DECEMBER 12, 2024

Kitchener-Waterloo-Cambridge-Guelph (KWCG) Electricity Planning

Engagement Webinar #1

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Land Acknowledgement

The IESO acknowledges that the Kitchener-Waterloo-Cambridge-Guelph Region is the traditional territory of Anishinaabe, Attiwonderonk and Haudenosaunee people.

The IESO would also like to acknowledge all First Nations, Inuit and Métis peoples and their valuable past and present contributions to this land.

Agenda

1. Land Acknowledgement
2. Ontario's Electricity Sector and IESO's Role
3. Regional Electricity Planning Process
4. Draft Demand Forecasts
5. Engagement & Next Steps
6. Discussion

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Connecting Today.
Powering Tomorrow.

We work with:

Generators >>> **Transmitters** >>> **Local Distribution Companies** >>> **Energy Consumers**

<<< **Communities** >>>

Seeking Input

As you listen today, consider any additional factors for:

Determining the electricity demand forecast scenarios for your region
What additional information, if any, should be incorporated in the proposed scenarios?

How can the proposed scenarios best capture the range and uncertainty of growth potential while informing near-term infrastructure investments?

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What areas of concern or interest about electricity should be considered as part of the planning process?

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Please submit your written comments by email to engagement@ieso.ca by January 8, 2025.

Regional Electricity Planning Process

Electricity Planning in Ontario

Provincial/Bulk System Planning

Addresses provincial electricity system needs and policy directions.

Underway: South and Central Bulk Study

Regional Planning

Addresses local electricity system needs at the transmission system level.

Underway: KWCG IRRP

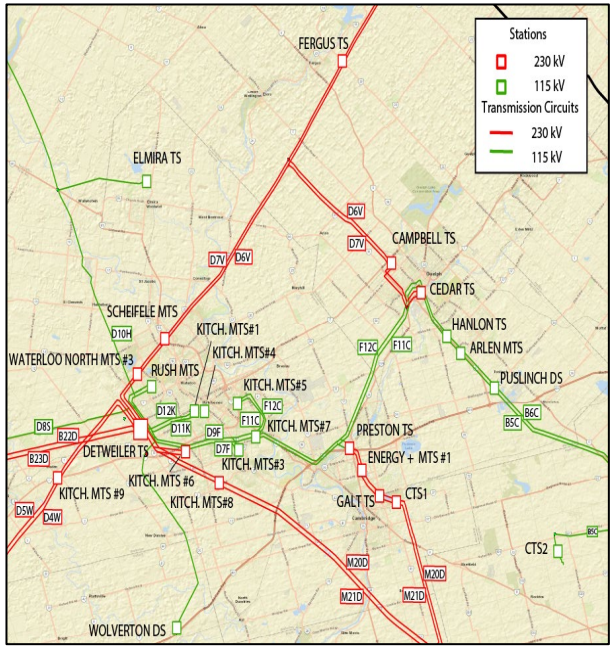
Distribution Planning

Addresses local electricity system needs and priorities at the distribution system level.

Led by local distribution companies.

Background on Electricity Planning in KWCG

- Since 2013, the IESO has undertaken regional planning work to address electricity needs.
- Recommendations included energy efficiency, distributed generation, transmission refurbishments, and replacing end-of-life equipment to ensure a continued reliable supply of electricity.
- More electricity planning on the way:
  - A new South and Central bulk study will determine bulk transmission needs required to enable economic development between the Hamilton and Windsor areas given future economic development.
  - The third regional electricity plan, or Integrated Regional Resource Plan (IRRP), for the KWCG area is currently being developed to outline electricity needs and recommended solutions to ensure a reliable supply of electricity over the next 20 years.



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KWCG Electrical Region

This region generally encompasses the City of Guelph, the Region of Waterloo including the municipalities of Kitchener, Waterloo, and Cambridge, and the townships of Wellesley, Woolwich, Wilmot, North Dumfries, as well the Townships of Mapleton, Centre Wellington, Puslinch, and Guelph/Eramosa in Wellington County, and the Township of Blandford-Blenheim in Oxford County.

