

ISO New England Update

Consumer Liaison Group Meeting

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TODAY'S UPDATES

- Consumer Liaison Group Resources and Announcements
- Markets Update
- Operations Update
- System Planning Update



CONSUMER LIAISON GROUP RESOURCES AND ANNOUNCEMENTS

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An Ongoing Dialogue: ISO's External Affairs Team



Eric Johnson Executive Director, External Affairs New England



Carrick Heilferty Policy Advisor Federal Affairs



Kerry Schlichting Lead State Policy Advisor Connecticut and Rhode Island



Sarah Adams State Policy Advisor Vermont



Marissa Ribeiro Dahan State Policy Advisor Massachusetts





Melissa Winne State Policy Advisor Maine

Nathan Raike Associate State Policy Advisor New Hampshire

Contact information: https://www.iso-ne.com/about/contact/government-industry-affairs

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Annual Report of the Consumer Liaison Group

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2023 Report

- On May 9, the ISO and the CLG
 Coordinating Committee posted the
 2023 annual report
 - The CLG Report is a joint publication of the ISO and the CLG Coordinating Committee (CLGCC)
 - The report provides summaries of the 2023 meetings; updates on ISO initiatives previously discussed at 2023 meetings; analysis of regional wholesale costs and retail rates; states priorities; and planned initiatives of the CLGCC



2023 CLG Annual Report

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

ISO Glossary and Acronyms

- ISO maintains a <u>glossary</u> with short definitions of industry terms appearing in ISO materials
- The glossary is available at the <u>ISO's</u> <u>website</u> under the **Participate** then **Support** menus
 - The feature is presented on the ISO website for use by anyone needing to get a handle on a term
 - As terms morph or emerge over time, the glossary is regularly updated
 - The page also includes links to official documents that include full-length legal definitions for many terms

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Participate > Support									
Glossary and Acron	iyms								
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IN THIS SECTION	Here, vou'll find general defini	itions of frea	uently used terms related to New England's wholesale						
Support	electricity markets and power system.								
Participant Readiness Project Outlook	Precise legal definitions can be found in the following documents:								
Request Data and Information	Section I: General Terms and Conditions rate of the Tariff								
Request CEII Access	ISO New England Manual for Definitions and Abbreviations (Manual M-35)								
Request Software	Participants Agreement								
Mailing Lists	Second Restated NEPOOL Agreement page								
Web Feeds									
Web Conferencing Support	0-3 A-C D-F O-I J-M N-Q K-U V-Z								
User Guides	0.9								
Glossary and Acronyms	(2.5. (0.) mission materialized								
Web Browser Support	matter	PM(10)	particulate matter identified in the US Clean Air Act as						
Web Services Data			considered harmful to human health, property, and ecosystems.						
Library of Participant Support Forms	10-minute nonspinning reserve	TMNSR	Operating reserve provided by off-line generation that can be						
Upload and Download File Format Protocols			electrically synchronized to the bulk electric power system an increase output within 10 minutes in response to a						
FAQs			contingency; also called 10-minute nonsynchronized reserve. (Also see 10-minute spinning reserve.)						
Website Help	10-minute nonsynchronized	TMNSR	(See 10-minute nonspinning reserve, the more common term.)						
	reserve		(· · · · · · · · · · · · · · · · · ·						
	10-minute spinning reserve	TMSR	Operating reserve provided by on-line operating generation that can increase output within 10 minutes in response to a contingency; also called 10-minute synchronized reserve. (Also see 10-minute nonspinning reserve.)						
	2 x 16; 2/16		2 days per week, 16 hours per day—typically the weekend peak hours of 6:01 a.m. to 10:00 p.m. (aka, hour ending 7 to hour ending 22).						

