This meeting is being recorded for training purposes.

NOVEMBER 24, 2025 | WEBEX

ISO New England Overview of Emergency Procedures and Communications Processes

Briefing for Government and Corporate Communications Contacts with New England's Local Control Centers and Transmission Companies

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Technical Instructions for Today's WebEx

- Today's meeting is being recorded
- All attendee lines are muted
- If you are experiencing technical issues or have a question you would like to submit, send it via **Chat** to the **host**
- Questions and Answers will be addressed throughout the meeting

This meeting is being recorded for training purposes.

Outline of Presentation

Key Takeaways

Pre-Winter Briefing 2025/2026

- New England expects to have sufficient electricity supplies this winter.
- ISO-NE anticipates demand for electricity will peak at **20,056 megawatts (MW)** under normal weather conditions. During extreme cold weather, demand is projected to peak at **21,125 MW**.
  - These demand forecasts are similar to last year's when demand peaked at 19,607 MW on January 22, 2025.
- National Oceanic and Atmospheric Administration (NOAA) is projecting **slightly warmer than average** temperatures in southern New England and **near-average** temperatures in the rest of New England, though a warmer than average season does not eliminate the threat of prolonged stretches of cold weather.

Winter Seasonal Outlook Webpage & Press Release

Key Takeaways, cont.

Pre-Winter Briefing 2025/2026

- This season marks the first time ISO-NE used the Probabilistic Energy Adequacy Tool (PEAT) to assess energy shortfall risk against the recently defined Regional Energy Shortfall Threshold (REST). PEAT is designed to quantify potential energy shortfall risk due to extreme weather events.
  - Based on this analysis, ISO-NE projects that the region is well-positioned going into the winter season. No violations of the REST were identified in the forecast modeling.

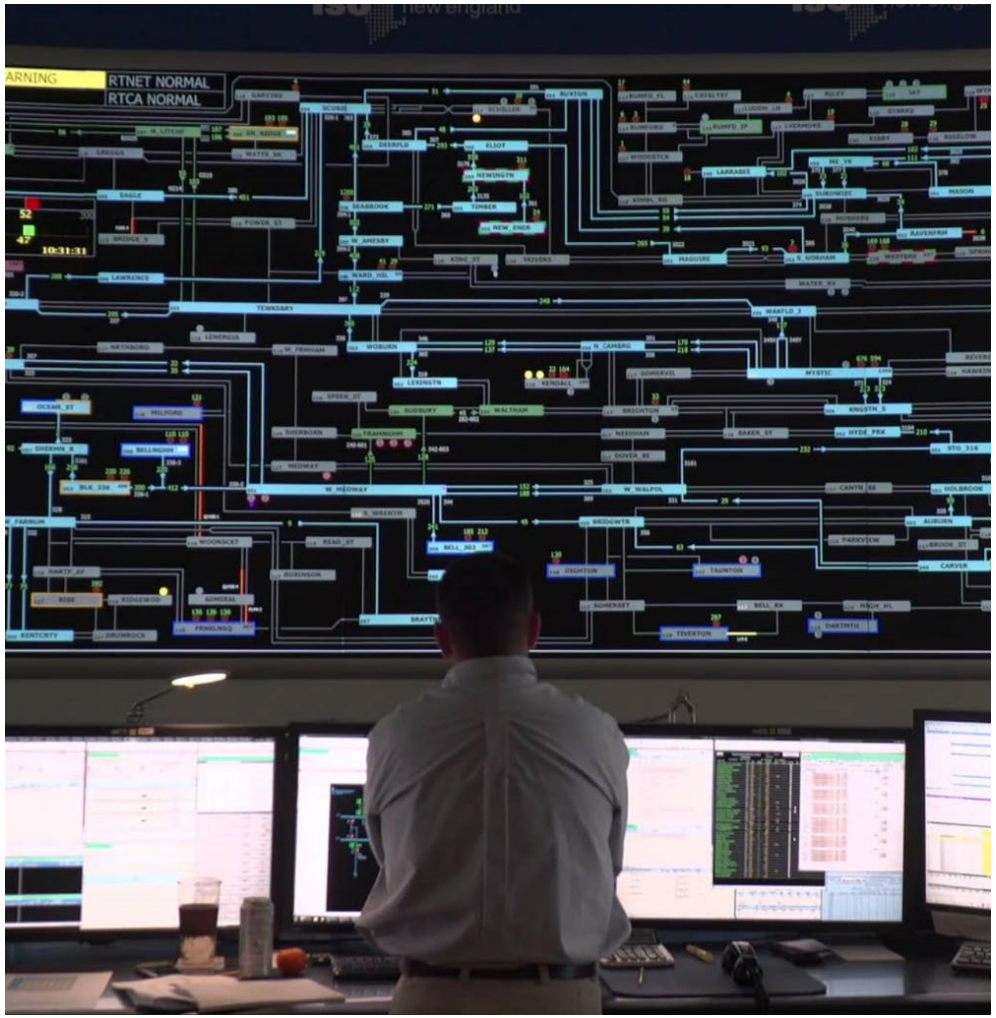
- The ISO has a **rolling 21-day energy supply forecast** to identify potential energy shortfalls while there is time to prevent them or lessen their impact.
  - Identifying and publicizing possible energy shortfalls weeks in advance signals to the region's wholesale energy market participants the need to contract for **additional fuel deliveries**.

ISO New England 2025/2026 Winter Outlook and Preparations

One Goal Lies at the Heart of ISO New England's Mission: *Reliability*

ISO New England is:

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



ISO-NE Is a Summer-Peaking System but Faces Particular Challenges in the Winter

Electricity use peaks in the summer, but energy constraints are a concern during the **winter peak**

- Region's all-time **winter** peak demand was **22,818 MW** on **January 15, 2004**
- Extended periods of extreme cold weather could pose challenges
- Natural gas pipeline constraints, coupled with global supply chain issues related to deliveries of oil and liquefied natural gas (LNG), are placing New England's power system at heightened risk under certain conditions

New England shifted from a winter-peaking system to a **summer-peaking** system in the early 1990s, largely because of the growth of air conditioning and a decline in electric heating

- Peak demand on a normal summer day has typically ranged from 17,500 MW to 22,000 MW
- Summer demand usually peaks on the hottest and **most humid** days and averaged roughly 25,600 MW since 2000
- Region's all-time peak demand was **28,130 MW** on **August 2, 2006**

Preparations for Winter Peak Demand

- New England's winter peak demand period runs from December through February
- In preparation for the winter, ISO New England:
  - Forecasts New England's demand for electricity and reserves
  - Evaluates region's winter supply outlook
  - Exercises communication plan
  - Conducts Winter Readiness Seminar (10/29/25) and surveys
  - Conducts dual-fuel audits
  - Conducts Load Shed and Voltage Reduction Test (8/19/25)
  - Conducts transmission system assessments

Preparations for Winter Peak Demand, *cont.*

- Ongoing coordination between electric and gas systems
- Short-term actions:
  - Survey fuel inventories of oil- and coal-fired generators every two weeks March – November and every week December – February
    - Surveys can be performed more often as needed
  - Confirm scheduled volumes with natural gas-fired generators daily
  - Forecast and report on expected energy availability over a 21-day look-ahead period
    - Reports published weekly during winter months (daily if Energy Alert or Energy Emergency is declared)

Communications Overview

The ISO Provides Information about Power System Emergencies to Various Stakeholders

- **External Affairs notifies:**
  - Governors' offices
  - State and federal regulators and staff
  - Emergency management agencies
  - Reliability councils
- **Corporate Communications notifies:**
  - Communication contacts from utilities
  - Public via the media and other channels

- **Control Room notifies:**
  - Local Control Centers
  - Generation station designated entities
  - Demand designated entities
- **Participant Support notifies:**
  - Market participants

ISO New England Communications with Government Officials & Utility Communications Contacts During Power System Emergencies

Who: **ISO-NE** External Affairs conducts outreach to 100+ **Government Contacts** at state and federal offices and agencies and reliability organizations, and to dozens of utility communications contacts

What: **Communications are triggered by ISO procedures** that require notifications to emergency contacts and/or appeals to the public for conservation

When:
- ISO implements **OP-4** or **OP-7** actions, or
- ISO declares an **Energy Alert** or **Energy Emergency** in the 21-day forecast, or
- During any other emergency affecting the reliability of the bulk power system

How: Automated alerts to emergency contacts via **phone**, **email and text message,** and **conference calls** to provide real-time updates on power system conditions; public updates via ISO website, Newswire, ISO to Go mobile app, X/Twitter and BlueSky

Why: To provide emergency contacts with **timely information** about system conditions

Under the ISO Information Policy, we will share system-level information during emergency communications; however, we will not release unit-specific information

Take Action to Prevent Spam Diversion of ISOAlerts

ISO New England sends automated alerts to emergency contacts via **phone**, **email, and text message,** and may hold **conference calls** to provide real-time updates on power system conditions

Spam filters are blocking ISO alerts for some users

- Recent software updates to both Apple and Android devices may block calls and texts from unknown numbers, diverting them to spam filters
- Emails may not go through if recipients do not confirm their email address

What you can do to ensure you receive alerts:

- Add RAVE's short code numbers to your contacts.
  - 226787, 67283, 78015, and 77295
- Save the ISO's phone number to your device: 413-535-4000
- Ensure members of your team do the same
- If prompted by ISO-NE via RAVE, confirm your email address
- Add isone@email.getrave.com to your email safe list

What Roles Do Public Officials and Consumers Play When Conservation Is Needed During a Power System Emergency?

ISO New England:

Initiates public appeals for conservation to manage a power system emergency

Utilities:

Relay public appeals to retail customers

Public Officials:

Amplify appeals for conservation by the ISO and Utilities

Unified message

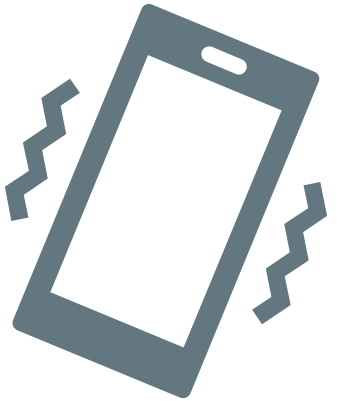
Consumers:

Reduce energy consumption

Bottom line: Consumers can lessen the *depth* and *duration* of emergency actions by reducing their energy use – such as by *turning off* non-essential lighting, *adjusting* thermostat settings, and *turning off* and *unplugging* all non-essential electronic devices.

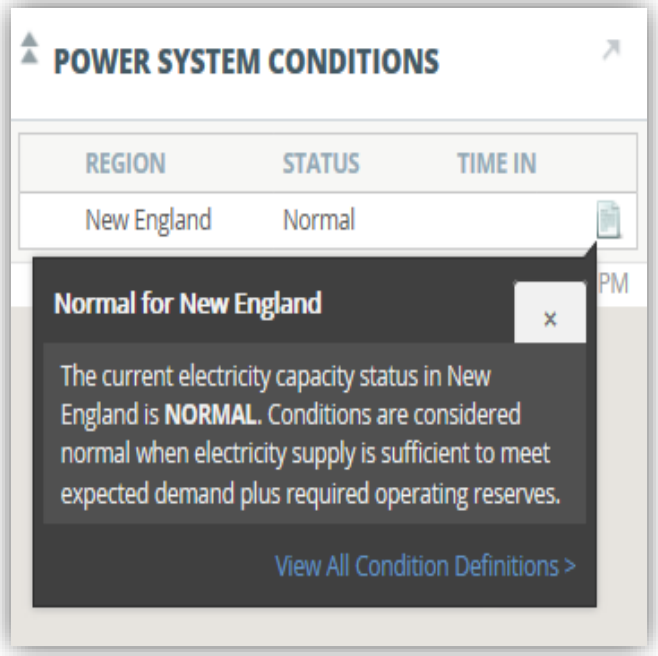
New Tool for Outreach to Consumers During Power System Emergencies

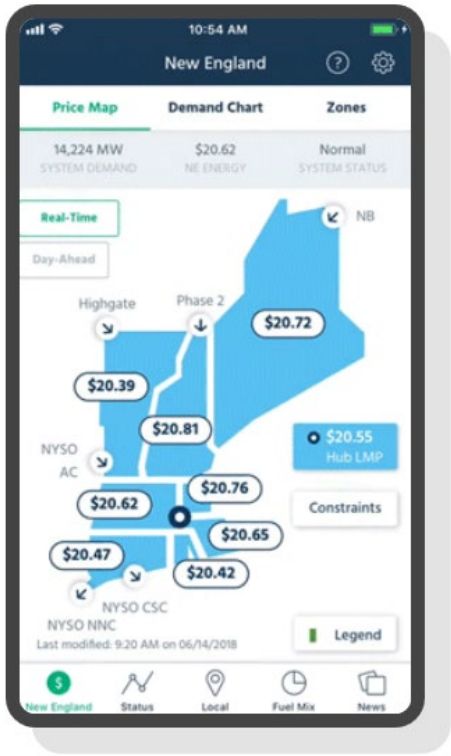
- **Wireless Emergency Alerts (WEAs)** are short communications, issued by designated alerting authorities, delivered directly to mobile phones
  - **Can be issued in English and Spanish**
- ISO-NE now has a process in place with the Massachusetts Emergency Management Agency (MEMA), allowing the ISO to request MEMA issue a WEA
  - ISO will explore similar arrangements with other New England states
- ISO-NE may request a WEA in certain emergency scenarios, such as impending or ongoing controlled power outages due to a regional electricity shortfall

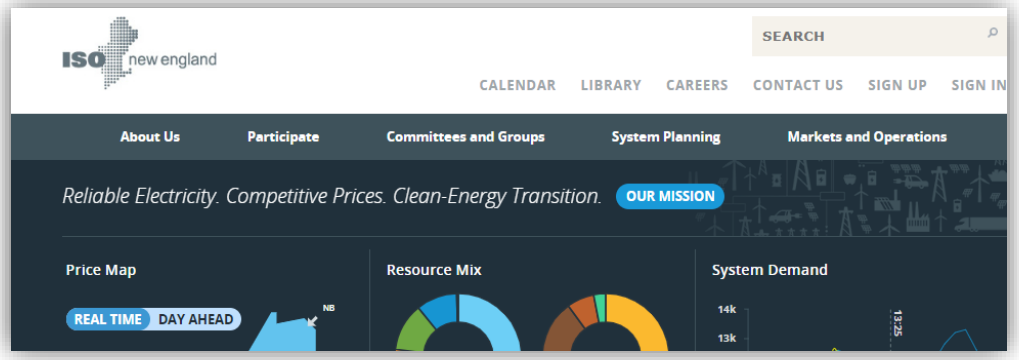


Digital and Social Media Communications Provide Real Time System Updates

- Visit ISO-NE homepage
- Visit *ISO Newswire* blog
- Visit ISO Express dashboard
- Follow @isonewengland on social media
- Download the ISO to Go App





