

APRIL 26, 2022

Northeast Ontario Electricity Planning

Today's Webinar

Purpose:

- To provide an update on the Northeast Bulk Plan and seek input on key considerations around scope, needs and potential solutions

Agenda:

- Background
- Scope, methodology and identified needs
- Options development
- Next steps

Seeking Input

- What other information should be considered in the study scope, examination of needs and potential options in Northeast Ontario?
- What feedback do you have regarding any of the options proposed?
- What other information should be considered in the continued development of these solutions leading up to the recommendations?

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



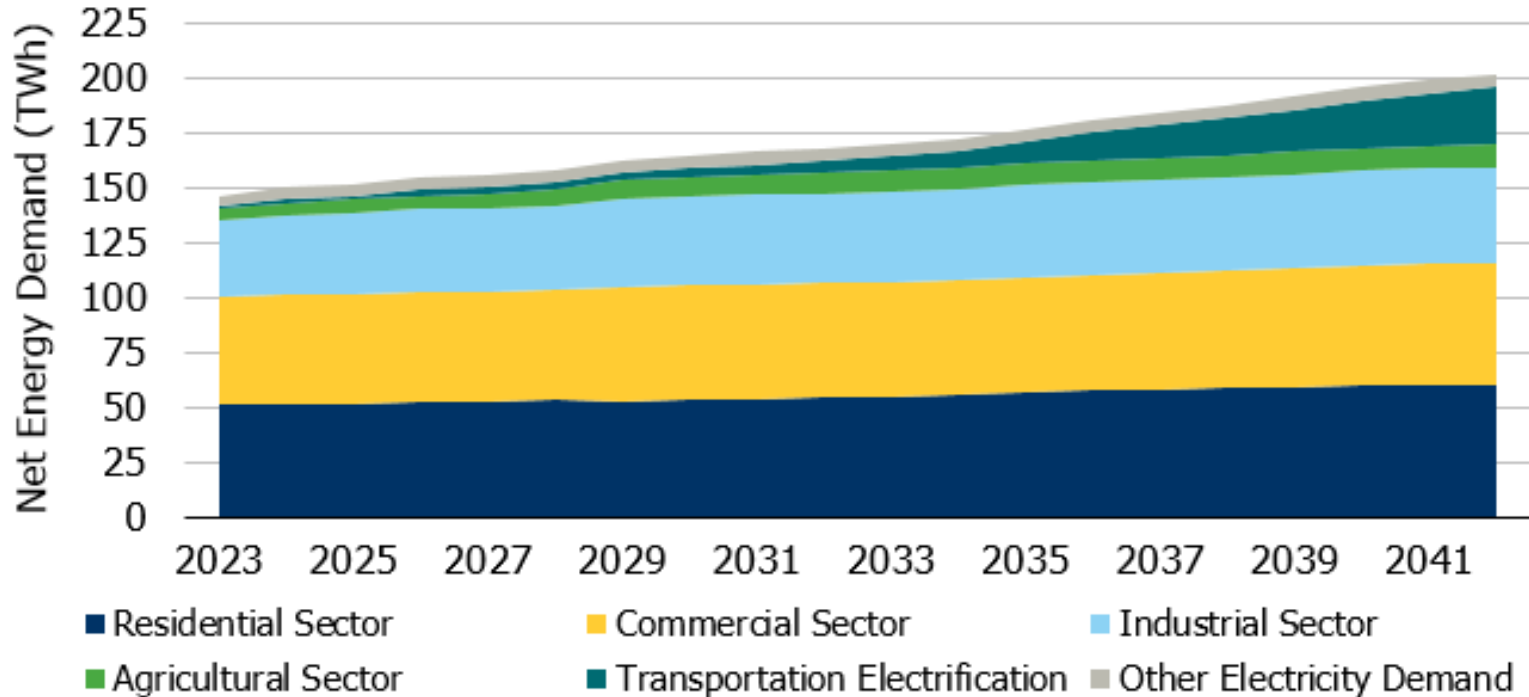
Background

Key Electricity Trends in Ontario Today

- Demand for electricity is on the rise
- Significant growth driven by specific sectors – agriculture, mining and metals
- Existing and new resources will be required to avoid shortfalls
- Technological evolution can support the energy goals of municipalities, Indigenous communities
- Local energy solutions are being tested
- Interest in decarbonization continues to grow, particularly among municipalities

