



# ISO New England Regional Update

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*Vermont System Planning Committee  
January 2023 Quarterly Meeting*

**Eric Johnson**

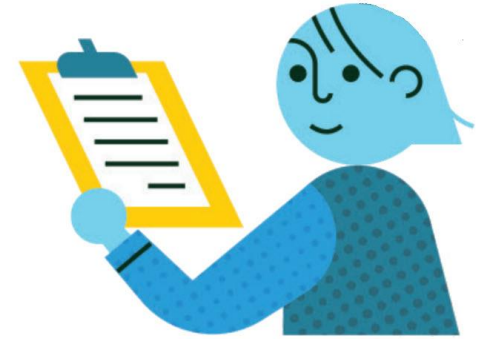
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# Today's Updates



- Forward Capacity Auction #17
- Winter Outlook
- Vermont 2032 Needs Assessment
- Transmission Planning Updates
- Reliability and Market Enhancement Projects
- FERC Filings and Updates
- ISO Interconnection Queue Snapshot
- ISO New England Publications and Resources



# FORWARD CAPACITY AUCTION #17 (FCA #17)



# Forward Capacity Auction #17 is Scheduled to Take Place in March 2023

- **FCA #17** will procure the resources needed to meet the demand for electricity, plus reserve requirements, during the June 1, 2026 to May 31, 2027 capacity commitment period
- In **November**, the ISO [submitted a pre-FCA informational filing](#) to FERC, outlining:
  - Capacity zones to be modeled
  - Resources qualified to participate
- The ISO will model **three** capacity zones in FCA #17
  - Northern New England Capacity Zone
    - Export-Constrained
  - Maine “Nested” Capacity Zone
    - Export-Constrained
  - Rest-of-Pool Capacity Zone



# FCA #17: Other Important Auction Inputs

- The ISO qualified a total of **32,798 MW** of existing capacity resources to participate in the auction, including:
  - **29,383 MW** from existing generating resources (intermittent and non-intermittent)
  - **84 MW** from existing import resources, and
  - **3,331 MW** from existing demand resources
- The ISO qualified **239 new capacity resources totaling 5,032 MW**, to participate in the auction
- The net Installed Capacity Requirement is **30,305 MW**
- The ISO qualified 2 demand bids, totaling **8 MW**, and 88 supply offers, totaling **515 MW**, to participate in the substitution auction



# WINTER 2022/2023 OUTLOOK

*On December 5, the ISO posted its [Winter Outlook Press Release](#)*

# Key Takeaways

*Pre-Winter Briefing 2022/2023*



- **Adequate electric supplies expected under mild and moderate weather**, which in New England is quite cold.
- The ISO's winter outlook again identifies potential reliability concerns based on a range of weather conditions. The ISO has operating procedures to manage an energy shortfall, but our winter outlook is not explicitly forecasting the need for those actions.
- ISO New England anticipates demand for electricity will peak at **20,009 megawatts (MW)** during average winter weather conditions of 10°F, and **20,695 MW** if temperatures reach below average conditions of 5°F. These demand projections are both **about 2 percent higher** than last year's forecasts.
- National Oceanic and Atmospheric Administration (NOAA) is projecting **average to above average temperatures in New England**, though a warmer than average season does not eliminate the threat of prolonged stretches of cold weather.



# Key Takeaways, cont.

*Pre-Winter Briefing 2022/2023*



- The ISO has a **rolling 21-day energy supply forecast** to identify potential energy shortfalls while there is time to prevent them or lessen their impact.
- Identifying and publicizing possible energy shortfalls weeks in advance signals to the region's wholesale energy market participants the need to contract for **additional fuel deliveries**.
- **Public appeals for conservation** are among the tools available to mitigate an energy shortfall if fuel replenishment is insufficient.
- ISO New England would initiate **controlled power outages** only if conservation and other measures were insufficient to balance energy supply and consumer demand.





