

Southwest Regional Electricity Network

Regional Electricity Planning Update

March 24, 2020

This document provides background and current information about electricity planning for Southwest Ontario, including the planning areas of [Burlington to Nanticoke](#), [Chatham-Kent/Lambton/Sarnia](#), [Greater Bruce/Huron](#), [Kitchener-Waterloo-Cambridge-Guelph](#), [London area](#), [Niagara](#), and [Windsor-Essex](#).

This information will help to prepare attendees for the Regional Electricity Network meeting on March 24, 2020. By providing this information in advance, the IESO hopes more time can be spent on understanding and learning about the electricity needs and priorities across the region and ensuring that network members are equipped to continue these discussions.

So, as you participate in the meeting, please consider:

- What information do you need in order to fully participate in your community's regional planning activities?
- Do you know your community's energy priorities? How can you help establish your community's energy goals and objectives?
- What direction should future conversations take to help inform the priorities for your community?

Please come prepared with your questions or, if you have questions you would like to submit in advance, please send them to communityengagement@ieso.ca and we'll be sure that they are addressed during this meeting.

There is additional background information on regional planning process on page 9 as well as

The appendix includes full links to documents referenced in the following pages.

SOUTHWEST REGIONS

The seven planning regions in southwest Ontario span from Windsor to Niagara and north to Bruce County.

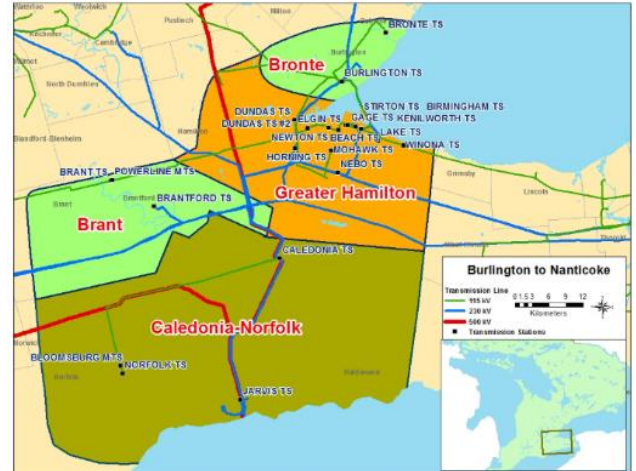
Burlington to Nanticoke

Location

The Burlington to Nanticoke region includes the municipalities of Burlington, Hamilton, Oakville, Brantford, Brant County, Haldimand County, and Norfolk. It is divided into four sub-regions – Brant, Bronte, Caledonia-Norfolk and Hamilton.

Key planning dates

The current cycle of regional planning for the region concluded with [an Integrated Regional Resource Plan \(IRRP\)](#) for the Hamilton sub-region completed in February 2019 and a [Regional Infrastructure Plan \(RIP\)](#) for the Burlington to Nanticoke Region completed in October 2019. The previous regional planning cycle had [IRRPs for the Brant sub-region](#) and the [Bronte sub-region](#) completed in 2015.



Observations

The recommendations in the 2019 IRRP for the Hamilton sub-region are focused on replacement of assets at their end of life, addressing modest capacity needs in some area, and ensuring reliability by examining the capability to restore load following specific transmission outages.

Interim measures/Recommendations

To address end-of-life asset replacement needs, it was recommended that the Lake Transmission Station (TS) and the Newton TS be rebuilt with similar facilities. In addition, the IRRP identified the need to further explore the end-of-life replacement needs for the Beach TS and the 115 kilovolt (kV) underground cables supplying downtown Hamilton. These actions should be completed before the next IRRP cycle so that the outcomes can inform further discussion at that time.

Next steps

Near-term infrastructure investments identified in the Hamilton sub-region IRRP will be completed by Hydro One by 2023. Further studies exploring end-of-life replacement needs for the 115 kV underground cables in Hamilton will be carried out as part of an addendum to Hamilton sub-region IRRP, and are expected to be completed in Q3 2020 to help inform the next cycle of regional planning.

