JUNE 25, 2024

Burlington to Nanticoke Regional Electricity Planning

Engagement Webinar #2



Objectives of Today's Engagement Webinar

- To provide an update on the electricity planning underway in the Burlington to Nanticoke Region
- To seek feedback on the defined electricity needs and screening of high-level options identified for the development of an electricity plan – Integrated Regional Resource Plan (IRRP)
- To outline next steps



Agenda

- 1. Recap: Regional Electricity Planning Status & the Demand Forecast
- 2. Overview of Electricity Needs
- 3. Screening Potential Options



Seeking Input

- What feedback do you have on the screening of high-level potential options?
- What information needs to be considered as we examine potential options?
- What information should be provided in future engagements?

Please submit your written comments by email to engagement@ieso.ca by July 16





We work with:



Ontario's Changing Electricity Landscape

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This is a **pivotal point** for the electricity system. Ontario is entering a period of growing needs – by 2050, electricity demand to grow by 60%.



These needs are being driven by **economic** growth, population growth and increased electrification.



This demand growth is happening in the midst of expiring generator contracts, nuclear refurbishments and the elimination of emissions from the grid.



To meet the emerging needs, **Ontario will require** additional new electricity infrastructure, including new supply and transmission.





Recap: Regional Electricity Planning Process & the Demand Forecast



Electricity Planning in Ontario

Provincial/Bulk System Planning

Addresses provincial electricity system needs and policy directions.

Underway: Central and West Bulk Study



Regional Planning

Addresses local electricity system needs at the transmission system level.

Underway: Burlington to Nanticoke IRRP Addresses local electricity system needs and priorities at the distribution system level.

Distribution

Planning

Led by local distribution companies.



Electricity Planning in Burlington to Nanticoke

An electricity plan – Integrated Regional Resource Plan (IRRP) – will be developed for Burlington to Nanticoke.

The IRRP will be developed by a Technical Working Group, led by the IESO, and consisting of the local distribution companies and the transmitter.

The area is divided into 4 electrical subregions, and is serviced by 230 kilovolt (kV) and 115 kV lines and transformer stations (TS).



Map for illustrative purposes.



Components of an IRRP

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How much power is needed over the planning timeframe? What needs are emerging in the region that need to be addressed?

Needs

What kinds of solutions can meet the future needs for the region?

Potential Solutions

Based on an assessment of potential options, what recommended actions will ensure a reliable and adequate electricity supply for the region over the long-term?

Recommendations



Developing the Demand Forecast

Developing a 20-year electricity demand forecast included:

- Information from the region's local distribution companies (LDCs) such as:
 - Demand forecasts for each station they are supplied from,
 - Municipal and community plans incorporated into their forecast, and,
 - Forecasting assumptions based on customer growth plans.
- Engaging with municipalities, customers, and other interested parties to understand and incorporate potential growth and decarbonization plans.
- Accounting for the impacts of existing demand side management programs, planned distributed generation, and extreme weather conditions in the electricity demand forecast.



Feedback Received

Engagement has been undertaken to understand issues and trends related to economic development and local energy solutions.

Key themes emerged:



Organic growth and economic development projects across the region

Significant community energy initiatives are planned



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Strong industrial growth and interest in ensuring electricity infrastructure can accommodate economic development



Brant and Caledonia-Norfolk Demand Forecast*

Key takeaway:

On average, an annual growth of 4% & 5% is expected for the Brant & Caledonia-Norfolk electrical sub-regions, respectively.

Industrial electrification projects contribute to the increase in the Brant and Caledonia-Norfolk demand forecast; Residential housing contribute to the increase in the Brant demand forecast.



* Distributers will provide updated forecasts accounting for new plans of electrification and economic growths.



Regional Planning Timeline





Update Since Last Engagement

- In September 2023, the IESO hosted a public engagement webinar to share the draft electricity demand forecast and request public feedback.
 - Feedback was received and posted along with the IESO's response in November.
- The Technical Working Group, led by the IESO, finalized the demand forecast, and studies were conducted to determine needs and potential options.
- New electrification and decarbonization plans with a significant impact on the Hamilton area were identified, requiring a shift in approach.
- One IRRP for the three sub-regions will be developed and extended by six months to allow for more time to assess and understand feedback around the needs and options to meet electricity needs.
 - Any emerging needs in Hamilton that are not addressed in the Burlington to Nanticoke IRRP will be included an addendum in 2025.



