



# ISO New England Power Grid Outlook

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*CBIA 2024 Energy & Environment Conference*

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# ISO New England (ISO) Has More Than Two Decades of Experience Overseeing the Region's Restructured Electric Power System

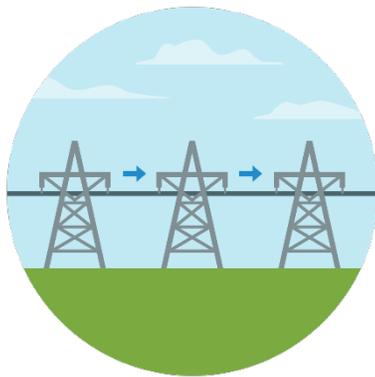
- **Regulated** by the Federal Energy Regulatory Commission
- **Reliability Coordinator** for New England under the North American Electric Reliability Corporation
- **Independent** of companies in the marketplace and **neutral** on technology



# ISO New England Performs Three Critical Roles to Ensure Reliable Electricity at Competitive Prices

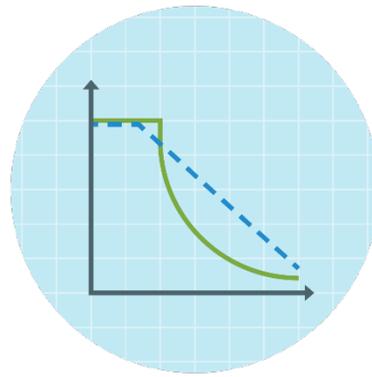
## Grid Operation

Coordinate and direct the flow of electricity over the region's high-voltage transmission system



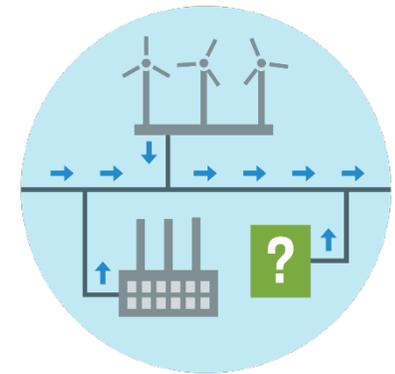
## Market Administration

Design, run, and oversee the markets where wholesale electricity is bought and sold

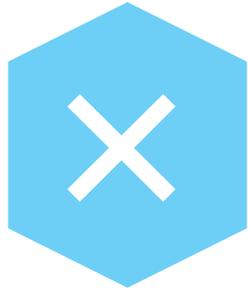


## Power System Planning

Study, analyze, and plan to make sure New England's electricity needs will be met over the next 10 years



# Things We Don't Do



Handle  
retail  
electricity



Own power  
grid  
infrastructure



Have a stake in  
companies  
that own grid  
infrastructure



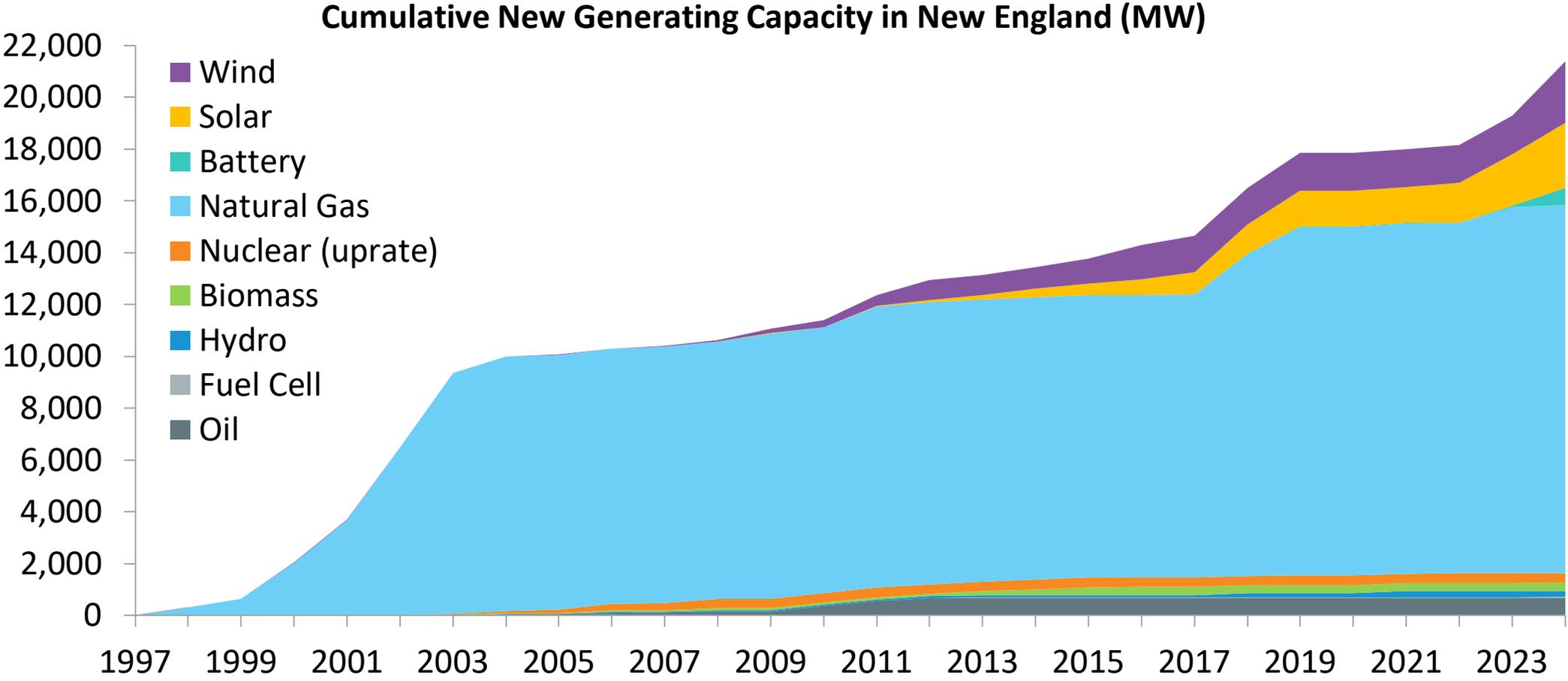
Have  
jurisdiction  
over fuel  
infrastructure



