NOVEMBER 1, 2013 | WASHINGTON, DC

Meeting Natural Gas/Electricity Challenges in New England

2013-2014 Winter Energy Outlook

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Overview

- The role of ISO New England
- Overview of Winter Operations
- Expectations for 2013-2014 Winter Conditions
- 2013-2014 Winter Reliability Program

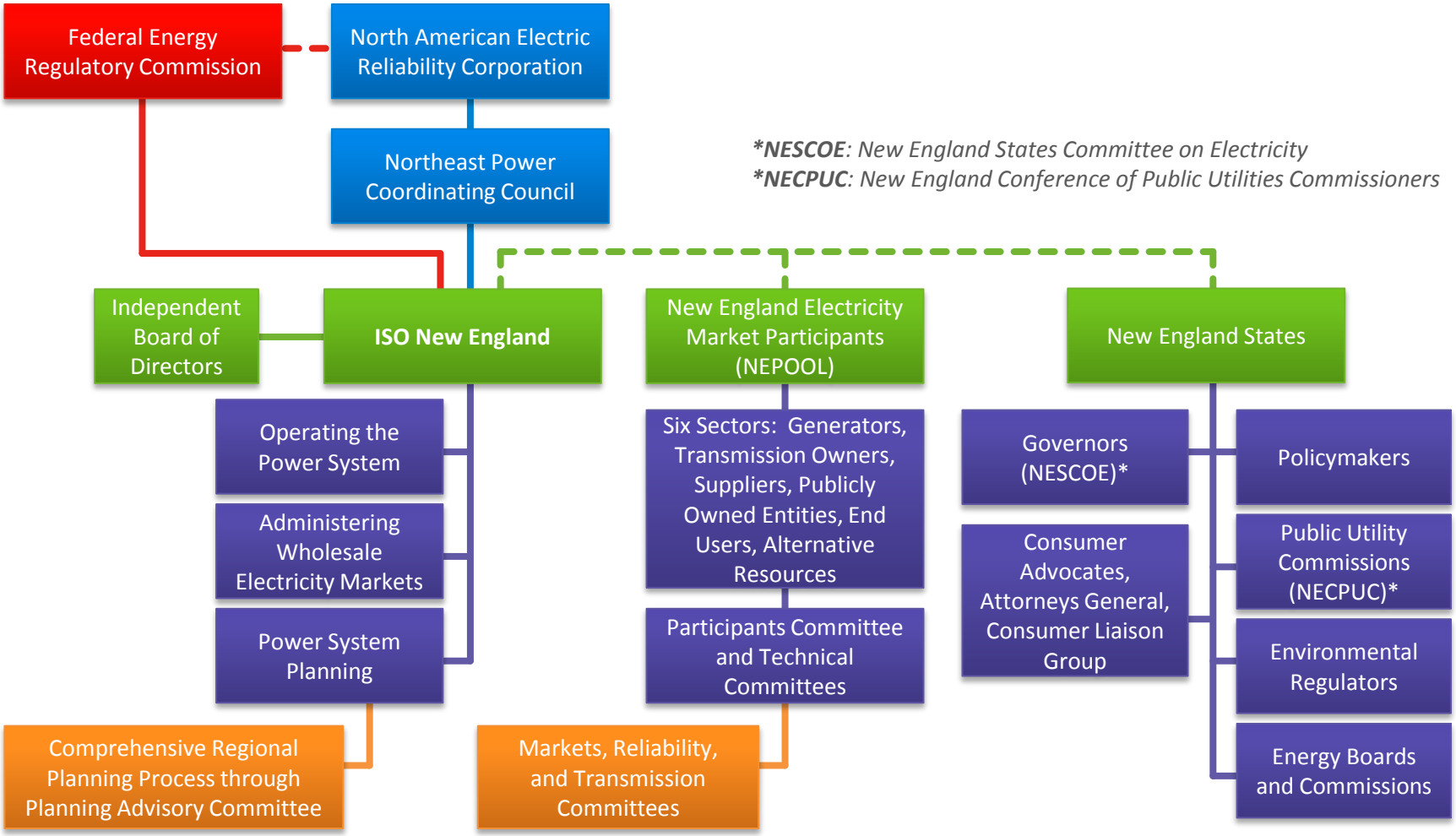
About ISO New England

- **Not-for-profit corporation created in 1997 to oversee New England's restructured electric power system**
  - Regulated by the Federal Energy Regulatory Commission (FERC)
- **Regional Transmission Organization**
  - Independent of companies doing business in the market
  - No financial interest in companies participating in the market
  - Neutral as to resource fuel type
- **Major Responsibilities**
