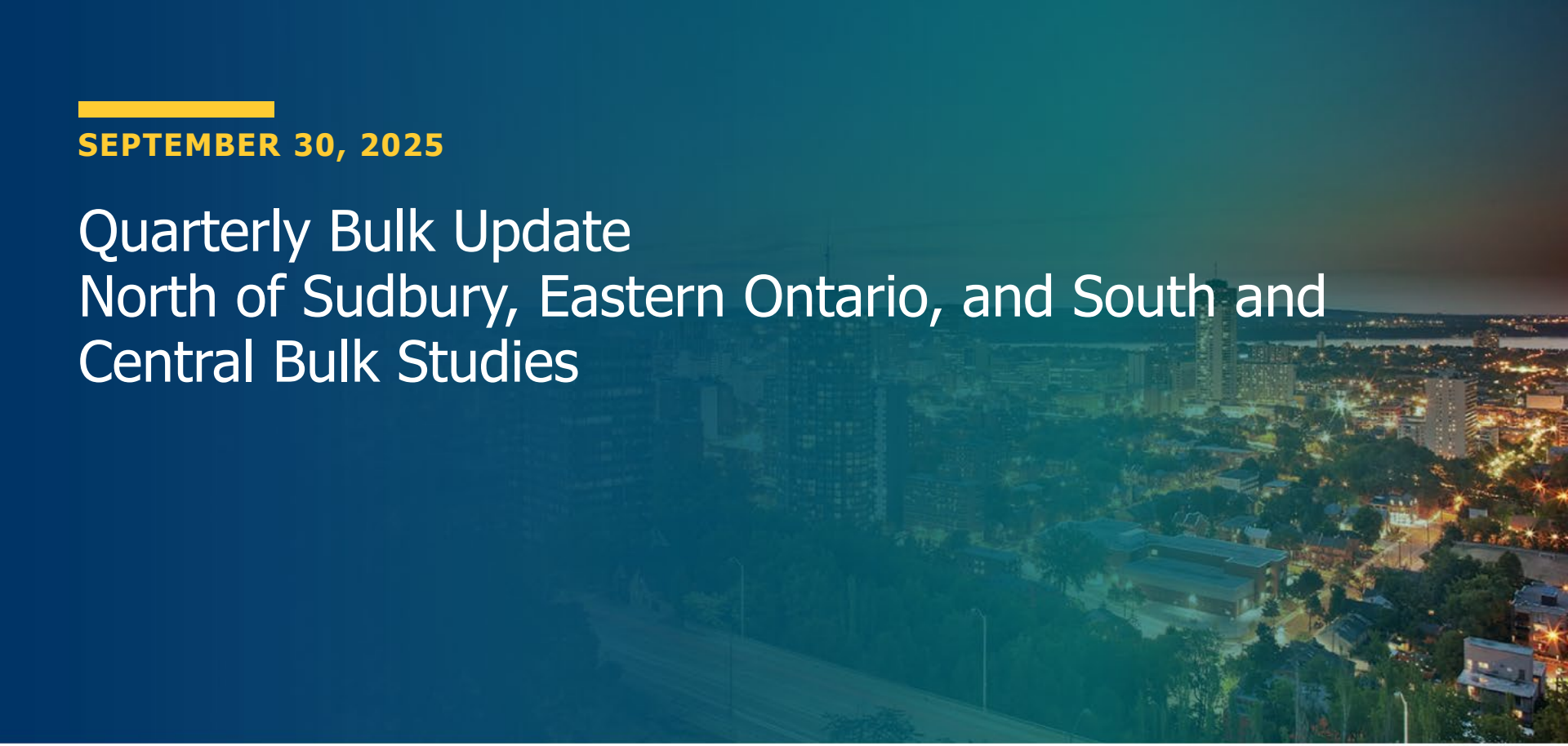
SEPTEMBER 30, 2025

Quarterly Bulk Update
North of Sudbury, Eastern Ontario, and South and Central Bulk Studies



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Territory Acknowledgement

The IESO acknowledges the land from where we are delivering today's webinar is the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Haudenosaunee and the Wendat peoples, and is now home to many diverse First Nations, Inuit and Métis peoples. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit First Nation.

As we have attendees from across Ontario, the IESO would also like to acknowledge all the traditional territories across the province, which include those of the Algonquin, Anishnabeg, Ojibwe, Cree, Oji-Cree, Huron-Wendat, Haudenosaunee, Métis, and Inuit peoples.

Agenda

- Approach to Meeting Ontario's Electricity Needs
- Bulk Transmission System Planning & Key Updates
- Plan Updates
  - North of Sudbury Bulk Plan
  - Eastern Ontario Bulk Plan
  - South and Central Bulk Plan
- Next Steps
- Discussion

Shaping Bulk Studies Through Engagement

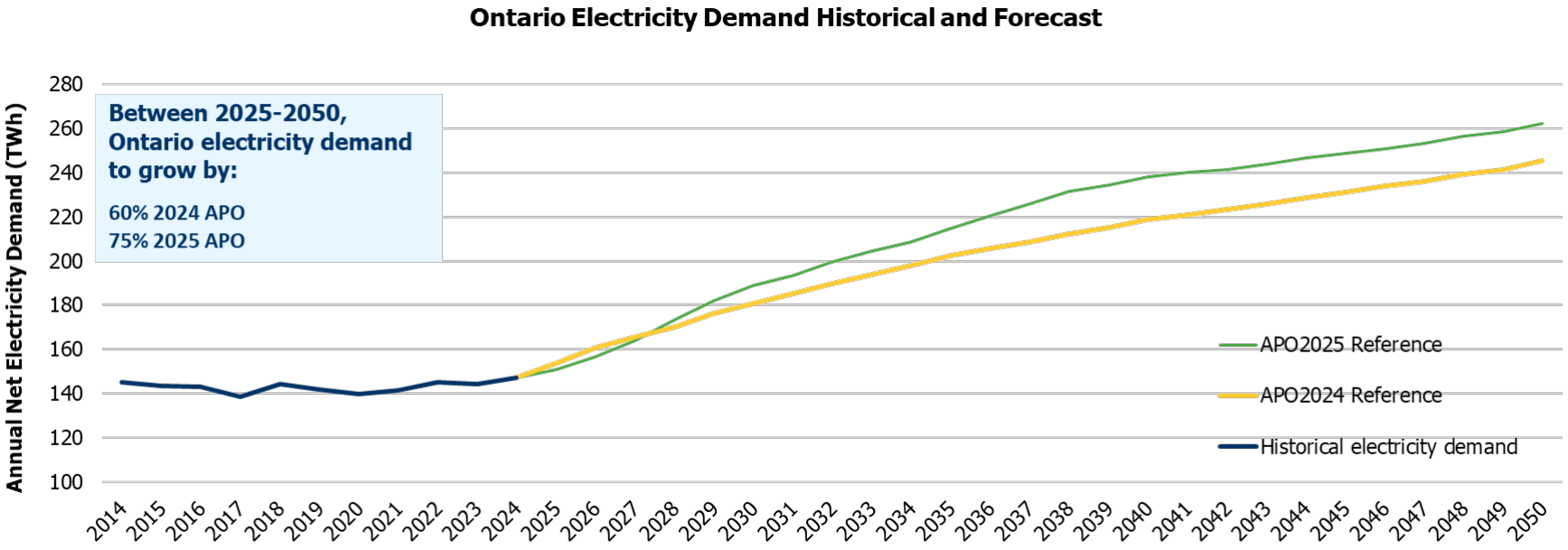
Input from the various perspectives across the electricity sector is essential to the IESO's decision-making process. Several tools are available to enable public engagement through several channels including:

- The IESO Bulletin provides dates for upcoming webinars and is emailed to subscribers at www.ieso.ca/subscribe. Bulk updates are scheduled every quarter.
- Webinar recordings and materials are available on the webpages for the North of Sudbury, Eastern Ontario Bulk Plan and South and Central Bulk Plan.
- We welcome feedback on the information we have shared. The IESO will consider all received feedback and post our response shortly after.

More information about how the IESO engages can be found on our External Relations Engagement Framework.

Meeting Ontario's Electricity Needs

Ontario's Changing Electricity Landscape



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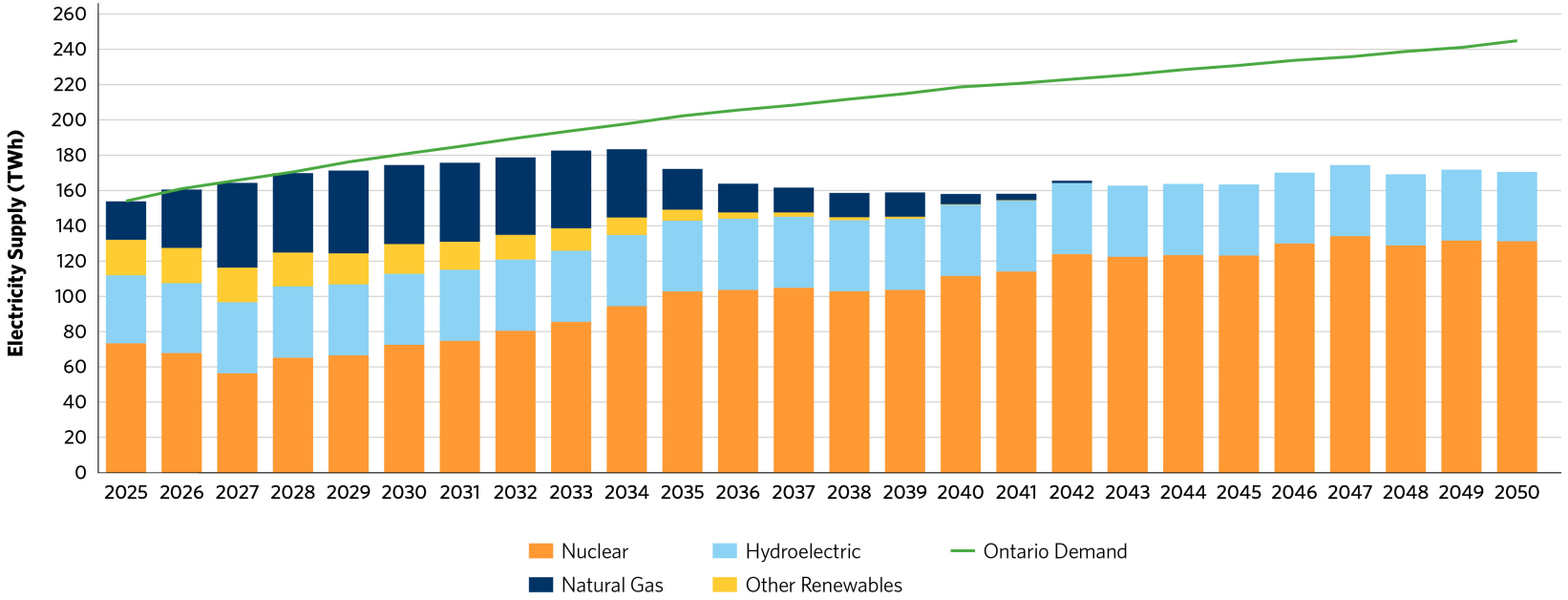
Energy Supply

Energy Adequacy Outlook



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Bulk Transmission System Planning & Key Updates

Bulk System Planning Overview

With capacity and energy needs forecasted to increase in the planning horizon, a robust transmission system will play an increasingly critical role in ensuring deliverability of resources to supply forecasted customer demand (including economic development and electrification) provincially and locally.

The Annual Planning Outlook contains the most up-to-date snapshot of bulk transmission needs.

- The IESO's Schedule of Planning Activities summarizes the plans that are underway and upcoming.
- Activities are reviewed and updated with the Annual Planning Outlook every year, considering the most recent demand and supply forecasts, and changes to reliability standards and public policy objectives.
- Based on these changes, the scope of existing plans may be adjusted, planning work may be re-prioritized, or new planning studies may be initiated.

For more details and data, download the Annual Planning Outlook from the IESO's website.

Bulk Transmission Schedule of Planning Activities

The 2025 APO includes the Schedule of Planning Activities (SOPA):

Study Name	Start – End (Estimate)
Central-West Ontario Bulk Plan	2023 – 2024 (complete)
South and Central Ontario Bulk Plan	2024 – Q3 2025 (on-going)
Niagara Bulk Plan	Q4 2025 – 2026 (upcoming)
Ontario Manitoba Intertie End-of-Life Joint Study	2022 – 2025 (on-going)
Northern Ontario Bulk Plan	2024 – Q3 2025 (complete)
North of Sudbury Bulk Plan	2025 – 2026 (on-going)
Northern Ontario Connection Study	2024 – 2025 (on-going)
Eastern Ontario Bulk Study	2024 – 2026 (on-going)

For more details and data, download the Annual Planning Outlook from the IESO's website.

Components of a Bulk Plan

Demand Forecasts	Needs	Evaluation of Options	Recommendations
How much power is needed over the planning timeframe? Key inputs: -Annual Planning Outlook -Mining load forecast -Regional Planning forecasts -System Impact Assessments	Can the electricity system meet customer demand via a combination of local generation and transmission capacity and maintain reliability planning standards?	What kinds of solutions can meet the future needs for the region? -new transmission -generation -storage -conservation Etc.	Based on an assessment of potential options, what recommended actions will ensure a reliable and adequate electricity supply over the long-term?

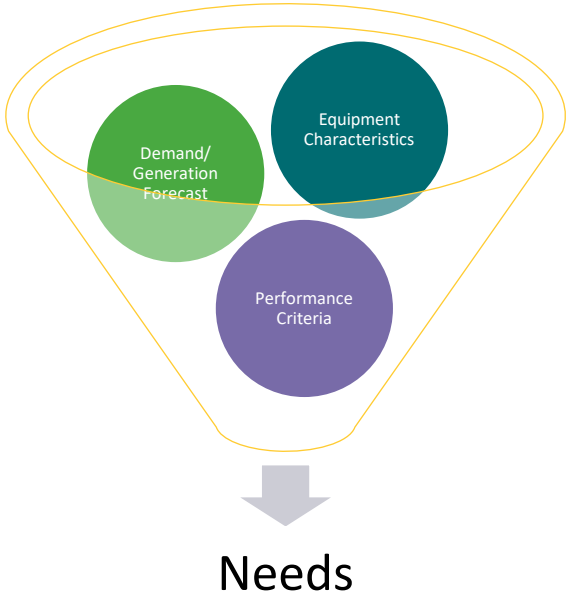
Determining Needs

The transmission system must be planned to satisfy a wide range of planning events and forecast scenarios as identified through various planning standards (ORTAC, NERC, NPCC).

