeper co-ordination with market participants requesting outages based on their order of precedence. Conversely, when reserves are above required levels, additional outages can be contemplated, provided other factors – such as local considerations, operability or transmission security – do not pose a reliability concern. In those cases, the IESO may place an outage at risk, signaling to the facility owner to consider rescheduling the outage.

Ontario's existing installed generation capacity is summarized in Table 4-1. The forecast capability at the Outlook peak is based on the firm resource scenario, which includes resources currently in commercial operation, and takes into account deratings, planned outages and an allowance for capability levels below rated installed capacity.

Table 4-1 | Existing Grid-Connected Resource Capacity

Fuel Type	Total Installed Capacity (MW)	Forecast Capability at 2025 Summer Peak [Firm-Normal] (MW)	Number of Stations	Change in Number of Stations	Change in Installed Capacity (MW)
Nuclear	12,184	9,569	4	0	0
Hydroelectric	8,862	5,320	76	0	0
Gas/Oil	10,450	8,912	30	0	0
Wind	4,943	742	42	0	0
Biofuel	287	280	4	0	0
Solar	478	66	10	0	0
Demand Measures	-	998	-	-	-
Firm Imports (+) / Exports (-) (MW)	-	689	-	-	-
Total	**37,205**	**26,576**	166	0	0

4.1 Supply Forecast Assumptions

4.1.1 Generation Resources

All generation resources scheduled to come into service, be upgraded or be shut down within the Outlook period are summarized in Table 4-2. This includes generation projects in the IESO's connection assessment and approval (CAA) process, those under construction, and contracted resources. Details regarding the IESO's CAA process and the status of these projects can be found on the Application Status section of the IESO website.

The estimated effective date column in Table 4-2 indicates when the market registration process is expected to be complete for each generation resource, based on information available to the IESO as of February 24, 2025. Two scenarios are used to describe project risks:

- The **planned scenario** assumes that all resources scheduled to come into service are available over the assessment period.

- The **firm scenario** assumes that only resources that have reached commercial operation status and completed commissioning at the time this assessment was completed are available.

Generators with expiring contracts and planned shutdowns or permanent[1] retirements that have a high likelihood of occurring are considered for both scenarios.

Table 4-2 | Committed Generation Resources Status

Project Name	Zone	Fuel Type	Estimated Effective Date	Project Status	Firm (MW)	Planned (MW)
Oneida Storage	Southwest	Storage	2025-Q2	Under Development	0	250
Same Technology Upgrades	Ontario	Gas	2025-Q2–Q4	Under Development	0	286
Brighton Beach Upgrade	West	Gas	2025-Q2	Under Development	0	42
E-LT1 Projects	Various	Various	2026-Q2	Under Development	0	1177
Kingsbridge 1&2	Southwest	Wind	2026-Q1	Expiring Contract	-40	-40
PTBurwell 1	West	Wind	2026-Q2	Expiring Contract	-99	-99
Prince Farm 1	Northeast	Wind	2026-Q3	Expiring Contract	-99	-99
Total					**-238**	**1517**

Notes on Table 4-2:

The total may not add up due to rounding and does not include in-service facilities. Project status provides an indication of the project progress, using the following terminology:

[1] Given the evolving nature of resource acquisitions and commitments in Ontario, Table 4-2 will be listing new resources as they commission and existing resources that are expected to permanently retire or mothball at the end of their current commitments.

- Under Development – projects in approvals and permitting stages (e.g., environmental assessment, municipal approvals, IESO connection assessment approvals) and projects under construction
- Commissioning – projects undergoing commissioning tests with the IESO
- Commercial Operation – projects that have achieved commercial operation status under the contract criteria, but have not met all of the IESO's market registration requirements
- Expiring Contract – contracts that will expire during the Outlook period are included in both scenarios only up to their contract expiry date. Generators (including non-utility generators) that continue to provide forecast output data are also included in the planned scenario for the rest of the 18-month period.
- Retirement – projects scheduled for permanent shutdown.

4.1.2 Generation Capability

Hydroelectric

A monthly forecast of hydroelectric generation output is calculated based on median historical values of hydroelectric production and contribution to operating reserve during weekday peak demand hours. Through this method, routine maintenance and actual forced outages of the generating units are implicitly accounted for in the historical data (see the first row in Table 4-3).

To reflect the impact of hydroelectric outages on the RAR and allow the assessment of hydroelectric outages as per the outage approval criteria, the hydroelectric capability is also calculated, without accounting for historical outages (see the second row of Table 4-3). Table 4-3 uses data from May 2002 to March 2024 which are updated annually to coincide with the release of the Q2 Outlook.

Table 4-3 | Monthly Historical Hydroelectric Median Values for Normal Weather Conditions

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Historical Hydroelectric Median Contribution (MW)	6,098	6,018	5,813	5,864	5,936	5,683	5,544	5,243	5,020	5,366	5,625	6,090

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Historical Hydroelectric Median Contribution without Outages (MW)	6,627	6,590	6,391	6,368	6,390	6,206	6,101	5,867	5,927	6,223	6,425	6,610

