JUNE 10, 2026

Kitchener-Waterloo-Cambridge-Guelph Regional Electricity Planning

Public Webinar

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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. Recap: Ontario's Electricity Sector and IESO's Role
2. Status and Recap Planning Activities to Date
3. Options Analysis and Draft Recommendations for Remaining Needs
4. Next Steps & Discussion

Our Commitment to Respectful Participation

- One speaker at a time; please raise your hand to enter the speaking queue.
- Keep remarks concise (approximately 60-90 seconds) and focused on the agenda topic.
- Avoid repeating points already covered; detailed feedback may be submitted in writing for follow-up.
- Maintain a respectful tone at all times.
- The IESO may redirect discussion to keep the agenda on track.
- Participants that are unable to participate respectfully by adhering to these principles may have their microphone disabled.

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We work with:

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

<<< **Communities** >>>

Summary

- Significant electricity demand is emerging in the Kitchener-Waterloo-Cambridge-Guelph (KWCG) region and a regional electricity plan – Integrated Regional Resource Plan (IRRP) is being developed to address emerging needs.
- To keep up with electricity demand, a phased approach is being taken that includes recommendations to meet near-term priority needs that were made ahead of IRRP completion this summer.
- Work has continued to study and develop options to address remaining needs in the KWCG region that will be discussed today.
- The draft recommendations will meet station and supply capacity needs, maintain compliance with reliability and planning criteria, and enable growth.

Seeking Input

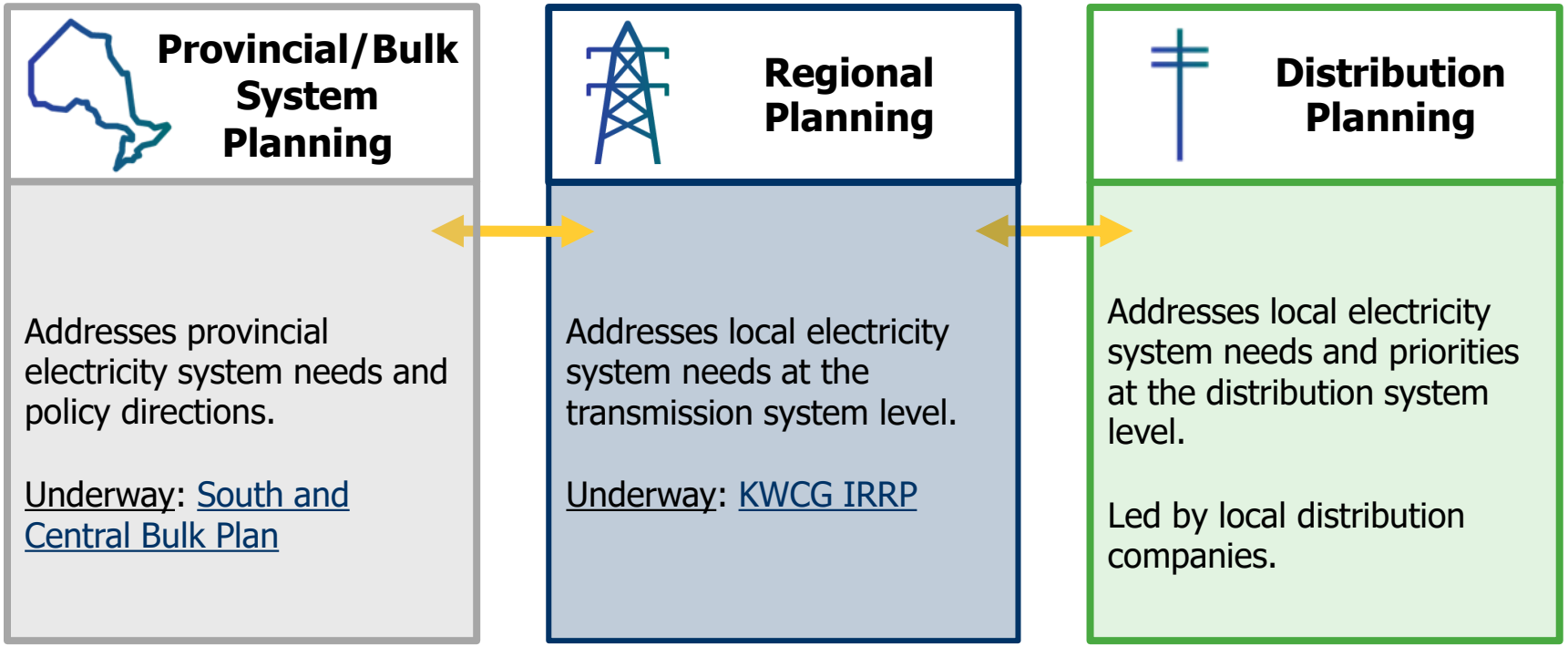
Local considerations and feedback are a critical component to the development of an Integrated Regional Resource Plan (IRRP). The IESO wants to understand:

- What feedback is there on the draft recommendations to address remaining needs?
- What information needs to be considered in the draft recommendations?
- How can the IESO continue to engage with communities and stakeholders as these recommendations are implemented, or to help prepare for the next planning cycle?

The IESO welcomes written feedback until **Wednesday, June 24, 2026.** Please submit feedback to engagement@ieso.ca.

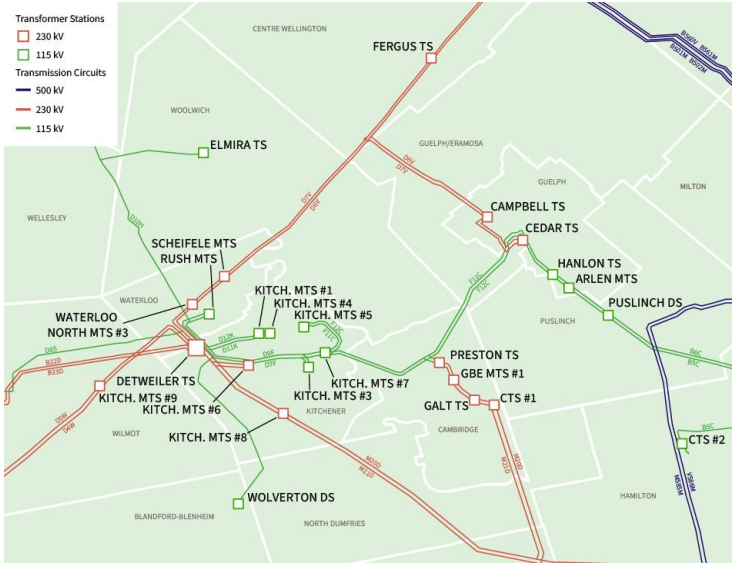
Status and Recap Planning Activities to Date

Recap: Electricity Planning in Ontario



Regional Electricity Planning in KWCG

- The IESO and Technical Working Group* are currently developing the third electricity plan (IRRP) for KWCG.
  - Planning work to date shows that the existing electricity system does not meet reliability standards to support future growth.
  - A phased approach was developed to ensure near-term needs could be met in a timely fashion ahead of the KWCG's IRRP publication in July 2026.
- Electricity demand in this region has an average annual growth rate of 3.7% in the summer and 5.5% in the winter in the near-term – compared to the provincial average annual demand growth rate of 2% by 2050.
  - Key drivers include large-scale projects and electrification, including heating and electric vehicles.
  - Higher winter demand due to the increase in electric heating.

