

# The Energy Transition, Challenges & Opportunities



November 3, 2023



Safety



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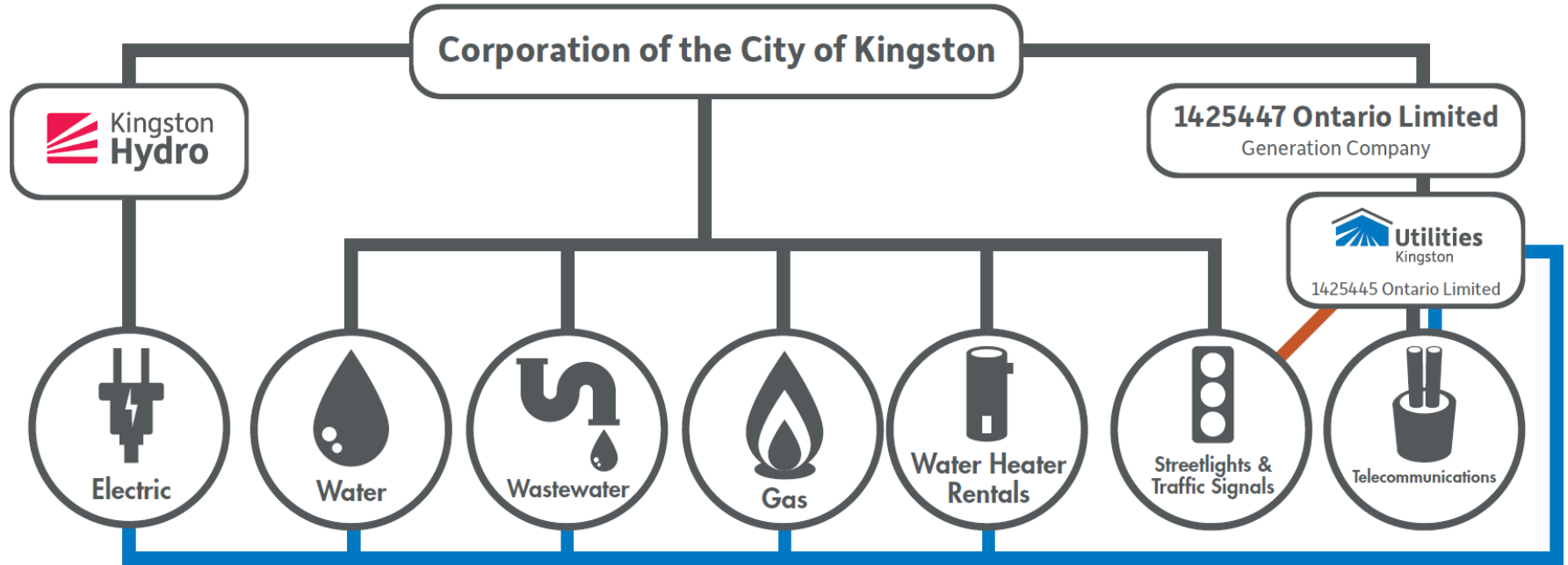


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Reliability

# Corporate Structure



— Own

— Manage, operate, maintain

— Operate, maintain



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# Energy Transition Continues in Ontario

- Actions of the Federal Government continue to drive the energy transition, including decarbonization of electricity supply and fuel-switching
- Actions of the Government of Ontario align with broader economic development strategy with recognition of corporate Environmental, Social and Governance (ESG) mandates, with recent successes
- Outlook for Ontario's electricity sector continues to indicate need for unprecedented investment in new electricity resources
- Continued pressure on Local Distribution Companies (LDCs) to prepare and adapt to energy transition, and opportunities to provide new services

## What is the Energy Transition?

*The Energy Transition is the global shift from fossil-based energy (i.e., oil, gas, coal) to renewable sources of energy (i.e., wind, solar, hydroelectric, etc.).*

*Decarbonizing the electricity sector is foundational to achieving the energy transition and resulting net-zero economy.*



