



ISO New England Overview of Emergency Procedures and Communications Processes

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

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Key Takeaways

Pre-Winter Briefing 2022/2023



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



Key Takeaways, cont.

Pre-Winter Briefing 2022/2023



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



High-Level Winter Assessment: Winter 2022/23

If this winter is similar to...

Winter 2021/22

Then...

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

Winter 2017/18

Then...

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

Winter 2013/14

Then...

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

All three scenarios for this winter:

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

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

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

	Winter 2021/22	Winter 2017/18	Winter 2013/14
Weather:	Milder than normal with a few short periods of below-normal temperatures	Milder than normal except for a two-week span of significantly below-normal temperatures	Colder than normal, highlighted by a polar vortex event with significant stretches of cold weather in New England and surrounding regions
Average temp. departure from normal:	+1.0°F degrees	+0.5°F degrees	-2.3°F degrees
Winter peak load:	19,623 MW	20,631 MW	21,514 MW
Total energy served:	30,591 GWh	33,186 GWh	35,509 GWh
Other weather and fuel characteristics:	During some periods fuel oil was more economic than natural gas for power generation	<p>The region was impacted by an extended stretch of cold weather from Dec. 25–Jan. 8; All major cities in New England experienced temps below normal for at least 13 consecutive days, of which 10 days averaged >10°F below normal</p> <p>The cold snap was marked by significant reductions in natural gas availability, and price inversion contributed to high oil usage; several oil-fired resources were postured to maintain fuel reserves</p>	<p>The region experienced several cold weather stretches of four or more consecutive days, including a stretch of 10 consecutive days at or below freezing</p> <p>High demand on both the electric and natural gas systems</p>



Outline of Presentation and Discussion

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 - Action in an Emergency (OP-7)
 - Abnormal Conditions Alert (M/LCC2)
 - Background on OP-21
 - External Affairs and Corporate Communications Contacts and Notifications
 - Other Information Resources



Focus of Today's Briefing: 2022/2023 Winter Outlook and 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

ISO INTRODUCTIONS AND BACKGROUND



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



Generation and Demand Resources Are Used to Meet New England's Energy Needs

- **350** dispatchable generators in the region
- **31,500 MW** of generating capacity
- Almost **30,000 MW** of proposed generation in the ISO Queue
 - Mostly wind, solar, and storage proposals
- Roughly **7,000 MW** of generation have retired or will retire in the next few years
- **765 MW** of active demand response and **2,032 MW** of energy efficiency with obligations in the Forward Capacity Market*
 - Demand resources have had further opportunities in the wholesale markets since 2018



* In the Forward Capacity Market, demand-reduction resources are treated as capacity resources.



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**

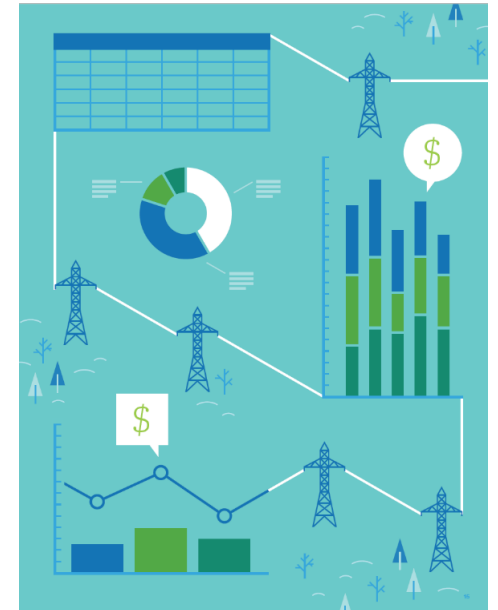


ISO NEW ENGLAND 2022/2023 WINTER OUTLOOK AND PREPARATIONS



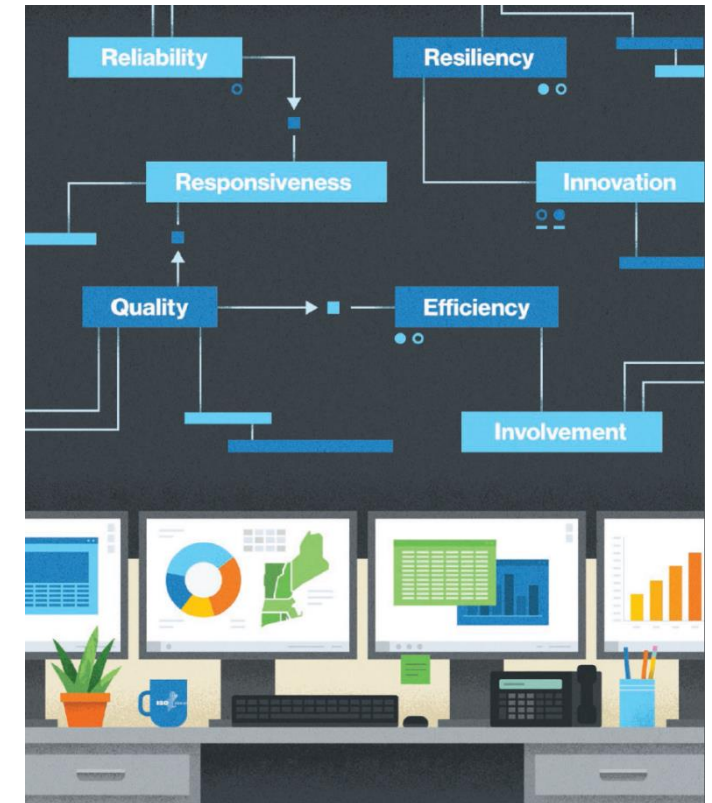
Preparations for Winter Peak Demand

- 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 (11/14) and surveys
 - Conducts dual-fuel audits
 - Conducts Load Shed and Voltage Reduction Test (10/18)
 - Conducts transmission system assessments



Preparations for Winter Peak Demand, *continued*

- Ongoing coordination between electric and gas systems
- Short-term actions:
 - Survey fuel inventories of oil- and coal-fired generators every two weeks April – November and every week December – March
 - 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)

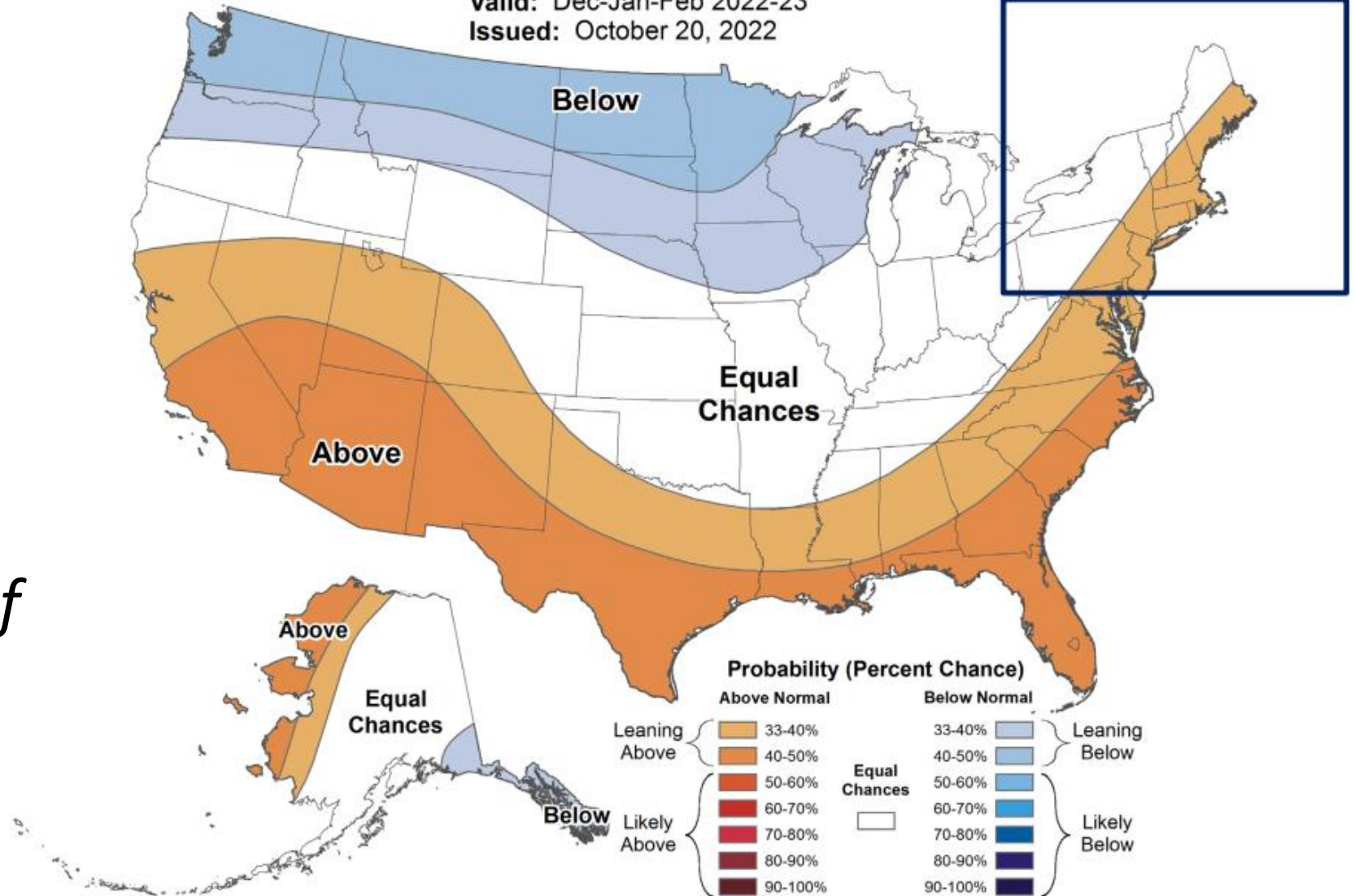




Seasonal Temperature Outlook



Valid: Dec-Jan-Feb 2022-23
Issued: October 20, 2022

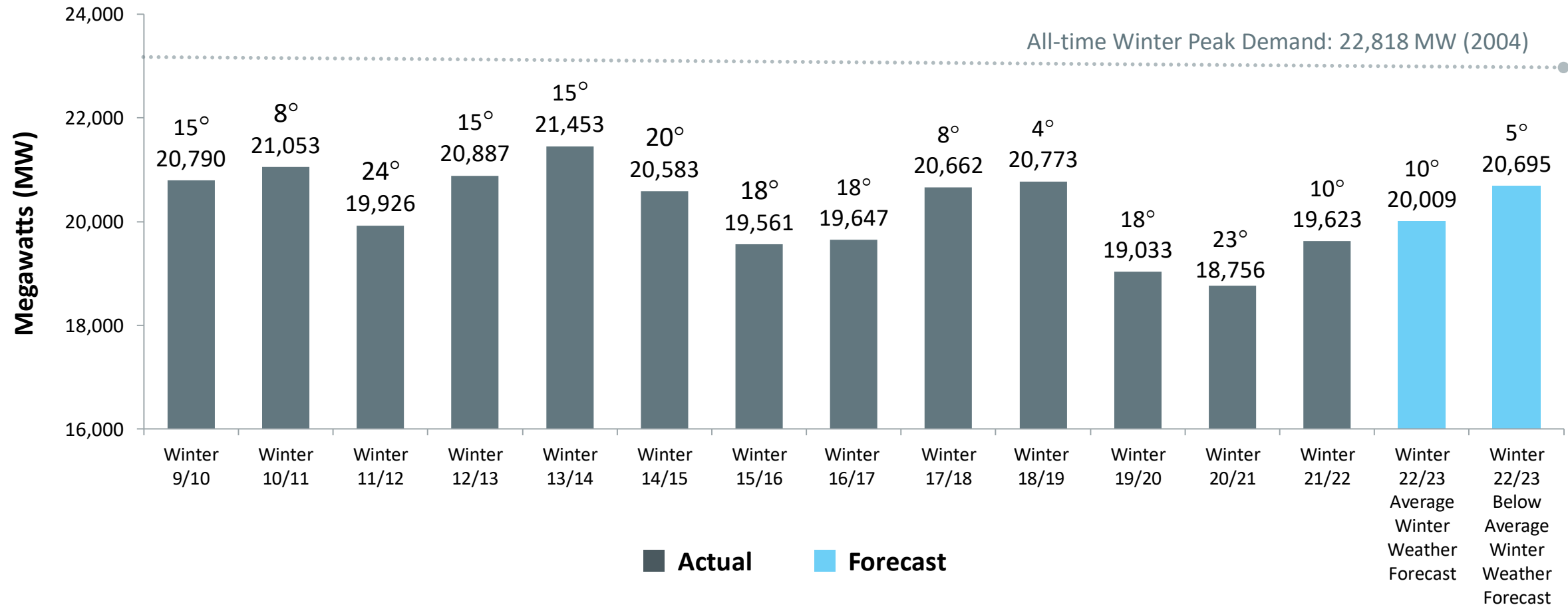


**Winter
Temperature
Outlook**
*Warmer than
normal
temperatures are
forecast for most of
New England*

Winter Peak Demand

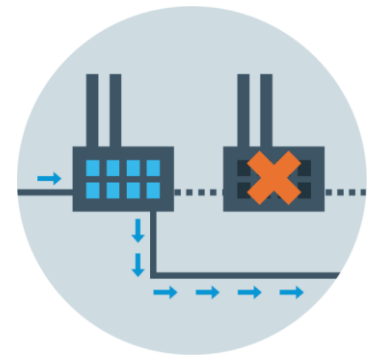
And Corresponding Temperatures*

Winter Peak Demand in Megawatts (MW)



Sources: [ISO-NE Seasonal Peaks Since 1980](#), [COO NEPOOL Participants Committee Report](#) (November 2022), [2022 CELT Forecast](#)
*Temperature is dry-bulb temperature in degrees Fahrenheit based on weighted average of eight New England weather stations.