End-of-life needs at Beach TS and Burlington TS identified in the IRRP require coordination with bulk system planning activities in the Middleport area. A plan addressing these end-of-life needs will be assessed as part of the Middleport Bulk Study.

Emerging needs in the Norfolk area related to the greenhouse load growth were identified in late 2019. The IESO is working with Hydro One to carry out preliminary studies to identify connection options to accommodate the new load, which are expected to be completed in Q2 2020. All the other identified needs/options in the mid- and long-term will be further reviewed by the Burlington to Nanticoke study team in the next regional planning cycle.

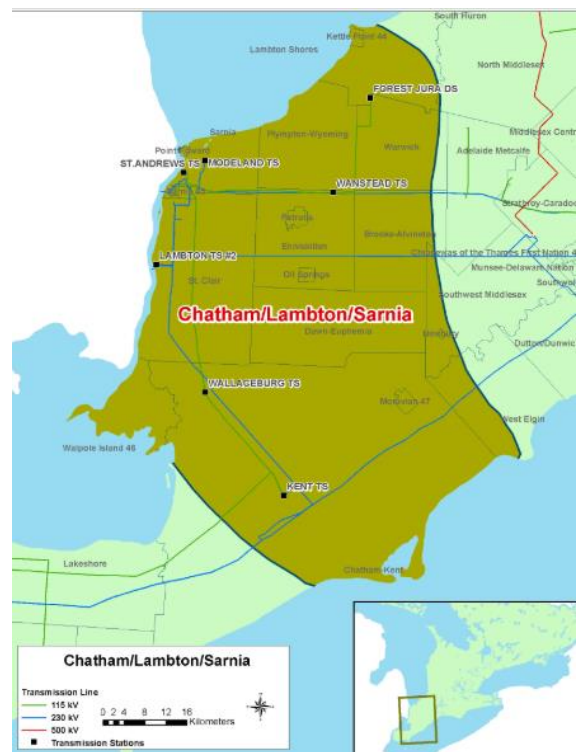
Chatham-Kent/Lambton/Sarnia

Location

The region includes the municipalities of Lambton Shores and Chatham-Kent, as well as the townships of Petrolia, Plympton-Wyoming, Brooke-Alvinston, Dawn-Euphemia, Enniskillen, St. Clair, Warwick, and villages of Oil Springs and Point Edward. The area is bordered by the London area to the east and Windsor-Essex to the southwest.

Key planning dates

During the first regional planning cycle in [2016, the Needs Assessment](#) completed by Hydro One concluded that there were no needs requiring regional coordination and integrated planning. The second cycle of regional planning is expected to begin by the end of the year.



Next steps

Hydro One will undertake a Needs Assessment for the second cycle of regional planning to identify emerging needs in the area. The IESO will then complete a Scoping Assessment that will determine the appropriate planning approach for the identified needs, specifically those requiring regional coordination. The next steps in the planning process will be dependent on the finding of the Needs Assessment.

IESO is working with Hydro One Networks and the local distributors to carry out preliminary studies to examine greenhouse load growth in the Dresden area. The studies will inform the upcoming regional planning activities expected to begin later in 2020.

Greater Bruce/Huron

Location

The region includes the municipalities of Arran–Elderslie, Brockton, Kincardine, Northern Bruce Peninsula, and South Bruce. It also includes the Township of Huron-Kinloss.

Key planning dates

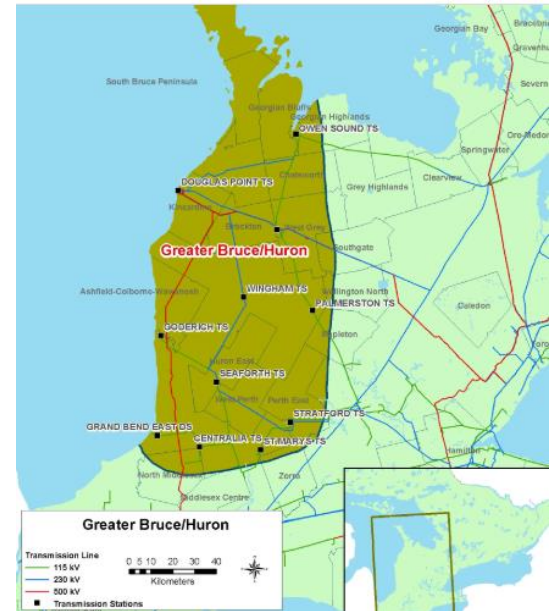
The first regional planning cycle began in 2019, and the [Scoping Assessment](#) completed by the IESO determined that regional coordination would be required for the Southern Huron-Perth sub-region. An IRRP is currently being developed and is expected to be complete by Q4 2020.