- Standards require that the system is secure for the loss of up to two transmission elements.

Power system simulations are run to identify system capacity needs which occur when the existing system is insufficient in accommodating the forecasted demand.

Needs = Demand – Transmission Capability – Dependable Generation

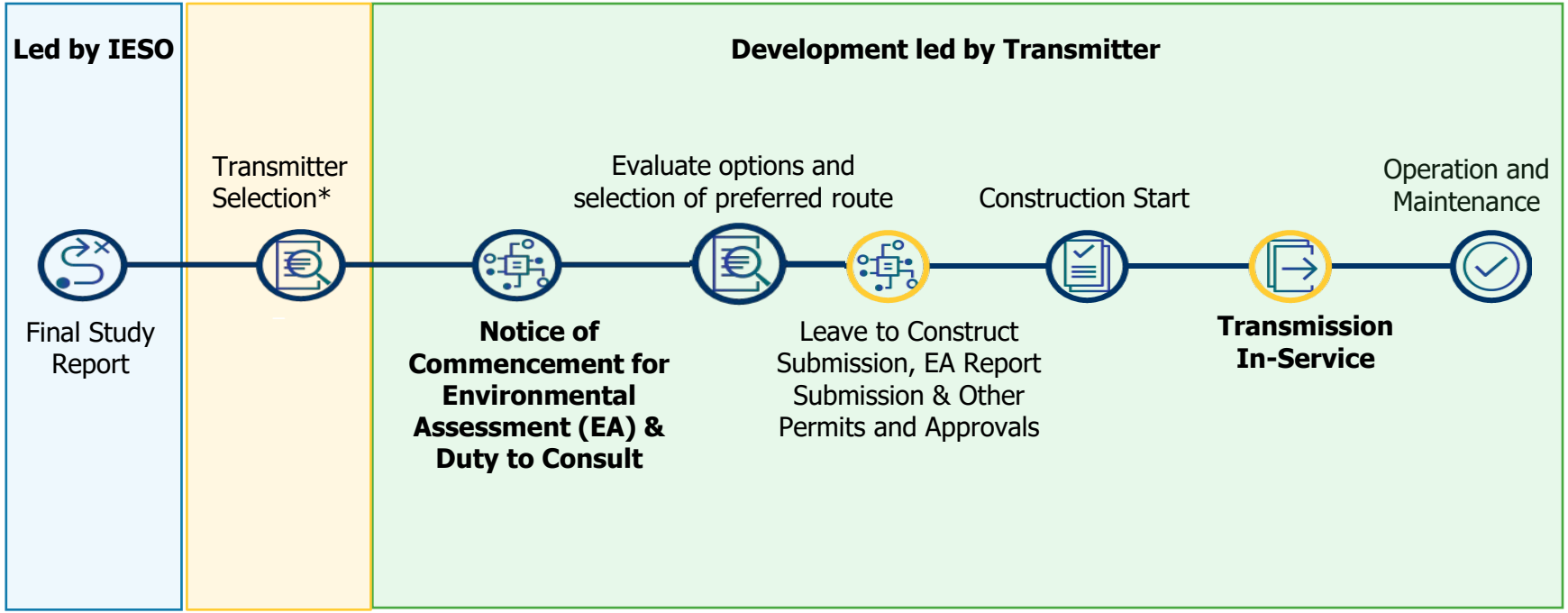


Evaluating Options

Potential solutions are evaluated based on the following key considerations:

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	• What is the lowest cost solution considering the possibility that one option may be able to address multiple needs simultaneously? • Would a combination of option types be most effective?
Lead Time	• New transmission infrastructure or resource procurement/development could take 4-10 years – how does this compare to the timing of needs?

Typical Process for Transmission Development



*Currently, no standardized process exists to select a transmitter; Transmitter Selection Framework under development

Transmitter Selection Framework Project Considerations

On October 2nd, the IESO is hosting a technically focused session on bulk planning for the transmitter community.

The purpose of the session is to seek input on the suitability of different transmission options under evaluation in ongoing bulk plans for the use of the IESO's Transmitter Selection Framework (TSF).

If you have any questions, or for more information, please reach out to engagement@ieso.ca.

North of Sudbury Bulk Plan

North of Sudbury Bulk Plan Overview

The study aims to develop a plan to manage the growing electricity demand driven by new mining and industrial electrification, connecting new supply resources, while addressing constraints in the existing transmission network. Key planning drivers for the North of Sudbury Bulk Plan include:

Adequacy of Electricity Supply Through the Transmission System

- Assess the adequacy of electricity supply to customers and potential large new load connections in the area north of Sudbury.

Supply Mix Uncertainties

- Assess the impacts of changing generation resources and potential retirements of gas fired generation facilities and the impact of these retirements in the area North of Sudbury.

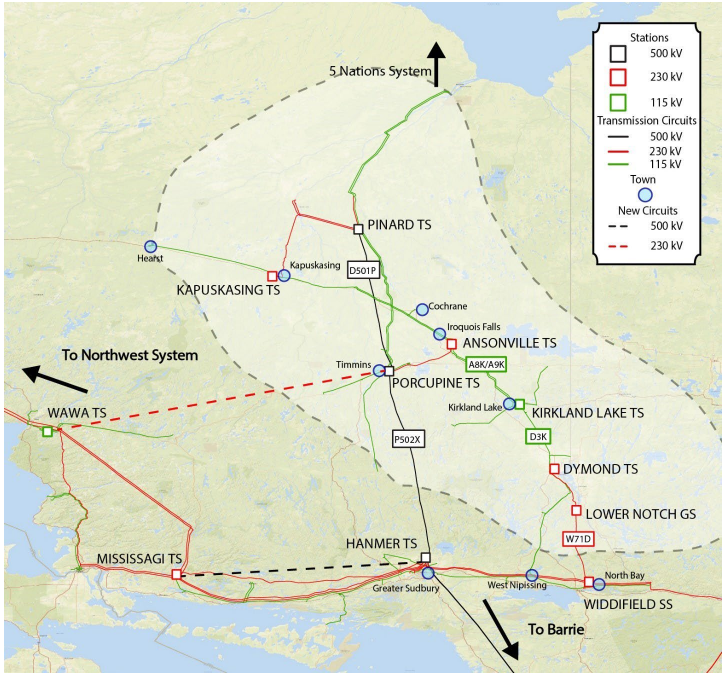
Connection of New Supply Resources

- Assess the ability to accommodate resource facilities in the area north of Sudbury.

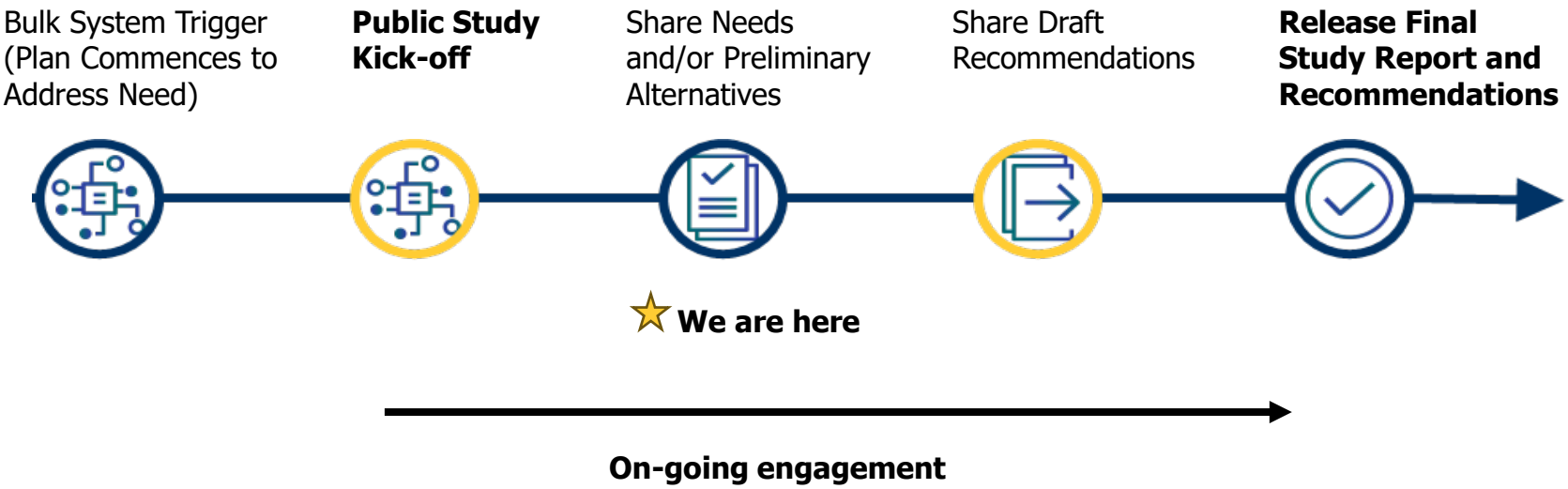
North of Sudbury Bulk System Background

North of Sudbury is supplied by:

- **Three transmission circuits** via a 500 kV circuit (P502X), a 230 kV circuit (W71D) and a 115 kV circuit (D3K). By 2031, a new single circuit 230 kV transmission line between Porcupine TS and Wawa TS will also be in-service, enhancing the region's connectivity.
- **Interconnections** with Quebec via H4Z and D4Z.
- **Local generation** consists of biofuel, gas fired, hydroelectric and solar generation.



North of Sudbury Bulk Plan



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Summary of Feedback – To Date

Key Areas of Feedback	Summary of IESO Response
Expand the study to include the Chapleau area due to reliability issues in the region.	The Chapleau area is within scope of the East Lake Superior Integrated Regional Planning process. As the IRRP progresses, and the East Lake Superior's infrastructure needs are understood, the Technical Working Group will screen and evaluate wire and non-wire options, including storage, to meet the needs.
Highlighted new sources of demand in the region	The IESO actively engages with a range of organizations throughout the province, such as the Ontario Mining Association (OMA) and is aware of mining developments in Northen Ontario. We invite you to share with us specific information regarding any new or existing projects or expansions.
More information about local power conditions and the IESO's plan to increase exports.	Local power conditions can be provided by the local distribution company. The IESO is undertaking joint studies with Hydro Quebec, and, as part of the Eastern Ontario bulk study, the scope includes exploring opportunities to expand the interties with neighbouring Quebec and New York.
New or expanded generation opportunities in the region.	The IESO has included the plans for potential hydroelectric and pumped storage projects in the Moose River Basin and surrounding area in the study, and options to connect these resources is being explored.

The webpage to view all received feedback and the IESO's responses can be found here.

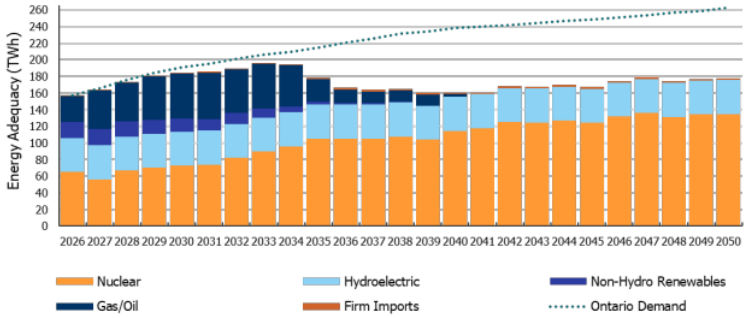
Enabling of Generation North of Sudbury

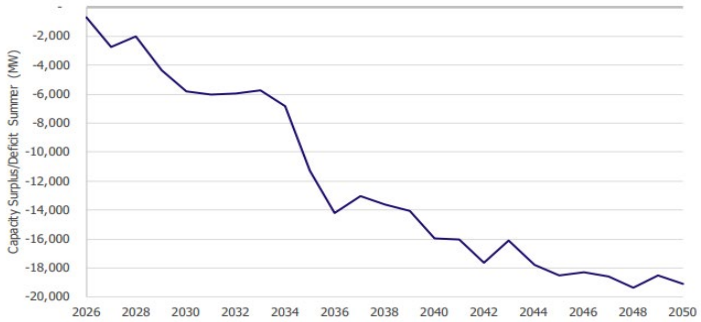
Ontario's electricity demand is projected to rise sharply over the next 25 years, requiring substantial new capacity and energy.

Northern Ontario offers a strategic opportunity to site new generation, supporting provincial reliability and economic development.

However, transmission constraints north of Sudbury limit the generation that can be connected and delivered to the rest of the province.

A key focus will be on understanding transmission constraints and assessing whether targeted transmission investments could unlock cost-effective supply and regional economic benefits.