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 1,560 MW to 2,250 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



COMMUNICATIONS OVERVIEW



When Are Communications Triggered?



- Several **operating procedures** trigger communications with external stakeholders:
 - Cold Weather Condition Operations (SOP-RTMKTS.0050.0007)
 - Action During a Capacity Deficiency (Operating Procedure No. 4)
 - Action in an Emergency (Operating Procedure No. 7)
 - Actions During an Energy Emergency (Operating Procedure No. 21)
- Other unusual and emergency circumstances in which the ISO communicates with external stakeholders:
 - Conservation appeals not triggered by an operating procedure
 - Emergencies (storms, potential terrorist alerts) that could affect operation and reliability of the region's power grid or wholesale markets
- ISO will use the OP-4 communication process as a **guide** for communicating power system emergencies that are not linked to an operating procedure
- ISO will share system-level information during emergency communications; however, we will not release unit-specific information



The ISO Communicates Power System Information to Various Stakeholders

- **External Affairs notifies:**

- Governors' offices
- State and federal regulators and staff
- State emergency management agencies
- Reliability councils

- **Corporate Communications notifies:**

- Communication contacts from market participant companies
- Public via the media

- **Control Room notifies:**

- Local Control Centers
- Generation station designated entities
- Demand designated entities

- **Customer Service notifies:**

- Market participants



ISO New England Communications with Government Officials 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

What:

Communications triggered by ISO procedures that require notification to Government 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:

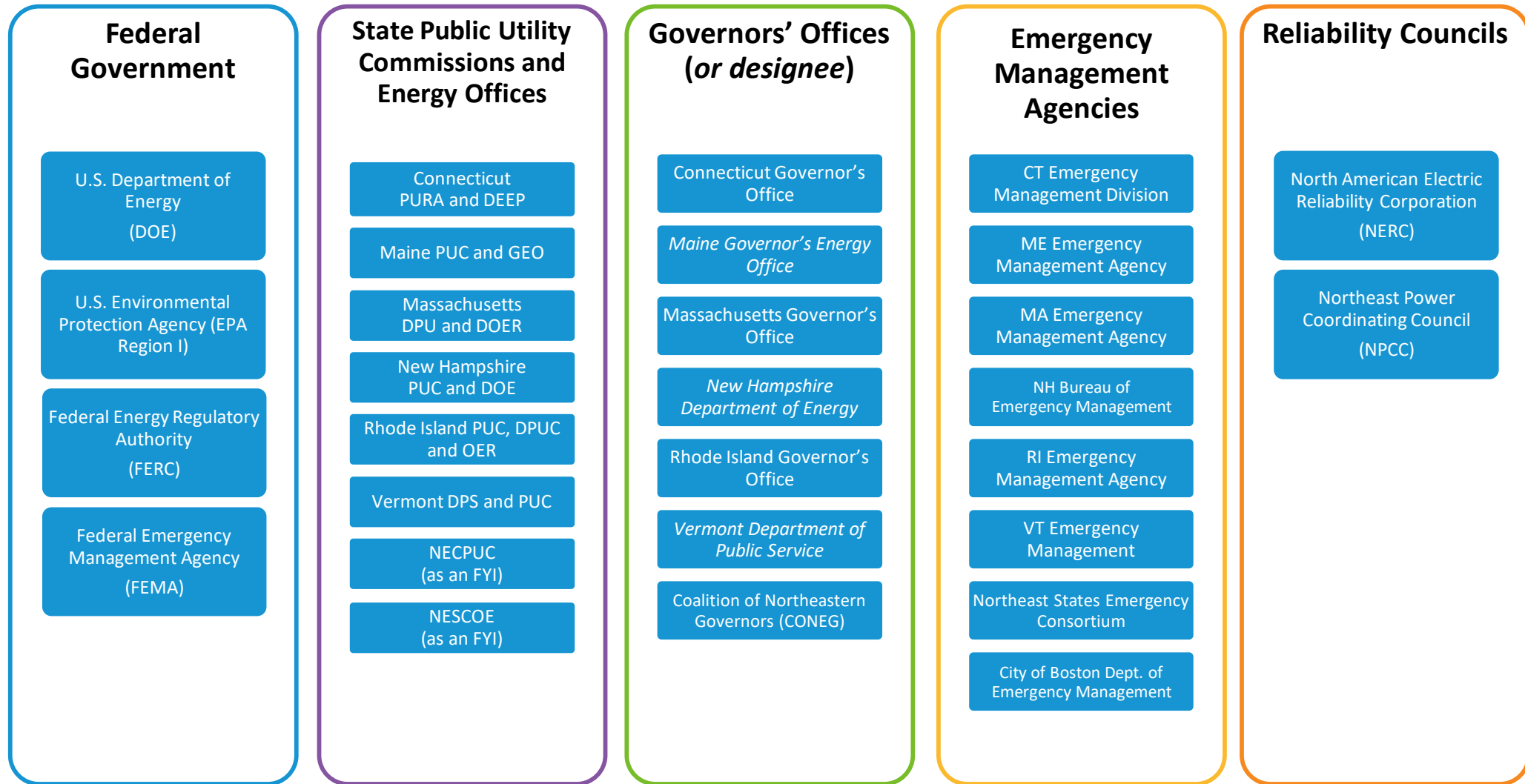
Automated alerts to Government Contacts via **phone**, **email**, and **text message** and **bridgelines** to provide real-time updates on power system conditions

Why:

To provide public officials with **timely information** about system conditions

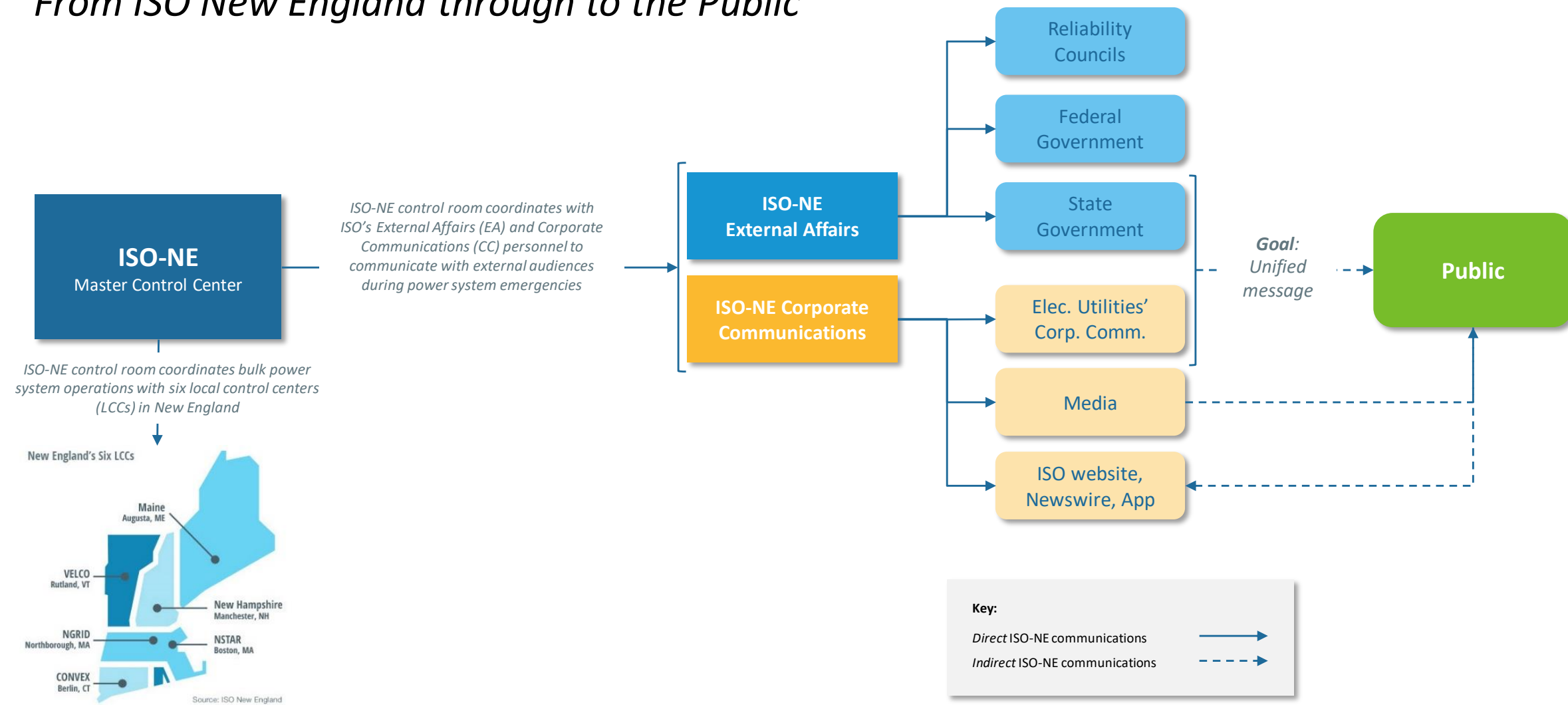


External Affairs (EA) Contacts



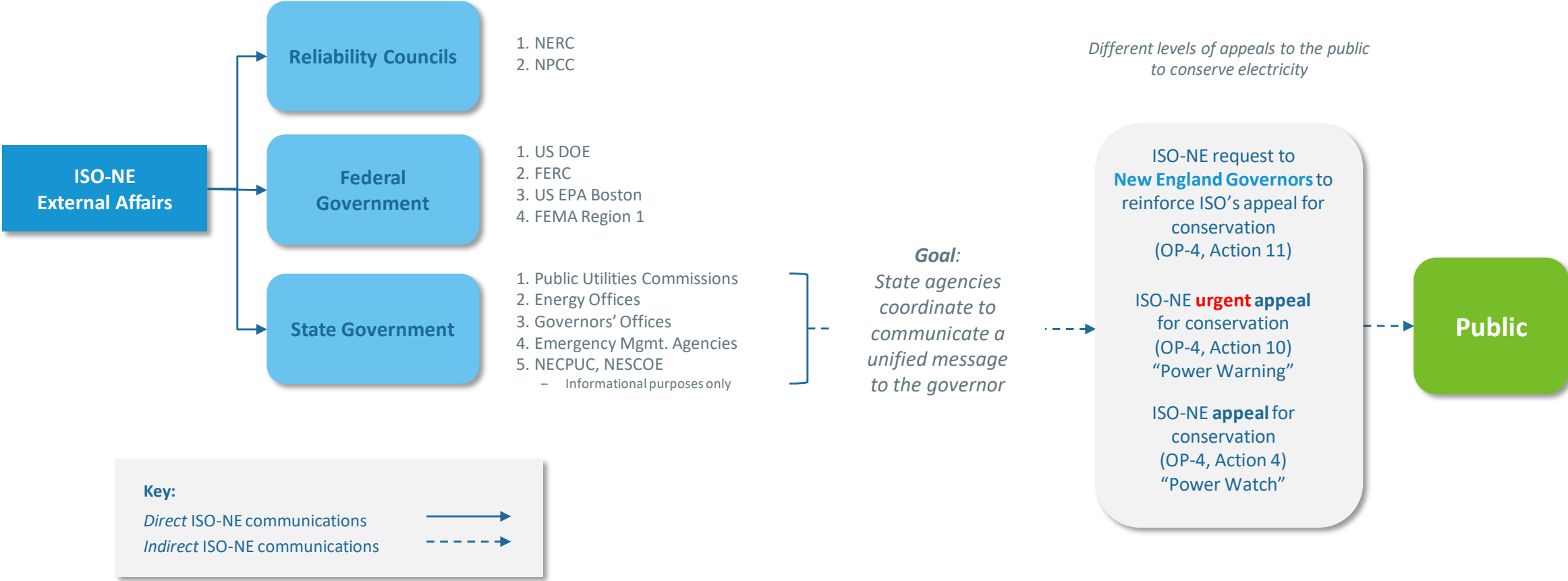
Communications Paths During a Power System Emergency:

From ISO New England through to the Public

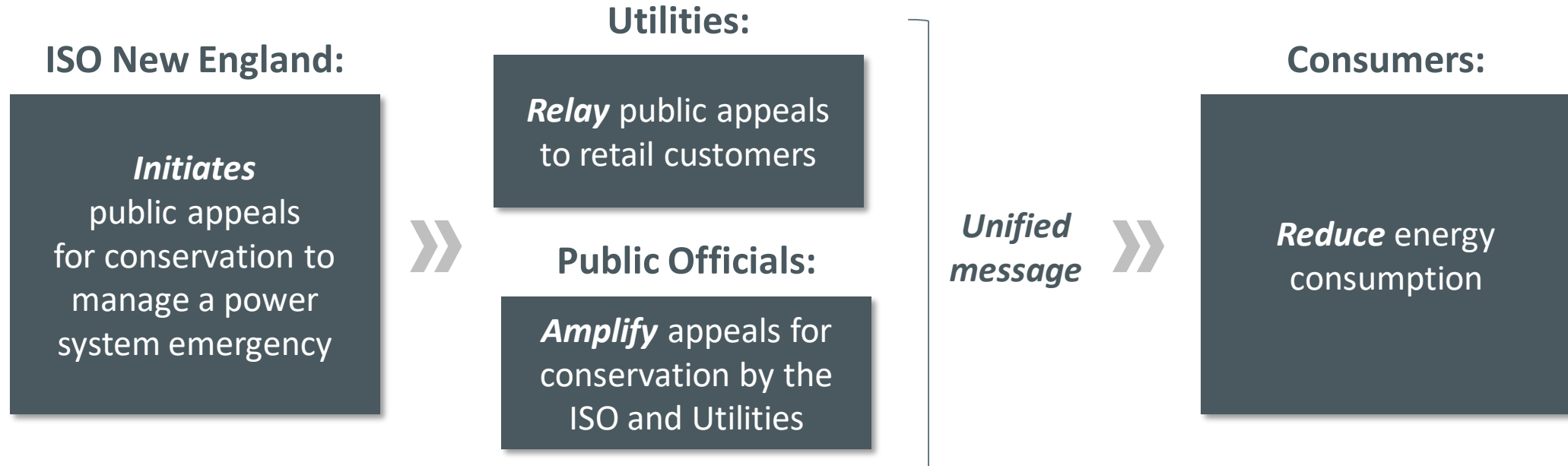


Communications Paths During a Power System Emergency:

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



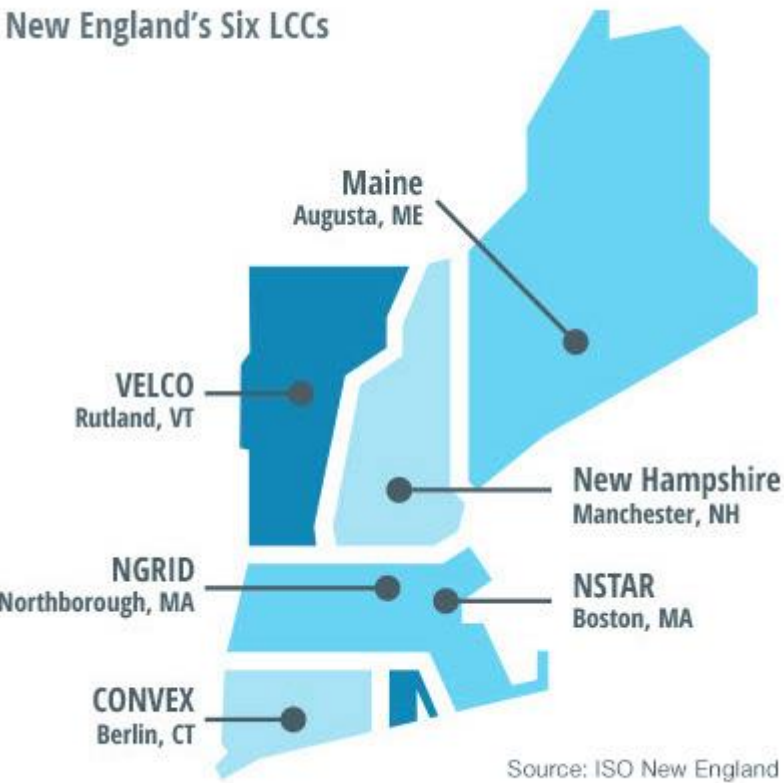
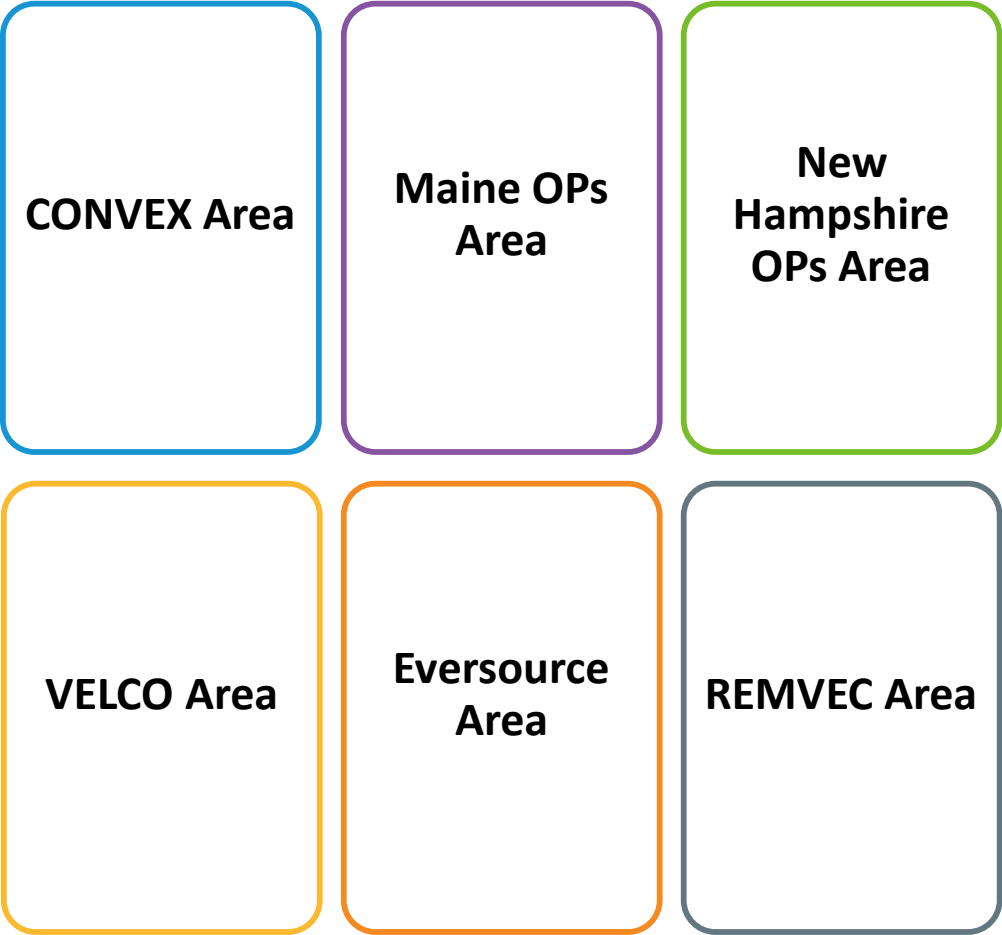
What Roles Do Public Officials and Consumers Play When Conservation Is Needed During a Power System Emergency?



Bottom line:

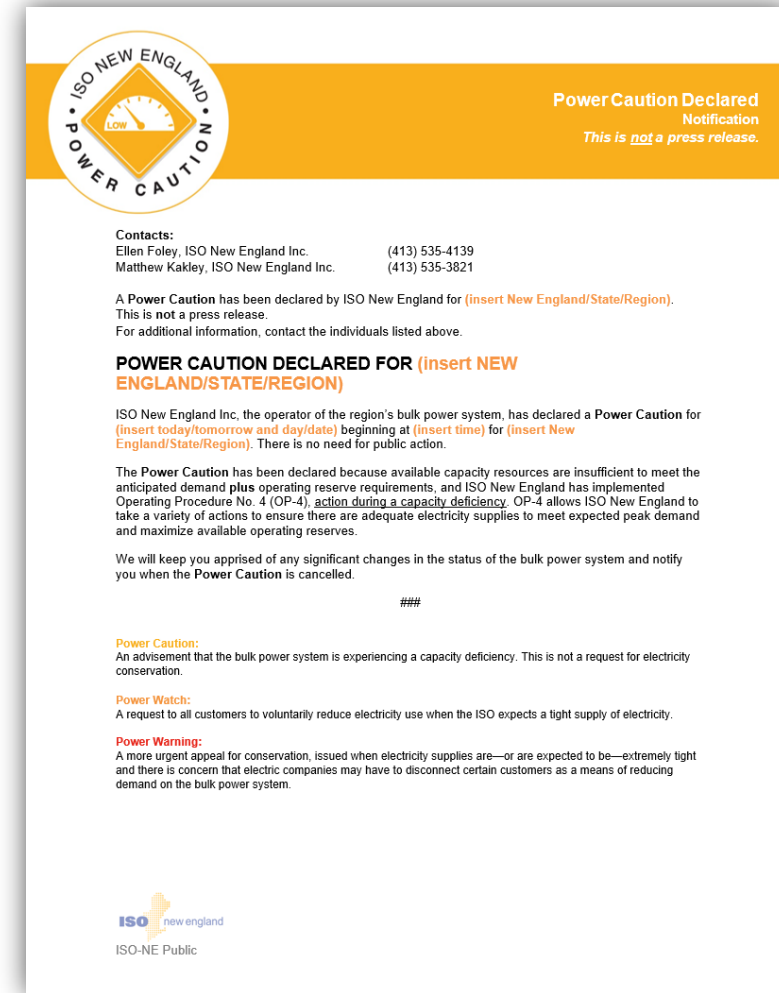
Consumers have the power to lessen the *depth* and *duration* of emergency actions by the ISO by reducing their energy use – such as by *turning off* non-essential lighting, *lowering* thermostat settings, and *turning off* and *unplugging* all non-essential electronic devices.

Corporate Communications (CC) Contacts



Corporate Communications Notifications

- Pre-scripted messages include:
 - *Power Caution, Power Watch, Power Warning, and Controlled Power Outage*
 - New England-wide
 - State- and area-specific
 - e.g., State of Connecticut, Greater Boston area
 - Time-specific
 - e.g., Today, Extended through Tomorrow, Power Watch Lifted



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



Implementation of Cold Weather Operations

- Cold Weather Watch declared on many occasions
 - Approx. six times in the last five years
- Cold Weather Warning declared on only a few occasions
- No Cold Weather Events declared to date



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



Seven-Day Capacity Forecast Sample

WEATHER	DAY 2 MON 11/28	DAY 3 TUE 11/29	DAY 4 WED 11/30	DAY 5 THU 12/01	DAY 6 FRI 12/02	DAY 7 SAT 12/03
High Temperature - Boston	56	43	58	54	42	51
Dew Point - Boston	51	25	46	46	17	32
High Temperature - Hartford	52	46	58	50	44	51
Dew Point - Hartford	46	23	45	41	18	30

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)

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	$\geq 1,000$ MW	$< 1,000$ MW	\leq zero MW

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



Communications Protocol



- SOP-RTMKTS.0050.0007 specifies communications with state regulators when a Cold Weather **Event** is declared
- External Affairs will communicate with government contacts for Cold Weather Watches, Cold Weather Warnings, and Cold Weather Events
 - Government contacts include:
 - State public utility commissions and certain state, regional, and federal energy offices
 - Regular contacts for OP-4 communication
 - State environmental regulators responsible for permitting of dual-fuel generating units
 - Not part of normal OP-4 communications



Cold Weather Watch

- ISO forecasts that sufficient capacity is available to meet the forecasted demand and reserve requirements
- **Operations:**
 - Post Notice to ISO website
- **Communications:**
 - Notify government contacts (by email)



Cold Weather Warning

- ISO forecasts that sufficient capacity may not be available to meet the forecasted demand and reserve requirements
- **Operations:**
 - Request dual-fuel units to prepare to switch to secondary fuels
 - Within limitations of equipment and in compliance with environmental/operating permits
 - Dual-fuel units are requested but not required to switch fuels
 - Post Notice to ISO website
- **Communications:**
 - Notify government contacts (by email)
 - Emphasize in communications with state environmental regulators the ISO's request for dual-fuel units to prepare to switch to secondary fuels
 - Initiate teleconferences with government contacts



Cold Weather Event

- ISO forecasts that sufficient capacity will not be available and that OP-4 actions may be taken to address an anticipated capacity deficiency (emergency actions are expected)
- **Operations:**
 - Units must confirm gas supplies to cover scheduled energy commitments
 - Daily review of gas nominations to determine if gas units have confirmed gas supplies
 - Post Notice to ISO website
 - Request for gas units that can burn oil to switch to oil for Cold Weather Event days
 - Dual-fuel units are requested but not required to switch fuels
 - Verify whether units have switched fuels or plan to switch



Cold Weather Event, *continued*

- **Communications:**
 - Notify government contacts (by email and phone)
 - Emphasize in communications with state environmental regulators the ISO's request for dual-fuel units to switch to secondary fuels
 - Initiate teleconferences with government contacts and environmental regulators
 - Generally surrounding morning/evening peak hours, or as needed
 - Public appeals and other OP-4 actions will be implemented as appropriate



ACTION DURING A CAPACITY DEFICIENCY

Operating Procedure No. 4 (OP-4)