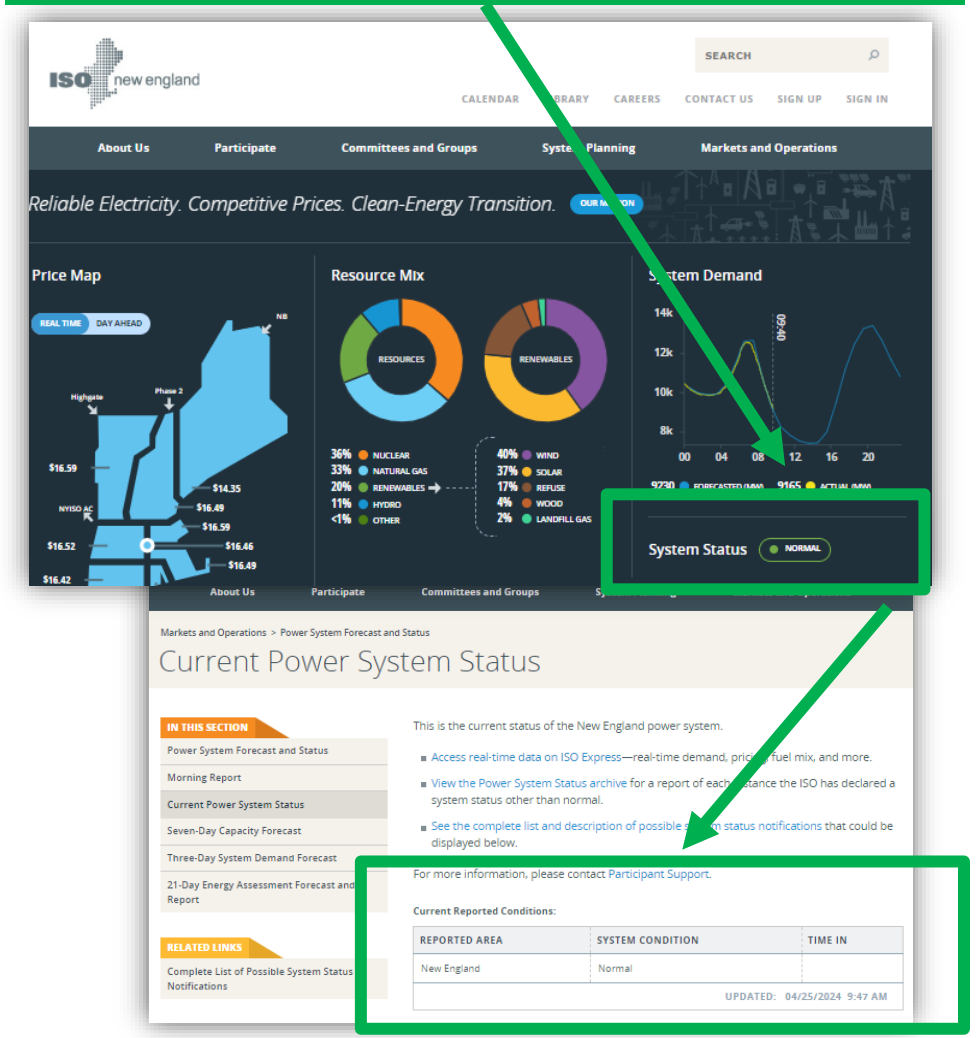


ISO NEWSWIRE

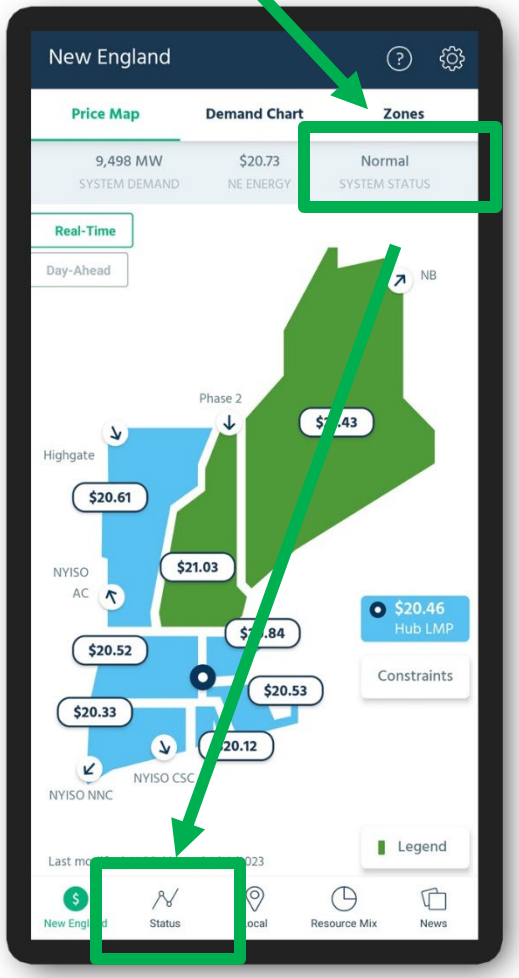
A Wholesale Electricity Industry Update

Two Easy Ways to View Power Systems Conditions

Website Home Page

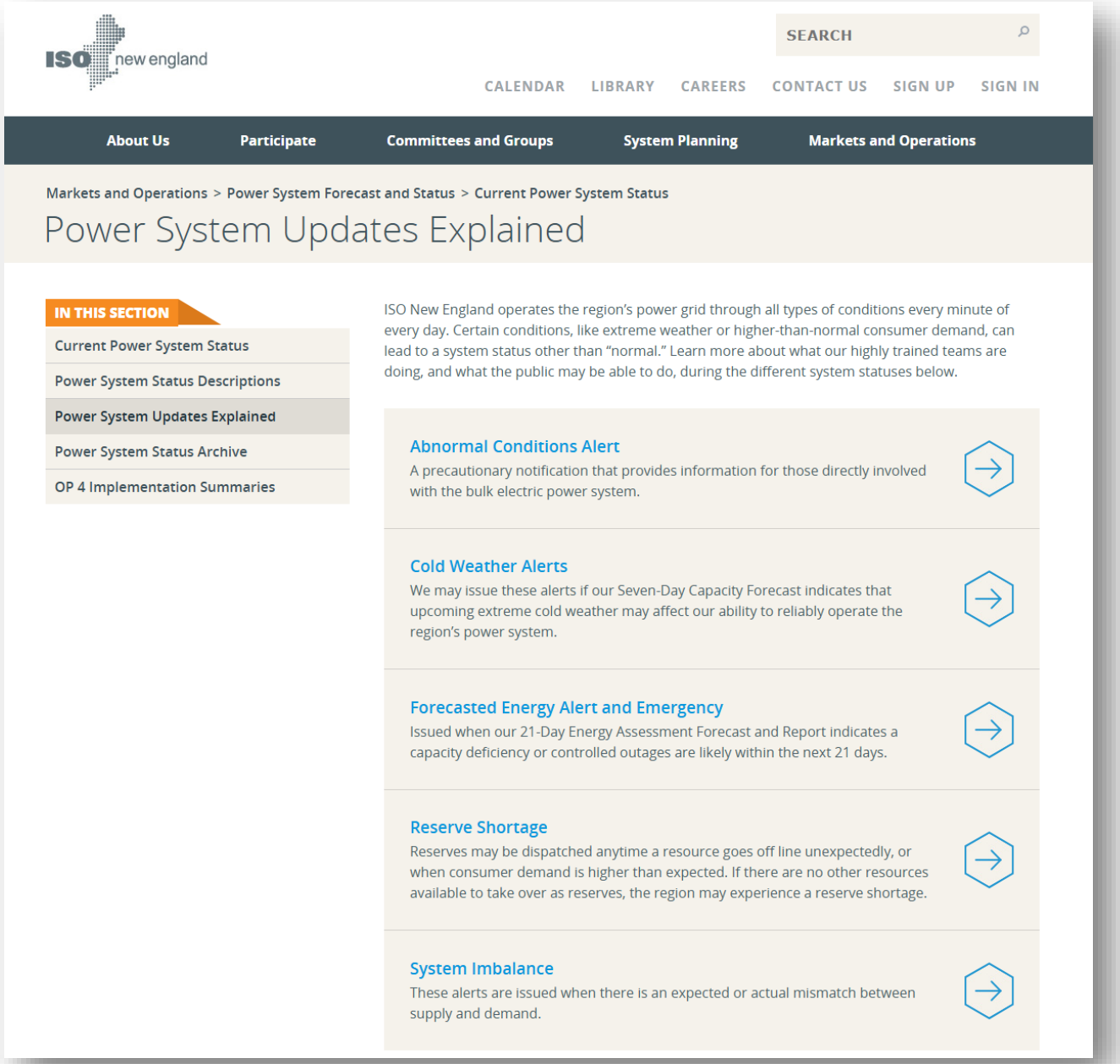


ISO to Go Mobile App



New Web Resource: Plain-Language Power System Status Explanations

[Current Power System Status > Power System Updates Explained]



Cold Weather Alerts

What ISO's Doing
Notifying power generators and other organizations with direct connections to the New England electrical grid and coordinating closely with operators of natural gas pipelines and natural-gas-fired resources, local control centers, and neighboring regional transmission organizations.

What the Public Can Do
No action required.

See Reference Materials > Other Information Resources for details

Forecasted Energy Alert and Emergency

What ISO's Doing
Taking actions as necessary to mitigate forecasted energy shortfalls:

- Enhanced reporting and communication about system conditions
- Daily fuel inventory surveys and energy assessments
- Requesting generators use fuel that is not in short supply
- Appeals for voluntary conservation, including public appeals from the region's governors

What the Public Can Do
No immediate action required **unless** the ISO has made an appeal for voluntary conservation of electricity use.

New Web Resource: Government Communication in Emergencies

[About Us > Government and Industry Affairs > Communications During Power System Emergencies]

New Web Resource: Government Communication in Emergencies, *cont.*

About Us > Government and Industry Affairs > Communications During Power System Emergencies

Operations Overview

Relevant ISO New England Operating Procedures

Cold Weather Condition Operations (SOP-RTMKTS.0050.0007)

Action During a Capacity Deficiency (OP-4)

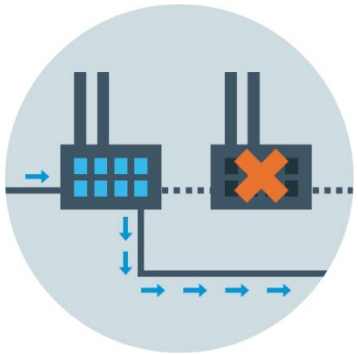
Operational Surveys, Energy Forecasting & Reporting and Actions During An Energy Emergency (OP-21)

Action in an Emergency (OP-7)

Additional information can be found in the appendix

Reserve Requirements

- ISO New England carries operating reserves to maintain **reliable** power system operations in the event of a contingency on the system*
  - **Ten-Minute Reserve Requirement**
    - ISO maintains Ten-Minute Reserves adequate to recover from the loss of 120% of the largest source of supply
      - Normally 1,500 MW to 2,400 MW
  - **Thirty-Minute Reserve Requirement**
    - ISO maintains Thirty-Minute Reserves adequate to recover from the loss of 50% of the second largest source of supply
      - Normally 625 MW



- A contingency is an **unplanned disconnection** of a power system element, such as a transmission facility or a generator

* Governed by Northeast Power Coordinating Council (NPCC) requirements and ISO New England procedures

Forecasting Tools for Winter Operations

ISO-NE Utilizes Forecasting Data to Inform System Operations

Cold Weather Condition Operations

- SOP-RTMKTS.0050.0007
  - Coordination between ISO and natural gas pipelines to assess conditions that could affect availability of gas-fired generation during *extreme cold weather conditions*
  - Procedure assesses both weather and **capacity** thresholds

Energy Inventory Accounting and Actions During an Energy Emergency

- Operating Procedure No. 21
  - ISO forecasts and reports on expected **energy** availability over a 21-day look-ahead period
  - ISO surveys generators about fuel supplies and emissions restrictions weekly during winter months (daily, if needed, based on 21-day forecast results)
  - Can address fuel shortages at any time, not just in winter
  - Involves implementation of operating procedures

Cold Weather Condition Operations

SOP-RTMKTS.0050.0007: Perform Cold Weather Condition Operations

Link: https://www.iso-ne.com/static-assets/documents/rules_proceds/operating/sysop/rt_mkts/sop_rtmkts_0050_0007.pdf

Electric/Gas Industry Coordination

- ISO confers with natural gas pipeline companies as needed during the winter
  - Review conditions for upcoming week:
    - Weather and temperature forecasts
    - Posted notices by pipeline operators
    - Equipment-related restrictions on delivery of gas supply
    - Overall capacity requirements to serve electric load in New England
- Generators are required to report their anticipated availability to ISO New England
  - Ability to procure fuel
  - Limitations that could reduce capacity or energy production

Evaluating Conditions

- ISO develops a Seven-Day Capacity Margin Forecast each day
- For the winter period, ISO incorporates the following inputs:
  - Review gas pipeline notices and potential impact on gas unit availability
  - Review weather forecast and potential impact of extreme cold weather conditions on gas unit availability
- ISO will classify the next two days as:
  - No Cold Weather Conditions, Cold Weather Watch, Cold Weather Warning, or Cold Weather Event
- Classifications are posted under Notices and the Seven-Day Capacity Margin Forecast
  - Cold Weather Watch and Warning declared on only a few occasions
  - No Cold Weather Events declared to date

Implementation Requires Conditions that Meet Weather *and* Capacity Thresholds

Threshold Categories	Cold Weather Watch**	Cold Weather Warning**	Cold Weather Event***
Cold Weather Conditions*	Extreme cold	Extreme cold	Extreme cold
Seven-Day Capacity Margin Forecast	≧ 1,000 MW	< 1,000 MW	≦ zero MW

* Effective Temperature must be less than or equal to (≦) zero degrees F for any single on-peak hour and Total Effective Heating Degree Days (EDD) must be greater than or equal to (≧) 65.

** Declarations are made in advance for the following 7-day period and expire at the end of the day at midnight unless cancelled earlier by ISO.

*** A Cold Weather Event will normally be declared one day prior to the Operating Day.

ISO Actions and Communications with Government Contacts

	Cold Weather Watch	Cold Weather Warning	Cold Weather Event
*Does ISO forecast show sufficient **capacity** to meet demand + reserves?*	**Yes**	Sufficient capacity may not be available	**No**
Actions by **ISO Operations**	Post notice to ISO website	Request dual-fuel units to *prepare* to switch fuels (within permit limits)*	Review gas nominations to determine if gas units have confirmed supplies, and Request gas units that can burn oil to *switch* to oil*
Communications from **ISO External Affairs**	Email notice to government contacts	Convene conference call with government contacts and environmental regulators	Follow up notification and convene conference call with government contacts and environmental regulators

* Dual-fuel units are not required to switch fuels.

Seven-Day Capacity Forecast Sample

WEATHER	DAY 2 TUE 11/18	DAY 3 WED 11/19	DAY 4 THU 11/20	DAY 5 FRI 11/21	DAY 6 SAT 11/22	DAY 7 SUN 11/23
High Temperature - Boston	46	45	45	49	47	46
Dew Point - Boston	24	26	30	42	35	33
High Temperature - Hartford	46	46	45	51	48	47
Dew Point - Hartford	23	26	26	41	33	34

LOAD RELIEF ACTIONS ANTICIPATED						
Power Watch	N	N	N	N	N	N
Power Warning	N	N	N	N	N	N
Cold Weather Watch	N	N	-	-	-	-
Cold Weather Warning	N	N	-	-	-	-
Cold Weather Event	N	N	-	-	-	-

Link: https://www.iso-ne.com (Markets and Operations > Power System Forecast and Status > Seven-Day Capacity Forecast)

Abnormal Conditions Alert

Master/Local Control Center Procedure No. 2 (M/LCC 2)

Link: https://www.iso-ne.com/participate/rules-procedures/master-lcc-procedures

M/LCC 2 – Abnormal Conditions Alert

- What is an abnormal condition on the bulk power system?
  - Forecasted or actual deficiency of operating reserves requiring implementation of OP-4 and/or OP-7
  - Low transmission voltages and/or low reactive reserves
  - Inability to provide first contingency protection when an undesirable post-contingency condition might result (e.g., load shedding)
  - Geomagnetic Disturbance (GMD)
  - Cold Weather Event is declared
  - Operational staffing shortage impacting normal power system operations within New England
  - Any other credible threat to power system reliability and integrity (e.g., terrorism, sabotage, storms)

M/LCC 2 – Abnormal Conditions Alert, *continued*

- The purpose of M/LCC 2:
  - Alerts power system personnel and market participants of abnormal system conditions
  - Outlines steps to be taken, including:
    - Cancellation of maintenance on power system resources
    - Delineates which outages can and cannot be allowed
- M/LCC 2 may be issued systemwide or locally
- M/LCC 2 may be skipped – the ISO may move straight into OP-4 and/or OP-7, if necessary
- Typically, EA does not send M/LCC 2 notices to OP-4 contacts

Energy Inventory Accounting and Actions During An Energy Emergency

Operating Procedure No. 21 (OP-21)

Link: https://www.iso-ne.com/participate/rules-procedures/operating-procedures

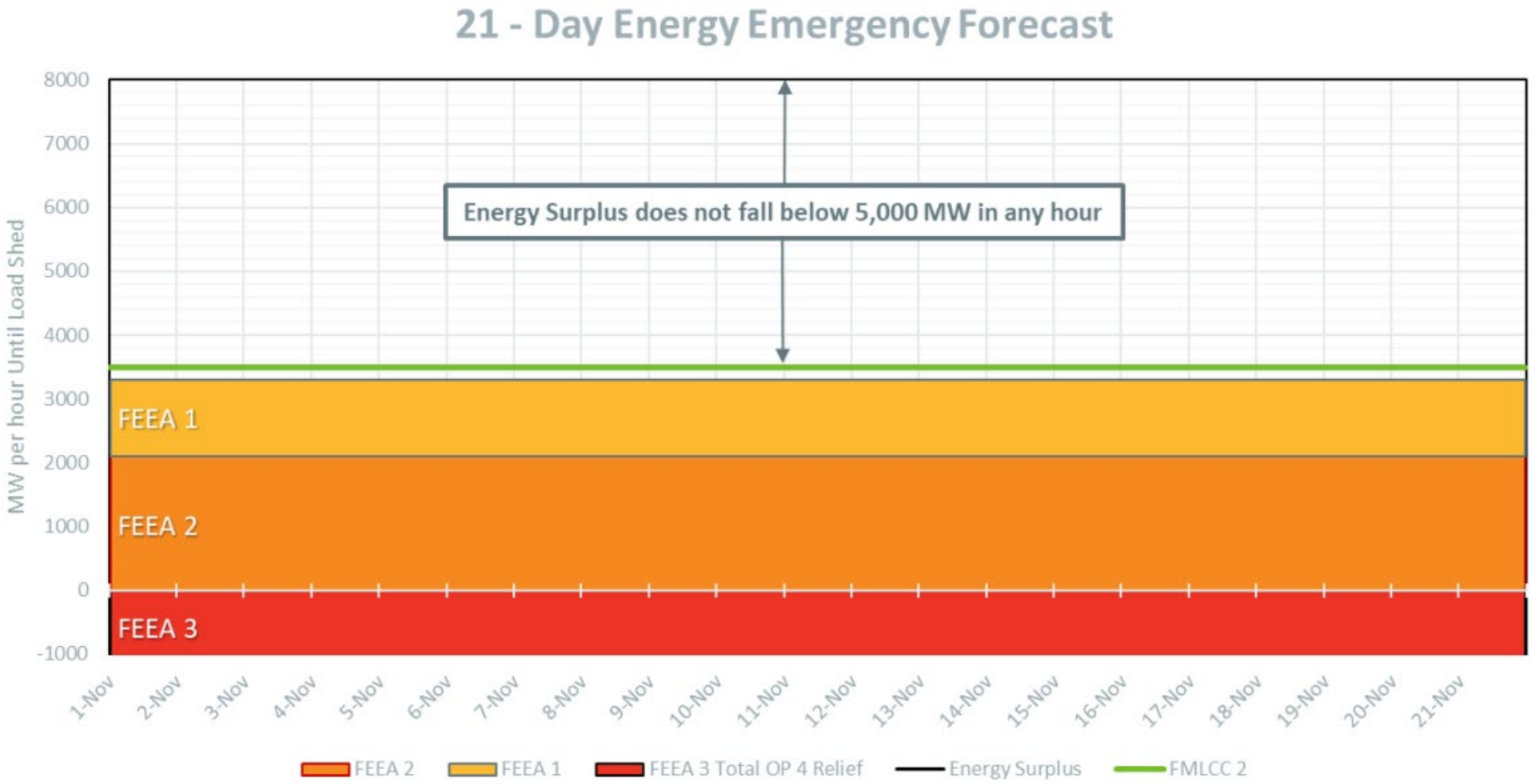
ISO New England Publishes 21-Day Energy Assessments on a Weekly Basis During Winter