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

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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

Other ISO New England Publications and Resources

- ISO Newswire
 - a source for regular news about ISO New England and the wholesale electricity industry within the six-state region
- ISO Press Releases
 - Access current and archived press releases detailing significant developments at the ISO and in New England's power system and wholesale electricity markets
- <u>Government and Industry Affairs Presentations,</u> <u>Speeches, Papers, and Other Materials</u>
 - Presentations and speeches delivered by our technical experts, senior management, and External Affairs team at industry events in New England and across the nation
 - Includes the monthly issues memo—a rundown of federal, regional, and state issues that the ISO provides to the New England Conference of Public Utilities Commissioners (NECPUC) and state consumer advocates

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MARKETS UPDATE

Monthly Markets Highlights



MONTHLY MARKET HIGHLIGHTS

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Monthly Wholesale Electricity Prices and Demand in New England, April 2024

March 2024 and Percent Change from March 2023 and February 2024	April 2024	Change from April 2023	Change from March 2024		
Average Real-Time Electricity Price (\$/megawatt-hour)	\$24.53	-10%	6.0%		
Average Natural Gas Price (\$/MMBtu)	\$1.51	-19.7%	-7.4%		
Peak Demand	15,657 MW	7.2%	-0.2%		
Total Electricity Use	8,292 GWh	2%	-10.4%		
Weather-Normalized Use*	8,271 GWh	-0.1%	-14.9%		

*Weather-normalized demand indicates how much electricity would have been consumed if the weather had been the same as the average weather over the last 20 years.

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April 2024 Generation in New England, by Source



2023 ANNUAL MARKETS REPORT



2023 Annual Markets Report Overview

- In May, ISO New England's Internal Market Monitor (IMM) issued the 2023 Annual Markets Report (AMR)
 - The IMM functions **independently** of ISO management and reports directly to the ISO Board of Directors
- The AMR assesses the **state of competition** in the wholesale electricity markets administered by the ISO during the most recent operating year
- The AMR also presents the most important findings, market outcomes, and market design changes of New England's wholesale electricity markets for 2023



Note: The 2023 Annual Markets Report is available on the Internal Market Monitor webpage

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Lower Energy Costs Drove an Overall Decrease in Total Wholesale Costs in 2023

- The total wholesale cost of electricity was \$9.5 billion
 - The 43% drop compared to 2022 costs (\$16.7 billion) is largely attributed to lower energy costs
- Energy market costs totaled \$4.8 billion, **down 59% from 2022**
 - Natural gas prices were down 67% year over year
 - Energy costs accounted for 51% of the year's total wholesale electricity costs, compared to 70% in 2022
- Capacity costs totaled \$1.3 billion, down 30% from 2022
- Cost per megawatt-hour (MWh) of load served last year was \$82, compared to \$140 in 2022
 - The average price in the Real-Time Energy Market was down 58% year over year, at \$35.70/MWh. The average price in the Day-Ahead Energy Market was down 57%, at \$36.82/MWh

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 Regional network load costs, which pay for the use of transmission facilities, reliability, and certain administrative services, were \$2.7 billion, down 4% from 2022

OPERATIONS UPDATE

Operational Impacts of Extreme Weather Events



Operational Impacts of Extreme Weather Events

- The ISO reported results from the Probabilistic Energy Adequacy Tool (PEAT) in 2023
 - PEAT framework for risk analysis under extreme weather events will be essential for evaluating regional energy shortfall risk (REST) — the electricity supply falling below consumer demand — giving the region's stakeholders advance warning and an opportunity to take steps to avert it
 - The REST scope of work was <u>introduced</u> at the December NEPOOL Reliability Committee meeting; work will continue through 2024
- More information on the Operational Impacts of Extreme Weather Events Key Project, including ongoing efforts related to development of a REST, is available on the ISO website: <u>Operational Impacts of Extreme</u> <u>Weather Events Key Project (iso-ne.com)</u>

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New England's energy shortfall risk is dynamic, and will evolve as the region continues its clean energy transition