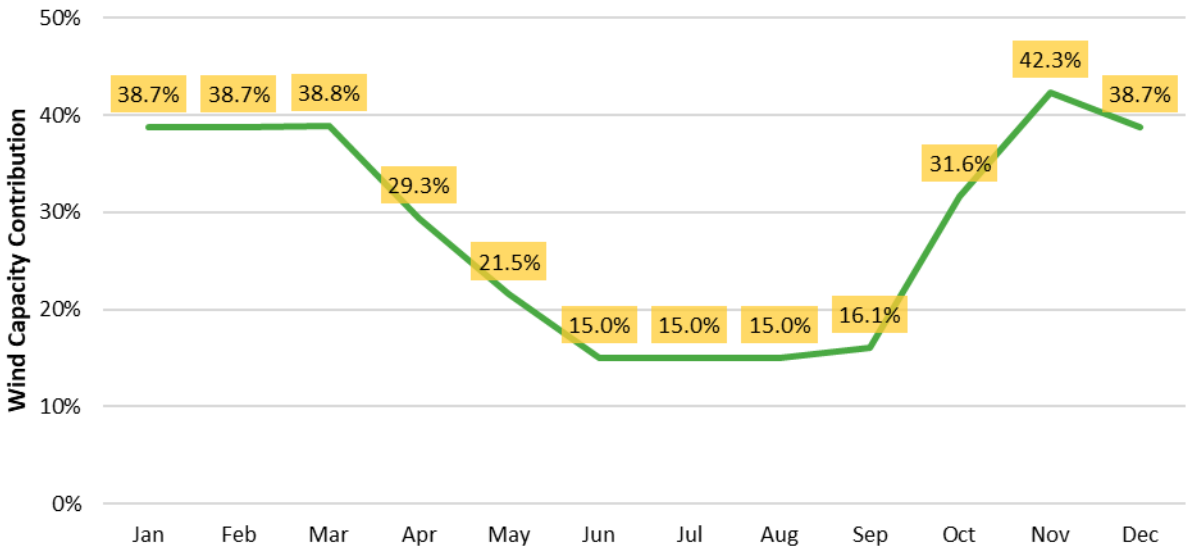
Thermal Generators

Thermal generators' capacity, planned outages and deratings are based on market participant submissions. Forced outage rates on demand are calculated by the IESO based on actual operational data. The IESO will continue to rely on market participant-submitted forced outage rates for comparison purposes.

Wind

For wind generation, monthly wind capacity contribution (WCC) values from the weekday peak hour are used. The process for determining wind contribution can be found in the Methodology to Perform the Reliability Outlook. Figure 4-1 shows the monthly WCC values, which are updated annually with the release of the Q2 Outlook.

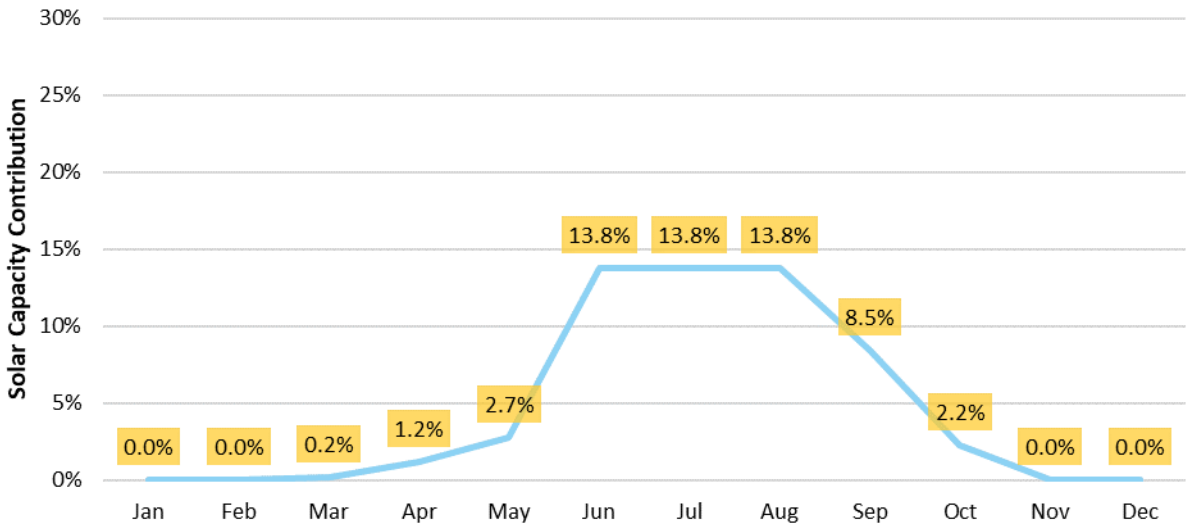
Figure 4-1 | Monthly Wind Capacity Contribution Values



Solar

For solar generation, monthly solar capacity contribution (SCC) values from the weekday peak hour are used. Information on how the solar contribution is calculated can be found in the Methodology to Perform the Reliability Outlook. Figure 4-2 shows the monthly SCC values, which are updated annually for the release of the Q2 Outlook.

Figure 4-2 | Monthly Solar Capacity Contribution Values



4.1.3 Demand Measures

Both demand measures and load modifiers can impact demand, but differ in how they are treated within the Outlook. Demand measures, such as dispatchable loads and demand response procured through the IESO's capacity auction, are not incorporated into the demand forecast and are instead treated as resources. Load modifiers are incorporated into the demand forecast. The impacts of activated demand measures are added back into the demand history prior to forecasting demand for future periods.

The 2024 Capacity Auction, which secured 2,122 MW of 2025 summer capacity and 1,525 MW of winter capacity, was included in the modelling for this outlook. Capacity targets from the IESO's 2024 Annual Planning Outlook have been included and modelled as demand measures in the firm resource scenario out to summer 2026.

4.1.4 Firm Transactions

Capacity-Backed Exports

The IESO allows Ontario resources to compete in the capacity auctions held by certain neighbouring jurisdictions, but only if Ontario has adequate supply and no reliability concerns. New York Independent System Operator (NYISO)[2] will allow up to 37 MW of capacity-backed exports from Ontario between November 2024 and April 2025.This limit is set to 13 MW of capacity-backed exports from Ontario for the summer of 2025.

Capacity Sharing Agreement

A 2015 Capacity Sharing Agreement with Hydro-Québec saw Ontario provide 500 MW of capacity to Quebec in the winter of 2015/16. Ontario currently has a commitment from Quebec to return 500 MW of firm capacity for four months during a summer of the IESO's choosing.