- The **energy assessment** is based on New England generators' reports of their fuel inventories, emissions limitations, and other factors that could limit their availability
- Hourly forecast results compared against established thresholds to trigger the declaration of either:
  - **Normal Conditions**
  - **Energy Alerts** (declared in Day 6-21 timeframe), or
  - **Energy Emergencies** (declared in Day 1-5 timeframe)
- Energy assessments are published to the ISO website (iso-ne.com)
  - **Weekly** (December – February)
  - **Bi-weekly** (March – November)
- During Energy Alert or Energy Emergency conditions, the ISO will publish energy assessments **daily**

21-Day Energy Assessment Raises Awareness About Energy Availability So Resources Can Take Action

- Resource owners and other stakeholders, including regulatory and government entities, will be made aware of actual or anticipated near-term **energy deficiencies**
  - For example, when oil or other fuels start running low or emissions limitations are constraining resource availability
- With up to three weeks' notice, resource owners have time to **evaluate status** of their resources and **take action** as needed to increase their availability
  - For example, make arrangements to have more fuel delivered or reschedule maintenance to transmission facilities

Sample: 21-Day Forecast Report



LEGEND:

FEEA: *Forecasted* Energy Emergency Alert
FMLCC-2: *Forecasted* Abnormal Conditions Alert

FMLCC-2: Resources are forecasted to be <200 MW above the operating reserve requirement

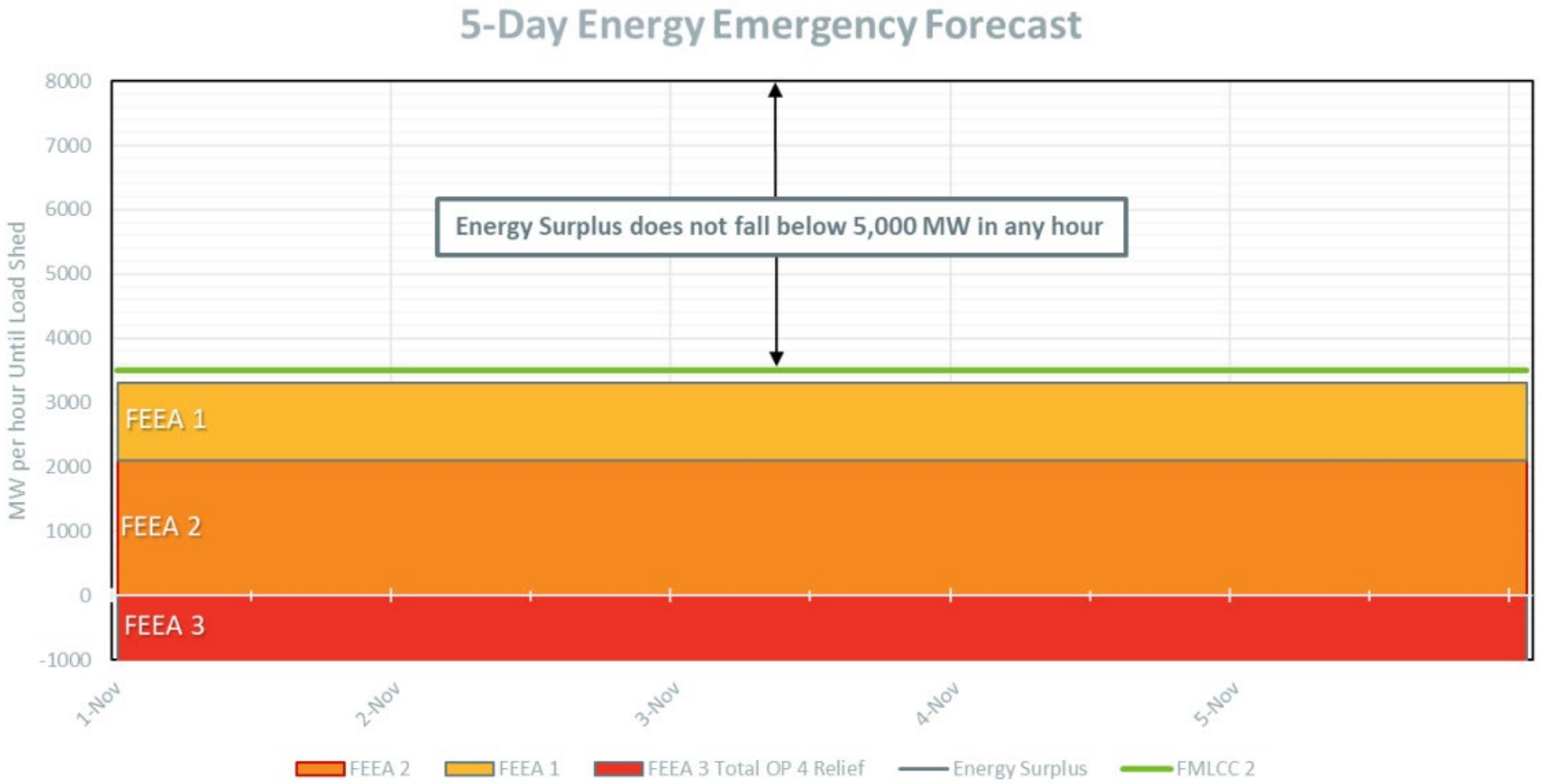
FEEA1: Resources are forecasted to fall below the operating reserve requirement and **OP-4 actions 1–5** are forecasted

FEEA2: Resources are forecasted to fall below the operating reserve requirement and **OP-4 actions 6–11** are forecasted

FEEA3: Resources are insufficient to meet firm load; **OP-7 actions** are forecasted

Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011 - Emergency Operations. These alerts do not trigger any additional communications with OP-4 contacts.

Sample: 5-Day Forecast Report



LEGEND:

FEEA: *Forecasted* Energy Emergency Alert
FMLCC-2: *Forecasted* Abnormal Conditions Alert

FMLCC-2: Resources are forecasted to be <200 MW above the operating reserve requirement

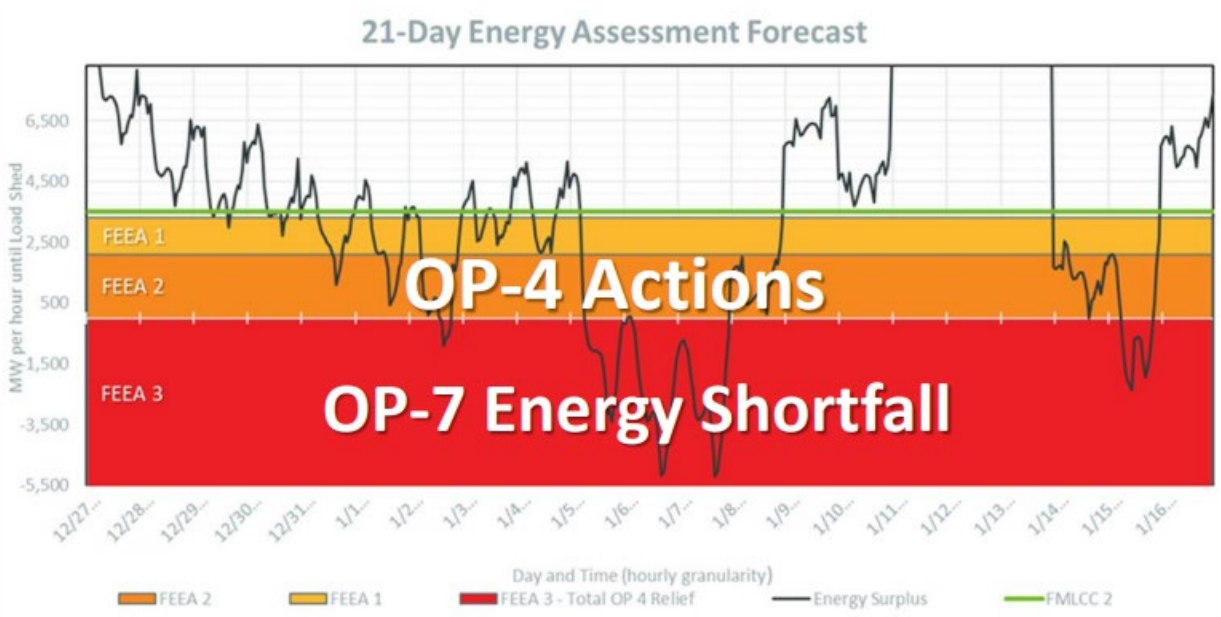
FEEA1: Resources are forecasted to fall below the operating reserve requirement and **OP-4 actions 1–5** are forecasted

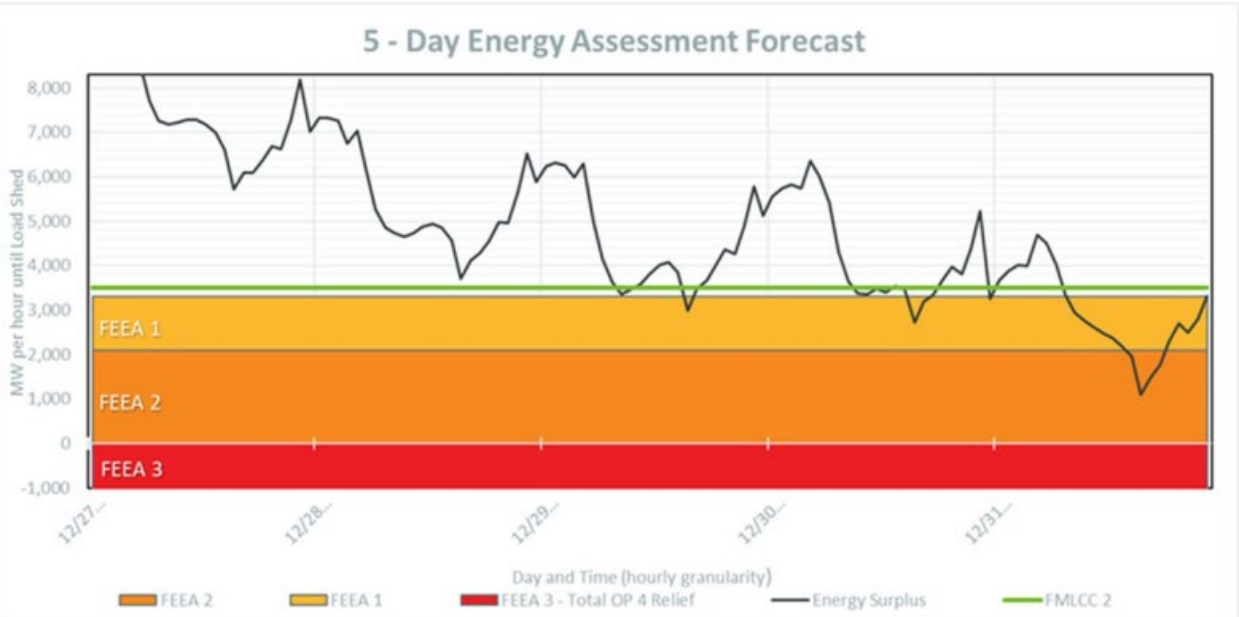
FEEA2: Resources are forecasted to fall below the operating reserve requirement and **OP-4 actions 6–11** are forecasted

FEEA3: Resources are insufficient to meet firm load; **OP-7 actions** are forecasted

Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011 - Emergency Operations. These alerts do not trigger any additional communications with OP-4 contacts.

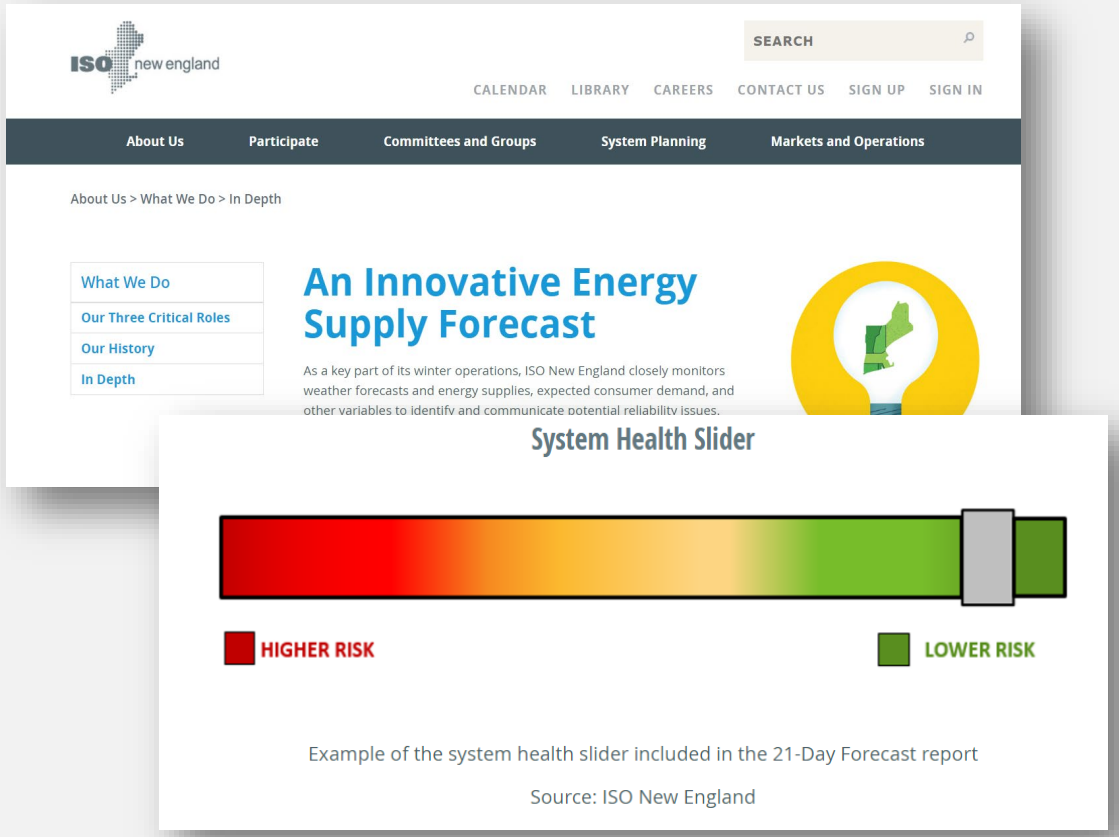
Example Reports with Energy Alerts and Emergencies





ISO Resources for OP-21 Information

For background on how to read the OP-21 report…



https://www.iso-ne.com/about/what-we-do/21-day-forecast

For updates on real-time issues…

https://isonewswire.com/

Winter Conservation Appeals: *Timing, Duration, and Coordination*

- Typically, ISO conservation appeals have been issued for a few hours of the afternoon to meet ***peak*** demand in the ***summer***
- The ISO can also issue conservation appeals to help the region conserve ***energy*** in the ***winter*** during extended cold weather
  - These appeals would likely be to conserve energy *in all forms* (not just electricity), and for potentially *longer* periods than in summer
- **Early Notification to Emergency Communications Contacts**: If the ISO forecasts a *potential energy shortfall* in the 21-day forecast, and we anticipate making conservation appeals, we would plan to reach out to you before the forecast is posted (public), so you have a preview of the information and so we can coordinate *messages* and the *timing* of any appeal(s)
  - The forecast is posted **weekly** Dec-Feb, typically on Wednesday

Action During a Capacity Deficiency

Operating Procedure No. 4 (OP-4)

Link: https://www.iso-ne.com/participate/rules-procedures/operating-procedures

OP-4 Is Implemented When One or More of the Following Occur

- **Demand + reserves** cannot be met with available resources
- **Contingencies** (1 or more) result in an immediate deficiency in available capacity
- **Transmission** facilities in a subarea are loaded beyond established transfer limits
- **Manual load shedding** (OP-7) is needed, but OP-4 actions could avoid or reduce that need
- **Abnormal voltage** and/or **reactive conditions** in a subarea
- **Assist other NPCC control areas** that are experiencing a capacity deficiency (would reduce our reserves below required margin)
- **Other serious threat** to the bulk power system for which the ISO determines this procedure would mitigate the impact

Key Takeaways: OP-4 Implementation

11 actions can be implemented…

…to cover the **affected area**:

- New England-wide
- State(s)
- LCC(s), or
- A specific area

…in any **order**

…or, **skipped** if emergency actions are needed…

…and declaration of any OP-4 actions **trigger notifications** on website and mobile app

What Triggers OP-4 Notifications?

