



Meeting Ontario's Growing Electricity Needs

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Agenda

- About the IESO and Current Energy Trends
- Ontario's Growing Electricity Needs
- How to Meet Ontario's Future Electricity Needs
- Breakout Sessions
- Wrap Up



About the IESO and Current Energy Trends

Carla Y. Nell

VP, Corporate Relations, Stakeholder Engagement and Innovation

Context

Demand for electricity in Ontario is increasing due to economic growth and a rapid shift to electrification. At the same time, communities are playing a growing role in shaping the province's electricity landscape.

To bring this together, the IESO is undertaking important discussions to inform our system planning activities, in particular around the development of new facilities to meet Ontario's future electricity needs – starting with today's dialogue that will help lay the foundation for this ongoing conversation.

About the IESO



Reliably operate Ontario's power system 24/7



Plan for Ontario's future energy needs



Acquire resources to meet future needs through competitive procurements and efficient electricity markets



Deliver province-wide energy efficiency



Support innovation

The Independent Electricity System Operator (IESO) manages the province's power system so that Ontarians receive power when and where they need it. It plans and prepares for future electricity needs.

The players in Ontario's electricity sector

What the IESO does

The IESO works at the heart of Ontario's power system, balancing supply and demand for electricity on a second-by-second basis and directing its flow across Ontario's high-voltage transmission lines so it's available to you. Ensuring there is enough energy to meet Ontario's demand 24 hours a day, 7 days a week, is highly complex

and requires close coordination of the many parts that make up the system. These include generators, transmitters and distributors that own and operate the lines through which electricity travels, as well as the large and residential consumers that help us respond to changing needs.



The Government of Ontario sets the overall policy for the energy sector and the Ontario Energy Board regulates it.

Key Electricity Trends in Ontario Today

- Demand for electricity is on the rise
- Increase in electrification
- Existing and new resources will be required to avoid shortfalls
- Local energy solutions are being tested
- Technological evolution can support the energy goals of municipalities, Indigenous communities
- Interest in decarbonization continues to grow, particularly among communities



Innovative Solutions to Meet Community Needs



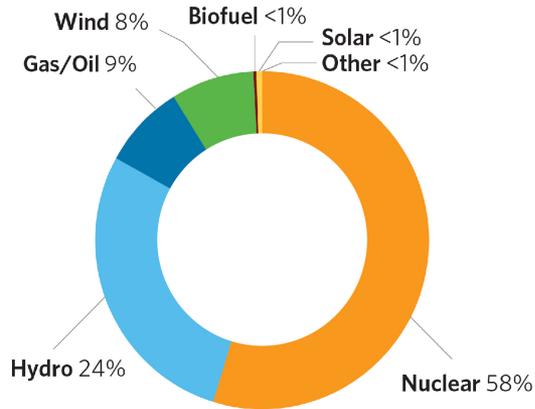
Six Nations of the Grand River First Nation: Six Nations of the Grand River Development Corporation (SNGRDC) developed a 217kW solar PV net-metering project on the Six Nations Bingo Hall to reduce community electricity consumption and move the community closer to creating a net-zero carbon facility.



Region of Waterloo: The Region of Waterloo is replacing the aeration equipment at the Hespeler Wastewater Treatment Plant in Cambridge with Membrane-Aerated Biofilm Reactor (MABR) technology that is expected to reduce electricity and demand consumption. The project will quantify the energy and demand savings and greenhouse gas reduction resulting from the MABR technology.

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**

"Supply mix" refers to the combination of resources used to meet Ontario's electricity needs. Diversity in the type of energy resources strengthens the reliability of Ontario's power system as different resources serve different functions.

What This Means for Communities

- Potential for new generation, distribution and/or transmission infrastructure to meet electricity needs
- Development of local solutions to local energy challenges
- Growing role for energy efficiency and demand management
- Supporting opportunities for economic development and job creation



Recap and What's Next (1)

- Demand for electricity is on the rise, trends within Ontario's electricity sector are evolving, the supply mix continues to change, new innovative solutions continue to be introduced, and local solutions are being developed for local challenges
- With this broader context in mind, the next section will explore the projected growth in electricity demand, the ability of the current supply mix to meet this demand, and review the need for new resources



Ontario's Growing Electricity Needs

David Devereaux

Senior Manager, Resource and Plan Assessments

The Annual Planning Outlook

- The Annual Planning Outlook (APO) provides an assessment of Ontario's energy landscape to help understand potential changes in demand and available supply that will assist the IESO in shaping its plans to meet future needs
- This year, the province's electricity system is shifting into a period of sustained demand growth with an increasing focus on decarbonization, requiring action on a number of fronts