Have control  
over siting  
decisions



# Wind and Solar Have Emerged as the Most Recent Capacity Additions to the System

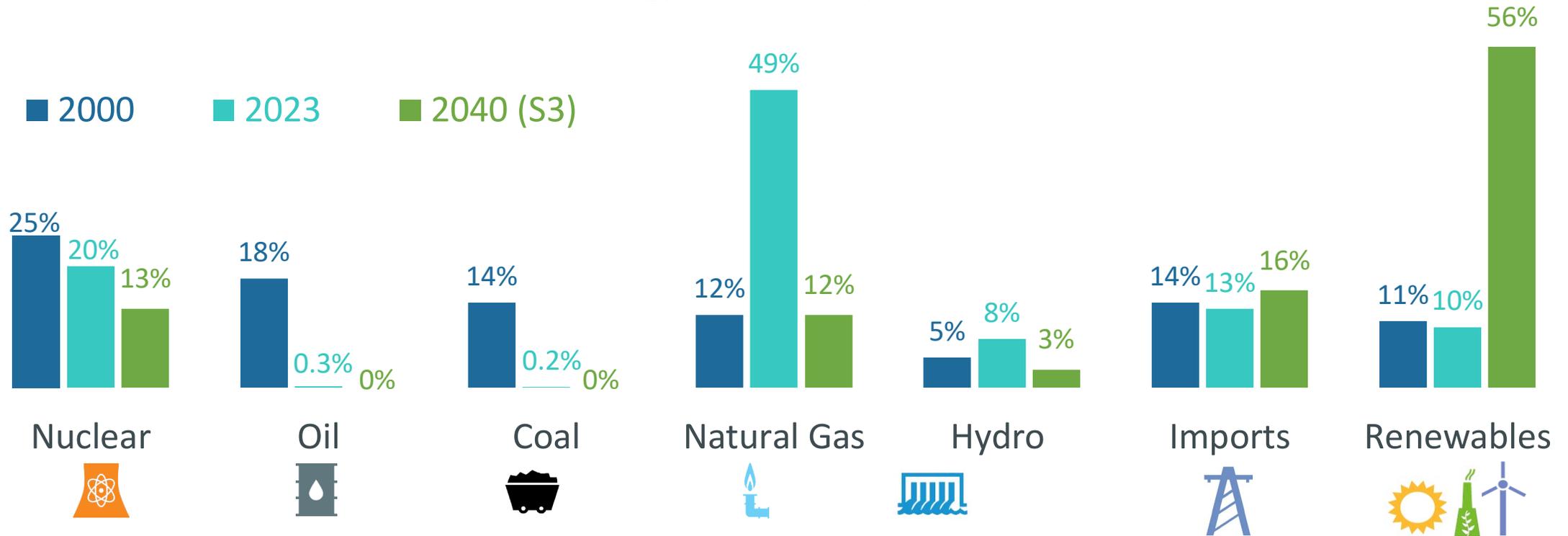


Note: New generating capacity for years 2021 – 2024 includes resources clearing in recent Forward Capacity Auctions.

# 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*

Percent of Total **Electric Energy** Production by Source (Past, Present, Future)