The 2024 Capacity Sharing Agreement between the IESO and Hydro-Québec (outlined in the memorandum of understanding[3]) permits for the swap of 600 MW of capacity over a period of up to seven years, starting in winter 2024/2025. Under the agreement, the IESO will provide 600 MW to Hydro-Québec in the winter and Hydro-Québec will provide 600 MW to the IESO in the summer. The IESO may choose to bank any amount of the 600 MW of summer capacity provided in a given year, to be used in a later summer during the agreement (up to the 1,250 MW capacity limit of the main intertie with Quebec), allowing capacity to be saved until it is required. More information can be found in the 2023 Capacity Sharing Agreement Backgrounder. Please note that this agreement is already considered when determining the 1,000 MW / 2,000 MW adequacy threshold.

4.1.5 Summary of Resource Assumptions

To assess future resource adequacy, the IESO must make assumptions about the amount of available resources. The Outlook considers two scenarios: a firm scenario and a planned scenario.

The starting point for both scenarios is the existing installed resources shown in Table 4-1. The planned scenario assumes that all resources scheduled to come into service are available over the assessment period. The firm scenario considers only those resources that have reached commercial operation status as of the time of this assessment. Generator-planned shutdowns or retirements that have a high likelihood of occurring are considered for both scenarios. They also both reflect planned outages submitted by generators. Table 4-4 shows the available resources that are forecast over the 18-month Outlook, under both scenarios in normal weather conditions, and at the time of the summer and winter peak demands.

[2] http://icap.nyiso.com/ucap/public/rgt_availability_display.do

[3] https://news.ontario.ca/en/release/1003444/the-governments-of-ontario-and-quebec-support-new-electricity-trade-agreement

Table 4-4 | Summary of Available Resources

Notes	Description	Summer Peak 2025 Firm Scenario	Summer Peak 2025 Planned Scenario	Winter Peak 2025/2026 Firm Scenario	Winter Peak 2025/2026 Planned Scenario	Summer Peak 2026 Firm Scenario	Summer Peak 2026 Planned Scenario
1	Installed Resources (MW)	37,205	37,650	37,205	37,729	37,066	38,762
2	Total Reductions in Resources (MW)	12,382	12,642	10,176	10,537	13,083	14,245
3	Demand Measures (MW)	998	998	867	867	1,940	1,940
4	Firm Imports (+) / Exports (-) (MW)	689	689	-420	-420	0	600
5	Available Resources (MW)	26,510	26,695	27,476	27,640	25,923	27,057
6	Bottling	66	65	157	281	309	306
7	Available Resources without Bottling (MW)	26,576	26,760	27,633	27,921	26,232	27,363

Notes on Table 4-4:

Installed Resources: The total generation capacity assumed to be installed at the time of the summer and winter peaks.

Total Reductions in Resources: The sum of deratings, planned outages, limitations due to transmission constraints and allowances for capability levels below rated installed capacity.

Demand Measures: The amount of demand reduction expected to be available at the time of peak, under a normal weather simulation.

Firm Imports/Exports: The amount of expected firm imports and exports at the time of summer and winter peaks, under a normal weather simulation.

Available Resources: Installed Resources (line 1) minus Total Reductions in Resources (line 2) plus Demand Measures (line 3) and Firm Imports/Exports (line 4). This differs from the Forecast Capability at System Peak shown in Table 4-1 due to the impacts of generation bottling (transmission limitations).

Available Resources without Bottling: Available resources after they are reduced due to bottling.

5. Adequacy Assessment

5.1 Capacity Adequacy Assessment

The capacity adequacy assessment accounts for zonal transmission constraints resulting from planned transmission outages assessed as of February 18, 2025. The generation planned outages occurring during this Outlook period have been assessed as of February 24, 2025.

5.1.1 Firm Scenario with Expected Weather

The firm scenario incorporates all capacity that had achieved commercial operation status as of February 24, 2025. Similarly, the firm scenario includes all demand that has a high probability of materializing in the next 18 months.

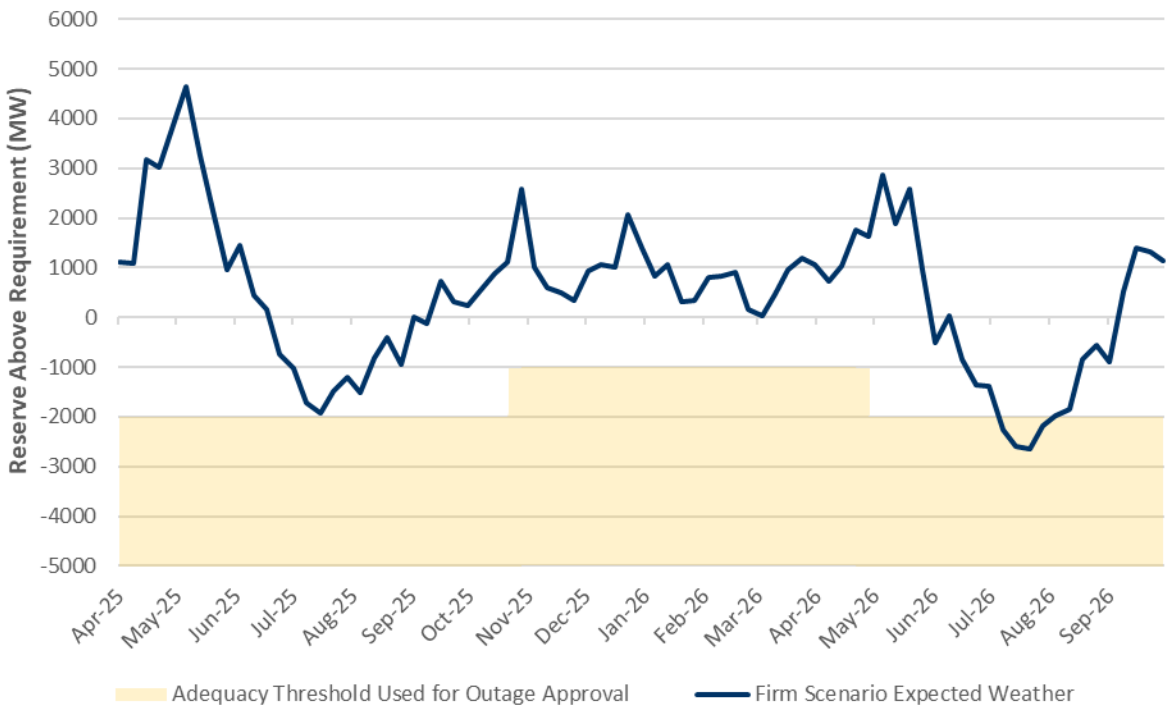
Figure 5-1 shows RAR levels, which represents the difference between available resources and required resources. The required resources equals forecasted firm demand plus the required reserve. The threshold decreases to -1,000 MW in the winter months to better reflect the lowered amount of imports to Ontario that can be relied on from other regions, compared to the summer months.

