

**Thank you for joining  
today's session**



**Please keep your cameras  
off and microphones muted  
until the Q&A**

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**JANUARY 15, 2024**

# Planning and Managing Ontario's Power System: An Introduction to the IESO

**Carla Y. Nell**, Vice President, Corporate Relations, Stakeholder Engagement and Innovation

**Dave Devereaux**, Director, Resource Planning

**Ahmed Maria**, Director, Transmission Integration

**Denise Jamal**, Director, Stakeholder & Community Engagement

# Agenda

1. Welcome & introductions
2. The IESO & Ontario's Electricity System
3. Ontario's electricity system: Addressing its needs and decarbonizing the grid
4. Regional electricity planning and transmission infrastructure
5. The critical role of Indigenous communities and municipalities in the success of Ontario's energy transition
6. Question & Answer

The slides and recording will be sent out to participants and posted on the Community Engagement webpage



# The IESO and Ontario's Electricity System

**Carla Y. Nell**, Vice President, Corporate Relations, Stakeholder Engagement and Innovation

# About the IESO



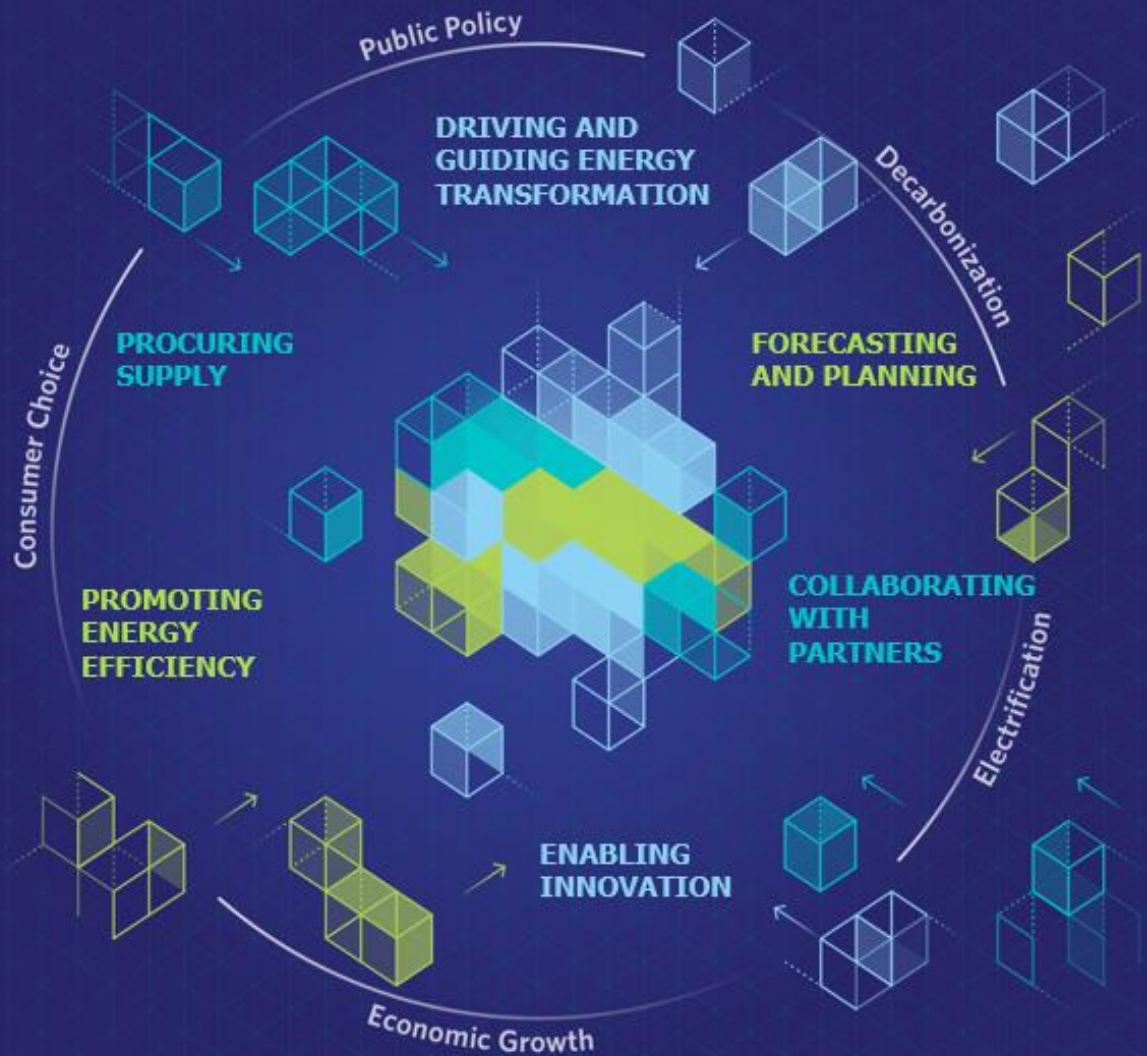
# Ontario's Electricity Sector




We work with:



# A RELIABLE, AFFORDABLE, SUSTAINABLE ELECTRICITY SYSTEM





# Ontario's electricity system: Addressing its needs and decarbonizing the grid

**Dave Devereaux**, Director, Resource Planning



# Different Types of Electricity Generation



Nuclear



Hydro (run  
of the river)

## Baseload

- Provides 24/7, consistent and reliable electricity, making them Ontario's primary energy sources.