Action 1: Notice to market participants that an energy deficiency exists, but no public appeal for electricity conservation

Action 4: Public appeal for electricity conservation, if conditions warrant

Action 10: Urgent public appeal to immediately turn off all unnecessary power use

Action 11: ISO requests Governors' support for Power Warning

Governors' Appeal

What Emergency Communications Contacts Can Expect

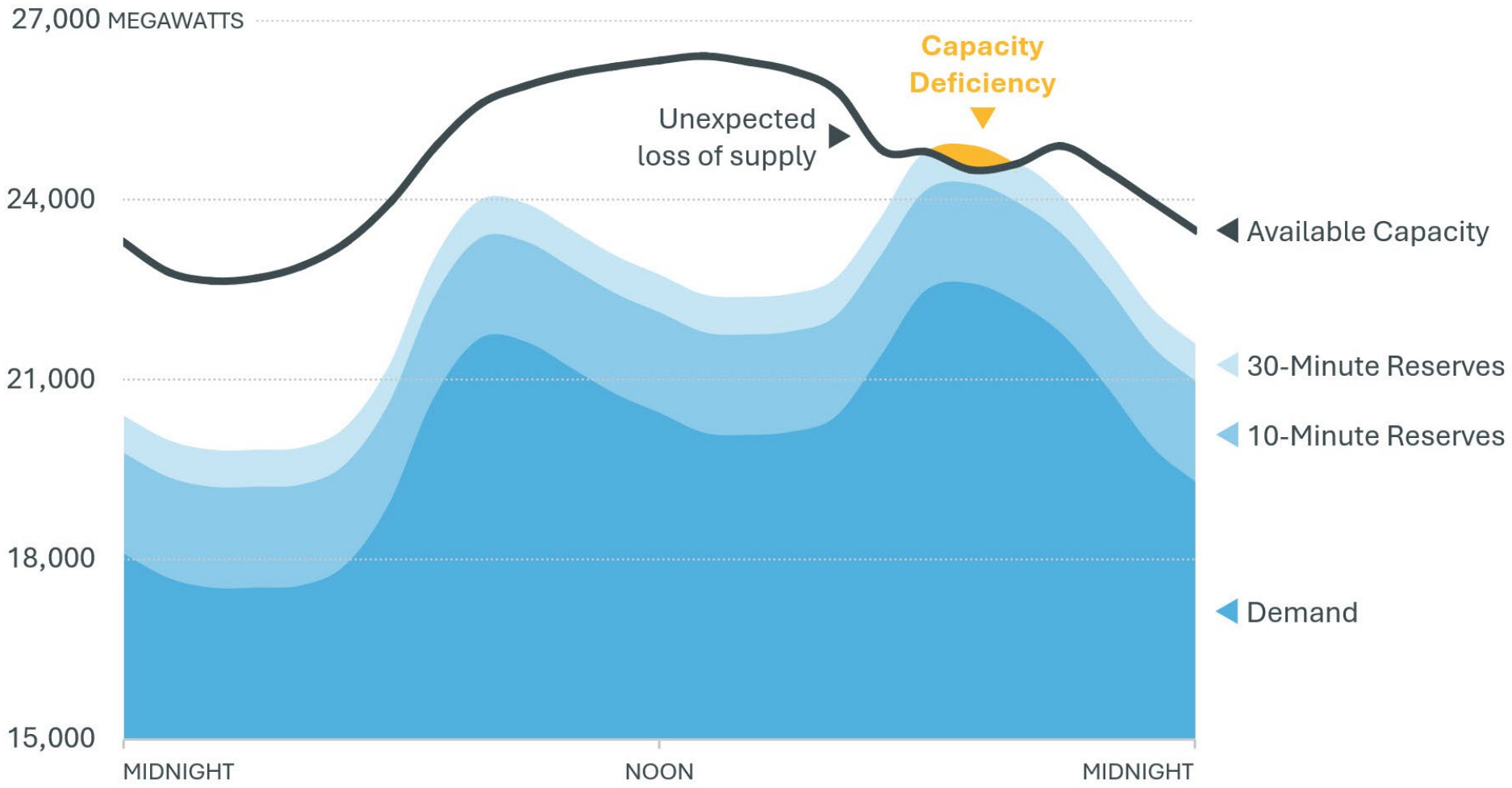
- Activation of **ISOAlert** if the ISO implements OP-4
  - Will create automated emails, phone calls, and/or text messages to all government and utility communications contacts*
- Follow-up notification if the ISO implements additional OP-4 actions that trigger a **public appeal for conservation**
  - To streamline notifications, we do not plan to make separate notifications for all incremental OP-4 actions
  - If the ISO issues a public appeal for conservation, we will invite emergency contacts to a **conference call briefing** on system conditions
- **System status** updates on the ISO homepage and mobile app throughout an event
- Notification when actions are **cancelled**
- For **localized** events, ISO will prioritize notification for emergency contacts in the affected area

Steps Taken for Different OP-4 Actions

	Actions	Notification via email, text, or phone	Activate Conference call
Power Caution	1	●	
Power Watch	4	●	If ISO issues public appeal
Power Warning	10	●	●
Governors' Appeal	11	●	

* ISO maintains three tiers of contacts for each organization: primary, secondary and alternate contacts. ISOAlert notifies all three tiers simultaneously. If ISO needs to bypass ISOAlert, we will reach out to primary contacts first and we will only call secondary and alternate contacts if the primary contact is unreachable.

Example of a Contingency Affecting Operating Reserves



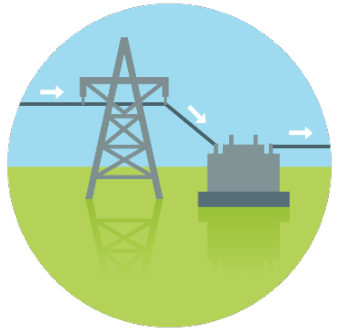
Note: Available Capacity includes scheduled resources and those with response times under 30 minutes.

Action in an Emergency

Operating Procedure No. 7 (OP-7)

Link: https://www.iso-ne.com/participate/rules-procedures/operating-procedures

Action in an Emergency (OP-7)



- If OP-4 actions are not adequate to manage a capacity deficiency, ISO will implement OP-7
  - OP-4 can be skipped to move into OP-7 immediately, if necessary
- OP-7 allows system operators to order the **disconnection** of firm customer load—frequently referred to as manual load shedding, load curtailment, controlled power outages, or rolling blackouts—as a means of maintaining the integrity of the bulk power system
- OP-7, like OP-4, can be called region-wide or locally
- When OP-7 actions are required, transmission and/or distribution companies disconnect customers at the direction of the ISO or the Local Control Centers (LCC)
  - ISO system operators do not have the ability to disconnect customers

Communications During OP-7

- Communications follow the **general framework** for OP-4 events
- Control Room will:
  - Notify LCCs, U.S. DOE, NERC, and NPCC
- Corporate Communications and External Affairs teams will:
  - Inform government officials and utility communications contacts of OP-7 implementation (prior to implementation, if possible)
  - Activate conference call and conduct regular conference call updates when time permits
  - Issue Controlled Power Outage notice and, if necessary, conservation appeal (prior to implementation, if possible)

ISO Operating Procedures Are Designed to *Protect* System Reliability, *Avoid* Worsening Conditions, and *Expedite* Return to Normal System Conditions

Power System Conditions:	Normal	Shortage of Operating Reserves	Shortage of Energy	Systemwide Blackout
Operating Procedures and related actions:		Actions During a Capacity Deficiency (OP-4)*; load management	Actions in an Emergency (OP-7); controlled power outages	System Restoration Plan (M/LCC-18)
Objective:		Restore operating reserves	Avoid uncontrolled outages and a systemwide blackout	Restart electric grid

* The ISO may also implement OP-4 actions if it could reduce the need for emergency actions under OP-7.

NPCC 2025-2026 Winter Reliability Assessment Overview

ISO New England Annual Pre-Winter Communications Training

Monday, November 24, 2025

NPCC, Inc.

The final report is expected to be posted by December 6, 2025
Seasonal Assessment (npcc.org)

Benefit of NPCC Winter Reliability Assessment

- Resource Adequacy ensures sufficient resources to meet demand reliably under normal & extreme conditions
- Prepare for uncertainties (fuel supply, weather, renewable variability)
  - **Highlight regions where Reserve Margins may be insufficient to handle cold snaps and wide-area freezing events that stress fuel supply chains and generator availability**
- Identify vulnerabilities before they impact the bulk power system
  - **Identify vulnerabilities such as natural gas delivery constraints or frozen equipment**
- Operational Readiness: Validate emergency procedures and operator preparedness
- Transparency & Accountability: Share findings with stakeholders
- Regional Coordination: Align NPCC with NERC and neighboring reliability coordinators
- **NPCC's Probabilistic Assessment results complement NERC Winter Reliability Assessment**

Major Considerations in NPCC Reliability Assessment

- **How to Measure Risks?**
  - Demand Forecasts (50/50, 90/10 scenarios)
  - Generation Adequacy (capacity, outages, retirements, new projects)
  - Capacity vs. Energy Risks
  - Deterministic vs. Probabilistic

- **What are the Additional Risks?**
  - Transmission Adequacy (bottlenecks, upgrades, inter-area transfers)
  - Fuel Supply Availability
  - Weather Uncertainty
  - Off-Peak Hour Risks
  - Sensitivity Factors (renewables, demand response, geomagnetic disturbances, voltage limits)

Capacity Assessment

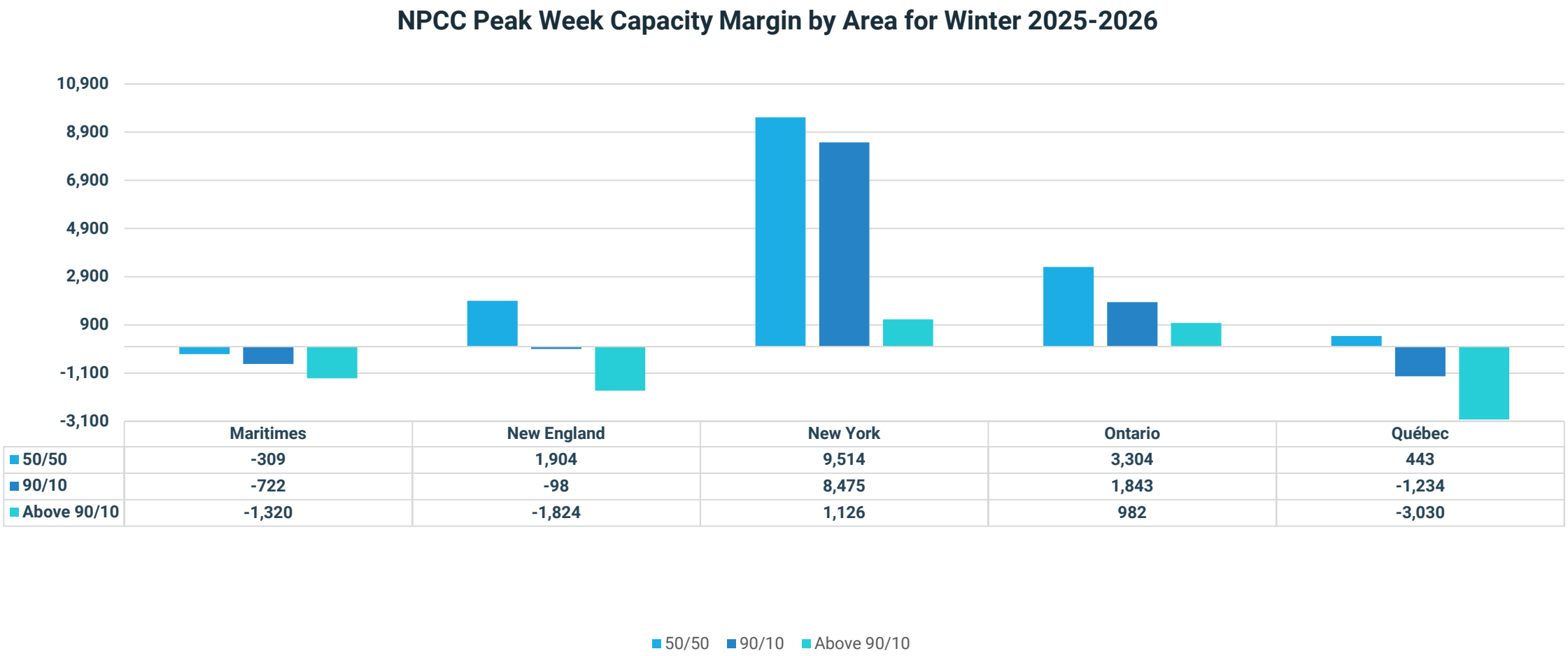
- **Review 50/50, 90/10, Above 90/10 forecasts for NPCC Wide Coincident Peak Demand**
  - NPCC Capacity margins and transmission capability is adequate under 50/50 and 90/10 conditions

    - **50/50 Peak Demand: 15,5111 MW - capacity margin**
      - Forecast: 112,810 MW (week of Jan 18, 2026)
      - Net margin: 13.7% (↓ from 14.6% last winter)
    - **90/10 Forecasted Demand: 9,595 MW - capacity margin**
      - Forecast: 118,725 MW
      - Net margin: 8.1% (↓ from 9.2% last winter)
    - **Above 90/10 Forecasted Demand: -3826 MW - capacity margin**
      - Forecast: 122,752 MW
      - Net margin: -3.1% (assumes 42,297 MW outages including maintenance, derates, unplanned)

- Installed Capacity:
  - On-peak: 161,426 MW
  - Total: 165,385 MW (↑ slightly from 165,116 MW last winter)

- Established Operating Procedures are available to maintain reliability and keep electricity supplies and demand in balance

Capacity Margins - by Area for Peak Weak



	Maritimes	New England	New York	Ontario	Québec
50/50	-309	1,904	9,514	3,304	443
90/10	-722	-98	8,475	1,843	-1,234
Above 90/10	-1,320	-1,824	1,126	982	-3,030

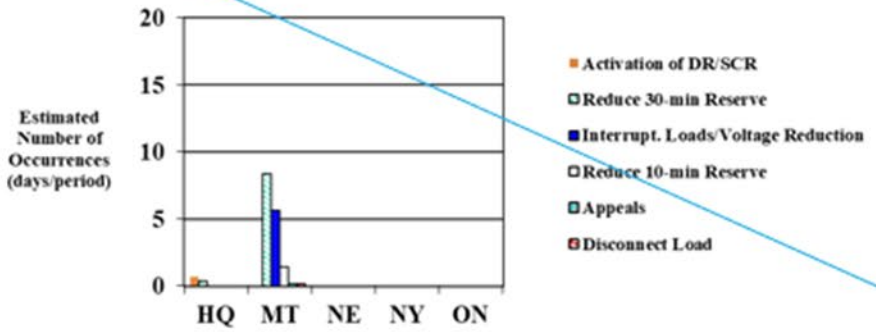
Energy Assessment

- This Probabilistic Assessment (hourly, chronological Monte-Carlo simulation) consistently review the resource adequacy and estimates the annual Loss of Load Expectation (LOLE) planning criteria for each NPCC Area for the winter months (December–February)
  - **Base(As is System) – Expected Resources**
    - Load representation
      - 50/50 chance of occurrence
      - Highest load levels - 10- 15% higher loads than Base Case– having a 7% chance of occurrence
  - **Severe case(Stressed system) - ~ 10% less available overall Reduced Resources**
- **NPCC's Probabilistic Assessment results complements NERC Reliability Assessments**

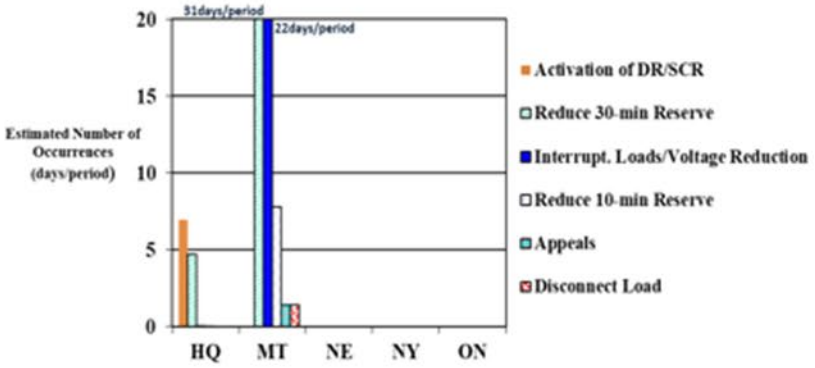
Summary – November 2025 - March 2026

Expected Use of Operating Procedures (days/period)