Annual Planning Outlook

Ontario's electricity system needs: 2023-2042

December 2021



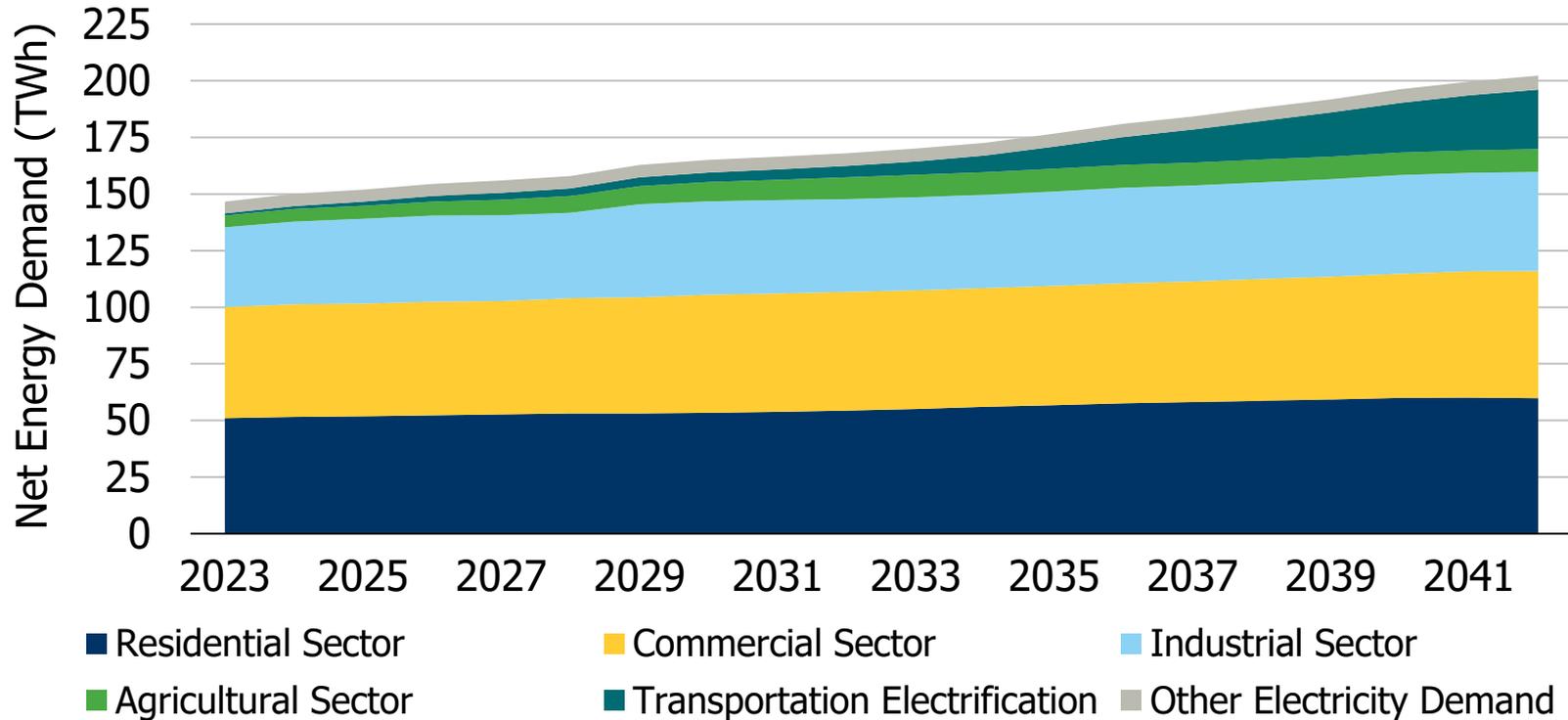
Key Insights

- Ontario is entering a time of marked electricity demand, growing faster than anticipated in the last Annual Planning Outlook
 - Growth in the industrial, mining and agricultural sectors, as well as transportation electrification, are leading to higher electricity demand than Ontario has seen in decades.
- Projected demand from electrification of transportation is forecast to grow an average of 20% per year
 - Driven by commitments for large transit electrification projects, and public policy support for industry and consumer over the long term

Key Insights (2)