Hydro



Gas

## Intermediate and Peaking

- Able to flexibly adapt to changing demand, ensuring a reliable supply during peak usage.



Solar



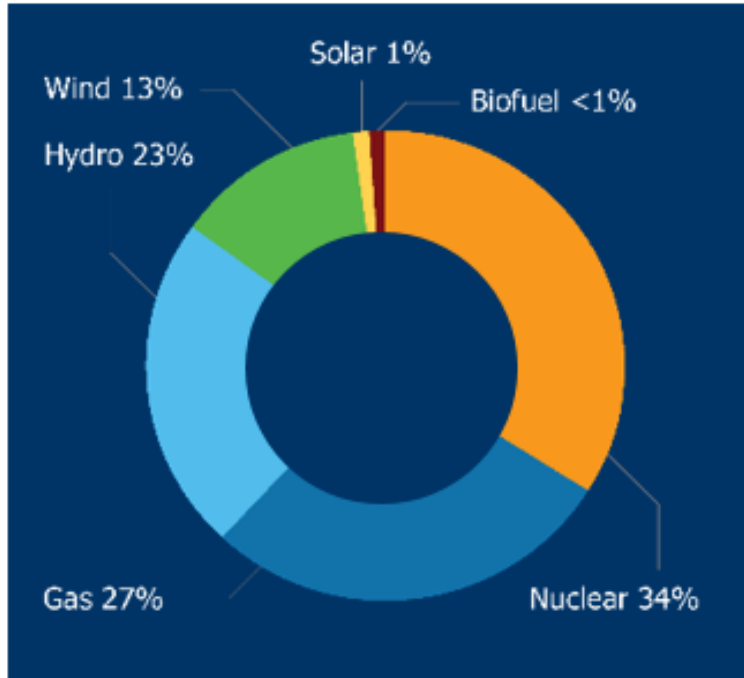
Wind

## Variable but Controllable

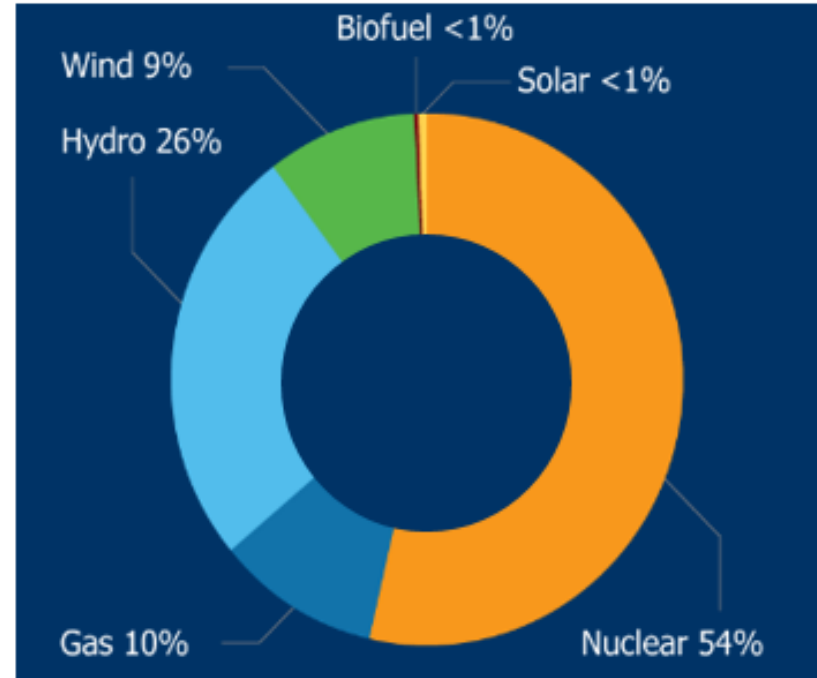
- Adapts output to weather conditions, maintaining flexibility to meet energy demand swiftly.