Low Risk

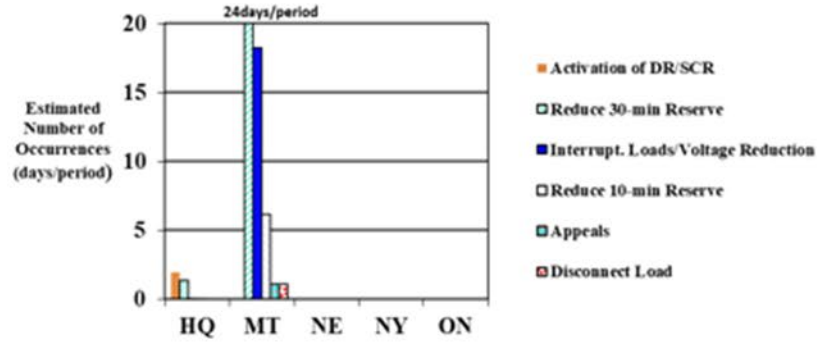


Base Case Assumptions – 50/50 Peak Load Level

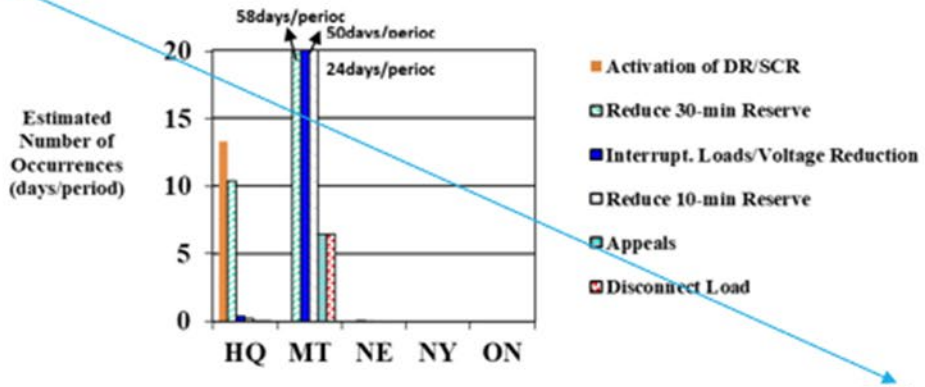


Base Case Assumptions– Highest load Levels

Increasing Risk, Decreasing Likelihood



Severe Case Assumptions – 50/50 Peak Load Level



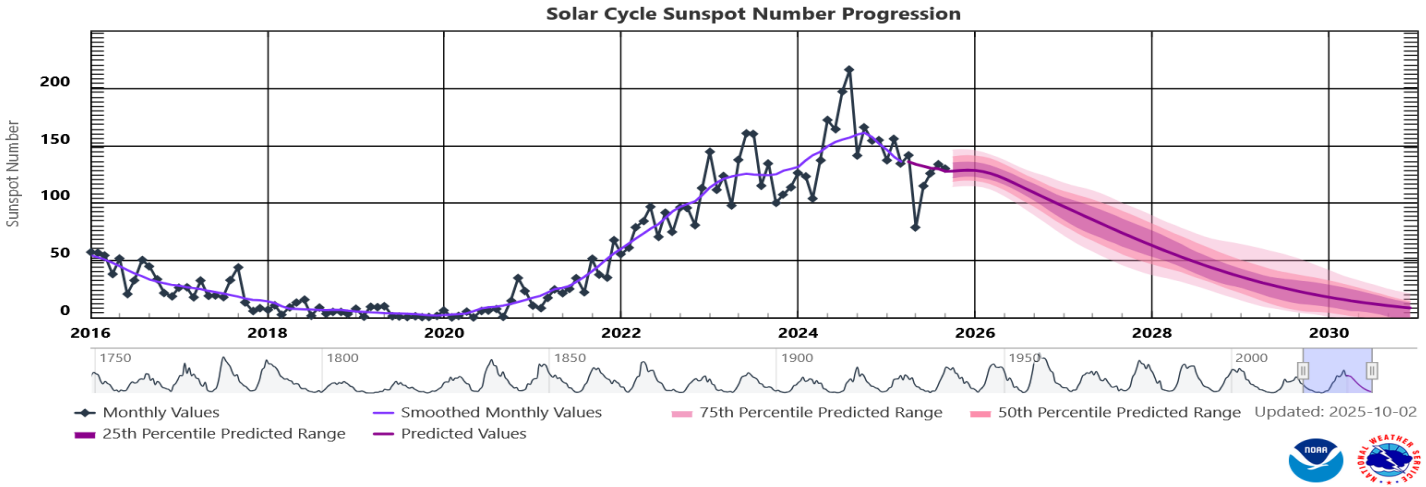
Severe Case Assumptions – Highest load Levels

Higher Risk

NPCC Winter Readiness

- Reliability Coordinator (RC) Communications:
  - Daily – discuss and alert NPCC and neighboring RCs of any potential or emerging problems
  - Weekly – review a seven-day outlook for the Region, including contingencies, margins and weather, and to ensure future system changes (generation and transmission) outages are coordinated
  - RCs continue to regularly conduct NPCC Emergency Preparedness Calls to review system conditions, if needed, prior to adverse weather
- NPCC Task Forces and Working Groups support continued reliable operations through reviewing and assessing the performance of the bulk power system
- Supports regional Electric-Gas Operations reliability coordination efforts promoting inter-sector communication, awareness and information sharing

Geomagnetic Outlook



Key risk windows for geomagnetically induced currents (GICs)to last several days:

- Oct: 12–15, 26–29
- Nov: 8–11, 22–25
- Dec: 5–8, 19–22
- Jan: 1–4, 15–18
- Feb: 11–14

Coronal holes may trigger unpredictable geomagnetic storms (K-index 5–7) during key fall/winter windows.

- Solar Cycle 25 likely peaked in October 2024, with sunspot activity exceeding predictions
- Solar activity remains high even after the sunspot peak. The geomagnetic activity maximum typically lags the sunspot maximum by about 2 years later, meaning elevated risk is expected through late 2025 and into 2026
- According to Space Weather Prediction Center, geomagnetic activity is uncertain, over the fall and winter months of 2025 and into early 2026 enhanced geomagnetic activity will persist
- Periods of minor to major geomagnetic storming, with K-indices ranging from 5 to 7, are expected to occur
- Operators are encouraged to monitor daily geomagnetic activity predictions this fall and winter

Both NERC and NPCC have implemented standards and procedures requiring entities to mitigate the potential effects of geomagnetic disturbances

Key Takeaways

Capacity and Energy Risk Assessment

- NPCC expects adequate supply under forecast conditions
- Risks remain under extreme scenarios
- Ongoing coordination and preparedness are critical

Seasonal Reliability Assessments are Essential for NPCC

- Mitigate seasonal reliability risks while enhancing cross-regional coordination.
- Ensure safe, reliable electricity for all consumers
- Even though RTOs/ISOs perform regional risk assessments, NPCC's wide-area, consistent methodology identifies risks across the region
- NPCC's approach provides a broader perspective and enhances stakeholder confidence

Questions?

Khatune Zannat
Manager, Probabilistic Assessment
Northeast Power Coordinating Council
Reliability Assessments and Performance Analysis
Contact Us | NPCC

Next Steps

- ISOAlert Test scheduled for **Today, Monday Nov. 24** for government and utility contacts

- Winter Seasonal Outlook Webpage & Press Release

- Send updated contact information to the ISO:

Government Contacts:

External Affairs Department:
- (413) 535-4138
- Gae Warman-Gold
  gwarmangold@iso-ne.com

Utility Communications Contacts:

Corporate Communications/
Media Relations Department:
- (413) 535-3842
- Randy Burlingame
  rburlingame@iso-ne.com

Questions

Reference Materials

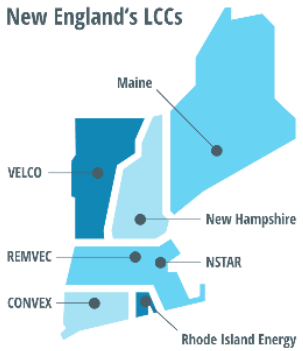
Communications Quick References

Communications Paths During a Power System Emergency:

From ISO New England through to the Public

ISO-NE
Master Control Center

ISO-NE control room coordinates bulk power system operations with seven local control centers (LCCs) in New England



ISO-NE control room coordinates with ISO's External Affairs (EA) and Corporate Communications (CC) personnel to communicate with external audiences during power system emergencies

ISO-NE External Affairs

ISO-NE Corporate Communications

- Reliability Councils
- Federal Government
- State Government
- Elec. Utilities' Corp. Comm.
- Media
- ISO website, Newswire, App

Goal: *Unified message*

Public

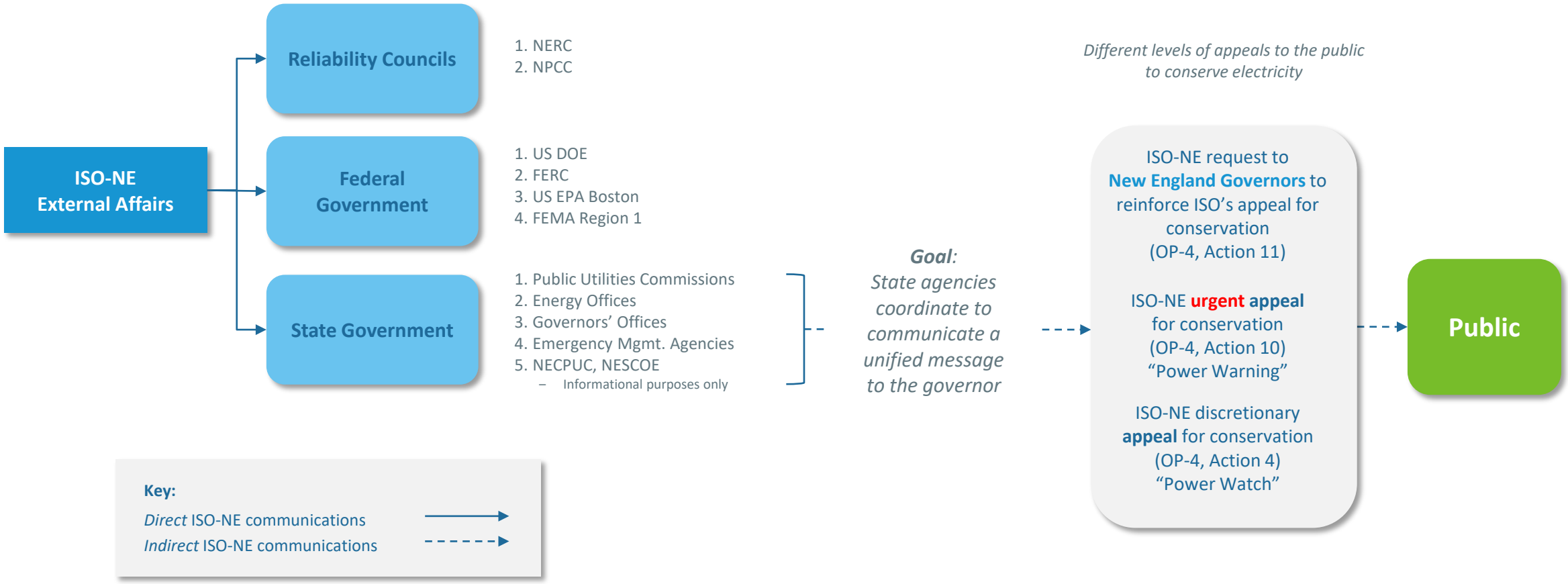
Key:

Direct ISO-NE communications

Indirect ISO-NE communications

Communications Paths During a Power System Emergency:

From ISO-NE External Affairs to State Agencies and the New England Governors through to the Public



External Affairs (EA) Contacts

Federal Government

- U.S. Department of Energy (DOE)
- U.S. Environmental Protection Agency (EPA Region I)
- Federal Energy Regulatory Authority (FERC)
- Federal Emergency Management Agency (FEMA)

State Public Utility Commissions and Energy Offices

- NESCOE (as an FYI)
- Vermont DPS and PUC
- NECPUC (as an FYI)
- Rhode Island PUC, DPUC and OER
- New Hampshire PUC and DOE
- Massachusetts DPU and DOER
- Maine PUC and GEO
- Connecticut PURA and DEEP

Governors' Offices (*or designee*)

- Connecticut Governor's Office
- *Maine Governor's Energy Office*
- Massachusetts Governor's Office
- *New Hampshire Department of Energy*
- Rhode Island Governor's Office
- *Vermont Department of Public Service*

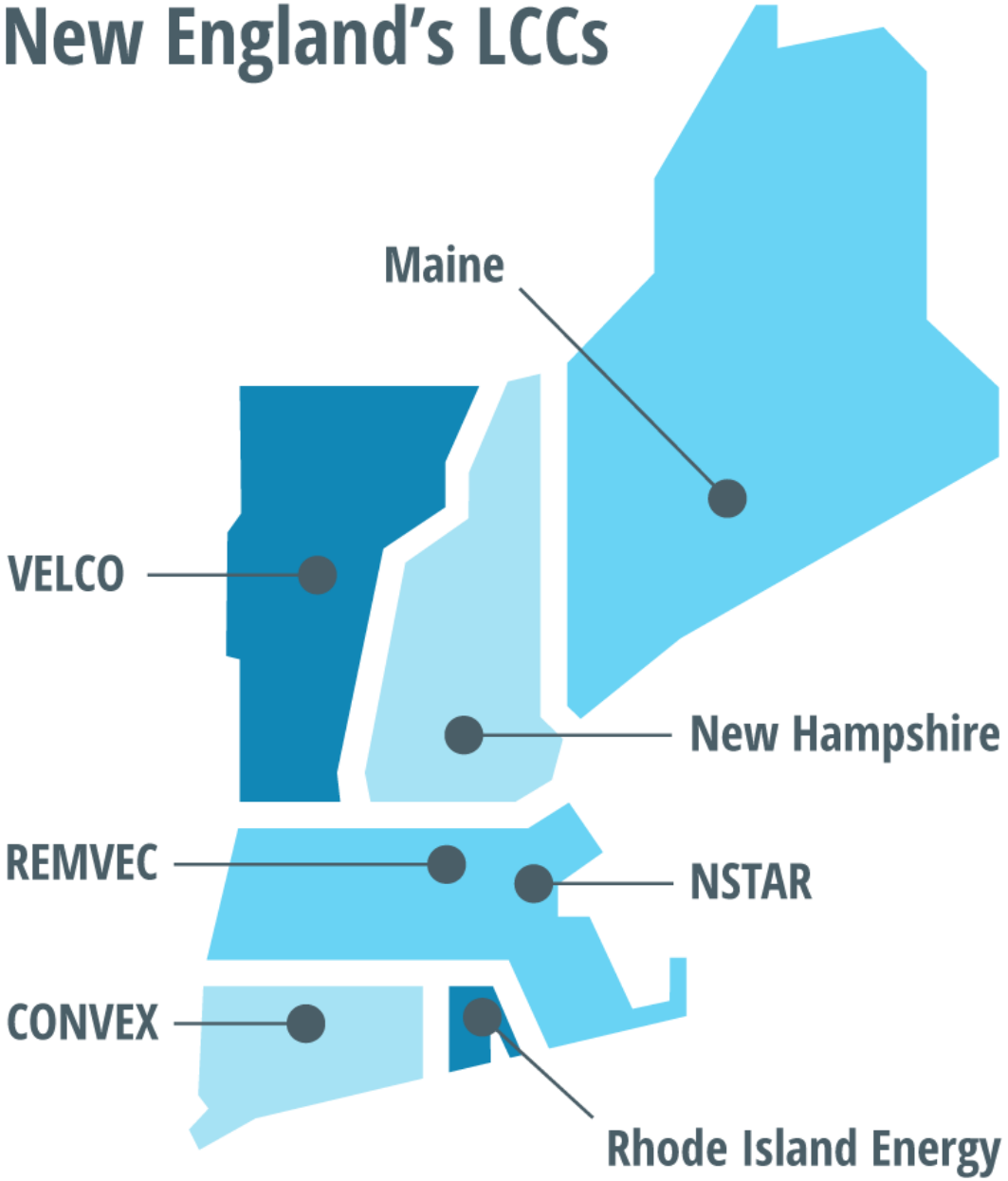
Emergency Management Agencies

- CT Emergency Management Division
- ME Emergency Management Agency
- MA Emergency Management Agency
- NH Bureau of Emergency Management
- RI Emergency Management Agency
- VT Emergency Management
- Northeast States Emergency Consortium

Reliability Councils

- North American Electric Reliability Corporation (NERC)
- Northeast Power Coordinating Council (NPCC)