# High-Level Winter Assessment: Winter 2022/23

*If this winter is similar to...*

## Winter 2021/22

*Then...*

The ISO anticipates that there would be sufficient capacity and energy available to meet the expected peak loads and energy needs

## Winter 2017/18

*Then...*

The ISO anticipates that the system can be operated reliably, but *may require* the implementation of **capacity deficiency procedures**

## Winter 2013/14

*Then...*

Assuming persistent below-normal temperatures and several cold stretches, the ISO anticipates that it *may require* implementation of **all available emergency procedures**

### All three scenarios for this winter:

Assume no significant generation or transmission outages and *minimal to moderate replenishment*

*See next slide for a description of these three past-winter periods*

If the region has **adequate fuel replenishment** this winter the ISO anticipates that the system can be operated reliably without the need for emergency procedures

# Actions by the ISO to Prepare for Winter

- Before and during the winter, the ISO:
  - Hosted a region-wide **energy shortfall tabletop exercise** on October 12
  - Hosted a **Generator Winter Readiness Seminar** on November 14
  - Distributed a **Winter Generator Readiness Survey**
  - Completed the annual **Natural Gas Critical Infrastructure Survey** process
  - Conducts **Generator Fuel and Emissions Surveys** weekly or daily during the winter
  - Performs **21-day energy assessment** weekly or daily, with results published to the ISO website
  - Can take **emergency actions to prevent grid collapse**
  - **May request energy conservation** to minimize need for emergency actions



# ISO New England Has Operating Procedures to Prepare for, and Respond to, Issues on the Grid



**Action During a  
Capacity Deficiency  
(OP-4)**



**Action in an  
Emergency  
(OP-7)**



**Cold Weather  
Condition Operations  
(SOP-RTMKTS.0050.0007)**



**Energy Inventory  
Accounting and  
Actions During an  
Energy Emergency  
(OP-21)**

# ISO-NE Maintains System Reliability Through Generator Outages, Loss of Imports on December 24

- The ISO declared a capacity deficiency at 4:30 p.m. after ~2,150 MW of resources scheduled to contribute power during the evening peak became unavailable
  - Outages were caused by cold temperatures or mechanical problems, not due to inadequate fuel supplies
  - The outages and reductions coincided with net imports being ~1,100 MW less than expected based on [that day's Morning Report](#)
- Cold weather also led to oil generation being more economical than gas-fired generation
- ISO system operators used several measures under Operating Procedure No. 4, or OP-4, including using reserve resources to balance supply and demand and requesting conservation at market participants' facilities
  - The capacity deficiency ended at 7 p.m. on December 24

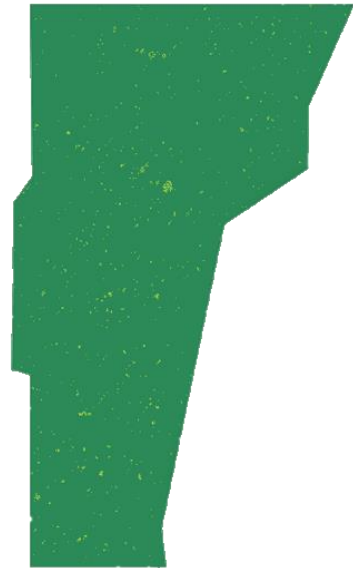


# VERMONT 2032 NEEDS ASSESSMENT

# Vermont 2032 Needs Assessment

## *Background*

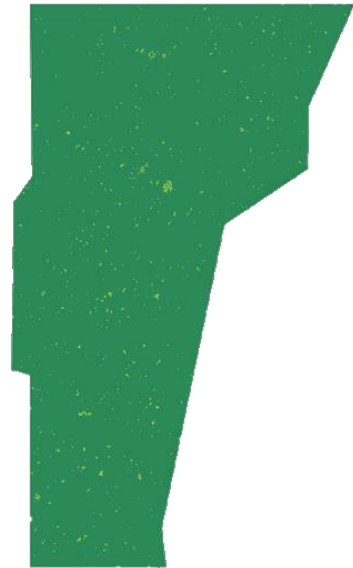
- The last Needs Assessment for the Vermont study area was the NH/VT 2023 Needs Assessment (completed in 2014)
- The ISO issued a [Notice of Initiation of the Vermont 2032 Needs Assessment](#) on November 16
- The ISO regularly conducts studies in key areas pursuant to the [Open Access Transmission Tariff](#) (Section II of the ISO Tariff) based on several triggers. The triggers for the Vermont 2032 Needs Assessment are:
  - Assess compliance with reliability standards and criteria consistent with the long term needs of the system
  - Assess the adequacy of the transmission system capability, such as transfer capability, to support local, regional and interregional reliability
  - Examine short circuit performance of the system
- The Vermont Needs Assessment will evaluate the performance and identify reliability-based needs in the Vermont Area for the year 2032