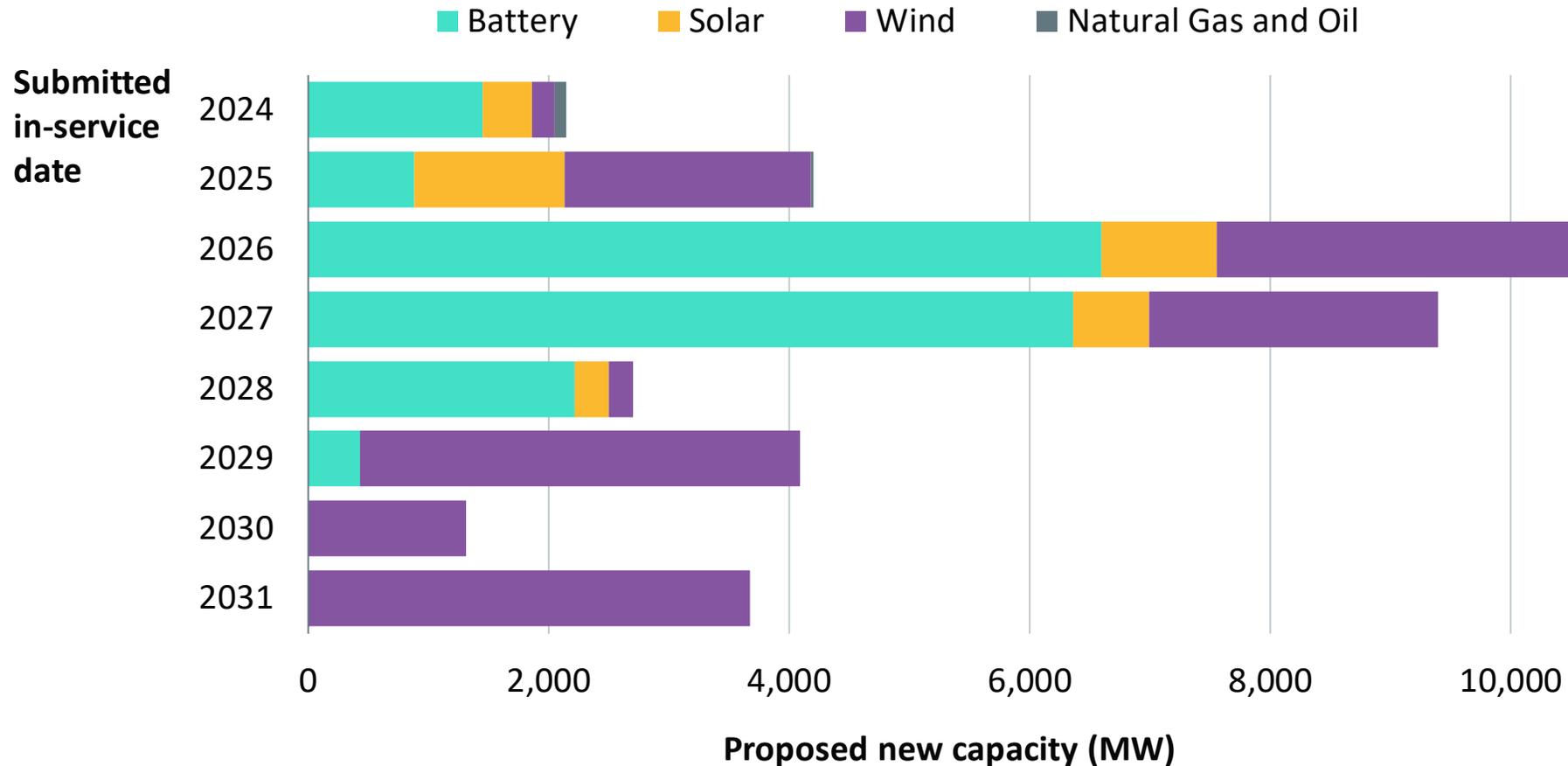


Source: ISO New England [Net Energy and Peak Load by Source](#); data for 2023 is preliminary and subject to resettlement; data for 2040 is based on Scenario 3 of the ISO New England [2021 Economic Study: Future Grid Reliability Study Phase 1](#). Renewables include landfill gas, biomass, other biomass gas, wind, grid-scale solar, behind-the-meter solar, municipal solid waste, and miscellaneous fuels.



# Batteries, Wind Dominate Interconnection Queue Requests

*ISO's Queue reflects more than 200 proposed projects of which over 6,000 MWs have signed interconnection agreements but are not yet commercially operational*



Source: [ISO Generator Interconnection Queue](#), FERC Jurisdictional Proposals (updated May 2024)

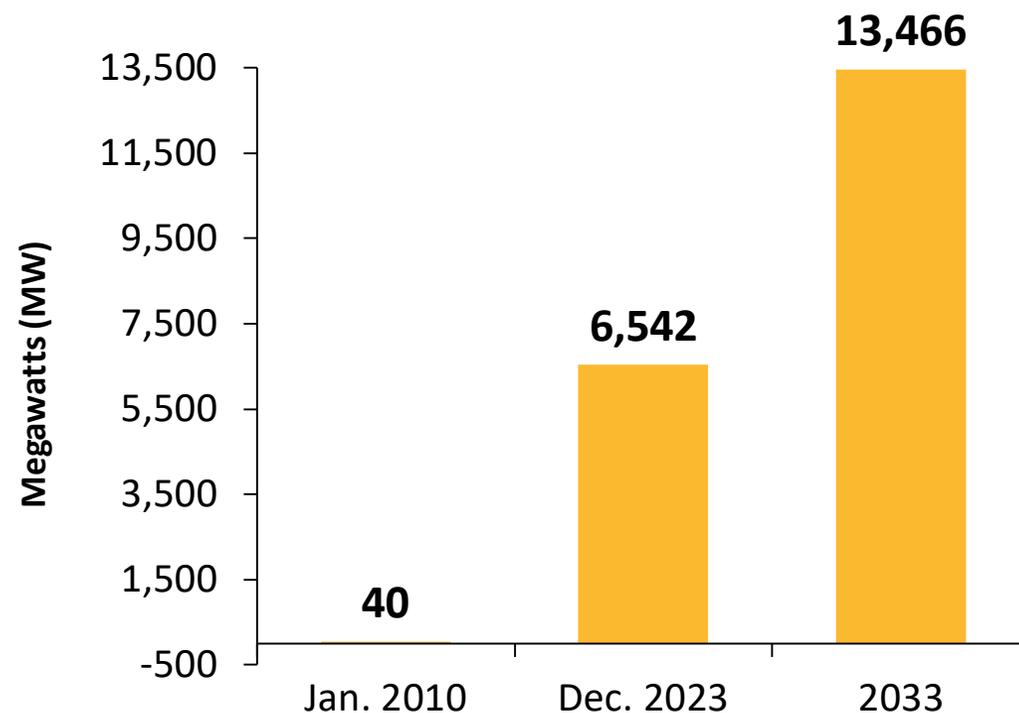


# ISO New England Forecasts Strong Growth in Solar Photovoltaic (PV) Resources

Dec. 2023 Solar PV Installed Capacity (MW<sub>ac</sub>)