# Ontario's Supply Mix

## Capacity

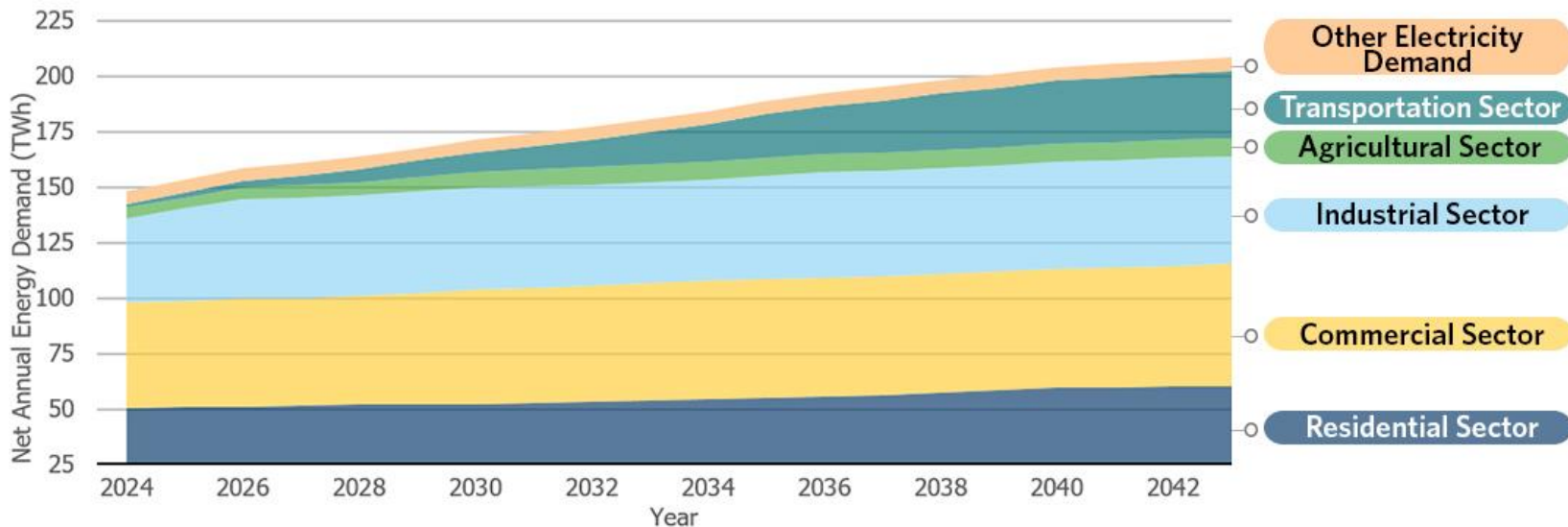


## Output

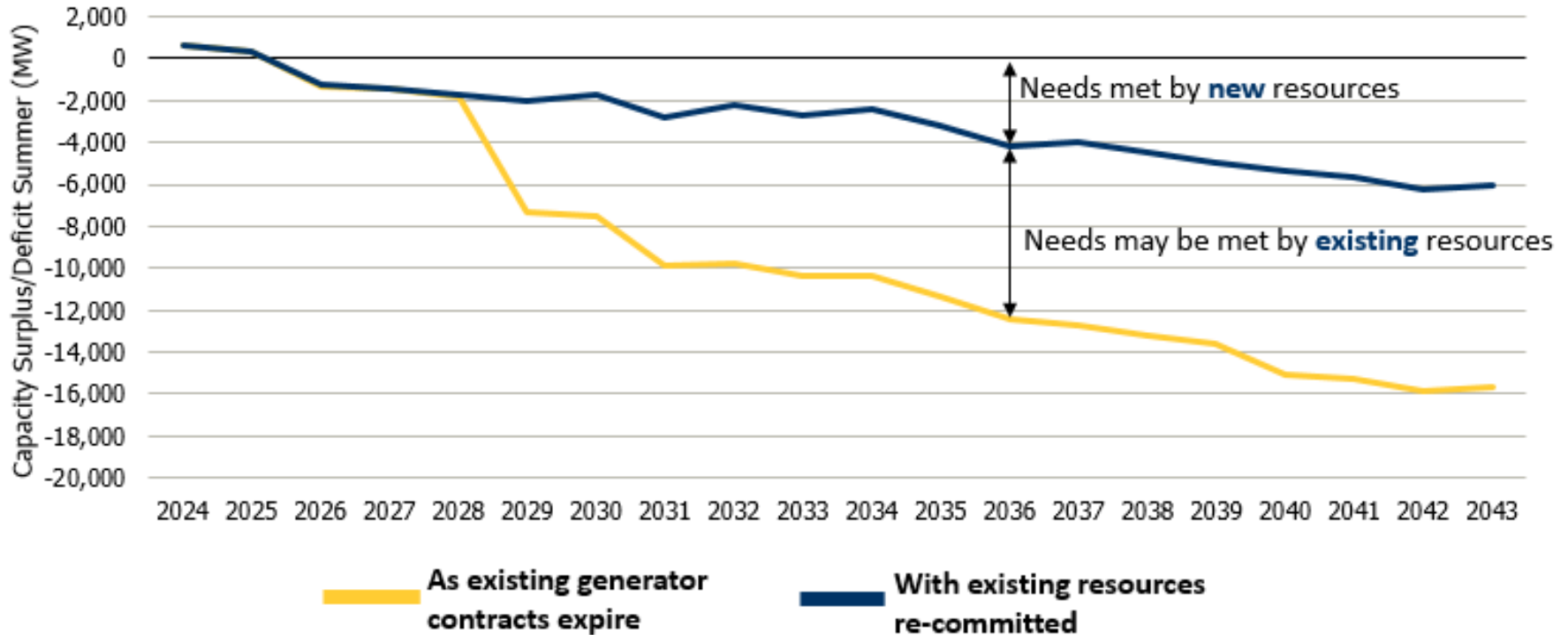


# Forecasting Demand for Electricity: The 20-Year Outlook

Demand for electricity is expected to increase by nearly 2% per year



# Ensuring Reliable Supply to Meet Growing Electricity Needs



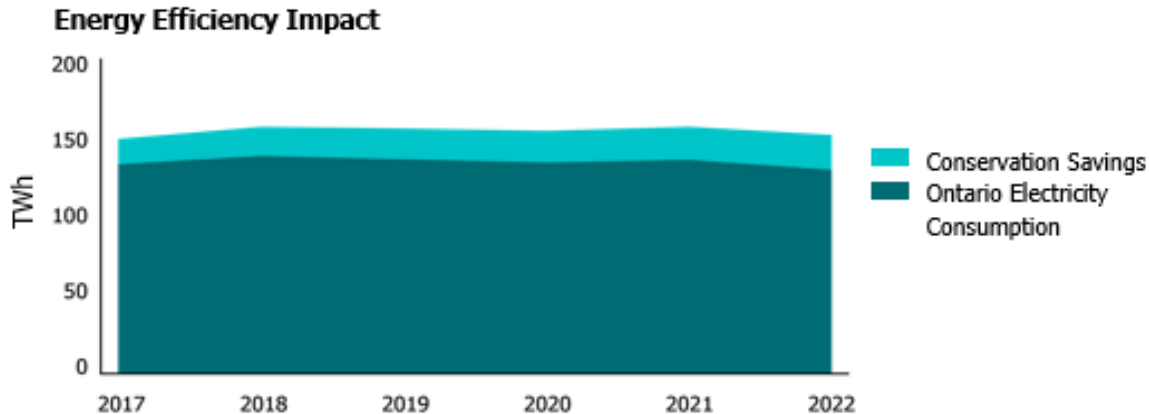
# Procuring New Generation & Storage

The IESO is securing new resources to meet emerging system needs.

- New energy storage and a limited amount of new gas, mostly from expansions at existing facilities, has been procured through an “expedited procurement” for 2026 and beyond.
- Long-term RFP for additional storage, gas and other resources to come into service by 2028 closed in December 2023 and results will be announced this Spring.
- A second long-term RFP will be launched later this year and target non-emitting resources such as wind, solar, hydro and biomass for the early 2030s.
- Municipal support is mandatory for projects in all procurements.

# Conservation and Demand Management

- Energy efficiency programs are available under the **Save on Energy** brand for commercial, institutional, industrial, on-reserve First Nations, and residents.
- Not only helps consumers lower their electricity bill, but helps reduce emissions from the electricity grid – an important step towards decarbonization.
- Provincial electricity demand is about 15% lower today thanks to energy efficiency programs.



## GHG emissions in Ontario by sector\*



Over a five-year average, Ontario's electricity system produced less than three per cent of total GHG emissions in the province.