# Vermont 2032 Needs Assessment

## *Study Horizon and Load Levels*

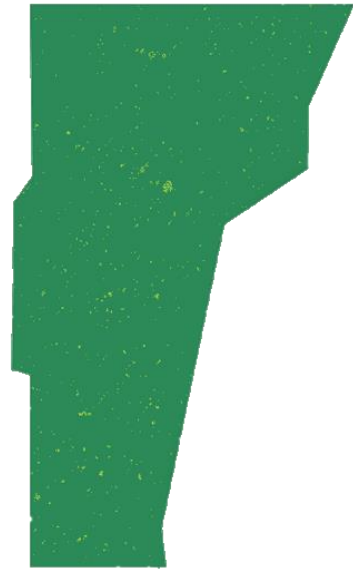
- The study will focus on the ten-year horizon utilizing the [2022 CELT report](#)
  - The 2032 90/10 gross summer peak load for New England is 31,630 MW
  - The two fixed load levels for minimum load analysis (nighttime and daytime)
- Two Daytime peak load scenarios will be assessed (with high renewables and with low renewables)
- One late evening peak load scenario will be assessed
  - 92% of 90/10 summer peak loads with 0% PV availability
- Two nighttime minimum load scenarios will be assessed (with high renewables and with low renewables)
- One daytime minimum load scenario will be assessed (without Energy Storage Systems charging)



# Vermont 2032 Needs Assessment

## *Schedule and Next Steps*

- The ISO plans to post the draft Vermont 2032 Needs Assessment Scope of Work report and intermediate study files for review by the Planning Advisory Committee (PAC) in Q1 2023
- The Vermont 2032 Needs Assessment is expected to be completed and presented to the PAC in Q3/Q4 2023





# TRANSMISSION PLANNING UPDATES



# 2050 Transmission Study Update

## Overview

- The ISO is conducting a study of possible transmission infrastructure and associated cost estimates needed to **reliably serve peak loads** in 2035, 2040, and 2050 using assumptions that reflect **state decarbonization policies**
- ISO staff provided [an update for the 2050 Transmission Study](#) at the Planning Advisory Committee on December 13:
  - Key Lessons Learned to Date
  - Solution Development Progress
  - Summary & Next Steps
- Results are preliminary and subject to change as the study progresses

The most up-to-date information on the 2050 study is available at the [Planning Advisory Committee](#) and [Longer-Term Transmission Studies](#) webpages.



# 2050 Transmission Study Update

## *Key Lessons Learned To Date*

### Increasing Capacity of Existing Lines Is Effective

- In many locations, fully utilizing existing overhead transmission rights-of-way is enough to address many load-serving concerns in 2035, 2040, and 2050

### 345/115 kV Transformers Are Critical

- The future transmission system will need to transfer power from remote renewable sources to dense population centers on 345 kV lines, and then step power down to 115 kV to serve individual substations

### Generator Sizes and Locations Can Affect Overloads

- Strategically locating points of interconnection for new generating resources can reduce transmission overloads
- Large offshore wind interconnections can lead to overloads leaving the point of interconnection; while smaller offshore wind interconnections can avoid this problem, trade-offs exist

### Solutions Are Sensitive To Load Distribution

- Distribution of load among the substations in New England plays a critical role in transmission line/transformer loading