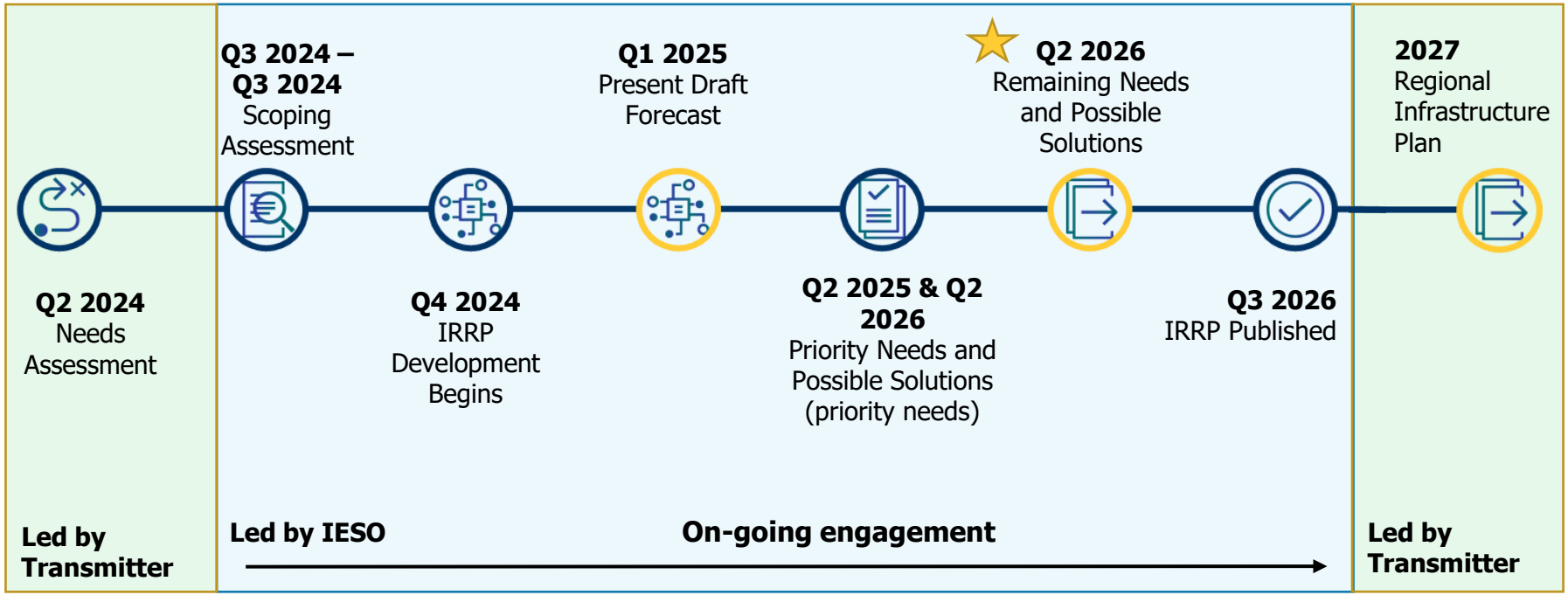


*The Technical Working Group is led by the IESO and comprised of Hydro One Transmission, Alectra, Centre Wellington Hydro, Enova Power, GrandBridge Energy, Halton Hills Hydro, Hydro One Distribution, Milton Hydro and Wellington North Power

Recap: Planning Activities to Date

- Several key recommendations, including new transmission infrastructure, have already been made to address near-term priority needs through a **September 2025 Urge Letter**
- **A parallel South & Central Bulk Plan** has been underway since 2024 and is on track for completion in Q3 2026. It will include key recommendations that will complement and support regional planning and investments by ensuring sufficient bulk electricity transmission and unlocking new options to deliver power to KWCG:
  - New 500/230 kV autotransformer station ("Guelph North TS") in Centre Wellington, needed by the early 2030s
  - New 500 kV line from Longwood Transformer Station ("TS") (in London) to Guelph North TS, then to Wellington TS, needed by the mid-2030s
- Engagement has been ongoing with municipalities, Indigenous communities, sector stakeholders and other interested parties to share updates and solicit input into key milestones throughout both these planning processes.
- Previous plans for the KWCG region (2015 and 2021) included recommendations for end-of-life transformer replacements and load transfers to address station and supply capacity needs along multiple transmission circuits.

2024-2026 KWCG Planning Timeline*



*Reflects typical 18-month IRRP timeline. Working Group has the flexibility to extend to 24 months where required

Summary of Needs

To ensure future growth is met in the KWCG region, the IRRP identified:

(1) Priority needs for which early recommendations have already been made

(2) Remaining needs for which further recommendations will be made (focus for this discussion)

Priority Needs	Remaining Needs
Over 250 MW need: • Immediate/near-term station capacity needs in Kitchener and Cambridge • Supply capacity needs on existing MxD circuits between Middleport (Haldimand County) and Detweiler (Kitchener)	Over 650 MW need across: • Station capacity needs in Waterloo, Kitchener, Guelph, Puslinch, and Blandford-Blenheim • Supply capacity needs on existing circuits between Detweiler (Kitchener) and Orangeville (DxV), Detweiler and Buchanan (London) (DxW), Detweiler and Kitchener municipal stations (DxK), and Detweiler and Elmira (D8S/D10H)

Feedback Received (1/2)

Key Areas of Feedback	Incorporating Feedback
Confirm whether electrification of transportation and heating, and population and land use projections have been included in the forecasts.	✓ The IESO shared these factors with the local LDCs who confirmed that the information was accounted for in the forecasts.
Provide more information regarding the forecast development including inputs and assumptions that were considered.	✓ Forecast data is provided by each of the local distribution companies in the KWCG electrical area to the IESO. In response to feedback received, the IESO posted the detailed methodology and data tables to better understand the data. ✓ Data and information to be made available during IRRP development is outlined in the IESO Regional Planning Information and Data document.
Consider both wires and non-wire solutions to meet electricity needs.	✓ Both wires and non-wire options play an important role in the regional planning process. ✓ Once the forecast scenarios and needs were finalized, the IESO screened and evaluated a combination of wire and non-wire options, including additional electricity demand-side management (eDSM), transmission- or distribution-connected resources such as Battery Energy Storage Systems (BESS) or wind generation, have been evaluated to meet the region's remaining electricity needs and the results will be shared in this webinar

Feedback Received (2/2)

Key Areas of Feedback	Incorporating Feedback
Short circuit limitations at Campbell TS are impacting potential solar PV projects.	✓ As a part of addressing remaining needs at Campbell TS, the IESO had screened in wires options, electricity demand-side management (eDSM), and potentially distributed generation (DG) for further analysis. The IESO is also working with Hydro One to determine the connection room for additional DG at this station, including an updated short circuit analysis.
Consider efficient, low-carbon heating solutions, including the use of waste heat from large electricity users such as data centres.	✓ The IESO looks forward to further engagement to understand opportunities for district energy systems to support the provinces' broader electricity system needs, as directed by the province's Integrated Energy Plan (Energy for Generations).

Options Analysis for Remaining Needs

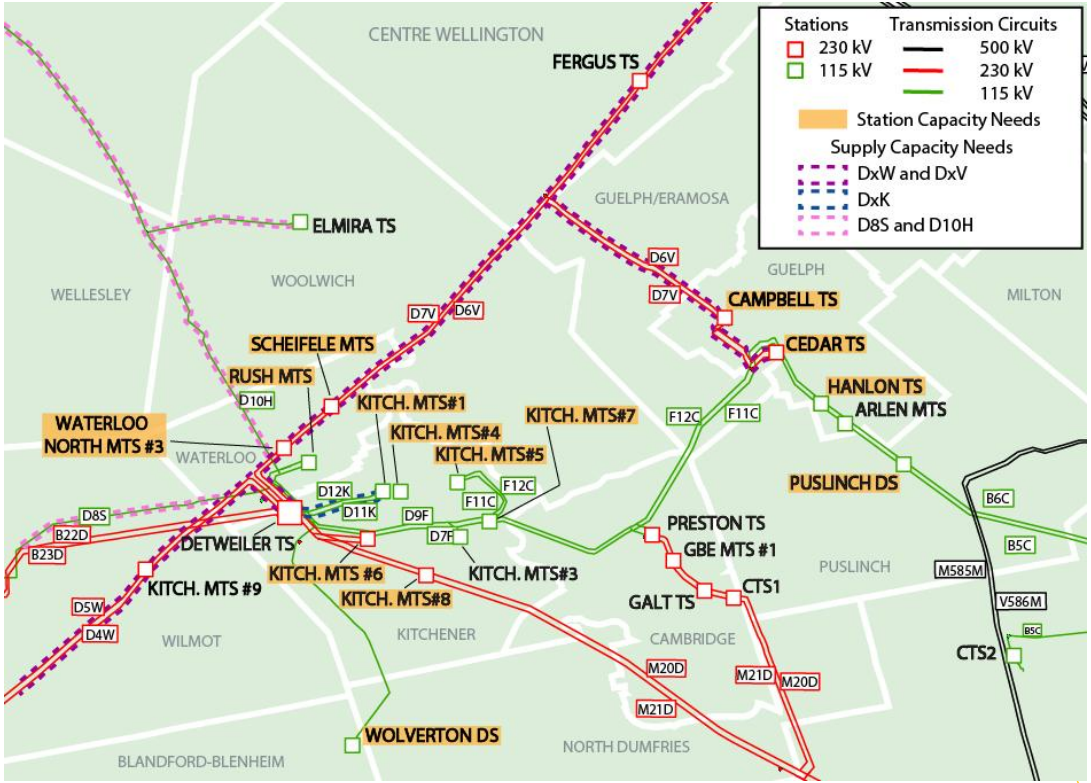
Recap: Options Screening and Recommendations for Priority Needs

- Wires options were determined to be the only technically feasible solutions to meet the near-term station capacity needs in Cambridge and supply needs between Middleport and Detweiler, though transmission-connected generation and eDSM were screened in for analysis too.