State	Installed Capacity (MW <sub>ac</sub> )	No. of Installations
Connecticut	1,091	91,290
Massachusetts	3,712	179,362
Maine	588	11,506
New Hampshire	244	21,234
Rhode Island	400	22,769
Vermont	507	21,179
<b>New England</b>	<b>6,542</b>	<b>347,341</b>

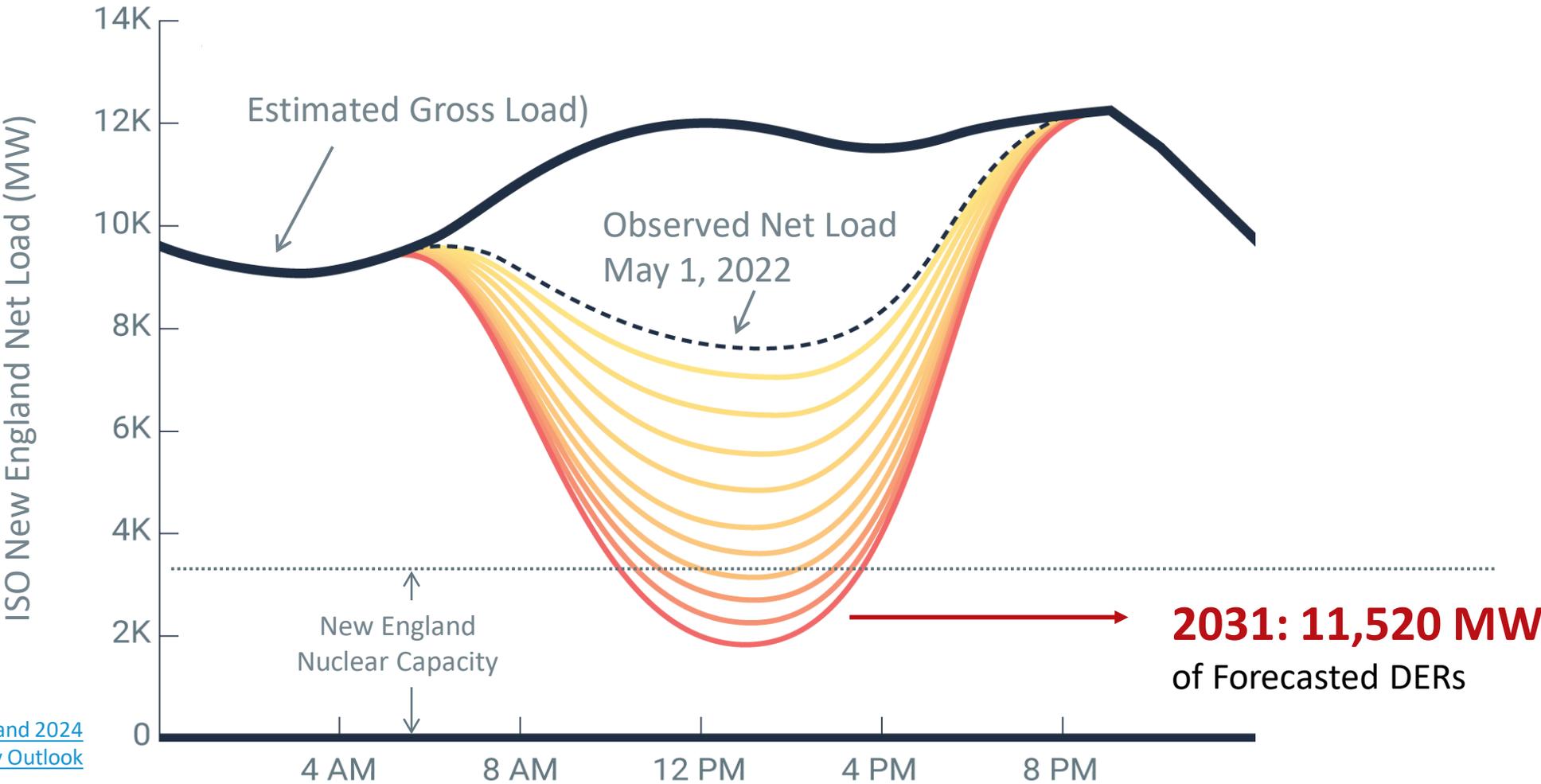
Cumulative Growth in Solar PV through 2033 (MW<sub>ac</sub>)



Note: The bar chart reflects the ISO’s projections for nameplate capacity from PV resources participating in the region’s wholesale electricity markets, as well as those connected “behind the meter.” The forecast does not include forward-looking PV projects > 5 MW in nameplate capacity Source: [ISO New England 2024-2033 Forecast Report of Capacity, Energy, Loads, and Transmission \(CELT\) Report](#) and [2024 Photovoltaic \(PV\) Forecast](#)