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

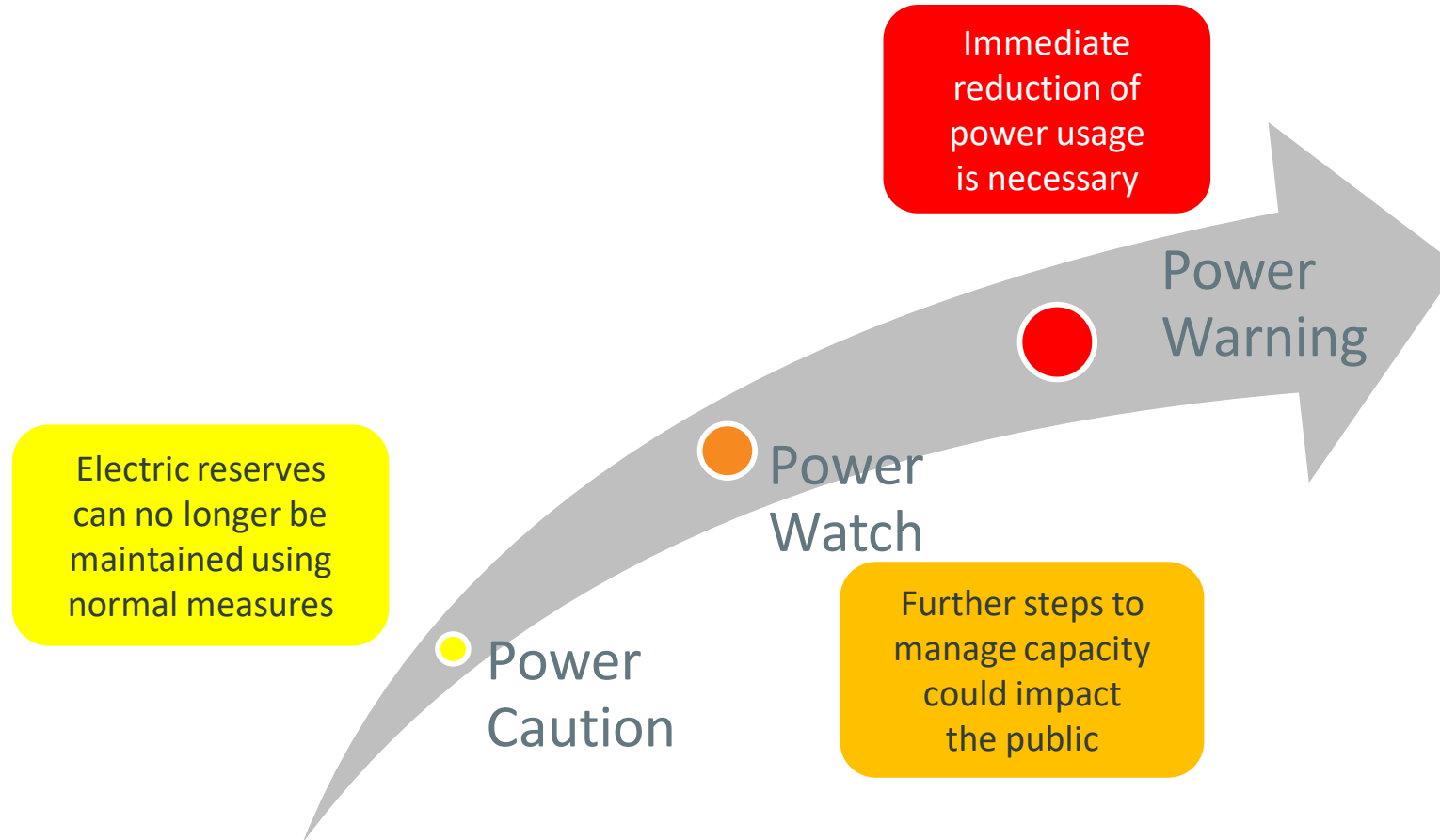
OP-4 Is Implemented When One or More of the Following Occur



- **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



OP-4: Three Primary Notifications



11 Actions Can Be Implemented



- OP-4 includes 11 actions that system operators can use to maintain system reliability
- OP-4 can be implemented New England-wide, by local control center area, by state, or targeted to a specific area
- OP-4 actions can be called in any order
- OP-4 can be skipped to move into Operating Procedure No. 7, *Action in an Emergency*, if necessary



Potential Relief Under OP-4

Roughly 1,900 – 4,000 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 additional OP-4 actions may be taken If conditions warrant, issue a public appeal for voluntary conservation	0 0 ²
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 1,900 – 4,000 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	Variable 0 – 125 ³
	Declare Energy Emergency Alert (EEA) Level 2	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	Variable 0 – 250 ³
	Declare Energy Emergency Alert (EEA) Level 2 (if not already declared)	0 ⁴
9	Request activation of transmission customer generation not contractually available to Market Participants during a capacity deficiency	5
	Request voluntary load curtailment by large industrial and commercial customers	200 ²

Source: [OP-4, Action During A Capacity Deficiency, Appendix A](#)



Potential Relief Under OP-4, *continued*

Roughly 1,900 – 4,000 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	200 ²
	Declare Energy Emergency Alert (EEA) Level 2 (if not already declared)	0 ⁴
11	Request state governors’ support for ISO appeals for conservation	100 ²
	Declare Energy Emergency Alert (EEA) Level 2 (if not already declared)	0 ⁴
	Total Relief (MW)	1,920 – 4,020

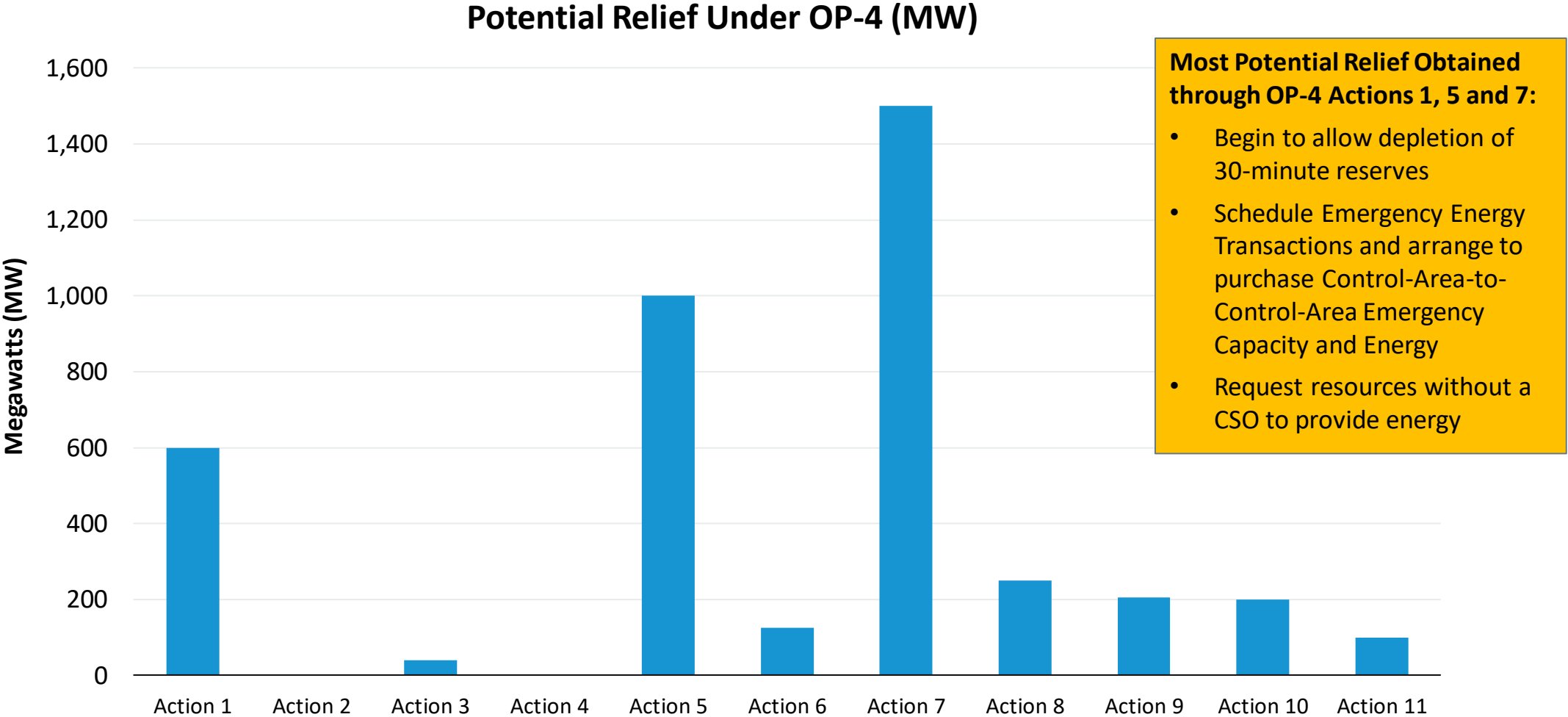
- NOTES:
- 1. Based on Summer Ratings. Assumes 25% of total MW Settlement-Only units <5 MW will be available and respond.
 - 2. The actual load relief obtained is highly dependent on circumstances surrounding the appeals, including timing and the amount of advanced notice that can be given.
 - 3. The 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 - Emergency Operations (<https://www.nerc.com/pa/rrm/ea/Pages/Energy-Emergency-Alerts.aspx>) 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, *continued*

Roughly 1,900 – 4,000 MW of potential relief systemwide from 11 actions



OP-4 Communications for a Power Caution

Actions 1-3 and 5-9



- CC and EA will:
 - Inform government officials and utility communications contacts of implementation of OP-4 and “Power Caution” via e-mail notification
 - No public appeal for conservation is necessary

*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.

Action	Description
1	Implement Power Caution and advise resources with a CSO to prepare to provide capacity Begin to allow depletion of 30-minute reserves
2	Declare Energy Emergency Alert (EEA) Level 1*
3	Request voluntary load curtailment of Market Participants’ facilities
5	Schedule Emergency Energy Transactions and arrange to purchase Control-Area-to-Control-Area Emergency Capacity and Energy
6	Implement voltage reductions requiring > 10 minutes Declare Energy Emergency Alert (EEA) Level 2*
7	Request generators and demand response resources without a CSO to provide energy for reliability purposes
8	Implement voltage reductions requiring 10 minutes or less Declare Energy Emergency Alert (EEA) Level 2*
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

OP-4 Communications for a Power Watch

Action 4 Power Watch and Request for Voluntary Conservation if Warranted



- CC and EA will:
 - Inform government officials and utility communications contacts of OP-4 implementation and “Power Watch” via e-mail notification
 - Update “pre-scripted” public appeal for voluntary electricity conservation and issue it via media advisory *if conditions warrant*
 - Activate conference call “bridgeline” and conduct regular conference call updates *if public appeal is issued*
 - Publicize conservation appeal: ISO-NE home page, Newswire, mobile app, and Twitter



OP-4 Communications for a Power Warning

Action 10 Power Warning and Radio/TV Appeal



- CC and EA will:
 - Inform government officials and utility communications contacts of OP-4 implementation and “Power Warning” via e-mail notification
 - Update “pre-scripted” public appeal for voluntary electricity conservation and issue it via media advisory
 - Activate conference call “bridgeline” and conduct regular conference call updates
 - Publicize conservation appeal: ISO-NE home page, Newswire, mobile app, and Twitter



OP-4 Communications for a Governors' Appeal

Action 11 Governors' Appeal

- CC and EA will:
 - Issue notice as far in advance as possible
 - ISO notifies state contacts to assist with appeal
 - Notify pre-determined governors' staff members
 - Action requested is for the governors to make an urgent public appeal for conservation



OP-4 Includes a Range of External Notifications



- ▲ OP-4 Actions 1-3 and 5-9
- ▲ Serves as a notice to Market Participants that a capacity deficiency exists
- ▲ No public appeal for electricity conservation is made



- ▲ OP-4 Action 4
- ▲ All internal and external stakeholders are notified
- ▲ Public appeal for electricity conservation if conditions warrant



- ▲ OP-4 Action 10
- ▲ All internal and external stakeholders are notified
- ▲ Urgent public appeal to immediately turn off all unnecessary power use



Governors' Appeal

- ▲ OP-4 Action 11
- ▲ ISO notifies state government contacts to assist with appeal
- ▲ ISO requests Governors' support for Power Warning

What Government Emergency Communications Contacts Can Expect



- External Affairs will notify Government contacts via **ISOAlert** if the ISO implements of any OP-4 actions
 - **ISOAlert** will trigger an automated email, phone call, and text message to all Government contacts (i.e., those designated as primary, secondary, and alternate)*
- If the ISO implements a Power Watch *with a public appeal* or a Power Warning, **ISOAlert** will prompt the recipient to connect to a conference **bridgeline**
- ISO staff will communicate the **status of the power system** on the bridgeline
- Notification will be sent notified when actions are **cancelled**
- For **localized** events, we will only notify the primary contact in the affected area

	Actions	Email	Text Message	Phone Call	Activate Bridgeline
Power Caution	1-3 5-9	●	●	●	
Power Watch	4	●	●	●	If ISO issues a public appeal
Power Warning	10	●	●	●	●
Governors' Appeal	11	●	●	●	

* If ISO-NE External Affairs needs to bypass ISOAlert, we will reach out to primary contacts first; we will only call secondary and alternate contacts if the primary contact is unreachable.