Demand Forecast Scenarios

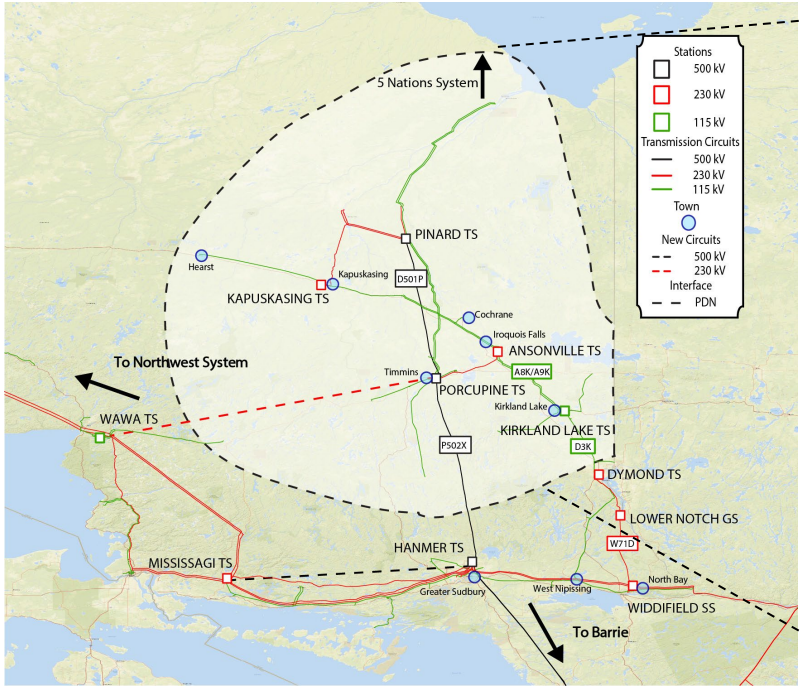
Two scenarios have been developed, accounting for organic load growth, electrification, industrial development and the impacts of weather:

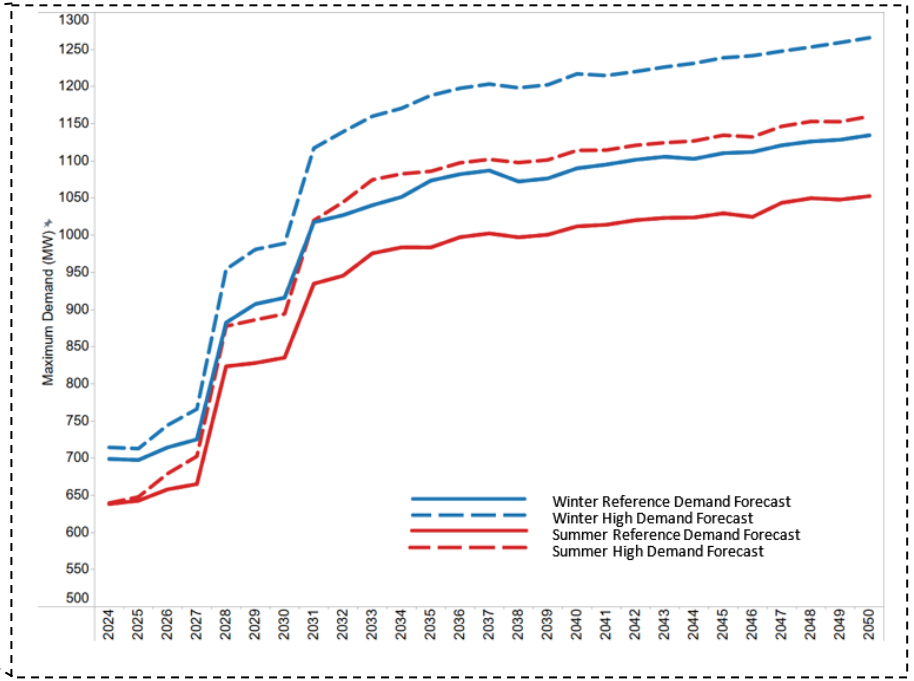
- **Reference Demand Scenario** takes into account existing loads, facilities with completed System Impact Assessments (SIAs), and projects that have reached a committed stage. To reflect uncertainty and varying timelines, the forecast also considers the relative maturity of other projects the IESO is aware of including those that have not yet received an SIA or formal commitment.
- **High Growth Scenario** builds upon the Reference Demand Scenario assumptions and includes additional large industrial projects without discounting

Demand Forecast will drive recommended solutions:

- To accommodate the near- to med-term demand forecast
- To preserve and support potential solutions needed over the long-term

Demand Forecast North of Sudbury – Winter & Summer





See Appendix for additional sub-area plots within the study region.

Demand Forecasts Takeaway

Under the reference demand scenario, peak demand is forecasted to increase by about 45% by 2031 and 60% by 2050, compared to 50% and 80% under the high-growth scenario.

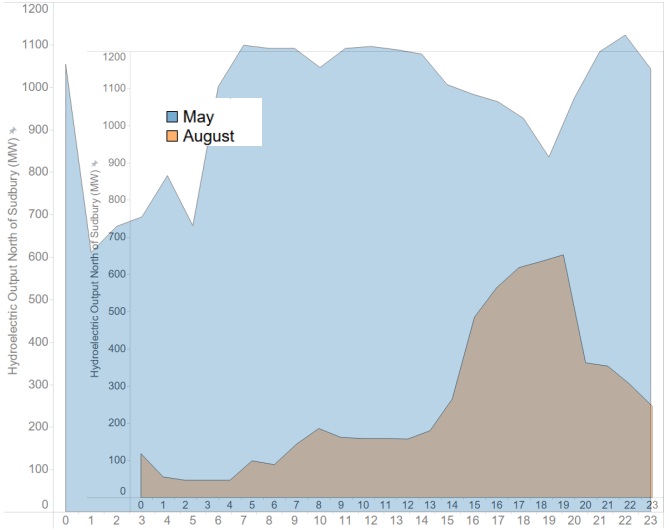
Growth is primarily driven by the connection of large industrial loads:

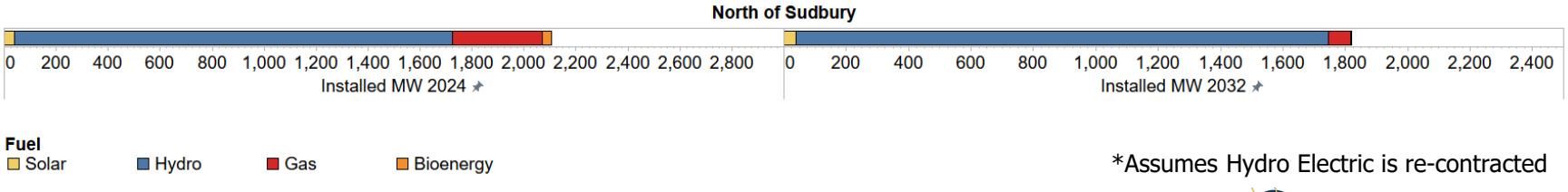
- The development of significant potential mineral deposit supplies in northern Ontario to support electrification vehicle manufacturing.
- Adoption of industrial process electrification in existing mines to improve operational economic efficiencies.

Forecast of Existing Generation

Installed Capacity North of Sudbury is declining and variable/limited in energy:

- > 200MW of thermal generation contracts ending by 2032
- Solar resources are variable in nature, and there can be consecutive days of low output from these resources
- Remaining ~1700MW of hydro-electric generation is energy limited (unable to run continuously)
- Therefore, we must plan for appropriate levels of generation
- **Future potential generation is considered in the evaluation of options**





*Assumes Hydro Electric is re-contracted

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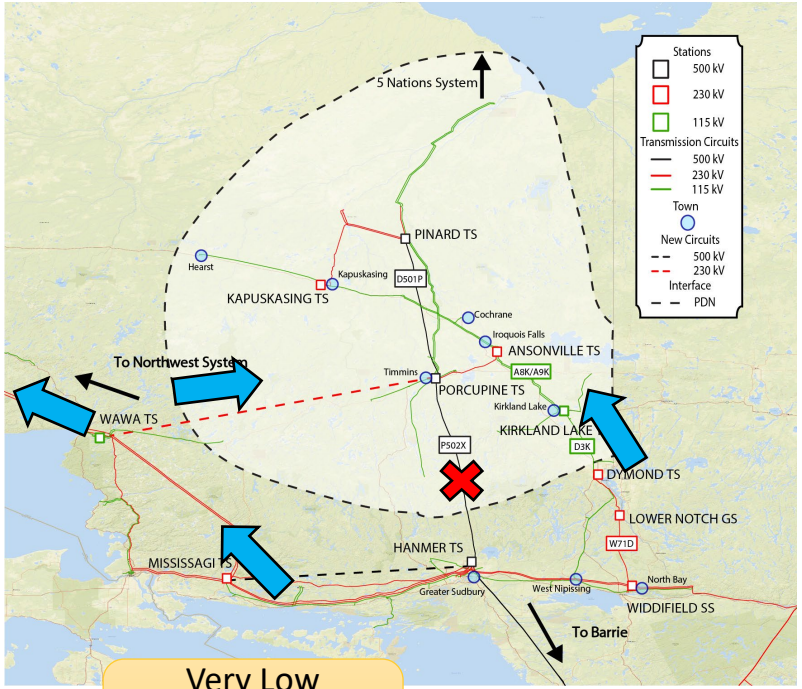
Needs Study – Background

The area north of Sudbury is connected to the rest of Ontario by two circuits: P502X (500 kV) and D3K (115 kV), with a third (230 kV to Wawa) planned for 2030.

P502X acts like a major highway, but if it's out of service, power must reroute through smaller, slower circuits prone to congestion.

- When hydro production is low, power flows north on P502X to meet demand.
- During high hydro production (freshet), power flows south to supply Southern Ontario.

If P502X fails, only one circuit (two by 2030) remains, risking equipment overload and voltage issues.



Very Low Thermal Ratings, High Impedance

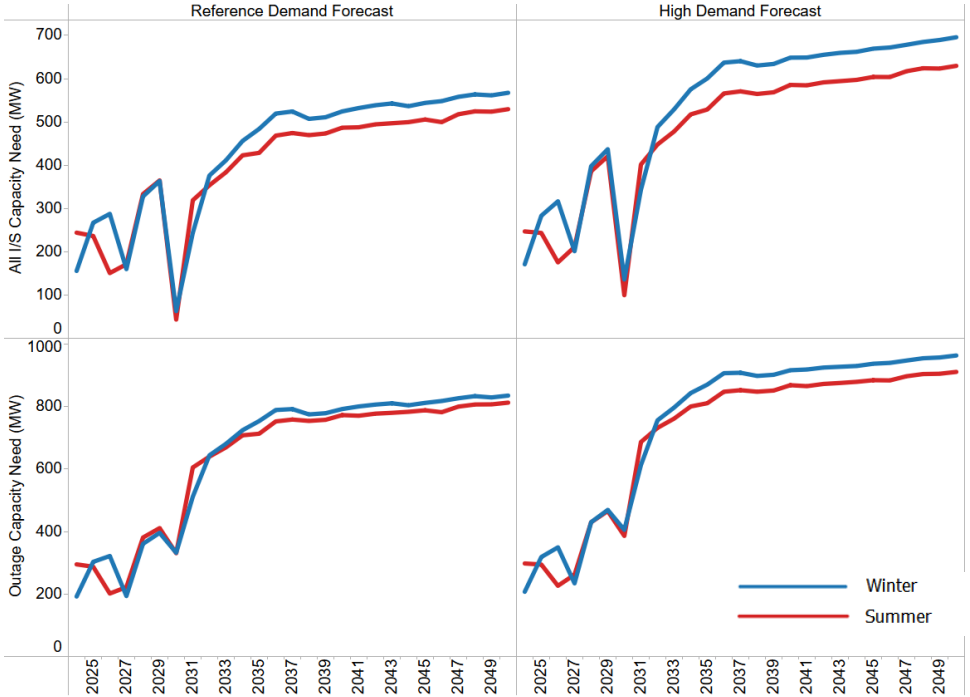
Needs Study – Findings

Both summer and winter electricity needs exist as a result of:

- Flat industrial demand profile
- Low overnight hydro generation (energy-limited resources)
- Decline of thermal generation under contract

The need will grow as additional demand connects to the area, eventually using up all the new capacity provided by the circuit between Porcupine TS and Wawa TS

While there is already a need today, this area has historically been managed through load rejection schemes, strategies that intentionally interrupt loads when a transmission circuit trips.



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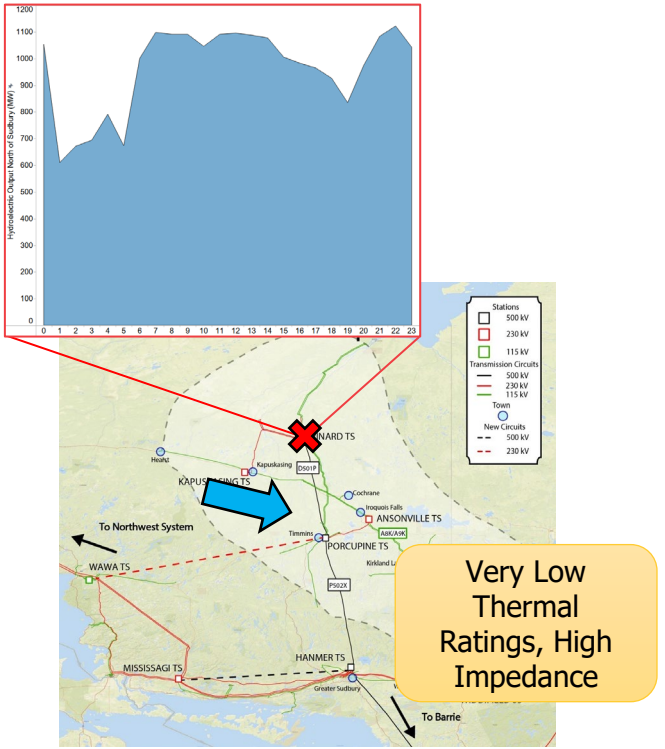
Challenges During High Generation

During periods of high hydroelectric output, exporting power from the area becomes difficult.

If a major transmission element is lost (as shown), all hydro generation shifts to the underlying 115 kV system.

This creates the need for remedial action schemes (RAS) that trips generation and loads to prevent unacceptable system conditions such as cascading outages or uncontrolled separation.



Objectives of the Options Analysis

The options analysis will focus on addressing the following key challenges identified in the North of Sudbury Bulk Study:

- Reliability gaps during low hydro conditions
- Inability to site new resources and congestion during high generation periods
- Aging infrastructure
- Assess Long Lead-Time Resource Opportunities

Next Steps & Staying Engaged

Upcoming milestones for the North of Sudbury Bulk Plan:

- Feedback due to engagement@ieso.ca by October 31, 2025.
- Quarterly update in Q4 2025 to provide a status update.
- Final report to released and published in Q1 2026.

Learn more about this plan by visiting the engagement webpage and subscribing to receive updates.

Eastern Ontario Bulk Plan

Eastern Ontario Bulk Plan Overview

Public engagement for the Eastern Ontario Bulk Plan began on September 24, 2024. The study focuses on developing a plan to address forecasted transmission system reliability issues.

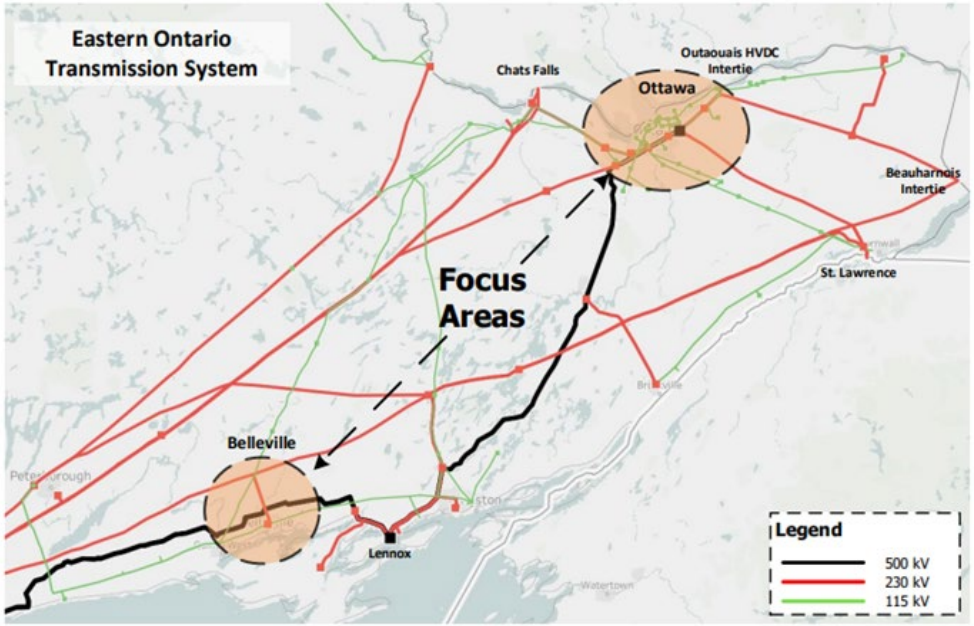
The study objectives include:

- evaluating the adequacy of electricity supply to key focus areas (including Ottawa, Belleville) over the next 20 years;
- assessing opportunities for expanding interties with neighbouring Quebec and New York; and
- exploring opportunities to improve transmission capability to deliver new resources located in Eastern Ontario.