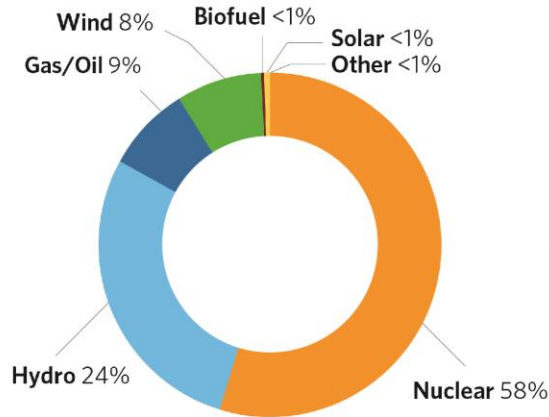


Ontario Has Entered a Period of Demand Growth



Ontario's Electricity Supply Mix Continues to Change

2021 ENERGY OUTPUT BY FUEL TYPE



FUTURE

Exploring pathways to **decarbonization**

Expanded opportunities for **energy storage**

Local energy projects that contribute to the provincial grid

Potential for increased **energy efficiency**

Different Levels of Planning in Ontario



Drivers for the Northeast Bulk Plan

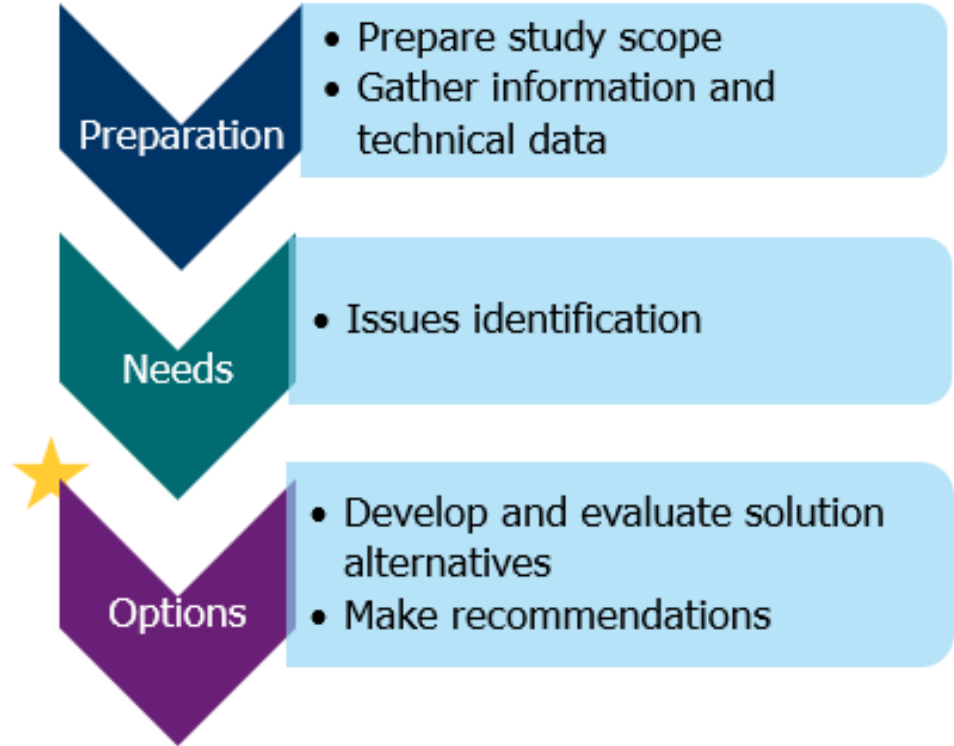
- Northern Ontario* consists primarily of industrial load, particularly in the mining and mineral processing sectors
 - Policies related to economic development and decarbonization have put upward pressure on demand growth
 - Substantial transmission infrastructure upgrades are needed to supply known and future loads in mining and metal sectors
- This plan will:
 - Ensure a reliable electricity supply to Northeast Ontario
 - Consider cost-effective ways of removing constraints on the existing hydro generation in the north
 - Implement a phased approach to addressing needs to align with developments, market trends and policies

*See Appendix for additional details about the Northern Ontario electricity system and projects underway

Northeast Bulk System Plan Development

Components of the Plan Development:

- Data Gathering
- Issues Identification
- Option Development and Evaluation
- Outreach and engagement with communities, stakeholders and public



Plan Status and Activities to Date

- A [public webinar](#) was held on **July 27, 2021** to provide an overview of the Northeast Bulk Plan process
- Study scope and needs have been defined and broader public engagement is being undertaken to seek input on key considerations around scope, needs and potential solutions
- Targeted discussions with communities, customers and stakeholders held in March-April, 2022 to gather input to help inform next steps

What we've heard so far...

