South Georgian Bay and Muskoka Integrated Regional Resource Plan

Load Forecast Methodology

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Powering Tomorrow.

This document describes the methodologies used to develop the peak demand forecast for the South Georgian Bay and Muskoka (SGBM) Region, Integrated Regional Resource Plan (IRRP) studies. Long-term estimates of electricity demand were provided by each of the participating LDCs, and informed by the forecast base year and starting point provided by the IESO. The sections that follow describe the weather correction methodology, and the methods and assumptions used by each LDC to forecast demand in their respective service area.

1. Method for Accounting for Weather Impact on Demand

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

As a first step, historical loads for the previous 5 years were adjusted to reflect each year's peak demand at median weather conditions. This trend of adjusted historic peaks was used to determine the starting demand at the base year. Median temperature peak refers to what peak demand would be expected if the most likely, or 50th-percentile-weather conditions were observed on the peak demand day. 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 were undertaken for both, summer and winter seasons; these steps are described below and summarized in **Figure 1**.

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

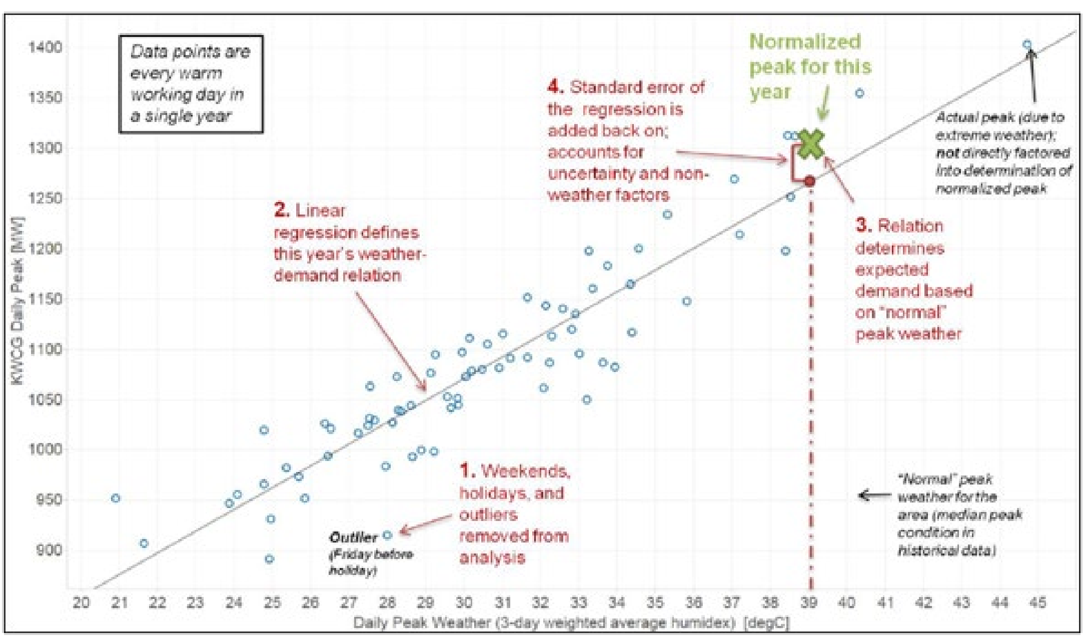

Figure 1 shows data pairs of daily peak demands and the 3-day rolling average maximum temperature. These points are taken for every warm-weather working day within a year; a similar analysis is done for cold weather days and the corresponding minimum temperatures.

After weekends and outliers are determined and removed from analysis, linear regression is applied to determine a relation that is used to estimate what the peak demand would have been, had the temperature been the historic median. In the figure, the peak demand of 1400 MW happened at a temperature close to 45 C, however at the historic median temperature of 39 C, the peak demand would have been about 1265 MW. Finally, the standard error of the regression is added back to the estimated peak demand, to account for uncertainty and other factors not related to temperature.

The historic median-weather summer and winter peaks for each station were provided to each LDC. This data was used as a starting point from which the LDCs could develop 20-year gross median demand forecasts 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; forecast demand savings from CDM and contracted DG were also accounted. The studies used to assess the adequacy and reliability of the electric power system are generally required to be based on extreme weather demand – typically the expected demand under the hottest (or coldest) weather conditions that can be reasonably expected to occur. Peaks that occur during extreme weather (i.e., summer heat waves in southern Ontario) are generally when the electricity system infrastructure is stressed the most.