**38%**  
Transport



**25%**  
Manufacturing and industrial processes



**12%**  
Residential heating



**13%**  
Other



**6%**  
Agriculture



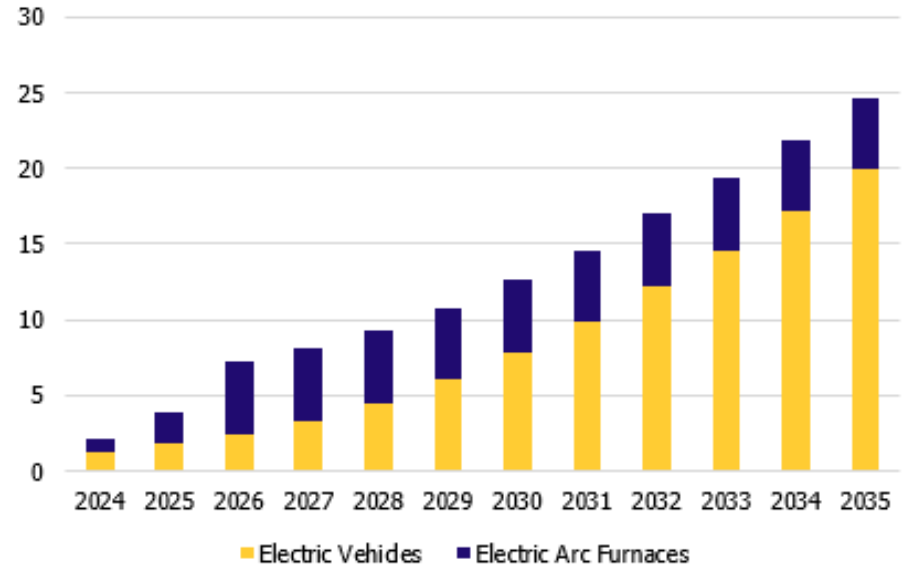
**4%**  
Waste

\*Percentages have been rounded and as a result will not add to 100.

# Emissions reductions can't happen without a reliable, affordable grid

- With a 90% clean energy supply, Ontario has a considerable clean energy advantage to decarbonize its economy, but businesses and consumers need an affordable and reliable electricity system.
- For example, a gasoline-fueled car produces at least 30 times more carbon emissions than an EV charged overnight.
- The economy and the electricity system cannot reliably and affordably decarbonize without incremental gas.

Forecast Emissions Reductions from Electrification (MT CO<sub>2</sub>e)

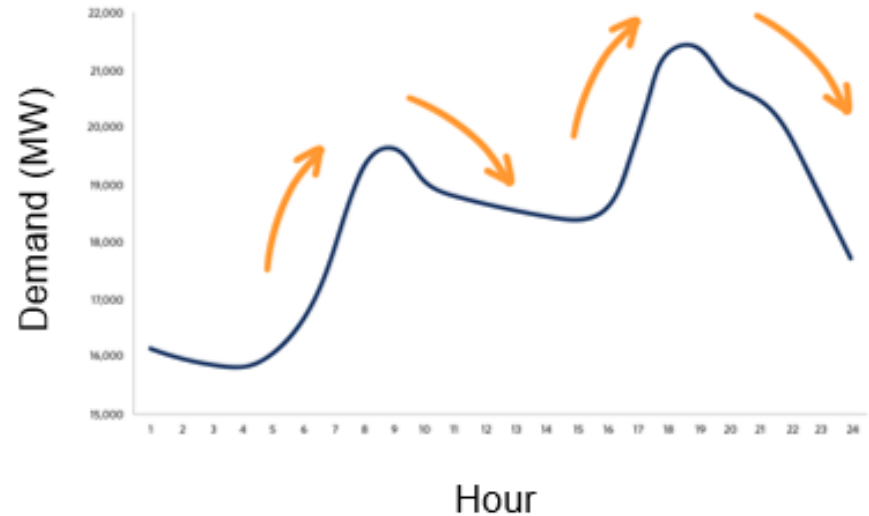




# Natural gas must bridge gap until new supply is ready

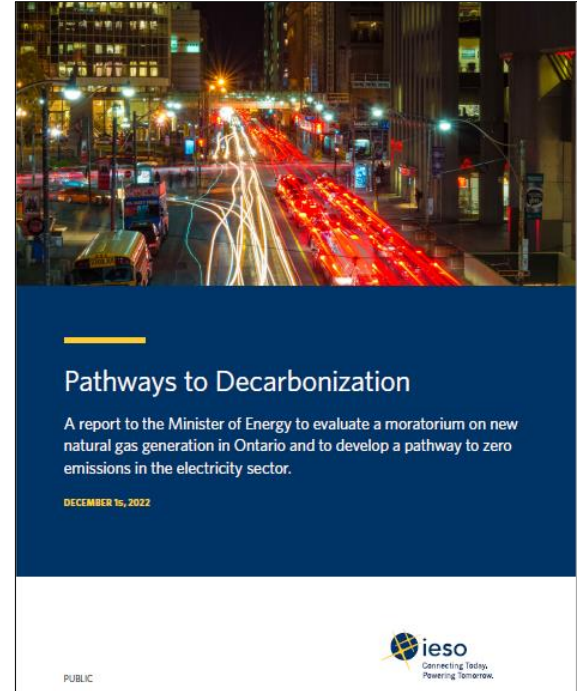
- Natural gas provides needed flexibility and certainty to quickly respond to changes in demand and system conditions. For example, in response to heat waves and other emergencies.
- There is currently no “like-for-like” replacement available. We will need to tap into a variety of solutions to reduce reliance on gas generation.
- IESO studies show moving too quickly to retire natural gas generation will increase costs and could cause blackouts\*
- Large infrastructure can take 10-15 years to build.