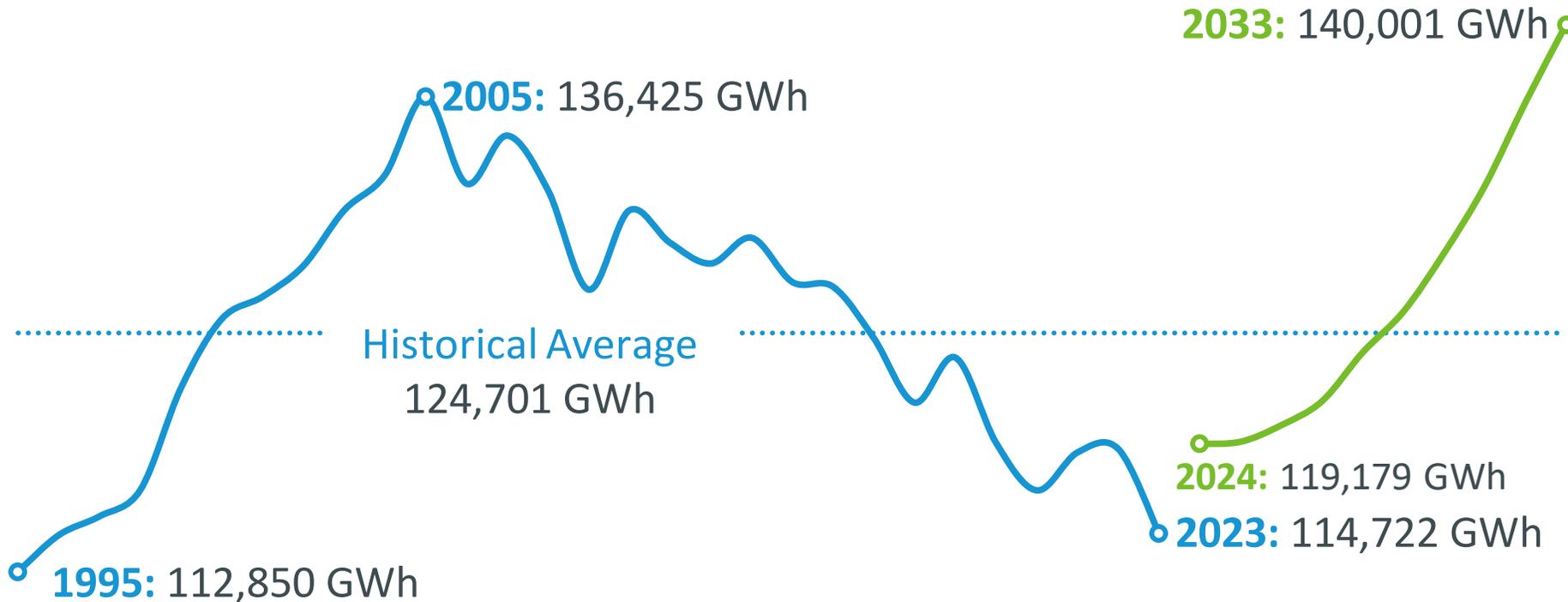
# Lower Net Loads with Increasing Levels of Behind-the-Meter Solar and Distributed Energy Resources (DERs)



Source: [ISO New England 2024 Regional Electricity Outlook](#)

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

## Historical and Forecast Net Energy Use



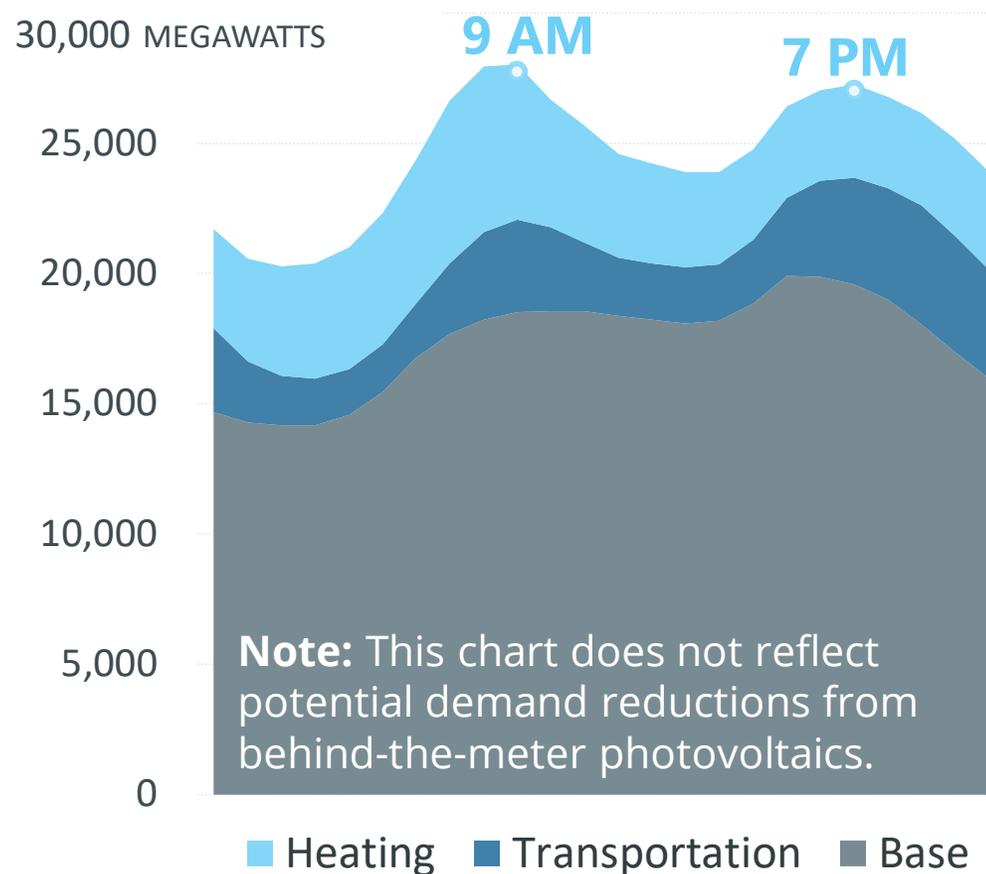
Source: [ISO New England 2024-2033 Forecast Report of Capacity, Energy, Loads, and Transmission \(2024 CELT\) Report](#)

# Heating Electrification Will Drive Higher Energy Use and Shift System Peak

By winter 2033/2034, heating will represent **13%** of the winter peak and **6%** of total annual energy use