Focus Areas - Background

Belleville Study: Aims to assess the bulk transmission system supplying the Belleville area and to identify the required transmission system enhancements to support regional demand growth.

Ottawa Study: Aims to assess the bulk transmission system capability, focusing on the Flow Into Ottawa (FIO) transmission interface, and identify the required bulk system enhancement to increase the FIO transfer capability to support regional demand growth and facilitate additional power transfer with neighbouring jurisdictions.



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Eastern Ontario Bulk Plan

Summary of Feedback – To Date

Key Areas of Feedback	Summary of the IESO Response
Need for Additional Data and Transparency	Key planning data is available through the Annual Planning Outlook, Data Directory, and bulk study webpages. Further detail on the timing and magnitude of needs will be shared at the appropriate stage in the study.
Explore alternative solutions, such a non-wire alternatives	The study is still in the early stages, and the assessment of potential options to enable the above-mentioned study objectives will be completed over the coming months.
Enable projects identified through Long Lead-Time Resource procurement	The Eastern Ontario Bulk Study will review the capability of the bulk system to support enabling projects identified through the Long Lead-Time Resource procurement, with insights from this work helping to identify potential areas where future projects could materialize.
Expand transmission infrastructure from the Wesleyville site to support future capacity needs, including exports.	The Eastern Ontario Bulk Study will assess options to increase eastbound transmission capability from Bowmanville/Lennox area to supply eastern Ontario, in coordination with the South and Central Bulk Study, which is focused on enhancing westbound capability. The IESO expects future bulk studies to explore options to ensure sufficient transmission capacity from the Wesleyville site. More information will be made available once planning for this next study kicks off.

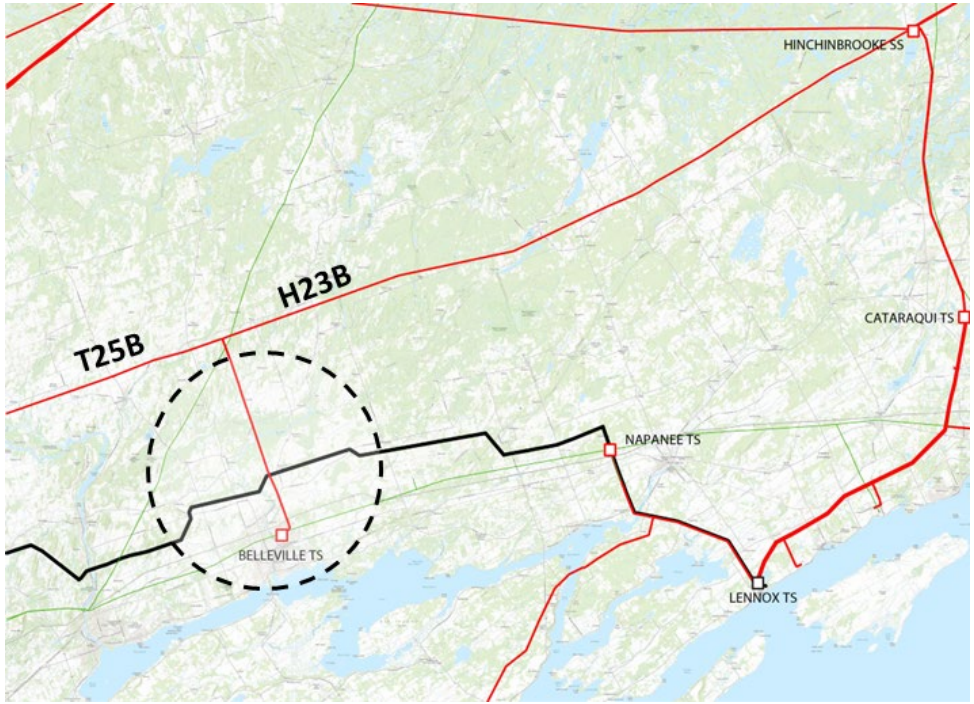
The webpage to view all received feedback and the IESO's responses can be found here.

Supply to Belleville Study

This study aims to assess the bulk transmission system supplying the Belleville area and to identify the required transmission system enhancements to support regional demand growth.

Coordinated with the ongoing Peterborough to Kingston IRRP to ensure alignment and consistency.

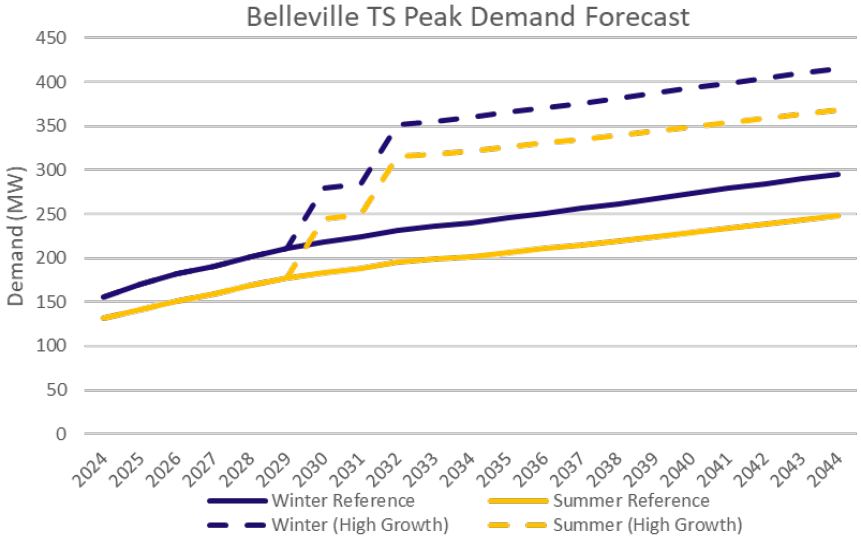
This study has completed the needs analysis and is currently in the option evaluation stage.



Supply to Belleville Study - Demand Forecast

Electricity demand in the Belleville area is expected to continue growing, consistent with forecasts in the ongoing Peterborough to Kingston IRRP

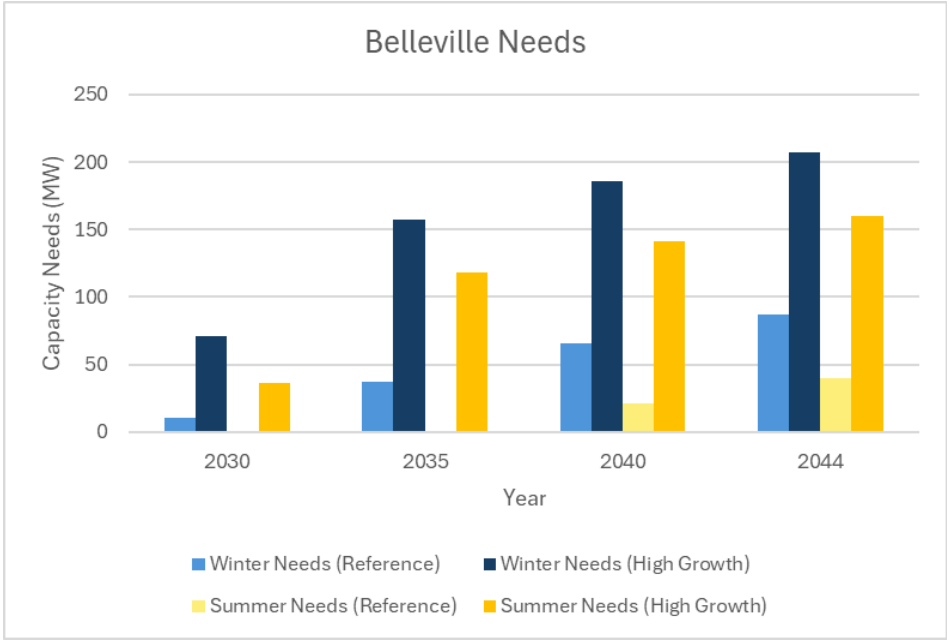
- The Reference Demand Forecast is aligned with the IESO Annual Planning Outlook (APO).
- The High Growth Forecast considers additional industrial growth to account for potential future industrial development in the area.



Supply to Belleville Study – Needs Summary

The existing transmission system has insufficient Load Meeting Capability (LMC) to reliably supply the forecast load growth in the Belleville area:

- Under the Reference Demand Forecast, electricity need is expected to begin in the year 2030, and is sustained over the planning horizon
- The High Growth Forecast, which reflects potential industrial development, is expected to drive higher electricity needs

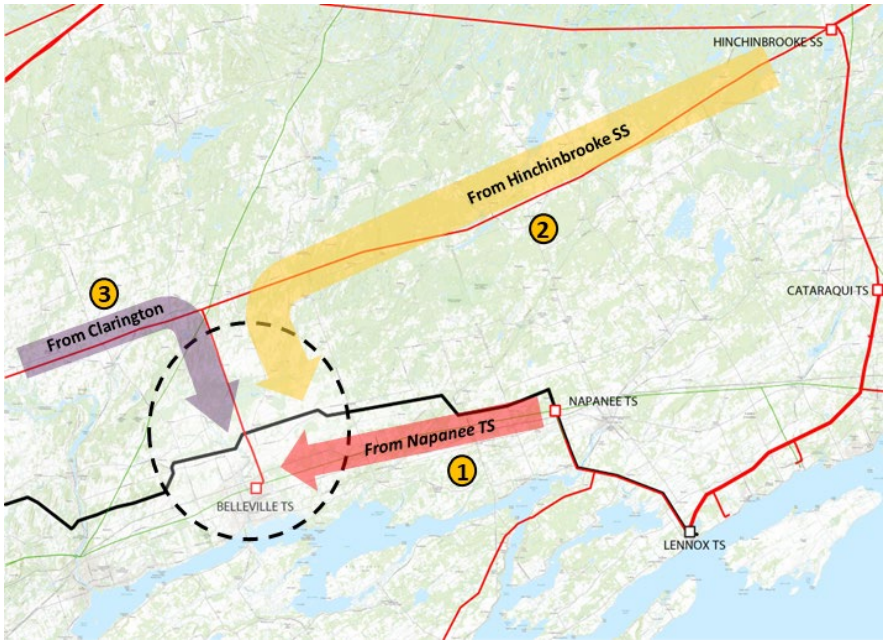


Supply to Belleville Study - Option Development

We are currently evaluating both non-wires and wires options to address the identified needs to supply Belleville:

- Non-Wires Options: A wide range of options have been developed, including electricity demand side management (eDSM), incremental energy efficiency, demand response (DR), energy storage and/or generation facilities
- Wires Options: Several transmission reinforcement options have been developed, and more details are provided in the following slides.

Supply to Belleville Study - Preliminary Wires Options



Draft transmission reinforcement options to enhance the 230 kV supply to Belleville from various sources:

- Option 1: Napanee to Belleville
- Option 2: Hinchinbrooke to Belleville
- Option 3: Clarington to Belleville

Common Foundational Considerations:

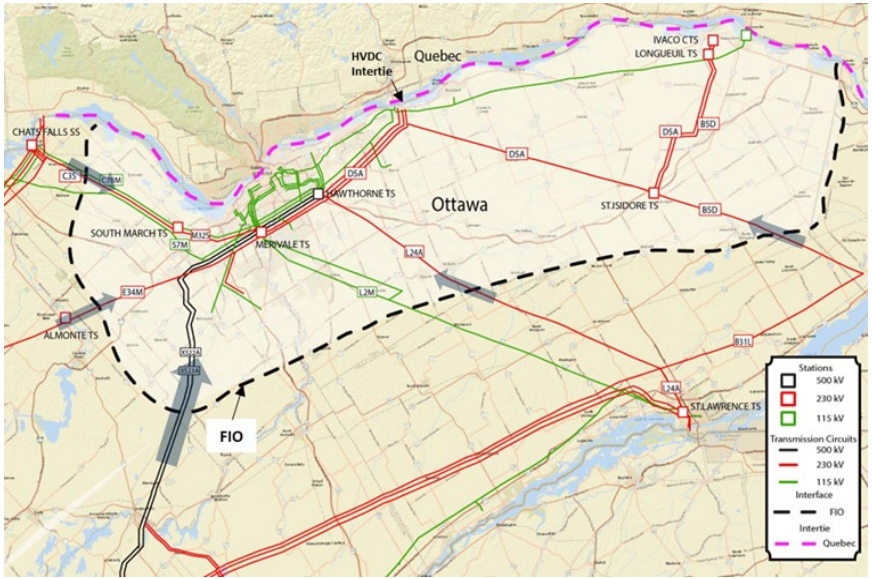
- A new switching station would be needed to support all options, enabling sectionalization, operational flexibility and future scalability.
- Reactive Compensation Devices are considered across all options to maintain voltage stability and improve system performance.

Supply to Ottawa Study

This study aims to:

- assess the bulk transmission system capability to supply Ottawa, focusing on the Flow Into Ottawa (FIO) transmission interface.
- identify the required bulk system enhancement to increase the FIO transfer capability to support regional demand growth and facilitate additional power transfer with neighboring jurisdictions.

Coordinated with the recently published Ottawa IRRP to ensure alignment and consistency.



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Key Bulk Transmission Interface

To serve Ottawa demand, the electricity system relies on both local generation and transmission lines, which form the Flow Into Ottawa (FIO) interface comprising:

- two 500 kV circuits between Lennox TS to Hawthorne TS
- four 230 kV circuits: two originating from St. Lawrence TS (or Beauharnois), one from Chats Falls SS, and one from Clarington TS

The FIO interface plays a critical role in meeting Ottawa demand and supporting exports to Quebec.