- Reliability is important to communities in this region, and in Northeast Ontario more broadly
- Enablement of economic growth and development is a key priority, and lack of electricity capacity and pricing are seen as a significant barrier
- There is strong interest in reinforcing the electricity transmission system in Northern Ontario to provide greater capacity and reliability, on par with Southern Ontario
- There is strong interest in the equity participation of local Indigenous communities in solutions development, particularly related to transmission
- Continued development in mining are expected with potential for agricultural growth (greenhouses)
- Hydrogen, hydrogenation and biomass are key areas of interest from a community energy perspective



Scope, methodology and identified needs

Northeast Bulk Plan Scope

- To determine if the electricity transmission infrastructure in Northeast Ontario is sufficient to supply expected load growth in the areas west of the City of Greater Sudbury to Town of Wawa, and north of the City of Greater Sudbury to City of Timmins
- To explore opportunities to improve transmission system capability to deliver additional capacity to where it's needed



Northeast Electricity Demand Forecast

- An electricity demand forecast was developed to examine the magnitude of projected demand growth in Northeast Ontario and the capability of existing transmission infrastructure to supply this increased load
 - Demand forecast and supply outlook are aligned with the IESO 2021 Annual Planning Outlook (APO)*
- Different scenarios were considered to capture additional industrial developments (e.g., expected developments/expansions in metal and mining) and incremental growth that could materialize in the region
 - While technical assessments are performed for all scenarios, balancing the need to enable growth and risk of overbuilding infrastructure is a key consideration

*<https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook>

Defining Needs: Security Analysis Methodology

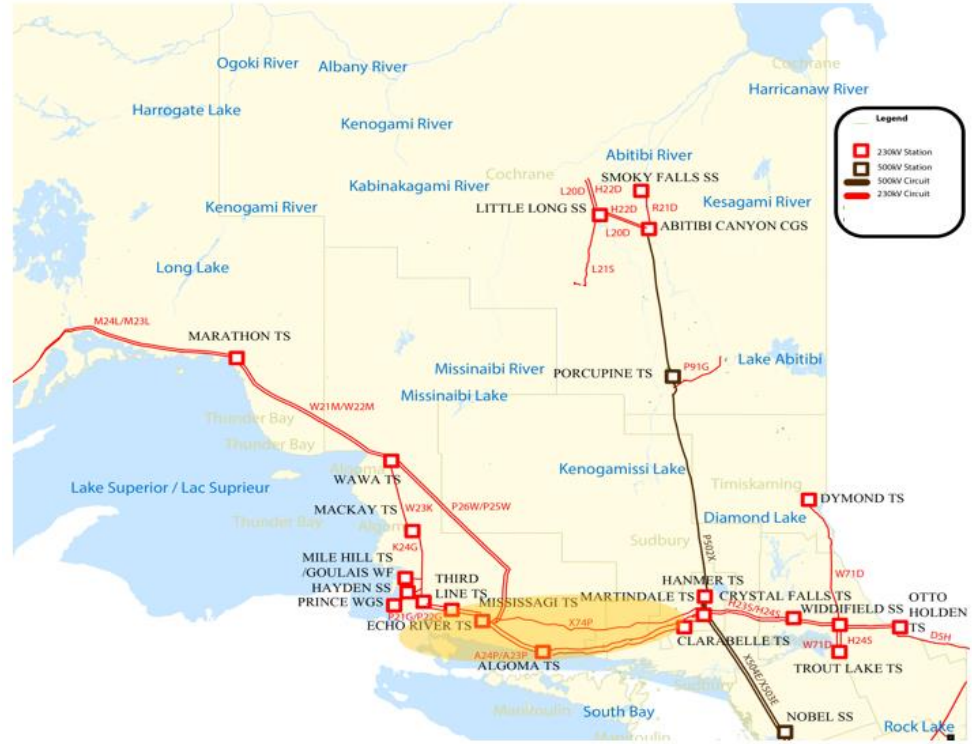
- Bulk system needs are defined based on the electricity demand forecast and the ability of existing infrastructure to supply the increased demand over the long-term
- An analysis is performed in accordance with North American and provincial regulations and requirements* to ensure the system is capable of supplying forecast demand in its current state and also during events and outages (i.e., Security Analysis**)

