East Lake Superior Integrated Regional Resource Plan (IRRP)

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This document includes the methodologies prepared by PUC Services, Algoma Power and Hydro One Networks Inc Distribution. to support the East Lake Superior region IRRP demand forecasts, with input from the IESO.

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1. PUC Services Forecast Methodology

1.1 Overview

The load forecast methodology employed by PUC Distribution Inc. and PUC Transmission LP provides projections of future electricity demand within our service territory. This methodology supports operational planning, system reliability, and infrastructure investment decisions. It is primarily based on historical load data summer and winter peaks and is augmented by known electrification trends and planning inputs from municipal energy projects.

1.2 Data Sources

The forecasting process uses historical electricity consumption data for PUC Distribution Inc. collected at hourly intervals over the past 5 years as well as known electrification plans and projects for both PUC Distribution Inc. and PUC Transmission LP. Sources include:

- Internal SCADA systems and smart meter data
- System-level demand records aligned with IESO revenue metering standards
- Municipal and regional planning documents, including the City of Sault Ste. Marie's Community Energy Plan
- Known electrification projects anticipated within our service territory

1.3 Methodology

1.3.1 Data Aggregation and Cleaning

- Peak summer and winter load data is aggregated and checked for completeness and accuracy.
- Anomalies are corrected using interpolation or are excluded from averages.

1.3.2 Forecasting Technique

- Historical peak summer and winter load was gathered and plotted to establish a baseline and a trend line of the summer and winter peaks is continued for the forecasted years.

1.3.3 Adjustment Factors

- Electrification Adjustments: The forecast assumes low electrification growth, consistent with current trends and observed uptake rates in our service area. PUC assumed a 1-1.5% per year increase.

- Planned Electrification: Specific electrification initiatives outlined in the City's Community Energy Plan (e.g., targeted building retrofits, municipal fleet electrification, district energy integration) are layered onto the forecast where applicable.
- Industrial Electrification and Growth: Known industrial electrification projects of existing businesses in our service territory have been added to the forecast. Anticipated new industrial customers have also been added to the forecast with the understanding that the IESO will apply a sensitivity analysis to these potential customers.

1.3.4 Forecast Use and Reporting

- They are used to inform capacity planning, grid operations, demand response coordination, and alignment with IESO planning processes.

1.4 Limitations

This method is grounded in historical consumption behavior and assumes relatively stable future patterns, modified for known electrification plans. While appropriate for near-term forecasting, it may not fully capture in detail disruptive changes such as rapid EV adoption, widespread electrification of heating, or behind-the-meter generation. Future iterations may incorporate scenario-based modeling or machine learning techniques to better accommodate dynamic trends.

2. Algoma Power Forecast Methodology

2.1 Summary

Load growth is primarily attributed to electric vehicles (EVs), residential household electrification, agricultural greenhouses, mining expansion, steel producer electrification in northern Ontario, and continued residential sector growth. The transportation sector demand outlook has the most significant change with EV charging as the primary driving force behind this growth. Algoma Power Inc. ("API") has aligned its forecasted annual planning outlook with the federal government targets on zero-emissions vehicle sales targets.

Geographically, API is responsible for one of the largest electrical distribution service territories in the province, spanning from Thessalon to Wawa. A large portion of Trans-Canada Highway is routed through this service territory and as such it is reasonable to expect there will be a need for improved and increased charging capacity in the future. The load growth includes future adoption of EV charging stations along the major highway corridors and small towns where existing gas stations reside to accommodate EV travelers.

2.2 Data Source

The forecasting estimations were analyzed using previous 5-year historical peak electrical consumption trends in the summer and winter for each transmission connected station.

2.3 Methodology

Using previous 5-year data trend, the following methodology was applied for estimating general load growth and growth in the locations where EV penetration is practical as discussed above:

- 20% accumulative general load growth (1.84%/annum over 10 years) plus 10% EV penetration rate.

3. Hydro One Networks Distribution Forecast Methodology

Hydro One Distribution services the areas of East Lake Superior (ELS) region that are not serviced by other LDCs. It supplies power through Chapleau stations included in the study area.

- Hydro One Distribution used both econometric and end-use forecasting to develop the 20-year load forecast provided to the IESO.
- A baseline forecast (MW station peak in the base year) was developed, taking into account such factors as normal operating conditions, coincident peak loading, and extreme weather conditions.
- For the ELS IRRP forecast, Hydro One Distribution used the weather corrected peak demand levels for the stations serving Hydro One customers.
- From the established baseline year, a growth rate (%) was applied to station demand levels to provide forecast values, at each station, within the study timeframe.
- Assumptions included in the growth rate can be related to such factors as: Ontario GDP growth rate, housing statistics, the intensification of urban developments (i.e., MW per sq. ft); and electrification trends (e.g., more vehicles switching from gas to electrical vehicles).
- Where possible, detailed information about load growth, based on local knowledge and or municipal/provincial plans, was used to augment the forecast values within the study period.

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

ieso
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