The following sections discuss the methodology and assumptions that the local distribution companies of the region followed to prepare their respective load forecasts.

2. Hydro One Networks – Distribution

2.1 Drivers of Load Growth and Reflection of Provincial and Municipal Growth Plans

Hydro One Distribution serves customers that are not covered by other utilities in South Georgian Bay-Muskoka (SGBM) region. The load growth is more in areas that are closer to built-up areas in the region. LDC's electrical load in the study area as a percentage of total Hydro One Distribution load is 2.39% in winter and 2.38% in summer. The service territory of Hydro One – Distribution in the SGBM Region is shown in **Figure 2**. Market and rate segmentation of electrical load was used in the forecast to consider growth behaviors of different customer sectors. **Table 1** and **Table 2** show extracts of market segmentation for Beaverton and Lindsay transformer stations.

Table 1 | Segmentation by Customer Class – 2024 Summer Peak

Transformer Station	LDC	Res	Com	Ind	Total
Beaverton TS (T3/T4)	Hydro One	84%	8%	7%	100%
Lindsay TS (T1/T2)	Hydro One	66%	24%	10%	100%

Table 2 | Segmentation by Customer Class – 2024 Winter Peak

Transformer Station	LDC	Res	Com	Ind	Total
Beaverton TS (T3/T4)	Hydro One	87%	7%	6%	100%
Lindsay TS (T1/T2)	Hydro One	72%	19%	9%	100%

Figure 2 | Service Territory of Hydro One – Distribution in the SGBM Region

Load growth for each station was calculated based on latest local, provincial information (including historical load, actual and projected economic and demographic factors, municipal energy plans, etc.) and the historical relation between them. This includes survey statistics for Simco County, Town of New Tecumseth, township of Oro-Medonte, and Town of Collingwood, as well as Beaverton Climate Action Plan, Muskoka Community Energy and Emissions Reduction Plan, City of Kawartha (includes Lindsay) corporate-energy-management-plan, Town of Orangeville Corporate Energy Conservation & Demand Management Plan, Town of Midland Municipal Action Plan, Municipality of Meaford Energy Conservation and Demand Management, Town of Parry Sound 5-Year Conservation and Demand Management Plan, Town of Huntsville Conservation and Demand Management Plan Update.

2.2 Methodology

Hydro One Distribution used both econometric and end-use forecasting to develop the load forecast provided to the IESO. A baseline forecast (MW station peak in the base year) was developed, considering such factors as normal operating conditions, coincident peak loading, and extreme weather conditions.

For the SGBM IRRP forecast, Hydro One Distribution used the weather-corrected peak demand levels for the station serving Hydro One customers. From the established baseline year, a growth rate (%) was applied to station demand level to provide forecast values within the study timeframe.

Assumptions included in the growth rate can be related to such factors as: Ontario Gross Domestic Product (GDP) growth rate, housing statistics, the intensification of urban developments (i.e., MW/sq. ft); and electrification trends (e.g., more vehicles switching from gas to electrical vehicles). The assumptions for Ontario's GDP growth rate are shown in **Table 3** to **Table 5**.

Table 3 | Ontario Real GDP Growth Rate (%) for Reference Forecast Scenario

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
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 4 | Ontario Real GDP Growth Rate (%) for High Forecast Scenario

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1.42	2.18	2.46	2.59	2.52	2.4	2.42	2.45	2.57	2.57
2035	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
2.48	2.55	2.52	2.47	2.42	2.42	2.4	2.39	2.38	2.35

Table 5 | Ontario Real GDP Growth Rate (%) for Low Forecast Scenario

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0.42	1.18	1.46	1.59	1.52	1.4	1.42	1.45	1.57	1.57
2035	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
1.48	1.55	1.52	1.47	1.42	1.42	1.4	1.39	1.38	1.35

Assumptions based on the area of new developments – (e.g., MW/sq ft of new residential, commercial, industrial facilities), are shown in **Table 6** to **Table 8**.

