MARCH 6, 2025 | VIRTUAL

Load Growth & Demand Drivers in New England

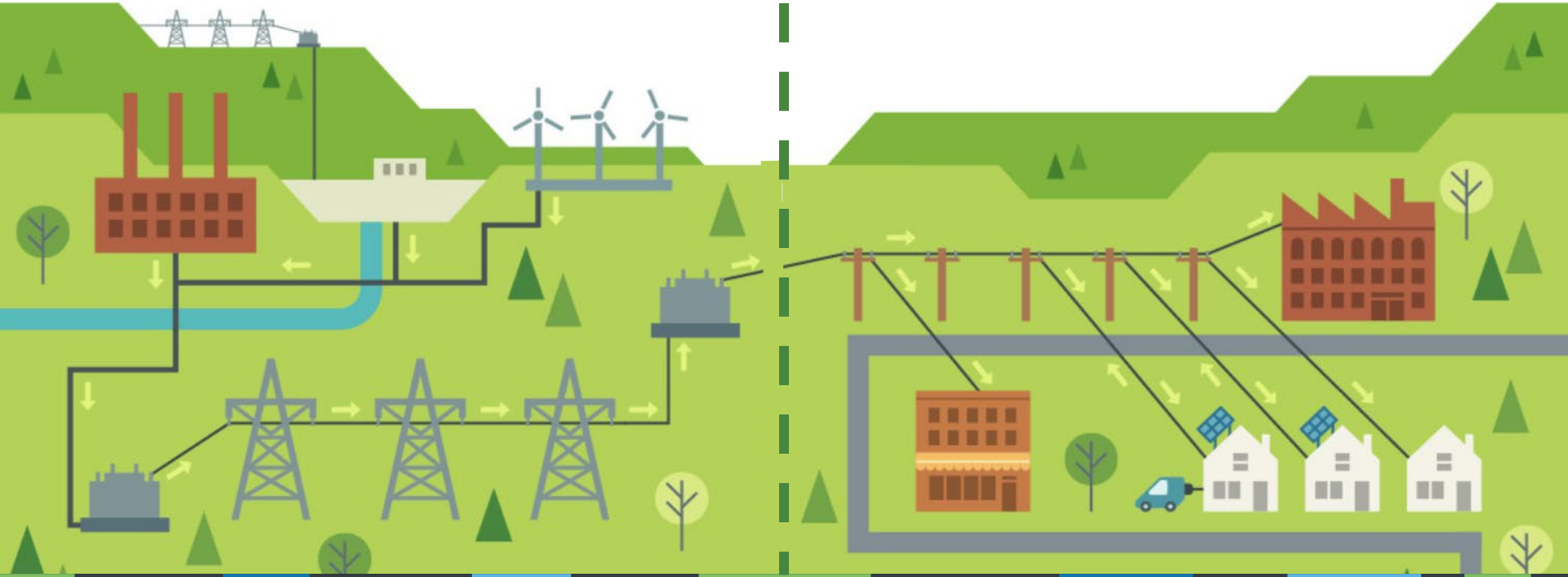
Powering the Future: Streamlining State Energy Permitting & Siting Across the Northeast