What Utility Communications Contacts Can Expect

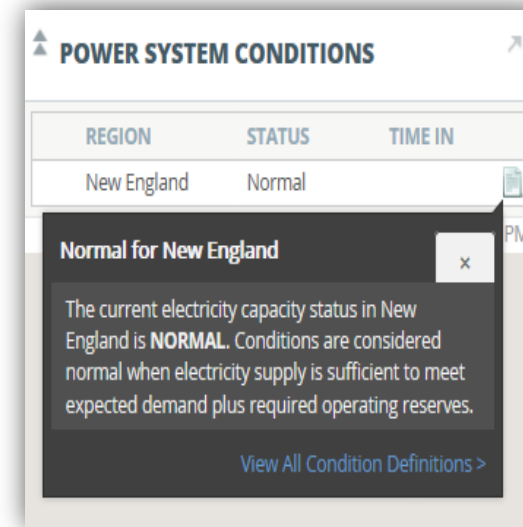
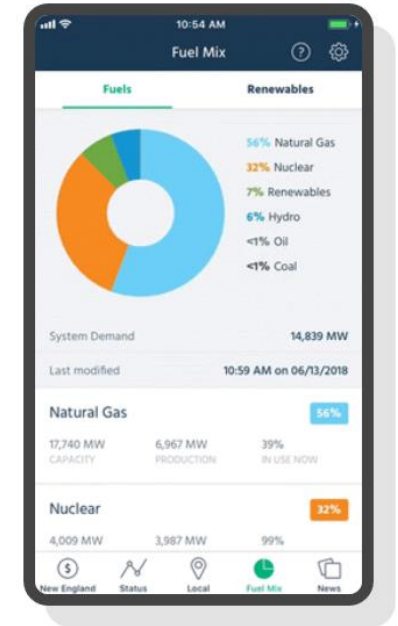
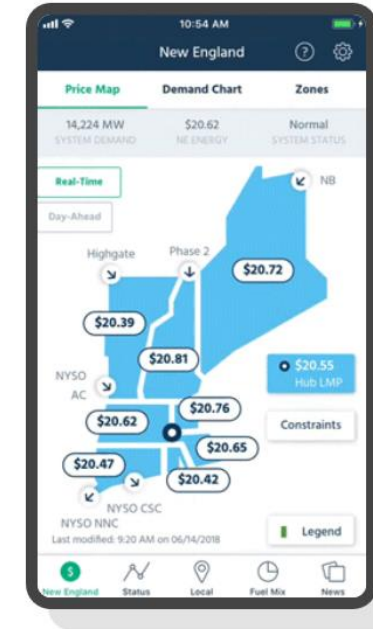


- Corporate Communications will notify utility communications contacts via **ISOAlert** if the ISO implements any OP-4 actions
 - **ISOAlert** will trigger an automated email and text message to all utility communications contacts (i.e., those designated as primary, secondary, and alternate)*
- If the ISO implements a Power Watch *with a public appeal* or a Power Warning, **ISOAlert** will prompt the utilities that operate a Local Control Centers to connect to a conference **bridgeline** call
- ISO staff will communicate the **status of the power system** on the bridgeline to the LCC Communications contacts
- OP-4 contacts will be notified when actions are **cancelled**
- For **localized** events, we will only notify the primary OP-4 contact in the affected area



Digital and Social Media Communications Are Used to Provide System Updates

- Log on to **ISO Express**
 - [ISO Express](#) provides real-time data and notifications regarding power system conditions
- Follow the ISO on **Twitter**
 - [@isonewengland](#)
- Download the **ISO to Go App** for free
 - [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



Provide Updated Contact Information to the ISO

- **Government Contacts:**

- External Affairs Department:

- By phone: (413) 535-4138
 - By email: gwarmangold@iso-ne.com



- **Utility Communications Contacts:**

- Corporate Communications/
Media Relations Department:

- By phone: (413) 535-4309
 - By email: rjohnson@iso-ne.com



ENERGY INVENTORY ACCOUNTING AND ACTIONS DURING AN ENERGY EMERGENCY

Operating Procedure No. 21 (OP-21)

Note: Changes to OP-21 were put into effect in 2018, adding an energy forecasting and reporting framework to establish energy alert thresholds similar to those used in NERC standards.

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 – March)
 - **Bi-weekly** (April – November)
- During Energy Alert or Energy Emergency conditions, the ISO will publish energy assessments **on a daily basis**



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

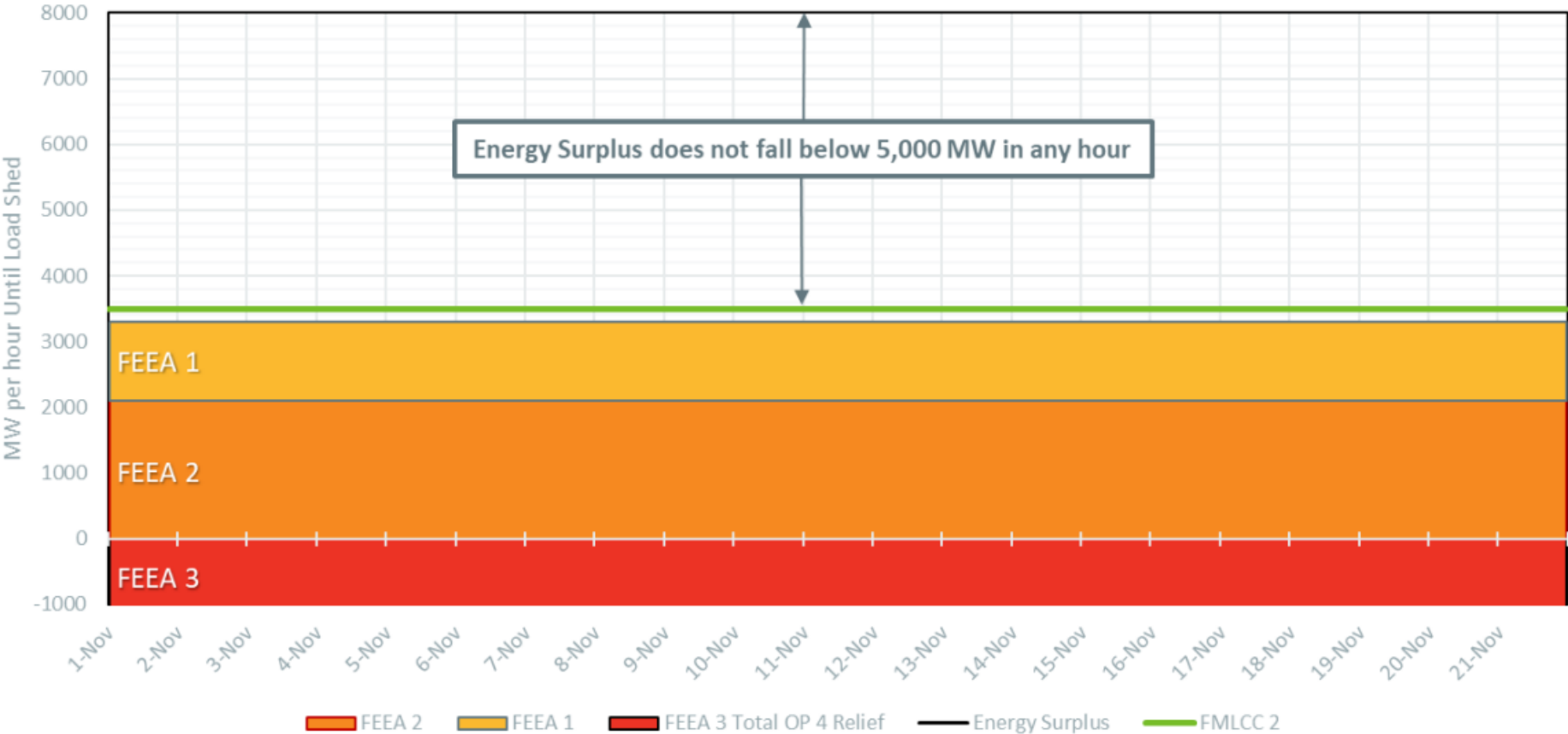


- Resource owners and other stakeholders, including regulatory and government entities, will be made aware of actual or anticipated near-term **energy deficiencies**
 - For example, when oil or other fuels start running low or emissions limitations are constraining resource availability
- With up to 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

21 - Day Energy Emergency Forecast



LEGEND:

FEEA: *Forecasted Energy 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

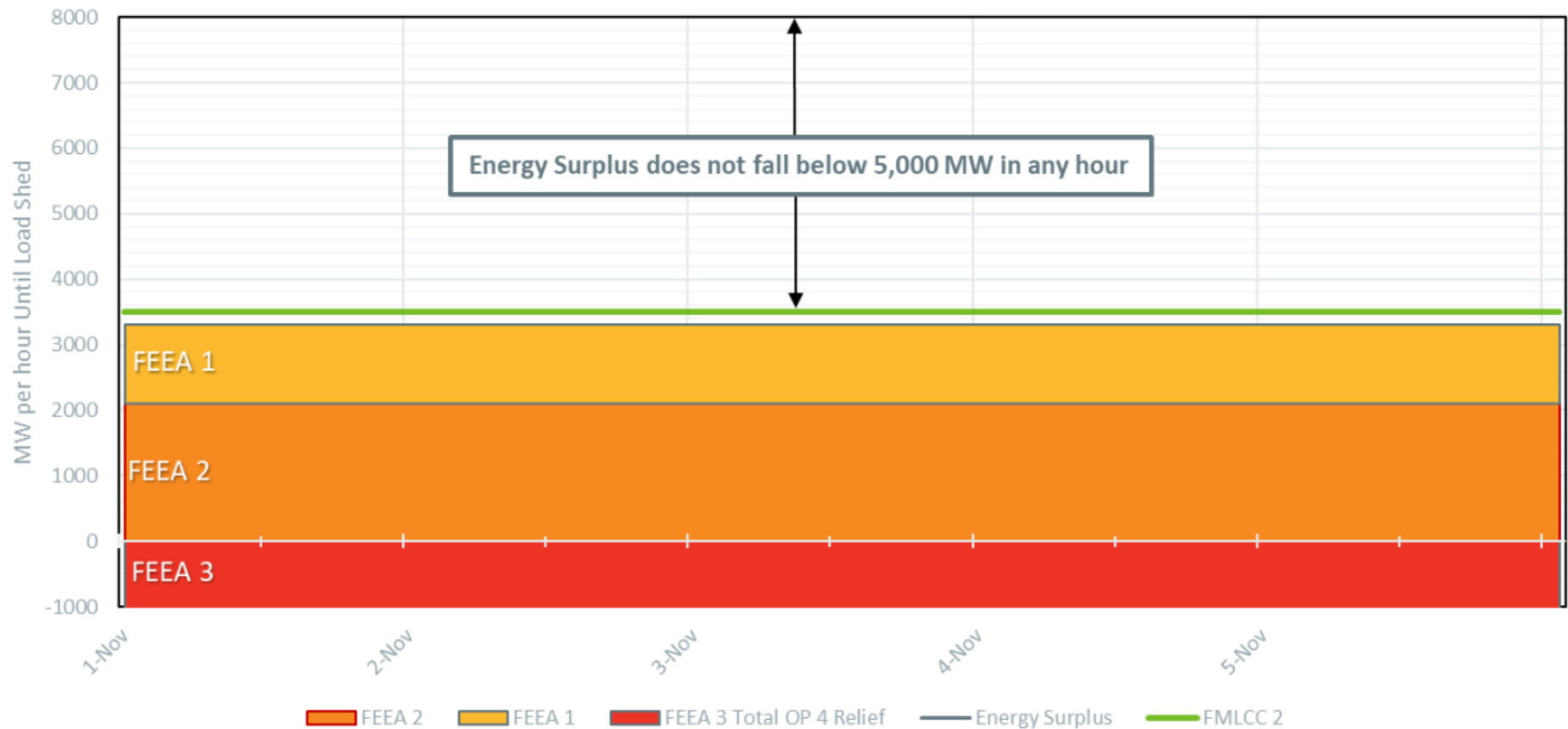
FEEA2: Resources are forecasted to fall below the operating reserve requirement and **OP-4 actions 6–11** are forecasted

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



Sample: 5-Day Forecast Report

5-Day Energy Emergency Forecast



LEGEND:

FEEA: *Forecasted Energy 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



ISO Resources for OP-21 Information

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

The screenshot shows the ISO New England website. The top navigation bar includes links for CALENDAR, LIBRARY, CAREERS, CONTACT US, SIGN UP, and SIGN IN. A search bar is also present. The main content area features an article titled 'An Innovative Energy Supply Forecast' with a sub-header 'About Us > What We Do > In Depth'. The article text states: 'As a key part of its winter operations, ISO New England closely monitors weather forecasts and energy supplies, expected consumer demand, and other variables to identify and communicate potential reliability issues.' Below the article is a 'System Health Slider' graphic. The slider is a horizontal bar with a color gradient from red on the left to green on the right. A grey slider handle is positioned towards the right end, indicating a lower risk level. Below the slider, the text reads: 'Example of the system health slider included in the 21-Day Forecast report' and 'Source: ISO New England'.

System Health Slider

Example of the system health slider included in the 21-Day Forecast report

Source: ISO New England

<https://wwwint.iso-ne.com/about/what-we-do/in-depth/21-day-forecast>

For updates on real-time issues...

The screenshot shows the ISO Newswire website. The top navigation bar includes links for About, Contact, BROWSE, and SEARCH. The main content area features a news article titled 'ISO-NE Board of Directors takes public input, outlines clean energy goals' dated 'NOVEMBER 14, 2022'. The article text states: 'The meeting included presentations on the ISO's ongoing work as well as emerging energy storage technologies.' Below the article is a 'Read More' link. Another article is visible below, titled 'Registration open for Quarterly Settlements Forum' dated 'NOVEMBER 18, 2022'. The article text states: 'This webinar presents information on ISO New England settlements, billing, and more.' Below this article is a 'Read More' link and a 'CATEGORIES' section with links for 'Market Participant Announcements' and 'Market Participant Training'.

ISO NEWSWIRE
A Wholesale Electricity Industry Update

ISO-NE Board of Directors takes public input, outlines clean energy goals

NOVEMBER 14, 2022

The meeting included presentations on the ISO's ongoing work as well as emerging energy storage technologies.

