

NOVEMBER 26, 2020

Electricity Planning in the West of London Area



Introduction

Part I: Windsor-Essex Integrated Regional Resource Plan (IRRP)
Addendum Study

Part II: West of London Bulk Study

Today's Webinar

Purpose:

- Given the overlap in scope of two electricity planning initiatives underway in Southwest Ontario, this webinar will cover both studies and seek input on key considerations

Objectives:

- To provide an overview of the two electricity planning initiatives underway in the areas west of London:
 - Regional planning: Windsor-Essex IRRP Addendum Study
 - Bulk planning: West of London
- Seek input on defined needs and potential options

Seeking Input

- What feedback do you have regarding any of the options proposed?
- What other information should be considered in the continued development of these solutions leading up to the recommendations?

**Please submit your written comments by email to
engagement@ieso.ca by December 17**

Different Levels of Planning in Ontario

West of London Study



Provincial/Bulk
System Planning

Addendum Study



Regional
Planning



Distribution
Planning





Part I – Windsor-Essex IRRP Addendum Study

Regional Planning Overview

- Regional planning ensures a reliable supply of electricity to Ontario's 21 planning regions and looks at the unique needs of each community
- There is an established process for engaging on specific components in the development of a long-term electricity plan:
 - Electricity demand forecast – how much electricity will the region need over the next 20 years?
 - Needs – what is the nature, magnitude, and timing of the needs?
 - Solutions – what potential options are available to meet these electricity needs and what are the community's preferences?

Regional Planning in Windsor-Essex

- A long-term electricity plan (in the form of an IRRP) was completed for the Windsor-Essex region in September 2019
- The IRRP addressed many supply needs in the Kingsville-Leamington area, with recommendations such as the Lakeshore Switching Station and new Chatham-Lakeshore circuits
- Another recommendation in the IRRP was to conduct a further study to assess any remaining needs on the local electricity infrastructure in the Kingsville-Leamington area

Types of Needs in Regional Planning

Capacity Needs

- Station capacity refers to the ability to convert power from the transmission system down to distribution system voltages to supply load customers
- System capacity (or "load meeting capability") refers to the ability of the electricity system to supply power to customers in the area, either by generating the power locally, or bringing it in through the transmission system

Load Restoration and Supply Security Needs

- Load restoration describes the electricity system's ability to restore power to those affected by a major transmission outage within reasonable timeframes (i.e., 8h, 4h, or 30 min)
- Supply security describes the total amount of load interrupted following major transmission outages

End-of-Life Asset Replacement Needs

- Based on the best available asset condition information at the time
- Evaluated to decide if the facility should be replaced "like-for-like", "right-sized", or retired

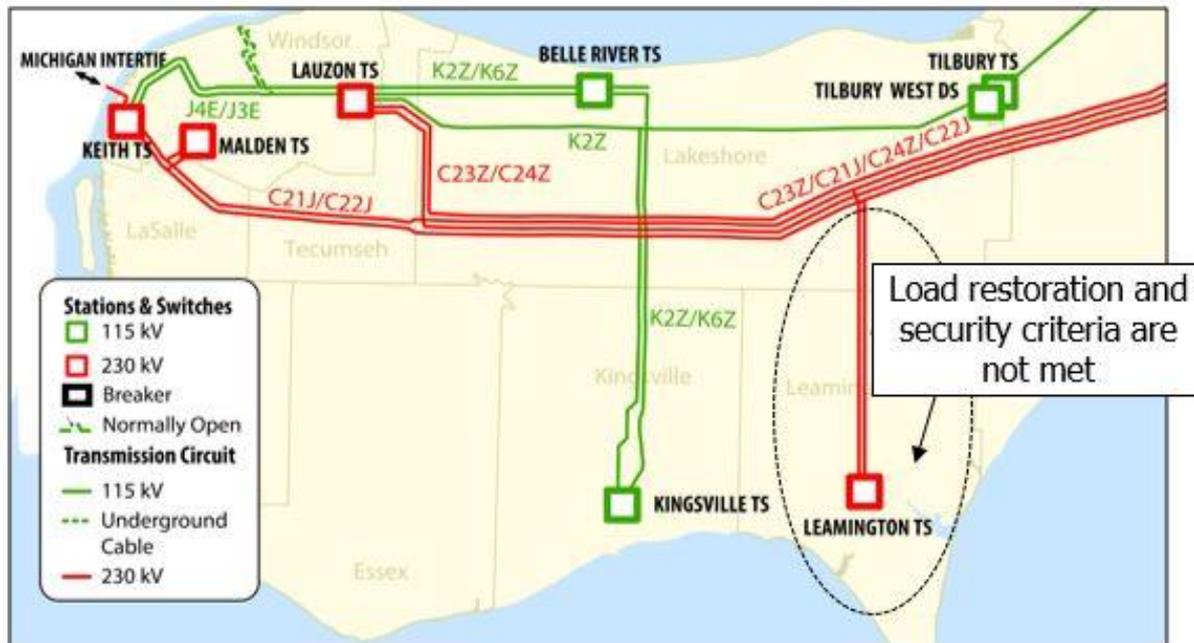
Needs of the Windsor-Essex IRRP Addendum Study (1)