Eric Johnson
EXECUTIVE DIRECTOR
EXTERNAL AFFAIRS

Kerry Schlichting
SUPERVISOR, STATE POLICY
EXTERNAL AFFAIRS

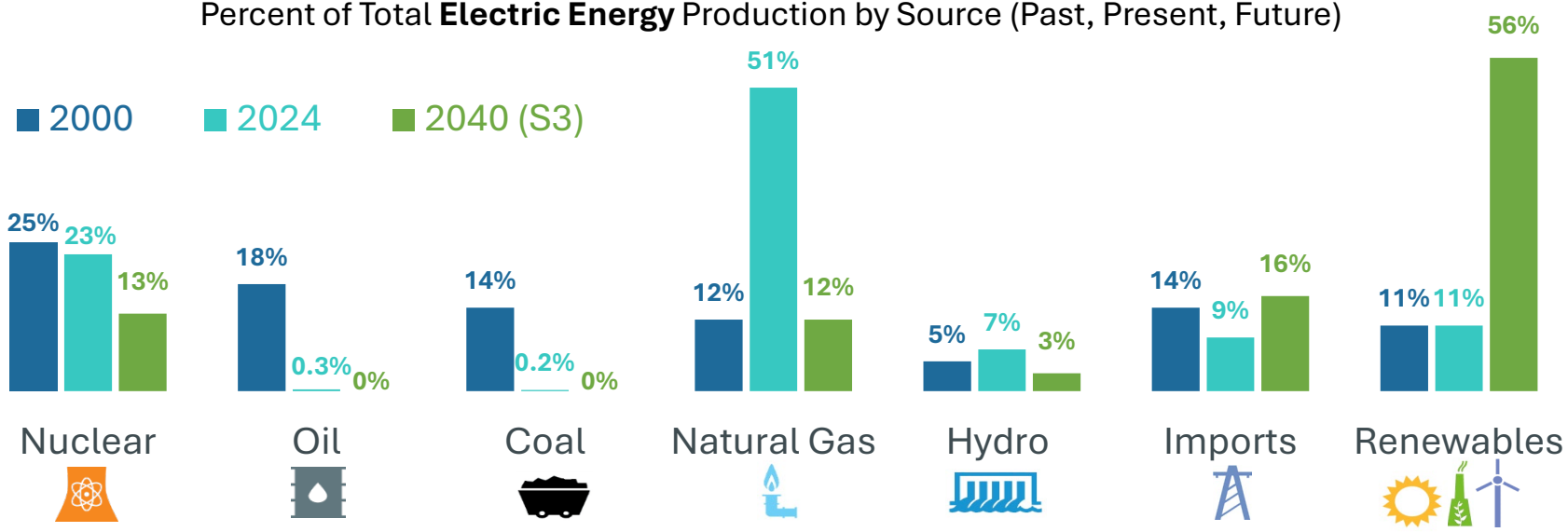
How Electricity Flows

High-voltage Power System (Wholesale Electricity) → Local Distribution System (Retail Electricity)



Dramatic Changes in the Energy Mix

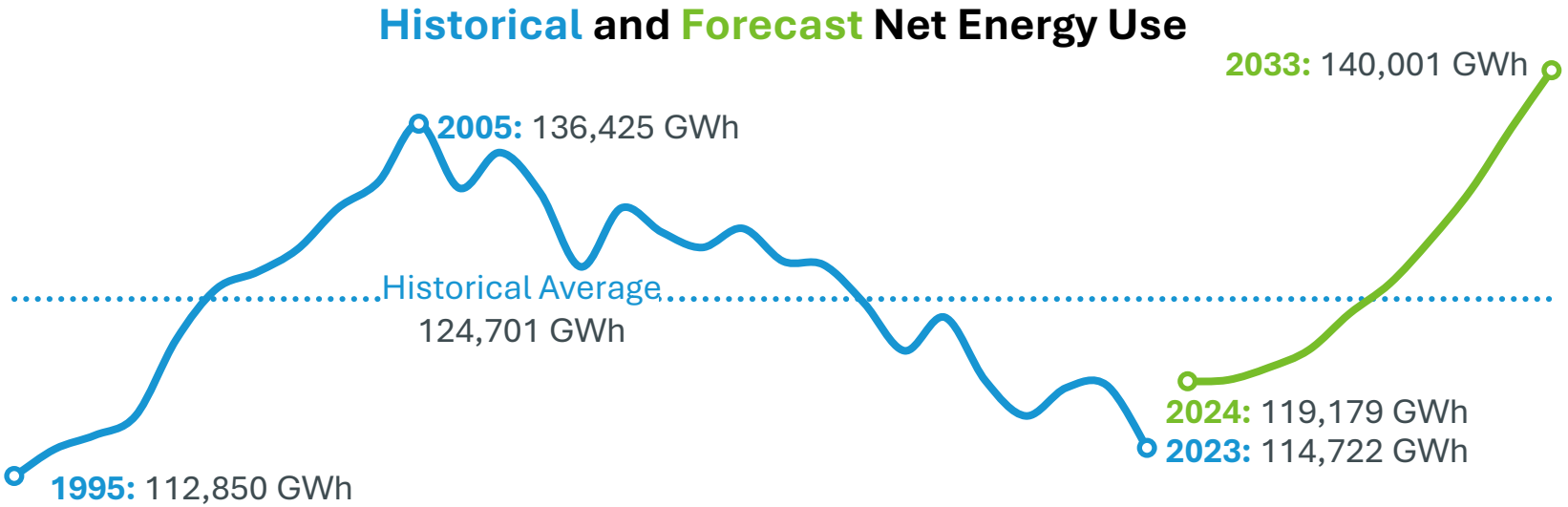
New England made a major shift from coal and oil to natural gas over the past two decades, and is shifting to renewable energy in the coming decades



Source: ISO New England Net Energy and Peak Load by Source; data for 2024 is preliminary and subject to resettlement; data for 2040 is based on Scenario 3 of the ISO New England 2021 Economic Study: Future Grid Reliability Study Phase 1. Renewables include landfill gas, biomass, other biomass gas, wind, grid-scale solar, behind-the-meter solar, municipal solid waste, and miscellaneous fuels.