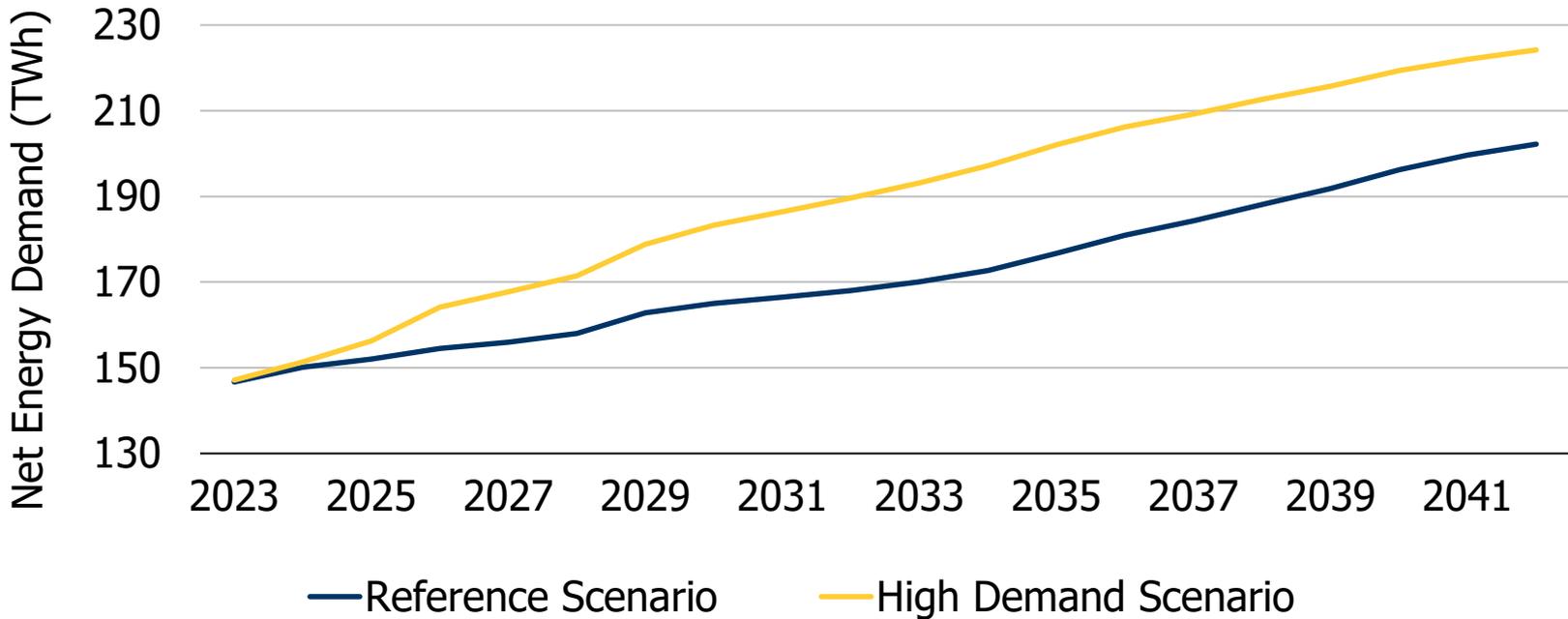
- Future policy decisions and economic growth mean long-term demand has the potential to be much higher
 - Driven by possible further government policies towards electrification, and large industrial sector projects emerging as a result of economic growth
- The supply mix in coming years could look very different and accelerated growth is happening in parts of the province that will need transmission support or local supply
 - Outlook includes considerable change through the 2020s and early 2030s due to the combined effect of nuclear retirements & refurbishment, and expiring contracts/commitments – in addition, mining and industrial electrification are creating pockets of regional growth that will require local solutions

Ontario is entering a time of demand growth



Long-term demand has the potential to be much higher

Energy Demand by Scenario



Demand: Agriculture

- All significant load growth seen in the West of London area, including Essex, Kent, and Lambton counties
- Growth is in greenhouses and associated artificial lighting, due to the move to year-round fruit, vegetable, flower, and cannabis production
- Energy demand is expected to more than double in this region by 2030



Demand: Mining and Metals

- Bulk of growth seen in Northeast and Northwest IESO zones
- Individual projects can lead to significant increases in demand
 - Algoma Steel electric arc furnace
- Economic growth and electrification/decarbonization are driving demand growth in these sectors



Demand: Transportation Electrification

Electric Vehicles

- Forecast includes assumption of 100% of light duty vehicles sold are non-emitting by 2035 (current federal policy)