The IESO expects to have sufficient reserves for the summer of 2025 and winters of 2025/26 . The week of July 20th 2025 presents the tightest conditions of summer 2025 with RAR at -1,936 MW. However, summer 2026 sees RAR fall below the adequacy threshold for four weeks starting the week of July 12th.When the RAR drops below -2,000 MW in the summer (and for periods in which it closely approaches this threshold), market participants and the IESO may need to further co-ordinate outages.

The IESO will continue to work closely with participants that have planned outages to ensure Ontario maintains adequate reserves. Ontario may have to rely on up to 2,000 MW of supply from other jurisdictions and/or additional operating actions in order to ensure reliability under , especially during periods of low reserves.

Under periods of tighter supply conditions, planned generator maintenance outages are difficult to schedule. Generators are advised not to schedule outages during periods when reserves are forecast to be low, and are strongly encouraged to plan ahead and co-ordinate the timing of outages with IESO staff. Outage requests during periods when reserves fall below the adequacy threshold will be put at risk and further outage co-ordination may be required.

Figure 5-1 | Expected Weather: Firm Scenario Reserve Above Requirement

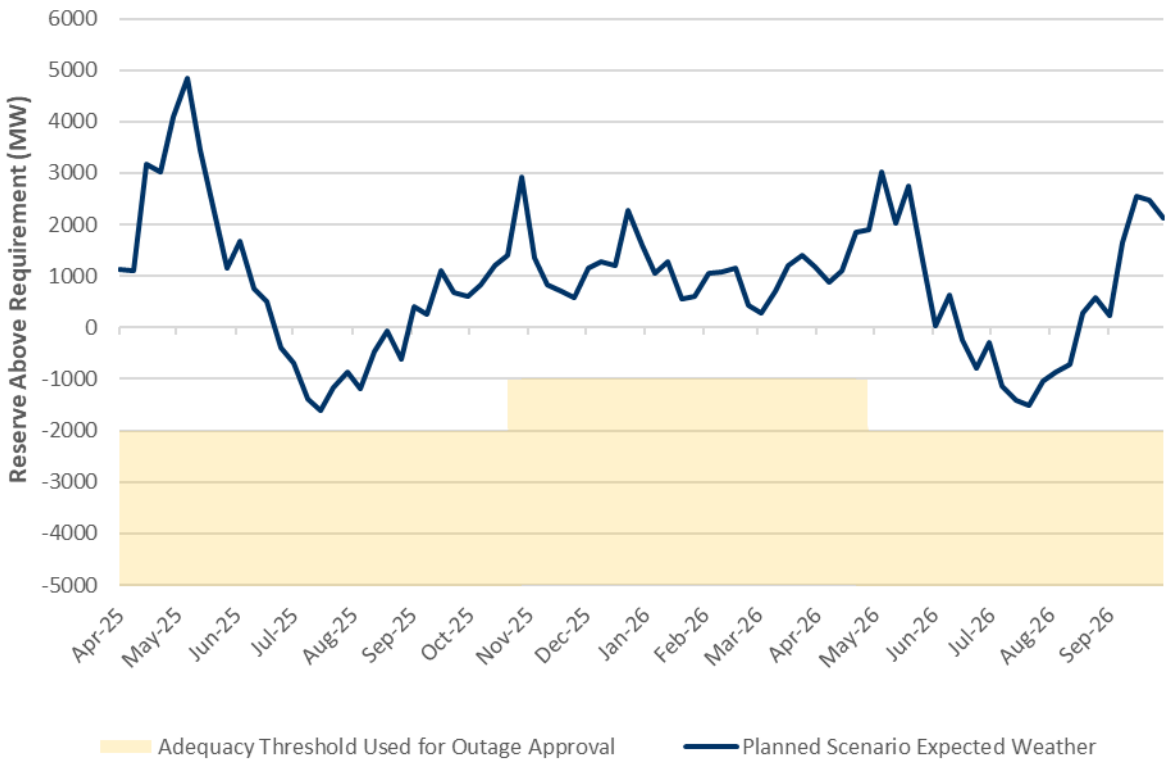


5.1.2 Planned Scenario with Expected Weather

The Planned scenario incorporates all existing capacity, as well as all capacity expected to come into service. As noted as of last quarter and on a go-forward basis, the planned scenario is calculated using planned demand. More information on this update can be found in the Methodology to Perform the Reliability Outlook. Approximately 1,517 MW of new generation capacity is expected to connect to Ontario's grid over this Outlook period. Planned Demand reflects incremental loads that are less certain but are large enough to warrant considering their impact on grid operations. Table 3-3 outlines the planned demand compared to firm.