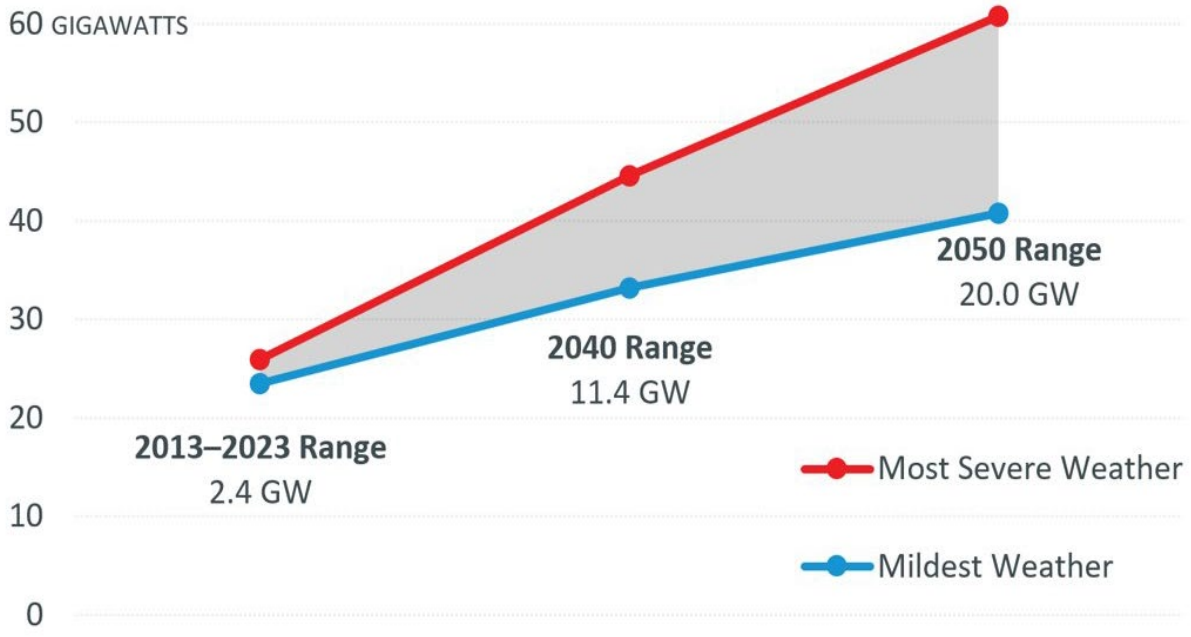
Increased Electrification is Expected to Drive Steady Growth in Net Annual Energy Use

Following two decades of decreased net energy use as a result of state policies incentivizing solar PV and energy efficiency



Source: ISO New England 2024-2033 Forecast Report of Capacity, Energy, Loads, and Transmission (2024 CELT Report) (May 2024)