Heating electrification leads to a new morning peak **700 MW higher** than the evening peak

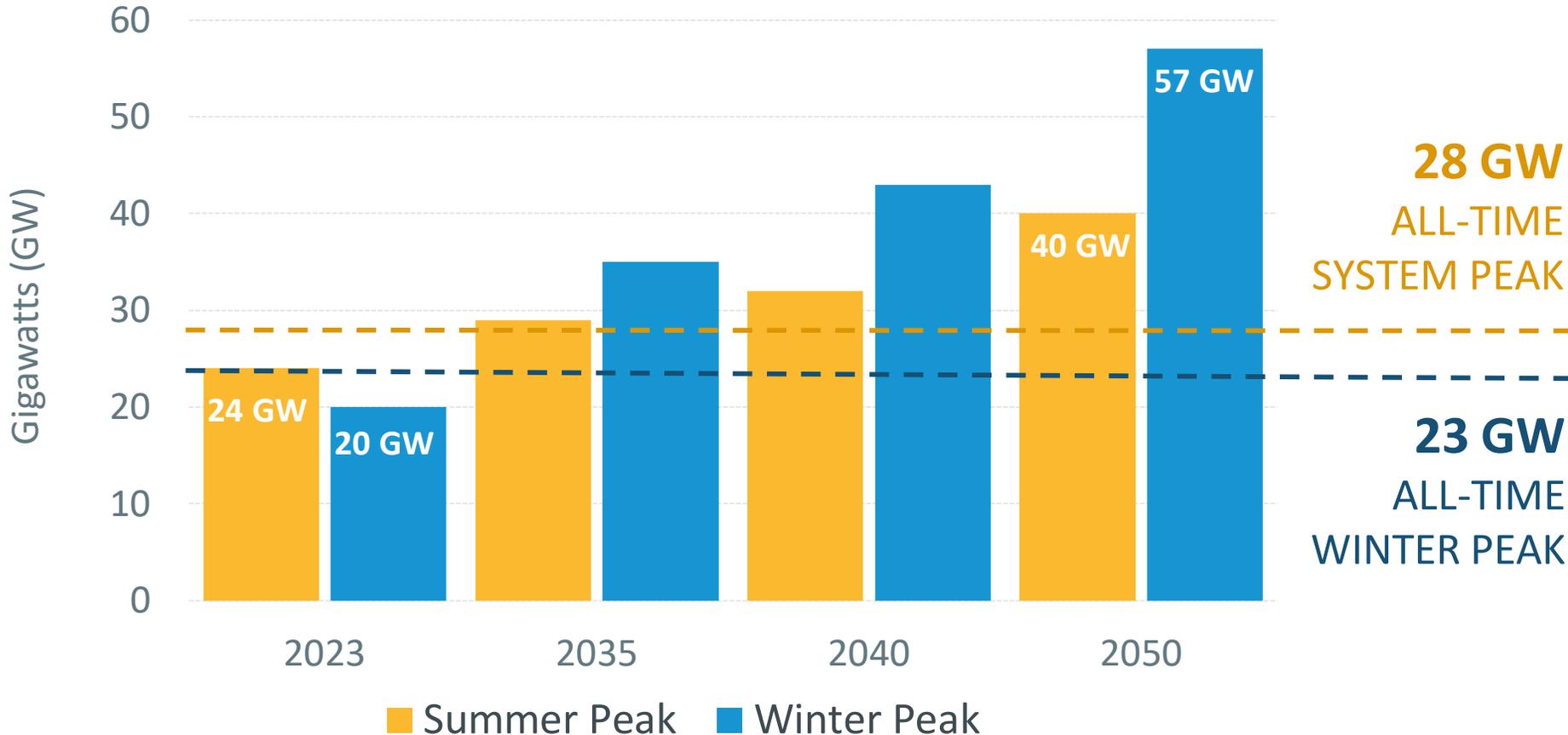
## Impact of Electrification on Hourly Demand