[Read More →](#)

Registration open for Quarterly Settlements Forum

NOVEMBER 18, 2022

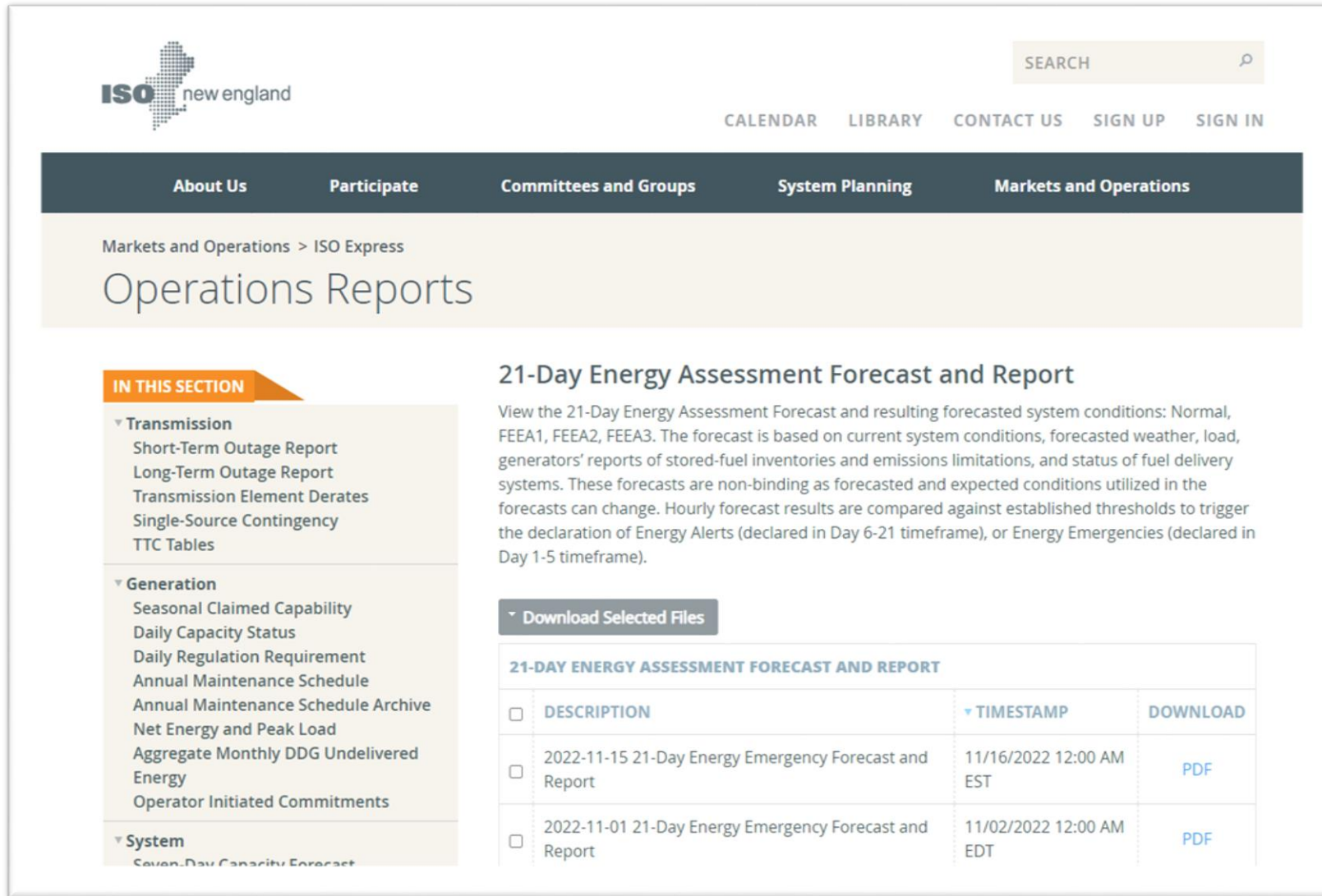
This webinar presents information on ISO New England settlements, billing, and more.

[Read More →](#)

CATEGORIES
[Market Participant Announcements](#), [Market Participant Training](#)

<https://isonewswire.com/>

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



The screenshot displays the ISO New England website's "Operations Reports" page. The header includes the ISO New England logo, a search bar, and navigation links for CALENDAR, LIBRARY, CONTACT US, SIGN UP, and SIGN IN. A dark navigation bar contains links for About Us, Participate, Committees and Groups, System Planning, and Markets and Operations. The main content area shows the breadcrumb "Markets and Operations > ISO Express" and the title "Operations Reports".

IN THIS SECTION

- ▼ **Transmission**
 - Short-Term Outage Report
 - Long-Term Outage Report
 - Transmission Element Derates
 - Single-Source Contingency
 - TTC Tables
- ▼ **Generation**
 - Seasonal Claimed Capability
 - Daily Capacity Status
 - Daily Regulation Requirement
 - Annual Maintenance Schedule
 - Annual Maintenance Schedule Archive
 - Net Energy and Peak Load
 - Aggregate Monthly DDG Undelivered Energy
 - Operator Initiated Commitments
- ▼ **System**
 - Seven-Day Capacity Forecast

21-Day Energy Assessment Forecast and Report

View the 21-Day Energy Assessment Forecast and resulting forecasted system conditions: Normal, FEEA1, FEEA2, FEEA3. The forecast is based on current system conditions, forecasted weather, load, generators' reports of stored-fuel inventories and emissions limitations, and status of fuel delivery systems. These forecasts are non-binding as forecasted and expected conditions utilized in the forecasts can change. Hourly forecast results are compared against established thresholds to trigger the declaration of Energy Alerts (declared in Day 6-21 timeframe), or Energy Emergencies (declared in Day 1-5 timeframe).

Download Selected Files

21-DAY ENERGY ASSESSMENT FORECAST AND REPORT		
<input type="checkbox"/> DESCRIPTION	▼ TIMESTAMP	DOWNLOAD
<input type="checkbox"/> 2022-11-15 21-Day Energy Emergency Forecast and Report	11/16/2022 12:00 AM EST	PDF
<input type="checkbox"/> 2022-11-01 21-Day Energy Emergency Forecast and Report	11/02/2022 12:00 AM EDT	PDF

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

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



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

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

If the ISO forecasts a **capacity deficiency** (operating-reserve shortage)

If the ISO forecasts an **energy shortage**

Tools to Protect System Reliability if Shortages Occur

ISO has longstanding operating procedures to manage capacity and energy shortages; *energy conservation by the public* is an essential tool during extreme cold weather

The ISO can implement 11 actions to restore operating reserves (OP-4)*

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.

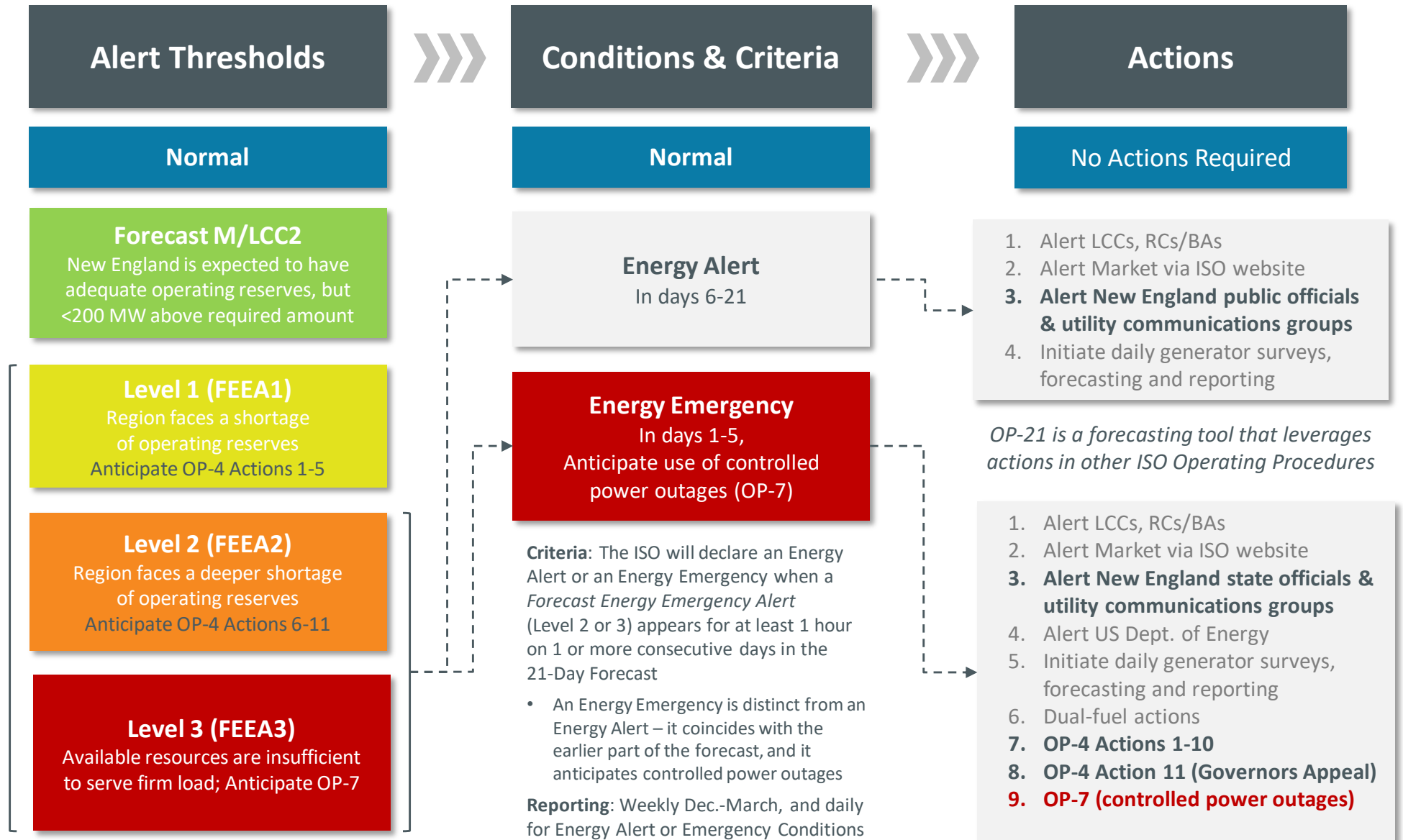
Communications to support ISO New England Operating Procedure No. 21 (OP-21): Operational Surveys, Energy Forecasting & Reporting and Actions During an Energy Emergency

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

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.

Information Sources:

- **OP-21:** https://www.iso-ne.com/static-assets/documents/rules_proceeds/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-011-1: Emergency Operations; <https://www.nerc.com/pa/Stand/Reliability%20Standards/EOP-011-1.pdf>



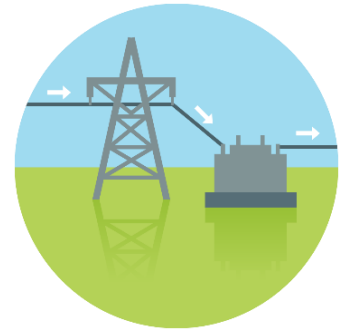
Note: ISO uses OP-4 actions to manage *capacity* deficiencies and OP-7 actions for *energy* deficiencies, but may also implement OP-4 if it could reduce the need for emergency actions under OP-7.

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, 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
- 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 “bridgeline” 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.

2022 - 2023 NPCC Winter Reliability Assessment: *Preliminary Results - Summary*

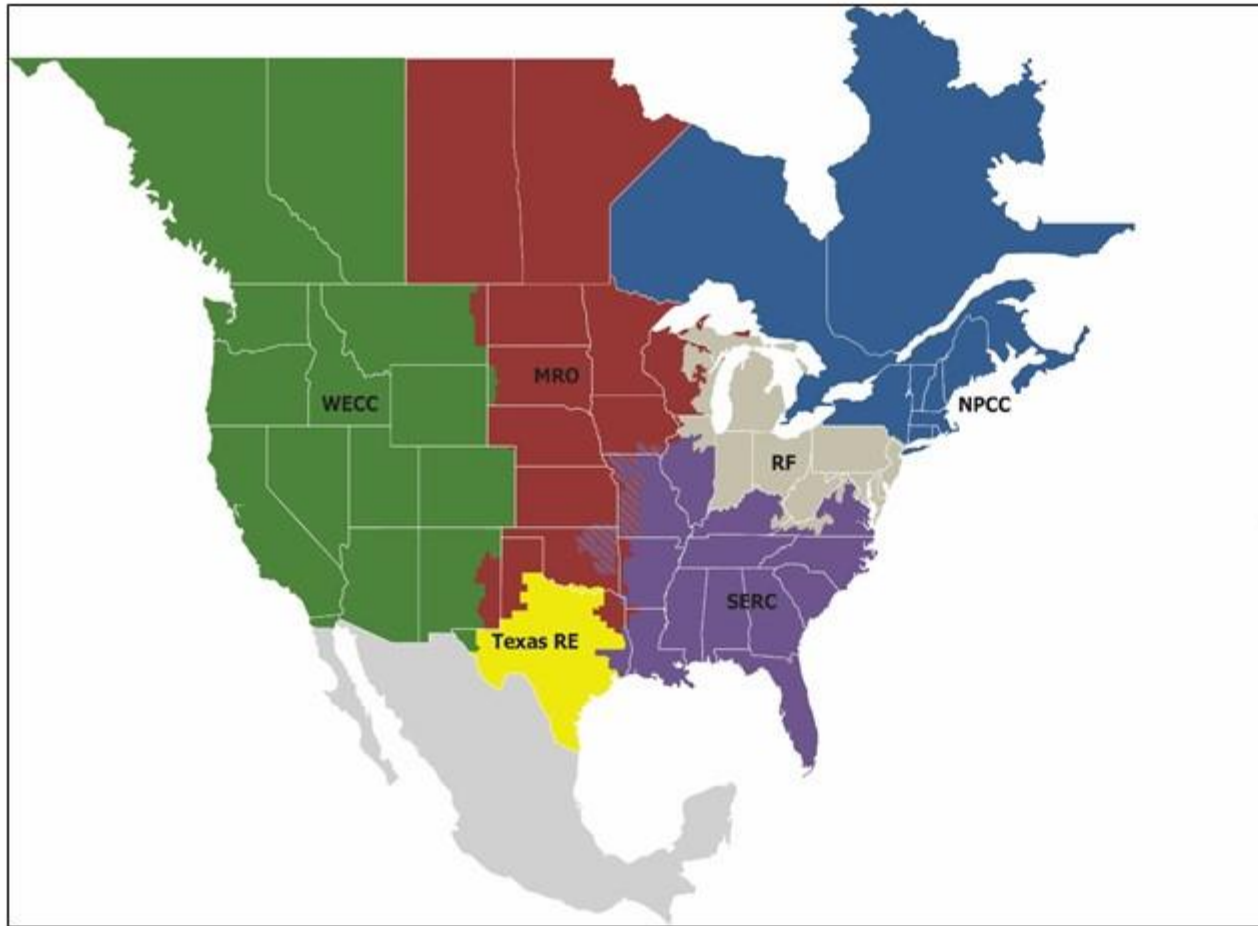
**ISO New England Annual
Pre-Winter Communications Training
Tuesday, November 29, 2022**