Expansion of electricity grid infrastructure to accommodate load growth



Increasing clean and renewable energy supply to meet energy demands

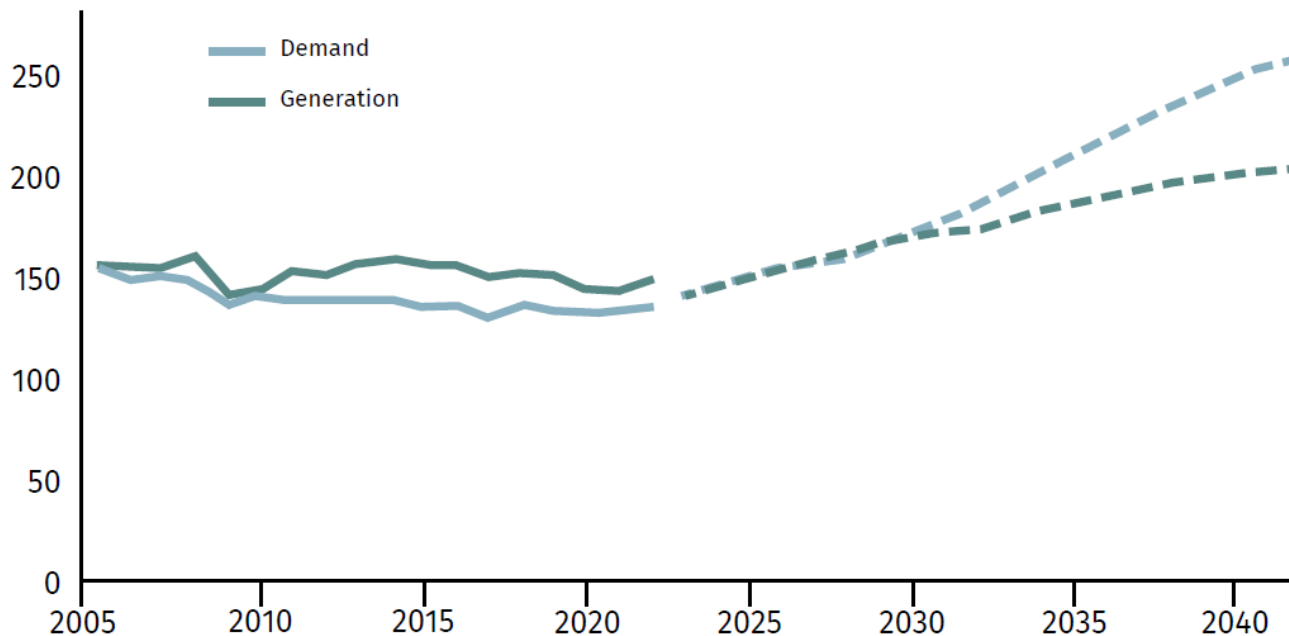


Modernizing the electricity grid to maintain reliability and affordability



# Ontario will struggle to meet rapid electricity growth

Ontario grid demand, TWh per year



Source: IESO Pathways to Decarbonization, Annual Planning Outlook, RBC Climate Action Institute