Peak Demand Day, January 2034

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

# Significant Demand Growth as System Peak Shifts to Winter

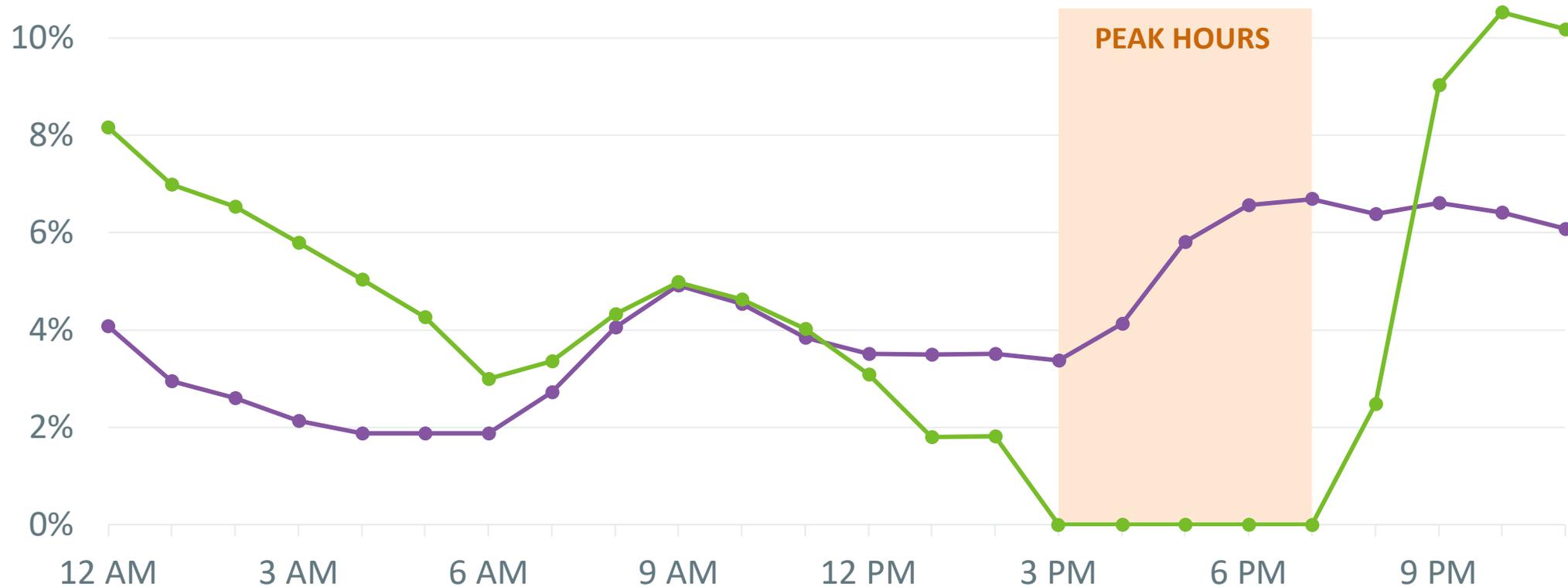


Source: [Massachusetts Energy Pathways to Deep Decarbonization study](#) and [ISO New England 2050 Transmission Study](#)

# Managed EV Charging Can Shift Load to Times When Demand and Wholesale Prices are Lower

## Managed vs. Unmanaged EV Charging

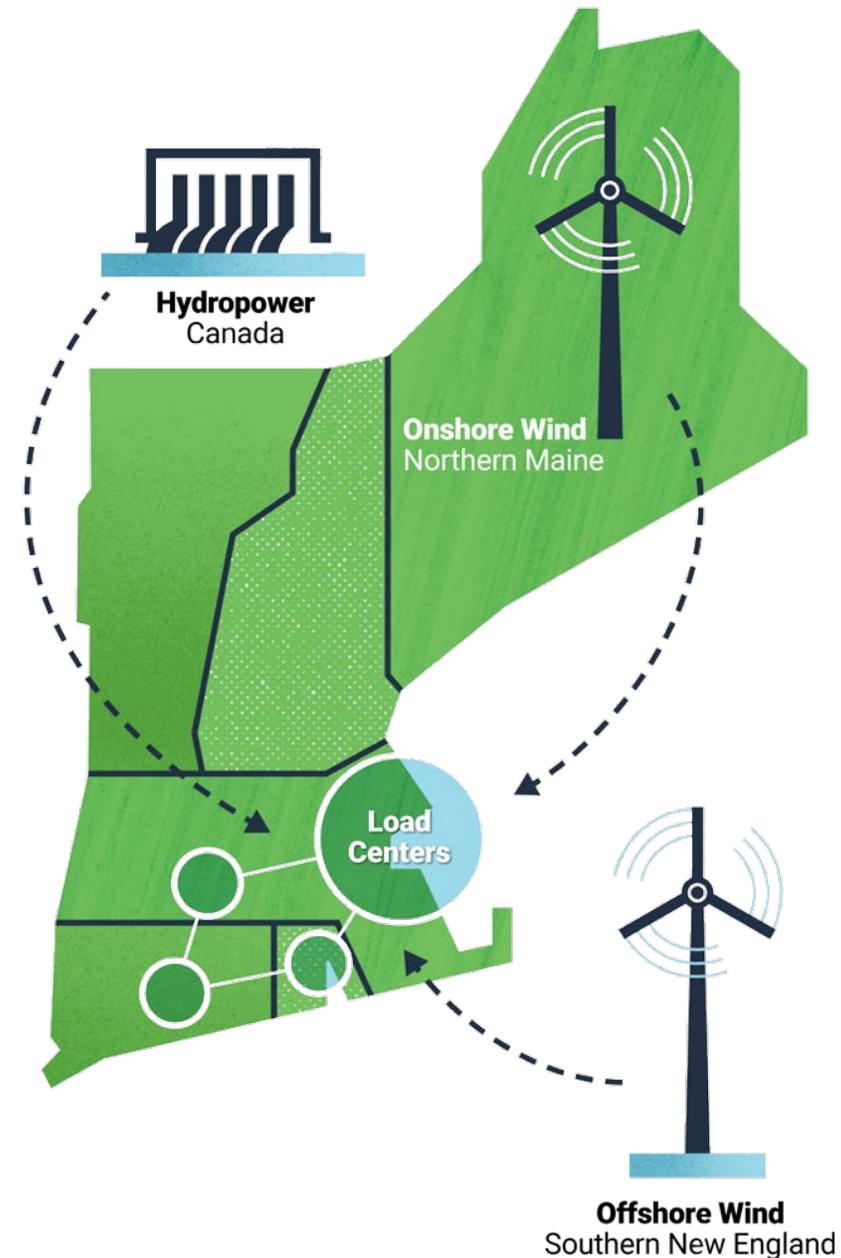
Hourly Percentage of Daily Charging Energy



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

# Significant Investment in New and Existing Infrastructure will be Critical to Enabling the Clean Energy Transition

**\$620 million to \$1 billion** in transmission reliability investment will be needed **each year through 2050** to support the clean energy transition



Source: [Massachusetts Energy Pathways to Deep Decarbonization study](#) and [ISO New England 2050 Transmission Study](#)