- The IRRP identified capacity needs near Kingsville TS, plus load restoration and security needs at Leamington TS after new customers connect
- The addendum study will recommend an integrated solution, with consideration for the overall region's needs



Needs of the Windsor-Essex IRRP Addendum Study (2)

- The IRRP also identified load restoration and security needs on the Leamington tap after new customers connect
- For instance, in the event of a double contingency on the 230 kV circuits, up to 510 MW of load is interrupted



Needs of the Windsor-Essex IRRP Addendum Study (3)

- There are additional, broader Windsor area supply capacity needs historically managed by operational measures (Special Protection Schemes)
- Modifications to these existing schemes or additional requirements may arise due to bulk system impacts as load continues to connect



Potential Options

- Regional planning seeks to recommend the most cost-effective, technically feasible, and integrated solution
- Potential options being examined may include:
 - Non-wires alternatives (e.g. distributed energy resources, energy efficiency measures etc.)
 - Wires (e.g. step-down station, transmission line, etc.)
 - Generation (e.g. utility-scale storage, gas-fired peaking plant, etc.)

Types of Wires Options

- Technical studies are currently being finalized for the addendum study wires options; results to be shared in Q1 2021
- These wires options involve combinations of the following elements:
 - A reconfiguration of lower voltage (115 kV) infrastructure to the higher voltage (230 kV) network
 - Additional and/or uprated load supply stations
 - Alternate supply points
 - New connection lines, as required, for any new or modified stations

Other Considerations for the Wire Options

Technical Feasibility

- Can the option actually be executed? i.e., proximity to customers, routing and spacing considerations, operations

Ability to Address Needs

- Are the number, magnitude, and diversity of needs adequately addressed?

Integration & Cost-Effectiveness

- Is there the ability to solve multiple needs simultaneously?
- Would a combination of option types be required?

Lead Time

- New transmission infrastructure is expected to take at least 4-5 years – how does this compare to the timing of needs?

Types of Non-Wires Options

- The addendum study will incorporate learnings from the 2019 IRRP and Kingsville-Leamington Local Advisory Committee to inform feasibility
- Various technology types could contribute to an integrated solution; ex:
 - Energy storage – potential to address load restoration/security needs
 - Demand response – lighting load curtailment could be paired with storage, local generation, or other innovative measures
 - Energy efficiency – in this region, complements wires infrastructure & supports the long-term forecast as the agriculture industry evolves

Evaluating Non-Wires Options

- In addition to the typical considerations taken into account before selecting a preferred option (i.e., slide 15), development of non-wires options requires more information and analyses
- What information might stakeholders and solution providers require from the study team?
- Conversely, what information do stakeholders and solution providers believe the study team should incorporate?

Example of More Analysis Needed

Need Characterization

- Hourly and seasonal details on the load forecast to provide more granularity on estimated frequency, duration, and size of need events
- To help size and characterize the option

Economic Assumptions & Financial Models

- Planning-level estimates of cost factors (i.e., capital, O&M, operating life expectations) to compare against the preferred wires option
- Expected funding streams if the option provides multiple services/benefits

Update on Ongoing Non-Wires Initiatives

LED Incentive for Greenhouses

- Targeted to the Windsor-Essex and Chatham-Kent regions
- The program has committed 60 GWh of energy savings and 5 MW of demand savings to date, with more project applications on the way

Indoor Agricultural Call for Proposals

- Through IESO's Grid Innovation Fund
- To date, two projects in Windsor-Essex have been chosen:
 - Allegro Acres Inc.: To evaluate the performance of LEDs and controls; potential to reduce electricity use
 - Great Lakes Greenhouses Inc.: To develop an AI program to increase energy efficiency without reducing crop yield

Seeking Input on Windsor-Essex IRRP Addendum

- What feedback do you have regarding any of the options proposed?
- What other information should be considered in the continued development of these solutions leading up to the recommendations?