Ontario Demand on a winter day




# IESO Pathways to Decarbonization Report


- Ontario's electricity sector can support broad, economy-wide decarbonisation.
- A moratorium on new gas generation is possible by 2027 if new resources are in place.
- Decarbonization by 2050 would require a system twice its current size with a diverse zero-emissions supply mix.
- Will require significant investments in capital, resources and labour. Estimated costs are ~\$400B over 23 years.




# Building an emissions-free grid – the path forward


## 2024–2025


 New commitments to small hydro facilities

 First large battery facility comes online


 Launch expanded energy efficiency programs


New capacity exchange agreement with Hydro Quebec

 New market opportunities for local energy projects

 New transmission lines bring power to Southern and Northeast Ontario (2025–2030)

## 2030–2034

 Proposed Pickering refurbishment

 Non-emitting generation fleet continues to grow

Note: New transmission will be needed throughout this timeline to enable all the changes in the supply mix. Planning is underway.

## 2026–2028



Battery fleet grows, contributing to Ontario's system needs

## 2029



First small nuclear reactor powers up

## 2032



Darlington and Bruce nuclear refurbishments largely complete



New non-emitting generation develops

## 2040



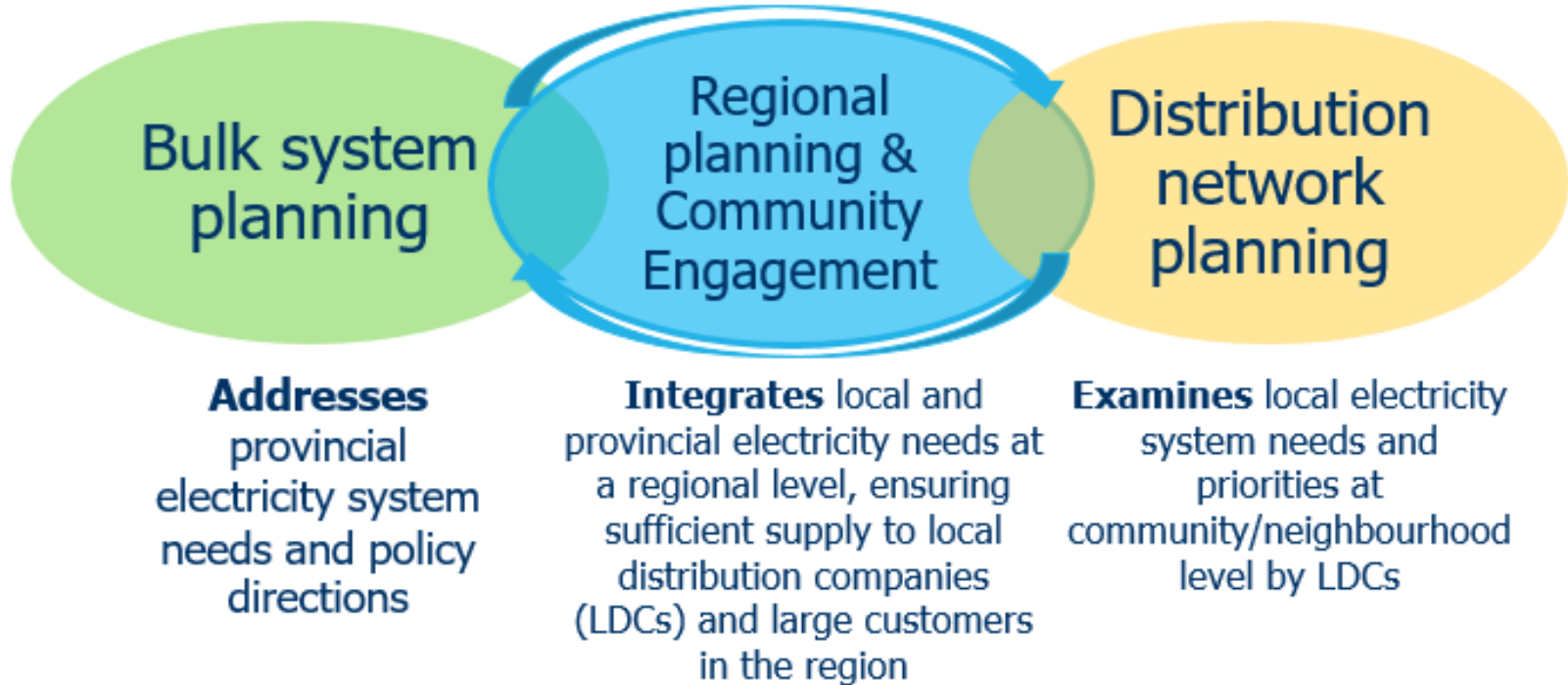
Most Ontario natural gas generation reach end of life



