



# Northeastern Ontario Electricity Planning

**September 13, 2022**

# Today's Webinar

## **Purpose:**

- To provide an update on the Northeast Bulk Plan and seek input on the recommended solutions
- To share a summary of feedback received through engagement activities and the IESO's responses
- To provide additional details regarding the options analysis
- To outline next steps

# Agenda

- Recap of Needs, Options Analysis and Preliminary Findings
- Additional Options Analysis
- Recommended Solutions
- Next Steps

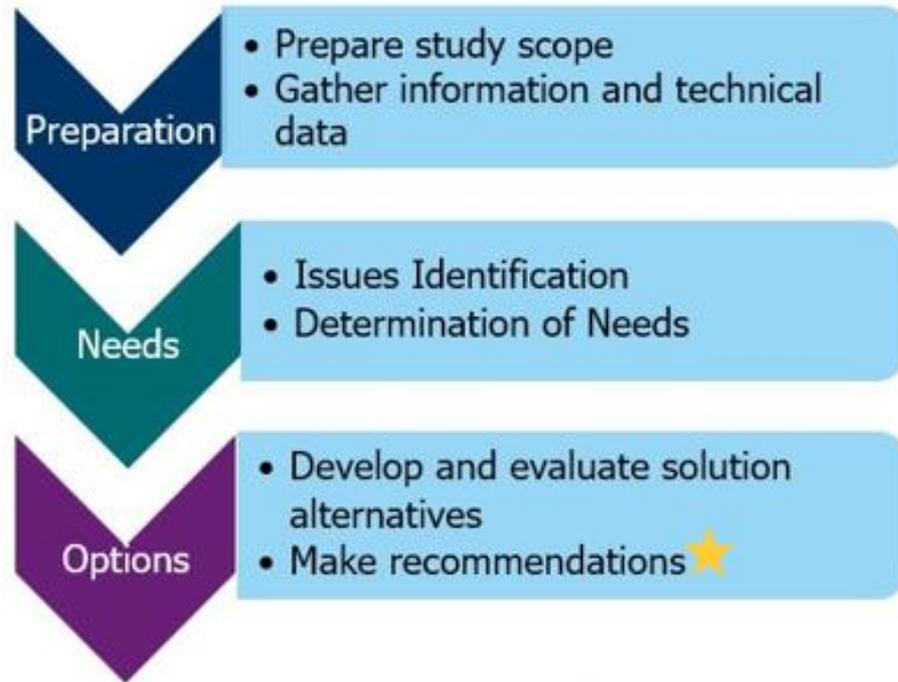
# Plan Status and Activities to Date

- Two public webinars held to date:
  - [July 27, 2021 webinar](#) to provide an overview of the electricity planning process for Northeast Ontario
  - [April 26, 2022 webinar](#) to provide an update on the Northeast Bulk Plan and 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
- IESO [responses](#) to written feedback collected to help inform evaluation of potential solutions posted

# Northeast Bulk System Plan Development

## Key Components:

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



# Seeking Input

- What feedback do you have regarding the draft recommendations?
- What other information should be considered in finalizing the recommended solutions and final report?
- How can the IESO continue to engage with communities and stakeholders as these recommendations are implemented, or to help prepare for future bulk and regional planning work?

**Please submit your written comments by email to [engagement@ieso.ca](mailto:engagement@ieso.ca) by October 4, 2022**



# Recap of Needs, Options Analysis and Preliminary Findings

# Emerging Needs in Northeast Ontario

- The existing bulk electricity transmission system in Northeast Ontario would not be sufficient to securely meet power transfer requirements to supply the forecasted demand growth
- Planning criteria are not met starting in 2029
- Identified reliability needs are expected to be sustained over the next 20 years



# Identifying Options

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

# Key Considerations in Options Evaluation

## 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 Presented in the April 26 Webinar

- In the April 26 webinar, the IESO presented the following transmission reinforcements as 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



# What we've heard so far...(1)

- Demand forecast may be higher than anticipated:
  - Significant growth in areas beyond west of Sudbury and Timmins is expected – Temiskaming Shores, Cochrane and Iroquois Falls
  - Decarbonization, Ontario's critical minerals, forestry and hydrogen strategies, and Ring of Fire will accelerate load growth
- Non-wires including large scale solar, storage, biomass and existing generation facilities and distributed energy resources should be explored

## What we've heard so far...(2)

- Strong support for transmission reinforcements
  - Solutions should enable a greater role for generation to meet both the needs in the area and the province as a whole
  - Technical considerations to provide greater reliability, resiliency and cost effectiveness
  - Dialogue with Indigenous communities is important

# Planning Considerations (1)

- Planning criteria is focused on ensuring that the transmission system will operate reliably to supply the expected load growth in the Northeast area
- The IESO's Pathways to Decarbonization study is exploring the value of Northern wind, solar, hydro and transmission enhancements that may be needed to enable further potential power production to serve load centers in Southern Ontario
- The IESO would welcome further discussion with communities to understand more about the anticipated load growth and any implications this may have on the North & East of Sudbury regional electricity planning initiative already underway

## Planning Considerations (2)

- In developing this plan, non-wires alternatives are considered along with the wires options
  - The solution to be recommended in this plan will ultimately be the lowest cost technically feasible alternative
- The options for transmission enhancements being examined as part of this plan will help enable new generation projects in Northern Ontario to meet the province's emerging capacity needs
- It is important to note that this is not the end of the IESO's planning for the Northeast and it is anticipated that ongoing electricity planning will be undertaken in Northeast Ontario



# Additional Options Analysis

# Options Analysis Overview

- Economic assessments evaluate non-wires and wires options to meet the identified needs

Quantitatively assess consumer impact of different options considering forecast cost and value of products and services it provides.