  - Operating the Regional Power System
  - Administering Wholesale Electricity Markets
  - Regional Power System Planning

New England's Electric Power Grid at a Glance

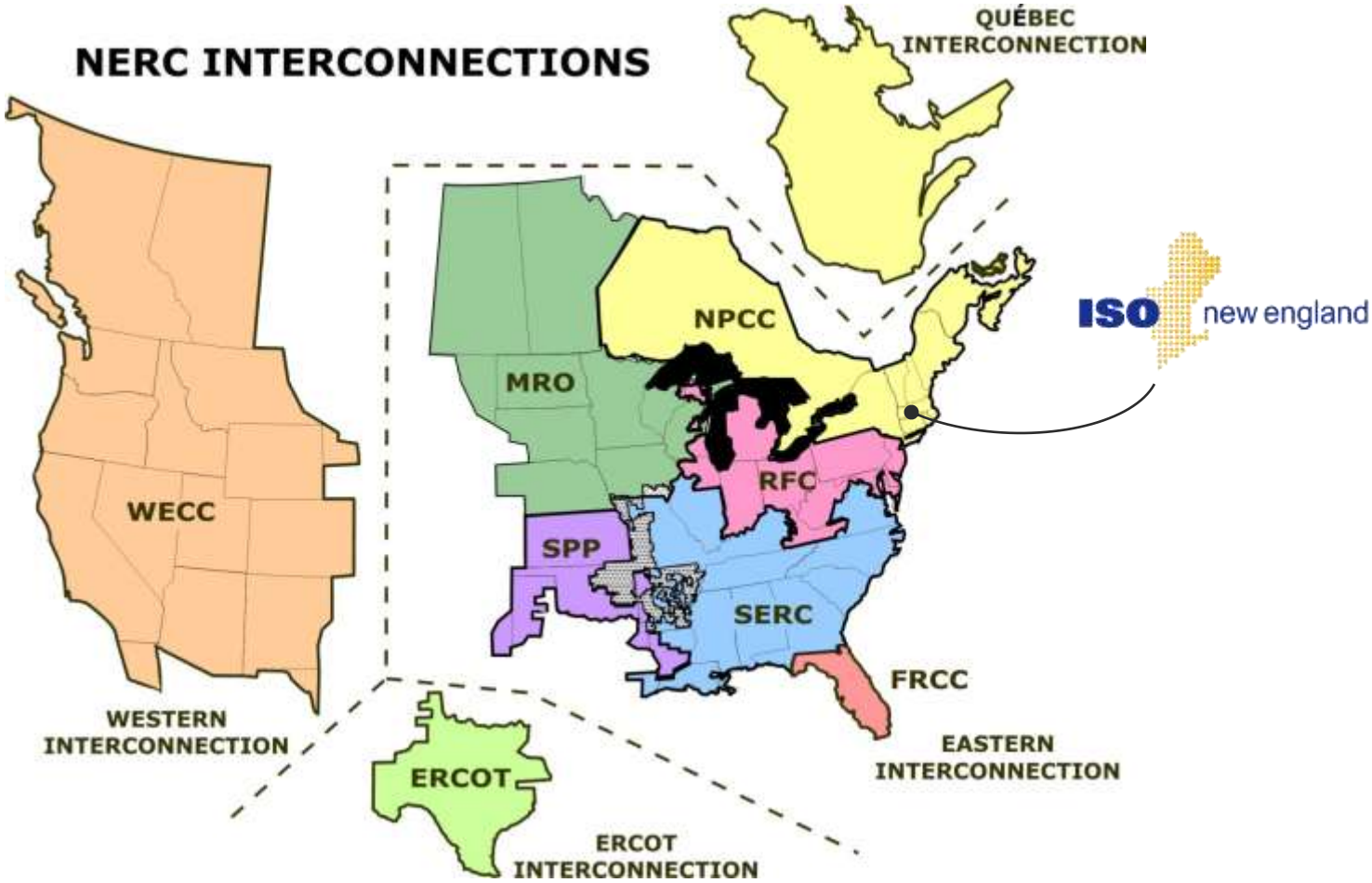
- 6.5 million households and businesses; population 14 million
- 350+ generators
- 8,000+ miles of high-voltage transmission lines (115 kV and above)
- 13 interconnections to electricity systems in New York and Canada
- 31,750+ megawatts (MW) of generating capacity and approximately 1,850 MW of demand resources
- 28,130 MW all-time peak demand, set on August 2, 2006
- 500+ buyers and sellers in the region's wholesale electricity markets
- $5 billion in transmission investment since 2002; approximately $6 billion planned over next 5 years
- $5 billion total energy market value in 2012