* [North American Electric Reliability Corporation \(NERC\)](#), [Northeast Power Coordinating Council \(NPCC\)](#) and [Ontario Resource and Transmission Assessment Criteria \(ORTAC\)](#)

**See Appendix for additional information on Security Analysis Methodology

Summary of Needs

- The existing transmission system that supplies the City of Sault Ste. Marie and City of Timmins, and the region west of the City of Greater Sudbury is insufficient to supply the forecasted demand.
- Planning criteria are not met starting in 2029
- Identified reliability needs are expected to be sustained over the next 20 years





Options development

Planning for Emerging Needs

- Based on the forecasted electricity needs in Northeast Ontario, the bulk system plan explores options to:
 - Address the transmission constraints that limit supply to the City of Sault Ste. Marie and City of Timmins areas, and to the region west of Sudbury.
 - Preserve options for future developments/expansions to supply additional increase in loads or accommodate more generation in Northern Ontario

Identifying Options

- Both wires and non-wires options have been developed identified, developed and evaluated

Option	Description
Wires	Transmission system reinforcements such as a new transmission corridor, new circuits within existing corridors and upsizing of infrastructure within existing corridors
Non-wires alternatives	Considers a wide range of resource types including Generation, Solar and Wind, Hydroelectric, Small Modular Reactor, Storage and Fuel Cells

Non-wires Alternatives and Considerations

- Alternatives and considerations of new resources will be explored with a wide range of resource types including Generation, Solar and Wind, Hydroelectric, Small Modular Reactor, Storage and Fuel Cells
- The feasibility and practicality of a new generation option has been evaluated aligning with IESO's Resource Adequacy Framework
- Preliminary economic assessment results indicate that the transmission option is a more cost effective option compared to generation options
 - Further details on the options assessment will be provided and input will be sought in subsequent engagement sessions. Depending on the feedback received, the IESO may revisit this preliminary assessment.

Wires Options

Supply to Sault Ste. Marie



Alternative A – New 230 kV line from Mississagi TS to Third Line TS (Sault Ste. Marie) within existing right-of-way

Alternative B – New 230 kV line from Wawa TS to Mackay TS to Third Line TS (Sault Ste. Marie) within existing right-of-way



Supply to Timmins and the region west of Sudbury



Option 1 – New 500 kV or 230 kV line from Porcupine TS (Timmins) to Wawa TS within a new corridor and right-of-way along Highway 101

Option 2 – New 500 kV or 230 kV line from Hanmer TS to Mississagi TS within existing corridor and right-of-way

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?