Table 6 | Ontario Housing Stats for Reference Forecast Scenario

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
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

Table 7 | Ontario Housing Stats for High Forecast Scenario

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
72.0	83.6	87.7	91.6	87.1	88.4	89.6	90.6	106.7	107.8
2035	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
108.8	110.0	110.8	111.2	111.6	111.7	111.9	112.5	113.2	113.6

Table 8 | Ontario Housing Stats for Low Forecast Scenario

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
71.2	82.0	85.3	88.2	83.0	83.4	83.7	83.8	97.9	97.8
2035	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
97.8	97.9	97.6	97.0	96.4	95.5	94.7	94.3	93.9	93.3

Regarding the expansion or electrification of public transit (e.g., MW/electrified GO station), the load forecast is consistent with the latest government policies to date, e.g., EV mandates and electrification policies.

Provincial and local economic and demographic developments and the relation between the two sets, and government policies/mandates were considered in developing the forecast.

Over the historical period, CDM was added to the actual load to arrive at the load forecast gross of CDM and then the CDM at the base-year of the forecast (2025) was deducted from load forecast. Thus, the forecast includes incremental CDM relative to 2025.

2.3 Detailed Breakdown

At a sample transformer station (Sample TS), the load forecast was constructed as follows. The municipal growth plan indicates new residential developments totaling 200,000 sq ft. are expected beginning in 2017. Assuming an electricity intensity of 5W/sq ft., this translates to new residential load of 1 MW expected at Sample TS starting in 2027. Sample TS is also anticipating a new 10 MW load due to a GO electrification station coming online in starting in 2028 and a 1% growth per year of its base load due to infill development. To outline these details, the information for Sample TS should be presented in a form similar to **Table 1**.

Table 9 | Example of Desired Level of Detailed Breakdown Information for Sample TS

Year		2024 (Historical)	2025	2026	2027	2028	2029	2030	…
Sample TS Peak (MW)		**20**	**20.2**	**20.4**	**21.11**	**28.51**	**30.52**	**32.23**	**…**
Forecasted Loads (MW)	200,000 sq ft of residential development outlined in growth plan (1 MW)				0.5	0.7	1	1	…
	1% annual growth of the base load due to infill development		0.2	0.4	0.61	0.81	1.02	1.23	…

Year		2024 (Historical)	2025	2026	2027	2028	2029	2030	…
	(20 MW base load)								
	New GO Station (10 MW)					7	8.5	10	…
High Growth Forecasted Load (MW)	Uncommitted large scale customer				5				

3. Alectra Utilities Corporation

3.1 Drivers of Growth

Alectra Utilities has developed its system peak demand load forecast utilizing an end-use analysis. The key drivers of growth are:

1. Organic growth (Population, Housing and Employment Growth
2. Large load primarily data centers (AI, Storage, Cloud Computing)
3. Transportation and Electrification.

3.2 Load Components

Alectra uses end-use methodology to prepare the load forecast. This load forecast methodology consists of following steps approach to completing load forecast that is outlined below:

1. Review Economic Development & Outlook
2. Review of Current Year Summer Weather
3. Review of Current System Peak
4. Prepare Base Forecast
5. General Influence Matrix

Load forecast results will be used for resources (capacity) adequacy assessment and system utilization and will be communicated to other parties.

3.2.1 Step 1 - Review Economic Development & Outlook

The first step in the load forecast process is to review the inventory of proposed large development projects and developable lands. Key sources of this information will be the Municipal and Regional growth plans and projections and provincial acts affecting land use.

Sources of growth and land use information are noted below:

Provincial Level

- Ontario Government Growth Plans
- Ontario Economic Development Review and Update
- Provincial Acts affecting land use
- Land Use Discussion papers

Regional Level

- Regional Economic and Development Review
- Regional Official Plan Amendment (ROPA)

- County Directions Report (Hemson Consulting)
- Region specific Area Growth Plan

Municipal Level

- Growth Management Update Analysis Report from each Municipalities
- Development Charges Background Study (as updated periodically by municipalities - Hemson, Watson Reports)
- Municipal Official Plan Amendment (OPA) and By-Laws affecting land use
- Municipal Economic & Development Review- Annual report
- Municipal Websites for other planning information

3.2.2 Review of Current Year Summer Weather

The correlation of peak demand with weather (temperature) was studied to support Alectra Load Forecast Methodology.