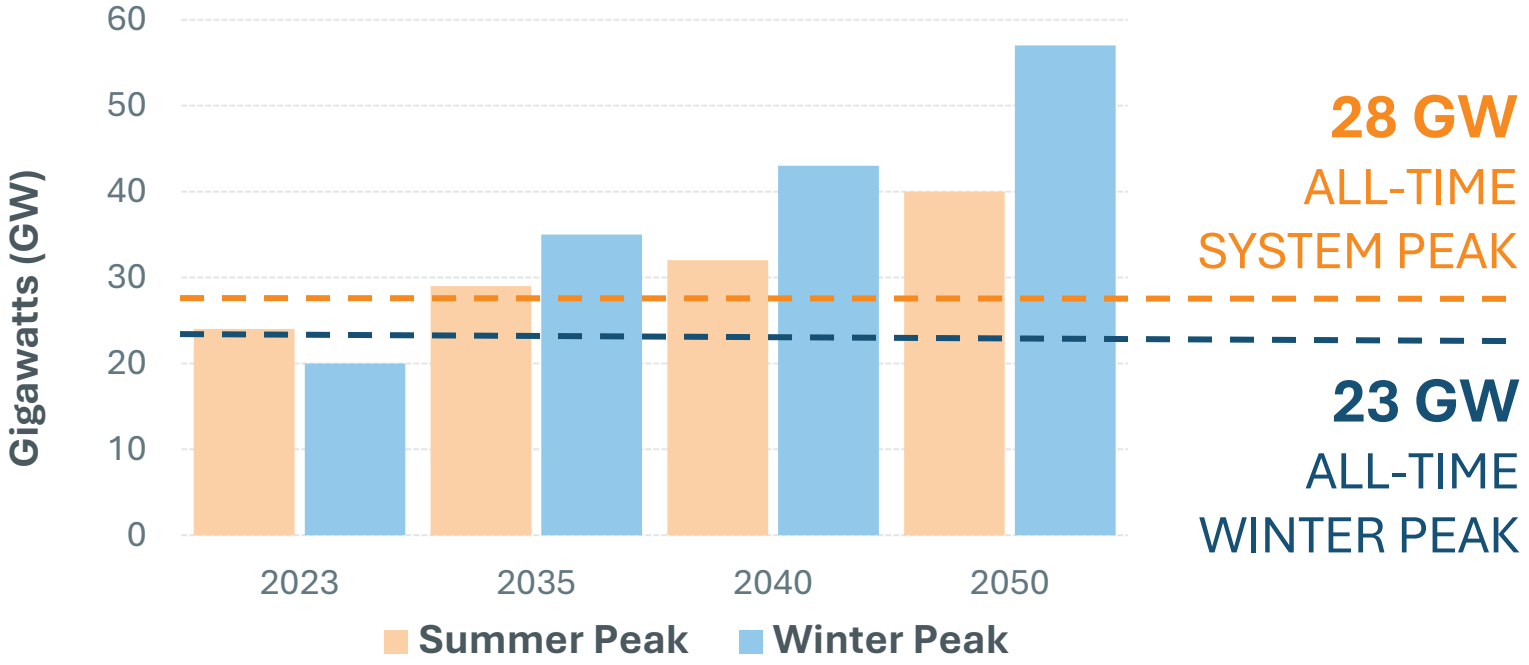
The Future New England Power System Will See Increased Variability in Supply and Demand



- As heating is electrified, peak demand for electricity will shift from **summer** to **winter**
- Peak demand could vary by up to 50% between mild and severe winters by 2050
- As weather-dependent resources increase, electricity supply will also become more variable