Figure 5-2 shows RAR levels under the Planned scenario. Reserves do not fall below the adequacy threshold requirements in this outlook period.

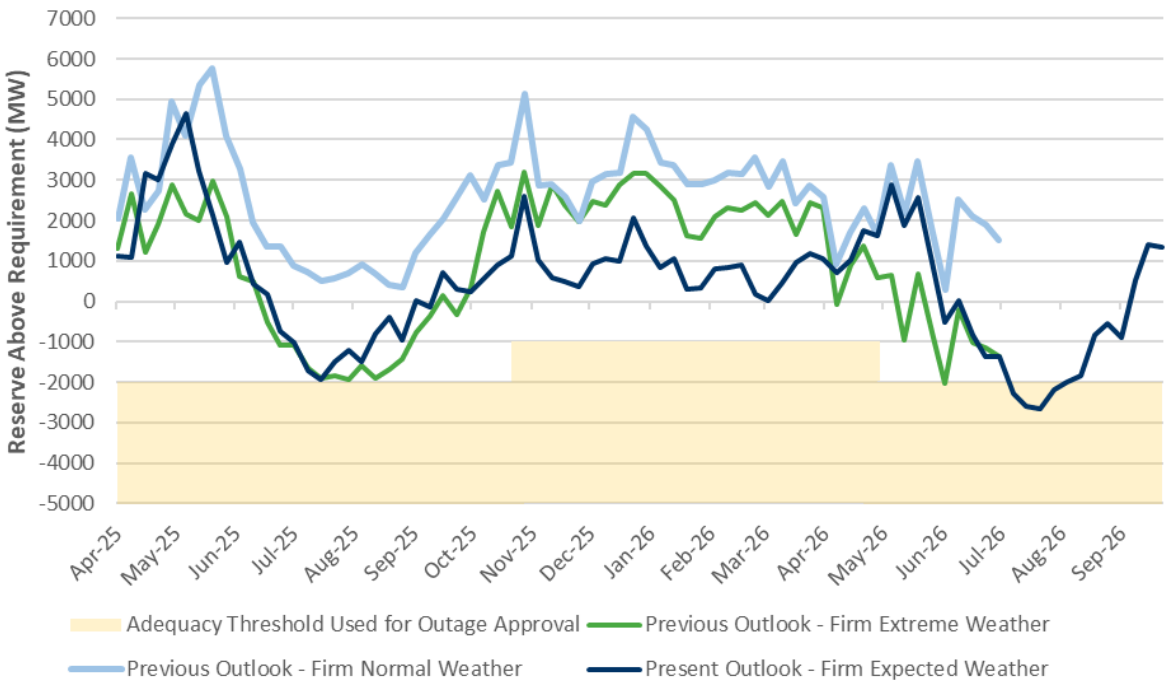
Figure 5-2 | Expected Weather: Planned Scenario Reserve Above Requirement



5.1.3 Comparison of the Current and Previous Weekly Adequacy Assessments for the Firm Extreme Weather Scenario

Figure 5-3 compares forecast RAR values in the current Outlook with those in the previous Outlook that was published on December 19, 2024. For Q1 2025, this graphic presents both previous normal and firm weather scenarios compared against the firm scenario of expected weather. In future outlooks, only the firm expected scenario will used and updated quarterly. This graphic provides an opportunity to note how probabilistic simulations compare against deterministic scenarios, and that probabilistic modelling reasonably represents past deterministic modelling.

Figure 5-3 | Comparison of Current and Previous Outlook: Firm Scenario Expected Weather Reserve Above Requirement



Resource adequacy assumptions and risks are discussed in detail in the Methodology to Perform the Reliability Outlook.

5.2 Energy Adequacy Assessment

This section assesses energy adequacy to determine whether Ontario has sufficient supply to meet its forecast energy demands, while highlighting potential adequacy concerns during the Outlook time frame. At the same time, the assessment estimates the aggregate production by resource category to meet the projected demand based on assumed resource availability. This assessment is based on both firm demand with firm supply and planned demand with planned supply. The planned scenario produces a potential future scenario which will be used for informational purposes only at this point in time; it is not being used to assess outage approvals.

5.2.1 Summary of Energy Adequacy Assumptions

The energy adequacy assessment (EAA) uses the same set of assumptions as the capacity assessment outlined in Tables 4-1 and 4-2, which indicate the total capacity of committed resources and when they are expected to be available over the next 18 months. The monthly forecast of energy production capability, based on energy modelling results, is included in the Reliability Outlook Data Tables.

For the EAA, the firm scenario is presented in Table 5-1 with the planned scenario in Table 5-2, both under typical weather (50/50 energy and peak demand) demand conditions. The key assumptions specific to this assessment are described in the Methodology to Perform the Reliability Outlook.

5.2.2 Results – Firm and Planned Scenario with Normal Weather

Table 5-1 and Table 5-2 summarize the energy simulation results over the next 18 months for both the Firm and Planned scenarios with normal weather demand both for Ontario and for each transmission zone.