Corporate Communications Utility Contacts

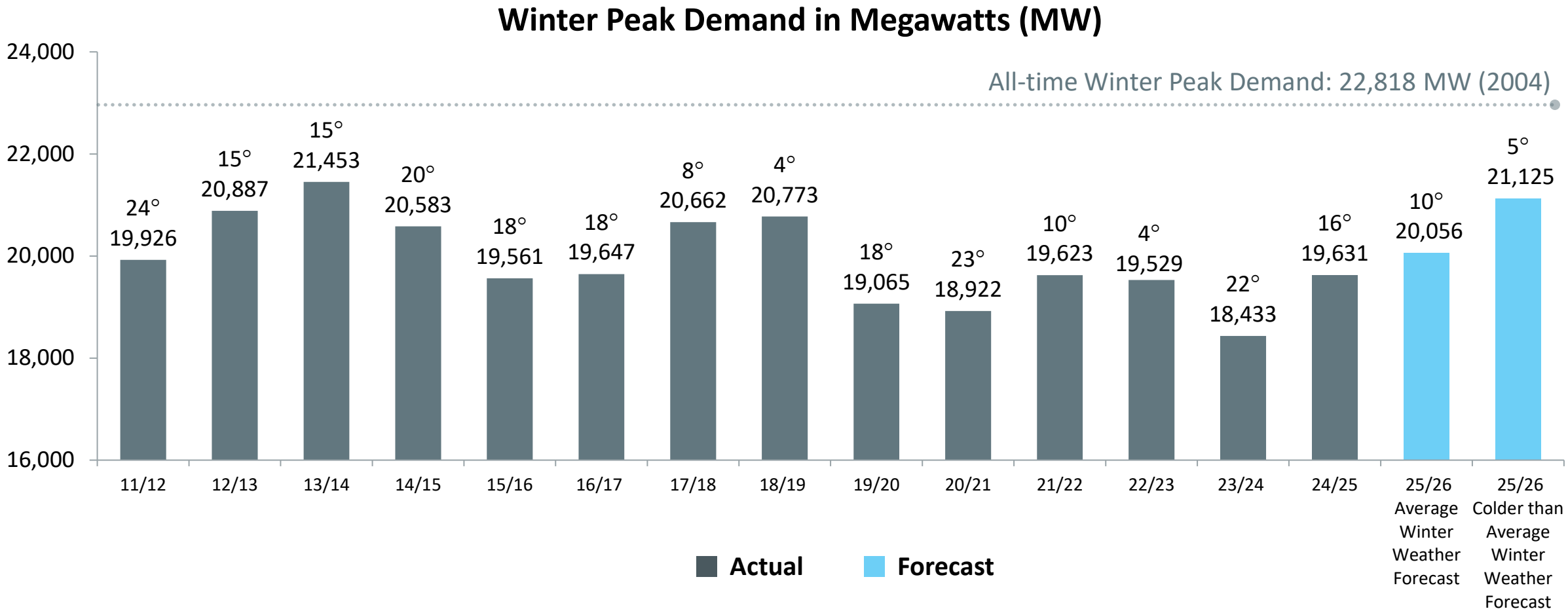


Pre-Winter Energy Analysis

2025-2026

Winter Peak Demand Corresponds to Temperature

*Colder temperatures produce higher demand; milder temperatures produce lower demand**

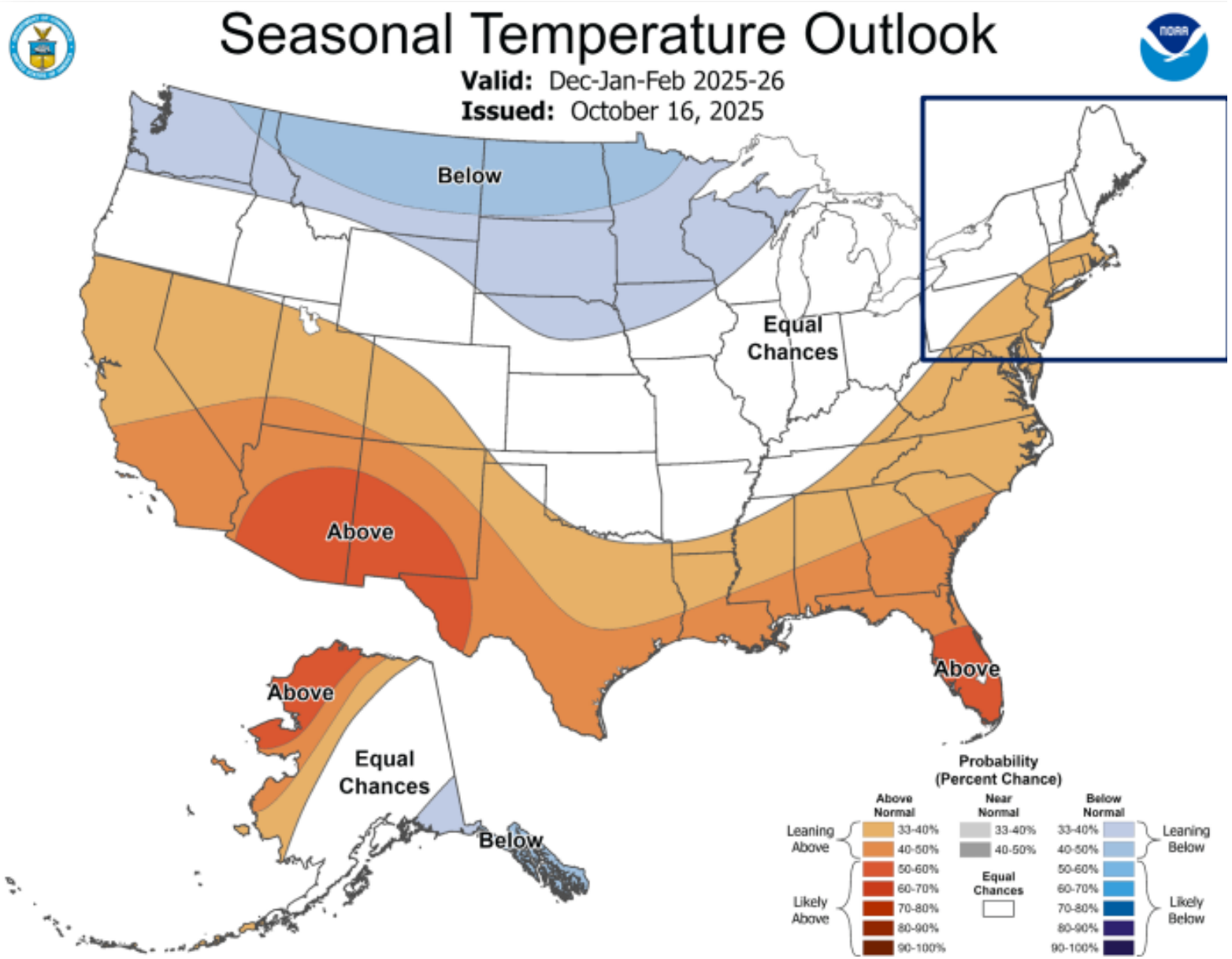


Sources: ISO-NE Seasonal Peaks Since 1980, 2025-2026 Winter Generator Readiness Seminar, 2025 CELT Forecast

*Temperature is dry-bulb temperature in degrees Fahrenheit based on weighted average of eight New England weather stations.

Winter Temperature Outlook

Warmer than normal temperatures are forecast for Southern New England, and equal chances for either above or below normal in Northern New England.



Abnormal Conditions Alert

Master/Local Control Center Procedure No. 2 (M/LCC 2)

Link: https://www.iso-ne.com/participate/rules-procedures/master-lcc-procedures

M/LCC 2 – Abnormal Conditions Alert

- What is an abnormal condition on the bulk power system?
  - Forecasted or actual deficiency of operating reserves requiring implementation of OP-4 and/or OP-7
  - Low transmission voltages and/or low reactive reserves
  - Inability to provide first contingency protection when an undesirable post-contingency condition might result (e.g., load shedding)
  - Geomagnetic Disturbance (GMD)
  - Cold Weather Event is declared
  - Operational staffing shortage impacting normal power system operations within New England
  - Any other credible threat to power system reliability and integrity (e.g., terrorism, sabotage, storms)

M/LCC 2 – Abnormal Conditions Alert, *continued*

- The purpose of M/LCC 2:
  - Alerts power system personnel and market participants of abnormal system conditions
  - Outlines steps to be taken, including:
    - Cancellation of maintenance on power system resources
    - Delineates which outages can and cannot be allowed
- M/LCC 2 may be issued systemwide or locally
- M/LCC 2 may be skipped – the ISO may move straight into OP-4 and/or OP-7, if necessary
- Typically, the ISO does not send M/LCC 2 notices to OP-4 contacts

Action During a Capacity Deficiency

Operating Procedure No. 4 (OP-4)

Link: http://www.iso-ne.com/participate/rules-procedures/operating-procedures

Action 1

- Inform all resources that a capacity deficiency exists
  - Each resource with a Capacity Supply Obligation (CSO) should prepare to provide capability
  - "Settlement-Only" Resources with real-time obligations and CSOs need to monitor the status of reserve pricing and meet their obligations under "Capacity Scarcity Condition" definitions in the Tariff
- Begin to allow depletion of 30-minute operating reserve
- Implement a **Power Caution**
  - Notify government official and utility communications contacts
  - Does not involve public appeals for conservation

Action 2

- Declare Energy Emergency Alert (EEA) Level 1
- EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011-4 Emergency Operations:
  - https://www.nerc.com/standards/reliability-standards/eop/eop-011-4

Action 3

- Request voluntary load curtailment of Market Participants' facilities in New England

Action 4

- Implement a **Power Watch**
  - Notify government official and utility communications contacts
    - Communicate that additional OP-4 actions may be taken
- If conditions warrant, issue a public appeal for voluntary conservation
  - Activate conference call and conduct regular conference call updates if public appeal is issued
  - Publicize conservation appeal

Action 5

- Implement Actions 5 and above to maintain 10-minute reserves
- Arrange to purchase available emergency capacity and energy, or energy only (if capacity backing is not available), from Market Participants or neighboring regions

*Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011-4 - Emergency Operations (https://www.nerc.com/standards/reliability-standards/eop/eop-011-4).

Action 6

- Declare Energy Emergency Alert (EEA) Level 2*
- Implement a voltage reduction of 5% of normal operating voltage requiring more than 10 minutes to implement
  - Local Control Centers (LCCs) implement voltage reduction on distribution and sub-transmission systems
- Alert NYISO that sharing of reserves within Northeast Power Coordinating Council (NPCC) may be required

Action 7

- Request generators and demand response resources not subject to a CSO to voluntarily provide energy for reliability purposes
  - Either on a forecast basis or in real time when ISO anticipates it will be unable to maintain 10-minute reserves

*Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011-4 - Emergency Operations (https://www.nerc.com/standards/reliability-standards/eop/eop-011-4).

Action 8

- Implement a voltage reduction of 5% of normal operating voltage that is attainable within 10 minutes
  - LCCs implement voltage reduction on distribution and sub-transmission systems
- Declare Energy Emergency Alert (EEA) Level 2 if not already performed under an earlier action*

Action 9

- Request activation of all customer generation not contractually available to Market Participants
- Request voluntary load curtailment by large industrial and commercial customers
- Request is made through Transmission and Distribution owners

Action 10

- Initiate appeals for voluntary load curtailment
  - Publicize conservation appeal via ISO-NE home page, Newswire, Mobile app, X/Twitter
- Implement a **Power Warning**
  - Notify government official and utility communications contacts via conference call bridgeline
  - Public appeals made when an immediate reduction in power usage is necessary to avert overload of the electrical system
  - Public appeals made when other efforts (e.g., emergency purchases, voluntary curtailment, contracted curtailment and voltage reductions) have been unsuccessful in bringing supply and demand back into balance
  - Conduct conference call updates
- Declare Energy Emergency Alert (EEA) Level 2 if not already performed under an earlier action*

Action 11

- Request New England governors to reinforce **Power Warning** appeals initiated in Action 10
  - Notify government official contacts
  - Request governors to make an urgent public appeal for conservation
- Declare Energy Emergency Alert (EEA) Level 2 if not already performed under an earlier action*

*Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011-4 - Emergency Operations (https://www.nerc.com/standards/reliability-standards/eop/eop-011-4).

Potential Relief Under OP-4

Roughly 1,145 – 4,020 MW of potential relief systemwide from 11 actions

OP-4 Action	Action Description (Page 1 of 3)	Possible Relief (MW)
1	Implement **Power Caution** and advise resources with a capacity supply obligation (CSO) to prepare to provide capacity and notify "Settlement-Only" generators with a CSO to monitor reserve pricing to meet those obligations Begin to allow depletion of 30-minute reserves	0[1] 600
2	Declare Energy Emergency Alert (EEA) Level 1	0[4]
3	Request voluntary load curtailment of Market Participants' facilities	40[2]
4	Implement **Power Watch**, a notification that further steps to manage capacity could affect the public	0
5	Schedule Emergency Energy Transactions and arrange to purchase Control-Area-to-Control-Area Emergency Capacity and Energy	Variable 0 – 1,000

Source: OP-4, Action During A Capacity Deficiency, Appendix A

Potential Relief Under OP-4, *continued*

Roughly 1,145 – 4,020 MW of potential relief systemwide from 11 actions

OP-4 Action	Action Description (Page 2 of 3)	Possible Relief (MW)
6	Implement a voltage reduction of 5% of normal operating voltage requiring more than 10 minutes Declare Energy Emergency Alert (EEA) Level 2	Variable 0 – 125[3] 0[4]
7	Request resources without a CSO to provide energy for reliability purposes	Variable 0 – 1,500
8	Implement a voltage reduction of 5% of normal operating voltage requiring 10 minutes or less Declare Energy Emergency Alert (EEA) Level 2 (if not already declared)	Variable 0 – 250[3] 0[4]
9	Request activation of transmission customer generation not contractually available to Market Participants during a capacity deficiency Request voluntary load curtailment by large industrial and commercial customers	5 200[2]

Source: OP-4, Action During A Capacity Deficiency, Appendix A

Potential Relief Under OP-4, *continued*

Roughly 1,145 – 4,020 MW of potential relief systemwide from 11 actions

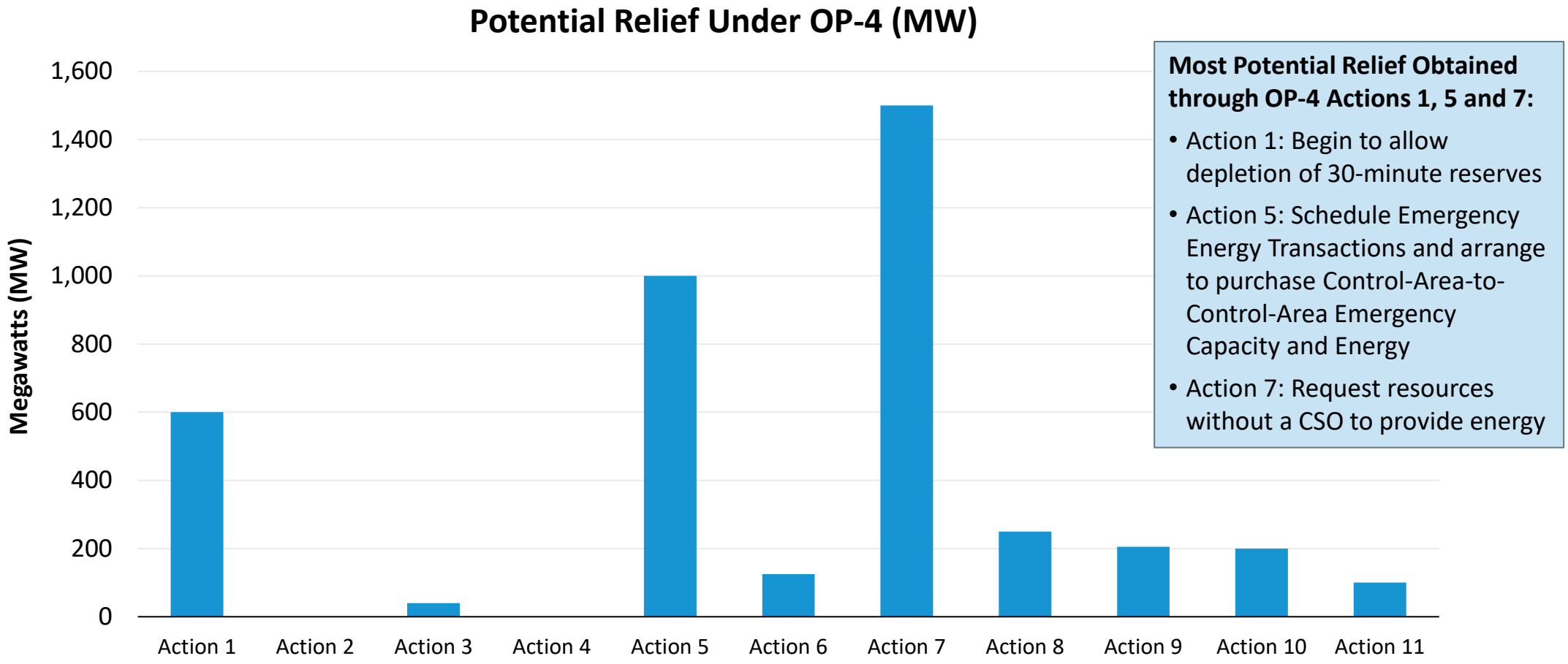
OP-4 Action	Action Description (Page 3 of 3)	Possible Relief (MW)
10	Implement **Power Warning** and issue urgent public appeal for voluntary conservation Declare Energy Emergency Alert (EEA) Level 2 (if not already declared)	200[2] 0[4]
11	Request state governors' support for ISO appeals for conservation Declare Energy Emergency Alert (EEA) Level 2 (if not already declared)	100[2] 0[4]
	Total Relief (MW)	1,145 – 4,020

NOTES:
1. Based on Summer Ratings. Assumes 25% of total MW Settlement-Only units <5 MW will be available and respond.
2. The actual load relief obtained is highly dependent on circumstances surrounding the appeals, including timing and the amount of advanced notice that can be given.
3. The MW values are based on a 25,000 MW system load and verified by the most recent voltage reduction test.
4. EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011-4 - Emergency Operations (https://www.nerc.com/standards/reliability-standards/eop/eop-011-4) and do not trigger additional communications with OP-4 contacts.