A summary of the reports is noted below:

- Alectra's summer system peaks invariably coincide with severe weather conditions (high temperatures). While other factors may be playing a part, it seems apparent that summer peak demands are being driven largely using space air conditioning equipment.
- The weather impact on demand loading is a combination of temperature, humidity, cloud cover and wind speed. Weather variables have been explored in terms of impact on peak demand. A weighted 3-day moving average temperature is considered to be the best and most simplistic variable to reflect the impact of weather on Alectra's summer peak demand.

3.2.3 Review Planning System Peak of Current Year

The peak station data used for settlement from May 1st to Sept 30th is obtained from regulatory.

- Review system monthly peaks
- Review CDM impacts
- Review Demand Response Programs (DR) impacts
- Review Distributed Generation (DG) offsets
- Perform peak demand vs. weather regression
- Weather normalize current year system peak
- Compare actual peaks in the previous year to verify effectiveness of the load forecast methodology

  The outcomes will be:

- Weather insensitive (Base) load and weather sensitivity (MW/°C)
- Weather normalized peak of the current year which serves as starting point for forecast

3.2.4 Prepare Base Forecast (End-use Analysis)

Alectra Utilities uses end-use for the peak demand forecast. The peak demand can be divided into residential and commercial/industrial demand, and sub-divided into rate classes.

In the End Use Analysis, historic load growth is to be reviewed for the individual municipal districts that comprise Alectra Utilities' service territory. Municipal growth patterns are determined by internal factors such as individual municipal policy and external factors such as the local environment. Growth patterns in neighboring municipalities may not be identical. A review of load growth is useful in determining how electrical growth in the past was driven by municipal policy, population growth, business expansion and customer usage and to establish any trends or electricity usage drivers that can guide us to predict load growth in the future.

A summary of annual expected growth over the forecast period is created based on the unit growth data considered in the forecast process.

The average of the fixed annual unit growth (MVA/year) related to municipal growth information can then be converted to fixed annual percentage growth (% per year) to develop the annual load increases over the forecast period.

3.2.5 General Influence Matrix

6. Load Growth Scenarios

    It is valuable to look at a number of varying load growth scenarios to address variable uncertainty in developing an electricity growth forecast. These are:

    Reference growth: Normal expected economic growth

    Low growth: Lower than expected growth due to economy slow down/recession or low population projection

    High growth: Higher than expected growth assumes strong economic growth, high growth population

    The normal or base scenario is usually calculated first, and the planner then adjusts for high or low demand scenarios using statistical methods.

7. Future Electric Vehicle (EV) Impact

    The electric vehicle forecast used is based on the Guidehouse Insights North American report. The total Ontario vehicle population figures were obtained from StatsCan, projected to 2040 using Ontario's Ministry of Finance growth projection. For the load forecasting period, the forecasted EV sales and associated charging load were broken down to Alectra's rate zones as a ratio of the population in each rate zone.

8. Data Center Impact

    Existing, new and proposed Data Center load is also included in the forecast to gauge the impact over the forecasting period.

3.3 Major Developments and Recommendations

Alectra East North is referred to Barrie and other cities in the Simcoe Region. Alectra East North service territories included the City of Barrie, Penetanguishene, Bradford West Gwillimbury, New Tecumseth (Alliston, Beeton, and Tottenham) and the Township of Essa (Thornton). Since electrical distribution systems in these territories are not connected, resource adequacy assessment is performed separately for each area. Therefore, load forecasts and system adequacy assessment is performed separately.