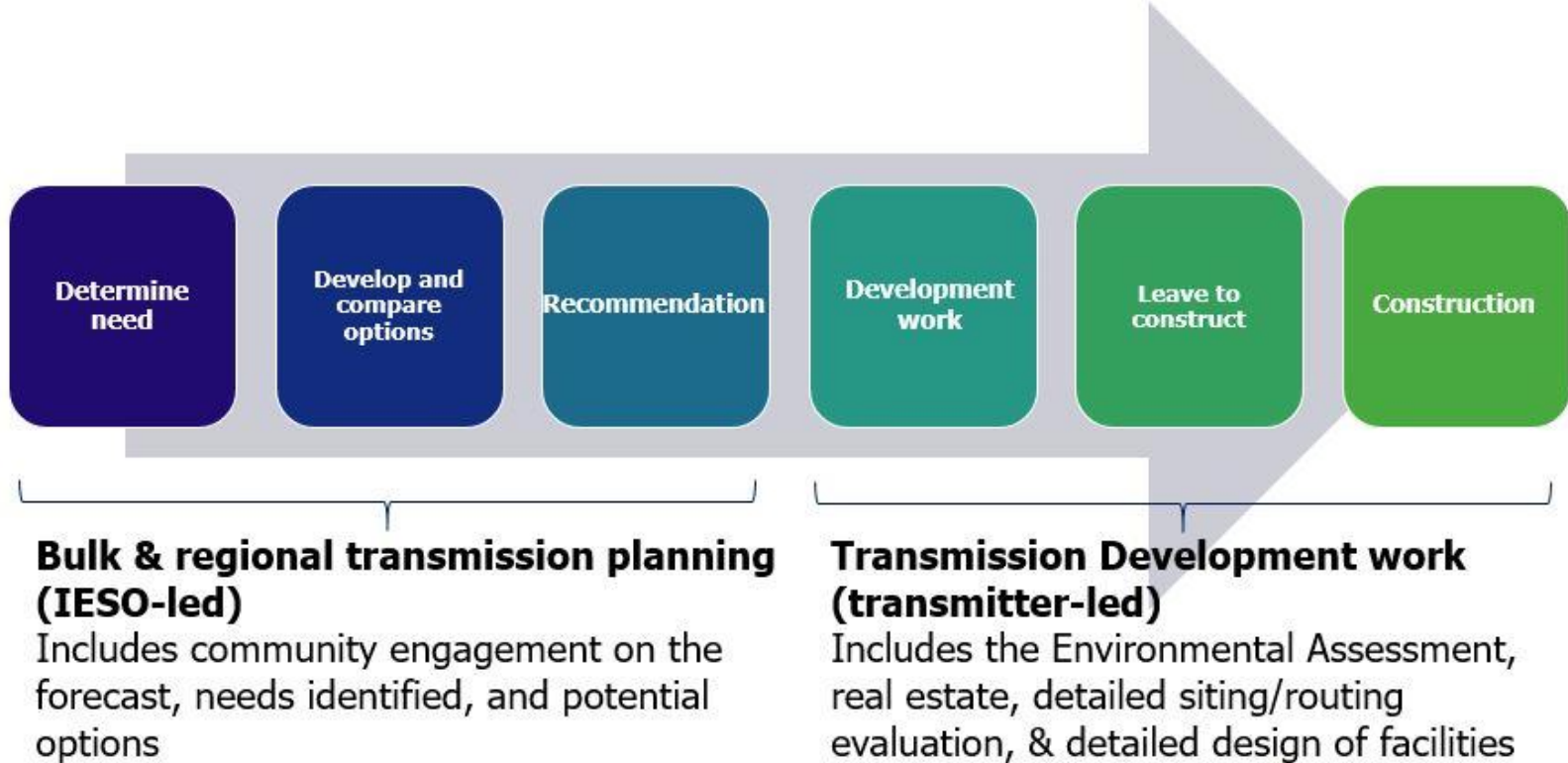
Preliminary Findings

- The following transmission reinforcements are likely to be the most effective way to address the Northeast bulk system needs:
 - a) A new double circuit 230 kV transmission line between Wawa TS and Porcupine TS;
 - b) Conversion of the existing 230 kV circuit between Mississagi TS and Hanmer TS to 500 kV and addition of two new autotransformers at Mississagi TS;
 - c) A new single circuit 230 kV transmission line between Mississagi TS and Third Line TS;
 - d) Voltage Control devices.

Preliminary Findings (2)

- The preferred transmission option will:
 - Address the identified system needs to accommodate forecasted load growth;
 - Further enable additional load in the west of Sudbury to Wawa area;
 - Enhance the connection between the Northeast and the Northwest and can help remove constraints on the existing hydro generation located in Northeast.

Typical Transmission Development Process





Next steps

Engagement Plan – Draft Timeline

A draft [engagement plan](#) for the region is now posted for comment on the engagement webpage:

Milestone	Timing	Key Areas for Input
Study scope, needs and potential options	Q1-Q2 2022	What additional information should be considered in the examination of needs and potential solutions? What feedback is there to the potential options? What factors should be considered in evaluating options?
Options analysis and draft recommendations	Q3-Q4 2022	What feedback is there to the options analysis and draft recommendations? What information should be considered in finalizing the recommendations?

Next Steps

- Deadline for written input on study scope, examination of needs and potential solutions – May 17
- Continued engagement with communities and stakeholders to inform plan development – Q3 2022
- Public webinar #2 to provide details of the options analysis and seek input on recommendations – Q3 2022
- Final Northeast Bulk Plan is expected to be posted Q3 2022
- Ongoing engagement for North & East of Sudbury regional electricity plan

Your Input is Important

- What other information should be considered in the study scope, examination of needs and potential options in Northeast Ontario?
- What feedback do you have regarding any of the options proposed?
- What other information should be considered in the continued development of these solutions leading up to the recommendations?