Source: OP-4, Action During A Capacity Deficiency, Appendix A

Potential Relief Under OP-4

Roughly 1,145 – 4,020 MW of potential relief systemwide from 11 actions



Most Potential Relief Obtained through OP-4 Actions 1, 5 and 7:

- Action 1: Begin to allow depletion of 30-minute reserves
- Action 5: Schedule Emergency Energy Transactions and arrange to purchase Control-Area-to-Control-Area Emergency Capacity and Energy
- Action 7: Request resources without a CSO to provide energy

OP-4, Action During A Capacity Deficiency, Appendix A

OP-4 Actions 2015-2025

Action	1	2	3	4	5	6	7	8	9	10	11
Date	Power Caution			Power Watch						Power Warning	Governor s' Appeal
9/9/2015	•										
8/11/2016	•	•									
9/3/2018	•	•	•	•	•						
12/24/2022	•	•	•		•						
7/5/2023	•	•									
6/18/2024	•	•									
8/1/2024	•	•									
6/27/2025	•	•	•		•						
11/23/2025	•	•									

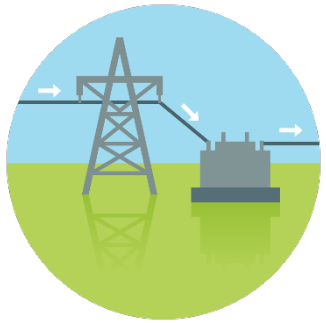
OP 4 Implementation Summaries

Action in an Emergency

Operating Procedure No. 7 (OP-7)

Link: http://www.iso-ne.com/participate/rules-procedures/operating-procedures

Action in an Emergency (OP-7)



- If OP-4 actions are not adequate to manage a capacity deficiency, the ISO will implement OP-7
  - OP-4 can be skipped to move into OP-7 immediately, if necessary
- OP-7 allows system operators to order the **disconnection** of firm customer load—frequently referred to as manual load shedding, load curtailment, controlled power outages, or rolling blackouts—as a means of maintaining the integrity of the bulk power system
- OP-7, like OP-4, can be called region-wide or locally
- When OP-7 actions are required, transmission and/or distribution companies disconnect customers at the direction of the ISO or the Local Control Centers (LCC)
  - ISO system operators do not have the ability to disconnect customers

Communications During OP-7

Communications follow the general framework for OP-4 events

- Control Room will:
  - Notify LCCs, U.S. DOE, NERC, and NPCC within the times prescribed by the various agencies
- CC and EA will:
  - Inform government officials and utility communications contacts of OP-7 implementation (prior to implementation, if possible)
    - Notification by phone and email
  - Activate conference call “bridge-line” and conduct regular conference call updates when time permits
  - Issue *Controlled Power Outage* notice and, if necessary, conservation appeal (prior to implementation, if possible)

Background Information on OP-21

Link: http://www.iso-ne.com/participate/rules-procedures/operating-procedures

Background on OP-21

- **Purpose:** OP-21 documents the processes and establishes the associated requirements to:
  - Collect fuel availability and environmental limitation information from each coal, oil, and natural gas-fired generator in the region, and any other resource that the ISO determines to be necessary
  - Forecast and report on expected energy availability over a 21-day look-ahead period
  - Declare Energy Alerts and Energy Emergencies based on forecasted or real-time system conditions
  - Take appropriate action in anticipation of, or during, an Energy Alert or Energy Emergency
  - Communicate with interstate natural gas pipelines, LNG import facilities, local gas distribution companies, generating resources, and all other regional stakeholders regarding matters related to resource fuel availability and environmental limitations

Background on OP-21

- **Applicability:** Energy Emergencies may occur at any time as a result of sustained national or regional shortages in fuel availability or deliverability to New England's generating resources
  - Shortages of fuel may come in many forms, including, but **not** limited to: severe drought, interruption to availability or transportation of natural gas, LNG, oil, or coal
- Because fuel shortages and/or environmental limitations may impact New England's ability to fully meet system load and ten-minute operating reserve requirements for days, weeks, or months at a time, the ISO may need to take action **in advance of** a projected Energy Emergency to manage and preserve fuel supplies within the region
  - Changes to OP-21 are intended to improve **situational awareness** and encourage **proactive measures** to avoid forecasted energy deficiencies

OP-21: PEAT and REST Threshold

- ISO's study results from the **Probabilistic Energy Adequacy Tool (PEAT)** helped inform the development of a **Regional Energy Shortfall Threshold (REST)**, a reliability-based threshold that reflects the region's level of risk tolerance with respect to energy shortfalls during extreme weather
- REST is only violated if both **magnitude *and* duration** exceed their thresholds
  - **Magnitude—**If the shortfall occurs, the region can tolerate up to either about 3% of customers being without power for 72 hours, or approximately every customer being without power for 3% of 72 hours (2.16 hours)
  - **Duration—**If the shortfall occurs, the region can tolerate up to about 18 hours of cumulative shortfall over a 21-day period

Learn more about the Operational Impacts of Extreme Weather Events Key Project

OP-21: Seasonal Analysis

- Each year, prior to the winter and summer seasons, ISO conducts and reports the results of a probabilistic energy assessment using **PEAT**
- ISO will screen high-risk weather events for further evaluation
  - The high-risk weather events are then simulated by considering a wide range of uncertainties (e.g., fuel oil levels, LNG inventory levels, imports, etc.) associated with them to assess energy shortfall risk
- Assessment results will be conveyed in terms of energy shortfall magnitude and duration, at a minimum, using the same parameters as the **REST**

OP-21: Long-Term Analysis

- Each year, ISO conducts and report the results of a probabilistic energy assessment using **PEAT** for 5 years and 10 years in the future using the most recent CELT
- ISO will screen high-risk weather events for further evaluation
  - The high-risk weather events are then simulated by considering a wide range of uncertainties (e.g., fuel oil levels, LNG inventory levels, imports, etc.) associated with them to assess energy shortfall risk
- Assessment results will be conveyed in terms of energy shortfall magnitude and duration, at a minimum, using the same parameters as the **REST**

ISO Developed Enhanced Operating Procedures as Risks Shift from *Capacity* to *Energy* Shortages

Then and Now…

In the past:
The ISO has implemented operating procedures to manage relatively short-duration *capacity deficiencies* (operating-reserve shortages) during the peak hour of the day, typically summertime

Going forward:
The ISO may need to implement more severe operating procedures to manage longer-duration *energy shortages* spanning days or weeks if extreme cold weather persists

Tools to *Assess* System Conditions during Cold Weather Periods	Tools to Protect System Reliability if Shortages Occur
ISO developed an Energy Forecasting and Reporting Procedure (OP-21) after winter 2017/18 to help manage the region's energy security risks during extreme cold weather	ISO has longstanding operating procedures to manage capacity and energy shortages; ***energy conservation by the public*** is an essential tool during extreme cold weather
If the ISO forecasts a **capacity deficiency** (operating-reserve shortage)	The ISO can implement 11 actions to restore operating reserves (OP-4)*
If the ISO forecasts an **energy shortage**	The ISO can direct controlled power outages to avoid uncontrolled system outages (OP-7)

* The ISO may also implement OP-4 actions if it could reduce the need for emergency actions under OP-7.

Communications to support ISO New England Operating Procedure No. 21 (OP-21): *Operational Surveys, Energy Forecasting & Reporting and Actions During an Energy Emergency*

Forecast Energy Emergency Alert (FEEA) Levels 1-3:

Alert Thresholds	Conditions & Criteria	Actions
Normal	**Normal**	No Actions Required
Forecast M/LCC2 New England is expected to have adequate operating reserves, but <200 MW above required amount	**Energy Alert** In days 6-21	1. Alert LCCs, RCs/BAs 2. Alert Market via ISO website **3. Alert New England public officials & utility communications groups** 4. Initiate daily generator surveys, forecasting and reporting
Level 1 (FEEA1) Region faces a shortage of operating reserves Anticipate OP-4 Actions 1-5	**Energy Emergency** In days 1-5, Anticipate use of controlled power outages (OP-7)	1. Alert LCCs, RCs/BAs 2. Alert Market via ISO website **3. Alert New England state officials & utility communications groups** 4. Alert US Dept. of Energy 5. Initiate daily generator surveys, forecasting and reporting 6. Dual-fuel actions **7. OP-4 Actions 1-10** **8. OP-4 Action 11 (Governors Appeal)** **9. OP-7 (controlled power outages)**
Level 2 (FEEA2) Region faces a deeper shortage of operating reserves Anticipate OP-4 Actions 6-11		
Level 3 (FEEA3) Available resources are insufficient to serve firm load; Anticipate OP-7		

OP-21 is a forecasting tool that leverages actions in other ISO Operating Procedures

Discretionary Appeals:
The ISO may issue public appeals for conservation that are not triggered by these operating procedures if it determines that actions by the public to conserve energy could lessen the need for emergency actions.

Criteria: The ISO will declare an Energy Alert or an Energy Emergency when a *Forecast Energy Emergency Alert* (Level 2 or 3) appears for at least 1 hour on 1 or more consecutive days in the 21-Day Forecast

- An Energy Emergency is distinct from an Energy Alert – it coincides with the earlier part of the forecast, and it anticipates controlled power outages

Reporting: Weekly Dec.-March, and daily for Energy Alert or Emergency Conditions

Information Sources:

- **OP-21**: https://www.iso-ne.com/static-assets/documents/rules_proceds/operating/isone/op21/op21_rto_final.pdf
- **21-Day Forecast**: https://www.iso-ne.com/isoexpress/web/reports/operations/-/tree/21-Day-Energy-Assessment-Forecast-and-Report-Results
- **All ISO Operating Procedures**: https://www.iso-ne.com/participate/rules-procedures
- **FEEA Levels** are based on NERC EOP-011-4: Emergency Operations; https://www.nerc.com/standards/reliability-standards/eop/eop-011-4

Note: ISO uses OP-4 actions to manage *capacity* deficiencies and OP-7 actions for *energy* deficiencies, but may also implement OP-4 if it could reduce the need for emergency actions under OP-7.

21-Day Energy Assessments Are Posted to the ISO's Operations Reports Webpage

Link: https://www.iso-ne.com (Markets and Operations > ISO Express > Operations Reports > 21-Day Energy Assessment Forecast and Report Results)

Potential Initiating Conditions for an Energy Emergency Include, *But Are Not Limited to:*

- One or more pipeline Operational Flow Orders (OFOs) have been declared
- Significant reductions in resource capability due to natural gas-related issues
- Weather forecast for an extended period of cold or hot weather
- Fuel delivery to fossil fuel-fired generating resources is, or may be, impaired
- Prolonged drought
- Adverse weather conditions within the Gulf of Mexico, Western Canada, or regional shale gas basins
- Abnormal conditions at regional LNG import, satellite storage, or LNG trucking facilities
- Extremely cold regional, national, or international weather conditions
- Extreme storm conditions offshore in the Maritimes
- Any viable threat to one or more of the pipelines or LDCs supplying the region
- Sustained environmental limitation on some, or several, regional resources
- Any other serious threat to the integrity of the bulk electric system for which the ISO determines that this procedure may mitigate the impact

Forecasting and Reporting Framework Has Been Added to OP-21 to Encourage Proactive Measures

- ISO New England performs Energy Emergency forecasting and reporting using an **hourly 21-day energy assessment** and comparing the results of that assessment with Energy Emergency **forecast alert thresholds** in order to identify and communicate potential reliability issues to regional stakeholders
- Forecasting and reporting framework:
  - Alerts stakeholders to the potential for near-term forecasted energy deficiencies
  - Allows resources in short supply of fuel to take action to replenish fuel supplies
  - Allows resources with potential environmental limitations to purchase additional credits or pursue regulatory relief to mitigate the limitation
  - Allows participants to take action to shorten or reschedule maintenance or repair to transmission facilities or resources throughout the region
  - Informs regulatory and government entities of potential energy deficiencies

Forecasted and Real-Time Energy Emergency Alerts

Forecast Alert Thresholds	Established Real-Time Alert Thresholds
Forecast M/LCC-2 (FMLCC2) • Resources during any hour are forecasted to be less than 200 MW above operating reserve requirements	**M/LCC-2** • Resources are less than 200 MW above operating reserve requirements
Forecast Energy Emergency Alert Level 1 (FEEA1) • Resources during any hour are forecasted to be less than operating reserve requirements and implementation of OP-4 Actions 1 – 5 is being forecasted (deficiency in 30-minute operating reserves)	**Energy Emergency Alert Level 1 (EEA1)** • OP-4 Action 2 implementation
Forecast Energy Emergency Alert Level 2 (FEEA2) • Resources during any hour are forecasted to be less than operating reserve requirements and implementation of OP-4 Actions 6 – 11 is being forecasted (deficiency in 10-minute operating reserves)	**Energy Emergency Alert Level 2 (EEA2)** • OP-4 Actions 6, 8, 10, or 11 implementation
Forecast Energy Emergency Alert Level 3 (FEEA3) • Resources during any hour are forecasted to be insufficient to serve firm load and implementation of controlled power outages under OP-7 is being forecasted	**Energy Emergency Alert Level 3 (EEA3)** • OP-7 implementation

Energy Alert Declarations and Actions

- An **Energy Alert** is declared when**:**
  - FEEA2 or FEEA3 is forecasted to occur in at least one hour on one or more consecutive days in **days 6 through 21** of the **21-day energy assessment**, or
  - Any other reason for which the ISO Chief Operating Officer, or designee, determines that the actions described below may mitigate the impact of an actual or forecasted energy deficiency
- Once an **Energy Alert** has been declared, the ISO must take the following actions:
  - Alert each Local Control Center (LCC) and surrounding Reliability Coordinator/Balancing Authority of the Energy Alert
  - Alert all market participants of the Energy Alert by posting to the ISO website
  - Alert New England state regulators and officials of the Energy Alert
  - Initiate daily data collection using OP-21 survey forms, and daily Energy Emergency forecasting and reporting

Energy Alert Declarations and Actions, *continued*

- Once an **Energy Alert** has been declared:
  - Each lead market participant must evaluate actual and anticipated fuel supplies and environmental limitations and should consider taking action as necessary to replenish fuel supplies and/or mitigate environmental limitations
  - Each lead market participant and Local Control Center must evaluate scheduled maintenance or repair to transmission facilities or resources in the region that reduces the capability of a facility or resource to supply energy to the region and should consider taking action, if possible, to maximize availability of those facilities or resources

Energy Emergency Declarations

- An **Energy Emergency** is declared when**:**
  - FEEA2 or FEEA3 is forecasted to occur in at least one hour on one or more consecutive days in **days 1 through 5** of the **21-day energy assessment**, or
  - Shedding of firm load under OP-7 is occurring or is anticipated to occur due to an actual energy deficiency resulting from a sustained shortage of fuel availability or deliverability to, or sustained environmental limitations on, some or several of New England's resources, or
  - Any other reason for which the ISO Chief Operating Officer, or designee, determines that the actions described below may mitigate the impact of an actual or forecasted energy deficiency

Energy Emergency Actions

- Once an **Energy Emergency** has been declared, the ISO must take the following actions:
  1. Alert each Local Control Center (LCC) and surrounding Reliability Coordinator/Balancing Authority of the Energy Emergency
  2. Alert all market participants of the Energy Emergency by posting to the ISO website
  3. Alert New England state regulators and officials of the Energy Emergency
  4. Report the Energy Emergency to the U.S. Department of Energy
  5. Initiate daily data collection using OP-21 survey forms, and daily Energy Emergency forecasting and reporting
  6. Request that each dual-fuel generator scheduled to operate voluntarily switch to operation on the fuel source that is not in short supply
  7. Implement specific capacity and load relief measures available through actions of OP-4, **excluding** requesting the New England State Governors to reinforce appeals for voluntary load curtailment (Action 11)

Energy Emergency Actions, *continued*

- If the seven actions described on the previous slide do not result in the necessary relief from the Energy Emergency, or if there is insufficient time for those measures to provide relief, the following actions may be taken:

8. Implement Action 11 of OP-4: Request the New England state governors to reinforce appeals for voluntary electrical load curtailment through Power Warning implementation

9. Under extreme conditions, the ISO must seek reliability relief through controlled power outages available through implementation of OP-7