The following local economic development efforts were identified for each region in Alectra East Simcoe County to support growth through the planning horizon:

- Barrie is actively encouraging the growth of the transportation and warehousing/wholesale trade sector, as well as manufacturing, construction, professional and scientific services and health services. Barrie has strong assets that serve a regional service function for Simcoe County. Three notable assets include the Royal Victoria Hospital, Georgian College and the SpringBOARD Innovation Centre. Barrie is also the home of four Data Centers with proposed Data Centers in the pipeline. The total proposed demand by the customers is 40 MW by 2032. Alectra is also working with the potential Data Centers with the additional requirement of 30 MW – 60 MW demand by 2035.
- The Town of Bradford encourages growth in the food processing, warehousing and distribution, retailing & service, machinery manufacturing, chemical & fabricated metal manufacturing and plastics manufacturing sectors. The immediate proximity to Highway 400, the strategic employment lands in the west end of the Town, proximity to the Greater Toronto Area and rapid population growth provide an attractive environment for business investment.
- The Town of New Tecumseth is home to the largest private sector employer (Honda Canada) in Simcoe County. The Town is engaged in economic development by ensuring there are service employment areas that provide a range of job opportunities. Honda Canada had announced its investment in a new EV Battery manufacturing plant which will bring more employment in the city. The developer of the 150-acre commercial/industrial lands south of Honda Canada is actively promoting the property on the international market. The forecast also included residential development consisting of 6400 units housing pledge by 2031 as well as various condominiums buildings.
- Penetanguishene is encouraging growth in tourism, culture, knowledge-based industries, and health care.
- Thornton has seen development in housing and small businesses.

Alectra Utilities EAST North has experienced a significant increase in demand due to various developments within its service territory. The City of Barrie has seen the largest demand growth, driven by potential data center projects as well as residential and commercial developments. As a result, existing stations are approaching their long-term ratings (LTR), necessitating the addition of a new transformer station by 2032–2033 to accommodate future load growth.

New Tecumseth and Bradford have also experienced substantial increases in load requirements. Each area is currently supplied by three feeders. The continued load growth in these communities will determine the need for additional feeders and/or upgrades to existing transformer stations to ensure sufficient capacity and reliable service.

4. EPCOR Electricity Distribution Ontario Inc.

4.1 Introduction

This document outlines the load forecasting methodology applied to the municipalities of Clearview, Collingwood, and the Town of The Blue Mountains (Thornbury). The forecasting approach is consistent across all three areas, with area-specific inputs applied where applicable.

4.2 Drivers of Growth

Drivers influencing load growth include:

- Residential intensification and greenfield development
- Commercial & industrial expansion
- Municipal development applications (i.e Hospital, Water Treatment Plant and Waste Water Treatment Plant), GIS-mapped land use data, and planning studies
- Economic conditions influencing development pacing

4.3 Load Components

4.3.1 Residential Density Assumptions

Updated standardized residential load allowances are shown in **Table 10**:

Table 10 | Updated Standardized Residential Load Allowances

Residential Density	Demand Allowance
High Density	2 kW / unit
Medium Density	3 kW / unit
Low Density	4 kW / unit

These values were applied uniformly across Clearview, Collingwood, and Town of The Blue Mountains (Thornbury).

4.3.2 Commercial & Industrial Load Conversion

Due to the wide variation in actual commercial/industrial loads, a standard conversion factor was used when no detailed application or known load was available:

0.007 kW per ft^2 or 0.08 kW per m^2

When a site had either:

- a known development application,
- projected transformer size, or
- LDC-confirmed load,

The known information superseded the standard conversion.

4.3.3 Commercial & Industrial Load Conversion

The following methodologies were applied:

- Bottom-up aggregation of residential, commercial, and industrial growth
- GIS-derived land area conversion for new commercial/industrial parcels
- Interpolation and extrapolation of municipal planning datasets
- Use of projected transformer size where known
- Comparison of multiple data sources to select the most realistic long-term trajectory

4.3.4 Area-Specific Forecasts

4.3.4.1 Town of Collingwood

The load forecast for the Town of Collingwood is grounded in multiple municipal datasets and planning documents that provide a detailed picture of expected residential, commercial, and industrial growth. The municipality supplied commercial floor area (m^2) from the Growth Management Discussion Paper (2020), and industrial floor area (m^2) from the County of Simcoe MCR (2022). Both sources extend to 2041, and these values were interpolated to 2045 to maintain continuity with the forecasted horizon. Residential projections for high, medium, and low-density units were also provided through the County of Simcoe MCR (2022), extending further to 2051. These unit counts were converted to electrical demand using the standardized load allowances of 2 kW per high density unit, 3 kW per medium density unit, and 4 kW per low density unit.