Due to the size, magnitude, and timing of the priority needs, the IESO issued an Urge Letter in Sept 2025 to Hydro One and GrandBridge Energy to immediately implement a set of integrated solutions:

- Hydro One to undertake development and construction of necessary upgrades to existing 115 kV transmission circuits Kitchener, Cambridge, and Puslinch with target completion Q2 2028, as well as a new 500/230 kV autotransformer station in Puslinch to be in-service in 2031, and a new 230 kV transmission line from Puslinch to Preston Transformer Station in Cambridge, also in-service by 2031.
- GrandBridge Energy to develop and construct a new 115 kV TS in the City of Cambridge to be in service in 2028.

Recap: Remaining Needs



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Overview of Potential Options

The following wire and non-wire options were considered to meet the electricity needs in KWCG:

- **Distribution-level load transfers:** Moving load from one station to another station that has available capacity – these are typically low cost and can be quickly implemented.
- **Electricity demand side management:** Implementing additional eDSM programs and initiatives to reduce electricity needs.
- **Local generation and/or storage options:** Exploring opportunities for new or expanded local generation including battery storage that can provide capacity, energy or voltage support to the area.
- **Wire options:** Building new or upgraded transmission facilities and/or implementing additional autotransformer capacity, reactive support, advanced control actions, and Remedial Action Schemes enhancements to improve system capability and reliability.

Options Evaluation

Wire and non-wire options are evaluated based on the following key considerations:

Technical Feasibility	• Can the option be executed? I.e., outlook for technology, proximity to customers, routing and spacing considerations, operation.
Ability to Address Needs	• Does it address the need while complying with the established reliability standards and criteria for the electric power system?
Cost-Effectiveness	• Is there the ability to solve multiple needs simultaneously? • How much can it cost and what are the benefits?
Lead Time	• New transmission infrastructure is expected to take at least 5-7 years – how does this compare to the timing of needs?
Community Considerations	• Input from community preferences and feedback regarding potential options, for example does it improve resilience for extreme weather?

Wires Options Development and Assessment

- Wires options to meet electricity needs are always screened in for further analysis.
- These include: load transfers, building new or upgraded transmission facilities and/or implementing additional autotransformer capacity, adding voltage support, introducing operational control actions, or other enhancements to improve system capability and reliability.
- When multiple wires options are possible, they are assessed by technical feasibility, cost, ability to meet the need, and long-term implications for system supply.

Wires Options Analysis: Station Capacity Needs in Kitchener

Need	Options Assessed	Costs and Benefits
Kitchener #1 Kitchener #4 Kitchener #5 Kitchener #7	• Load transfers on the distribution system • New 230 kV station in Kitchener Freeport area	• Load transfers: $500k per distribution tie*, utilizes the distribution system to reallocate load and maximize the use of existing stations and transmission infrastructure • New station: $30-45 million, brings in new capacity for future growth
Kitchener #6 Kitchener #8	• Station expansion	• Station expansion: $30-45 million, brings in new capacity for future growth

*Number required will depend on Enova Power's more detailed distribution planning

Wires Options Analysis: Station Capacity Needs in Waterloo

Need	Options Assessed	Costs and Benefits
Rush MTS, Scheifele MTS, and Waterloo North MTS #3	• New 230 kV stations in Waterloo and Woolwich	• Station expansion: $30-45 million, brings in new capacity for future growth • Stations could be supplied by existing transmission lines in the medium-term

Wires Options Analysis: Supply Capacity Needs in Waterloo

Need	Options Assessed	Costs and Benefits
DxV-DxW supply and load security	**Near-Term to Medium-Term** • Voltage support + circuit upgrades • New 230 kV line + Cedar station work + circuit upgrades + capacitor bank • Detweiler station work + capacitor banks + circuit upgrades **Long-Term** • 230 kV line from Puslinch to new Waterloo stations • 500 kV line between London and a new Kitchener station and Milton + 230 kV line between new Detweiler and new Waterloo stations • 500 kV line between London and Centre Wellington + 500 kV line between Centre Wellington and Puslinch + new capacitor banks + 230 kV line between Centre Wellington and new Waterloo stations	**Near-Term to Medium-Term** • Costs range from: approximately $70 million to $235 million • Faster options that can help addresses urgent supply limits **Long-Term** • Costs start at $360M • Different integrated options that bring new paths of supply to KWCG and are coordinated with the South and Central bulk study

Wires Options Analysis: Other Station Capacity Needs

Need	Options Assessed	Costs and Benefits
Arlen MTS and Hanlon TS in Guelph	• Monitor load growth	• No cost yet; need can be re-evaluated in the next planning cycle (2029)
Campbell TS in Guelph	• Station upgrade	• $25 million, improves existing station ratings
Cedar TS in Guelph	• Like-for-like 115 kV transformer replacement • Upsized 115 kV transformer replacement • New 230 kV station	• Like-for-like transformer: $20M, addresses end-of-life (EOL) need • Upsized transformer: $55M, addresses EOL need while providing more capacity • New 230 kV station: $60M, addresses EOL need, increases capacity, and offers more long-term flexibility

Wires Options Analysis: Other Station Capacity Needs

Need	Options Assessed	Cost and Feasibility
Puslinch DS	• New 230 kV station	• $65 million, brings in new capacity for future growth
Wolverton DS in Blandford-Blenheim	• Station upgrade	• Project already underway, improves existing station ratings and maximizes the use of existing infrastructure

Wires Options Analysis: Other Supply Capacity Needs

Need	Options Assessed	Cost and Feasibility
D11K/D12K transmission lines in Kitchener	• Circuit reconductoring	• $12.5 million, improves existing system capability while maximizing the use of existing lines
D8S-D10H transmission lines in Waterloo, Wellesley, and Woolwich	• Circuit reconductoring • Transfer load at Rush MTS to new Waterloo stations	• Reconductoring: $3.5 - 5 million, improves existing system capability while maximizing the use of existing lines • Load transfer: can be an integrated solution with DxV supply reinforcements

Non-Wires Alternatives (NWA) Development and Assessment

Process

1. Non-Wires Alternatives (NWA) Screening – Further screening is conducted on the need profiles to determine NWAs that are technically feasible to meet local needs.

2. NWA Development - Detailed modelling and analysis are conducted to further develop non-wires options for the local areas identified in step 1.

3. Economic Analysis - The total costs and system benefits of the non-wires options developed in step 2 are calculated for comparison against each other, and against transmission (i.e. "wires only") options to meet local needs, if the NWA is technically feasible.

NWAs Analysis for Screened-In Remaining Station Capacity Needs (1/3)

Some needs were screened in for further non-wires analysis after the October 2025 KWCG IRRP webinar.

Station	Feasibility of NWAs	Summary of Analysis
Rush MTS (Waterloo)	Infeasible	• All NWAs are technically feasible as interim solutions to mid to late-2030s, but are unable to meet needs in the long-term
Kitchener MTS #1	Infeasible	• All NWAs are technically feasible as interim solutions, but are unable to meet needs in the long-term • Battery energy storage systems (BESS) and renewables could meet needs until the late-2030s before exceeding connection limits.
Kitchener MTS #4	Infeasible	• All NWAs are technically feasible as interim solutions, but are unable to meet needs in the long-term (e.g. demand response can likely defer needs by one year) • BESS and renewables could meet needs until the late-2030s before exceeding connection limits.