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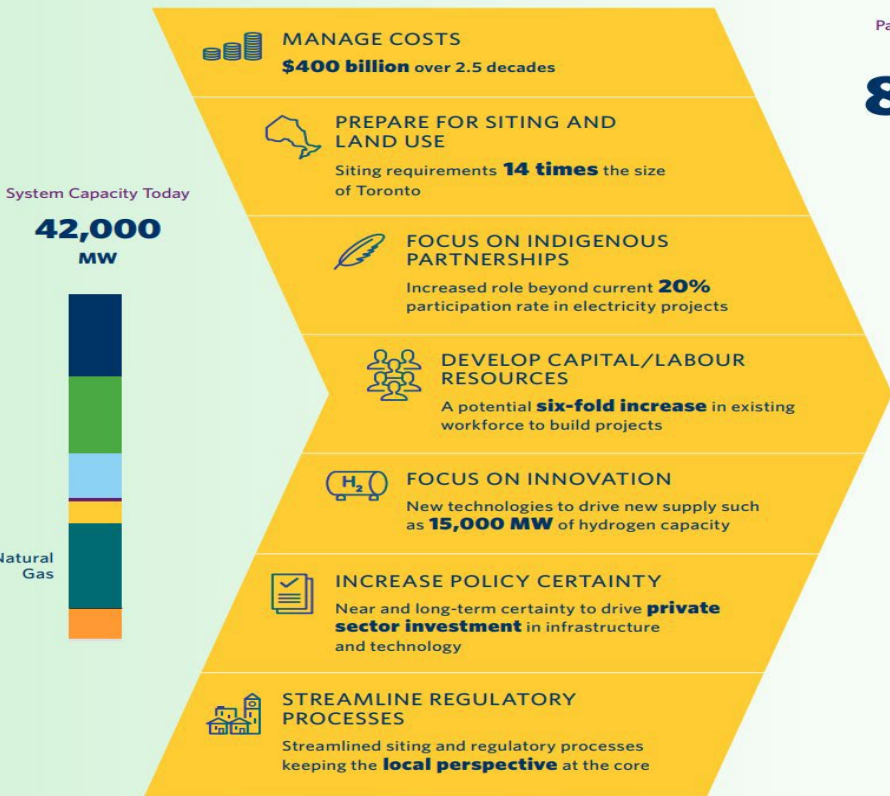
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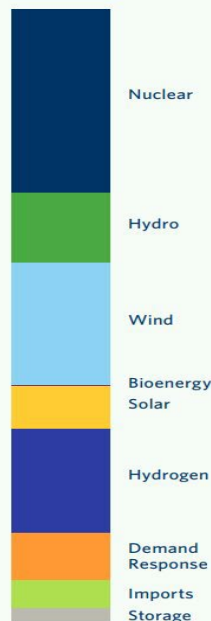
# Decarbonizing Ontario's Electricity System

Bridging the work of today with the needs of a decarbonized world will be challenging and complex. Ontario's electricity system is well positioned to make the transition, but will need to address a series of challenges in order to achieve decarbonization.



Pathways to Decarbonization 2050 Scenario

**88,000 MW**



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# Power Shift: How Ontario Can Cut Its \$450-Billion Electricity Bill



Ontario faces a \$450-billion investment bill by 2050 to meet surging demand and emerge as a green-grid hub that's attractive to industries looking to cut or eliminate their emissions.



Rising electricity demand could strain the province's grid as early as 2026 and even trigger chronic shortages by 2030. To meet pressing short-term needs, Ontario is eyeing more gas-fired power generation, which, unabated, could clash with the federal government's forthcoming Clean Electricity Regulations.



The province can avoid making expensive decisions on its future energy mix by pursuing robust policy measures and incentives to save power.



Timely action to conserve energy could save enough electricity to power 3 million homes by early 2040s—a little more than half of the province's residential electricity demand.



Readily available technologies such as smart thermostats, electric panels and AI-enabled HVAC systems that can substantially improve grid efficiency and sustainability would give Ontario the room to manage demand peaks without building new gas plants.



The measures could save Ontario ratepayers at least \$500 million in avoided generation costs annually over that time.

