GTA East Integrated Regional Resource Plan (DRAFT)

DRAFT Forecast Methodology Document
July 16, 2025

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This methodology document was prepared by IESO, with inputs from Elexicon, Hydro One Networks Inc. and Oshawa Power.

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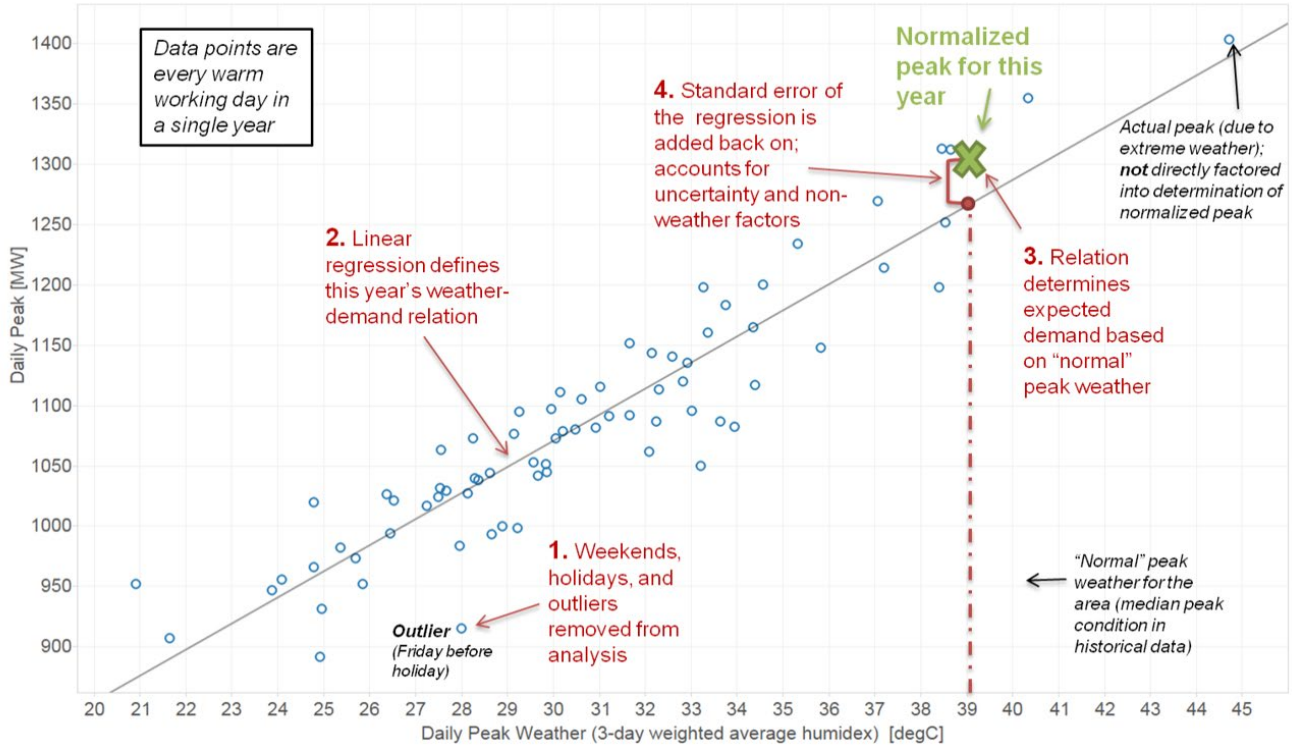
1. Demand Forecast and Methodology

1.1 Method for Accounting for Weather Impact on Demand

Weather has a large influence on the demand for electricity, so to develop a standardized starting point for the forecast, the historical electricity demand information is weather-normalized. This section details the weather normalization process used to establish the starting point for regional demand forecasts.

First, the historical loads were adjusted to reflect the median peak weather conditions for each transformer station in the area for the forecast base year (i.e., 2024 for the GTA East IRRP). Median peak refers to what peak demand would be expected if the most likely, or 50th percentile, weather conditions were observed. This means that in any given year there is an estimated 50% chance of exceeding this peak, and a 50% chance of not meeting this peak. The methodological steps are described in Figure 1 and were undertaken for both the summer and winter seasons.

Figure 1 | Method for Determining Weather-Normalized Peak (Illustrative)



The station-level 2024 median weather summer and winter peaks were provided to each LDC. This data was used as a starting point from which the LDCs could develop 20-year gross median demand forecast using their preferred methodologies (described in the next sections).