Note: All non-wires analysis assumed the inclusion of additional eDSM

NWAs Analysis for Screened-In Remaining Station Capacity Needs (2/3)

Station	Feasibility of NWAs	Summary
DxK (Kitchener MTS #1 + 4)	Infeasible	• Some NWAs are technically feasible as interim solutions • BESS and renewables could meet needs until the late-2030s before exceeding connection limits.
Kitchener MTS #6	**Feasible**	• By 2043, a portfolio of 19 MW of distributed energy resources — comprising 4 MW of solar and 15 MW of battery energy storage (BESS) — can fully meet system needs and reliability requirements • The first NWA units must be in service by 2033. • **This solution represents a significantly lower-cost option, with an estimated net cost of ~$5 million, compared to approximately $39 million for the traditional wires solution (new 230 kV station).**
Kitchener MTS #7	Infeasible	• All NWAs are technically feasible as interim solutions to mid to late-2030s • BESS and renewables could meet needs until the late-2030s before exceeding connection limits.

NWAs Analysis for Screened-In Remaining Station Capacity Needs (3/3)

Station	Feasibility of NWAs	Summary
Puslinch DS	**Feasible**	• By 2043, a portfolio of 21 MW of distributed energy resources — comprising 13 MW of solar and 8 MW of BESS — can fully meet system needs and reliability requirements over the long term. • The first NWA units are expected to be in service by 2030. • **This solution represents a significantly lower-cost option, with an estimated net cost of ~$9 million, compared to approximately $65 million for the traditional wires solution (new 230 kV station).** • Other non-emitting NWA options exceed reliability standards • Natural gas is technically feasible but is more costly, at approximately $68M even in comparison to the $65M wires option.

Draft Recommendations for Remaining Needs

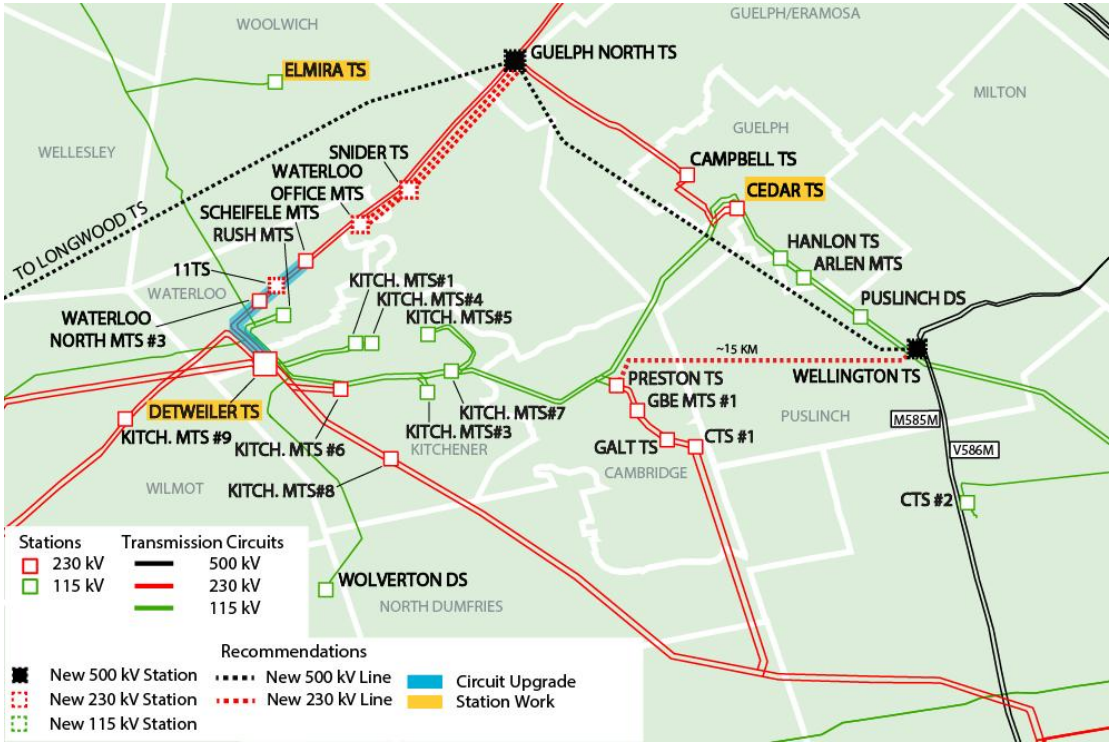
Draft Recommendations: Station and Supply Capacity Needs in the Waterloo Area

Need	Draft Recommendation
Rush MTS, Scheifele MTS, and Waterloo North MTS #3 station capacity	• Build three new 230 kV stations in Waterloo and Woolwich (Enova Power 11 TS, Office MTS, and Snider TS) – the first station starting in 2030 • By mid-2030s, transfer stations to 230 kV connection lines from Guelph North TS

DxV supply and DxW supply	• By 2031 or earlier:
	  • Conduct station work at Detweiler TS to minimize the impact of outages*
	  • Add capacitor banks at existing stations*
	  • Thermally uprate existing circuits*
	  • Construct a new 500/230 kV autotransformer station (Guelph North TS) in Centre Wellington
	  • Implement distribution-level load transfers
	• By 2034 or earlier:
	  • Build a new single-circuit 500 kV line from Longwood TS to Guelph North TS to Wellington TS (also a draft recommendation in the South & Central Bulk Plan being developed in parallel with the KWCG IRRP)

*These wires recommendations will be further refined in the Regional Infrastructure Plan, led by the transmitter after the IRRP

Map of Waterloo Area Draft Wires Recommendations



 *Number of capacitor banks and extent of circuit upgrades to be refined

Draft Recommendations: Station Capacity Needs in Kitchener

Need	Draft Recommendation
Kitchener #1, 4, 5, 7	• Additional eDSM • Load transfers to neighbouring Kitchener stations • New station needed in the area by 2039 at the latest
Kitchener #6	• Additional eDSM • Implementation of 4 MW of distributed BESS in 2033, and distributed solar (4 MW) and BESS (11 MW) between 2038-2043
Kitchener #8	• Additional eDSM • Station expansion by 2030

Draft Recommendations: Other Station Capacity Needs (1/2)

Need	Draft Recommendation
Arlen MTS and Hanlon TS in Guelph	• Monitor growth and address needs in next planning cycle in 2029
Campbell TS in Guelph	• Additional eDSM • Install switchgear at T3/T4 by 2031 • Transfer excess load at T1/T2 to T3/T4 • Monitor growth ahead of next planning cycle
Cedar TS in Guelph	• Additional eDSM • Reconfigure T7/T8 from 115 kV to 230 kV by 2032, when it reaches end of life • Transfer excess load at T1/T2 to T7/T8

Draft Recommendations: Other Station Capacity Needs (2/2)