The following Indigenous communities may be potentially impacted or may have an interest based on treaty territory, traditional territory or traditional land uses: Mississaugas of the Credit, Six Nations of the Grand River, Haudenosaunee Confederacy Chiefs Council, and Grand River Métis Council.

Regional Electricity Planning Process

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.

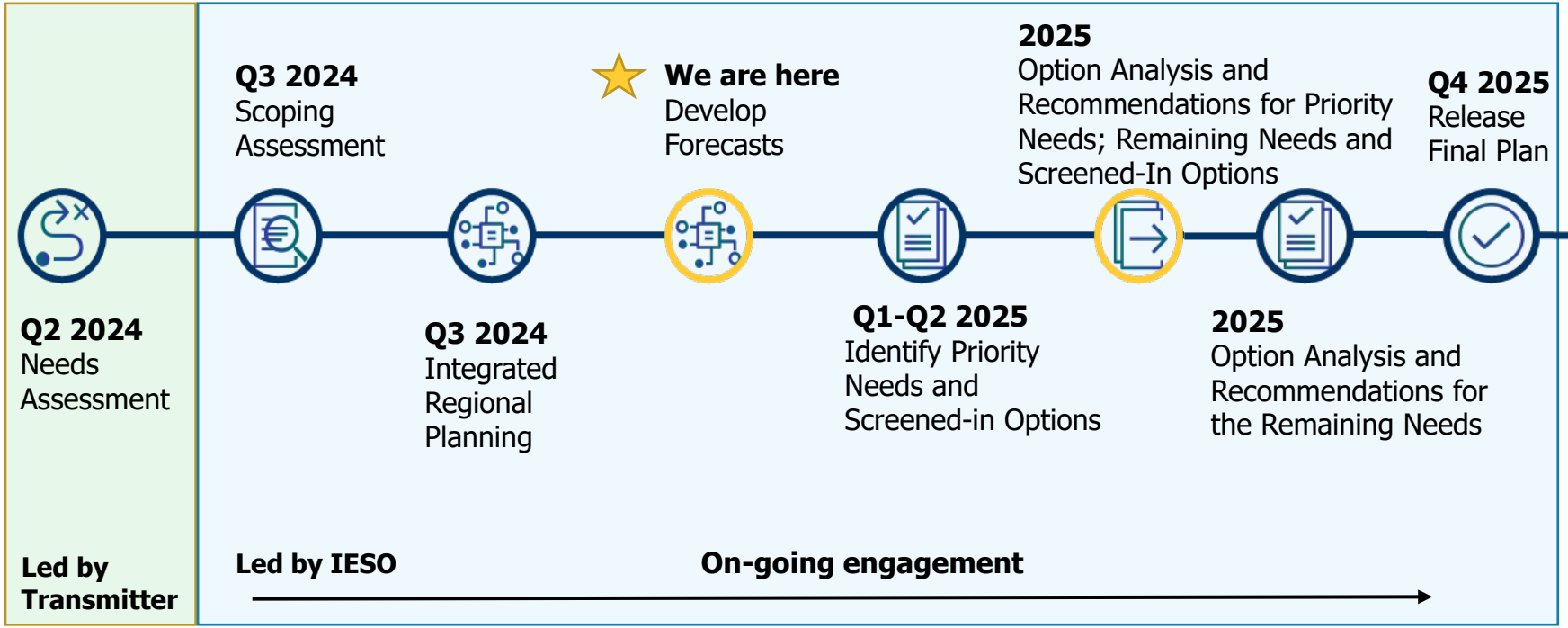
The regional plan for the Kitchener-Waterloo-Cambridge-Guelph (KWCG) electrical area will be developed by a Technical Working Group, led by the IESO, and consisting of the local distribution companies and the transmitter.

Technical Working Group

The regional planning process is conducted by a Technical Working Group consisting of:

Team Lead, System Operator	• Independent Electricity System Operator
Lead Transmitter	• Hydro One Networks Inc. (Transmission)
Local Distribution Companies	• Alectra Inc. • Centre Wellington • Enova Power Corp. • Grandbridge Energy • Halton Hills Hydro Inc. • Hydro One Networks Inc. (Distribution) • Milton Hydro • Wellington North

Regional Planning Milestones for KWCG



Components of an IRRP

Demand Forecast	Needs	Potential Solutions	Recommendations
How much power is needed over the planning timeframe?	What needs are emerging in the region that need to be addressed?	What kinds of solutions can meet the future needs for the region?	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?