Observations

Modest growth is expected in the southernmost portions of Huron County and Perth County. The IRRP that is expected to be complete by late 2020 will examine the nature and timing of this growth and provide options for meeting future needs.

Next steps

The IESO will continue to pursue and encourage community input because the information provided will help the IESO understand the nature of the growth and local preferences which will, in turn, inform recommendations in the IRRP.



Kitchener-Waterloo-Cambridge-Guelph

Location

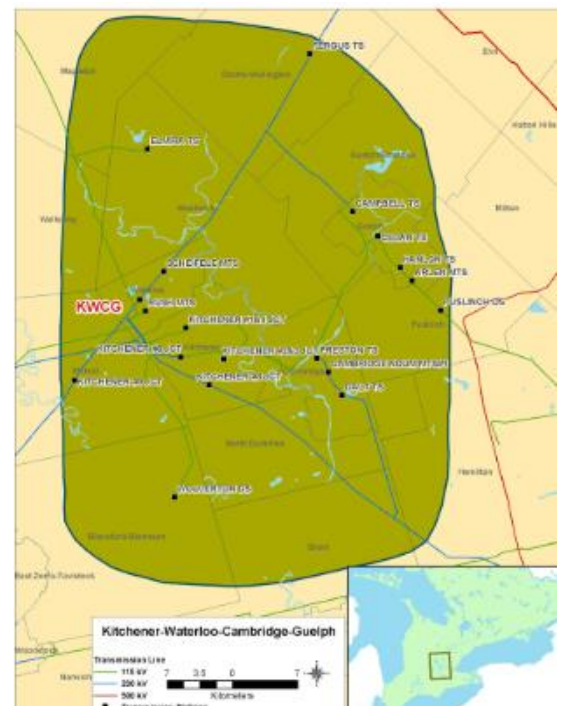
The region includes the municipalities of Kitchener, Waterloo, Cambridge and Guelph, as well as portions of Perth and Wellington counties and the townships of Wellesley, Woolwich, Wilmot, and North Dumfries.

Key planning dates

The regional planning cycle for the Kitchener-Waterloo-Cambridge-Guelph region is underway, with an IRRP anticipated to be completed in Q3 2020.

Observations

The IRRP will address emerging needs over the next 20 years, including a specific pocket of business and industrial



growth east of the Grand River, including the northern part of Cambridge, the southern part of Woolwich Township and the southeast corner of Kitchener. Other needs such as assets reaching end of life in Guelph and supply reliability will also be examined in the IRRP.

Interim measures/Recommendations

In the last regional planning cycle, the [Kitchener Waterloo Cambridge Guelph IRRP](#), completed in April 2015, identified a number of transmission upgrades.

The Guelph Area Transmission Refurbishment (GATR) Project was placed in-service in Q4 2016 to address imminent supply needs in south central Guelph and the Kitchener area and to minimize the impact of potential supply interruptions to customers in Waterloo, Guelph and surrounding areas. The GATR project included the installation of two 230-115 kV auto-transformers, switching facilities, and upgrades to an existing transmission line in Guelph. The switching facilities work was completed in October 2017 at the Galt Junction to improve supply reliability for the Cambridge-Kitchener 230 kV sub-system.