# There Are **Four Pillars** Necessary to Support a Successful Clean Energy Transition



## **PILLAR ONE**

### **Clean Energy**

Significant amounts of clean energy to power the economy with a greener grid

## **PILLAR TWO**

### **Balancing Resources**

Resources that can supply electricity, reduce demand, or provide other services to maintain power system equilibrium

## **PILLAR THREE**

### **Energy Adequacy**

A dependable energy supply chain and/or a robust energy reserve to manage through extended periods of severe weather or energy supply constraints

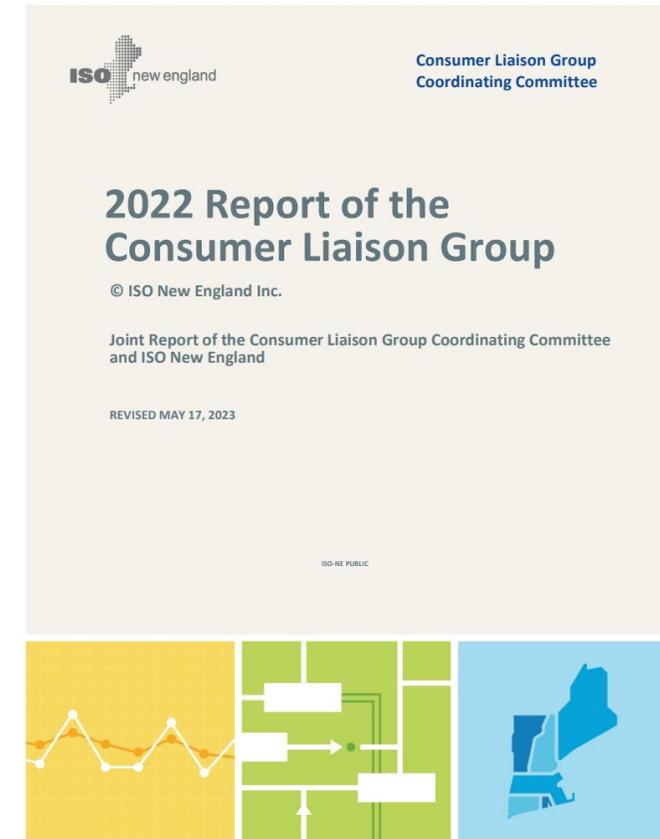
## **PILLAR FOUR**

### **Robust Transmission**

To integrate renewable resources and move clean energy to consumers across New England

# ***Consumer Liaison Group Provides a Forum for Consumers to Learn about Regional Electricity Issues***

- A forum for sharing information between the ISO and electricity consumers in New England
- The CLG Coordinating Committee consists of 12 members who represent various stakeholder groups
- Quarterly meetings are free and open to the public, with in-person and virtual options to participate
- Upcoming 2024 CLG Meeting Dates:
  - Thursday, September 12
  - Wednesday, December 4



[2022 CLG Annual Report](#)

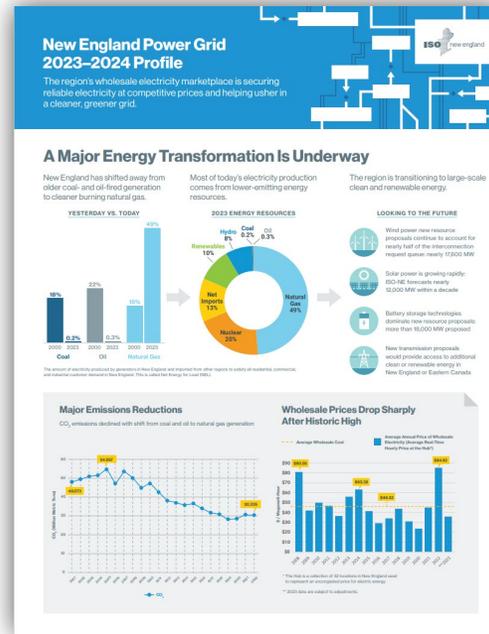
More information on the CLG is available at: <https://www.iso-ne.com/committees/industry-collaborations/consumer-liaison/>

# ISO New England Releases Several Publications



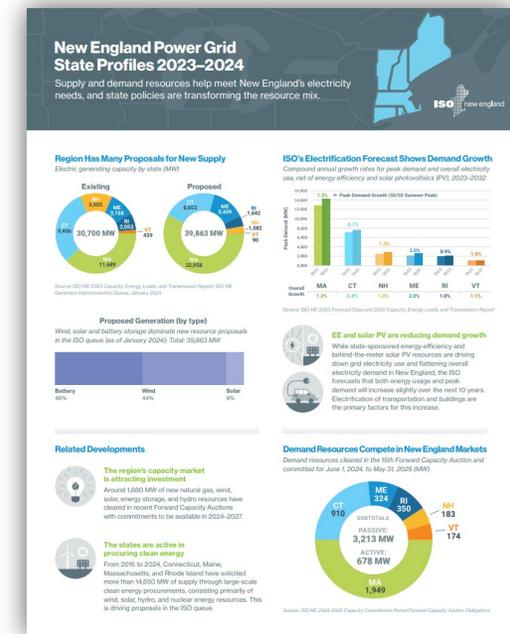
## 2024 Regional Electricity Outlook

Provides an in-depth look at New England's biggest challenges to power system reliability, the solutions the region is pursuing, and other ISO New England efforts to improve services and performance



## New England Power Grid Profile

Provides key grid and market stats on how New England's wholesale electricity markets are securing reliable electricity at competitive prices and helping usher in a cleaner, greener grid



## New England State Profiles

Provides state-specific facts and figures relating to supply and demand resources tied into the New England electric grid and state policies transforming the resource mix in the region

# Questions