Quantitative Economic Assessment

# Non-Wires Alternatives (NWA)

- Through the engagement activities undertaken to inform plan development, the IESO has explored various opportunities for alternative resource technologies
  - Examples include nature gas, solar and wind, hydroelectric, storage, biomass, small modular reactor and fuel cells
- The feasibility and practicality of a new generation option has been evaluated aligning with IESO's Resource Adequacy Framework
- Potential NWAs that can satisfy technical requirements and have the lowest cost would be used as a benchmark to be compared with the wires options

# Evaluating NWAs: Cost Comparison

- To assess the cost-effectiveness, this plan applied the approach that allows for an apples-to-apples comparison of all options
  - Comparing the same dollars, to the same need (size and timing) and providing the same level of reliability/performance
- Other qualitative attributes (i.e., ability to quick start, fast ramp rates, flexibility in operation, dispatchable, etc.) have been considered as well
- Discounted Cash Flow (DCF) analysis has been performed to find the net present value (NPV) of expected future cash flows of the resource cost and system benefit by using a discount rate

# NWA Analysis and Considerations

- The characteristics of NWA is an important consideration given the nature of the forecasted large industrial load (24/7 operation)
  - Energy limited resource (e.g., storage) would not be suitable to satisfy the technical requirements
- Locational constraints of the existing transmission infrastructure are considered by aligning with the IESO's ongoing resource procurement programs
  - Challenges associated with finding proper locations near the load
  - Localized NWA would only benefit particular loads

# Economic Evaluation and Comparison

- Economic evaluation is performed based on the lowest cost NWA that can satisfy the technical requirements
  - Two NWA options were considered: natural gas generation and a combination of natural gas and wind generation
  - The assessment results indicate that the wires option is a more cost effective option compared to NWAs



# Recommended Solutions

# Additional Wires Alternatives Analysis

- Wires alternatives have been further evaluated based on the following aspects:
  - Technical performance – ability to fully address the identified needs
  - Cost effectiveness – satisfying technical requirement with the lowest cost
  - Implementation considerations – physical feasibility, lead time, stakeholder feedback and community preferences
  - Flexibility for future expansion

# Recommended Solutions

**a)** One new single circuit 230 kV transmission line (build with 500 kV standards) between Wawa TS and Porcupine TS [2030 in-service date]

**b)** One new single circuit 500 kV transmission line between Mississagi TS and Hanmer TS and two new autotransformers at Mississagi TS [2029 in-service date]

**c)** One new double circuit 230 kV transmission line between Mississagi TS and Third Line TS [2029 in-service date]



# Rationale for Recommended Solutions

- Based on the feedback received from communities and stakeholders and further implementation considerations, the following risks were found for the preliminary findings communicated during the April 26 webinar:
  - Challenges to take the outages necessary to implement the X74P conversion
  - There was a risk that the required expansion could not be built in time to supply the expected growth scenario by the expected timeline of 2029
  - Challenges to expand Wawa TS to accommodate two circuits
  - The expansions could supply the expected load growth; however, further expansions would be needed to accommodate a higher growth scenario.
- Therefore, the draft recommendations have been updated to mitigate these risks.