To assess future non-residential load, the Town of Collingwood's Land Use Planning GIS mapping and Development Activity dataset were reviewed to identify existing and future industrial and commercial parcels. Land areas were converted into m^2 and where no known load application existed, land areas were assessed using the standard non-residential conversion factor of 0.08 kW per m^2. In cases where developers had already engaged with EPCOR and provided projected transformer sizes or preliminary load estimates, these known values replaced the land-based estimation.

When both the GIS-based land conversion method and the municipally provided forecasts were compared, the municipally supplied datasets (Growth Management Discussion Paper and County MCR) were found to yield higher and more realistic long-term load projections and were therefore selected as the primary input.

Collingwood also submitted a Municipal Input Survey containing a list of Town-initiated projects. These projects were incorporated into the forecast in the year they are expected to connect, using the available information, projected transformer size, comparison against a similar development, or land-based conversion. This ensured that all municipal identified developments were captured with appropriate load representation.

4.3.4.2 Township of Clearview (Creemore & Stayner)

The forecast for the Township of Clearview relies primarily on the Official Plan of the Township of Clearview (May 2024). Residential growth expectations were drawn from Table 1.3 (Target Distribution of New Dwelling Units, 2021–2051) and Table 1.4 (Target Share of Housing Density Types per Settlement Area). These values were converted to electrical demand using the standardized residential load assumptions of 2 kW per high density unit, 3 kW per medium density unit, and 4 kW per low density unit. Because significant portions of greenfield development in Stayner and Creemore fall within Hydro One service territory, these areas were not included in the EPCOR forecast.

For non-residential growth, industrial and commercial parcels were identified using Simcoe GIS. Land areas associated with future development were converted into electrical demand based on the default conversion factor of 0.08 kW per m². This approach ensures that Clearview's forecast reflects both planned residential growth and the industrial/commercial development identified even though projected land use has not been determined.

4.3.4.3 Town of The Blue Mountains (Thornbury)

The load forecast for the Town of The Blue Mountains is based on the data submitted through the municipal input form. The municipality provided future residential unit counts for low and medium density housing, which were translated into electrical demand using the standard assumptions of 4 kW per low density unit and 3 kW per medium density unit. No high-density residential information was supplied, and therefore no high-density projections were included.

Commercial and industrial load projections were not included due to the nature of the municipal submission.

4.3.5 Scenarios

Three growth scenarios were applied:

- **Low Growth** → 50% of projected load growth
- **Normal Growth** → 75% of projected load growth
- **High Growth** → 100% of projected load growth

These scenarios reflect uncertainty and are historical variability.

In reviewing historic load data across all three municipalities, winter and summer peak demand trends were found to be effectively identical. As a result, seasonal differentiation was not applied to the scenario modelling, and the same peak demand trajectory was used for both summer and winter conditions. This reflects the limited historical divergence between seasonal peaks and ensures consistency across the forecast.

5. Wasaga Distribution Inc.

5.1 Introduction

This document outlines the methodology used by Wasaga Distribution Inc. (WDI) to develop its load forecast in support of regional planning, infrastructure investment, and coordination with provincial planning initiatives.

The methodology aligns with Load Forecast Methodology guidance and reflects local growth conditions, historical trends, and municipal planning inputs.

5.2 Drivers of Growth

The load forecast incorporates the following key drivers of electricity demand growth, informed by municipal planning inputs and developed in coordination with the Town of Wasaga Beach Planning Department:

- Population and Housing Growth: Sustained population growth driving residential development, including subdivision expansion and infill.
- Commercial Load Growth: Expansion of commercial services driven by population growth, tourism activity, and planned development.
- Major Developments: Known large developments and institutional projects incorporated into long-term growth expectations.
- Electrification Trends (Scenario-Based): Potential impacts of electric vehicles (EVs), electrified heating, and other electrification applications are considered through scenario analysis and are not derived from municipal planning inputs.