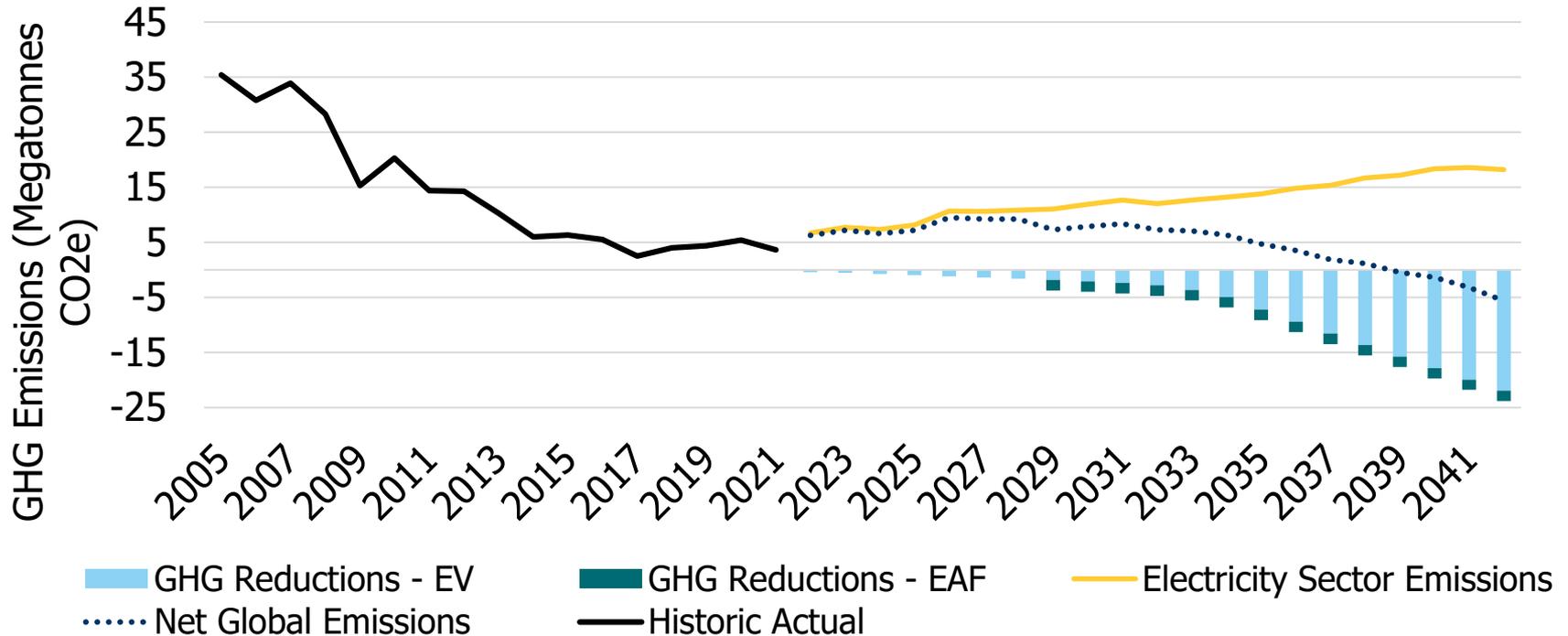
Transit Electrification

- GTA subway extensions
- New Light-Rail Transit (LRT) projects
- GO rail system electrification



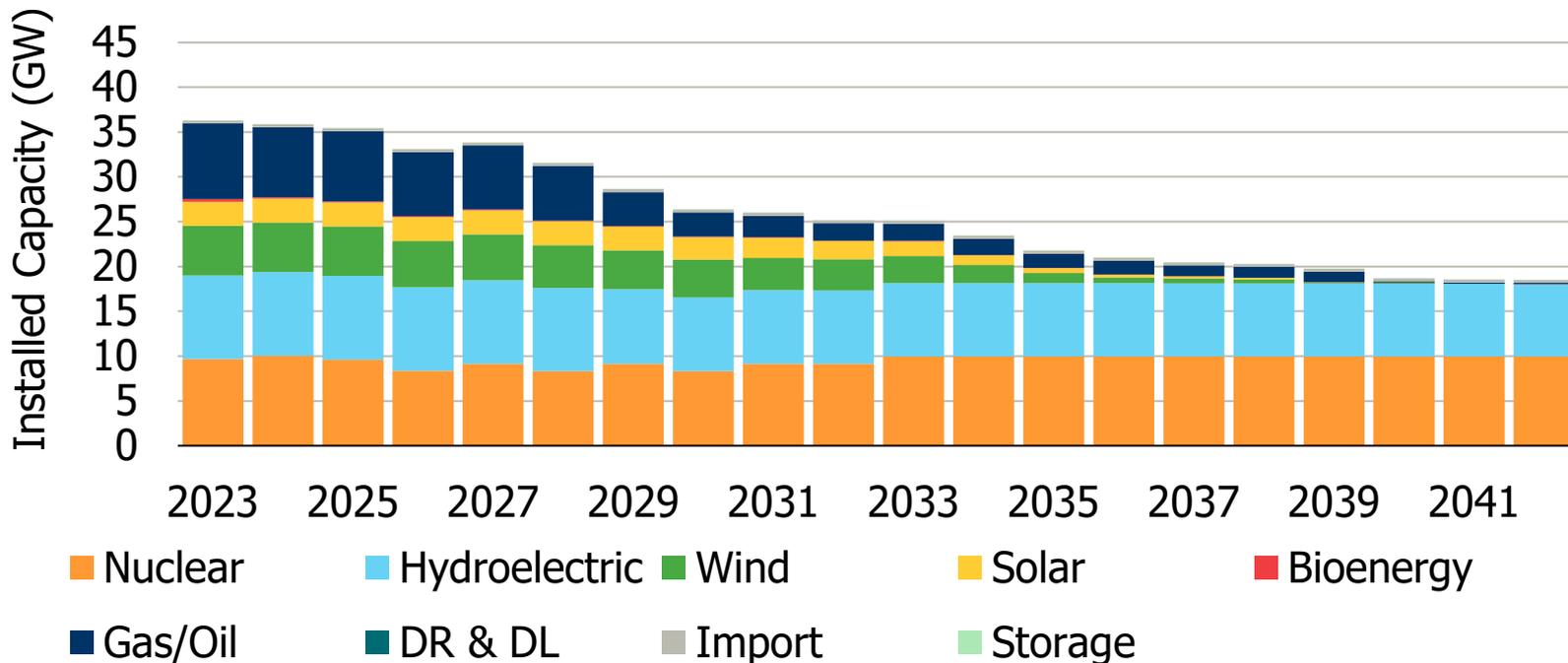
Electrification means emissions reductions