Andreas Klaube
Manager, Probabilistic Assessment
Northeast Power Coordinating Council





Northeast Power Coordinating Council (NPCC)



www.npcc.org

- One of six NERC Regional Entities throughout the US, Canada and portions of Mexico
- Area (sq. miles): 1.2 million
- Population: 56+ million people
- States (US): 7 Provinces (Canada): 4
- Registered Entities: ~239, performing ~472 functions
- Share of Eastern Interconnection Load: ~20%
- Share of NPCC Load: 44% US / 56% Canadian
- Share of Total Canadian Load within NPCC: ~65%



2022 – 2023 NPCC Winter Reliability Assessment - Summary

Deterministic Assessment – NPCC Capacity margins and transmission capability adequate

- Historical Review Winter 2021-22 – Maritimes & Québec all-time peak demand
- NPCC Resource Adequacy Projections – NPCC Net Operable Capacity Margin 500 MW higher than last year
- NPCC Winter Readiness – NPCC is prepared for a variety of anticipated system conditions
- Case Assumptions – Range of demand and resource availability scenarios developed
 - 50/50, 90/10, and Above 90/10 Forecasts modelled
- Geomagnetic Outlook – NERC Standards and NPCC Procedures in place to address anticipated GMD activity

Probabilistic Assessment – Base, Severe and Sensitivity Cases modelled

- For the Base and Severe Cases, only the Maritimes Area shows a likelihood of limited use of Operating Procedures this Winter
- A sensitivity case was also analyzed using a probabilistic approach, for system conditions assuming expected and severe resource unavailability, with a 2017-18 Winter weather pattern adjusted to each Area's 2022-2023 forecast, under both expected and highest load assumptions.

2022 -2023 Winter Weather Outlooks for NPCC

- Above Normal/Normal Temperatures – NPCC US
- Above Normal Temperatures – NPCC Canada

This presentation contains preliminary results.
The final report expected to be available by December 9, 2022
@ [Seasonal Assessment \(npcc.org\)](https://npcc.org).



Summary of Major Findings – NPCC Region

- Overall coincident winter peak demand is expected to be around 110,639 MW – approximately 1,248 MW more than last winter. Total capacity of about 169,914 MW is projected to be in place to meet electricity demand this winter (1,156 MW more than last winter).
- After accounting for transmission constraints, the region's spare operable capacity (capacity over and above reserve requirements) under expected conditions during the winter period is estimated to be substantial – ranging from approximately 20,400 to 35,200 MW.
- NPCC's assessment indicates overall adequate capacity margins and transmission capability to meet the region's peak demand and required operating reserve this winter.



Summary of Major Findings – NPCC Region

- In low likelihood, high demand and severe case conditions, necessary strategies and procedures are in place to provide load relief, manage operational challenges and potential emergencies as they may develop.
- For New England, given the fuel constraints on the natural gas system, situational awareness of the available liquified natural gas (LNG) and fuel-oil inventories and replenishment plans for those inventories is essential to understanding regional energy availability. The potential for emissions limitations at some dual-fuel units are being closely monitored by ISO-NE in the event of significant oil burn. LNG imports are critical to meeting New England's energy needs, particularly during cold weather.
- It is critical that generation owners in the region have plans in place to replenish fuel supplies in order to maintain reliability.



NPCC Resources – January 2023



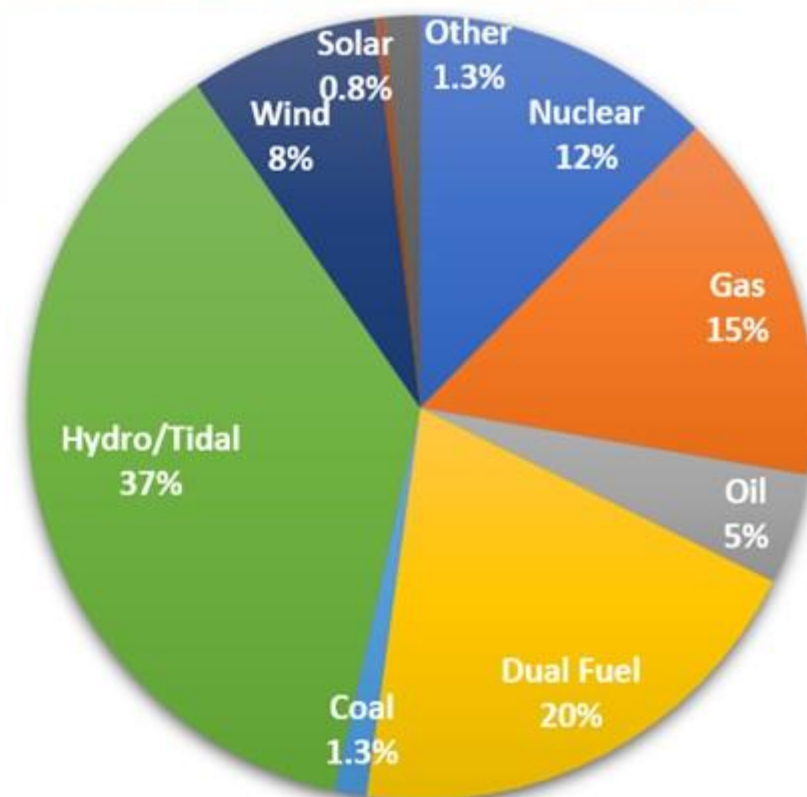
Renewables, BTM and Load Management

Nameplate Wind Capacity	13,880 MW
Nameplate Solar Capacity	3,578 MW
Installed Behind-The-Meter (BTM) PV*	9,969 MW
Demand Response Program Resources	4,960 MW

*Estimated BTM Photovoltaics; Impact on
Non-coincident Peak load: 0 MW

- Forecast Installed Capacity: **165,548 MW**
 - Total Capacity represents about 169,914 MW
- Forecast Peak Demand: **110,639 MW**

NPCC Installed Capacity by Fuel Type



Note: May not equal 100% due to rounding



NPCC Winter Readiness

- Reliability Coordinator (RC) Communications:
 - Daily – discuss and alert NPCC and neighboring RCs of any potential or emerging issues
 - 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 conduct NPCC Emergency Preparedness Calls when needed and periodic tests of procedures
- NPCC Task Forces and Working Groups support continued reliable operations through planning, reviewing and assessing the performance of the bulk power system
- Support regional Electric-Gas Operations reliability coordination efforts promoting cross-sector communication, awareness and information sharing



Summary of Major Findings – New England

- New England expects to have sufficient resources to meet its 50/50 winter peak demand forecast of 20,009 MW – 299 MW higher than last winter's forecast. Accounting for purchases, sales, required operating reserve, planned and unplanned outages results in a spare operable capacity of approximately 5,039 MW during the peak week.
- Given fuel constraints on the natural gas system, situational awareness of the available LNG and fuel-oil inventories and replenishment plans for those inventories is essential to understanding regional energy availability. LNG imports are critical to meeting New England's energy needs, particularly during cold weather.
- New England continues to observe sustained growth in distributed photovoltaic (PV) resources. Load reduction from PV can be observed during the midday hours of sunny winter days; however, the winter peak demand occurs after sunset.



Summary of Major Findings – New York

- The New York Independent System Operator (New York ISO) forecasts total capacity of 43,184 MW for the 2022-2023 winter peak demand forecast of 23,893 MW, which is 132 MW lower than the corresponding 2021-2022 winter peak demand forecast.
- Since the 2021-22 winter season, generation capacity in New York has slightly increased. The losses of numerous oil powered steam units in New York City (totaling to -357 MW) and a couple of gas turbines are compensated for by the addition of considerable capacity (666 MW) in wind, largely in the West, and Mohawk areas, as well as 100 MW of Solar in the West, and 23 MW of Solar on Long Island.
- Accounting for purchases, sales, required operating reserve, planned and unplanned outages results in a spare operable capacity of approximately 11,411 MW during the peak week.



Summary of Major Findings – Ontario

- Ontario is projected to have an adequate supply of electricity this winter and Ontario's transmission system is expected to be adequate. The Ontario 2022-2023 winter 50/50 peak demand forecast is 21,255 MW. The forecast is roughly 315 MW higher than last winter's 50/50 forecast peak demand.
- Considering all changes and capacity adjustments, the resultant net change for Ontario generation from last winter is approximately a 178 MW increase. This corresponds to a spare operable capacity of approximately 2,504 MW during the peak week.
- For this Winter Operating Period, Ontario's transmission system is expected to be adequate with planned transmission system enhancements and scheduled transmission outages under normal and extreme conditions. Ontario has an expected coincident import capability of approximately 5,200 MW.



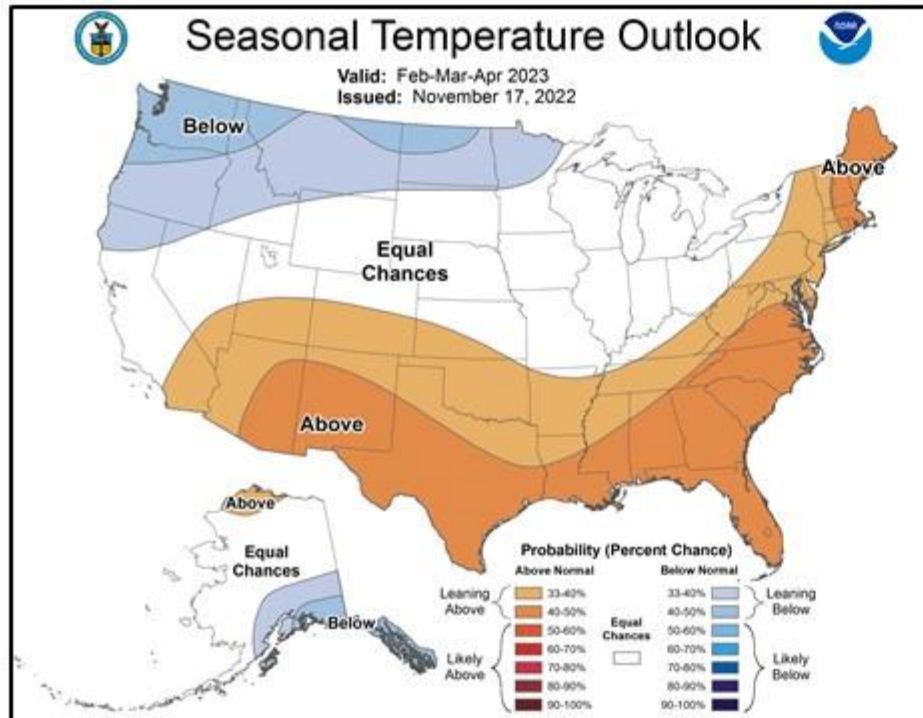
Summary of Major Findings

Québec and the Canadian Maritimes

- The Québec and Canadian Maritime Provinces are winter peaking; no transmission reliability or resource adequacy issues have been identified.
- For the Québec Area, forecasts estimate a spare operable capacity of approximately 1,902 MW during the peak week.
- Accounting for purchases, sales, required operating reserve, planned and unplanned outages results in a spare operable capacity for the Maritimes of approximately -278 MW during the peak week. As a result, the Maritimes Area shows a likelihood of limited use of Operating Procedures this Winter.
- The Maritime Link undersea cable, in conjunction with the construction of the Muskrat Falls hydro development in Labrador, presently provides for a 153 MW firm capacity import to Nova Scotia (NS). Due to short-term maintenance outages and the ongoing commissioning work on the HVDC transmission link from Labrador to Newfoundland, a 148 MW coal-fired unit will be retained in NS, if needed, to provide firm capacity and maintain an adequate planning reserve margin for the upcoming winter 2022-2023.