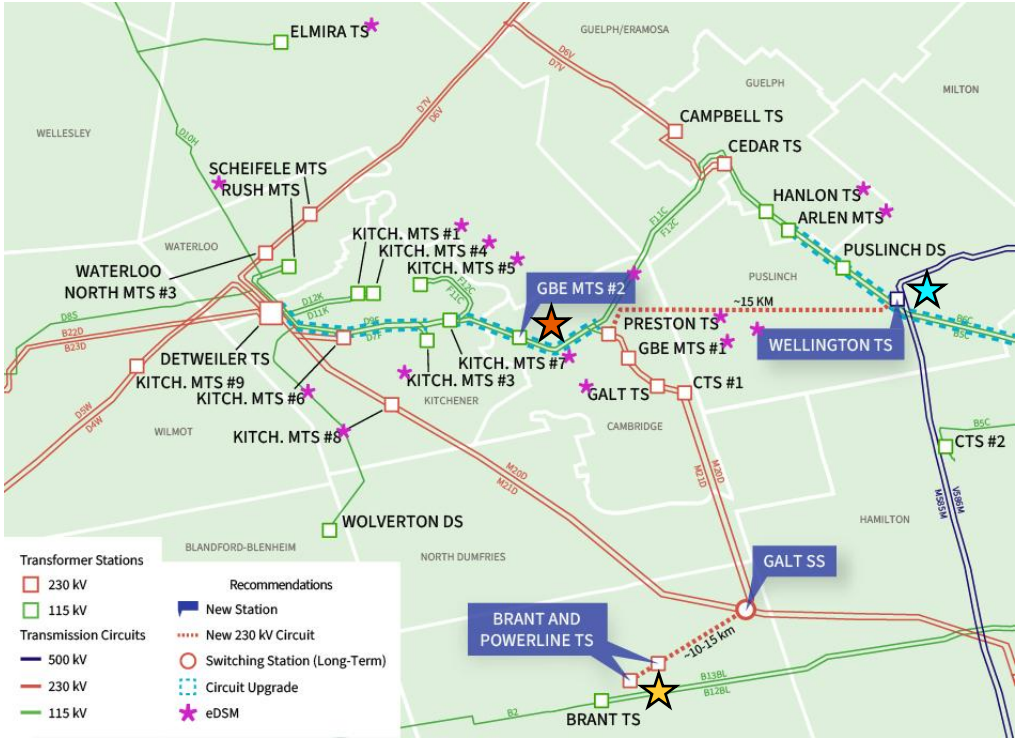
Need	Draft Recommendation
Puslinch DS	• Additional eDSM • Implementation of 13 MW of distributed solar and 8 MW of distributed battery energy storage between 2029-2043, with the first units starting in 2030
Wolverton DS in Blandford-Blenheim	• Additional eDSM • Station work (fan monitoring project to increase station limits) by the end of 2026

Draft Recommendations: Other Supply Capacity Needs

Need	Draft Recommendation
D11K/D12K transmission lines in Kitchener	• Additional eDSM • Upgrade existing circuits by 2033
D8S-D10H transmission lines in Waterloo, Wellesley, and Woolwich	• Additional eDSM • Distribution load transfers to the existing DxV transmission lines by 2032

Summary of Recommendations: Priority Needs

- Additional targeted eDSM to manage and ease pressure on the system. (shown on map with ★)
- Upgrade the existing transmission lines between Burlington and Puslinch, Freeport junction (JCT) and Speedsville JCT, and Detweiler TS and Kitchener #3. (shown on map with light blue dashed lines ⋯⋯)
- Build new stations in Cambridge (see ★ on map) and Brant/Brantford (see ★ on map).
- Build a new 230 kV transmission line from Puslinch to Preston TS (see red dashed line on map) and a new autostation in Puslinch (see ★ on map).
- Monitor overall load growth and eDSM



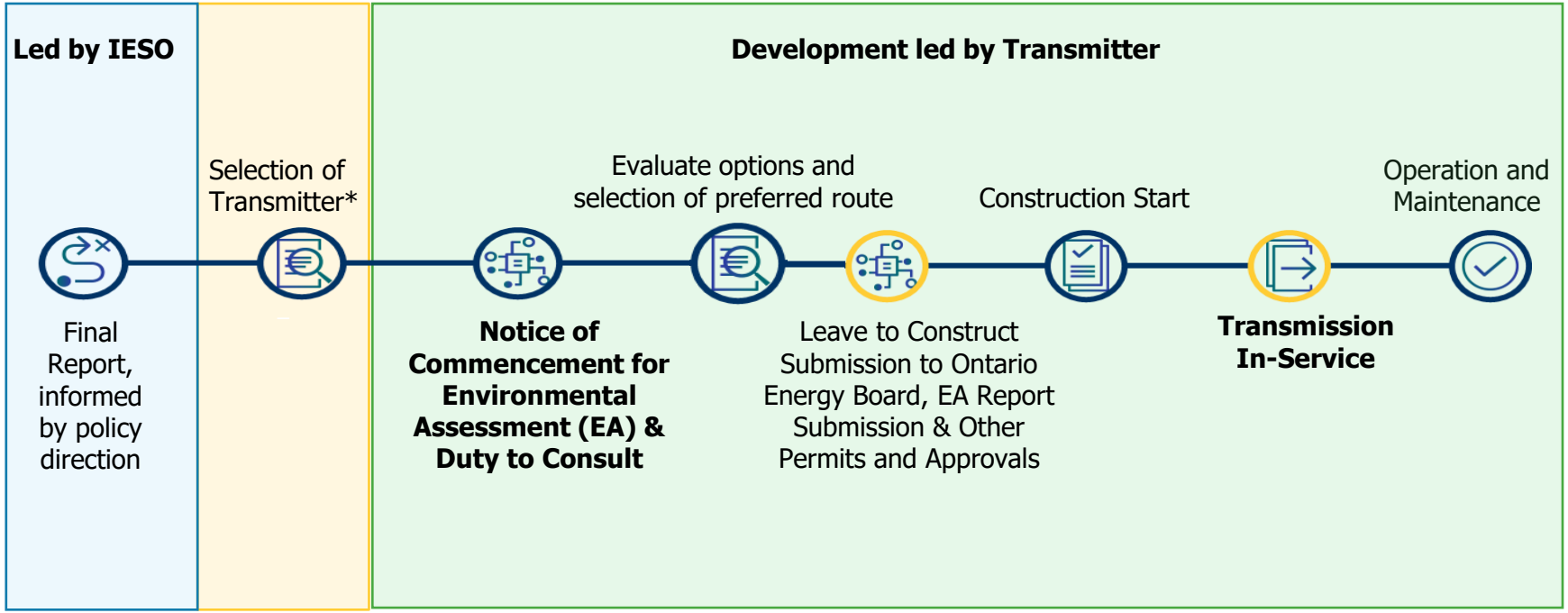
Note: Conceptual diagram; exact routing/siting are subject to transmitter-led or distributer-led development work after the IRRP.

Summary of Draft Recommendations: Remaining Needs

To meet growing demand and to ensure the electricity system in the KWCG region meets reliability requirements, an integrated set of investments are recommended:

- New stations in Waterloo and Guelph
- Upgrades on existing transmission lines in Waterloo
- Station expansion and load transfers in Kitchener
- New line between Centre Wellington and Puslinch
- New line into Centre Wellington from London
- Additional eDSM (238 MW and 314 MW for summer and winter, respectively, for the region by 2043)
- Distributed solar generation and energy storage at Kitchener MTS #6 and Puslinch DS
- Monitoring growth and new developments in the region ahead of the next planning cycle in 2029

Typical Process for Transmission Development



* Transmitter Selection Framework under development

Next Steps & Discussion

Energy Efficiency Opportunities

- To help meet the province's rapidly growing demand for electricity, the IESO's energy efficiency programs, through Save on Energy, has been expanded from $1 billion over four years, to $10.9 billion over 12 years.
- Key programs of interest to your municipality, residents and small businesses include:
  - Peak Perks – Residential and small business electricity customers with an eligible smart thermostat can be rewarded for reducing their energy use when demand for electricity is high in the summer.
  - Home Renovation Savings – Homeowners can get rebates up to 30% for home energy efficiency renovations and improvements.
  - Retrofit – Facility/building owners and lessees can get up to 50% of eligible project costs covered for targeted energy efficiency retrofits.
  - Energy Affordability Program – Support for income-eligible electricity customers to better manage monthly electricity costs and increase their home comfort.
  - XLerate Program – Streamlined, pay-for-performance initiative for industrial, municipal, institutional, and healthcare facilities through a simplified approach to undertaking large-scale energy-efficiency projects
- Some programs will continue to expand – to stay informed, sign up for the quarterly newsletter.

Next Steps

Participants can expect to hear from the IESO at these milestones:

- **June 24, 2026:** Deadline for feedback to the IESO on the options analysis and draft recommendations.
- **July 8, 2026:** IRRP will be completed and published on the engagement webpage.

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

- For wires solutions, the local 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

Local considerations and feedback are a critical component to the development of an Integrated Regional Resource Plan (IRRP). The IESO wants to understand:

- What feedback is there on the draft recommendations to address remaining needs?
- What information needs to be considered in the draft recommendations?
- How can the IESO continue to engage with communities and stakeholders as these recommendations are implemented, or to help prepare for the next planning cycle?

The IESO welcomes written feedback until **Wednesday, June 24, 2026.** Please submit feedback to engagement@ieso.ca.