Industry Structure in New England



**NESCOE*: *New England States Committee on Electricity*
**NECPUC*: *New England Conference of Public Utilities Commissioners*

We are Part of the Eastern Interconnection



OVERVIEW OF WINTER OPERATIONS AND EXPECTATIONS FOR 2013-2014 WINTER CONDITIONS

Preparations for Winter Peak Demand

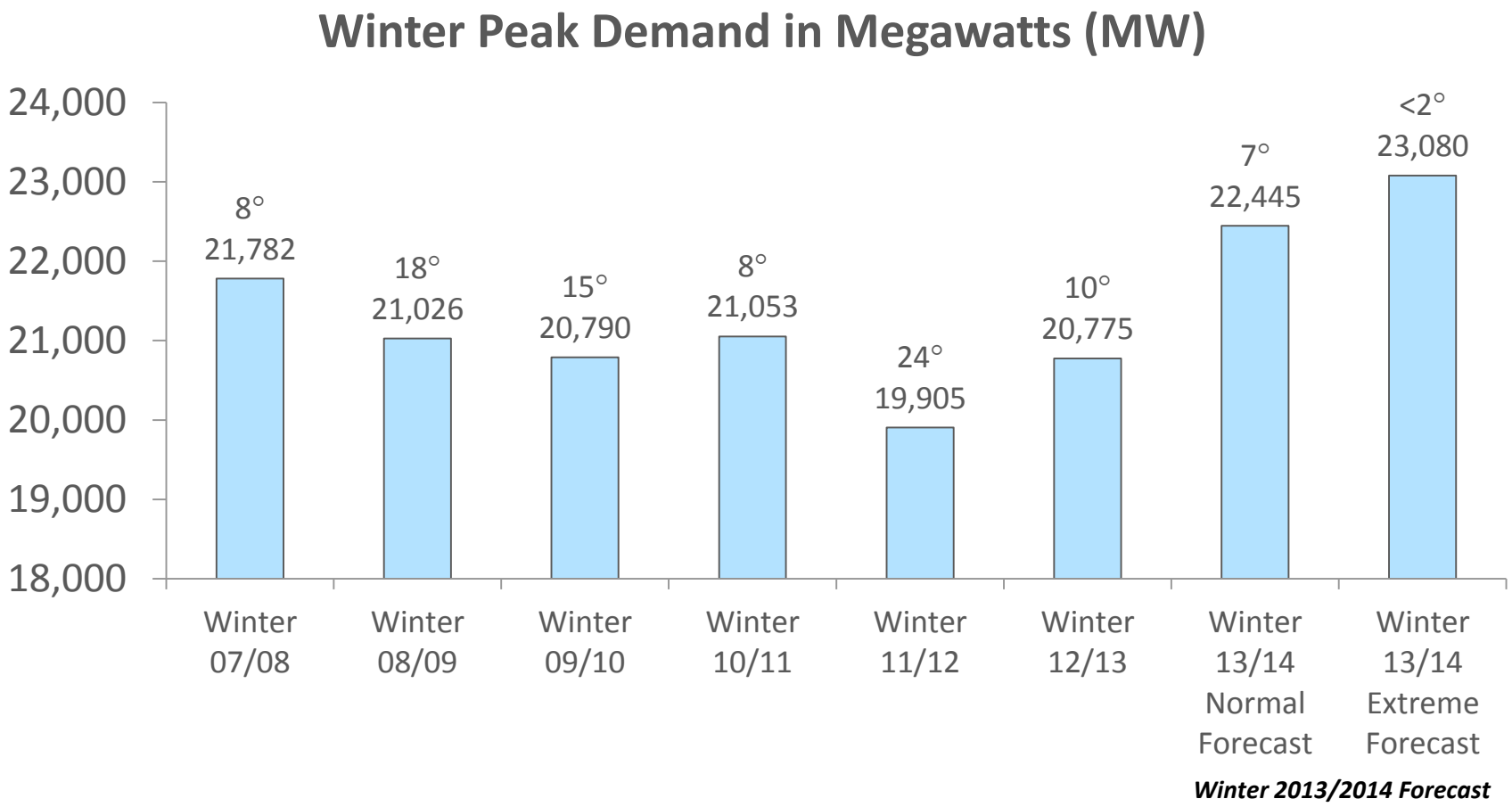
- New England's winter-peak demand period runs from December through March
- In preparation for the winter, ISO New England:
  - Forecasts New England's demand for electricity and reserves
  - Evaluates the region's winter capacity outlook
  - Exercises communication plan