Table 5-1 | Summary of Zonal Energy for Firm Scenario, Normal Weather

Zone	18-Month Energy Demand TWh	18-Month Energy Demand Average MW	18-Month Energy Production TWh	18-Month Energy Production Average MW	Net Inter-Zonal Energy Transfer TWh	Zonal Energy Demand on Peak Day of 18-Month Period GWh	Available Energy on Peak Day of 18-Month Period GWh
Bruce	1.1	82	62.7	4,769	61.6	1.8	120.1
East	13.3	1,010	20.8	1,581	7.5	27.7	100.4
Essa	15.6	1,188	3.8	288	-11.8	33.4	16.3
Niagara	6.4	488	21.6	1,642	15.2	15.5	49.7
Northeast	16.4	1,249	15.9	1,210	-0.5	30.1	39.8

Zone	18-Month Energy Demand TWh	18-Month Energy Demand Average MW	18-Month Energy Production TWh	18-Month Energy Production Average MW	Net Inter-Zonal Energy Transfer TWh	Zonal Energy Demand on Peak Day of 18-Month Period GWh	Available Energy on Peak Day of 18-Month Period GWh
Northwest	5.2	393	6.9	524	1.7	9.2	20.3
Ottawa	13.4	1,021	0.7	55	-12.7	30.2	1.5
Southwest	44.3	3,367	9.4	712	-34.9	99.7	23.1
Toronto	76.5	5,817	59.1	4,490	-17.4	185.7	123.5
West	23.8	1,806	18.2	1,382	-5.6	53.9	79.4
Ontario	**216.0**	**16,421**	**219.0**	**16,652**	**3.0**	**487.2**	**574.1**

Table 5-2 | Summary of Zonal Energy for Planned Scenario, Normal Weather

Zone	18-Month Energy Demand TWh	18-Month Energy Demand Average MW	18-Month Energy Production TWh	18-Month Energy Production Average MW	Net Inter-Zonal Energy Transfer TWh	Zonal Energy Demand on Peak Day of 18-Month Period GWh	Available Energy on Peak Day of 18Month Period GWh
Bruce	1.1	82	62.8	4,771	61.7	1.8	120.1
East	13.3	1,013	20.6	1,565	7.3	28.0	102.4
Essa	15.6	1,189	3.7	281	-11.9	33.5	17.9
Niagara	6.6	502	21.6	1,646	15.0	16.5	50.3
Northeast	16.5	1,254	15.9	1,210	-0.6	30.8	39.7
Northwest	5.2	393	6.9	525	1.7	9.2	19.8
Ottawa	13.4	1,021	0.7	55	-12.7	30.2	1.5
Southwest	44.4	3,376	9.5	724	-34.9	100.3	27.4
Toronto	76.6	5,826	59.1	4,494	-17.5	186.4	126.1
West	23.8	1,807	18.7	1,424	-5.1	54.0	90.1
Ontario	**216.5**	**16,464**	**219.6**	**16,695**	**3.0**	**490.7**	**595.3**

5.2.3 Findings and Conclusions

The EAA indicates that Ontario is expected to have sufficient supply to meet its forecast energy needs throughout the outlook period for the Firm scenario with normal weather demand, without having to rely on support from external jurisdictions. Under the Planned scenario, the energy outlook shows increased energy production, signifying that planned resource additions more than offset any changes in demand.

The figures and tables in this section are based on a simulation of the province's power system, using the assumptions presented within the Outlook to assess whether Ontario will be energy adequate.

Figure 5-4 breaks down projected production by fuel type to meet Ontario's energy demand for the next 18 months, while Figure 5-5 shows the expected production by fuel type for each month. The province's energy exports and imports are not considered in this assessment. Table 5-3 and 5-4 summarizes these simulated production results by fuel type, for each year.

Figure 5-4 | Forecast Energy Production by Fuel Type (Firm Scenario)

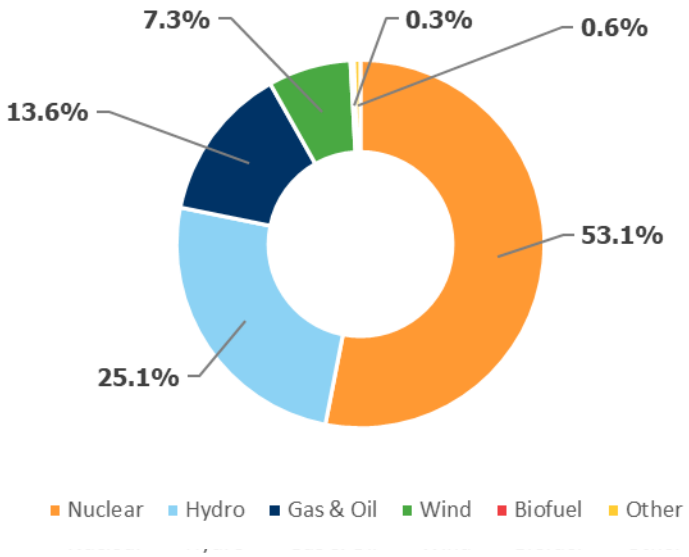


Figure 5-5 | Forecast Monthly Energy Production by Fuel Type (Firm Scenario)