Electricity Sector Greenhouse Gas Emissions, Historical and Forecast

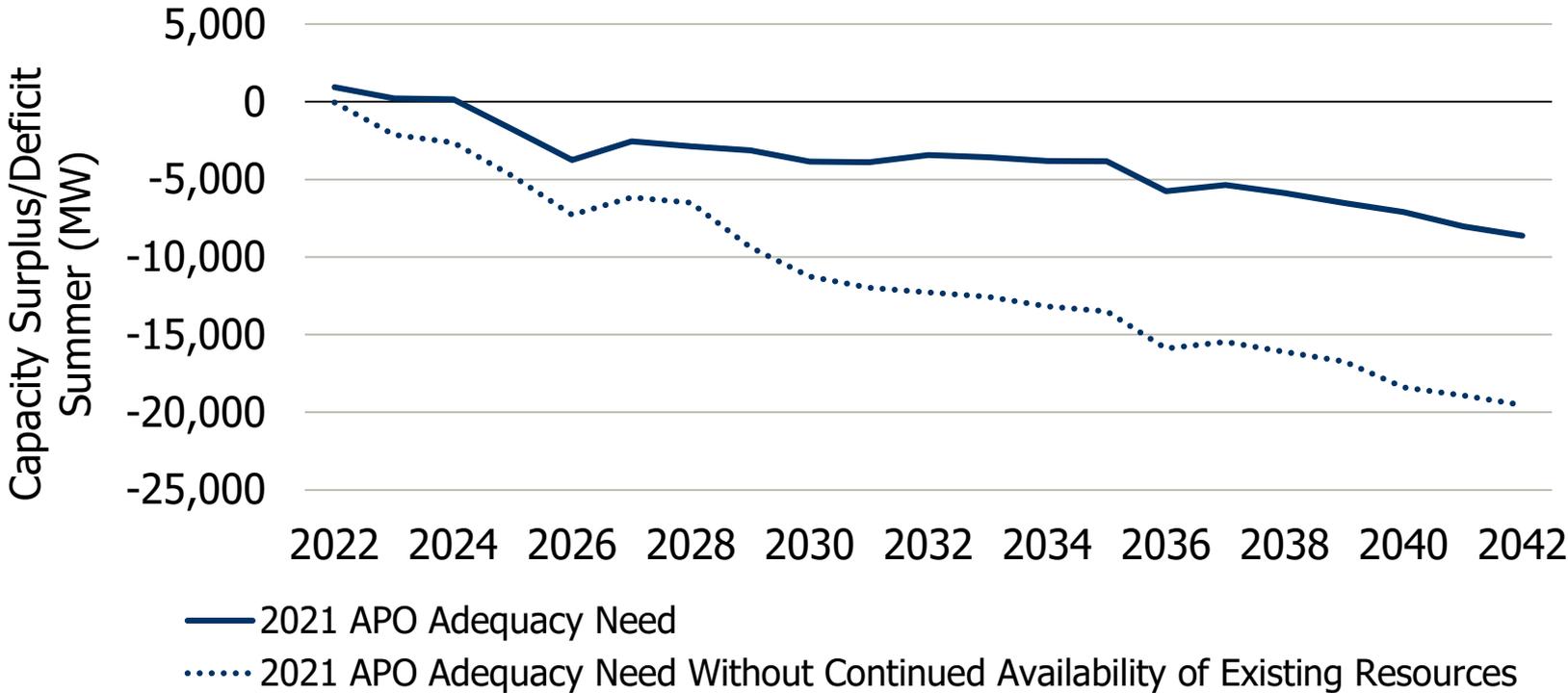


The supply mix could look very different in coming years

Installed capacity without reacquisition of expired contracts 2023 - 2042



Supply needs are emerging: **summer** capacity outlook



Ontario's Transmission System

- The provincial transmission network will continue to play a critical role in helping to meet electricity needs by moving power from one part of the province to another
- The IESO works with transmitters, such as Hydro One, the Ontario Energy Board and Local Distribution Companies to address transmission system needs
- The IESO also works with many communities during the development of bulk and regional plans to explore the use of transmission and other solutions in your local areas

More information on planning in your area can be found [here](#)

Recap and What's Next (2)

- The province's electricity system is shifting into a period of sustained demand growth with an increasing focus on decarbonization
- This period of growing electricity demand will mean that Ontario will need all existing resources, as well as new sources of electricity supply
- With this context in mind, the next section will explore how the IESO will ensure the reliability of our grid to support Ontario's growing needs, and economic development opportunities
- The IESO will launch electricity procurements – such as issuing a Request for Proposals (RFPs) in 2022 – to acquire new electricity generation facilities