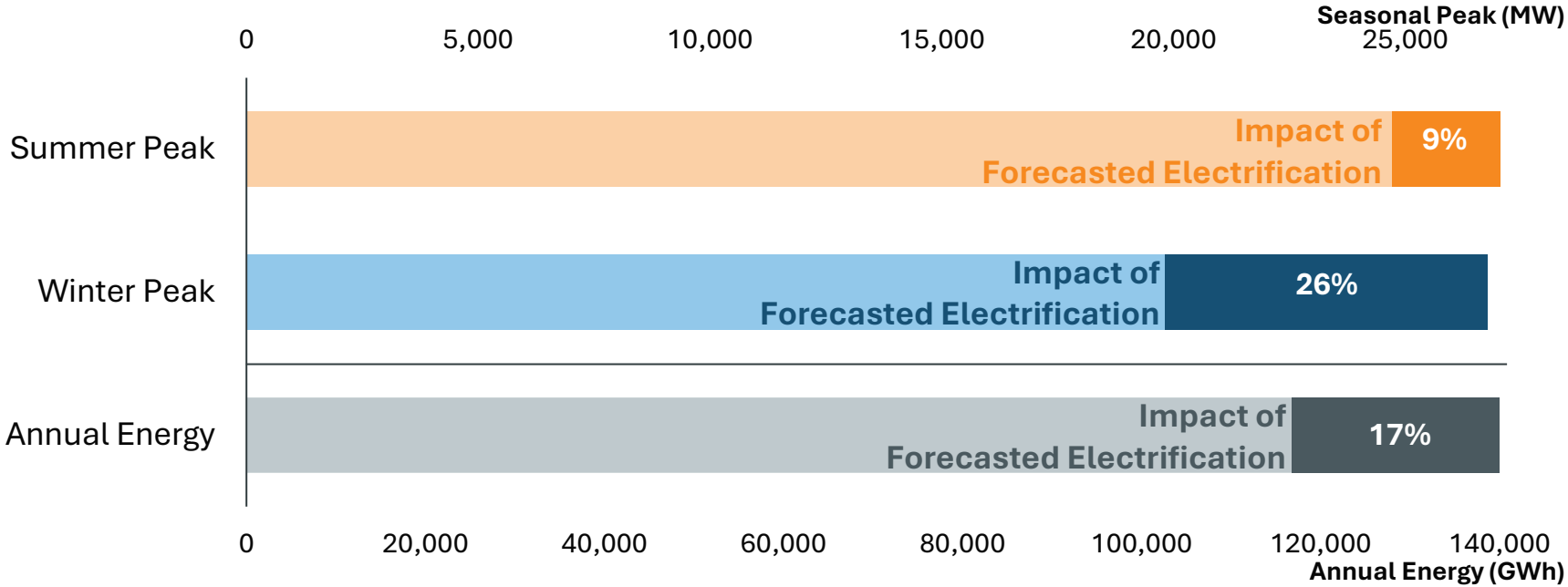
Peak Demand Period Will Shift to Winter

Significant amounts of clean energy will be needed to meet state decarbonization goals while serving significantly increased demand



Impact of Electrification on 2033 Annual Energy Use and Seasonal Demand in New England

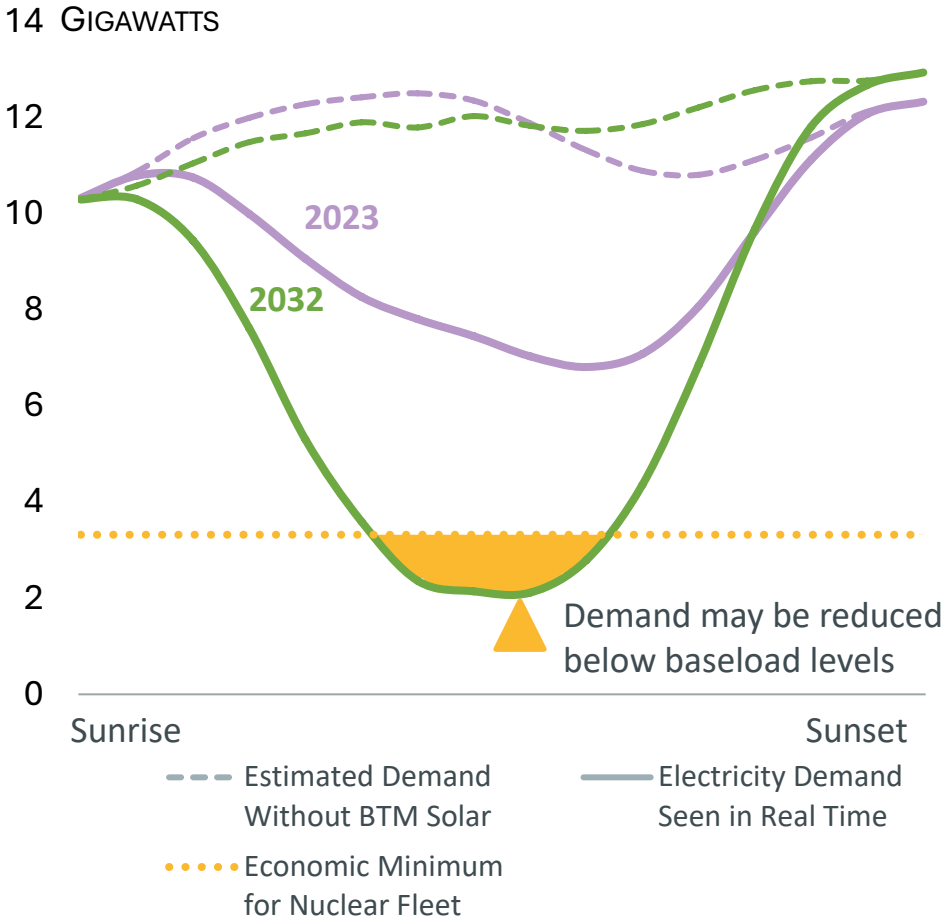
In 2033, impacts of electrification are expected to account for more than 23,000 GWh of annual energy consumption, roughly 2,500 MW of summer demand and 7,000 MW of winter demand