5.3 Load Components

The load forecast is disaggregated into the following modeled components, which translate the identified drivers of growth into forecast demand:

- Base Load Growth: Changes in average consumption of existing customers over time.
- Residential Load: Derived from forecast customer growth and class-specific demand assumptions.
- Commercial Load: Based on aggregate development (gross floor area) and demand factors.
- Major Projects / Discrete Loads: Incorporated where sufficient data is available, otherwise reflected within aggregate growth.
- Electrification Load Additions: Modeled as separate components and applied as incremental demand under scenario conditions.

5.4 Forecast Methodology

WDI applies a bottom-up forecasting approach in which total load is derived from projected customer counts and class-specific average demand, with adjustments for load shape. Electrification impacts are not included in the base forecast and are applied only under scenario-based conditions.

5.4.1 Load Calculation Approach

Class-specific demand factors are applied to convert forecast development into load. These factors are based on historical system performance and planning-level assumptions and are applied by customer class and land use type (e.g., residential density and commercial/institutional floor area).

Planning-level demand factors are used to estimate peak demand contributions, with sensitivity to higher per-unit loads observed in certain developments.

5.4.2 Forecast Inputs and Treatment

- Residential customer growth is derived from municipal building permit projections.
- Commercial growth is derived from aggregate gross floor area estimates based on best available information.
- Redevelopment and intensification are incorporated within annual average build-out rates.
- External inputs include municipal planning data and publicly available electrification trends.
- Distributed Energy Resources are not explicitly modeled.
- Electrification impacts are not embedded in the base forecast and are addressed through scenario analysis.

5.4.3 Power Factor Assumptions

An average system power factor, based on observed conditions, is applied in converting between MW and MVA where required.

5.5 Historical Data Preparation

Historical data was prepared as follows:

- Data Sources:
- WDI billing and customer data
- Historical system load data (44 kV level)
- Data Segmentation
- Separation of residential and commercial loads
- Identification and removal of anomalies
- Trend Analysis
- Historical customer growth used to establish baseline trends

5.6 Scenarios

Scenario analysis is used to assess uncertainty in load growth and electrification. Scenarios are not probabilistic and are intended to bound potential outcomes.

- Reference (Base Case) Scenario
- Based on municipal growth projections
- Electrification impacts excluded or minimal
- High Growth Scenario
- Increased development activity
- Accelerated electrification adoption
- Low Growth Scenario
- Slower development pace
- Limited electrification uptake

5.7 Results

Detailed results are provided in accompanying data tables. The forecast indicates sustained load and peak demand growth driven primarily by residential development and associated commercial expansion, consistent with applied demand factors and historical system characteristics.

5.8 Limitations and Considerations

Key sources of uncertainty include:

- Development timing and phasing
- Economic conditions
- Electrification uptake and policy direction
- Customer behavior changes

Electrification impacts are subject to uncertainty and are based on available data and assumptions at the time of forecast development.

5.9 Municipal Planning Assumptions

Municipal planning inputs provided by the Town of Wasaga Beach form a foundational input to the development of the WDI load forecast. These inputs inform both the magnitude and spatial distribution of forecast load growth.

5.9.1 Residential Growth (Housing Units)

Residential growth is based on projected building permit issuance, reflecting long-term development within the municipality. Growth is assumed to occur on an average annual basis and is used as a proxy for customer additions.

5.9.2 Spatial Allocation of Growth

Forecast growth is allocated across hydro substation service areas based on existing supply capacity, aligning demand growth with system infrastructure.

5.9.3 Commercial Development

Commercial growth is based on aggregate development information, including known major projects. Commercial load is incorporated at a system level and is not explicitly time sequenced.

5.9.4 Industrial Growth

No material industrial growth is assumed over the forecast horizon.

5.9.5 Electrification

Municipal-level electrification data was not available. Electrification impacts are treated as uncertainties and addressed through scenario analysis.

5.10 Conclusion

The WDI load forecast is based on municipal planning inputs, historical data, and established forecasting methods. The methodology ensures consistency with regional planning practices while reflecting the local characteristics of the service area.

6. Elexicon Energy

6.1 Drivers of Growth

Elexicon's load forecast is driven by four primary factors:

- **Customer Growth** – Population growth, residential development, commercial and industrial expansion, and committed customer connection requests.
- **Building Electrification** – Adoption of electric heating, heat pumps, electric water heating, and net-zero building initiatives.
- **Electric Vehicles (EVs)** – Increasing penetration of light-duty, medium-duty, and heavy-duty electric vehicles.
- **Weather Normalization** – Temperature-driven demand impacts assessed under mild, normal, and extreme weather conditions.