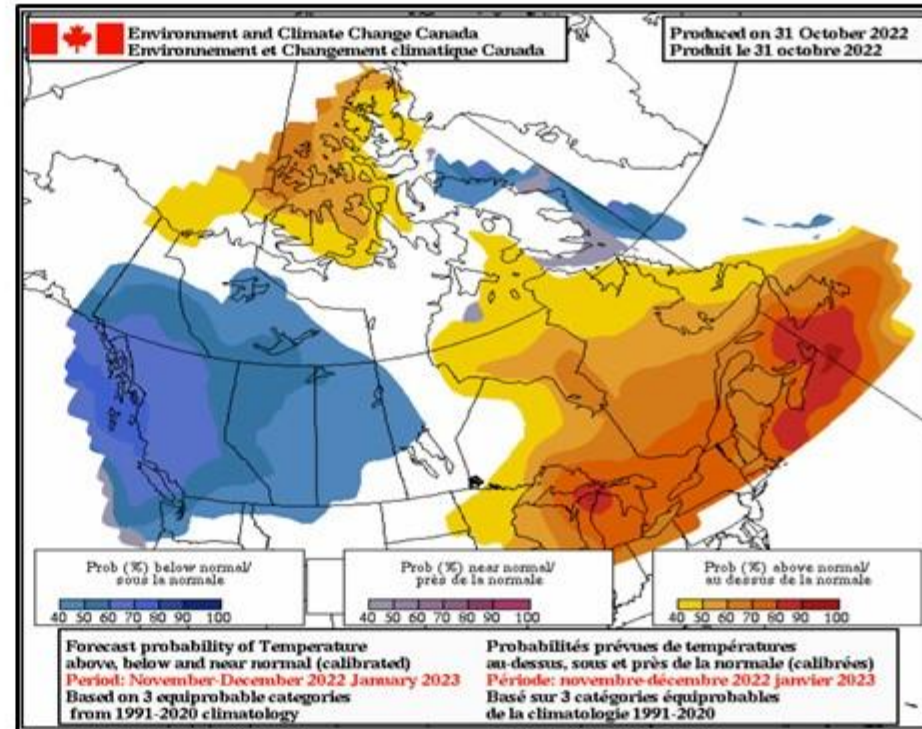


2022 – 2023 Winter Temperature Outlook



NOAA Climate Prediction Center

[Link](#)



Environment Canada

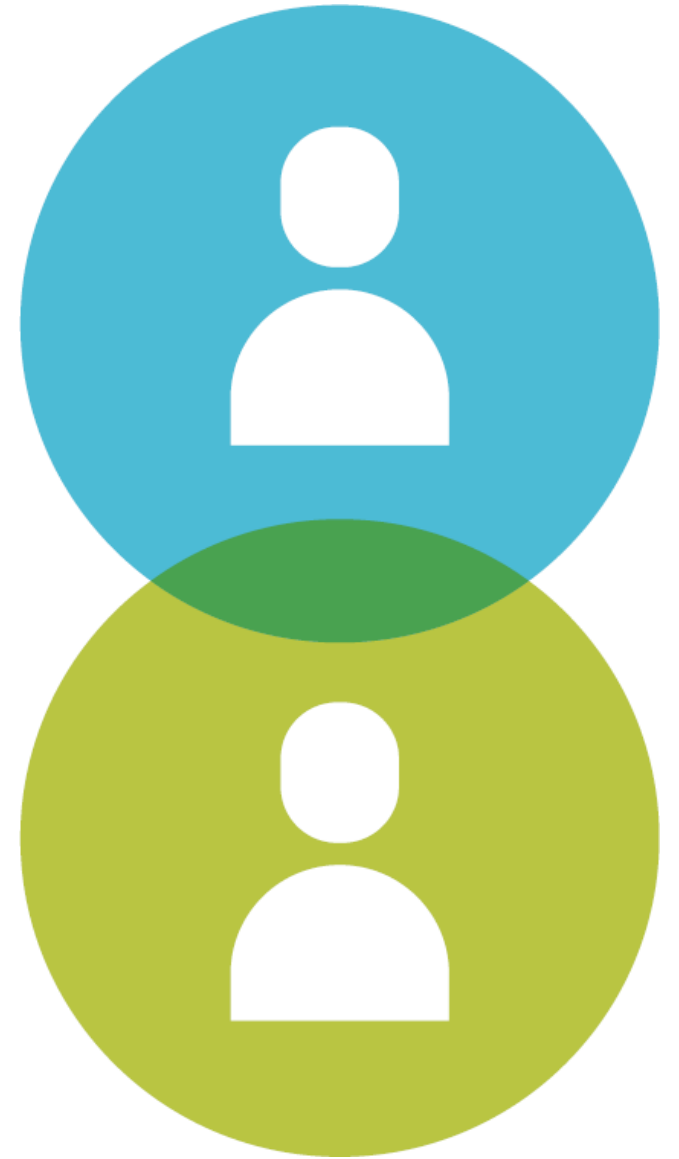
[Link](#)

Next Steps

- **Test scheduled for Tuesday November 29 (today) for OP-4 government contacts**
- Early December
 - 2022/23 Winter Outlook Factsheet
 - Press Release

Reminder

- Send updated contact information to the ISO



Provide Updated Contact Information to the ISO

- **Government Contacts:**

- External Affairs Department:

- By phone: (413) 535-4138
 - By email: gwarmangold@iso-ne.com



- **Utility Communications Contacts:**

- Corporate Communications/
Media Relations Department:

- By phone: (413) 535-4309
 - By email: rjohnson@iso-ne.com



Questions



APPENDIX



BACKGROUND INFORMATION ON 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**
 - 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 - Emergency Operations:
 - <https://www.nerc.com/pa/rrm/ea/Pages/Energy-Emergency-Alerts.aspx>



Action 3



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

Action 4



- Implement a **Power Watch**
 - Notification that additional OP-4 actions may be taken
- If conditions warrant, issue a public appeal for voluntary conservation



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

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

*Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011 - Emergency Operations (<https://www.nerc.com/pa/rrm/ea/Pages/Energy-Emergency-Alerts.aspx>).



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

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*

*Note: EEA levels are described in Attachment 1 to NERC Reliability Standard EOP-011 - Emergency Operations (<https://www.nerc.com/pa/rrm/ea/Pages/Energy-Emergency-Alerts.aspx>).



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 radio/television appeals for voluntary load curtailment
- Implement a **Power Warning**
 - 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
- 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
- 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 - Emergency Operations (<https://www.nerc.com/pa/rrm/ea/Pages/Energy-Emergency-Alerts.aspx>).



OP-4 Actions from Beginning of FCM to Present

Action	1	2	3	4	5	6	7	8	9	10	11
Date	Power Caution	Power Caution	Power Caution	Power Watch	Power Caution	Power Caution	Power Caution	Power Caution	Power Caution	Power Warning	Governors' Appeal
6/24/2010	•	•	•	•	•						
7/5/2010	•										
8/9/2010	•										
4/22/2011	•										
7/22/2011	•	•	•		•						
8/16/2011	•	•			•						
12/19/2011	•	•									
1/28/2013	•	•									
7/19/2013	•	•	•		•						
12/14/2013	•	•			•						
9/28/2014	•										
12/4/2014	•										
9/9/2015	•										
8/11/2016	•	•									
9/3/2018	•	•	•	•	•						

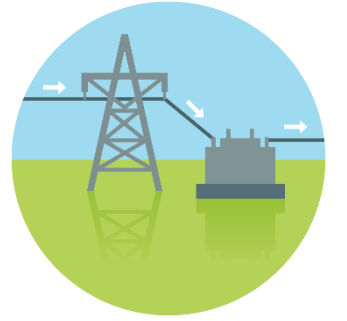
Note: The OP-4 actions above were called New England-wide, except on July 19, 2013 (actions 2, 3, and 5 were called for all zones but Maine) and on August 11, 2016 (action 2 was called for all zones but Maine).

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)



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



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



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) <ul style="list-style-type: none"> Resources during any hour are forecasted to be less than 200 MW above operating reserve requirements 	M/LCC-2 <ul style="list-style-type: none"> Resources are less than 200 MW above operating reserve requirements
Forecast Energy Emergency Alert Level 1 (FEEA1) <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> OP-4 Action 2 implementation
Forecast Energy Emergency Alert Level 2 (FEEA2) <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> OP-4 Actions 6, 8, 10, or 11 implementation
Forecast Energy Emergency Alert Level 3 (FEEA3) <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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

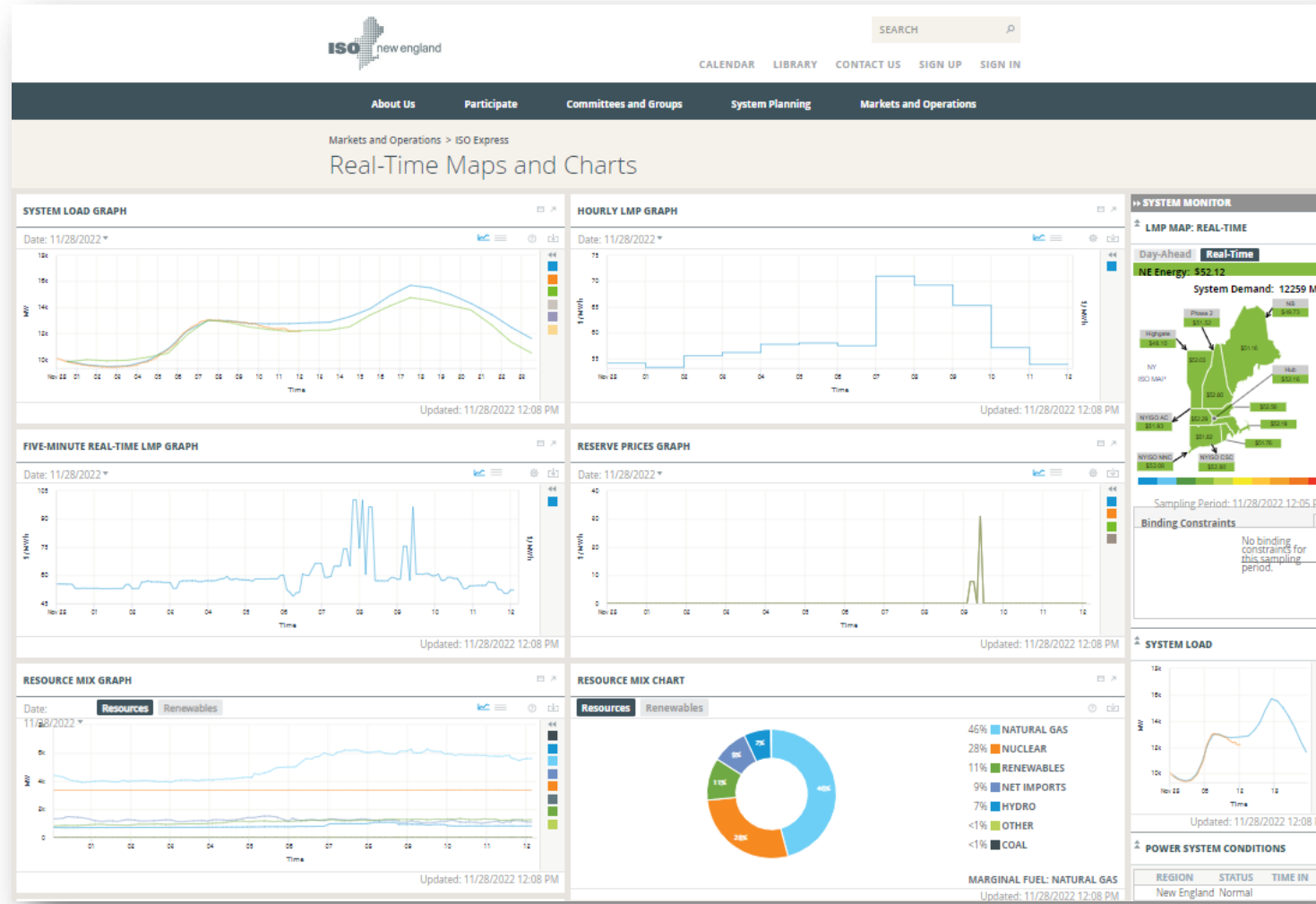


OTHER INFORMATION RESOURCES



For a Quick Look at Power System Conditions...

Visit the System Monitor on ISO Express



ISO Express is available at: <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

The screenshot shows the ISO New England website. At the top is the ISO New England logo and a search bar. Below the logo is a navigation bar with links: About Us, Participate, Committees and Groups, System Planning, and Markets and Operations. The main content area is titled "Mailing Lists" and includes a sidebar with a list of links. The "Mailing Lists" link in the sidebar is highlighted. The main content area contains several sections: "General ISO and Industry Information" with links to "ISO Newswire" and "ISO Training"; "Participant Readiness" with a description of updates to the "Participant Readiness Project Outlook" webpage; "Notices" with a description of the "All Notices" mailing list; "Participant Issues" with a description of notices of miscellaneous reports; and "Emergency Operating System Notices" with a description of alerts on abnormal operating system conditions. A "RELATED LINKS" section at the bottom left lists "Implementation of ISO operating procedures, such as OP 4: Action During a Capacity Deficiency".

ISO new england

SEARCH

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Participate > Support

Mailing Lists

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- Request Data and Information
- Request CEII Access
- Request Software
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- User Guides
- Glossary and Acronyms
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- Web Services Data
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- FAQs
- Website Help

ISO New England offers several email lists to help market participants and other stakeholders keep up with ISO and industry developments. To subscribe, click on a mailing list name, and hit send when the subscription email opens up.

General ISO and Industry Information

ISO Newswire
A monthly list of the most recent articles from the ISO's news blog, [ISO Newswire](#)

ISO Training
Announcements of training courses offered by the ISO

Participant Readiness
Notification of updates to the [Participant Readiness Project Outlook](#) webpage or the near-term project pages listed therein, which discuss major upcoming ISO projects that require action from affected market participants

Notices

Subscribe to [All Notices](#) to receive all of the following mailing lists. Or, select only the specific mailing lists you'd like.

Participant Issues
Notices of miscellaneous reports, changes in policy issues, and other general matters related to our customers

Emergency Operating System Notices
Alerts on abnormal operating system conditions, including:

- Implementation of ISO operating procedures, such as [OP 4: Action During a Capacity Deficiency](#)

RELATED LINKS

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