Once the 20-year, median peak demand forecasts were submitted to the IESO, the normal weather forecast was adjusted to reflect the impact of extreme weather conditions on electricity demand and forecast demand savings from electricity Demand Side Management (eDSM) and contracted

Distributed Generation (DG) were netted out of the forecast to create the final planning forecast. In accordance with the Load Forecast Guideline for Ontario published by the Ontario Energy Board (OEB) the forecast is adjusted to extreme weather.

1.2 Elexicon Energy Inc: Gross Forecast Methodology and Assumptions

Elexicon Energy Inc. (formerly Veridian and Whitby Hydro), through its subsidiary of Elexicon Corporation, serves over 180,000 homes and businesses across ten municipalities in east central Ontario including Ajax, Clarington, and Whitby. The service territory for Elexicon Energy in the GTA East region is shown below in Figure 2. For the GTA East IRRP, Elexicon Energy developed forecasts for Cherrywood TS, Enfield TS, Seaton MTS, Thornton TS, Whitby TS, and Wilson TS.

Figure 2 | Elexicon Energy Service Territory Map in the GTA East Region

1.2.1 Forecast Methodology

Elexicon developed three different load growths of the forecast including customer growth, electric vehicles, and building electrification as described in the following sections. These load growth drivers were derived through municipal and regional growth plan, federal adoption targets, and historical data trends. Then, these load growths were combined and applied to the starting point provided from the IESO to develop reference forecast.

1.2.2 Forecast Assumptions

1.2.2.1 Customer Growth

A bottom-up approach was applied using projected growth for residential and business archetypes and their associated load impacts, as well as known connection requests from large industrial loads.

Residential

Eleixcon used Envision Durham's Draft Official Plan for anticipated number of homes in the forecast period to project a base growth forecast for residential growth. Using StatsCan's Census in conjunction with annual energy consumption for each archetype, a split and average demand per type of residence was produced. The average load impacts were converted to peak using regional load factors from historical loading data trends.

Commercial and Industrial

Using StatsCan historical business counts and employment numbers, a business-to-employee ratio was developed per district and by business type. The forecasted employment growth in the Envision Durham Draft Official Plan was then converted to a business count projection by type. Business types were then mapped to average load impacts with load per business type derived from ELX OEB Yearbook. In addition to this forecasted growth, known connection requests for large upcoming residential/industrial loads were also incorporated.

1.2.2.2 Building Electrification

The forecast incorporates anticipated increases in peak demand from space heating and cooling, including impacts from both new construction and retrofits of existing buildings

Residential

Elexicon used the Durham Community Energy Plan and Federal net-zero new building targets to project both new construction and retrofits of existing buildings. Energy Use Intensity (EUI) data from NRCan was used to calculate the average energy usage of different archetypes. This was then adjusted using the Coefficient of Performance (COP) for heat pumps, and seasonal load factors were applied to convert average energy usage to peak demand impact.

Commercial

Elexicon used the Durham Community Energy Plan to project floor space targets for both new construction and retrofits of existing buildings. Energy Use Intensity (EUI) data by business type was used to calculate the average energy usage of different business types. This was then adjusted using the COP for space heating and water heating.

1.2.2.3 Electric Vehicles

Peak load impacts of Electric Vehicles (EV) charging were forecasted based on assumptions regarding EV sales targets, Internal Combustion Engine (ICE) retirement rates, and EV load impacts.

Elexicon projected the vehicle population based on population forecasts, vehicle-per-person ratios, and business counts for medium and heavy-duty vehicles. EV sales targets were based on federal policies for zero-emission vehicles. The peak impact of different types of electric vehicles, as provided by NRCan, was used to calculate EV load impacts.

1.2.3 References

The following plans were referenced to define the forecasts:

- Envision Durham's Draft Official Plan
- North-Easting Pickering Secondary Plan
- Durham Community Energy Plan

1.3 Hydro One Networks Inc. Distribution: Gross Forecast Methodology and Assumptions

Hydro One Networks Inc. Distribution (Hydro One Distribution) services the areas of GTA East region that are not serviced by other LDCs. It supplies power through Enfield TS and Wilson TS included in the study area for the GTA East Forecast. Figure 3 shows part of Hydro One's service territory, which includes the GTA East region.