Preparations for Winter 2013/2014

- Implementation of Winter 2013-2014 Reliability Program
- Ongoing coordination between electric and gas systems
- Short-term actions:
  - Conduct fuel inventory of oil- and coal-fired generators monthly
  - Confirm gas nominations with natural gas-fired generators daily

Winter Peak Demand

And Corresponding Temperatures

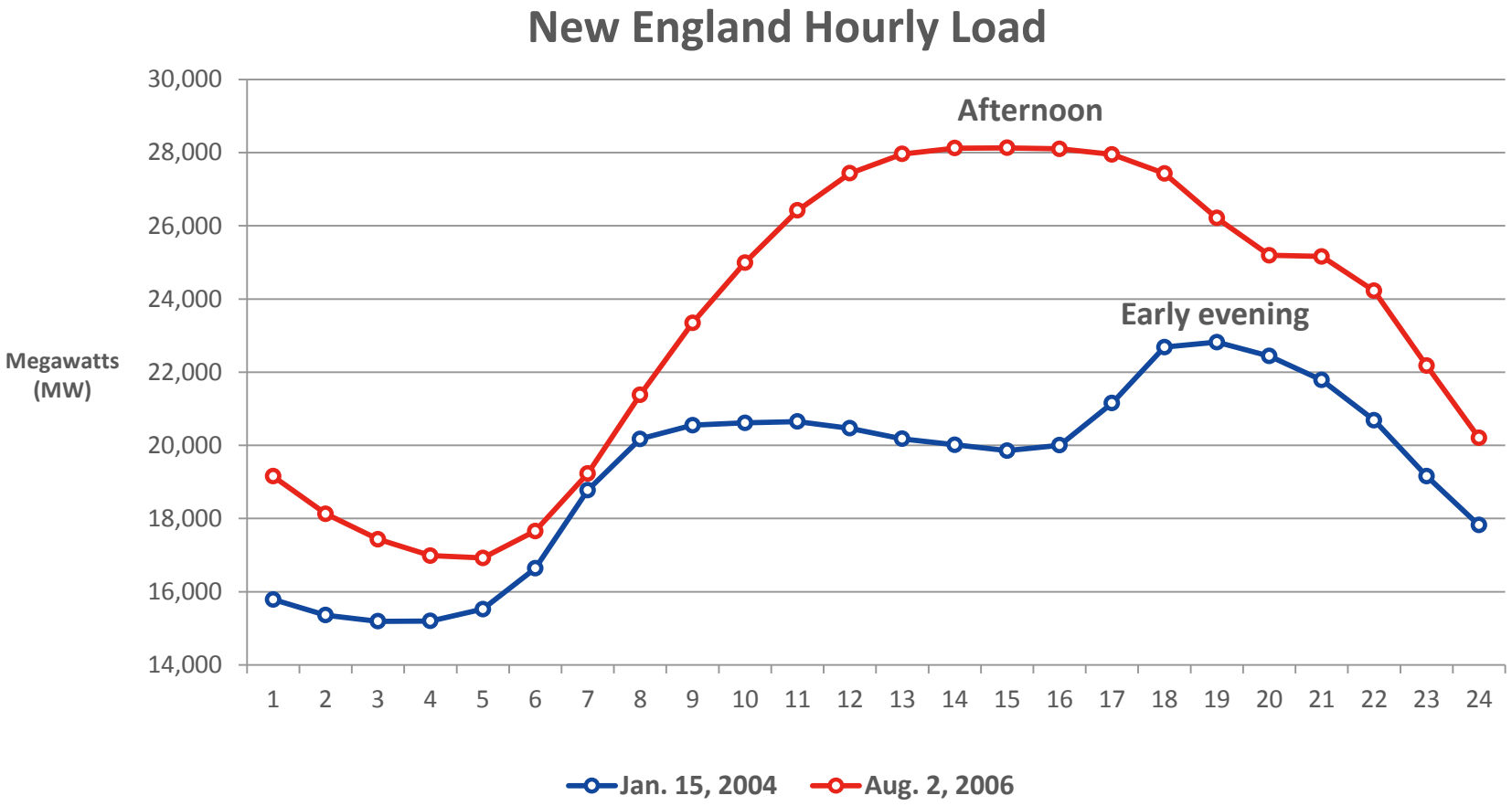


Temperature is dry-bulb temperature in degrees Fahrenheit based on weighted average of eight New England weather stations.

Source: 2013 CELT

Peak Day Profiles: Summer vs. Winter

Air-conditioning and lighting loads drive seasonal peaks



Winter 2013/2014 Outlook

- ISO expects to have adequate capacity for this winter
  - Winter 2013/2014 Reliability Program in place
- Winter outlook will be announced via:
  - Press release (http://www.iso-ne.com/nwsiss/pr/index.html)
  - ISO Newswire (http://www.isonewswire.com/)
  - Twitter (www.twitter.com/isonewengland)

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

- Connecticut PURA and DEEP
- Maine PUC (Electric and Emergency Staff)
- Massachusetts DPU and DOER
- New Hampshire PUC
- Rhode Island PUC, DPUC and OER
- Vermont DPS and PSB
- NECPUC

Governors' Offices

- Connecticut Governor's Office
- Maine Governor's Office
- Massachusetts Governor's Office
- New Hampshire Governor's Office
- New Hampshire Governor's Office of Energy and Planning
- Rhode Island Governor's Office
- Coalition of Northeast Governors

Emergency Management Agencies

- Connecticut Emergency Management Division
- Maine Emergency Management Agency
- Massachusetts Emergency Management Agency
- New Hampshire Bureau of Emergency Management
- Rhode Island Emergency Management Agency
- Vermont Emergency Management
- Northeast States Emergency Consortium

Reliability Councils

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

FERC Expects Pipeline Constraints and Higher Natural Gas and Electricity Prices in New England

- FERC winter outlook notes that natural gas prices in New England "may spike again this winter as temperatures fall and local pipelines become constrained."
- FERC expects a corresponding rise in wholesale electricity prices as a result of increases in the price of natural gas
- FERC outlook highlights the uncertainty of liquefied natural gas imports into New England