# Regional electricity planning and transmission infrastructure

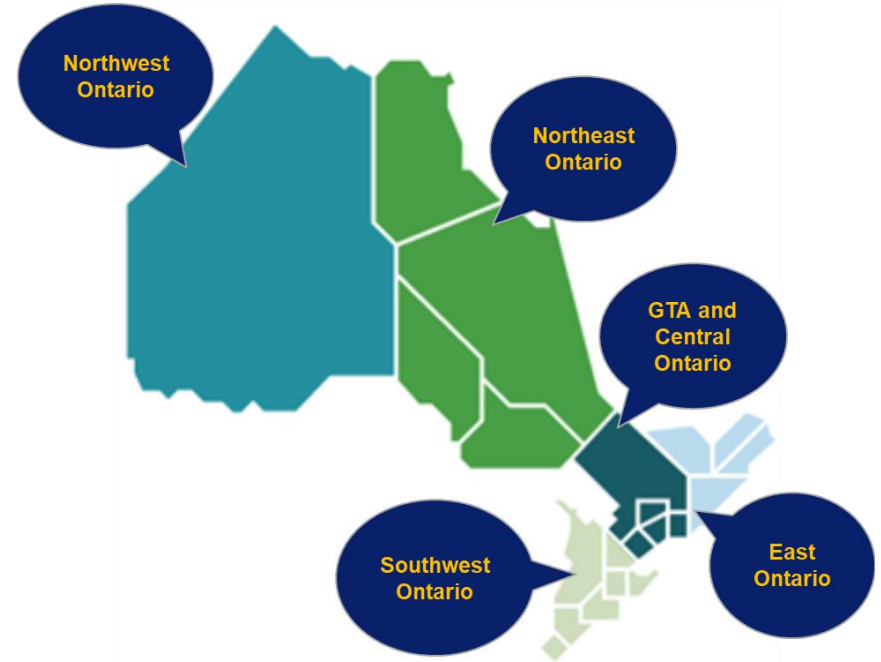
**Ahmed Maria**, Director, Transmission Integration

# Communities have a critical role in regional electricity planning



# 21 electricity planning regions

- Based on electricity infrastructure boundaries
- Planning based on each region's unique needs and characteristics
- Communities provide input on the following components within the plan:
  - Help to identify future electricity needs
  - Seek input on a variety of options to meet needs
  - Provide feedback on plan recommendations



# Role of Distributed Energy Resources (DERs)

- Growing potential for DERs – solar, wind, battery, electric vehicles (EVs) – we can tap into this local infrastructure to meet local and provincial grid needs.
- Provides revenue for communities and businesses, while allowing to contribute to grid reliability.
- Communities looking for opportunities to use DERs as alternatives to traditional infrastructure – which we consider through our regional planning process.

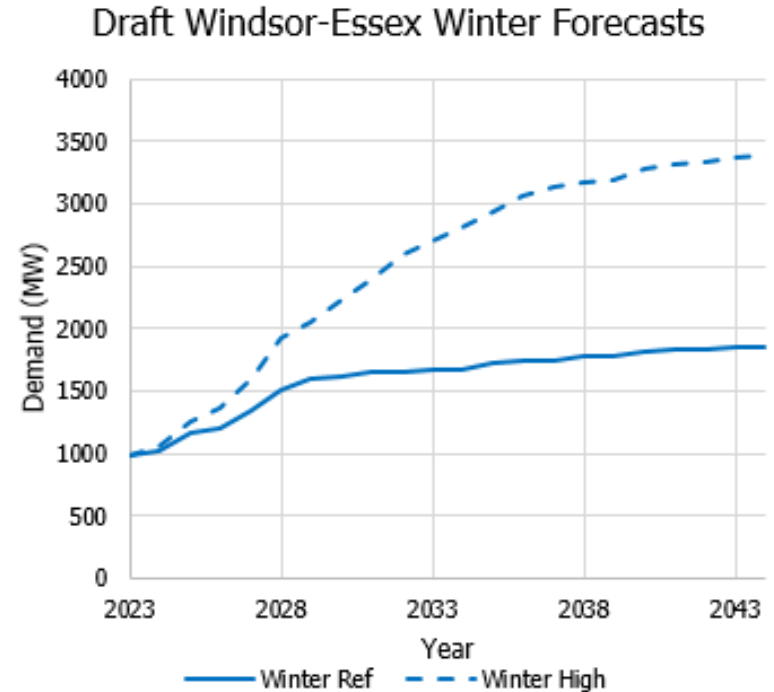
# Transmission

- Transmission infrastructure is critical to meeting growing electricity demand, ensuring power can get from point A to point B.
- As our system may need to double in size, significant new transmission infrastructure is needed.
- Must be considered holistically alongside other resources like generation and storage.
- Community input is key to determining whether alternatives are available and, if not, where new transmission should be situated.