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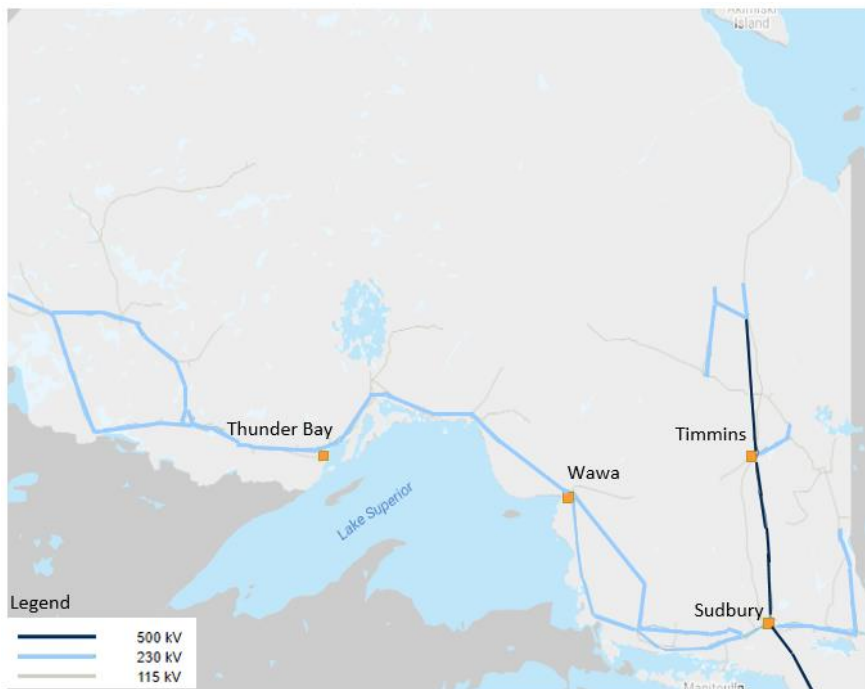
Keeping in Touch

- Follow Northeast Bulk planning activities – [Northeast Ontario Bulk Planning Initiatives \(ieso.ca\)](https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Regional-Electricity-Planning-Northeast-Ontario)
- Dedicated engagement webpage – <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Regional-Electricity-Planning-Northeast-Ontario>
- Follow North & East of Sudbury regional electricity planning activities – <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Regional-Electricity-Planning-North-East-of-Sudbury>
- Join the Northeast Regional Electricity Network – <https://www.ieso.ca/en/Get-Involved/Regional-Planning/Electricity-Networks/Overview> > join Northeast Network
- Email engagement@ieso.ca with any questions or comments



Appendix

Landscape of Electricity in Northern Ontario



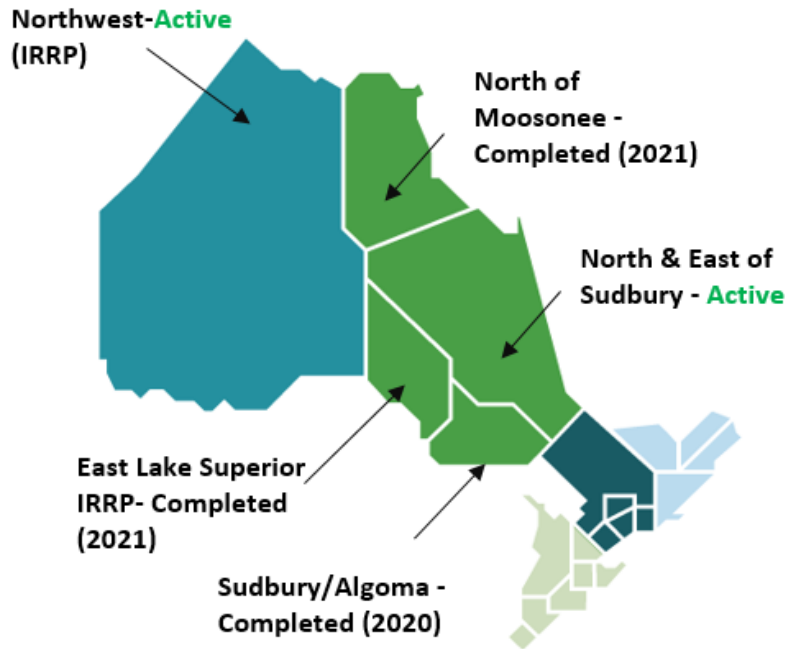
- The Northern Ontario transmission system consists of 500 kV circuits generally delivering power north and south, a 230 kV system generally connecting east and west, and an underlying 115 kV system that supplies local customers
- Generation is mainly hydroelectric with a small portion of cogeneration, wind, solar, and biofuel
- Industrial load is primarily in the mining, processing and forestry sectors