Figure 3 | Hydro One Service Territory Map in the GTA East Region

1.3.1 Forecast Methodology

Hydro One Distribution employed both econometric and end-use approaches to develop forecasts for the GTA East IRRP. These forecasts were derived by leveraging provincial load forecasts (including historical load, actual and projected economic and demographic factors, municipal energy plans, etc), which were adjusted for stations in GTA East based on their historical relationship. Additionally, local information, including Municipal Energy Plans, Official Plans and local and regional demographic and economic factors, was incorporated to the forecast to ensure its alignment with local and regional conditions.

1.3.2 Forecast Assumptions

1.3.2.1 GDP and Housing Assumptions

Hydro One used Ontario's GDP annual growth rates and Ontario housing growths for the planning forecast which are outlined in **Table 1** and **Table 2** below.

Table 1 | Ontario GDP Annual Growth Rate

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Ontario GDP Annual Growth Rates (%)	0.92	1.68	1.96	2.09	2.02	1.90	1.92	1.95	2.07	2.07
	2035	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
	1.98	2.05	2.02	1.97	1.92	1.92	1.90	1.89	1.88	1.85

Table 2 | Ontario Housing Growth

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Ontario Housing (thousands)	71.6	82.8	86.5	89.9	85.0	85.9	86.6	87.1	102.2	102.7
	2035	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
	103.2	103.8	104.0	103.9	103.7	103.3	103.0	103.0	103.1	103.0

1.3.2.2 Other Drivers of Load Growth

EVs and electrification assumptions are based on the latest government mandates and initiatives in this regard.

1.3.3 References

The following plans were referenced to define the forecasts:

- Oshawa Corporate Energy Management Plan
- Durham Community Energy Plan
- Elexicon 2023 Corporate, Environmental and Social Responsibility Report

1.4 Oshawa Power Forecast Methodology and Assumptions

Oshawa Power, through its subsidiary of Oshawa Power & Utilities Corporation, serves over 60,000 customers in the city of Oshawa. The service territory for Oshawa Power in the GTA East region is shown below in Figure 4. For the GTA East IRRP, Oshawa Power developed forecasts for Enfield TS, Thornton TS, and Wilson TS.

Figure 4 | Oshawa Power Service Territory Map in the GTA East Region

1.4.1 Forecast Methodology and Assumptions

Oshawa Power developed different aspects of the forecast including residential, commercial, and industrial growth as well as electrification of vehicles, residential and commercial buildings as described in the following sections. Then, all aspects of the forecast are combined and applied to the starting point provided from the IESO to develop reference forecast.

1.4.1.1 Residential Forecast

Oshawa Power used Envision Durham's Draft Official Plan for anticipated number of homes in the forecast period to project residential growth. Using StatsCan's Census in conjunction with annual energy consumption for each archetype, a split and average demand per type of residence was produced. The average was converted to peak using a load factor and further tailored to reflect Oshawa's load profile.

1.4.1.2 Commercial and Industrial Forecast

Oshawa Power used Envision Durham's Draft Official Plan employment forecasts in conjunction with StatsCan's historical distribution of business in Oshawa, and average number of employees per business type (from the region of Durham Regional development charge background study), to project commercial and industrial growth by business type.

NRCAN's annual energy consumption per business type was used to arrive at the load impact resulting from business growth in Oshawa.

1.4.1.3 Electrification

Electric Vehicles (EV)

EV forecasts were based on adoption of Federal policy for zero emission vehicles as per the 2030 Emission reduction Plan. Ministry of Transportation (MTO) data was used for current vehicle population in Oshawa. Projections were based on population growth as per the Envision Durham plan. EV sales targets as per the 2030 Emission reduction plan was used to project adoption rates which includes new sales as well as retirement of existing Internal Combustion Engine (ICE) vehicles. A peak impact of Light duty EV and medium/heavy duty EV was used as per NRCAN's EV study. This was further reduced to account for combination of different technologies.

Residential and Commercial Electrification

Residential building electrification targets were based on the Durham Community Energy Plan targets for retrofit and new net zero home. The same residential home growth forecast and distribution between archetypes used in the Residential Forecast (section 1.4.1.1) was used. The net zero home targets were considered, but the impact on the grid was based on upgrade request experienced by Oshawa Power in previous years.

Commercial building electrification targets were also Durham Community Energy Plan targets for retrofit and new net zero builds. The Durham Community Energy plan did not have targets for industrial electrification.

1.4.2 References

The following plans were referenced to define the forecasts:

- Envision Durham's Official Plan
- 2030 Emission reduction Plan
- Durham Community Energy Plan
- City of Oshawa Official Plan

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