Why the ISO and stakeholders are taking action

- Operational and market improvements are needed to address emerging concerns for New England's increasing reliance on natural gas for power generation, and resource performance issues in the region

Summary: Recent and Coming Improvements

Working with stakeholders to improve electric market efficiency and enhance coordination with the natural gas market

Recently Implemented (2012–2013)	Near-Term Actions (2013–2014)	Longer-Term Actions (2018–2019)
• Ongoing improvements to information sharing with natural gas pipelines • Moved Day Ahead Market timeline in 2013 • Increased forward reserve requirements (2013)	• 2013-14 Winter Reliability Program (approved by FERC) • Proposed to tighten FCM Shortage Event trigger (pending at FERC) • Developed energy market offer-flexibility enhancements (take effect in Dec. 2014)	• Strengthen Forward Capacity Market Performance Incentives "Pay for Performance"

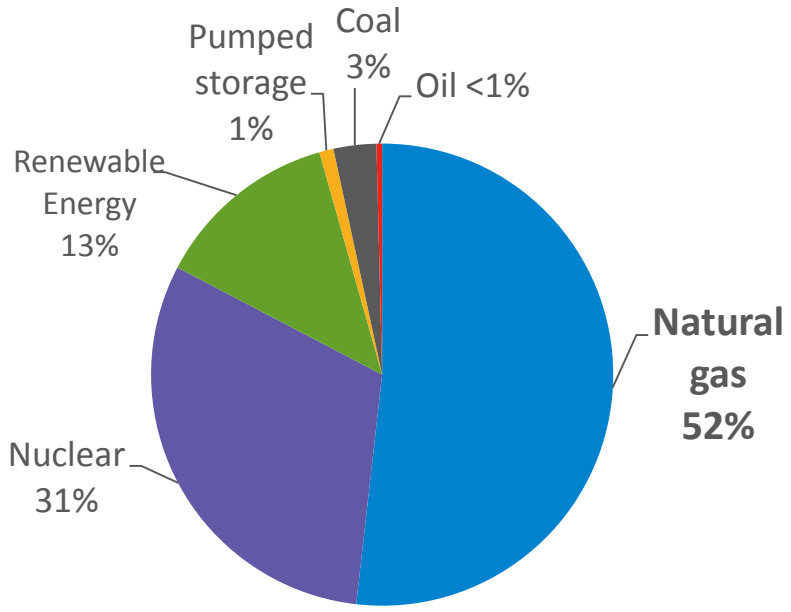
2013-2014 WINTER RELIABILITY PROGRAM

Background, Overview, and Results

Natural gas has become the dominant fuel for power generation in New England

Existing Generation

Natural gas has largely displaced oil- and coal-fired generation



Energy by Fuel Type, 2012 (GWh)

Observations for Oil Units

- Overall, oil-fired generators provide a very small amount of total system energy production
- However, the ISO relies on oil resources during winter periods when demand is high and the natural gas system is constrained

Oil-related operating issues last winter

- Oil-fired generators entered the winter with **low fuel inventories**
- Runtimes diminish quickly without **replenishment of oil tanks**
- Cold weather creates challenges for **fuel deliveries**
- As oil generation has diminished, its **supply chain has contracted**
- Extreme cold and pipeline constraints **increase demand on oil units**
- High natural gas prices made some oil-fired generators economic in the energy market, which **reduced already-low oil inventories**
- If cold weather had persisted, or had been colder than normal, the region may have had **insufficient fuel** to meet energy needs

Lessons learned and actions for this winter

- **Key point:** Stop-gap measure needed this winter to strengthen fuel security while long-term solutions are developed to address resource performance
- **Post-winter analysis (2012-2013)**
  - In February, the ISO produced a report for stakeholders documenting the operating challenges experienced last winter: Winter Operations Summary: January – February 2013, February 27, 2013
- **Pre-winter preparations (2013-2014)**
  - In March, the ISO and stakeholders began to assess the needs for a winter reliability program for 2013-2014
  - In June, the ISO proposed the Winter Reliability Program to FERC
  - This summer, the ISO accepted bids for the program
  - In September/October, FERC conditionally approved program and bid results
  - In October, ISO provided FERC additional information on bid selection process