**RBC Climate Action Institute**  
**Power Shift | June 2023**



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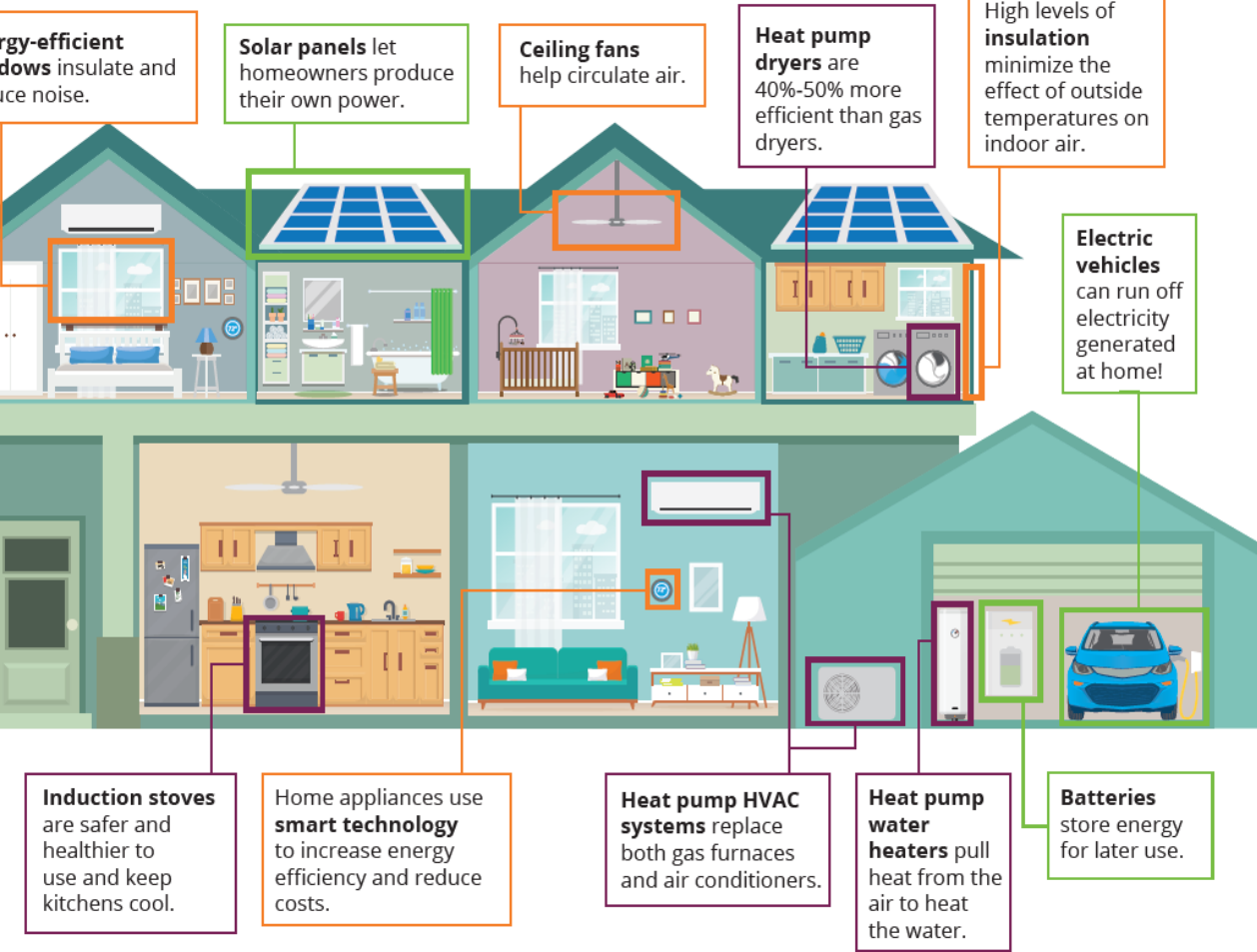