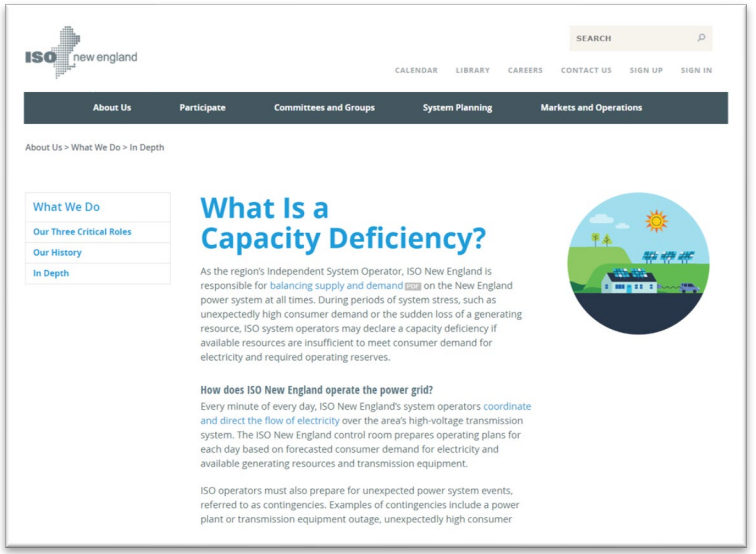
Forecasting and Reporting

- During Normal Conditions, ISO New England performs Energy Emergency forecasting and reporting:
  - **Weekly** (December through March)
  - **Bi-weekly** (April through November)
- During Energy Alert or Energy Emergency conditions, the ISO performs Energy Emergency forecasting and reporting on a **daily** basis, until such time as the conditions no longer exist
- Reports are posted to the **ISO website** and include:
  - A summary, by operating day, detailing whether conditions are expected to be Normal, Forecast M/LCC-2, Forecast Energy Emergency Alert 1, Forecast Energy Emergency Alert 2, or Forecast Energy Emergency Alert 3
  - A determination of whether the threshold for declaring an Energy Alert or Energy Emergency has been met
  - To the extent possible, the reasons why the threshold was met

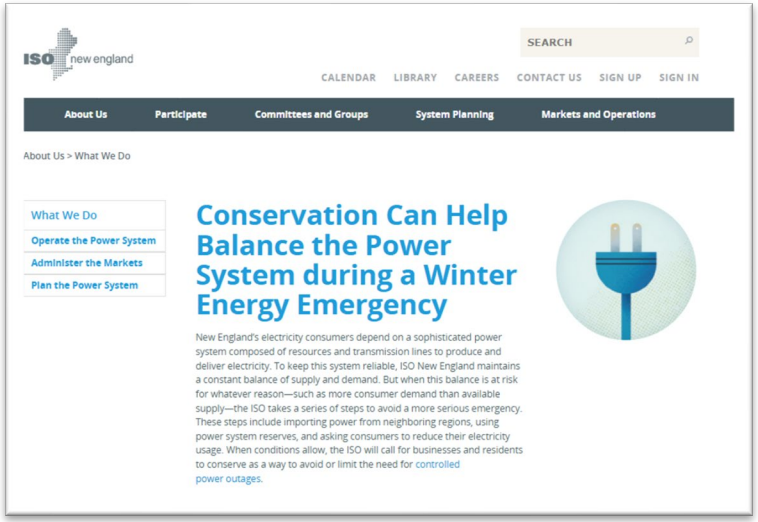
Other Information Resources

Related Web Content

- Web pages to assist in the event emergency communications are needed:
  - *“What Is a Capacity Deficiency?”*
    - A high-level explainer of a capacity deficiencies and the steps ISO New England will take to manage them
  - *"Conservation Can Help Balance the Power System during a Winter Energy Emergency"*
    - An overview of the role of conservation in a capacity deficiency, including tips for consumers to reduce their energy use



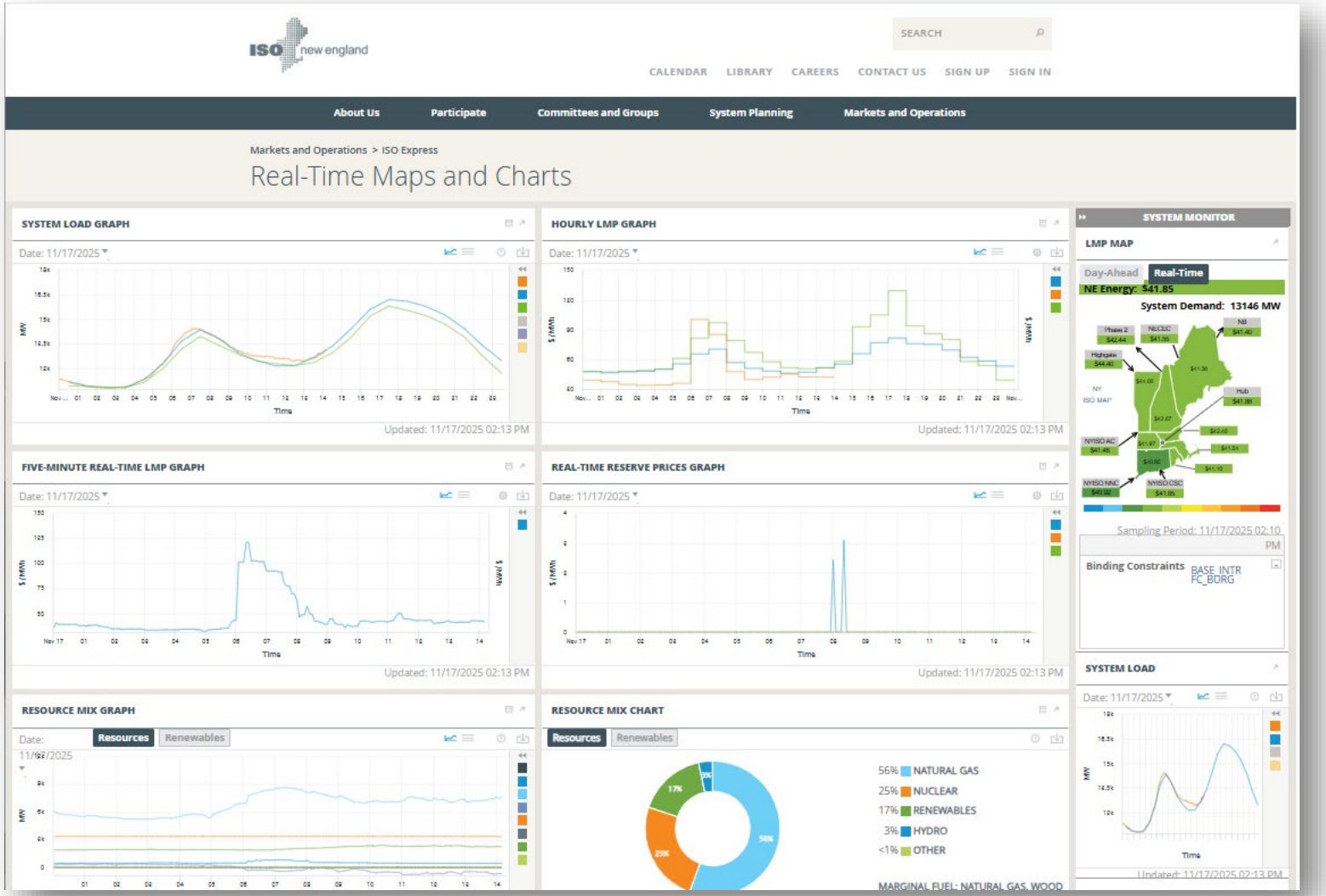
https://www.iso-ne.com/about/what-we-do/capacity-deficiency



https://www.iso-ne.com/about/what-we-do/winter-conservation

For a Quick Look at Power System Conditions…

Visit the System Monitor on ISO Express

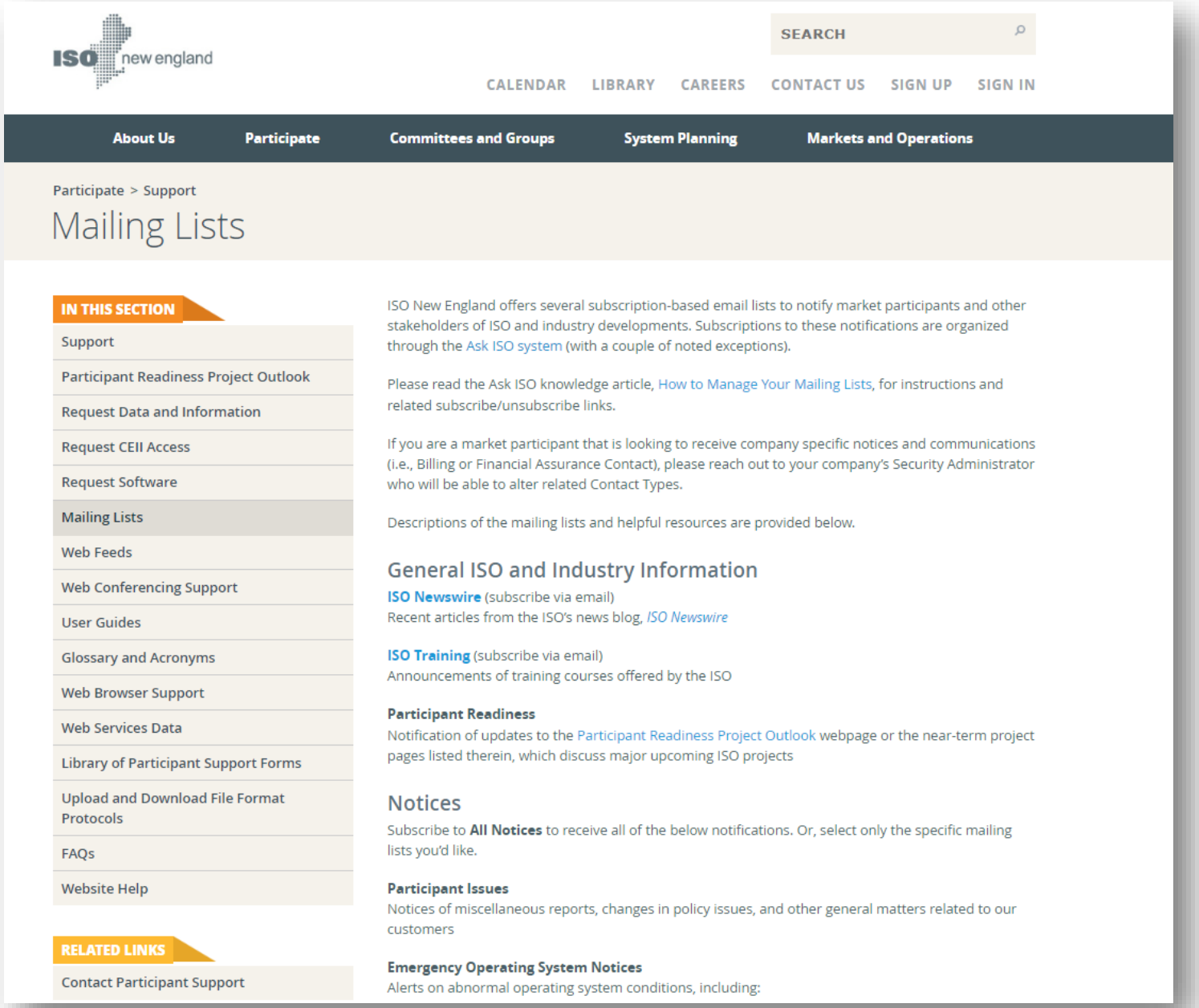


http://www.iso-ne.com/isoexpress/

Options to Subscribe to ISO New England Email Lists

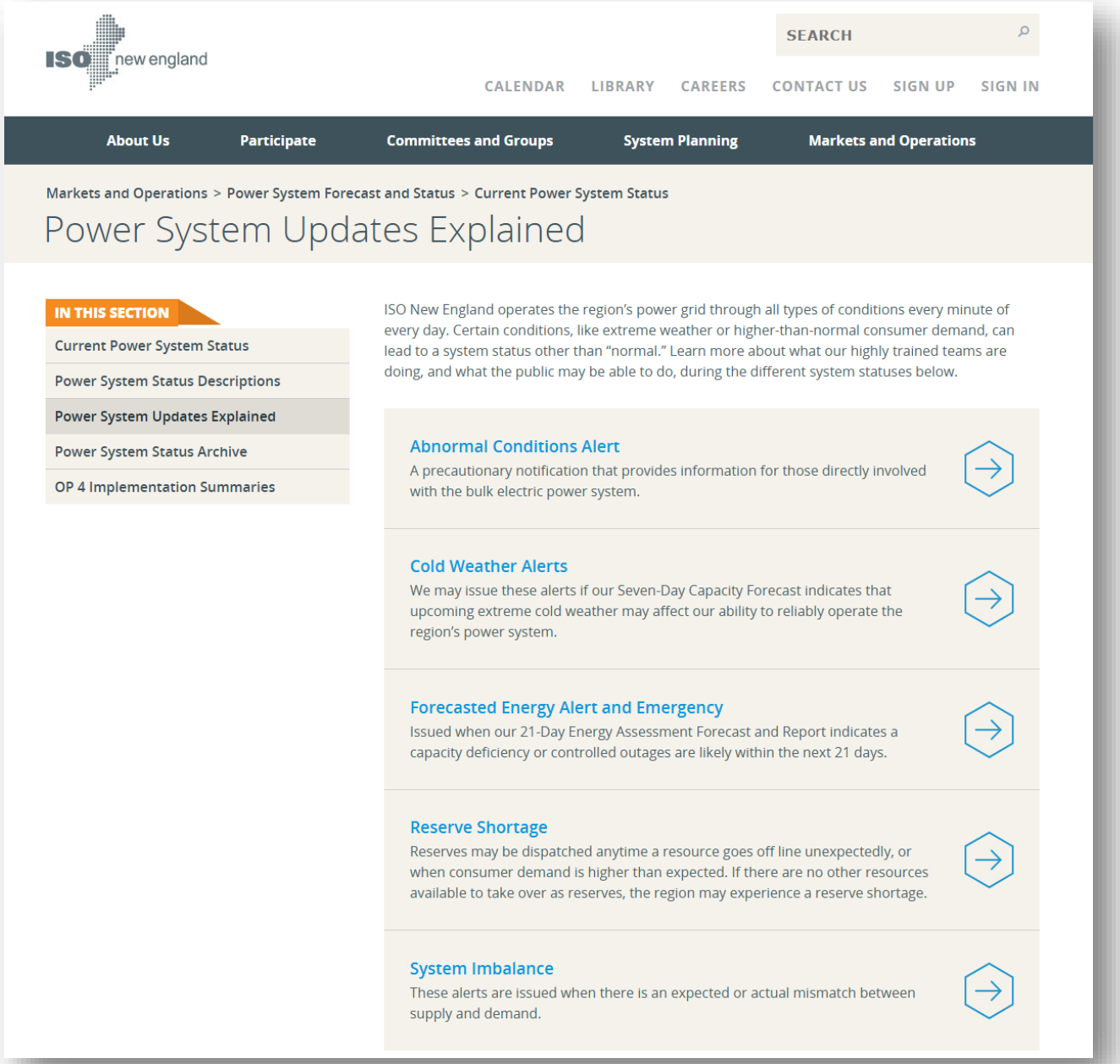
Subscribe to receive All Notices, Emergency Operating System Notices, and others

Subscribe here: http://www.iso-ne.com/participate/support/mailing-lists



New Web Resource: Plain-Language Power System Status Explanations

[Current Power System Status > Power System Updates Explained]



Abnormal Conditions Alert

Master/Local Control Center Procedure No. 2 (M/LCC 2)

What We're Doing

Alerting power system personnel and wholesale electricity market participants of potential system operating issues and asking them to suspend any testing or maintenance on their resources that could affect grid reliability.

What the Public Can Do

No action required.

[Power System Updates Explained > Abnormal Conditions Alert]

Cold Weather Alerts

What We're Doing

Notifying power generators and other organizations with direct connections to the New England electrical grid and coordinating closely with operators of natural gas pipelines and natural-gas-fired resources, local control centers, and neighboring regional transmission organizations.

What the Public Can Do

No immediate action required **unless** the ISO has made an appeal for voluntary conservation of electricity use.

Power System Updates Explained > Cold Weather Alerts

Forecasted Energy Alert and Emergency

What We're Doing

Taking actions as necessary to mitigate forecasted energy shortfalls:

- Enhanced reporting and communication about system conditions
- Daily fuel inventory surveys and energy assessments
- Requesting generators use fuel that is not in short supply
- Appeals for voluntary conservation, including public appeals from the region's governors

What the Public Can Do

No immediate action required **unless** the ISO has made an appeal for voluntary conservation of electricity use.

[Power System Updates Explained > Forecasted Energy Alert and Emergency]

Reserve Shortage/ Capacity Deficiency

What We're Doing

System operators are alerting power system personnel and market participants about the system conditions. ISO operators are taking additional actions, including using reserve resources, to maintain system reliability.

What the Public Can Do

No immediate action required **unless** the ISO has made an appeal for voluntary conservation of electricity use.

[Power System Updates Explained > Reserve Shortage]

System Imbalance

What We're Doing

Notifying power generators and other organizations with direct connections to the New England electrical grid to take actions to reduce output, imports, or otherwise balance the system.

What the Public Can Do

No action required.

Power System Updates Explained > System Imbalance

For More Information

Subscribe to *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

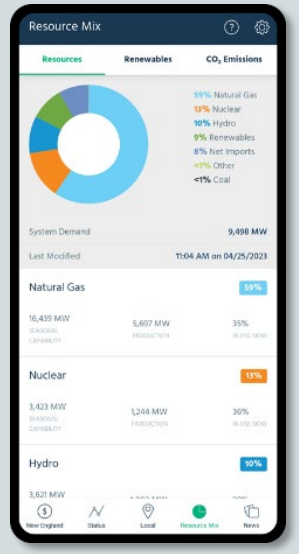
ISO Express provides real-time data on New England's wholesale electricity markets and power system operations

Follow the ISO on Social Media

www.iso-ne.com/social

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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