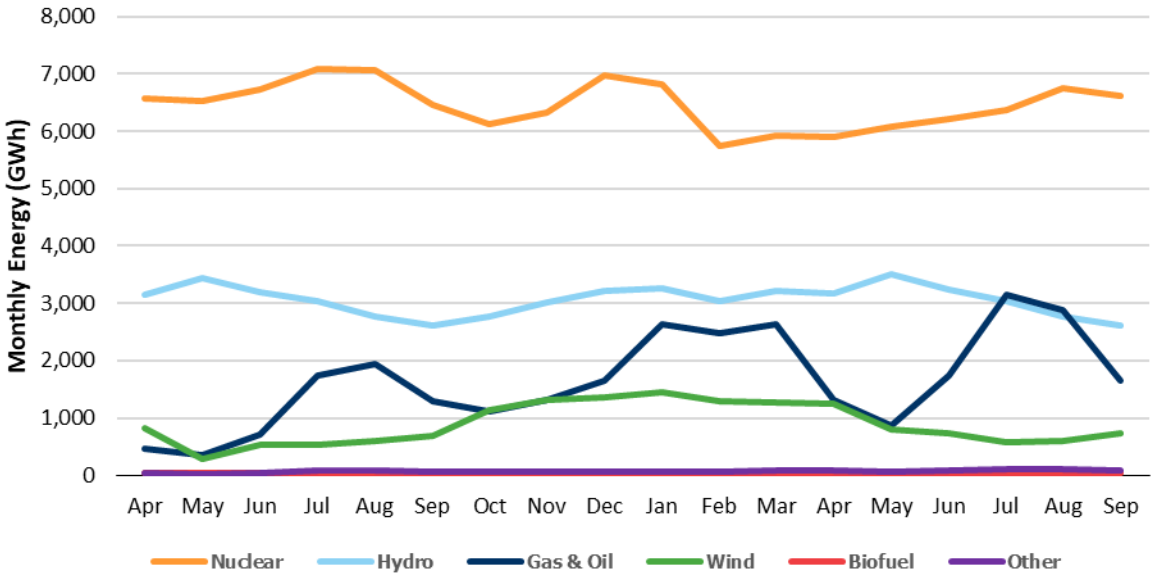


Table 5-3 | Energy Production by Fuel Type for the Firm Scenario, Normal Weather

Fuel Type (Grid-Connected)	2025 (Apr 1 – Dec 31) (GWh)	2026 (Jan 1 – Sep 30) (GWh)	Total (GWh)
Nuclear	59,858	56,377	116,235
Hydro	27,190	27,823	55,012
Gas & Oil	10,546	19,326	29,872
Wind	7,250	8,715	15,966
Biofuel	345	345	689
Other (Solar & DR)	513	725	1,238
Total	**105,702**	**113,310**	**219,012**

Table 5-4 | Energy Production by Fuel Type for the Planned Scenario, Normal Weather

Fuel Type (Grid-Connected)	2025 (Apr 1 – Dec 31) (GWh)	2026 (Jan 1 – Sep 30) (GWh)	Total (GWh)
Nuclear	59,869	56,378	116,247
Hydro	27,191	27,822	55,013
Gas & Oil	10,517	19,612	30,129
Wind	7,275	8,809	16,083
Biofuel	345	345	690
Other (Solar & DR)	543	864	1,407
Total	**105,739**	**113,830**	**219,569**

6. Transmission Reliability Assessment

Ontario's transmission system is expected to continue to reliably supply province-wide demand for the next 18 months. However, some combinations of transmission and/or generation outages could create operating challenges. For this reason, planned outages will necessitate enhanced co-ordination between transmitters and generators. Planned outages for certain windows may need to be rescheduled.

6.1 Transmission Projects

This section considers the information transmitters have provided with respect to transmission projects that are planned for completion within the next 18 months. The list of transmission projects can be found in Appendix B1. Note that the planned in-service dates in this table and throughout this document are as of December 2024. Any changes will be communicated through subsequent Reliability Outlooks.

6.2 Transmission Outages

The IESO's assessment of transmission outage plans is shown in Appendix C, Tables C1 to C11. The methodology used to assess the transmission outage plans is described in the Methodology to Perform the Reliability Outlook. This Outlook reflects transmission outage plans submitted to the IESO as of February 18, 2025.

6.3 Transmission Considerations

The purpose of this section of the report is to highlight projects and outages that may affect reliability and/or the scheduling of other outages, and to consolidate these considerations by zone. For more information about the IESO's transmission zones and interfaces, please see the Transfer Capability Assessment Methodology.

Bruce, Southwest, and West Zones

Multiple new transmission lines are under development in the region that will increase available supply starting mid-decade. Specifically, two new 230-kV circuits from Chatham SS to Lakeshore SS are complete that support continued load growth.

The Bruce B 500 kV switchyard is being rebuilt and expected to be in-service by Q1 2026. The existing circuits are being cut-over to the new switchyard, among other outages that are required.

The following outages will impact the flow out of the Bruce zone:

- A planned two-week outage starting June 29, 2025, a planned three-week outage starting July 23, 2025, a planned one-week outage starting August 26, 2025, and another planned three-week outage starting June 2, 2026, on circuit B502M
- A planned three-week outage starting February 25, 2026, on circuit B560V
- A planned one-week outage starting May 25, 2025, on circuit B561M
- A planned three-week outage starting July 13, 2026, on circuit N582L
- A planned two-week outage starting September 2, 2025 on circuit L51D

Toronto, East, and Ottawa Zones

There are upcoming nuclear refurbishments of multiple units at Darlington with overlapping timelines, along with the staged shutdown of the Pickering A NGS. As a result, it will be increasingly challenging for market participants to take outages impacting the Flow East Towards Toronto (FETT) interface given increased west-east flow from resources in Southwestern Ontario along those circuits. Of note, the FETT Capacity Upgrade (i.e., Richview-Trafalgar Reinforcement) project to address future needs is underway; the project is expected to be in-service by Q1 2026. The Etobicoke Greenway Project (formerly the Richview TS to Manby TS Transmission Line Reinforcement) will improve the bulk transmission supply into the city of Toronto to supply the urban centre's growing demand. This project is expected to be in-service by Q2 2026.

The following outages will impact the flow into Ottawa zone:

- A planned two-week outage starting September 30, 2025, on circuit T31H
- A planned five-week outage starting November 2, 2025, on circuit T32H

Northwest, Northeast, and Essa Zones

To meet growing electricity need in the Northwest, mainly driven by economic development and electrification of mining activities, the Waasigan Transmission Line is currently under development. Phase 1 of the project, which consists of a new double-circuit 230 kV transmission line between Lakehead TS and MacKenzie TS, is expected to be in-service by Q4 2025. Outages to the parallel circuits, as well as at Lakehead TS and MacKenzie TS will be required in order to integrate the new circuits, and will temporarily reduce system resiliency during this time. Phase 2 of the project, which consists of a new 230 kV transmission line between MacKenzie TS and Dryden TS, is recommended to be in-service by Q4 2027.