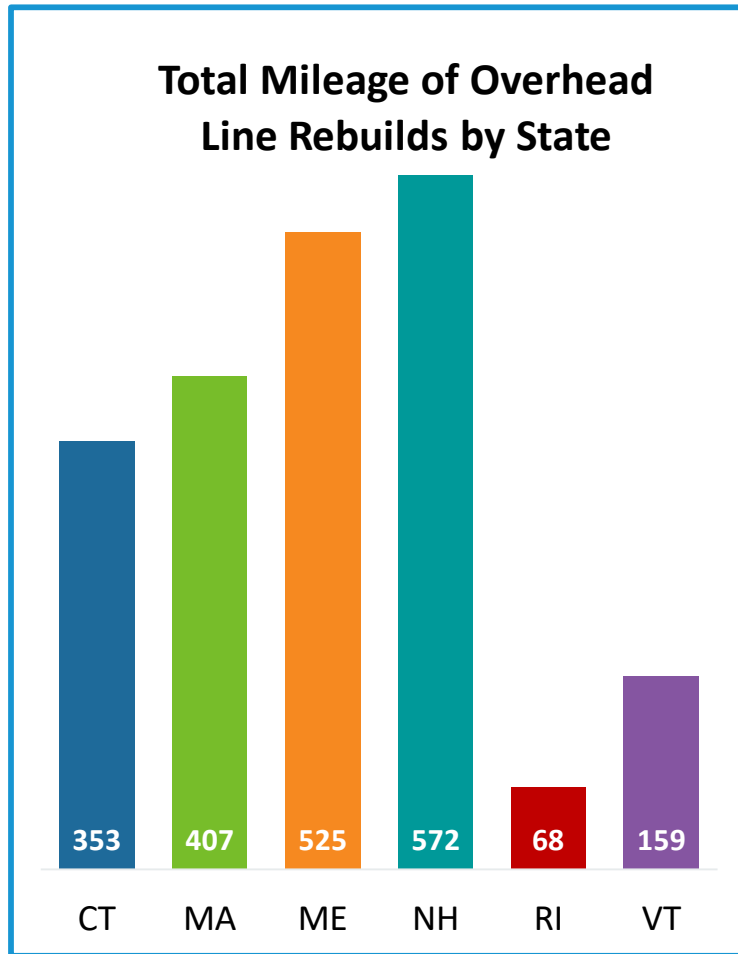
# 2050 Transmission Study Update

## *Solution Development*

- Solution development is underway for the **primary solution set**
  - 2050 Winter Evening Sensitivity (51 GW load)
  - 2050 Summer Daytime Peak Sensitivity
  - 2050 Summer Evening A & B
- Most solution development so far has focused on **urban areas**
  - Highest density of load
  - More underground transmission, which cannot be upgraded in-place as easily as overhead transmission
  - *The 2050 Transmission Study will suggest solutions for any location in New England where overloads are observed, whether in an urban area or not*
- Focus is initially on the **51 GW 2050 Winter Peak snapshot**
  - Winter peak snapshot shows the greatest extent of overloads, and solutions for winter peak will likely address summer peak overloads
  - Offshore wind POI relocation is occasionally spot-checked in summer peak snapshots, where wind output is assumed to be lower, to ensure that solutions remain effective during summer peak conditions

# 2050 Transmission Study Update

## Overhead Line Rebuilds



- As detailed at the [April 2022 PAC](#), the ISO will use per-mile cost assumptions developed through an analysis of past asset condition rebuilds on **urban areas** for line rebuild/reconductoring
  - 69 kV: 111 miles (\$0.22 billion)
  - 115 kV: 1,491 miles (\$2.98 billion)
  - 230 kV: 63 miles (\$0.19 billion)
  - 345 kV 419 miles (\$2.09 billion)
- Total mileage and mileage by state numbers indicate preliminary total mileage of existing lines to be rebuilt for higher capacity and are subject to change

# 2050 Transmission Study Update

## *Next Steps*

- Solution development work will be ongoing throughout 2023
  - Transmission solutions presented to-date should be regarded as preliminary and subject to change
- Consultant has begun to develop cost estimates for more complex solution components
- Next update to the PAC is anticipated in late Q1/early Q2 2023