Next steps

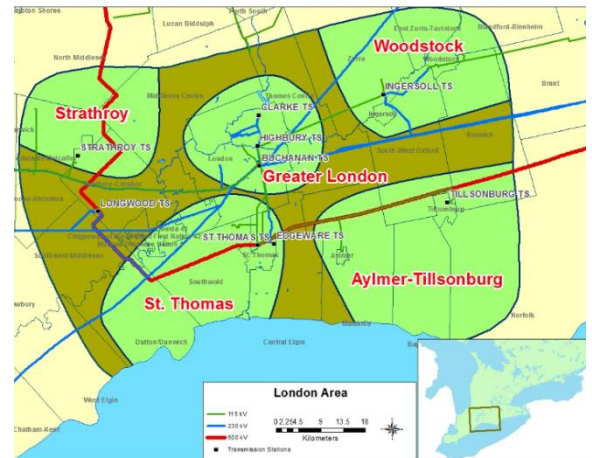
The IESO will continue to pursue and encourage community input because the information provided will help the IESO understand the nature of the growth and local preferences which will, in turn, inform recommendations in the IRRP.

London Area

Location

Regional planning for the London area is divided into five sub-regions, including Greater London, Aylmer-Tillsonburg, Strathroy, Woodstock and St. Thomas. The region includes Oxford County, City of Woodstock, Middlesex County, City of London, Elgin County, and City of St. Thomas.

In addition, the transmission facilities in this region also supply part of Norfolk County.



Key planning dates

The previous cycle of regional planning concluded in February 2017 with the publication of an [IRRP for the Greater London sub-region](#). A [RIP](#) outlining the implementation plan for London Area completed in August 2017.

Observations

The recommendations in the 2017 Greater London IRRP focused on providing greater operational flexibility, increasing backup capability to critical loads in downtown London, improving load restoration times and enhancing load transfer capability.

Interim measures/Recommendations

The IRRP for Greater London confirmed the need to rebuild the end-of-life Nelson TS and convert the station's low voltage supply from 13.8 kV to 27.6 kV in order to harmonize the voltage with the other supply stations serving London. The project was completed in February 2019.

Next steps

Regional planning activities for the London area are expected to begin in April 2020, starting with the Needs Assessment.

Niagara

Location

The Niagara Region comprises the cities of Port Colborne, Welland, Thorold, Niagara Falls, St. Catharines; the towns of Niagara-on-the-Lake, Fort Erie, Pelham, Grimsby; and the townships of West Lincoln and Wainfleet.

Key planning dates

The previous cycle of regional planning concluded with the completion of the [Needs Assessment Report](#) for the Niagara Region in April 2016. No needs requiring regional coordination were identified.

Next steps

Regional planning activities for the Niagara region are expected to begin by the end of 2020, starting with the Needs Assessment.



Windsor-Essex

Location

The Windsor-Essex region extends from Chatham southwest to Windsor. It comprises the City of Windsor, the Municipality of Leamington, the towns of Amherstberg, Essex, Kingsville, Lakeshore, LaSalle, Tecumseh, and the Township of Pelee, as well as the western portion of the Municipality of Chatham-Kent.



Key planning dates

The regional planning cycle for the Windsor-Essex region was completed in September 2019 when an [IRRP](#) was released.

Observations

Emerging industries, particularly agriculture, have led to substantial growth in the area. The Kingsville-Leamington area within the Windsor-Essex region is home to North America's largest concentration of greenhouse vegetable production. This rapid expansion, which reflects growth in cannabis operations, and the shift to year-round artificial crop lighting, will continue to increase electricity supply requirements in the Kingsville-Leamington area, which are expected to double over the next five years.

Interim measures/Recommendations

Given the significant forecast demand increase in the Kingsville-Leamington area, the IRRP identified infrastructure investments as well as other, more novel, options such as energy efficiency, demand response and other alternative measures for consideration.

The IRRP focused both on recommendations to meet near-term needs, and on the near-term actions required to determine the options to meet mid- and long-term needs. Significant consideration was given to the potential for demand-side options to help relieve capacity needs in the Kingsville-Leamington area, with specific recommendations for near-term actions to support projects that reduce electricity demand from indoor agriculture or mitigate market barriers. For instance, the IESO issued a targeted call for indoor agriculture projects aimed at reducing peak demand, through which funding to successful proponents will be provided through the IESO's Grid Innovation Fund.