Overview of Electricity Needs



Identifying Needs

Studies have been conducted to analyze the infrastructure's needs based on the electricity demand forecast and a number of technical studies (system capability, operating standards) of the infrastructure. Needs studied in this process fall in the following categories:

- **Station capacity:** Ability of a station to deliver power from the grid down to the distribution systems.
- **Supply capacity:** Ability of the system to supply power through the transmission lines to a local area.
- Asset replacement: Station or transmission equipment has reached end of life.
- Load restoration: Ability of the system to restore power after select contingencies.
- Load supply security: Maximum amount of power that can be lost during select contingencies.



Location of Infrastructure with Needs



- 1. Station capacity needs at Brant Transmission Station (TS) & Powerline Municipal Transformer Station (MTS)
- 2. Station capacity needs at Norfolk Transmission Station (TS) & Bloomsburg Municipal Transformer Station (MTS)
- **3. Supply capacity** needs in the Brant 115 kV Subsystem is tied to supply capacity needs in the Woodstock and Hamilton Subsystems.
- 4. Supply capacity needs on the Caledonia-Norfolk 115 kilovolt (kV) Subsystem



Electricity Needs

Need Type	Impacted Equipment	Need Timing
Station Capacity Ability of a station to deliver	Powerline Municipal Transformer Station (MTS)	Near-term
power from the grid down to the distribution system	Brant Transmission Station (TS)	Long-term
	Bloomsburg Municipal Transformer Station MTS	Near-term
	Norfolk Transmission Station (TS)	Medium-term
Supply Capacity Ability of the system to supply power through the transmission lines to	Brant 115 kV Subsystem (also impacting related Woodstock and Hamilton 115 kV systems)	Near-term
a local area.	Caledonia 115 kV Subsystem, line segment C9 & C12 supplying Bloomsburg MTS and Norfolk TS	Near-term

Note: Hydro One's Need Assessment reported a station capacity need for Caledonia TS, however after a full analysis, it is confirmed there is no need.



Summary of Needs



Impact on Reliability:

Today, the electricity system meets reliability standards. With the forecasted growth, the IESO recommends to plan reinforcement to maintain reliability.





Supply Capacity Needs



Screening Potential Options



Determining Options

Over the course of the planning process, the IESO will:

Evaluate various wire and non-wire options to address the region's near, medium and long-term electricity needs. A combination of wire and non-wire options may be needed to address the needs including:

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- Traditional wires option to supply local area
- Non-wires alternatives (NWAs), such as transmission-connected generation or energy storage, CDM, distributed generation or demand response*

Seek community feedback to enhance development and evaluation of options before making a final recommendation.

*More information regarding screening NWAs can be found in the <u>IESO's Guide to Assessing NWAs</u>.



Screening Steps

Type of Need

Evaluate the compatibility of the need with the various option types, based on technical requirements and permissibility under planning standards and criteria

Need Traits

Further filter compatible options with high-level need traits (such as timing, size, and coincidence with system needs)

Additional Considerations

Take into account local factors that may require further analysis of non-wire alternatives, even if earlier steps haven't identified nonwires alternatives as suitable.



Options Screened In (1)

* In combination with other options ** Fossil-fuelled generation is excluded

Option Category	Related Needs	Ability of Option to Address Need
Installing a Dynamic Voltage Support Device	Brant/Woodstock 115 kV Subsystem supply capacity needs; Caledonia-Norfolk 115kV Subsystem supply capacity needs	Installing this device will keep the system stable in the short term * – it will not meet the needs or enable growth.
Conservation and Demand Management (CDM)	All transformer station (TS) capacity needs; Brant 115 kV Subsystem supply capacity needs; Caledonia-Norfolk 115kV Subsystem supply capacity needs	Introducing CDM initiatives would not meet or meaningfully reduce the needs, it will also not enable growth* – CDM would slightly reduce peak electricity demand and consumption.