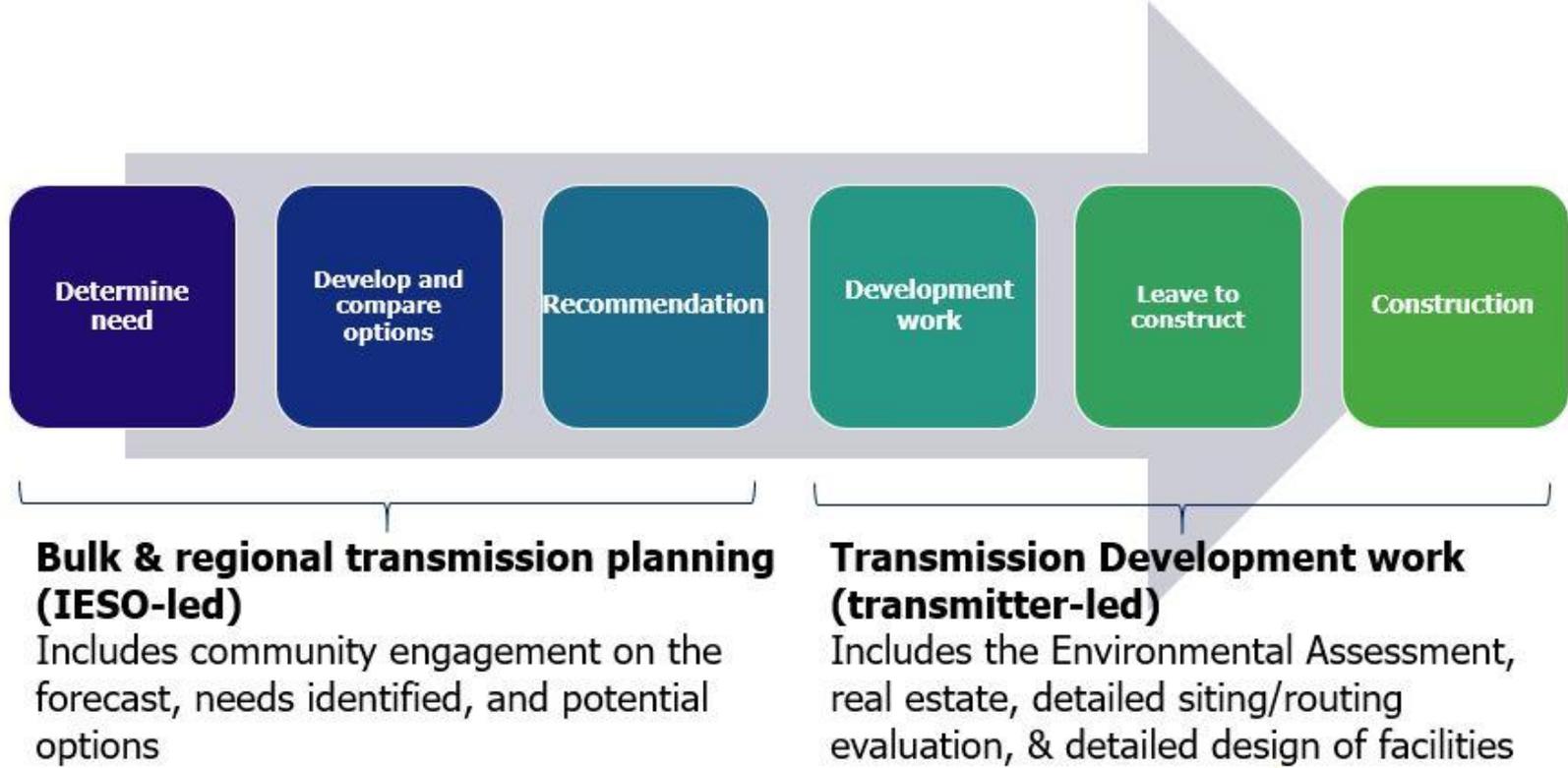
# Summary of Wires Options Comparison

Wires Options	Enabled Demand Growth Scenario	Estimated Capital Cost (\$M)
Preliminary Recommendations in April's Webinar	Potential Growth Scenario	1,130 - 1,405
Updated Recommendations	High Growth Scenario	1,250 - 1,530

# Merits of the Recommended Solutions

- The recommended solutions can:
  - Address the identified needs to accommodate forecasted load growth in Northeast
  - Increase the transmission system transfer capability by approximately 700 MW to supply loads that are located around the East Lake Superior and Northwest regions
  - Improve the reliability to supply loads that are located around Timmins area
  - Enhance the connection between the Northeast and the Northwest and improve the resiliency of the Northern Ontario system
  - Reserve the ability to expand the reinforcements in the future based on input from other relevant planning activities in the North

# Typical Transmission Development Process





# Next Steps

# Upcoming Milestones

- Written feedback due – October 4
- Publish Northeast Bulk Plan Report with IESO responses to feedback – October 2022
- Ongoing discussions through Northeast Regional Electricity Network

## Seeking Input

- What feedback do you have regarding the draft recommendations?
- What other information should be considered in finalizing the recommended solutions and final report?
- How can the IESO continue to engage with communities and stakeholders as these recommendations are implemented, or to help prepare for future bulk and regional planning work?

**Please submit your written comments by email to [engagement@ieso.ca](mailto:engagement@ieso.ca) by October 4, 2022**

# Keeping in Touch

- Follow Northeast Bulk planning activities – [Northeast Ontario Bulk Planning Initiatives \(ieso.ca\)](#)
- Dedicated engagement webpage – <https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Regional-Electricity-Planning-Northeast-Ontario>
- 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](mailto:engagement@ieso.ca) with any questions or comments

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# Thank You

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# Appendix

# Northeast Bulk Plan Background

- Electricity demand from the mining and mineral processing sectors in the northeast is forecasted to increase, driven by economic development decarbonization policies
- Needs are emerging due to increased demand 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



# Northeast Bulk Plan Scope

- The Northeast Bulk Plan examines forecasted electricity demand, needs and potential solutions, and will recommend actions to ensure the adequacy and reliability of supply over the long-term
- Options for both transmission system reinforcements (e.g. new corridors, new circuits, upsizing existing infrastructure, etc.) and non-wires alternatives (e.g. renewables, hydroelectric, storage, etc.) have been examined as potential solutions