# RELIABILITY AND MARKET ENHANCEMENT PROJECTS

*Mystic Cost of Service Agreement*

*Inventoried Energy Program Revisions*

*Operational Impact of Extreme Weather Project*

# ISO Discusses Mystic Cost of Service Agreement

- Representatives from the ISO discussed the Mystic Generation Station's Cost-of-Service (COS) [Agreement](#) at NEPOOL's October Participants Committee (PC) and Markets Committee (MC) meetings
  - The ISO discussed the structure of the agreement, requirements for the facility's owner, costs of the agreement during the summer months, and ways to estimate potential costs in the coming months
- In 2018, after the owner of the Mystic Generation Station signaled their intention to retire the remaining generating units (Mystic 8 and 9), the ISO filed for, and FERC approved the retention of the units for regional fuel security for the Capacity Commitment Period (CCP) 2022/23 and CCP 2023/2024
  - Mystic 8 and 9 are fueled exclusively by the Everett Liquefied Natural Gas (LNG) facility
  - The Mystic units, the Everett LNG facility, and the cost of LNG delivered to fuel the generating units are included in the Cost-of-Service Agreement



- More information about the Mystic COS Agreement is available on the [ISO website](#)



# Changes to Inventoried Energy Program

- The ISO is required to make changes to the Inventoried Energy Program (IEP) in order to comply with a [DC Circuit Court of Appeals ruling](#), and subsequent [FERC Order](#), which found that certain resources should not be eligible for the IEP
  - In order to comply with FERC's directive, the ISO is removing assets that run on coal, nuclear, biomass or hydropower from eligibility for the program
- At the October Markets Committee meeting, ISO staff [discussed](#) revisions to the IEP
  - The IEP is a voluntary program that will compensate certain asset types for maintaining inventoried energy during the winters of 2023-2024 and 2024-2025
- The ISO discussed the compliance filing and held a vote on the matter at the [November Participant's Committee meeting](#)
  - The ISO's compliance filing was filed on **November 22, 2022**
- The ISO is separately proposing other changes to the IEP, including updates to key program parameters, such as the payment rate and gas contract eligibility, in order to reflect current market conditions
  - The updates are intended to increase the likelihood of attracting incremental inventoried energy to support winter reliability

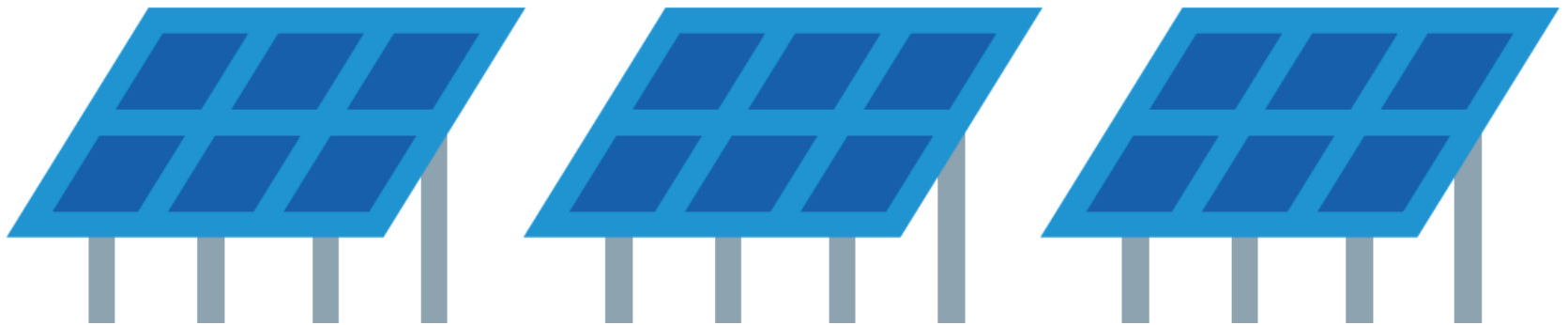
# Operational Impacts of Extreme Weather Events Project is Progressing