Options Screened In (2)

* In combination with other options ** Fossil-fuelled generation is excluded

Option Category	Related Needs	Ability of Option to Address Need
Generation ^{**} (Battery Energy Storage System (BESS), Wind, Solar)	All transformer station (TS) capacity needs; Brant 115 kV Subsystem supply capacity needs; Caledonia-Norfolk 115kV Subsystem supply capacity needs	Installing at least one resource of the appropriate capacity at or near key stations can meet the needs in the medium term * – up to the forecasted 20 years.
Wires	All transformer station (TS) capacity needs; Brant 115 kV Subsystem supply capacity needs; Caledonia-Norfolk 115kV Subsystem supply capacity needs	New or upgraded components of existing transmission and transformer infrastructure can meet the needs in the long-term * – up to the forecasted 20 years and beyond that.



Next Steps





The IESO will continue to engage and inform municipalities throughout the IRRP's development. Communities can expect to hear from the IESO at these milestones:

June 2024: Needs and potential options presented in a public engagement webinar

July 2024: Deadline for feedback to the IESO on needs and potential options

July 2024: Posting updated IRRP Terms of Reference

Fall 2024: Options analysis and draft recommendations are presented in a public engagement webinar with an opportunity to provide feedback

November 2024: IRRP report will be completed and published on the webpage



Seeking Input

Local considerations and feedback are a critical component to the development of an Integrated Regional Resource Plan (IRRP). As the options phase of the IRRP continues to identify how to best meet the area's infrastructure needs, the IESO wants to hear your:

- Perspectives regarding the high-level wire and non-wire options
- Additional information that should be considered in the assessment of these options
- Additional information that should be provided in future engagements to help understand municipal perspectives and insights

Please submit your written comments by email to <u>engagement@ieso.ca</u> by July 16



Summary of Needs and Categories of Options

Throughout the Burlington to Nanticoke Region, there are four stations (1,2) and four lines (3,4) that the IESO is recommending to plan reinforcements to maintain reliability. To achieve this, the **IESO is considering various wire and non-wire options**:



Wired solution is the most suitable to meet needs in the longterm. A wired solution can include new 230 kV transmission and transformer infrastructure (3,4).



Non-wire alternatives are also being explored to address short and medium-term needs effectively. Non-wire alternatives could mean generation (e.g., battery storage, wind, solar located near 1,2).

A combination of options will be required to meet the needs. The feasibility of all options will continue to be evaluated to recommend the most cost-effective and technically feasible solutions.

Your input will help ensure that any additional information or considerations are included as part of the decision making process.







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Appendix



Regional Electricity Planning

The regional system planning process ensures an affordable and reliable supply of electricity across Ontario. The process looks at the unique needs of each region, and considers a range of options and resources to keep the lights on.

An electricity plan – Integrated Regional Resource Plan (IRRP) – will be developed for Burlington to Nanticoke Region.

The IRRPs will be developed by a Technical Working Group, led by the IESO, and consisting of the local distribution companies and the transmitter.



Burlington to Nanticoke's Technical Working Group

Team Lead, System Operator

Lead Transmitter

Local Distribution Companies Independent Electricity System Operator

• Hydro One Networks Inc. (Transmission)

- Oakville Hydro Electricity Distribution Inc.
- Burlington Hydro Inc.
- GrandBridge Energy Inc.
- Alectra Utilities Corporation
- Hydro One Networks Inc. (Distribution)



Additional Information

To help inform important decisions related to the Long-Term Procurements, the IESO has a number of resources including:



LT RFP community engagement webpage

<u>Resource Adequacy Updates</u> and the May 9, 2024 Resource Adequacy Update

<u>Frequently asked questions</u> on the procurements

For questions on the long-term procurements, please reach out to <u>communityengagement@ieso.ca</u>



Previous Cycles of Regional Planning

Two cycles of planning have been completed for the Burlington to Nanticoke region:

- First cycle focused on the <u>Brant</u> and <u>Bronte</u> sub-regions and completed in April 2015 and June 2016 respectively
- Second cycle focused on the <u>Hamilton</u> sub-region and completed in February 2019



Determining the Need for an IRRP





Gathering Data for the Demand Forecast

The region's needs are assessed based on a 20-year forecast of peak electricity demand. The peak demand forecast is created by:

- **1. Collecting** gross demand forecast information from local distribution companies, and assuming median weather conditions (demand is weather-sensitive).
- 2. Estimating impact of conservation and demand management targets.
- **3. Calculating** the forecast peak demand contribution of contracted distributed generation.
- 4. Adjusting the forecast to account for extreme weather conditions.



Single Line Diagrams