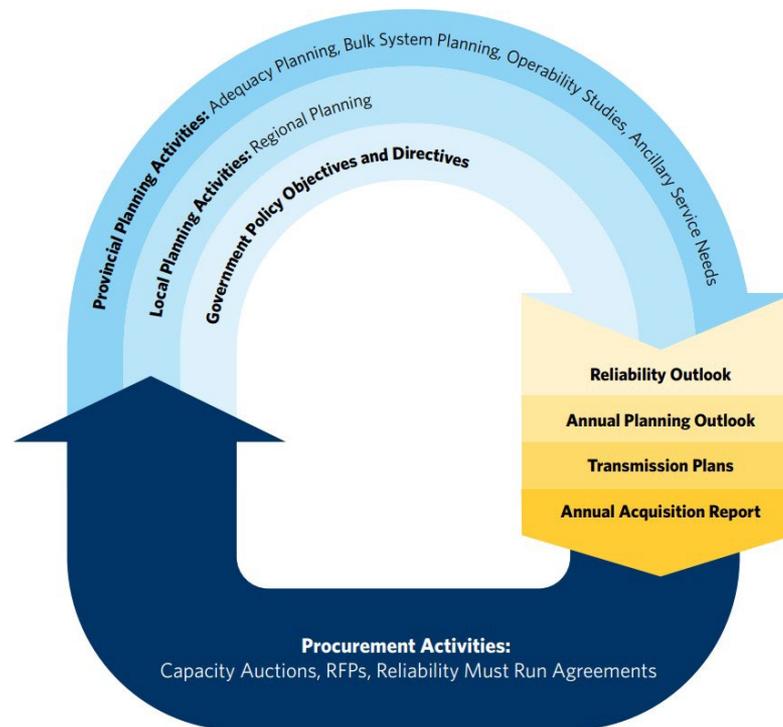
How to Meet Ontario's Future Electricity Needs

Barbara Ellard

Director, Resource and System Adequacy

Bringing it all together

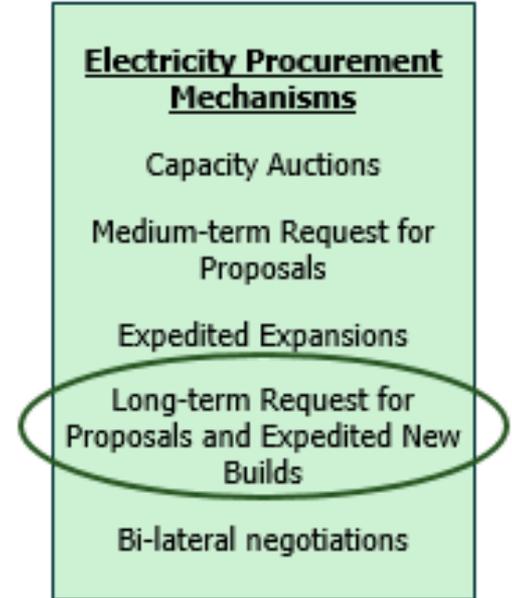
- The IESO uses its planning activities and products, including the Annual Planning Outlook, to identify future system needs
- Different procurement mechanisms are available to acquire the needed resources to meet Ontario's future needs, identified in the Annual Acquisition Report (AAR)
- The IESO will revisit Ontario's electricity needs on an annual basis to adjust and readjust how it meets those needs as circumstances change



2022 Annual Acquisition Report (AAR)

Released on April 4, the 2022 AAR identifies how the province's electricity needs will be met now and in the future:

- **Short-term needs (2022 – 2024)** – solutions are in place to meet needs as a result of efforts already underway
- **Medium-term needs (2025 – 2026)** - supply needs increase following retirement of the Pickering Nuclear Generating Station
- **Long-term needs (2027+)** - longer-term electricity demand continues to grow requiring new supply solutions beyond what is already planned



The IESO continually assesses the timing of electricity needs in conjunction with the available procurement mechanisms to determine how the needs will be met.

The Most Pressing Needs – Preparing for 2025/2026 and 2027+

- The 2022 AAR shows that electricity system needs in the years up to and including 2024 are expected to be met through existing resources and the plans already identified in the 2021 AAR
- However, based on increased demand, retirement of Pickering Nuclear Generating Station and expiring contracts, the needs emerging in 2025/2026 will require action beyond what was projected last year
- The province will require new resources to maintain reliability of the electricity system and for this, the IESO will be launching a procurement process - the Long-Term Request for Proposals (LT RFP)
- Given the length of time needed to build new resources, the dialogue needs to begin today to help secure a reliable supply of electricity

The Long-Term Procurement Process

Long-Term Request for Qualifications (LT RFQ)

- Objective is to ensure that there are interested parties with the capability to develop projects, construct and operate facilities
- RFQ will focus on evaluating proponents based on their technical and/or development capability, experience working with Indigenous communities, and financial wherewithal
- Only qualified proponents under the RFQ will be eligible to participate in the RFP stages

Long-Term Request for Proposals (LT 1 RFP)

- Objective is to solicit proposals from qualified proponents and offer contracts (15-year term) for projects that most competitively meet local and provincial needs
- LT1 RFP will procure 2,500 MW of new capacity for needs arising in the 2025-2027 timeframe
- The IESO is still defining the eligible resources, but it will include resources deployed on greenfield sites or on existing projects – further details will be available in the second half of 2022

Long-Term Expedited Procurement

- Objective is to solicit proposals from qualified proponents and offer long-term contracts for projects that most competitively meet local and provincial needs
- Under this process, the IESO will procure resources that can meet needs arising in the 2025 timeframe