Thank You

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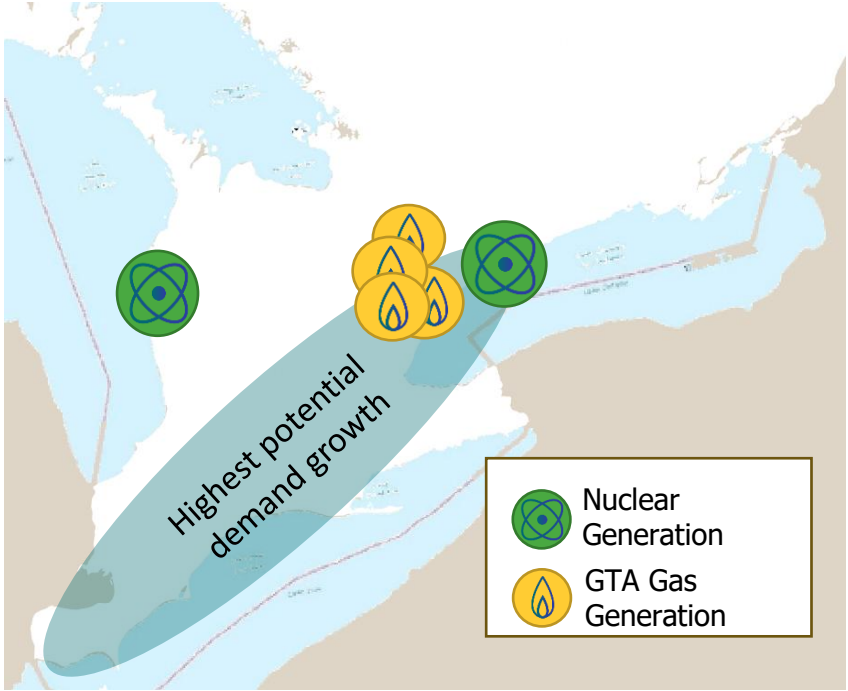
APPENDIX

South and Central Bulk Plan

This comprehensive bulk system plan will enable:

- Reliable electricity supply to fast-growing regions, particularly between Windsor and Hamilton and in the Greater Toronto Area (GTA)
- Delivery of future generation resources to the grid, including new nuclear resources at Bruce and Darlington sites.
- Early planning for decreased reliance on emitting resources, particularly in the GTA
- Electrification and fuel switching, data centres, and other large load centres
- Opportunities to preserve new or expanded corridors for future electricity infrastructure
- Co-ordination with other bulk electricity planning in the north and east, as well as regional plans



Co-ordinating With Local Needs

Bulk system planning is led by the IESO to assess the ability of the provincial transmission system to deliver electricity from where it is generated to where it is needed.

Regional planning focuses on delivering that capacity within 21 local planning areas across the province.

The South and Central Bulk Plan is integrated with **Integrated Regional Resource Plans (IRRPs)**, which includes current or recently completed IRRPs: Toronto, Windsor-Essex, **Kitchener-Waterloo-Cambridge-Guelph,** GTA North, GTA West, and the London Area

Regional needs can trigger requirements for bulk system upgrades, and bulk plans can impact needs and options considered locally:

1. Co-ordination in planning scope
2. Alignment in demand forecast and system assumptions
3. Co-ordination between bulk and regional solutions

Evaluation of Portfolios

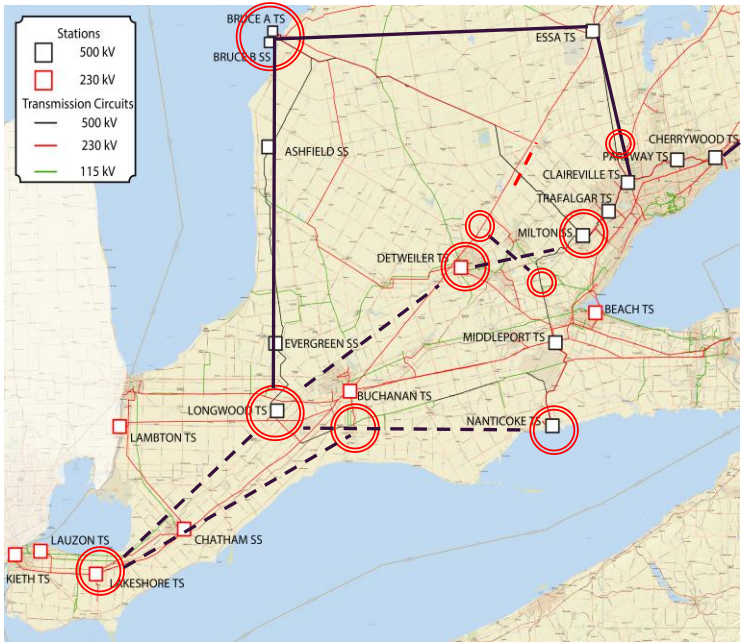
The IESO developed **three distinct portfolios of options,** representing three different holistic approaches to meeting the same plan objectives.

Each portfolio includes **a set of common transmission investments that are critical for achieving the plan objectives under all future scenarios assessed**. These investments are paired with additional reinforcements to meet the overall objectives of the bulk plan.

The portfolios vary based on options to support growth (e.g., economic development) in the load centres:

- 500 kV or 230 kV supply to the London Area region
- 500 kV supply into Windsor-Essex region
- 500 kV or 230 kV supply to the Kitchener-Waterloo-Cambridge-Guelph region

Illustrative Map of the Potential Bulk Transmission Reinforcements Across Three Portfolios



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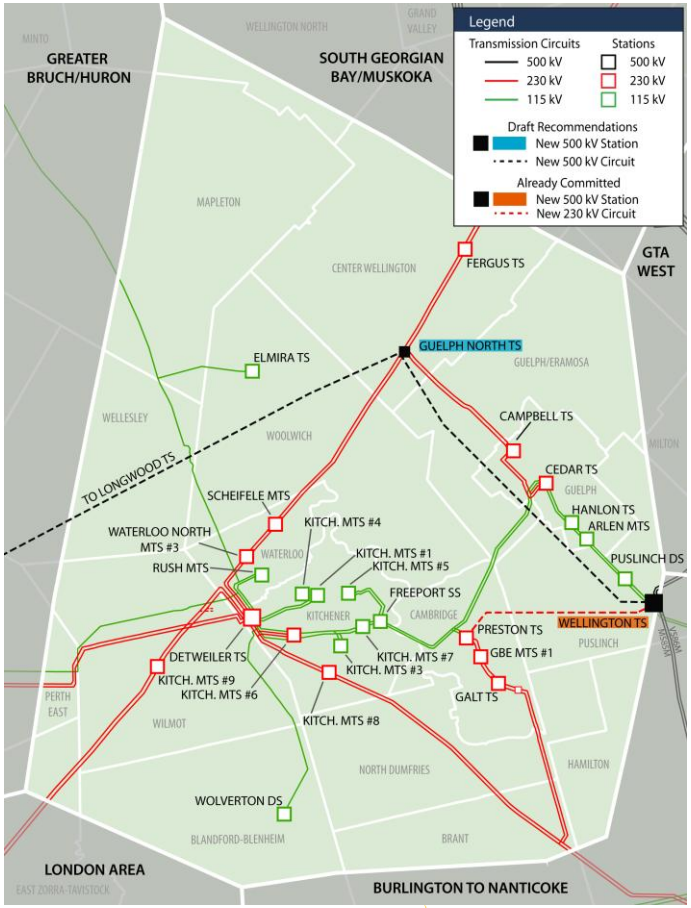
Implications for this Area

The following draft recommendations from the South and Central Bulk Plan's Portfolio B impact this region:

- **New 500/230 kV autotransformer station** ("Guelph North TS") in Centre Wellington, needed by the early 2030s
- **New 500 kV line** from Longwood TS (in London) to Guelph North TS, then to Wellington TS, needed by the mid-2030s