Northern Ontario Transmission Projects Underway



- Implementation of East-West Tie Reinforcement project
- Implementation of Wataynikaneyap Transmission project

Regional Planning Activities Across Northern Ontario

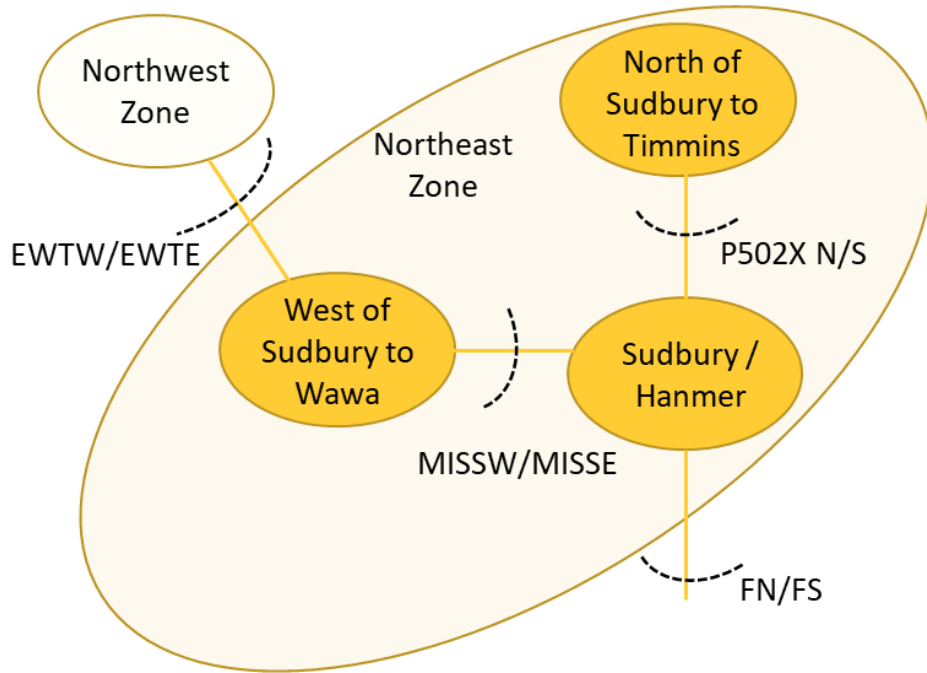


- Five regional planning areas (Northwest, East Lake Superior, North of Moosonee, North & East of Sudbury and Sudbury/Algoma)
- IRRP completed for East Lake Superior in April 2021
- Regional planning is actively underway for Northwest and North & East of Sudbury

For more information, please visit:

<https://www.ieso.ca/en/Get-Involved/Regional-Planning>

Bulk Transmission Interfaces in Northern Ontario



- Bulk Transmission Interface is defined as any circuit or group of transmission circuits interconnecting two subsystems

Interface	Interconnected subsystems
Flow North / South (FN/FS)	Northeast and Essa Zone
East West Tie West / East (EWTW/EWTE)	Northeast and Northwest Zone
Mississagi West / East (MISSW/MISSE)	Sudbury and west to Wawa subsystem
P502X North/South:	Sudbury and north to Timmins subsystem

Security Analysis Methodology

Security analysis was performed to ensure the planned system to be secure prior to contingency and following credible contingencies for:

1. All facilities initially in-service, under extreme weather peak demand, and highly dependable generation conditions (hydroelectric output that can be relied on 98% of the time), among other requirements
2. One element initially out-of-service, under normal weather peak demand, and dependable generation conditions (hydroelectric output that can be relied on 85% of the time), among other requirements

Thank You

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