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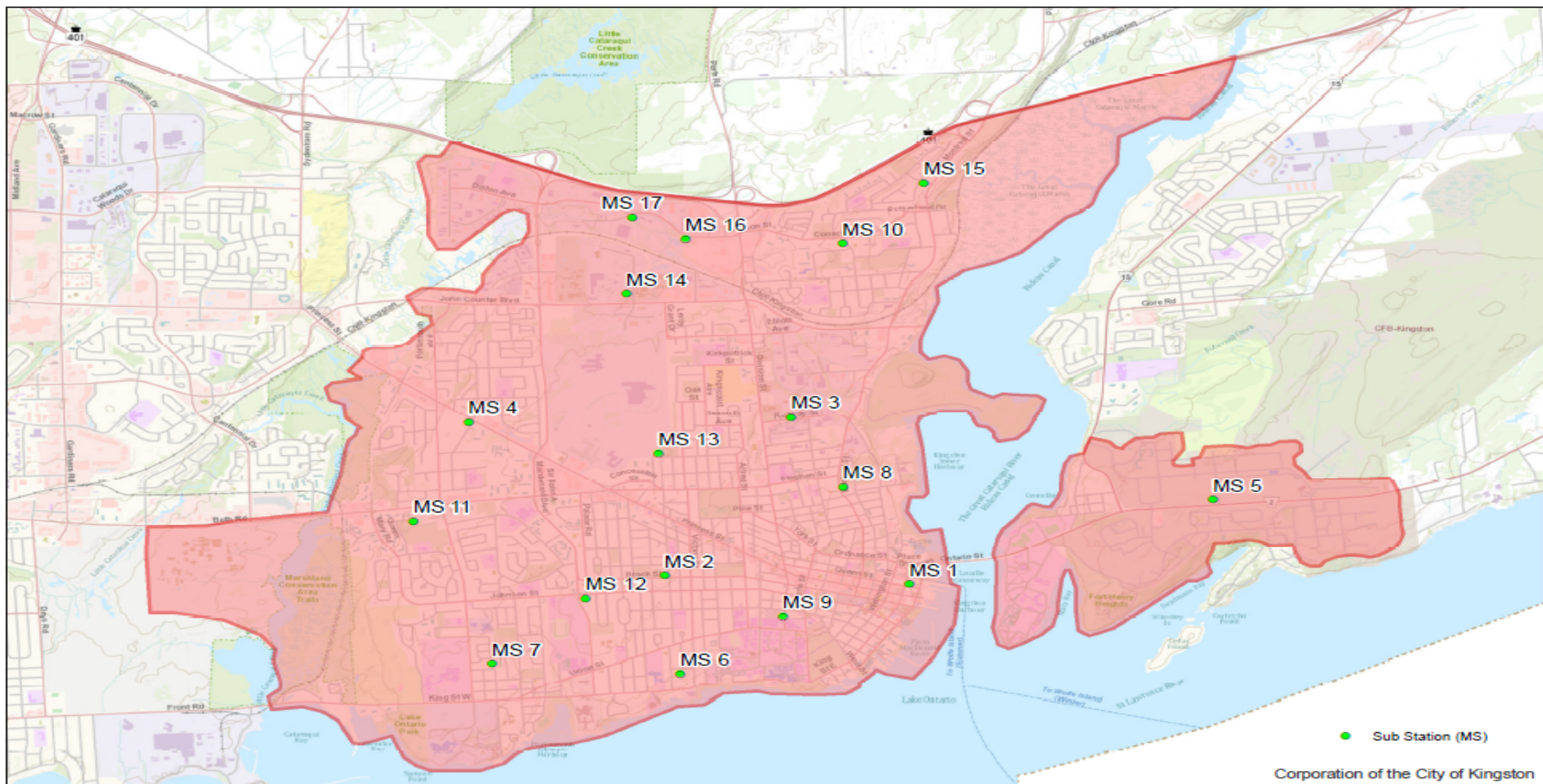


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# Vision for Net-Zero Homes



- Clean All-Electric Features**
- Clean Energy Features**
- Energy Efficiency Features**

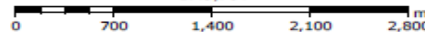


**Electric  
Service Area**



Utilities Engineering - GIS

1:49,764



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K7L 4X7 - Utilities\_GIS@utilitieskingston.com - 613-546-0000