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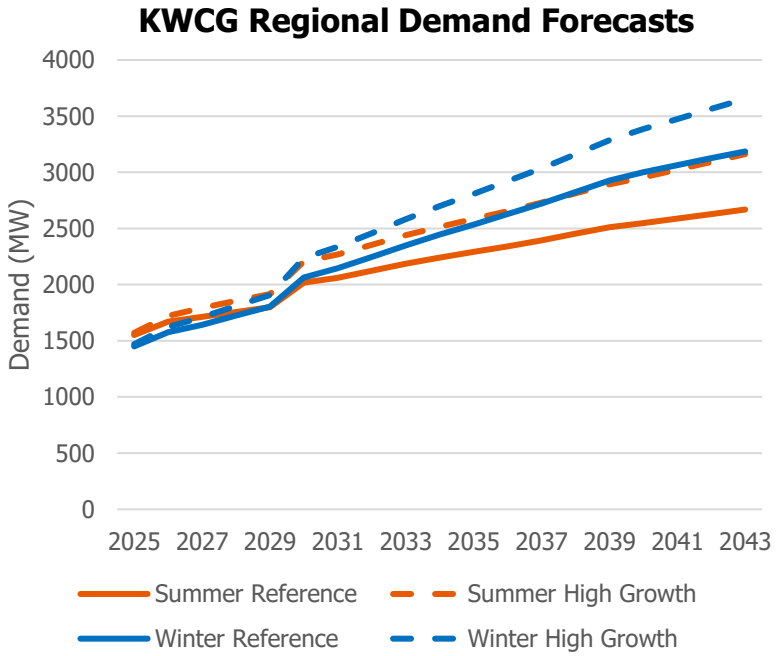
Enabling Growth for the Long Term

- All portfolios examined in the South and Central Bulk Plan enable significant load growth across multiple municipalities in the KWCG region
- KWCG electricity demand has an average annual growth rate of 3.7% in the summer and 5.5% in the winter in the near-term, compared to the provincial average annual demand growth rate of 2% by 2050
- Both regional and bulk transmission investments are required to enable this growth, and the economic and municipal development and electrification that drive it



Bulk and Regional Electricity Coordination

- KWCG regional electricity planning is already underway, with some recommendations made recently for urgent needs (demand-side management, Wellington TS, and new 230 kV line to Preston TS)
- The bulk draft transmission options **complement and support regional planning and investments** by:
  - **Ensuring sufficient bulk electricity supply** to the region
  - **Unlocking new options** that can be considered in regional planning by introducing more 500 kV supply points in the area
- The KWCG IRRP will be finalized July 8, 2026 and will incorporate the South and Central bulk recommendations.

Overview of Electricity Needs

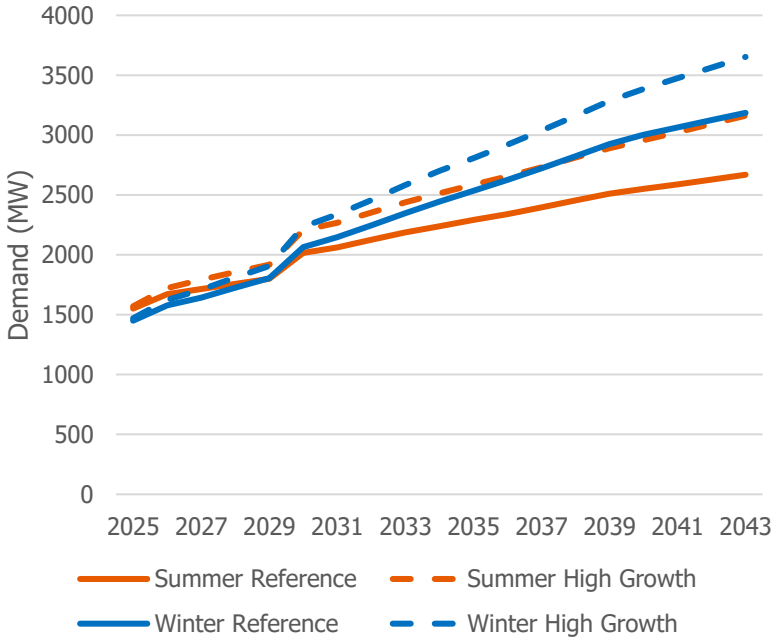
The Technical Working Group used the final demand forecast to assess if the existing transmission stations and lines can meet the forecasted growth within reliability requirements as part of NERC, NPCC and ORTAC. If it cannot, the shortfall is categorized into one of five needs:

- **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 an interruption or loss of load.
- **Load supply security:** Maximum amount of power that can be lost during select contingencies.

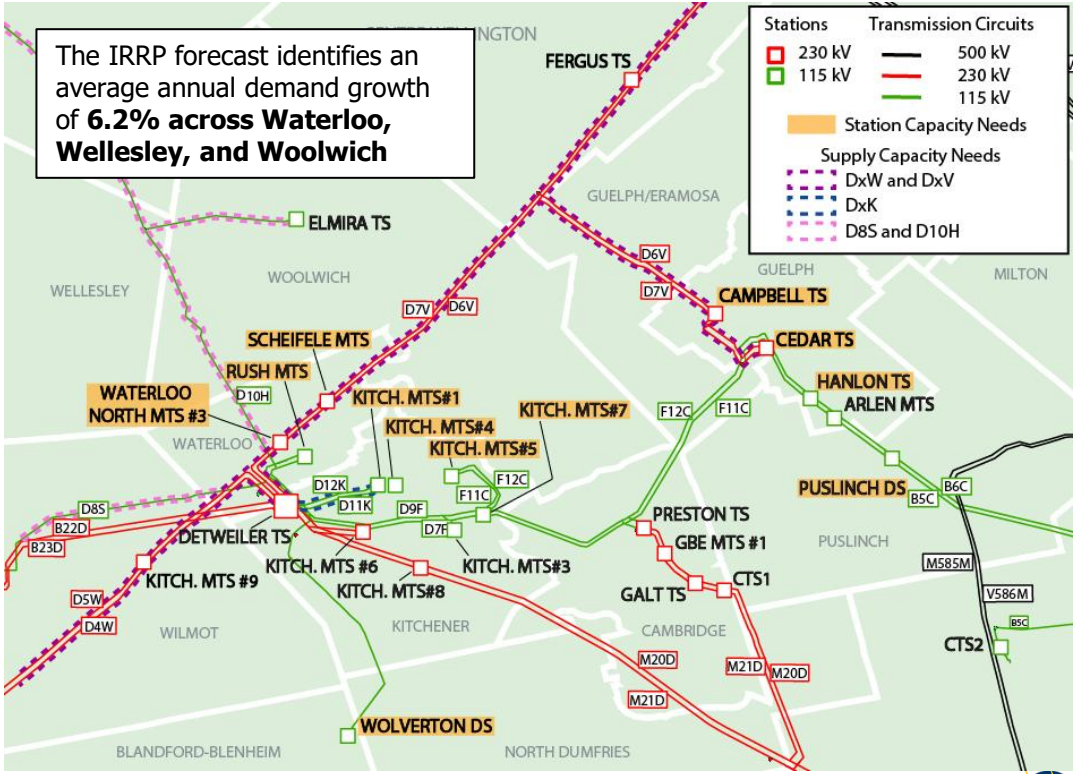
Final Demand Forecasts

Key takeaways:

- KWCG demand has an average annual growth rate of 3.7% in the summer and 5.5% in the winter in the near-term – compared to the provincial average annual demand growth rate of 2% by 2050.
  - Summer demand is driven by new large-scale customers and electrification.
  - Winter demand, although driven by the same growth drivers as the summer forecasts, has higher growth rates due to the increase in electric heating.
  - KWCG, currently a summer-peaking region, becomes dual peaking in 2029 before shifting to winter peaking.
- The current reference forecast has nearly 3x the annual growth rate relative to the previous cycle of regional planning, due to aforementioned factors.