Municipal & Indigenous Community Involvement in the LT RFPs

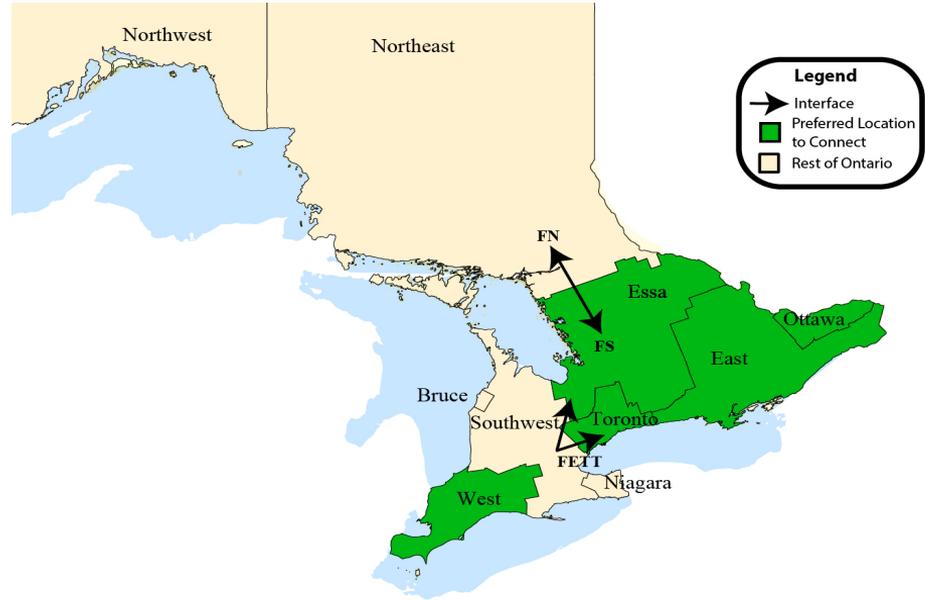
- Municipalities and Indigenous communities will be critical to the success of the LT RFP procurements and your input into the design will be important
- New facilities may be proposed by developers on land under municipal jurisdiction, require municipal permits, and some municipalities may also be interested in being involved with project proposals
- Indigenous communities may be partners on projects, developers of projects, or engaged by developers for projects in their traditional territories
- IESO, Indigenous communities, and municipalities will need to work together to help ensure that Ontario continues to have the electricity supply it needs in the future

Locational Considerations

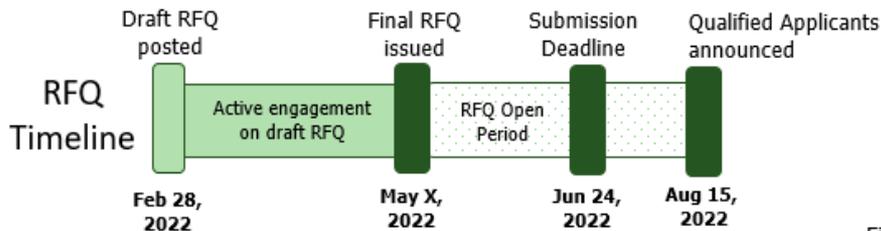
In order to address both province-wide and more localized electricity needs, the LT RFP will seek to acquire projects across Ontario

The areas highlighted in green show an illustrative example of locations that may be more highly valued or prioritized under the LT RFP

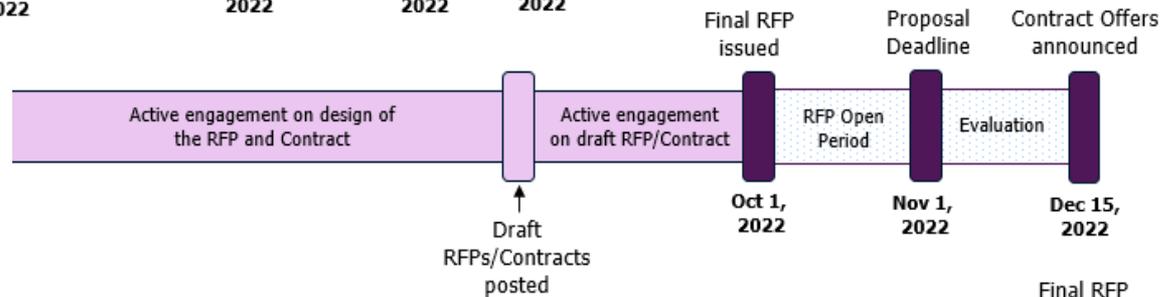
The priority areas will continue to evolve as planning studies and procurement design considerations are updated



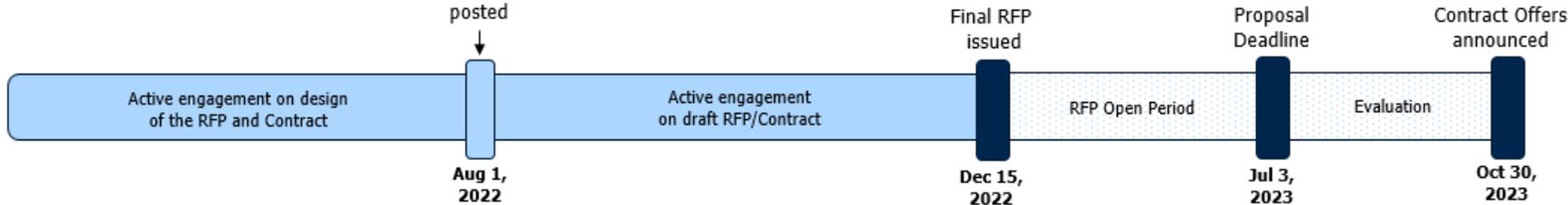
LT RFP and Expedited Procurement Timelines*