Demand Forecast

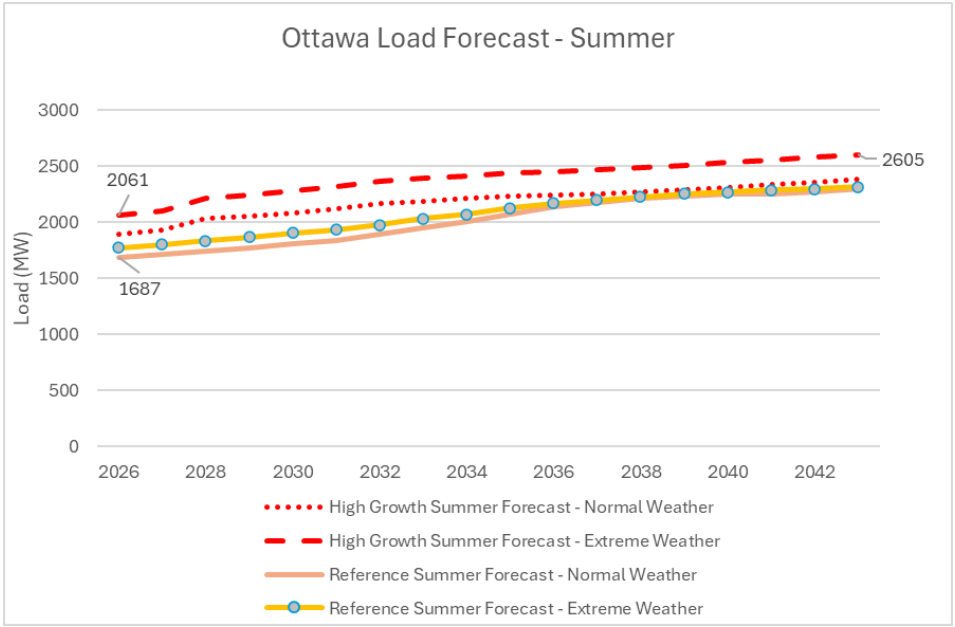
This bulk system study considers a range of demand forecast scenarios.

- The Reference Demand Forecast is aligned with the 2025 IESO Annual Planning Outlook (APO) and will be updated to reflect the 2026 APO once available.
- The High Growth Forecast incorporates the demand forecast outlined in the Ottawa Integrated Regional Resource Plan (IRRP).

The scenario planning approach is being adopted to:

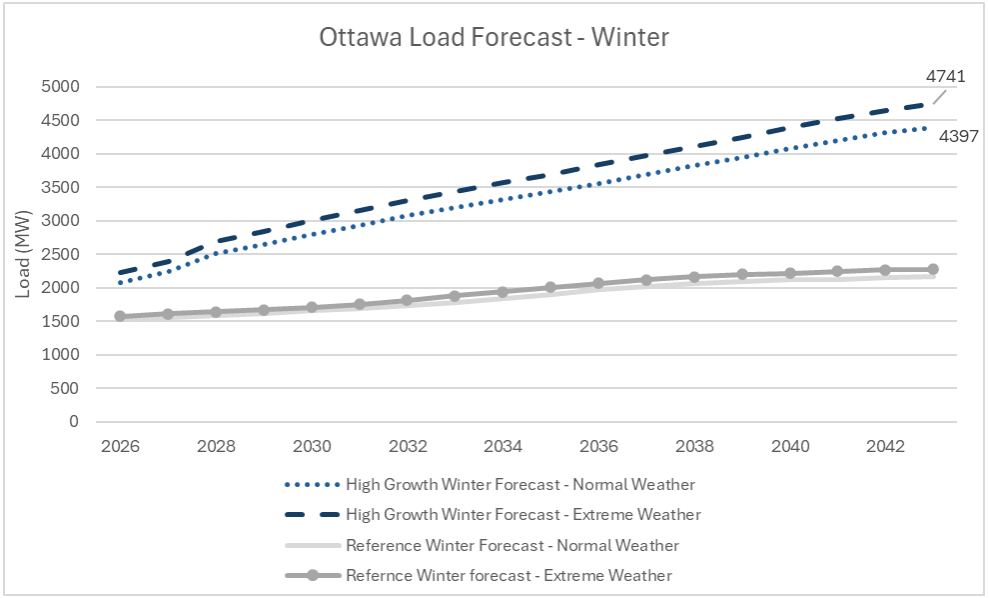
- capture a range of potential demand growth,
- maintain alignment with regional planning efforts and help ensure local developments and electrification trends are appropriately reflected, and
- ensure flexibility and robustness.

Demand Forecast - Summer



Demand forecast scenarios show similar trends in summer demand

Demand Forecast - Winter



Winter demand projections differ between the two scenarios, with the High Growth anticipating significantly higher growth primarily driven by increased electrification assumptions due to decarbonization.

FIO Interface – Existing Limitations

The following issues that limit FIO transfer capability today were identified:

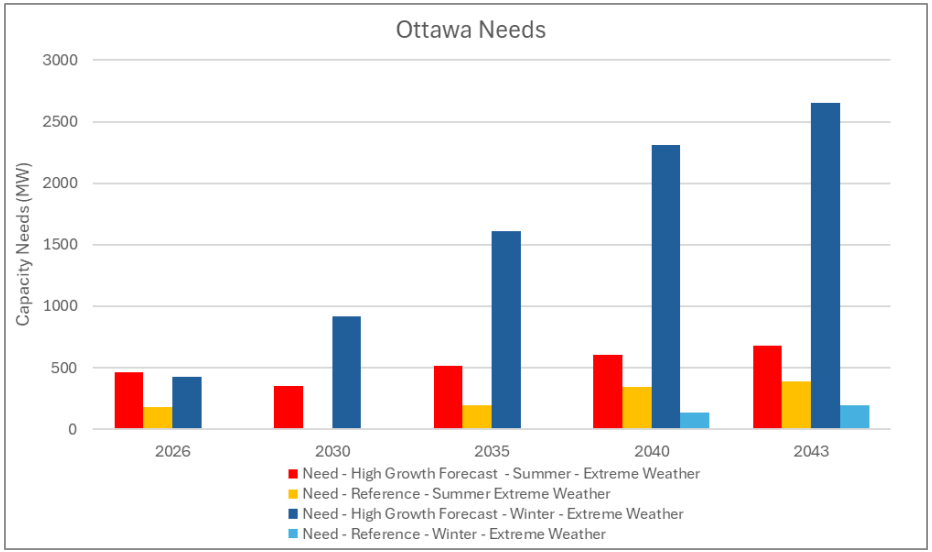
- Thermal overloading on the remaining 500/230 kV autotransformer following the loss of two other autotransformers at Hawthorne TS. This issue is due to one autotransformer, installed in 2023 to replace a failed unit, having a lower thermal rating than the other two.
- Voltage stability issues under outage conditions involving the loss of both existing 500 kV circuits.
- 230 kV thermal overloading issues under outage conditions involving the loss of both existing 500 kV circuits.

Operational measures can currently be utilized to manage the limitations associated with these identified issues.

Draft Needs Summary - All Elements In Service

The existing transmission system has insufficient capacity to reliably supply the forecast extreme weather peak demand growth in the Ottawa area:

The need is expected to grow to approximately 400 MW and 2,650 MW by year 2043, depending on the demand forecast scenario.

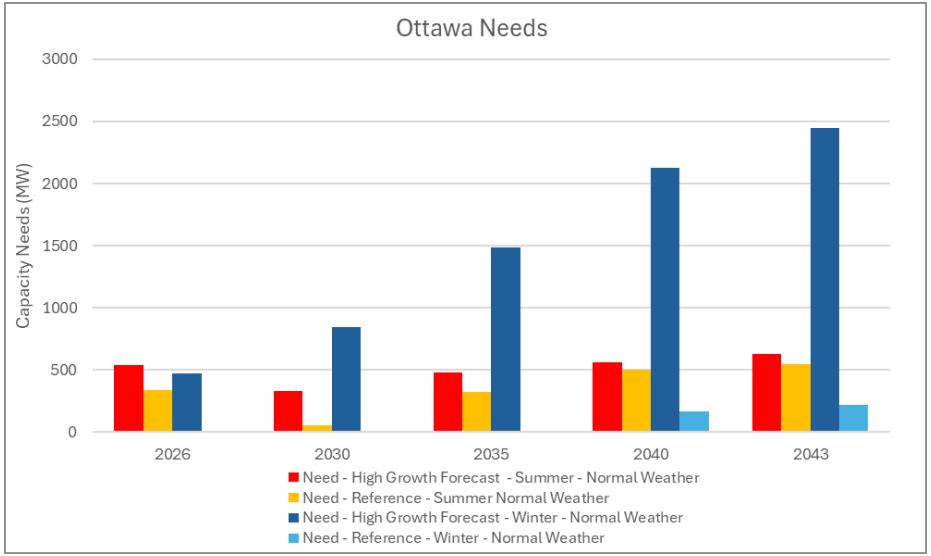


Draft Needs Summary - Outage

The needs under a transmission circuit on outage shows that the electricity system has insufficient capacity to reliably supply the forecast normal weather peak demand growth in the Ottawa area:

The need is expected to grow to approximately 550 MW and 2,450 MW by year 2043, depending on the demand forecast scenario.

While some system improvements are expected by 2030 with new resources and transmission coming in service, the need for additional capacity will persist due to growing demand.



Option Development

The IESO will be developing and evaluating both non-wires and wires options to address the identified needs to supply Ottawa:

- Non-Wires Options include electricity demand side management (eDSM), incremental energy efficiency, demand response (DR) and energy storage and/or generation facilities.
- Wires Options include new or upgrading transmission stations or lines, and additional reactive power support facilities.

Draft findings will be shared at the next Bulk Planning Study update webinar.

Next Steps & Staying Engaged

Upcoming milestones for the Eastern Ontario Bulk Plan:

- Feedback due to engagement@ieso.ca by October 31, 2025.
- Quarterly update in Q4 2025 to share options and draft recommendations.
- Final report to released and published in Q1 2026.

Learn more about this plan by visiting the engagement webpage and subscribing to receive updates.

South and Central Bulk Plan

Recap: Objectives of the South and Central Bulk Study

The study focuses on supporting economic growth and enabling new supply resources by:

1. **Confirming transmission reinforcements required to enable the connection of:**
   - Small modular reactors at the existing Darlington nuclear GS and expanded nuclear at Bruce NGS.
   - Considering potential pumped storage at Meaford and Marmora.
2. **Determining transmission required to enable decreased reliance on emitting resources, specifically:**
   - York Energy Center in York Region; Portlands Energy Center in city of Toronto; Halton Hills GS in GTA West; Sithe Goreway GS in GTA West.
3. **Determining transmission required to enable reliable supply under various long-term high growth/ economic development/ electrification scenarios within key growth areas:**
   - Greater Toronto Area.
   - Windsor to Hamilton corridor.
4. **Ensuring transmission reinforcements recommended through the Northern Ontario Bulk Study are coordinated with bulk system improvements in the GTA.**

Recap: Early Actions

In Q4 2024, the IESO recommended a set of Early Actions to accelerate the pace of future upgrades by reducing development lead times for new projects when there is sufficient confidence in their necessity and/or risk in delaying implementation. Based on the South and Central Bulk Plan, two actions were proposed and included in the Ministry's Integrated Energy Plan released in June 2025:

1. A new double-circuit 500 kV transmission line from Bowmanville to Toronto
2. Corridor studies within the GTA

Since the identification of these early actions, detailed study has continued for the needs and options in each of the four study modules (Bruce, GTA, East of Toronto, and Windsor to Hamilton).

This led to the development of portfolios of options, which refine the scope of the original early actions (i.e. termination for the Bowmanville line and early uses for the corridors under study) and identify additional reinforcements critical to ensuring the system is future-ready.

Recap: Development of Preliminary Portfolios

The IESO developed three distinct preliminary portfolio of options, representing different approaches to meeting the study objectives. Each portfolio addressed the identified needs emerging between 2035 and the early 2040s (later dates tied to the timing of Bruce C). Study of 2050 needs and options will be studied in Phase 2 in 2026.

Portfolios of options were used due to the volume of system changes being contemplated. Assessing the costs and benefits of a portfolio of options that meet the plan's objectives allows the evaluation of alternatives to better consider the impact of the uncertainties in how the power system will evolve (e.g., the impact of different load and generation futures on overall system costs for the different transmission build out options).

Each portfolio shares a common backbone (i.e., strategic, future-ready investments), critical for achieving key plan objectives under several futures. In each portfolio, these "future-ready" investments are paired with additional reinforcements to meet the overall objectives of the South and Central bulk plans. Variations between portfolios are focused on different options for supporting growth (e.g., economic development) in the load centres.