A major focus of this IRRP was to provide the region with adequate line connection and step-down transformation capacity, and maintain a high level of reliability. A companion bulk study was completed in June 2019 that focused on bulk electricity needs.

The implementation of some of the recommendations prior to the completion of the IRRP was necessary to address the region's urgent needs – in particular, the switching station at Lakeshore and 230 kV double-circuit transmission line from the Chatham Switching Station to a new switching station. For the near- and mid-term needs in local areas, specific recommendations have been identified for capacity, end-of-life and restoration, as appropriate.

To accommodate the connection of additional transmission customers starting in early 2020, interim measures, such as load rejection, which reduces power consumption in response to a decline in frequency, are required, resulting in a lower level of reliability to connecting customers than what is typically provided. The need for interim measures during normal operations is alleviated by the proposed switching station, and will be eliminated when the new line between Chatham TS and the switching station come into service by 2022 and the winter of 2025/2026 respectively.

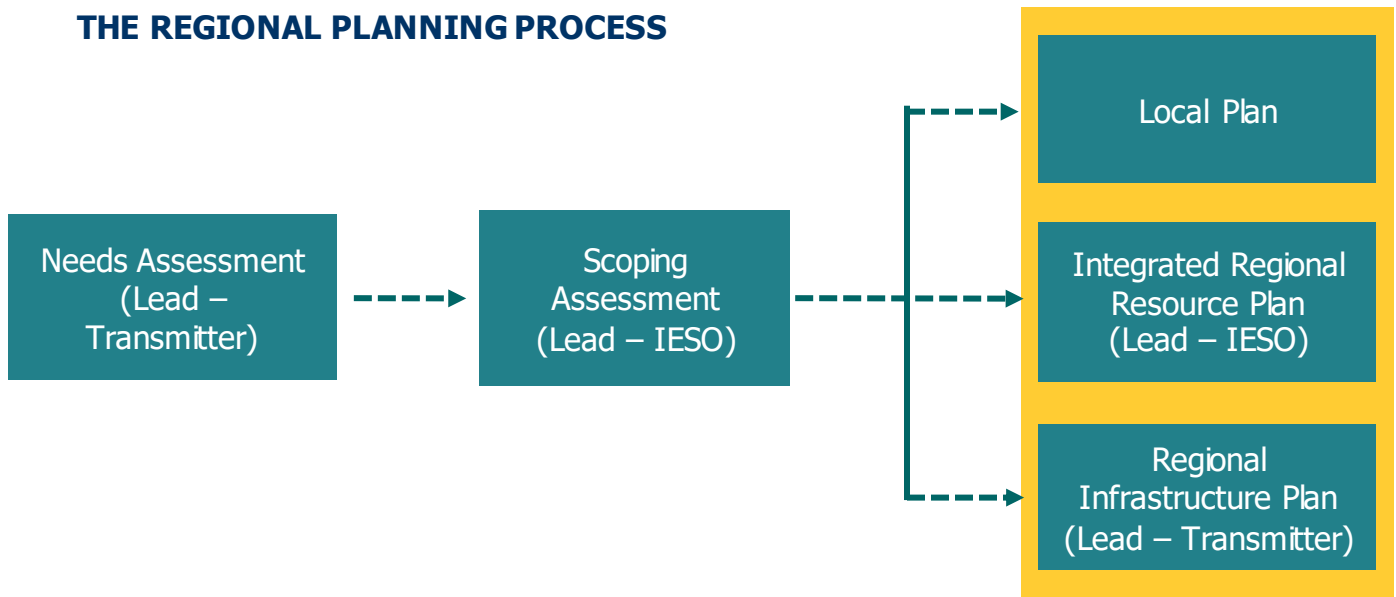
Next steps

Infrastructure investments identified in the Windsor-Essex IRRP and bulk study will be implemented by Hydro One.

Further studies exploring 115 kV sub-system capacity, end-of-life replacement needs, and Leamington load restoration needs will be carried out as part of an addendum to the Windsor-Essex IRRP, and are expected to be completed in 2020 to help inform the next cycle of regional planning.