Regional Needs Being Assessed in the KWCG IRRP



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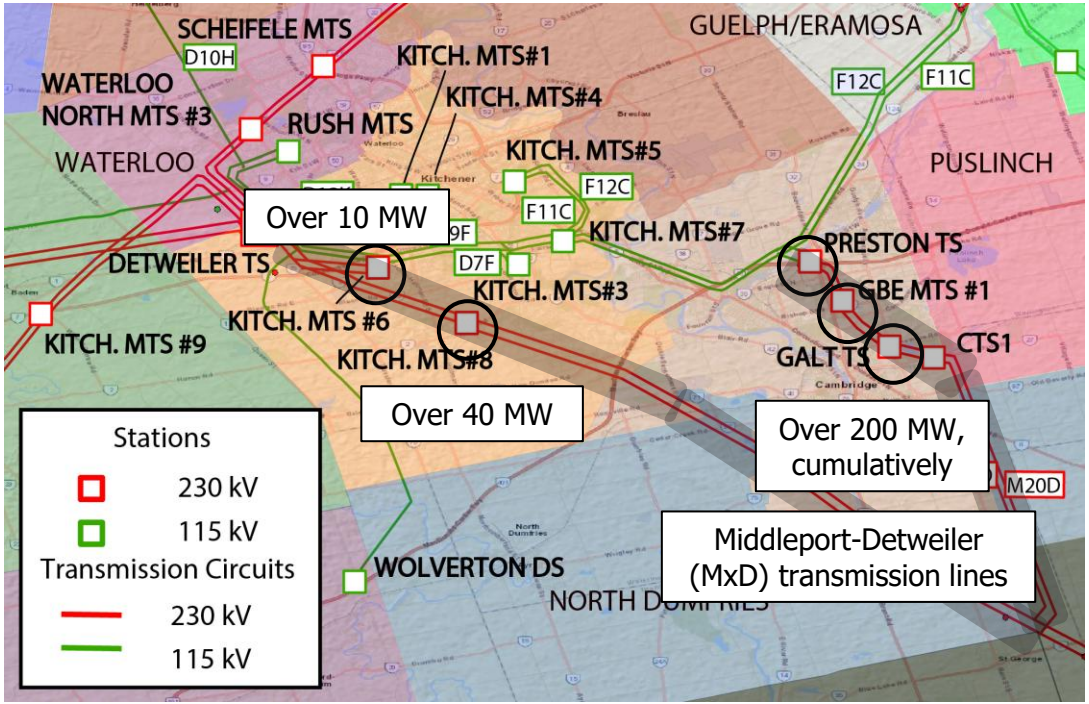
Priority Needs - Size



- Ongoing work to upsize Preston TS will partially help
- New (115 kV and 230 kV) stations are already being considered by GrandBridge Energy and Enova Power

Legend

Station capacity needs

Supply capacity needs

Rationale for Recommendations

A **multi-pronged approach** is needed to meet KWCG's electricity needs, balancing short-term demands with long-term flexibility while leveraging existing infrastructure as much as possible:

- **Upgrading 115 kV circuits** offers a cost-effective, quick solution to boost supply capacity and enable a new GrandBridge Energy transformer station, addressing immediate customer connection needs in the region.
- A **new 500/230 kV auto-transformer station at Puslinch**, **with a double-circuit 230 kV line from Puslinch DS to Preston TS**, will increase capacity (to enable new customer connections and overall growth), enhance system security and restoration capabilities, and support long-term growth in Cambridge, Kitchener, and Brant and Brantford.
- **In the mid-2030s and beyond**, another transformer station in Cambridge and switching station at Galt could be needed to further strengthen the network and support economic development in the region.
- **Non-wires alternatives alone** are not advised due to feasibility concerns. However, targeted **additional eDSM** is recommended to help manage demand and reduce system pressure.

This integrated solution is the most **cost-effective, feasible approach capable of meeting local electricity needs**.

Key Details for Building the New 230 kV Line & Station

- The new station in Puslinch (specifically Crieff) leverages existing property owned by Hydro One.
- The new transmission line from the Puslinch station to Preston TS is subject to further consultations through the Environmental Assessment and Leave to Construct processes (see next slide). These public engagements will inform the design details (tower construction, clearance, etc.) and route options.
- These recommendations help meet immediate electricity needs in the region but also introduce an opportunity to address station supply needs specifically at the existing Puslinch distribution station, where 67% growth is forecast by 2043.

Priority Needs - Timing

Need Type	Impacts	Need Timing – Reference	Need Timing – High Scenario
Station capacity	Kitchener Municipal Transformer Station (MTS) #8	Immediate	
	Preston TS	Immediate	
	GrandBridge Energy MTS #1	Immediate	
	Galt TS	Immediate	
	Kitchener MTS #6	Mid-2030s	Early 2030s
Supply capacity, load security and restoration	230 kV circuits between Middleport and Detweiler (MxD)	Immediate	

Overview of Remaining Needs (1/3)

Following the completion of options analysis and recommendations to address priority needs, ongoing planning work has focused on addressing remaining station and supply capacity needs in the KWCG region.

Need	Type	Location	Summer Need Date	Summer Need by 2045 (MW)
115 kV	Supply Capacity	Kitchener	2031	25
DxV and DxW	Supply Capacity	Area between Detweiler and Orangeville, area between Detweiler and Buchanan	Immediate	575
D8S-D10H	Supply Capacity	Area between Detweiler and Elmira	2033	26
DxK	Supply Capacity	Area between Detweiler and Kitchener MTS #1 and #4	2033	42
DxV	Load Security	Area between Detweiler and Orangeville	2030	325
DxV	Load Restoration	Area between Detweiler and Orangeville	Immediate	666
Cedar TS (T7/T8)	End-Of-Life	Guelph	2032	N/A

Overview of Remaining Needs (2/3)

Need	Type	Location	Summer Need Date	Summer Need by 2045 (MW)
Cedar TS (T1/T2)	Station Capacity	Guelph	2034	25
Cedar TS (T7/T8)	Station Capacity	Guelph	2033	13
Hanlon TS	Station Capacity	Guelph	2042	1
Kitchener #5	Station Capacity	Kitchener	2037	10
Kitchener #7	Station Capacity	Kitchener	2036	12
Puslinch DS	Station Capacity	Puslinch	2029	13
Wolverton DS	Station Capacity	Blandford-Blenheim	Immediate	17

Overview of Remaining Needs (3/3)

Need	Type	Location	Summer Need Date	Summer Need by 2045 (MW)
Campbell TS (T1/T2)	Station Capacity	Guelph	Immediate	31
Campbell TS (T3/T4)	Station Capacity	Guelph	Immediate	19
Scheifele MTS	Station Capacity	Waterloo	2028	144
Waterloo North MTS #3	Station Capacity	Waterloo	Immediate	254
Rush MTS	Station Capacity	Waterloo	2031	33
Kitchener #1	Station Capacity	Kitchener	2035	16
Kitchener #4	Station Capacity	Kitchener	2035	19

Recap: Screening for Remaining Station Capacity Needs

Station	eDSM	Distributed Generation	Transmission-Connected Resource	Demand Response	Wires Options	Rationale for Screened-Out Options
Kitchener MTS #1	✓	*		✓	✓	Technical inability; transmission-connected resources cannot address station capacity needs
Kitchener MTS #4	✓	*		✓	✓	
Kitchener MTS #5	✓	*		✓	✓	
Kitchener MTS #7	✓	*		✓	✓	
Rush MTS	✓	*		✓	✓	
Hanlon TS	✓	✓		✓	✓	
Wolverton DS	✓				✓	Technical inability, urgency, potential for low-cost wires option

Recap: Screening for Remaining Station Capacity Needs

Station	eDSM	Distributed Generation	Transmission-Connected Resource	Demand Response	Wires Options	Rationale for Screened Out Options
Cedar TS (T1/T2)	✓	✓		✓	✓	Technical inability
Cedar TS (T7/T8)	✓				✓	Technical inability and potential end-of-life opportunity
Puslinch DS	✓				✓	Technical inability, urgency, potential wires option that complements draft Puslinch recommendation for priority needs
Waterloo MTS #3	✓				✓	Technical inability, urgency, and magnitude of need
Scheifele MTS	✓	*			✓	
Campbell TS	✓	*			✓	

*May have limited DG connection capacity at these stations due to short circuit limitations; pending WG analysis.

Recap: Screening Results for Other Remaining Needs

Need	eDSM	Distributed Generation	Transmission-Connected Resource	Demand Response	Wires Options	Rationale for Screened Out Options
DxK supply capacity needs	✓	✓	✓	✓	✓	
D8S and D10H supply capacity needs	✓				✓	High potential for low cost and fast wires options impacting existing infrastructure
DxV and DxW supply capacity, load security, and load restoration needs	✓				✓	Urgency, magnitude of need, and technical inability to address load security and load restoration needs