Recap: Preliminary Portfolio A

New 500 kV Transmission Lines (grey):

- Bruce to Essa double-circuit (potential bypass to Kleinburg)
- Bruce to Longwood double-circuit (potential bypass to Lakeshore)
- Potential Longwood to Nanticoke single-circuit
- Bowmanville to Parkway double-circuit
- Essa to Kleinburg single-circuit

New 230 kV Transmission Lines (red):

- Trafalgar to Oakville
- Meadowvale to Hurontario
- Potential Orangeville to Detweiler

New Stations (blue):

- Kleinburg TS and potential St. Thomas TS

Station Upgrades (purple)

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Recap: Preliminary Portfolio B

New 500 kV Transmission Lines (grey):

- Bruce to Essa double-circuit (potential bypass to Kleinburg)
- Bruce to Longwood double-circuit
- Potential Longwood to Detweiler to Milton
- Bowmanville to Parkway double-circuit
- Essa to Kleinburg single-circuit

New 230 kV Transmission Lines (red):

- Trafalgar to Oakville
- Meadowvale to Hurontario

New Stations (blue):

- Kleinburg TS and St. Thomas TS

Station Upgrades (purple)

Recap: Preliminary Portfolio C

New 500 kV Transmission Lines (grey):

- Bruce to Essa double-circuit (potential bypass to Kleinburg)
- Bruce to Longwood double-circuit
- Potential Longwood to Detweiler to Milton
- Bowmanville to Parkway double-circuit
- Essa to Kleinburg single-circuit

New 230 kV Transmission Lines (red):

- Trafalgar to Oakville
- Meadowvale to Hurontario
- Potential Buchanan to Middleport

New Stations (blue):

- Kleinburg TS

Station Upgrades (purple)

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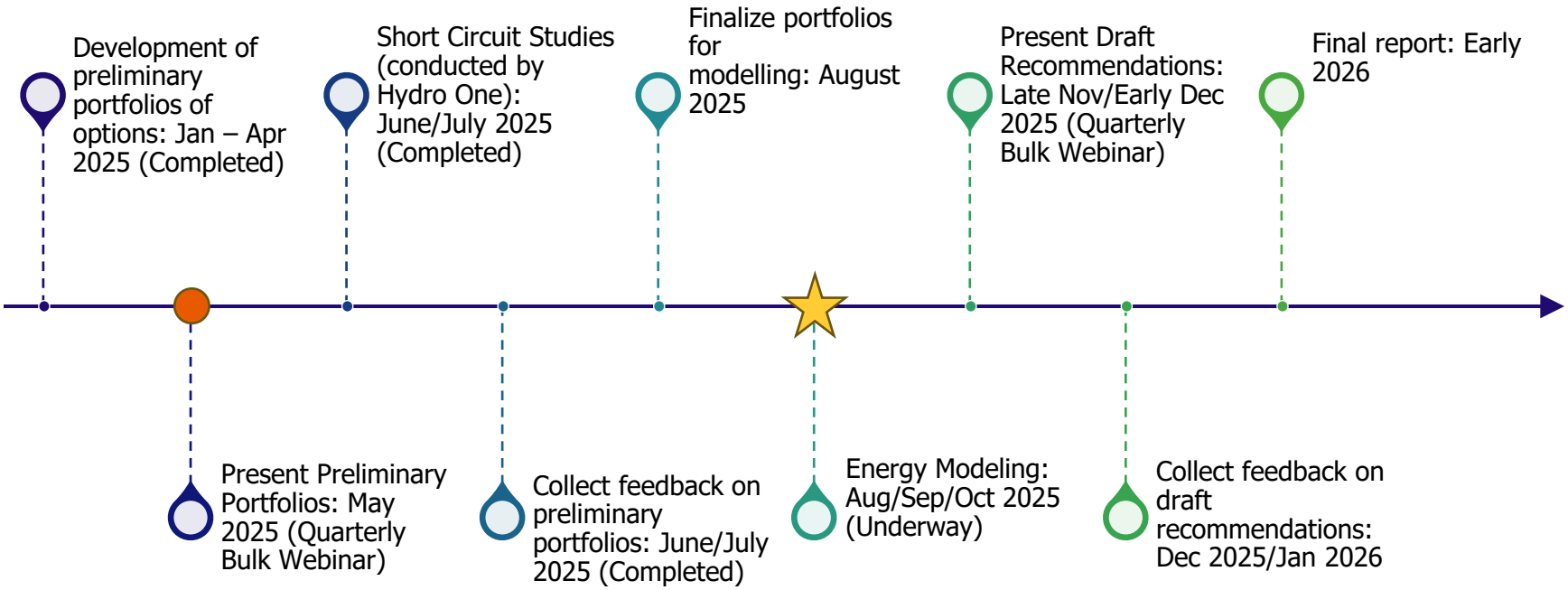
Study Timeline



Feedback Received – To Date

Key Areas of Feedback	IESO Response
Need for Additional Data and Transparency	Key planning data is available through the Annual Planning Outlook, Data Directory, and bulk study webpages, while ongoing engagement opportunities facilitate dialogue related to system expansion and planning methodologies.
Reducing Development Time is Important	In November 2024, the IESO shared Early Actions to reduce development lead time for new infrastructure projects, when there is sufficient confidence in its need and/or risks associated with delaying implementation.
Evaluation of non-wire alternatives is important	This study was initiated to review the capability of the bulk system to support future generation connections and demand growth in key areas throughout southern and central Ontario, including the GTA and Hamilton to Windsor, to enable a decarbonized power system in the future. The options under evaluation will improve deliverability of new resources in key areas. Further details on the 2035 and 2050 needs, and linkages to ongoing regional plans that would inform the impact of non-wires alternatives on the timing and magnitude of the needs, will be addressed in upcoming engagements for the South and Central Bulk plan and provided in the final report.

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

Feedback Received – To Date continued

Key Areas of Feedback	IESO Response
Mixed support for the study options A, B, and C due to the various needs that study-area communities are experiencing	The IESO appreciates the opportunity to clarify that the options under consideration in the South and Central Bulk Study are intended to address these needs as shared through this feedback and provide several approaches as to how these needs can be addressed.
Strong interest exists around alignment and co-ordination of the South and Central Bulk Plan with existing bulk and regional plans as well as planning for the future.	The IESO clarified the integration of bulk and regional planning and encouraged participation in these regional planning initiatives and/or maintain contact with the local distribution company to provide information about anticipated growth and development. Future studies will continue to explore transmission options to ensure future capacity to enable resource and demand changes.
Recommendations were shared with the IESO about the type of information they would appreciate receiving and type of engagement to be undertaken	We will consider these recommendations as planning continues to progress.
Concerns around space availability for future expansions at Detweiler TS	The IESO notes the concerns raised on space limitations and will look at other suitable areas around Detweiler that allow for sufficient connection into the existing network.

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

Refined Draft Portfolios

IESO has refined the draft portfolios and has begun detailed modelling as part of the options evaluation phase. The portfolios were refined based on:

- Results of the short circuit studies conducted by Hydro One on all three draft portfolios
- Written and verbal feedback from South and Central public and targeted engagements
- Developments from on ongoing regional planning in KWCG, GTA West, Toronto, GTA North and the London Area
- Detailed modelling of the specific options in the portfolios, and
- Feedback from existing transmitters on space availability at existing stations.

Energy Modelling Updates

A production cost model will be used to simulate the hourly dispatch of resources to meet electricity demand in the South and Central area, for both the existing transmission system and with each portfolio of options. This enables the economic evaluation between portfolios.

Generation assumptions will be consistent with the 2025 Annual Planning Outlook and will include existing and committed resources in 2035, plus future resources identified through the Capacity Expansion model. Scenarios will be used to explore the impact of the location of these future resources on the economic performance of the different portfolios.

Data Sharing

In October, the IESO will share the following data sets:

- Finalized portfolio details
- Revised zonal diagram demarking the sub-zones created for the energy model
- Sub-zonal level load forecast, aligned with the set-up of the energy model
- Generation assumptions for each scenario, aligned with the set-up of the energy model

Next Steps & Staying Engaged

Upcoming milestones for the South and Central Bulk Plan:

- October: Data tables detailing the revised portfolios and energy modelling inputs.
- Q4 2025: Targeted outreach for final portfolios through parallel regional planning engagements.
- November/December: Webinar to share outcomes of energy modelling and draft recommendations.
- Q1 2026: Final report released which will:
  - Identify actions to initiate development work, as required, to address transmission needs.
  - Identify transmission corridors - new or existing - whose development or preservation should be prioritized to ensure viability of short-, medium-, and long-term options.
  - Highlight unmet needs (where applicable), and the additional steps that may be required to identify solutions or meet needs.

Learn more about this plan by visiting the engagement webpage and subscribing to receive updates.

Next Steps and Discussion

Next Steps

- Feedback submissions (North of Sudbury and Eastern Ontario) are due by October 31, 2025, to engagement@ieso.ca.
- Quarterly updates will continue for each study until final reports are released.
- Final reports to be released and published:
  - North of Sudbury Bulk Plan – Q1 2026
  - Eastern Ontario Bulk Plan – Q1 2026
  - South and Central Bulk Plan – Q1 2026

Discussion

North of Sudbury Bulk Plan:

- What other information should be considered in the examination of needs and potential options?
- What other information should be considered in the continued development of solutions leading up to the recommendations?

Eastern Ontario Bulk Plan:

- What other information should be considered in the examination of bulk system needs to supply Ottawa?
- What feedback do you have regarding any of the proposed transmission options to enhance supply to Belleville?
- What other information should be considered in the continued development of these solutions leading up to the recommendations?

The IESO welcomes written feedback until October 31, 2025. Please submit feedback to engagement@ieso.ca using the feedback form posted on the linked engagement webpages, above.

Thank You

STAY INVOLVED

- Learn more at www.ieso.ca/learn
- Subscribe to updates at IESO.ca/subscribe
- Download the IESO's Municipal Toolkit
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Appendix A

Bulk Transmission Planning Activities

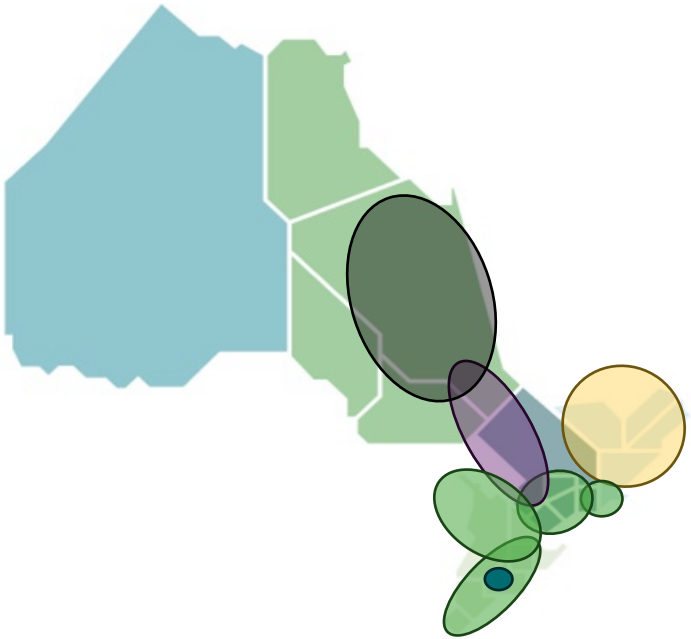
- **Northern Ontario Bulk Plan (Completed)**
  Transmission expansion options between the Greater Toronto Area and Sudbury to facilitate load growth and enable renewable resources.

- **North of Sudbury (Active)**
  Evaluates electricity supply, generation uncertainties, enable new resources, interconnections with Quebec, operational challenges.

- **South and Central Ontario (Active)**
  Accommodating load growth, incorporating new non-emitting resources (small modular reactors, Bruce C), supply to the GTA.

- **Eastern Ontario (Active)**
  Evaluates supply to eastern Ontario (including Ottawa and Belleville areas), and interconnections with Quebec/New York.

- **Central-West (Completed)**
  Ensured reliable electricity supply to support the Volkswagen EV plant plus spin-off and associated growth in the London Electrical Area.

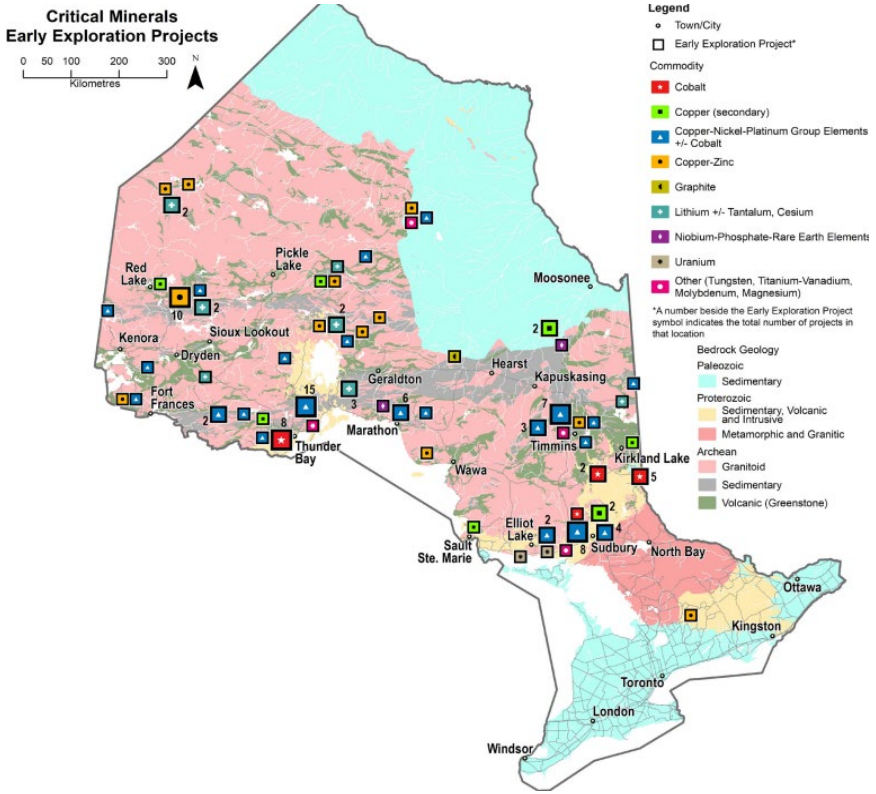


Appendix B – North of Sudbury Sub Area Demand Profiles and Needs

Drivers for Growth

Forecasts continue to show increasing demand growth in Northern Ontario due to:

- The development of significant potential mineral deposit supplies in northern Ontario to support electrification vehicle manufacturing.
- Electrification of metal production sub-sector and mining.
- Adoption of industrial process electrification in existing mines.