Feedback Received

Key Areas of Feedback	Considering Feedback[1]
Explore both wire and non-wire options.	Various wire and non-wire options will be screened and evaluated considering the unique characteristics of the region to address its future electricity needs.
Consider using a broad range of scenarios in the IRRP process.	Two scenarios, a reference and high scenario, has been developed for KWCG. Plan recommendations will primarily be driven by the reference demand forecast, and the high forecast scenario will be considered to test the robustness of the plan, identify signposts to monitor forecast changes, and contemplate additional actions required if higher demand growth materializes.
Share additional information on the forecasting methodology, specifically more details regarding assumptions used to develop each scenario.	The IESO strives to make information available throughout the development of the IRRP to enable meaningful feedback during the process. As part of the IRRP for KWCG, the IESO will provide detailed methodology and load forecasts in Q4 2024.

[1] Webpage to view all feedback received and the IESO's responses can be found here.

Draft Electricity Demand Forecasts

Local Planning Drivers

Important considerations that influence the load forecasts:


Municipal/regional growth plans


Climate change action plans


Community energy plans


Business plans of major electricity consumers or large projects


Distributed energy resources/energy projects

Local Distribution Companies incorporate these drivers into the electricity demand forecast.

Developing the Demand Forecasts

Local distribution companies (LDCs) are the main source for the demand forecasts, and they:

- Provided summer and winter demand forecasts for each station their areas are supplied from,
- Incorporated municipal and community plans into their forecasts, and
- Established forecasting assumptions based on customer growth plans.

In addition to LDC forecasts, the IESO and the Technical Working Group:

- Accounts for impacts of existing demand side management programs, planned distributed generation, and extreme weather conditions in the electricity demand forecasts.
- Works directly with customers and industry stakeholders to create demand forecasts for large electricity consumers that may seek connection on the transmission system.
- Works with the LDC to ensure that additional insights from municipalities, customers, and other interested parties have been incorporated in the demand forecasts for the regional planning process.

Forecast Scenarios

Two scenarios have been developed for KWCG:

- **Reference:** firm loads (current and planned), organic growth, etc.
- **High:** incorporate potential demand growth that is less certain, in terms of timelines, magnitude, and location.

While plan recommendations will primarily be driven by the reference demand forecast, the high forecast scenario will be considered to test the robustness of the plan, identify signposts to monitor forecast changes, and contemplate additional actions required if higher demand growth materializes.

Overview of Scenario Assumptions

Load	Reference Forecast	High Forecast
Residential	Growth rate applied by each local distribution company (LDC), informed by municipal input	Same as reference
Electrification and energy plans	Growth incorporated by each LDC, informed by municipal input	Same as reference with higher levels of electrification
Industrial	Growth incorporated by each LDC, informed by municipal input	Same as reference
Data Centers	Connection requests with reasonable certainty incorporated by each LDC	Same as reference with additional connection requests with less certainty

Reference forecast will drive firm near- and mid-term recommendations. High forecast will be used to establish plan based on load thresholds rather than need years, direct early development work, and identify sign-posts to trigger further investments.

To address urgent needs, work has begun to understand options. This includes advanced capacity supply needs raised by new 80 MW data center connection request.

