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ISO New England Overview and Regional Update

Connecticut General Assembly

Energy & Technology Committee

Eric Johnson

DIRECTOR, EXTERNAL AFFAIRS

Mary Louise "Weezie" Nuara

EXTERNAL AFFAIRS REPRESENTATIVE

About ISO New England

- **Regulated by** the Federal Energy Regulatory Commission (FERC)
- **Reliability coordinator** for New England under the North American Electric Reliability Corporation (NERC)
- Nearly two decades of experience **overseeing** New England's restructured electric power system
- **Independent** of companies doing business in the marketplace

Reliability is the Core of ISO New England's Mission

Fulfilled by three interconnected and interdependent responsibilities

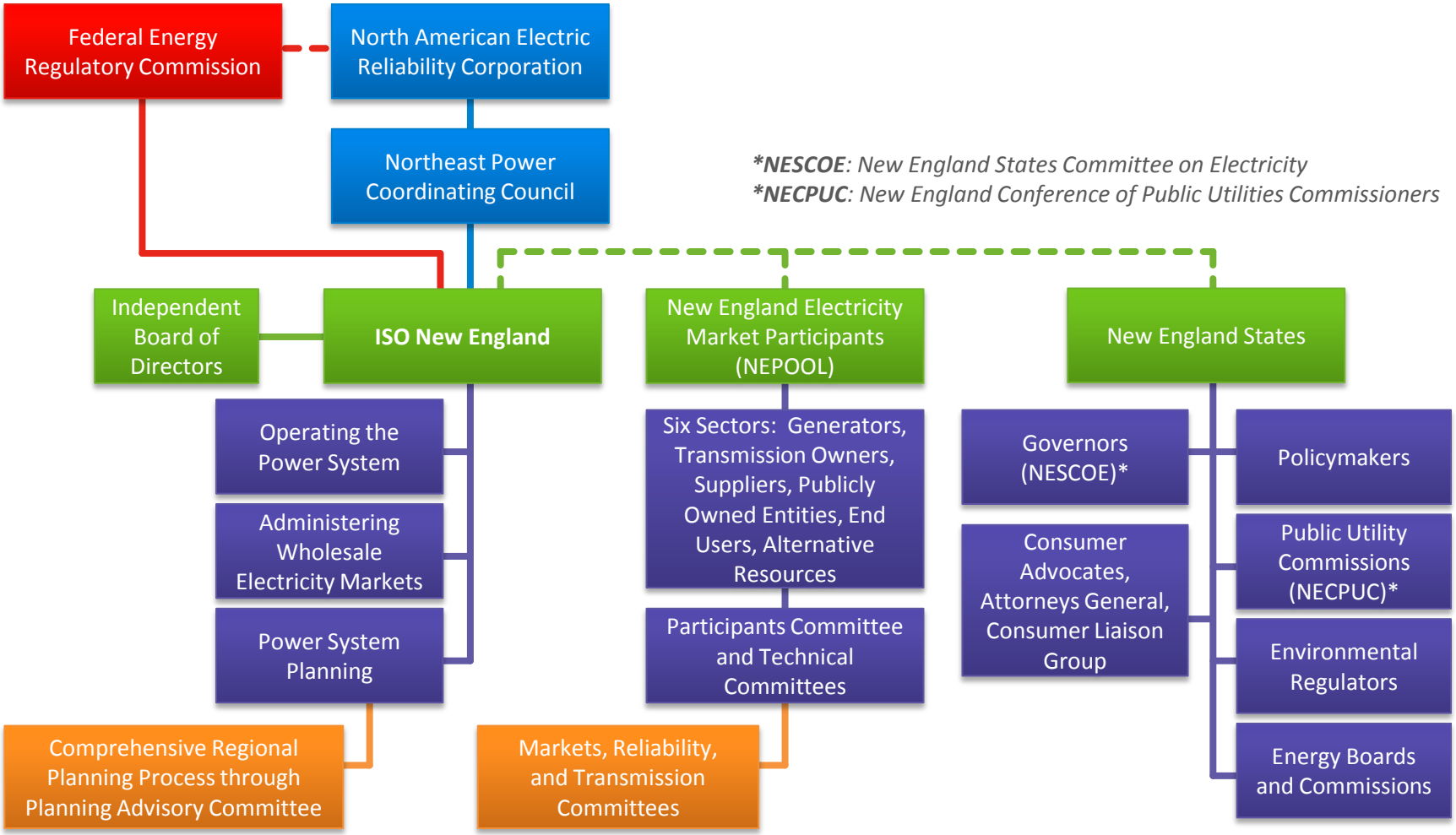
Overseeing the day-to-day operation of New England's electric power generation and transmission system