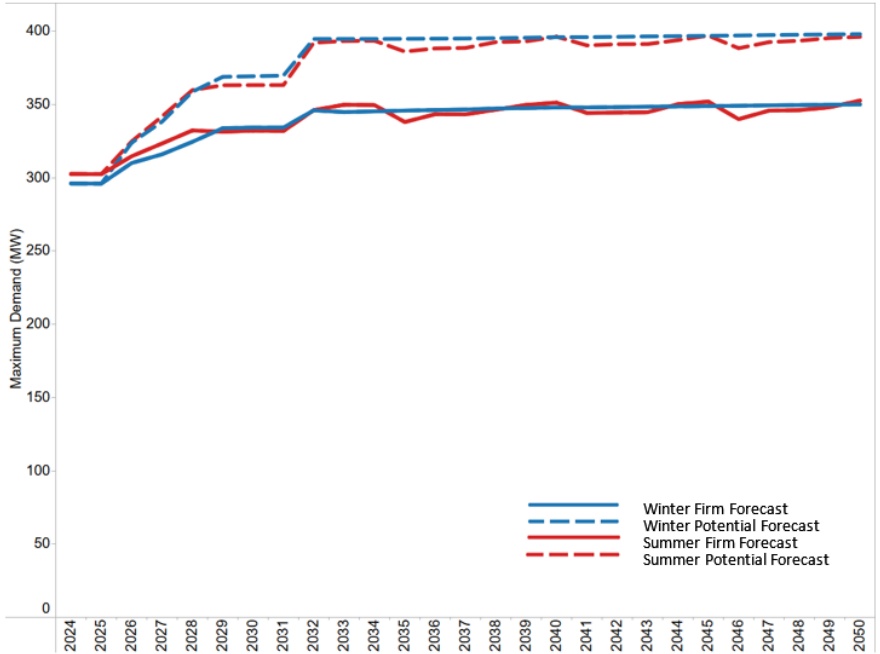


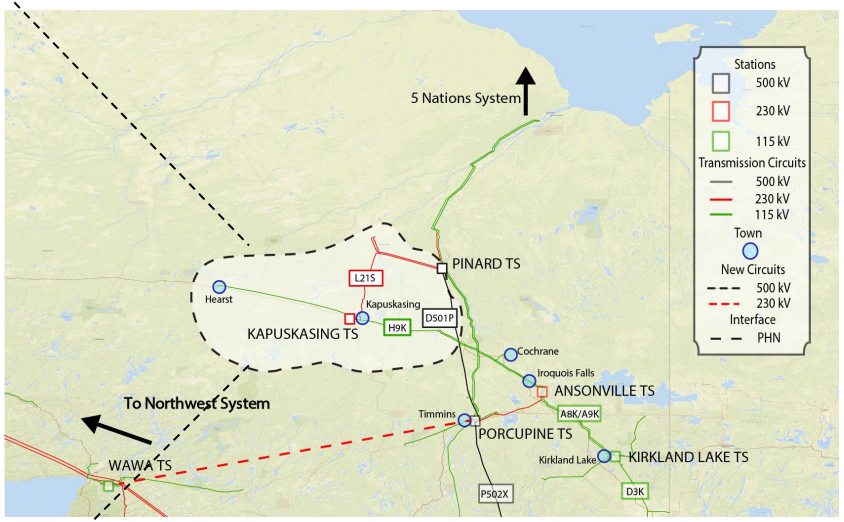
North of Sudbury Scope of Study

The study will focus on developing a plan to address:

- North of Sudbury adequate need, further broken down into various sub areas.
- Challenges siting new resources in this area (Enablement of new resources north of Sudbury, further broken down into the various sub areas)
- 115kV transmission that is end of life.
- Generation mix uncertainties.
- Opportunities for new interconnection with Quebec in the Kirkland Lake area.
- Operability challenges with respect to maintaining voltages.
- Reducing/eliminating the reliance on Remedial Action Schemes ("RAS").
- Any additional needs that emerge in carrying out the Bulk Plan.

Demand Forecast - North of Porcupine /Hunta





Note: Load facilities connected to the Pinard 230 kV bus are geographically east of Pinard and not encircled in the diagram.

The Pinard 115 kV bus is not electrically connected to the 230 kV / 500 kV buses and therefore facilities connected to the Pinard 115kV bus are not within this interface.

Needs Study- North of Porcupine /Hunta

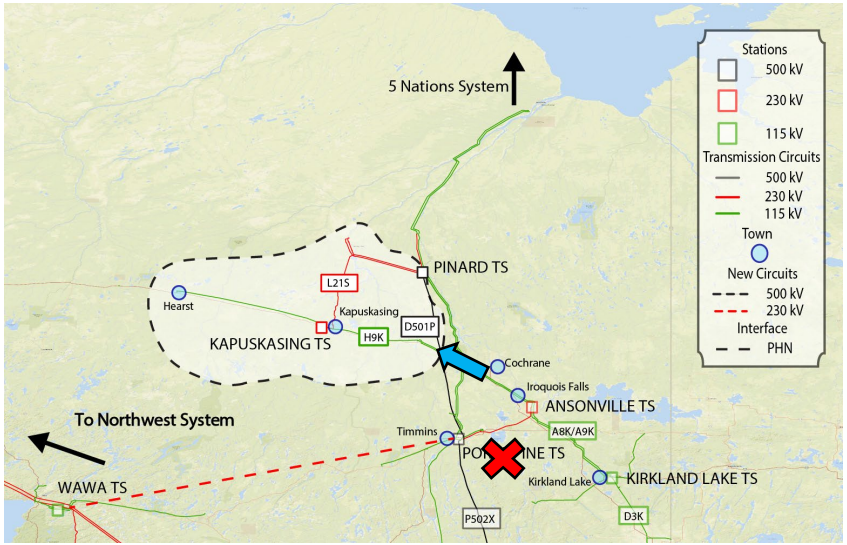
The North of Porcupine /Hunta sub area area is connected to the remainder of the province via H9K (115 kV) and D501P (500 kV)

H9K was originally constructed in the 1930s with low thermal ratings

The circuits that connect the area are also long in length leading to large voltage drops

The loss of D501P leaves the area connected via H9K which leads to unacceptable system performance

This same phenomena will limit the ability to site resources in this area. I.e. a large amount of generation connected only to H9K leads to unacceptable system performance



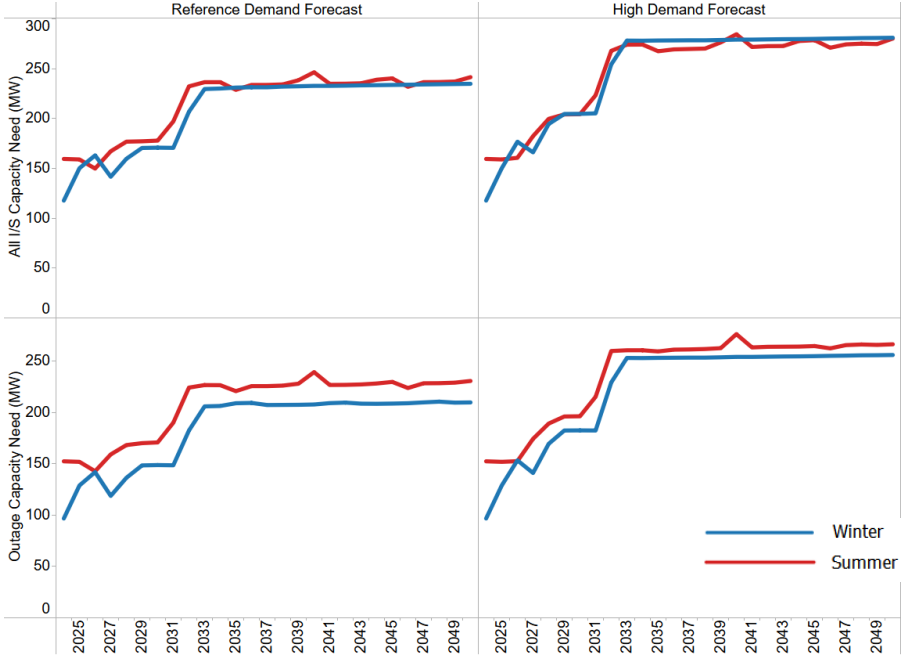
Needs Study – North of Porcupine /Hunta (2)

Both summer and winter needs exist where they are largest, due to:

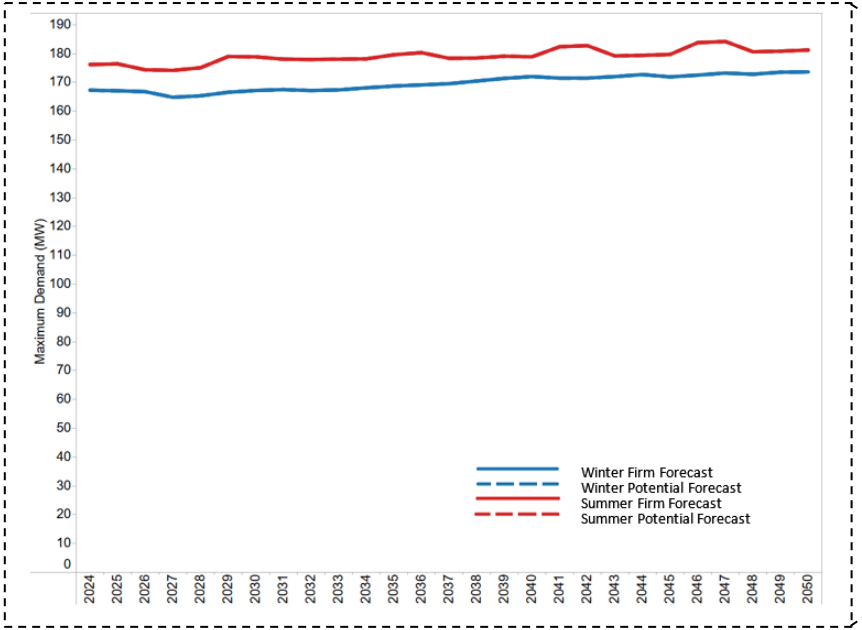
- Flat industrial demand profile
- Low overnight hydro generation (energy-limited resources)
- Decline of thermal generation under contract

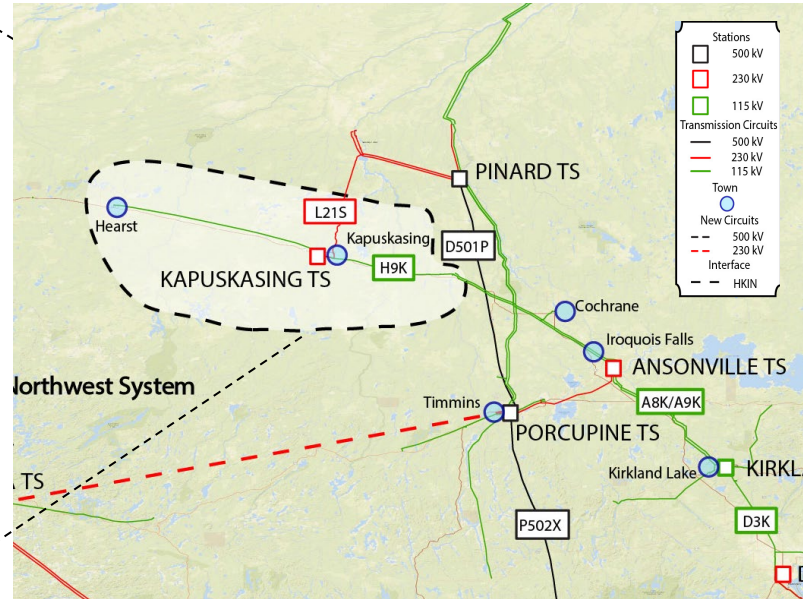
Although there is a need today this is area has historically been operated via the use of load rejection schemes

- Eg. intentionally trip loads when a circuit trips to prevent undesirable outcomes



Demand Forecast - Kapuskasing / Hunta Area





Needs Study- Kapuskasing / Hunta Area

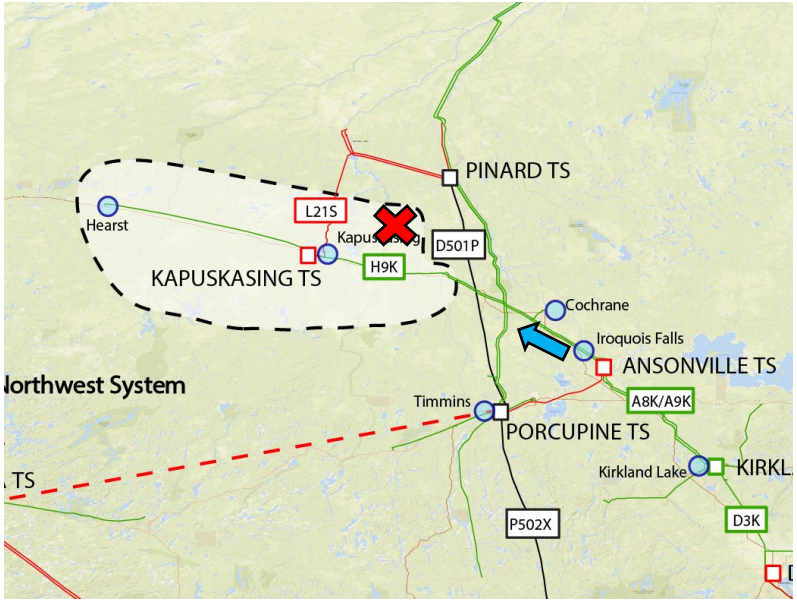
The Kapuskasing sub area area is connected to the remainder of the province via H9K (115 kV) and L21S (230 kV)

H9K was originally constructed in the 1930s with low thermal ratings

The circuits that connect the area are also long in length leading to large voltage drops

The loss of L21S leaves the area connected via H9K which leads to unacceptable system performance

This same phenomena will limit the ability to site resources in this area. I.e. a large amount of generation connected only to H9K leads to unacceptable system performance



Needs Study – Kapuskasing / Hunta Area

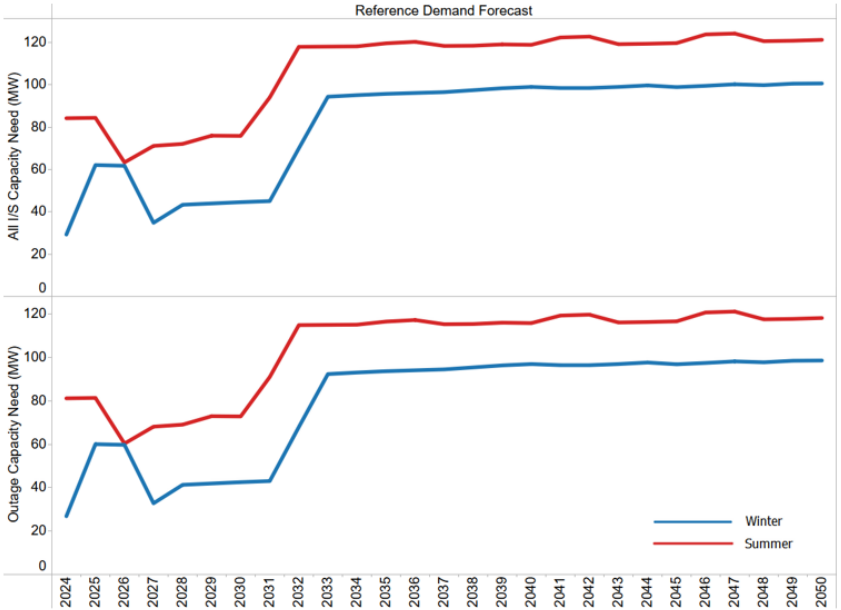
Both summer and winter needs exist where they are largest, due to:

- Flat industrial demand profile
- Low overnight hydro generation (energy-limited resources)
- Decline of thermal generation under contract