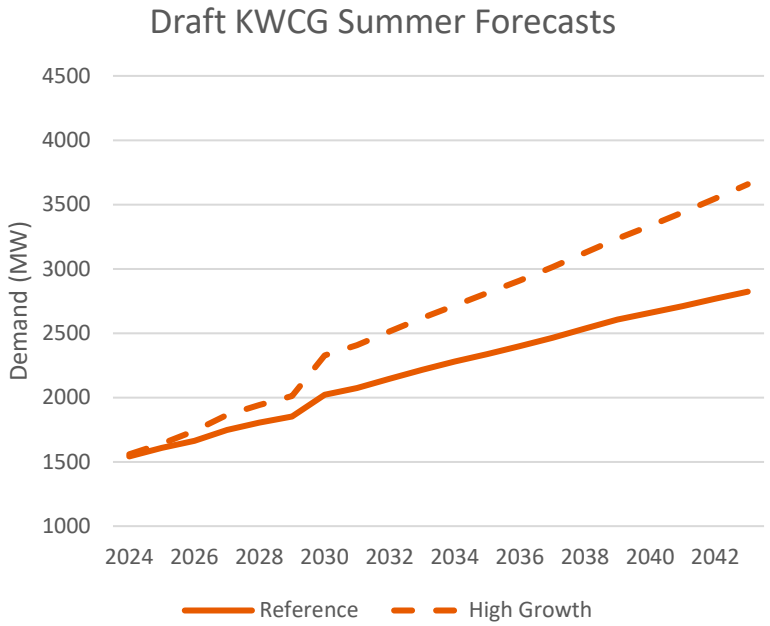
Draft Summer KWCG Forecasts

Reference Scenario:

- Average growth rate of ~3%, higher than provincial average of 2%.
- Near-term growth primarily driven by new large-scale customers and electrification.

High Scenario:

- Average growth rate of ~4.5% over 20-years.
- Near-term growth primarily driven by new large-scale customers and electrification.



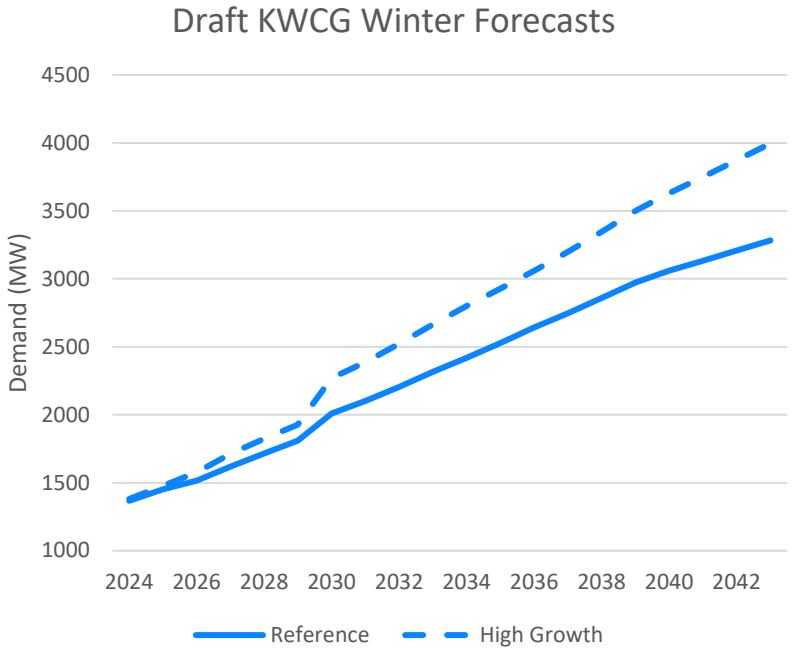
Draft Winter KWCG Forecasts

Reference Scenario:

- Average growth rate of ~5%, higher than provincial average of 2%.
- Near-term growth primarily driven by new large-scale customers and electrification.

High Scenario:

- Average growth rate of ~6% over 20-years.



Engagement & Next Steps

Ongoing Engagement

Your input plays an important role in developing the electricity plan.

Participate in upcoming public webinars

Subscribe to receive updates on the IESO website –> select Kitchener Waterloo Cambridge Guelph

Follow the Kitchener Waterloo Cambridge Guelph regional planning activities online

Engagement Key Areas for Input

Milestone	Timeline	Community Input
Electricity demand forecast and engagement plan	Current	What economic development or other growth or project plans might influence the regional load forecast? What additional information should be considered?
Identify priority needs and screened-in options	Q1-Q2 2025	What additional information should be considered? What community feedback can be shared regarding screened in options? What other options should be considered?
Option analysis and recommendations for priority needs; remaining needs and screened-in options	Q3 2025	What additional information should be considered? What community feedback can be shared regarding screened in options for remaining needs? What other options should be considered? What community feedback is there on the draft recommendations for priority needs? What information should be considered in the recommendations?
Option analysis and recommendations for the remaining needs	Q4 2025	What community feedback is there on the draft recommendations? What information should be considered in the recommendations?
Final IRRP	Q4 2025	