- The ISO is working with Electric Power Research Institute (EPRI) to conduct a [probabilistic energy security study](#) for the New England region in the operational timeframe (10 years) under extreme weather events
  - The project is collaborative opportunity for industry leaders and regional stakeholders to learn how extreme weather events in the future may affect the evolving power system and to prompt thinking about how best to prepare
  - **Step 1 (Extreme Weather Modeling)** analysis was completed in May
  - **Step 2 (Risk Model Development and Scenario)** – preliminary results were [presented](#) at the January Reliability Committee meeting
  - **Step 3 (Perform Energy Adequacy Assessment)** – initial results expected in March
  - The results of the study will help inform the region's larger energy security/energy adequacy discussion
- The ISO expects final Study results in 2023

# FERC FILINGS AND UPDATES

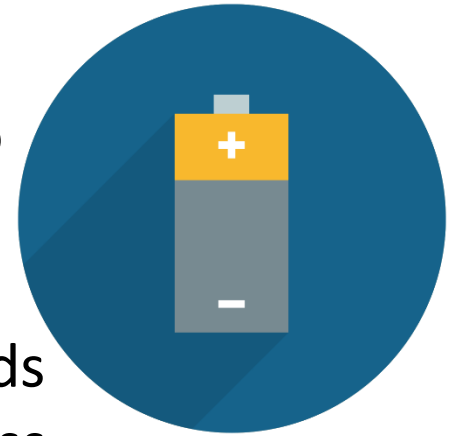
# ISO-NE Files Revisions to Incorporate Solar Resources into Do-Not-Exceed Dispatch Rules

- On November 30, the ISO [filed Tariff revisions](#) to FERC to revise the Do-Not-Exceed (DNE) dispatch rules to allow front-of-meter solar resources to become dispatchable resources
- This change will allow front of-meter solar resources to set the locational marginal price (LMP) similar to how wind and run-of-river hydro can participate in the market



# Storage as a Transmission-Only Asset (SATOA)

- On December 29, the ISO [filed revisions](#) to the Tariff and Transmission Operating Agreement to incorporate rules that will enable electric storage facilities to be planned and operated as transmission-only assets to address system needs identified in the regional system planning process set forth in the OATT
- The revisions will allow storage to be considered as a solution to needs in both the Solutions Study process and the competitive solution process



# FOR MORE INFORMATION...



## Subscribe to the *ISO Newswire*

[ISO Newswire](#) is your source for regular news about ISO New England and the wholesale electricity industry within the six-state region



## Log on to ISO Express

[ISO Express](#) provides real-time data on New England's wholesale electricity markets and power system operations



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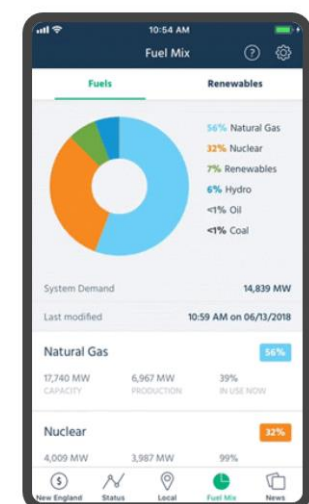
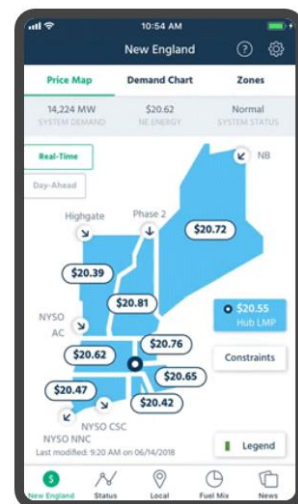


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[ISO to Go](#) is a free mobile application that puts real-time wholesale electricity pricing and power grid information in the palm of your hand