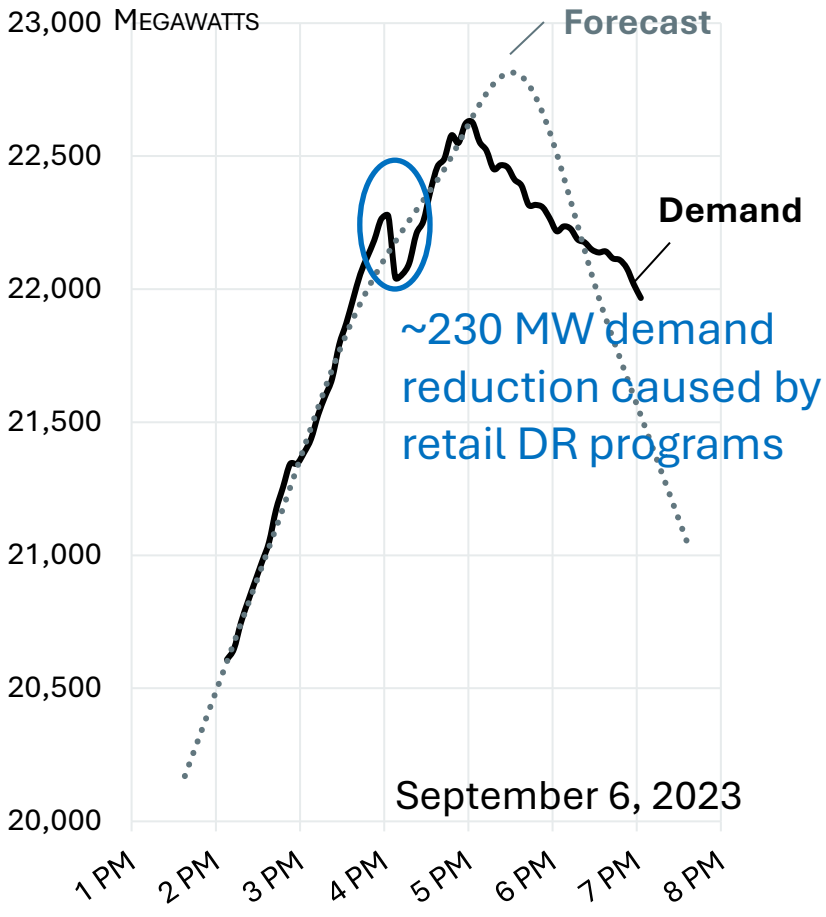


Source: ISO New England 2024-2033 Forecast Report of Capacity, Energy, Loads, and Transmission (2024 CELT Report) (May 2024)

Growth in the Region's Distributed PV Produces Extreme 'Duck Curves' on Some Days

- Balancing, flexible resources will be crucial to ensure equilibrium as intermittent resources see swings in energy production



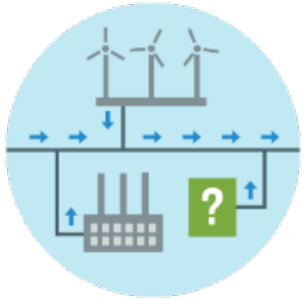


Retail Demand Response Programs Can Significantly Reduce System Load

- Retail demand response programs can have a significant impact on ISO's system and market operations
- The ISO does not have direct visibility or control of retail demand response programs
- The effects of retail programs operating outside of ISO's markets can be challenging to forecast

Consideration of Data Centers in New England

- ISO-NE would view proposals for large new loads as non-normal growth/“Step Loads”
  - Awareness of step loads primarily comes to ISO from the transmission request process
  - For ISO’s modeling and forecasting purposes, growing need to have more insight on what's going on in the distribution system
- Behind-the-meter proposals may trigger ISO review of generator net output and capacity obligations; ISO may review existing interconnection facility modifications for adverse impacts
- Project-specific considerations include:
  - Will load be flexible, not flexible, or price sensitive?
  - Will project have on-site generation, storage, or backup?
  - How and where is the project interconnecting?



Key Takeaways

- New England's electric power system is changing rapidly
- ISO-NE is focused on developing solutions to today's grid challenges
- In response to new regulatory requirements, policy and stakeholder requests, and changing industry dynamics, system planning and markets in the New England region are evolving significantly

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Questions