Revision: 1  
Units: Meters  
CRS: NAD 1983 UTM Zone 18N

Reviewer: Carol Belanger  
Producer: stzaluski  
Date: 2022-07-22

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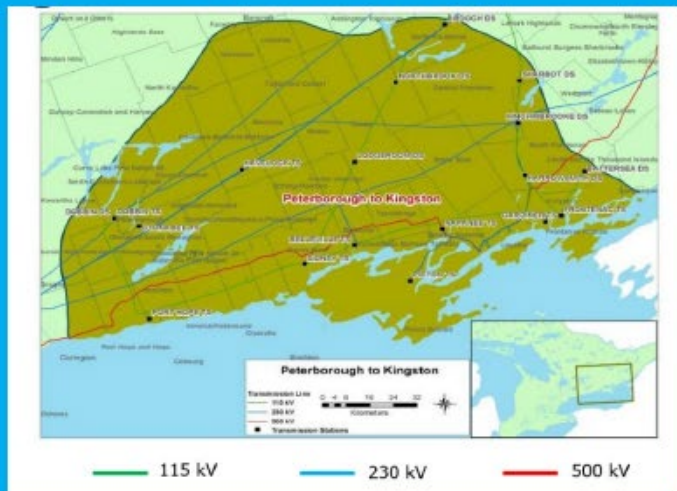
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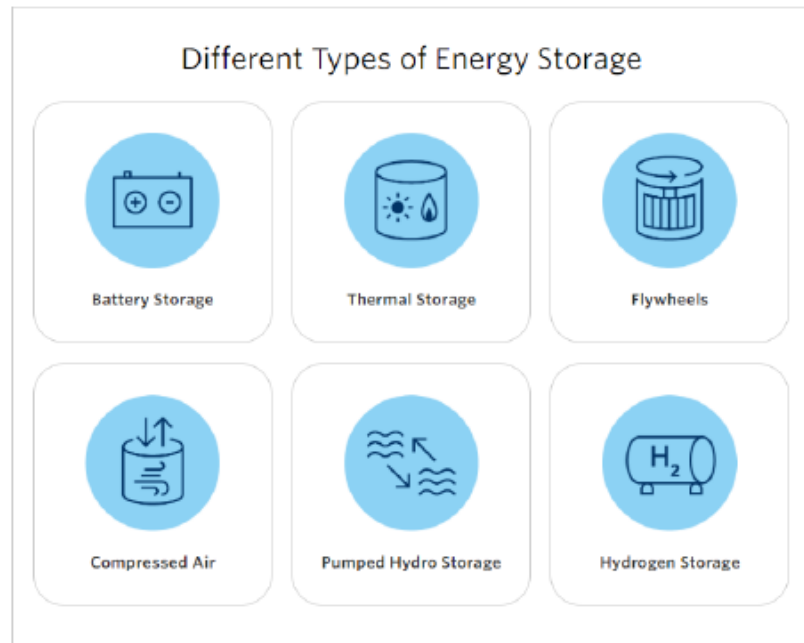
# Regional Planning: Peterborough to Kingston

- March 2020: The IESO in tandem with local Stakeholders, launched the Peterborough to Kingston Regional Planning Process. The process concluded in Nov 2021
- This region includes First Nation communities of Alderville First Nation, Curve Lake First Nation, Huron Wendat, Kawartha Nishnawbe, and the Mohawks of the Bay of Quinte, Métis Nation of Ontario councils, and all or part of the following municipalities:
  - Municipalities of Frontenac County
  - Hastings County
  - Northumberland County
  - Peterborough County
  - Prince Edward County
  - Parts of Lennox and Addington County & related municipalities



# Role of Energy Storage

- After years of stable supply, Ontario is entering a period of need with demand expected to increase by 2 per cent per year over the next twenty years due to electrification, decarbonization and economic growth
- Today, Ontario's electricity grid is already approximately 97% clean, one of the cleanest in North America but electricity demand is also anticipated to double in to address net-zero goals this increases the demand on new sources of clean energy
- Storage is unique among electricity generation types in that it can act as a form of both supply and demand, drawing energy from the grid during off-peak hours when demand is low and injecting that energy back into the grid when it is needed most
- Storage is particularly useful in supporting the wide-scale integration of renewable resources, like wind and solar, because it can help smooth out changes in energy output caused by unpredictable weather



# New DSO Functions Emerge in High-DER Future

## Traditional LDC Functions

- Asset Ownership
- Asset Management
- Network Reliability
- Customer Metering, Billing, Settlement
- Implementing Government Programs

## Evolving LDC Functions

- DERs as NWA's
- DER Connections
- DER Rate Design
- Enhanced Load Forecasting

## New DSO Functions

- DER Forecasting
- DER Operation and Dispatch
- DER Markets
- T-D Coordination
- Enhanced Data Management
- Information Platforms

# Utilities Kingston Strategic Priorities



Development of a new distribution station to serve growing electricity load as well as proactive response and strategy related load growth per IESO Integrated Regional Resource Plan



Consideration of strategic opportunities to increase scale and customer base of the utility



Development of new long-duration energy storage resources in collaboration with Hydrostor



Identifying new roles and responsibilities, including participation in a local distribution system operator (DSO) market and the potential to supply renewable energy to customers



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# Thank you!

# QUESTIONS?



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