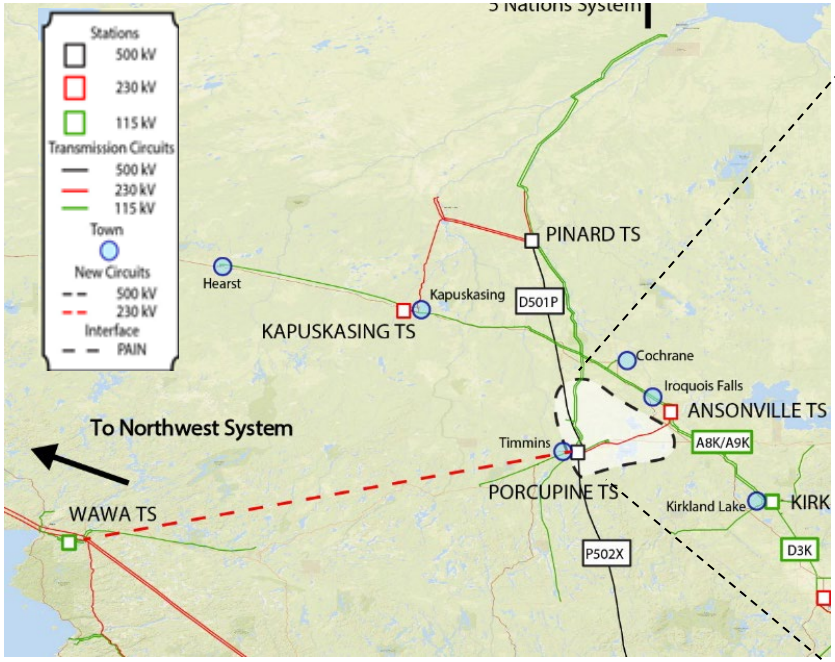
Although there is a need today this is area has historically been operated via the use of load rejection schemes

- E.g. intentionally trip loads when a circuit trip to prevent undesirable outcomes

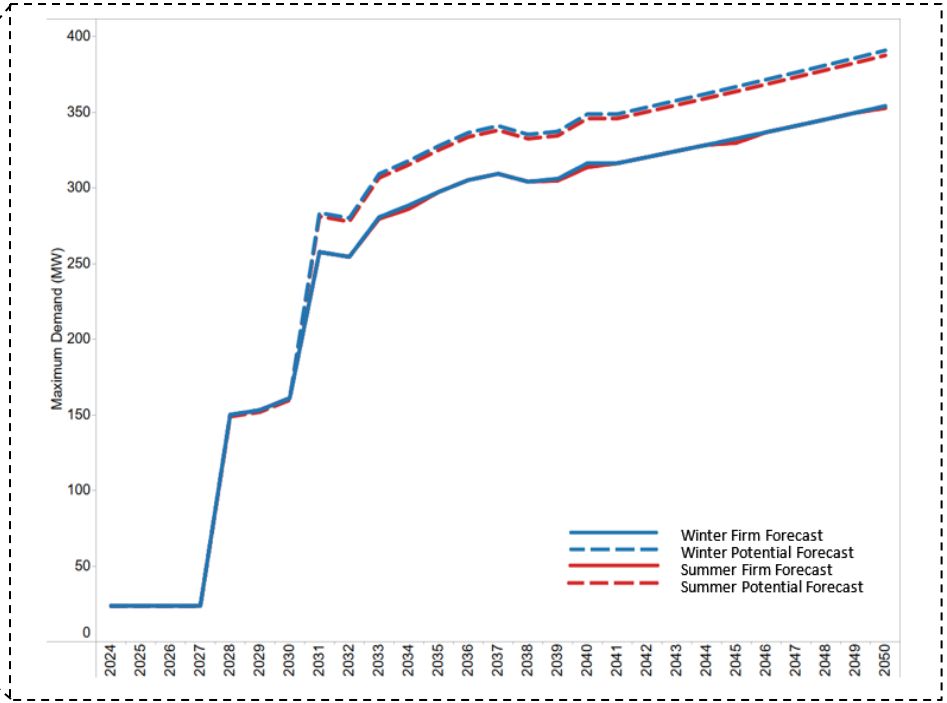
Note: Only the reference forecast needs are shown as there is no high growth forecast for this area



Demand Forecast - Porcupine /Ansonville 230 kV



Note: Transformers not shown, load supplied off 115 kV circuits out of Porcupine are not included in this area

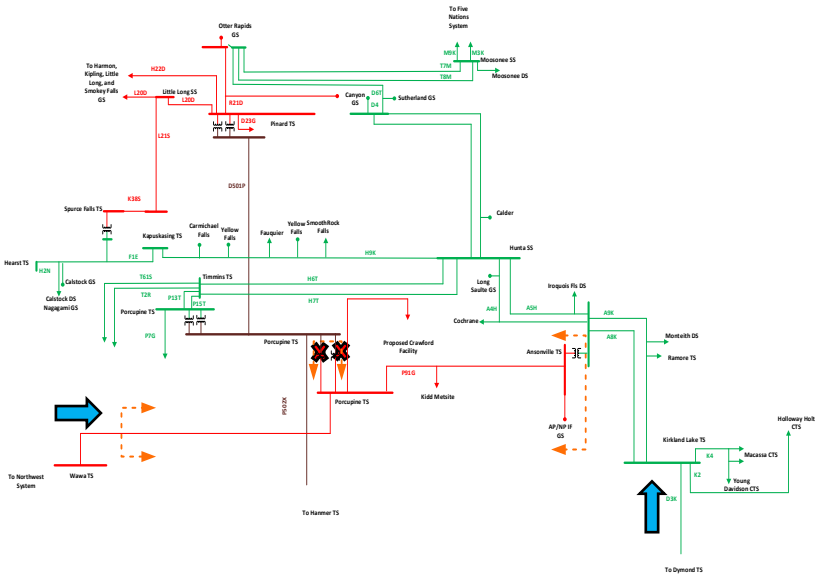


Needs Study- Porcupine /Ansonville 230 kV

In this case the issue arises from the loss of the transformers connecting the 230 kV bus to the remainder of the power system.

Note the transformers are not shown on the previous diagram but are located within the Porcupine Transformer station.

The diagram to right helps illustrate this by showing the components non-geographically and the orange lines represent the geographic boundaries in the previous slide.

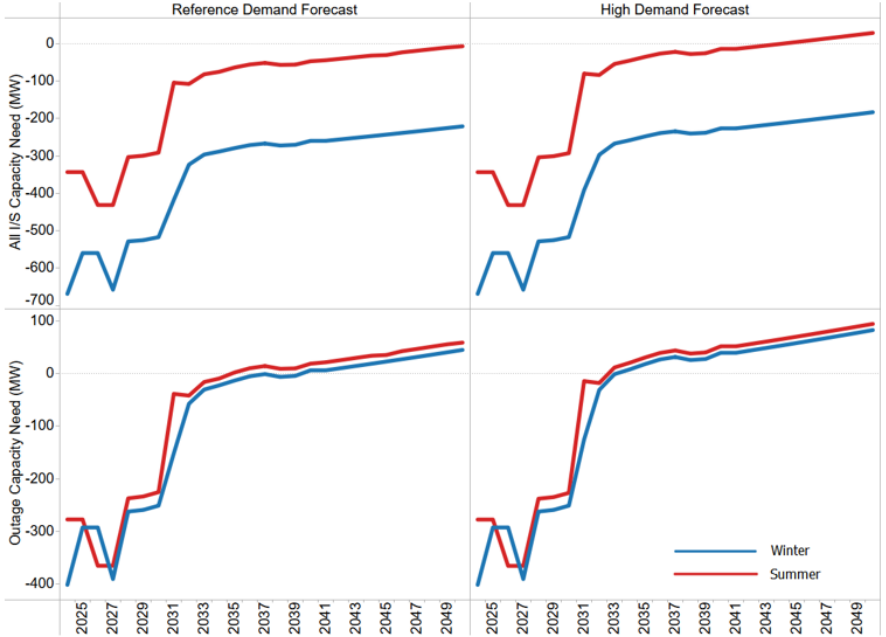


Note not all facilities are shown

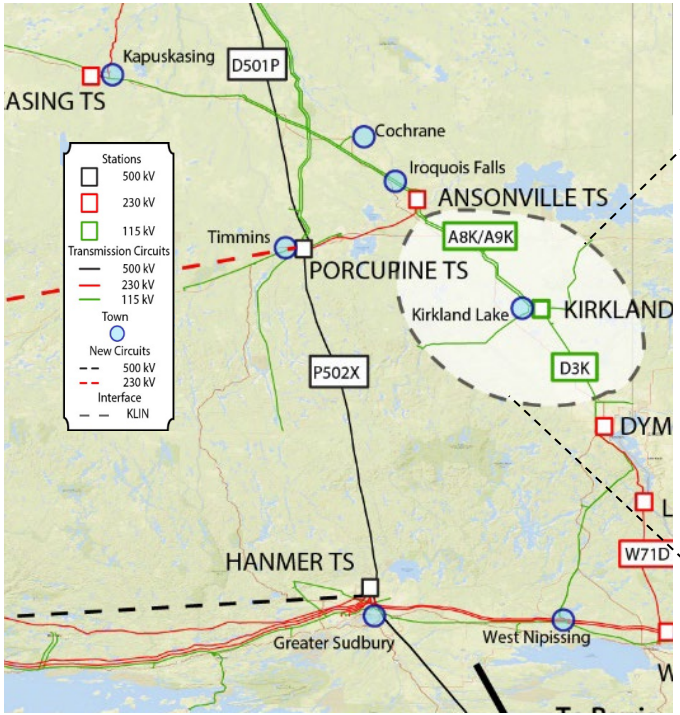
Needs Study – Porcupine /Ansonville 230 kV (2)

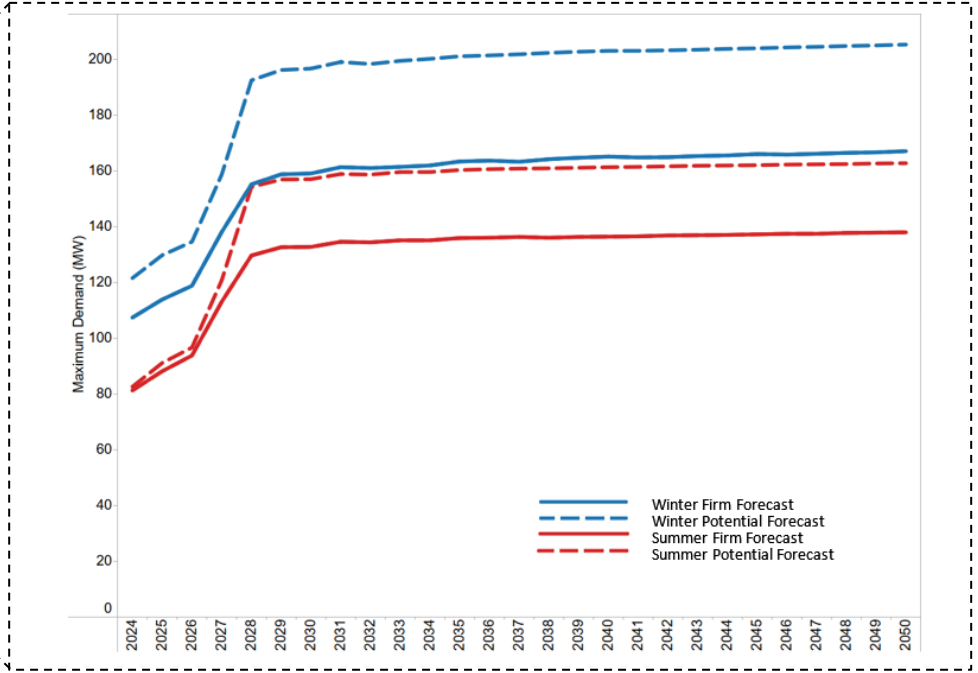
Minor <100MW needs occur following the end of contract of gas facilities and potential retirement of these facilities for both summer and winter months during the outage scenario only.

Given the large amount of inferred resource extraction and refining potential in the Timmins Nickle district, it would be advantageous to align option analysis for other needs with the ability to increase the LMC for this area where possible.



Demand Forecast – Kirkland Lake Area





Needs Study- Kirkland Lake Area

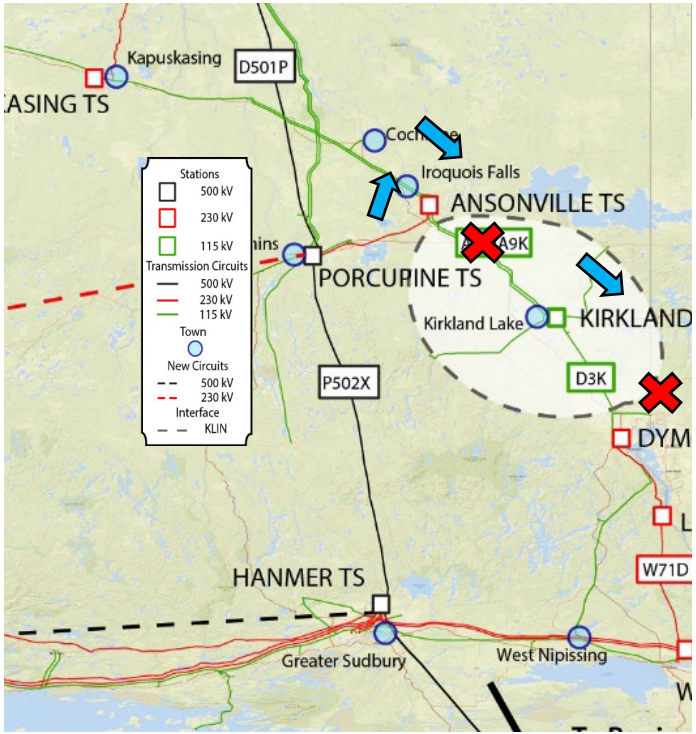
The Kirkland lake sub area is connected to the remainder of the province via D3K and A8K/A9K which are supplied by P91G (230 kV) and A4H/A5H

A4H/A5H were originally constructed in the 1930s with low thermal ratings

The circuits that connect the area are also long in length leading to large voltage drops

The loss of D3K followed by (P91G) results in the entire area supplied by A4H/A5H which leads to unacceptable system performance

The loss of A8K+A9K results in the area left radially connected to D3K limiting the ability to site generation in the area



Needs Study – Kirkland Lake Area

- Both summer and winter needs exist where they are largest, due to:
  - Flat industrial demand profile
  - Decline of thermal generation under contract
- Although there is a need today this is area has historically been operated via the use of load rejection schemes
  - E.g. intentionally trip loads when a circuit trips to prevent undesirable outcomes

Note: Only the reference forecast needs are shown as there is no high growth forecast for this area.