Operational Impacts of Extreme Weather Events

- Regional Energy Shortfall Threshold: ISO's initial 2027 and 2032 energy adequacy study results from the PEAT will help inform the development of a reliability-based threshold that reflects the region's level of risk tolerance with respect to energy shortfalls during extreme weather
 - Considerations for development of the REST:
 - Periodicity of Studies (When?)
 - o Extreme Event Selection Process (How?)
 - REST Metrics and Thresholds (*What?*)
 - Stakeholder discussions continued in Q2 2024 on establishing a REST, with a proposal anticipated to be presented by the end of year
 - Analysis of scope, timing, and feasibility of regional solutions to maintain/achieve a REST would follow in 2025 as needed



SYSTEM PLANNING UPDATE

2024 CELT Report

Longer-term Transmission Planning



2024 CELT REPORT



ISO Releases Annual 10-Year Forecast Report

- Issued on May 1, the annual Capacity, Energy, Loads, and Transmission (CELT) <u>Report</u> is the **primary source** for assumptions used in ISO system planning studies
- **Overall** electricity use is expected to **increase** 1.8% annually over the ten year period (2024–2033)
- Summer peak demand is expected to increase 1% annually
- Winter peak demand is expected to increase 3.1% annually



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

Historical and Forecast Net Energy Use



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

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Electricity Demand from Electric Vehicles and Heating Sectors to Grow Over the Next Decade

Transportation and Heating Forecasts:

Impact on Peak Electricity Demand, 2024–2033



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

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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



Managed charging profiles added to Transportation Electrification Forecast

Managed charging programs offer incentives for EV owners to avoid charging during peak hours, shifting charging to times when demand and wholesale prices tend to be 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) (May 2024)

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Energy Efficiency and Behind-the-Meter Solar Resources Are Reducing Demand on the Grid

- 136,355 GWh: all-time highest total annual energy served, set in 2005
- Energy efficiency (EE) and behindthe-meter (BTM) solar are reducing demand on the grid
- Annual energy use reductions:
 2024: EE and BTM solar reduce load by 11.9%
 2033: EE and BTM solar reduce load

by 13.1%



Projected Energy Use (GWh) With and Without EE and PV Savings

The gross peak and load forecast minus existing and anticipated "behind-the-meter" (BTM) solar PV resources The gross peak and load forecast minus existing and anticipated BTM solar PV and energy efficiency

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

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ISO New England Forecasts Growth in Distributed Generation Resources

 Since 2013, the ISO has led a regional Distributed Generation Forecast Working Group (DGFWG) to collect data on distributed generation (DG) policies and implementation, and to forecast long-term incremental DG growth in New England

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- The DGFWG focuses on the following types of DG resources:
 - Under 5 MW
 - Connected to the distribution system
 - Not visible to the ISO directly
 - Specifically solar photovoltaic (PV)
 resources, the largest DG component
- The ISO forecasts strong growth in solar PV over the next 10 years



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

December 2023 Solar PV Installed Capacity (MW_{ac})

Cumulative Growth in Solar PV through 2033 (MW_{ac})

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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 (2024 CELT Report) (May 2024), and 2024 Photovoltaic (PV) Forecast; MW values are AC

LONGER-TERM TRANSMISSION PLANNING



Longer-term Transmission Planning

2050 Transmission Study

- The <u>2050 Transmission Study</u> was the first longer-term transmission study conducted for New England
- The roadmaps provided are not comprehensive plans and transmission concerns may not



occur in exactly the way the Study outlines, but these big-picture **observations can help inform future decision making**

• At the time of the study's completion, the longer-term transmission study process is **purely informational**; but, the ISO began stakeholder discussions on Phase 2 of the longer-term transmission study process in October 2023



Longer-term Transmission Planning

Phase 2 of the Longer Term Transmission Planning (LTTP)

- The region will need significant transmission upgrades to ensure a reliable grid through the clean energy transition
 - The region's aging transmission system has the potential to become a significant bottleneck to progress if it does not keep pace with changes to other elements of the power system
- On May 9, the <u>ISO filed</u> Phase 2 of the LTTP tariff changes with the Federal Energy Regulatory Commission (FERC), which would create a new process to give the New England states greater control in achieving environmental policies and goals
 - The new process would operate in addition to current transmission planning protocols