# Case Study: Southwest Ontario

- Electricity demand is quadrupling in southwest Ontario due to agriculture growth and new battery production facilities.
- IESO has engaged with municipalities, greenhouses, First Nations, and other local stakeholders.
- A multi-pronged approach is being implemented, including multiple new transmission lines under development, targeted energy efficiency programs, and local generation.



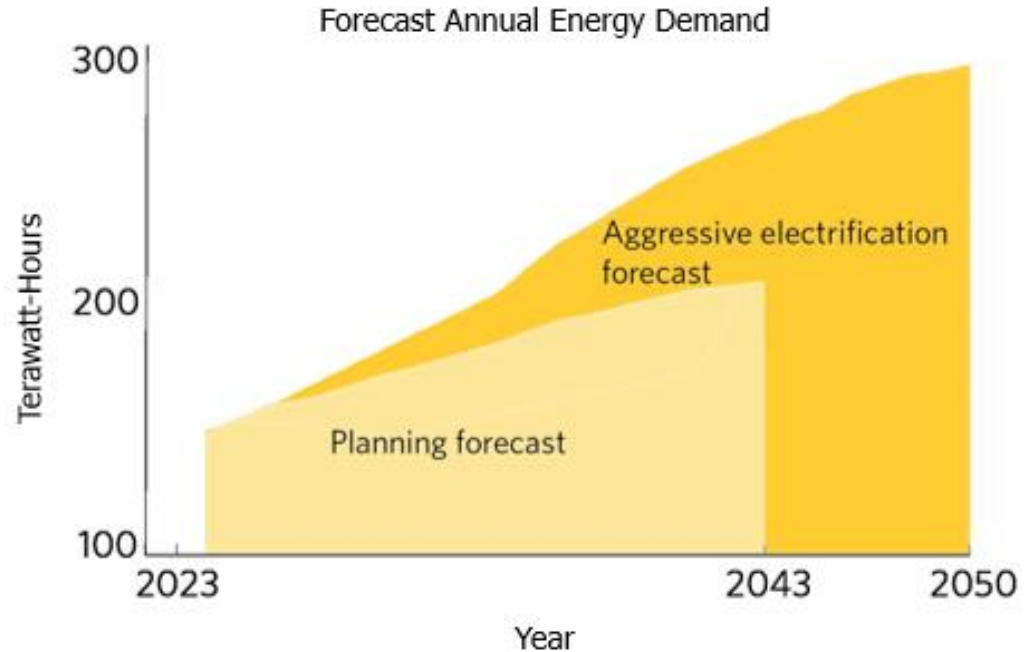


# The critical role of Indigenous communities and municipalities in the success of Ontario's energy transition

**Denise Jamal**, Director, Stakeholder & Community Engagement

# Ontario's Changing Electricity Landscape

- Electricity demand is forecast to grow by at least 40% over the next 20 years.
- Growth is driven by economic development, population, and electrification.



# What This Means for Communities

- To help acquire the supply and transmission infrastructure needed to prepare the electricity system brought on by this expected growth, community engagement and support is critical.
- Communities across Ontario play a pivotal role in shaping local, regional, and provincial energy challenges.



# The Role of Your Community in the Energy Future

- Informing electricity planning and focusing on decarbonisation.
- Developing and hosting new generation and electricity infrastructure.
- Playing a bigger role in where new generation, distribution and/or transmission infrastructure is located.
- Identifying opportunities for economic development and job creation.
- Integrating local energy solutions, including energy efficiency and demand side management.
- Leveraging the IESO's Energy Support Programs and Save on Energy Programs.

# Engaging with Communities

Input from Indigenous communities and municipalities encourages the IESO to:

- Inform and engage with communities in a timely manner.
- Keep economic development top of mind to meet future needs.
- Incentivize developers to better understand, interact and collaborate with communities.
- Continue to provide support and guidance on how to work with developers.
- Support the investment in innovative technologies.



# Question & Answer

# Conclusion

- Ontario is in the midst of a transformation to eliminate emissions from the grid while ensuring that it can support economic growth and broader electrification in other sectors.
- The IESO's decarbonization plan is underpinned by the need for natural gas output in the near term, to ensure we can continue to power homes, businesses, and communities during upcoming supply shortfalls.
- The IESO is working with communities to prepare for future economic growth as well as understand the role they can play to support reliability across the province.
- Please register for the January 17 webinar [here](#) to learn more about the upcoming IESO initiatives including the second long-term procurement and the transmitter selection framework.



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# Thank You

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## CONTACT

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