2013-2014 Winter Reliability Program

- **Objective**: to obtain incremental energy inventory to help ensure reliable system conditions this winter assuming cold weather conditions (~ winter 2003-04, the coldest in 10 years)
- **Solutions**: focused on oil inventory service (including dual-fuel generation) and demand response
  - Oil inventory service could be in the form of storage at the beginning of the winter period (oil-fired generators), or quickly deliverable through replenishment of oil tanks (dual-fuel units)
- **Target**: sought up to 2.4 million megawatt-hours (MWh) of energy (equivalent of 4.2 million barrels of oil)
- **Winter period**: December 1, 2013 to February 28, 2014

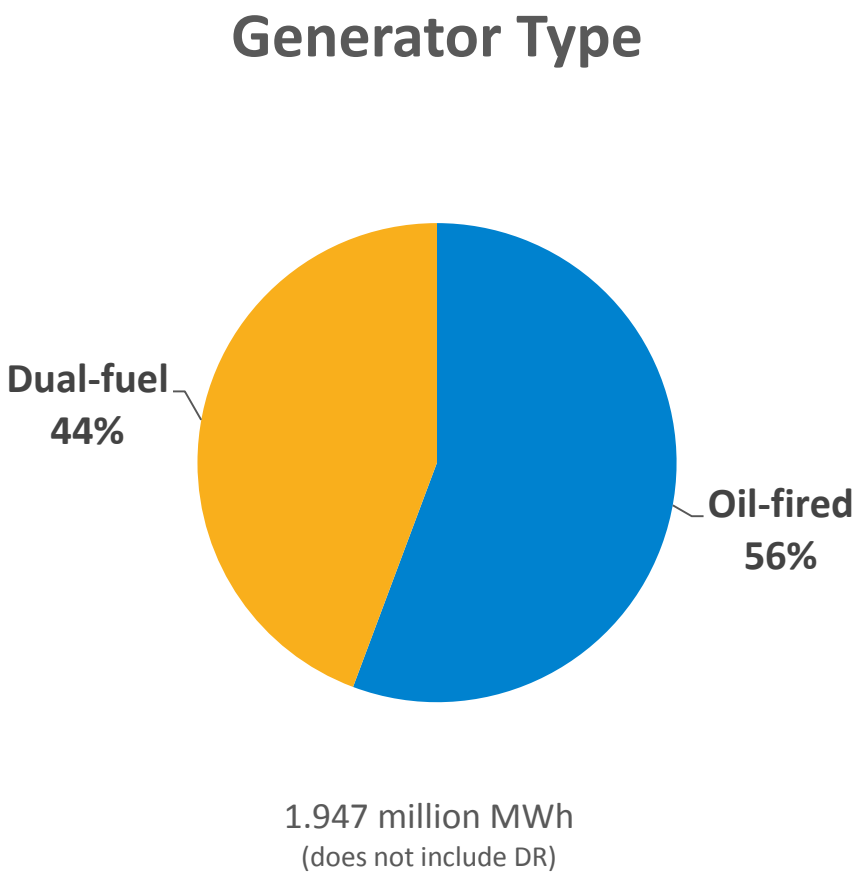
Procurement balanced reliability and costs

- **Results**
  - Primarily oil inventory; some dual-fuel generation and demand response
  - ISO selected most of the target amount of resources
  - Procurement balanced fuel security and reliable operations with cost

	Bids *MWh*	**Price** *$ (Millions)*
Target amount of energy from oil inventory services or demand response	2.4 million MWh	-
Final bids	2.29 million (96% of target)	$114.3
Selected by ISO	1.95 million (81% of target)	$75.1

Breakout of oil inventory services

- Oil-fired generators provide most of the energy needed
- Among dual-fuel generators, some rely on ability to replenish oil tanks
- Entities selected to provide services are listed in ISO's August 26 FERC filing of program bid results



Questions