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 Would enable the ISO to provide technical assistance for potential projects to help ready the region's transmission infrastructure for the future





Longer-term Transmission Planning

Phase 2 of the Longer Term Transmission Planning (LTTP)

- The approach outlined in LTTP Phase 2 provides a way for the states to evaluate and finance these upgrades
 - New process will grant the states greater insight, and include additional opportunities for them to provide input and request feedback as proposed projects move through ISO's evaluation process
 - As part of the planning process, the ISO will issue and evaluate requests for proposals (RFPs) to address needs identified by the states
 - Depending on the relative costs and benefits of the selected proposal, either the ISO or New England States Committee on Electricity (NESCOE), on behalf of a subset of the New England states, will select a transmission solution

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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

Follow the ISO on X (fka Twitter) @isonewengland



Download the ISO to Go App

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



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(?) 60

14,839 MW

Questions

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APPENDIX



New England Wholesale Electricity Costs^(a)

	2018		2019		2020		2021		2022		2023**	
	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh	\$ Mil.	¢/kWh
Wholesale Market Costs			-	-	-				•		-	
Energy (LMPs) ^(b)	\$6,041	4.7	\$4,105	3.3	\$2,996	2.4	\$6,101	4.8	\$11,712	9.0	\$4,847	3.9
Ancillaries ^(c)	\$147	0.1	\$83	0.1	\$62	0.1	\$52	0.0	\$124	0.1	\$182	0.1
Capacity ^(d)	\$3,606	2.8	\$3,401	2.7	\$2,662	2.2	\$2,243	1.8	\$1,864	1.4	\$1,308	1.1
Subtotal	\$9,794	7.6	\$7,589	6.0	\$5,720	4.7	\$8,404	6.6	\$13,701	10.5	\$6,338	5.1
Transmission charges ^(e)	\$2,250	1.7	\$2,146	1.7	\$2,331	1.9	\$2,688	2.1	\$2,739	2.1	\$2,612	2.1
RTO costs ^(f)	\$196	0.2	\$184	0.1	\$191	0.2	\$216	0.2	\$214	0.2	\$214	0.2
Mystic Cost of Service Agreement					nent	\$173	0.1	\$460	0.4			
Total	\$12,240	9.4	\$9,918	7.9	\$8,242	6.7	\$11,308	8.9	\$16,828	13.0	\$9,624	7.7

(a) Average annual costs are based on the 12 months beginning January 1 and ending December 31. Costs in millions = the dollar value of the costs to New England wholesale market load servers for ISOadministered services. Cents/kWh = the value derived by dividing the dollar value (indicated above) by the real-time load obligation. These values are presented for illustrative purposes only and do not reflect actual charge methodologies. ***The wholesale values for 2023 are preliminary and subject to resettlement.**

(b) Energy values are derived from wholesale market pricing and represent the results of the Day-Ahead Energy Market plus deviations from the Day-Ahead Energy Market reflected in the Real-Time Energy Market.

(c) Ancillaries include first- and second-contingency Net Commitment-Period Compensation (NCPC), forward reserves, real-time reserves, regulation service, and a reduction for the Marginal Loss Revenue Fund.

(d) Capacity charges are those associated with the Forward Capacity Market (FCM).

(e) Transmission charges reflect the collection of transmission owners' revenue requirements and tariff-based reliability services, including black-start capability, voltage support, and FCM reliability.

(f) RTO costs are the costs to run and operate ISO New England and are based on actual collections, as determined under Section IV of the ISO New England Inc. Transmission, Markets, and Services Tariff.

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** 2023 figures are preliminary

New England Wholesale Electricity Costs*

Annual wholesale electricity costs have ranged from \$7.7 billion to \$16.8 billion