# Questions



# ISO GENERATOR INTERCONNECTION QUEUE SNAPSHOT

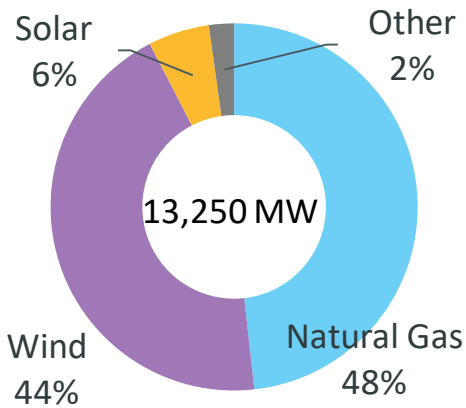




# The ISO Generator Interconnection Queue Provides Snapshots of the Future Resource Mix

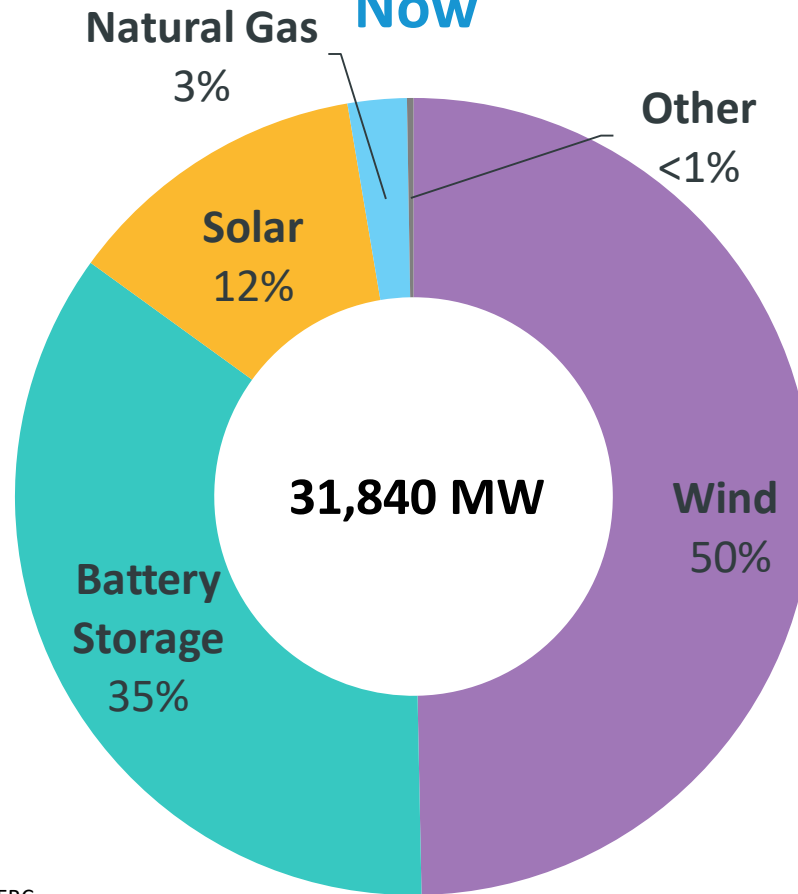
*Dramatic shift in types of proposed resources from natural gas to wind*

**Then**



June 2017

**Now**



January 2023

## Offshore Wind



CT	2,400 MW
MA	10,593 MW
ME	12 MW
RI	704 MW

## Onshore Wind



ME	2,110 MW
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Source: ISO Generator Interconnection Queue, FERC Jurisdictional Proposals; Nameplate Capacity Ratings.

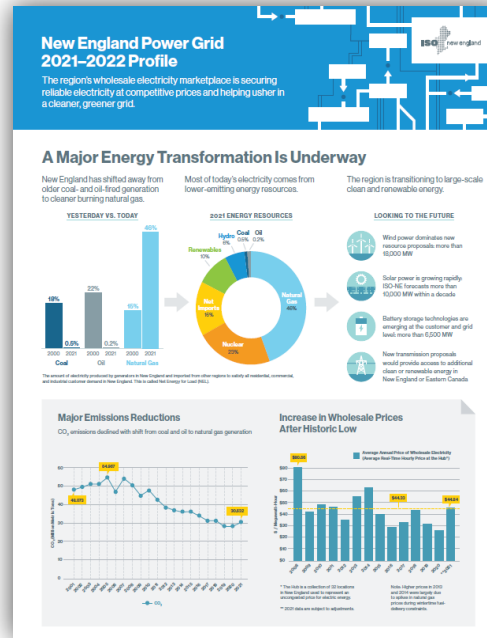
# ISO NEW ENGLAND PUBLICATIONS AND RESOURCES