6.2 Load Components

The System Peak Load Forecast is developed using four independent sub-forecasts:

1. **Weather-Normalized Baseload** – Existing demand under typical weather conditions.
2. **Customer Growth** – Incremental demand from new residential, commercial, and industrial development.
3. **Building Electrification** – Additional load resulting from fuel-switching and electrification of buildings.
4. **Electric Vehicle Load** – Additional demand resulting from EV adoption.

The combined forecast provides a comprehensive view of future peak demand across Elexicon's service territory.

6.3 Forecast Methods

Elexicon uses a combination of econometric, bottom-up, and policy-based forecasting methods.

- **Baseload Forecast –** A multivariate regression model is used to weather-normalize historical daily peak demand and establish future baseline loading trends.
- **Customer Growth Forecast** – Developed using municipal and regional growth forecasts, demographic projections, employment forecasts, development plans, and committed load requests.
- **Building Electrification Forecast** – Based on municipal and community energy plans, energy-use intensity assumptions, retrofit and new-build electrification targets.
- **EV Forecast** – Developed using vehicle population forecasts, federal ZEV targets, adoption curves, charging assumptions, and vehicle retirement rates.

The four sub-forecasts are aggregated to create the final System Peak Load Forecast.

6.4 Historical Data Preparation

Historical system peak data is used to develop the forecast baseline.

Key preparation activities include:

- Weather normalization using Heating Degree Days (HDD) and Cooling Degree Days (CDD).
- Adjustment for seasonal, weekday, holiday, and abnormal events.
- Statistical validation of forecast models.
- Separation of customer growth, electrification, and EV impacts to avoid double-counting.

This process establishes a consistent baseline for future demand projections.

6.5 Scenarios

Scenario analysis is performed to capture uncertainty in future growth and electrification.

Customer Growth

- **Low** – 50% of projected residential and C&I growth materializes.
- **Medium** – 75% of projected residential and C&I growth materializes.
- **High** – 100% of projected residential and C&I growth materializes.

Building Electrification

- **Low** – Current electrification targets maintained with slower retrofit adoption.
- **Medium** – Municipal electrification targets achieved with delayed implementation of some C&I targets.
- **High** – Full achievement of municipal and federal electrification objectives.

Electric Vehicles

- **Low** – Business-as-usual adoption based on historical trends.
- **Medium** – Federal ZEV sales targets achieved five years later than planned.
- **High** – Federal ZEV sales targets achieved on schedule.

Weather Normalization

- **P10** – Mild weather.
- **P50** – Normal weather.
- **P90** – Extreme weather.

For capacity planning, Elexicon utilizes the **P90 Weather Scenario**, **High Customer Growth**, **High Building Electrification**, and **Medium EV Adoption** scenario combination.

6.6 Results

The load forecasting methodology produces a consolidated System Peak Load Forecast that supports distribution system planning, capacity assessments, and infrastructure investment decisions.

The forecast indicates continued demand growth driven by customer growth, transportation electrification, and building electrification. Results are used to assess station and feeder loading, identify future capacity constraints, and prioritize system investments required to maintain reliability and meet future customer needs.

7. InnPower

7.1 Forecast Scenarios Preparation

The logic behind each scenario is outlined below:

- The high scenario is based on developer projections, which are often optimistic and typically assume a greater number of units will be built and energized within a shorter timeframe.
- The mid scenario relies on the most recent and reliable available data. Planned energizations are expected to be supported by formal submittals requesting an OTC in the system, along with coordination and communication with the planning and engineering teams. This scenario also incorporates relevant in-house knowledge regarding units that are likely to be energized.
- The low scenario is grounded in the most dependable information, including historical records, current market conditions, and the actual status of the proposed subdivision in the field, as well as progress in drawings and documentation.
- Across all scenarios, while the average demand per customer remains consistent, an absorption factor has been applied in the final calculations to account for historical load growth and population trends in Innisfil and South Barrie.

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

@OntarioIESO
linkedin.com/company/IESO

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