Next Steps

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

2025:

- Identify priority needs and screened-in options and seek feedback.
- Share option analysis and recommendations for priority needs and remaining needs and screened-in options and seek feedback.
- Share option analysis and recommendations for remaining needs and seek feedback.
- IRRP report and data tables will be completed and published on the webpage.

After IRRP, depending on the recommendations of the IRRP, the following next steps can be expected:

- For wired solutions, the transmitter will lead the development of a Regional Infrastructure Plan, which assesses and develops a detailed plan on how wire options can be implemented.
- For non-wire solutions, implementation mechanisms for new resources and energy efficiency programs will be determined following plan publication.

Seeking Input

As you listen today, consider any additional factors for:

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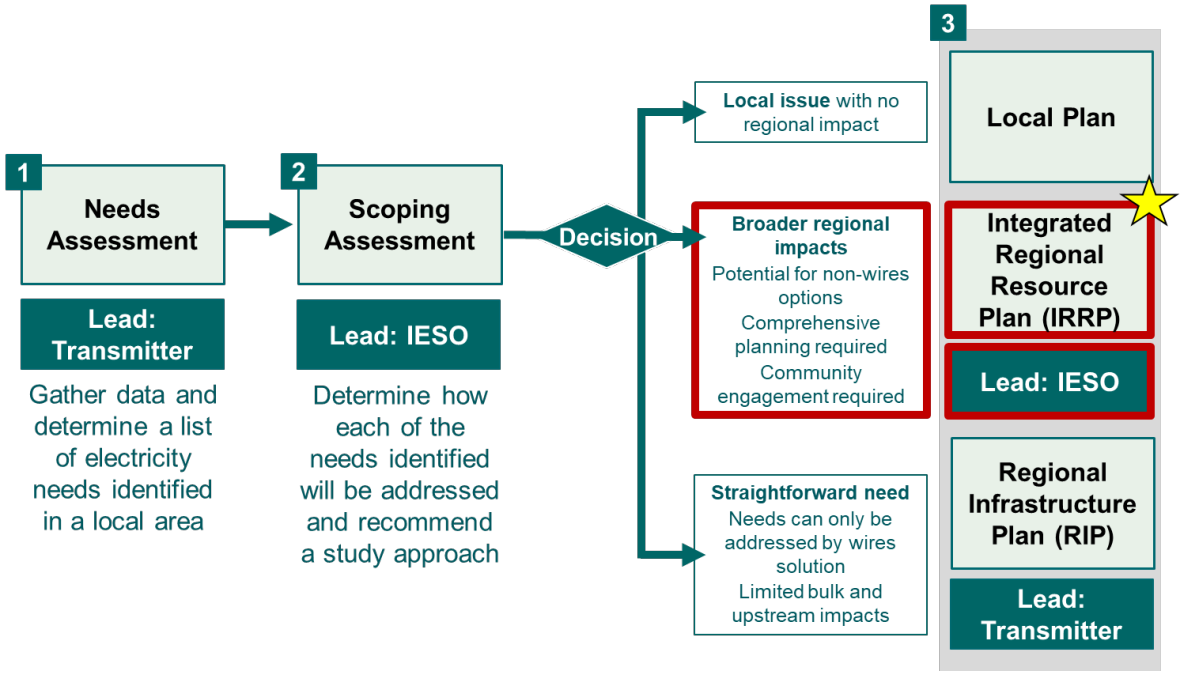
Appendix

Determining the Need for an IRRP



Preliminary Electricity Needs Identified for KWCG (1)

Preliminary electricity needs identified in the Needs Assessment:

Need Type	#	Impacted Equipment	Timing	Considerations
Station Capacity Ability of a station to deliver power from the grid down to the distribution system.	1	Preston TS (T3 & T4)	Near-term	Potential large load project may drive need for a new station
	2	Energy+ Inc. MTS (T1 & T2)	Near-term	Proximity to potential new station
	3	Cedar TS (T7 & T8), (T1 & T2)	Near-term, Mid-term	Planned end-of-life replacement
	4	Kitchener MTS #7 (T14 & T13)	Mid-term	Potential for near-term load transfers
	5	Rush MTS (T1 & T2)	Mid-term	Proximity to potential new station
	6	Waterloo North MTS #3 (T1 & T2)	Mid-term	Proximity to potential new station
	7	Campbell TS (T3 & T4)	Mid-term	Load will exceed current capabilities

Preliminary Electricity Needs Identified for KWCG (2)

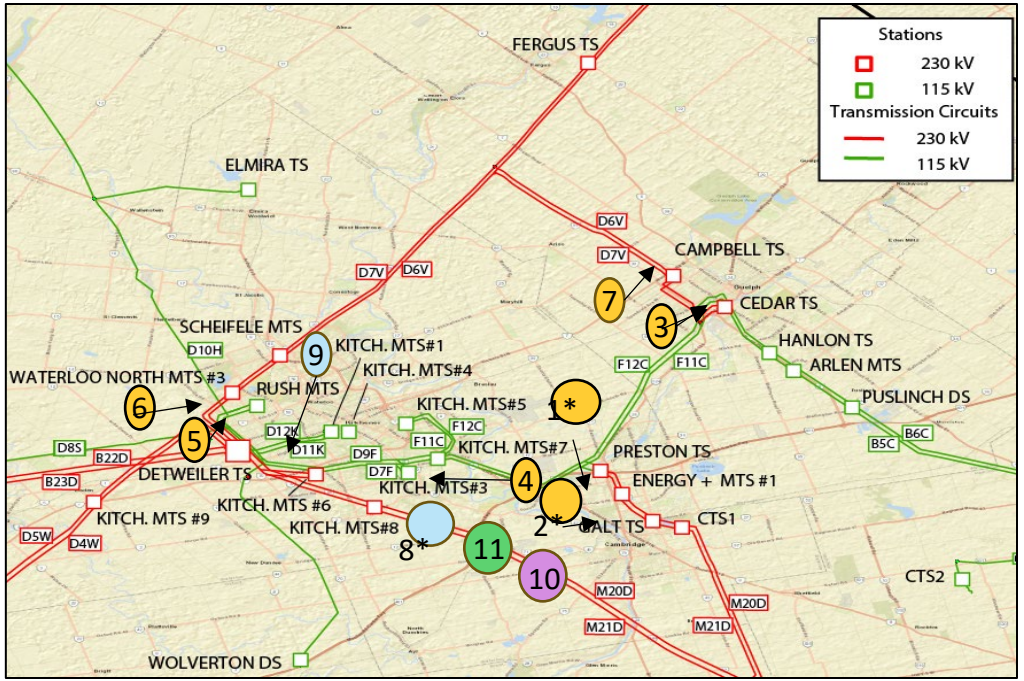
Preliminary Station Capacity needs:

Need Type	#	Impacted Equipment	Timing	Considerations
Supply Capacity Ability of the system to supply power through the transmission lines to a local area.	8	230 kV M20D/M21D: Galt Junction to Cambridge #1 Junction	Near-term	Supplies Kitchener MTS #6, Kitchener MTS #8, Galt TS, Preston TS, Energy+ MTS #1, and a customer CTS
	9	115 kV D11K/D12K: Detweiler to Kitchener #1 & #4	Mid-term	Supplies Kitchener MTS #1 and Kitchener MTS #4
Load Supply Security Maximum amount of power that can be lost during select contingencies.	10	230 kV M20D/M21D Circuit	Mid-term	Interrelated with capacity needs 1, 2, 8 and 11
Load Restoration Ability of the system to restore power after select contingencies.	11	230 kV M20D/M21D Circuit	Near-term	Interrelated with capacity needs 1, 2, 8 and 10

Geographic Location of Identified Needs

Legend

- Station Capacity Needs
- Supply Capacity Needs
- Load Supply Security
- Load Restoration
- * Pressing Needs



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