# ISO New England Releases Several Publications



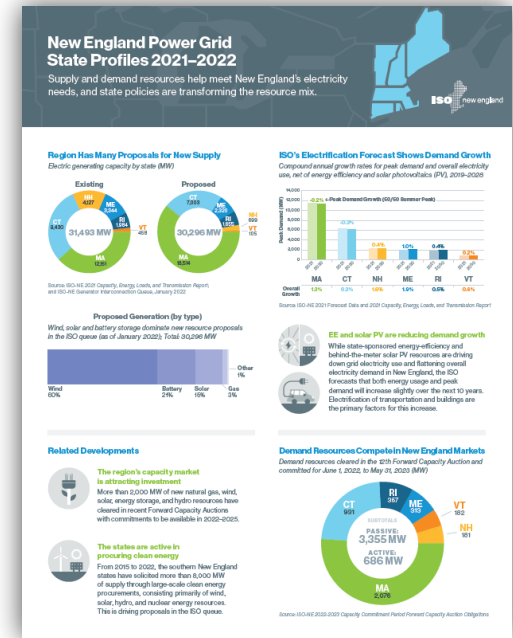
## 2022 Regional Electricity Outlook

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



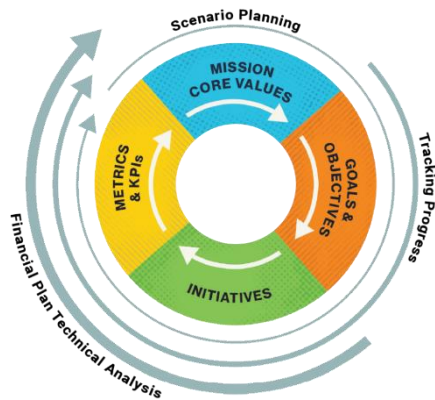
## New England State Profiles

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

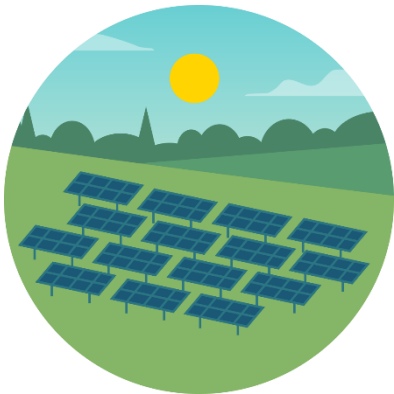
# ISO New England's Strategic Plan



- On **October 26**, the ISO released [Vision in Action: ISO New England's Strategic Plan](#)
- The plan provides insight into how the ISO intends to fulfill its three critical roles during the clean energy transition
- In addition to discussing the ISO's key goals and initiatives, the plan offers perspectives on trends shaping the power industry
- ISO CEO Gordon van Welie presented an overview of the plan at the Nov 1 Open Board Meeting



# The Impact of Behind-the-Meter (BTM) Solar Photovoltaic Resources on Load



- To ensure reliable operations, the ISO [estimates behind-the-meter solar production](#) from the region's more than 240,000 BTM PV systems
  - System forecasters use these estimates to put together their forecast of regional grid demand
- [ISO Express data dashboard](#) users can concurrently view actual grid demand, and grid demand plus estimated production from BTM PV
  - To view grid use combined with estimated BTM PV, toggle on “Actual Including Estimated Behind-the-Meter Solar” in the panel on the right of the system load graph
- The ISO also produces an [annual long-term PV forecast](#) that helps determine future system load characteristics that are important for the reliable planning and operation of the system

# 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
- 2023 Meetings
  - Thursday, March 30
  - Thursday, June 8
  - Thursday, September 21
  - Wednesday, December 6



2021 CLG Annual Report is posted at: [https://www.iso-ne.com/static-assets/documents/2022/03/2021\\_report\\_of\\_the\\_consumer\\_liaison\\_group\\_final.pdf](https://www.iso-ne.com/static-assets/documents/2022/03/2021_report_of_the_consumer_liaison_group_final.pdf)

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