Given the unprecedented growth in the Kingsville-Leamington area driven by the agriculture sector, the IESO will continue to monitor long-term load growth and local generation in the area between regional planning cycles to determine when decisions on the long-term plan are required, inform the next cycle of regional planning for the area, and trigger the next cycle, as required.

THE REGIONAL PLANNING PROCESS



The planning cycle begins in each region at least every five years.

The local transmitter conducts a needs assessment to identify any electricity requirements in a local area. In some cases, the process stops here because there are no new identified needs.

If there are local needs identified, the IESO works with the transmitter and local distribution companies to conduct a scoping assessment to determine how these needs should be addressed, which includes recommending a study approach. Stakeholders and communities have an opportunity to review and provide comment on the scoping assessment report before it is finalized.

Once the report is complete, the IESO has three options:

1. **Local Plan** - This is the choice when there is no requirement for provincial or regional coordination or involvement. It is a local issue that may include a smaller project or local solution.
2. **Integrated Regional Resource Plan** - This is the next step if there is the potential to integrate lower cost solutions to meet many local needs versus addressing each need individually. It is also used to consider cost-effective solutions that could meet both a provincial and local need, as opposed to dealing with them separately. Engaging the local community to better understand future electricity demand or potential solutions to meet that demand is an important part of an IRRP.

An IRRP considers options in terms of their feasibility, cost, reliability, government policy directives, environmental performance and community preferences.

While IRRPs are 20-year plans, they generally identify specific priorities and actions to meet any needs for the near term (<5 years) and medium term (5-10 years), as well as developing options which should be considered for the long term (10-20 years).

Community and stakeholder engagement continues throughout the IRRP phase.

3. Regional Infrastructure Plan - If a wires-only, or a transmission-based approach, is identified as the best way to address planning needs, a Regional Infrastructure Plan (RIP) is undertaken.

APPENDIX

1. Hamilton sub-region IRRP, 2019: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/Hamilton/Hamilton-IRRP-FINAL-February2019.pdf?la=en> (page 2)
2. Burlington to Nanticoke RIP, 2019: <https://www.hydroone.com/abouthydroone/CorporateInformation/regionalplans/burlingtonnanticoke/Documents/Burlington%20to%20Nanticoke%20-%202nd%20Cycle%20Regional%20Infrastructure%20Plan.pdf> (page 2)
3. Brant sub-region IRRP, 2015: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/Brant/2015-Brant-IRRP-Report.pdf?la=en> (page 2)
4. Bronte sub-region IRRP, 2015: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/Brant/2015-Brant-IRRP-Appendices.pdf?la=en> (page 2)
5. Chatham Kent Lambton Sarnia Needs Assessment, 2016: <https://www.hydroone.com/abouthydroone/CorporateInformation/regionalplans/chathamlambtonarnia/Documents/Needs%20Assessment%20Report%20-%20Chatham-Kent-Lambton-Sarnia.pdf> (page 3)
6. Greater Bruce Scoping Assessment, 2019: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/Greater-Bruce-Huron/Greater-Bruce-Huron-20190919-Scoping-Assessment-Outcome-Report.pdf?la=en> (page 4)
7. Kitchener Waterloo Cambridge Guelph IRRP, 2015: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/KWCG/2015-KWCG-IRRP-Report.pdf?la=en> (page 5)
8. IRRP for the Greater London sub-region, 2017: <http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/London-Area/Final-Greater-London-IRRP-20170120.pdf?la=en> (page 6)
9. London Area RIP, 2017: https://www.hydroone.com/abouthydroone/CorporateInformation/regionalplans/london/Documents/RIP_Report_London_Area_Region_Aug25_FINAL.pdf (page 6)
10. Niagara Needs Assessment Report, 2016: <https://www.hydroone.com/abouthydroone/CorporateInformation/regionalplans/niagara/Documents/Needs%20Assessment%20Report%20-%20%20Niagara.pdf> (page 7)
11. Windsor-Essex IRRP, 2019: http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/Windsor-Essex/Windsor_Essex_IRRP_Report_20190903.pdf?la=en (page 7)