In the Sault Ste. Marie area, there will be an increase in load because of Algoma Steel converting their coke-fired furnaces to electric-arc furnaces (EAF). Phase 1 of the project has recently been completed, Phase 2 is expected to be completed by Q3 2027, and Phase 3 is expected to be completed by Q4 2029. Phase 1 involved EAF operation of up to 140 MW connected to Patrick St TS. Lake Superior Power (LSP) generating units which are currently not operating will also be brought back in-service. Phase 2 will involve EAF operation of up to 250 MW with the EAF and LSP reconnected to new 230/115 kV Tagona West TS. LSP generating units in-service will be able to provide 110 MW to offset load and support voltage. Phase 3 will involve EAF operation of up to 300 MW and LSP units will be taken out of service.The fluctuating nature of electric-arc furnace operation in an electrical area with limited transmission will require special attention to manage voltage and power fluctuations, particularly prior to the completion of the system reinforcements recommended in the Northeast Bulk System plan. In the interim, these fluctuations will be managed by dynamic reactive resources and load management systems that will be implemented as part of the project.

The transmission line refurbishments between Kirkland Lake and Matachewan in Northeastern Ontario on circuit K4 are now complete.

7. Operability

Ontario's power system is operating within a period of tighter supply conditions requiring careful consideration of outage management. The IESO will continue to assess other aspects of operability and report on them in future Outlooks where appropriate. This section highlights existing or emerging operability issues that could impact the reliability of Ontario's power system.

Operability refers to the IESO's ability to manage a variety of conditions on the power system as they occur in real-time. The IESO works to ensure that the power system is reliable under changing system conditions, variability of supply and fluctuations in load, while respecting thermal, voltage and transient stability limits on the system. Operability is assessed in advance to ensure that the power system is adequately prepared for expected real-time conditions, while also having the ability to absorb and adapt to unexpected changes.

7.1 Outage Management Considerations

Ontario continues to experience a period during which generation and transmission outages will be difficult to accommodate, and the IESO is working with market participants to manage this. In addition to meeting global Ontario adequacy needs, transmission adequacy and security must be safeguarded.

There are a significant number of major generation and transmission projects either currently underway or expected to begin in the near future. As the timing of many of these projects overlap with each other and can require multiple equipment outages, reliability assessments are increasingly complex. An example mentioned earlier describes major projects that are related to the Flow East Towards Toronto (FETT) interface.

A key factor impacting outage management is the amount of extended forced transmission outages. With more overlapping and urgent outage requests, as well as major transmission projects in different development stages targeting in-service dates, operating the power system is becoming increasingly complex. Prioritizing the timely repair of a forced outage is necessary to reduce the impact on the delivery of other ongoing capital projects, and to enable other necessary maintenance outages to proceed.

With consideration of equipment failure, tighter supply conditions and other factors such as supply chain delays, further outage co-ordination or rescheduling may be required. Transmitters and generators are strongly encouraged to plan ahead, co-ordinate with one another, submit outage requests early, and co-ordinate with the IESO; scheduling outages at desired times may still be difficult due to the significant number of major projects that are planned for the same

time. Furthermore, outages are not guaranteed as unanticipated equipment failures may change reliability assessments.

One important aspect of grid equipment outages is recall time. Recall times indicate how long it takes for equipment on outage to return to service. Minimizing recall times increases the likelihood of outages being approved. If many outages are non-recallable, it can be difficult to accommodate additional outages as there needs to be a reliable plan to reposture the system after an equipment failure occurs on the grid. If multiple equipment failures occur, there may be instances where outage management alone will not address the concern. Under such circumstances the IESO may need to rely on additional non-firm imports or emergency operating procedures in order to ensure reliability. More information on actions the IESO can take to ensure reliability can be found in Market Manual 7.1: IESO Controlled Grid Operating Procedures.

8. Resources Referenced in This Report

The table below lists additional resources in the order they appear in the report.

Table 8-1 | Additional Resources

Resource	Location in this Report
Reliability Outlook Webpage	Introduction
Security and Adequacy Assessments	Introduction
2025 Q1 Outlook Tables	Throughout
Connection Assessments and Approval Process	Assessment Assumptions
Methodology to Perform the Reliability Outlook	Throughout
Capacity Auction	Demand Measures
Enabling Capacity Exports	Firm Transactions
Ontario Resource and Transmission Assessment Criteria	Transmission Considerations
NERC Transmission Planning Standard TPL-001-4	Transmission Considerations
NPCC Directory #1	Transmission Considerations
Market Manual 7.1	Operability
Annual Planning Outlook	Resource Adequacy

9. List of Acronyms

Acronym	Definition
CAA	Connection Assessment and Approval
DR	Demand Response
EAA	Energy Adequacy Assessment
FETT	Flow East Toward Toronto
GS	Generating Station
GTA	Greater Toronto Area
ICI	Industrial Conservation Initiative
IESO	Independent Electricity System Operator
IRRP	Integrated Regional Resource Plan
kV	Kilovolt
LDC	Local Distribution Company
MW	Megawatt(s)
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
NYISO	New York Independent System Operator
ORTAC	Ontario Resource and Transmission Criteria
PAR	Phase Angle Regulator
RAR	Reserve Above Requirement
RAS	Remedial Action Scheme
SBG	Surplus Baseload Generation
SCC	Solar Capacity Contribution
TS	Transmission/Transformer Station
TWh	Terawatt-hour(s)
WCC	Wind Capacity Contribution

Independent Electricity System Operator
1600-120 Adelaide Street West
Toronto, Ontario M5H 1T1

Phone: 905.403.6900
Toll-free: 1.888.448.7777
E-mail: customer.relations@ieso.ca

ieso.ca

@IESO_Tweets
linkedin.com/company/IESO

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