Expedited Procurement Timeline



LT1 RFP Timeline



* All future dates are tentative; 2022/2023 timelines not to scale



Please Join a Discussion

Recap and What's Next (3)

- Starting in 2025/2026, the province will require new capacity to maintain reliability of the electricity system and for this, the IESO will be launching a procurement process - the Long-Term Request for Proposals (LT RFP)
- The procurement process will begin with selecting Qualified Applicants through the RFQ process and then follow with selecting projects through the RFP process
- Given the length of time needed to build new capacity, the dialogue needs to begin today, and the coordination between IESO, Indigenous communities, and municipalities will be critical
- With this context in mind, two breakout sessions will be held today to discuss the LT RFPs with Indigenous communities and municipalities

You're invited to join a discussion

- Please join us for a targeted discussion to ask questions and learn more about what the LT RFP means for you, as well as what you might need to prepare for future discussions
- Discussion with Municipalities: 2:00 p.m. to 3:00 p.m.
[Meeting Registration – Zoom](#)
- Discussion with Indigenous Communities: 2:00 p.m. to 3:00 p.m.
[Meeting Registration - Zoom](#)

How to Stay Involved

- Engagement with stakeholders and communities is a high priority for the IESO as we plan for the future
- We have a range of engagement forums: regional electricity networks, monthly engagement days, direct email to engagement@ieso.ca
- Visit the [Save on Energy](#) for information about conservation programs, including ones for small business and industry
- Visit the Indigenous Energy Support Program information [webpage](#)
- We look forward to working with you

Thank You

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[@IESO Tweets](https://twitter.com/IESO)

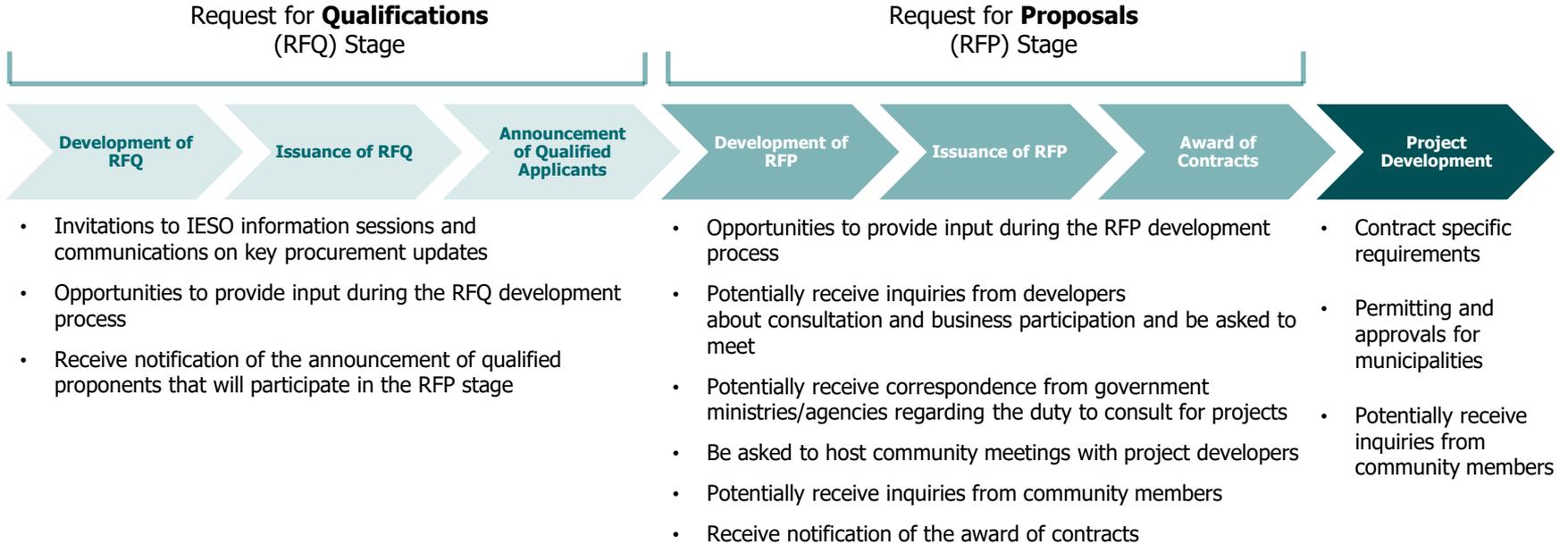


[linkedin.com/company/IESO](https://www.linkedin.com/company/IESO)



Appendix

What Communities Can Expect Throughout the Process



Receive information from the IESO to understand the process, timelines and current status