Please submit your written comments by email to engagement@ieso.ca by December 17

Next Steps for Windsor-Essex IRRP Addendum

- December 17, 2020 – Deadline for written feedback on potential options
- January 11, 2021 – IESO responses to feedback received
- Q1 2021 – Further engagement sessions as required
- Q1 2021 – Final recommendations and study report published; Windsor-Essex IRRP engagement initiative closed



Part II – West of London Bulk Study

Integrated Bulk System Planning Process Under Development

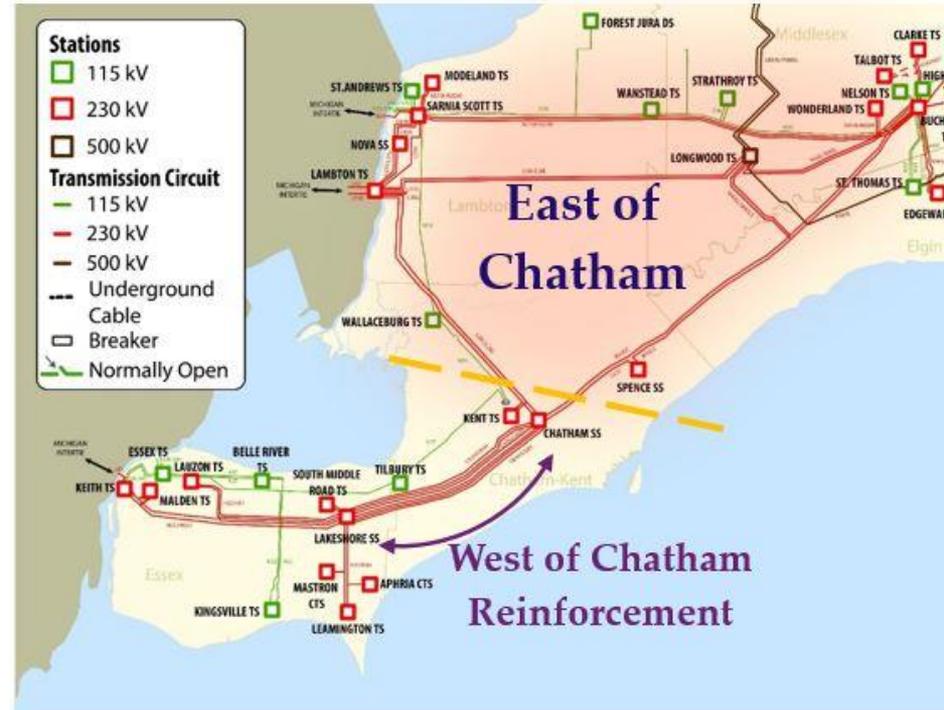
- An integrated bulk system planning process is currently being developed, with the goal of formalizing the process to enhance transparency and stakeholder input
- At a high-level the process design will include:
 1. The stages in the process from information gathering to the recommendation of actions, including timing
 2. The interaction with the IESO's resource acquisition mechanisms and with other planning processes (e.g. Regional Planning)
 3. How stakeholders can participate in the planning process, and will be kept informed
- The on-going West of London bulk study will seek to encompass those principles, in advance of this formalized process

Background

2019 Windsor-Essex bulk study recommended upgrades that addressed all transmission system limitations west of Chatham; however, transmission limitations remain east of Chatham, impacting the connection of:

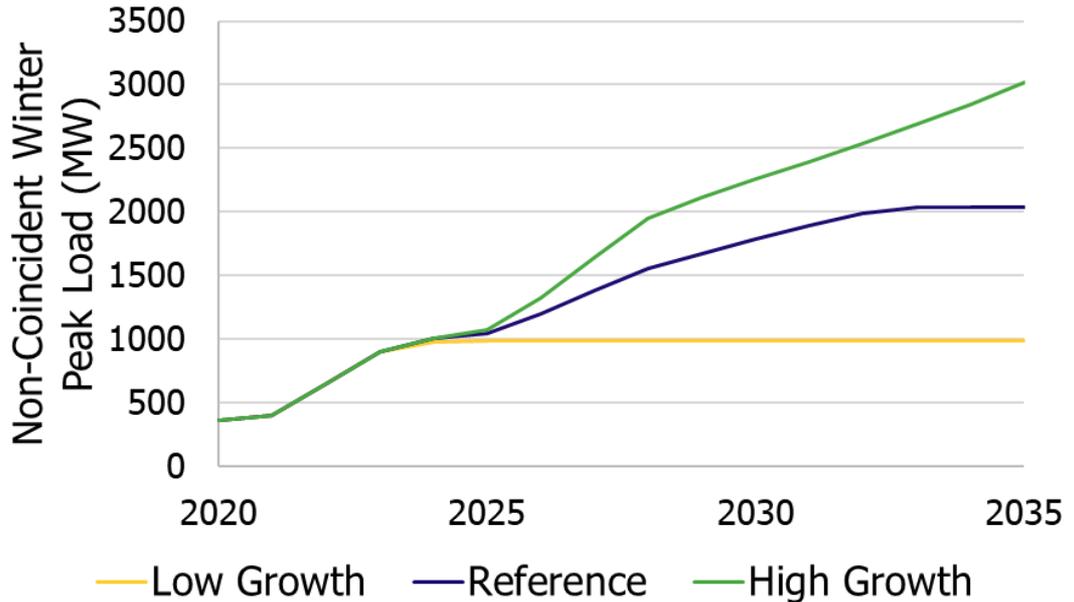
- 400 MW of load at South Middle Road TS, expected by 2022/23 – currently undergoing a connection assessment; and
- Any further load around the Chatham area

The reinforcements needed east of Chatham are being determined through this West of London study



West of London Greenhouse Load Forecasts

- The Reference forecast anticipates an additional 1,100 MW of growth on top of South Middle Rd
 - Focused in Kingsville, Leamington, Lakeshore and Dresden
- A capacity need starts to emerge in 2028, based on the current system and resources
 - May see challenges operating the current system earlier



West of London Plan – Staged Approach

The reinforcement of the transmission system east of Chatham will occur in two stages:

Stage 1 of the bulk study:

- Ensures sufficient bulk transfer capability east of Chatham to supply the forecasted load; and
- Improves the deliverability of existing generation in the Lambton-Sarnia area – allows those units to operate at levels historically seen during peaks

Stage 2 of the plan will:

- Ensure sufficient bulk transfer capability to supply the high growth scenarios;
- Ensure the full capability of existing generation can be relied upon to help meet provincial needs; and
- Maintain the Ontario-Michigan inertie capability

Short-Listed Options

- **Main alternatives to address Stage 1:**
 - Reinforce the Lambton x Chatham corridor
 - Local 650 MW generation/storage west of Chatham
- **Main alternatives to address Stage 2:**
 - Reinforce Chatham x Longwood corridor
 - Reinforce Lambton x Longwood corridor
 - Separate local generation/storage option



Next Steps for West of London

Between now and year end:

- December 17, 2020 – Deadline for written feedback on potential options
- January 11, 2021 – IESO responses to feedback received
- Finalize the Stage 1 recommendation

Between now and Q1 2021:

- Q1 2021 – Further engagement, as required
- Finalize Stage 2 recommendations
- Publish West of London bulk plan
- Regional electricity planning for Chatham-Kent/Lambton/Sarnia to kick off

Seeking Input on West of London Study

- What feedback do you have regarding any of the options proposed?
- What other information should be considered in the continued development of these solutions leading up to the recommendations?

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How to get involved

- Subscribe to receive updates on regional electricity planning:
www.ieso.ca/subscribe
- Join an ongoing dialogue through one of five regional electricity networks:
www.ieso.ca/regionalelectricitynetwork
- New online engagement platform coming soon
- Contact communityengagement@ieso.ca



Questions?

Do you have any questions for clarification on the material presented today?

Submit questions via the webinar window, or by email to engagement@ieso.ca

Thank You

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