Managing comprehensive regional power system planning

Developing and administering the region's competitive wholesale electricity markets

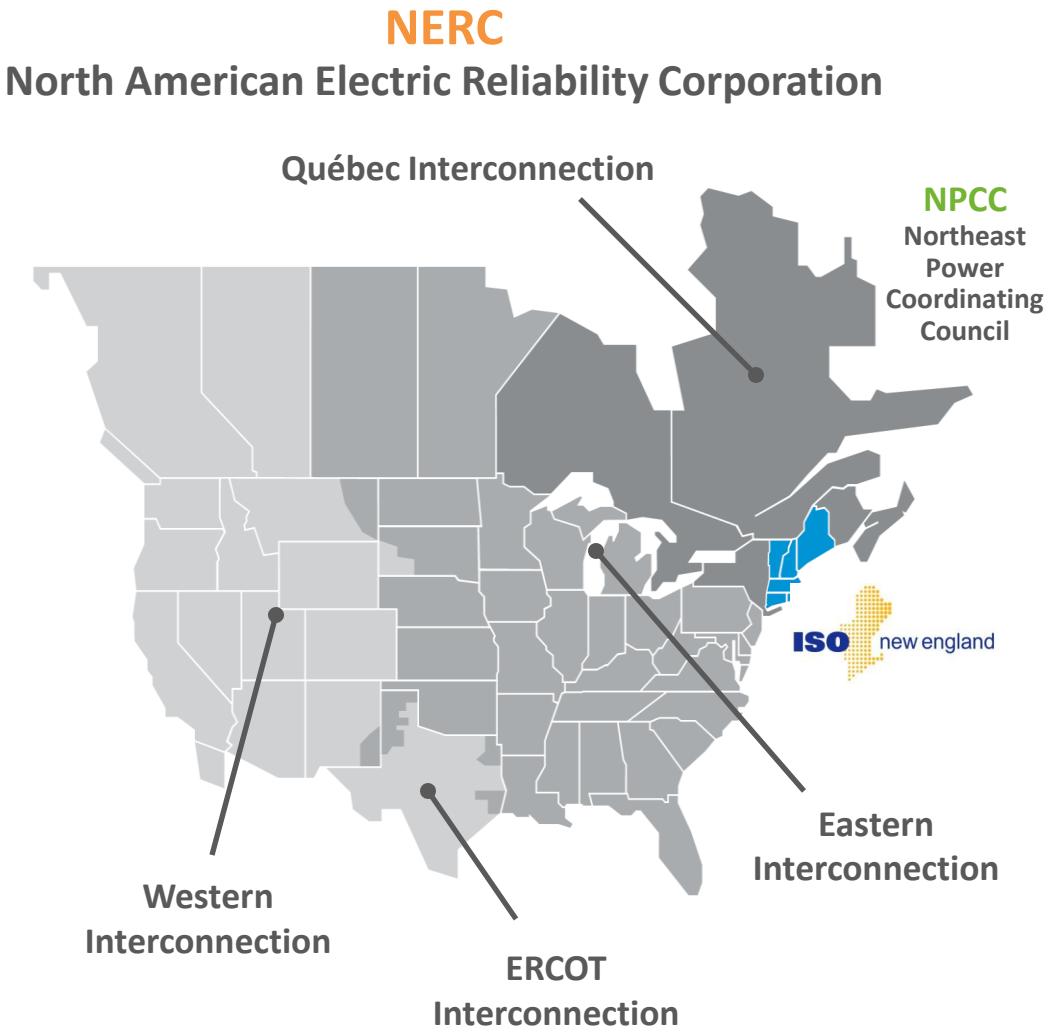
Federal Entities and an Independent Board Provide Oversight of ISO's Responsibilities

Robust stakeholder process for states and market participants informs ISO-NE



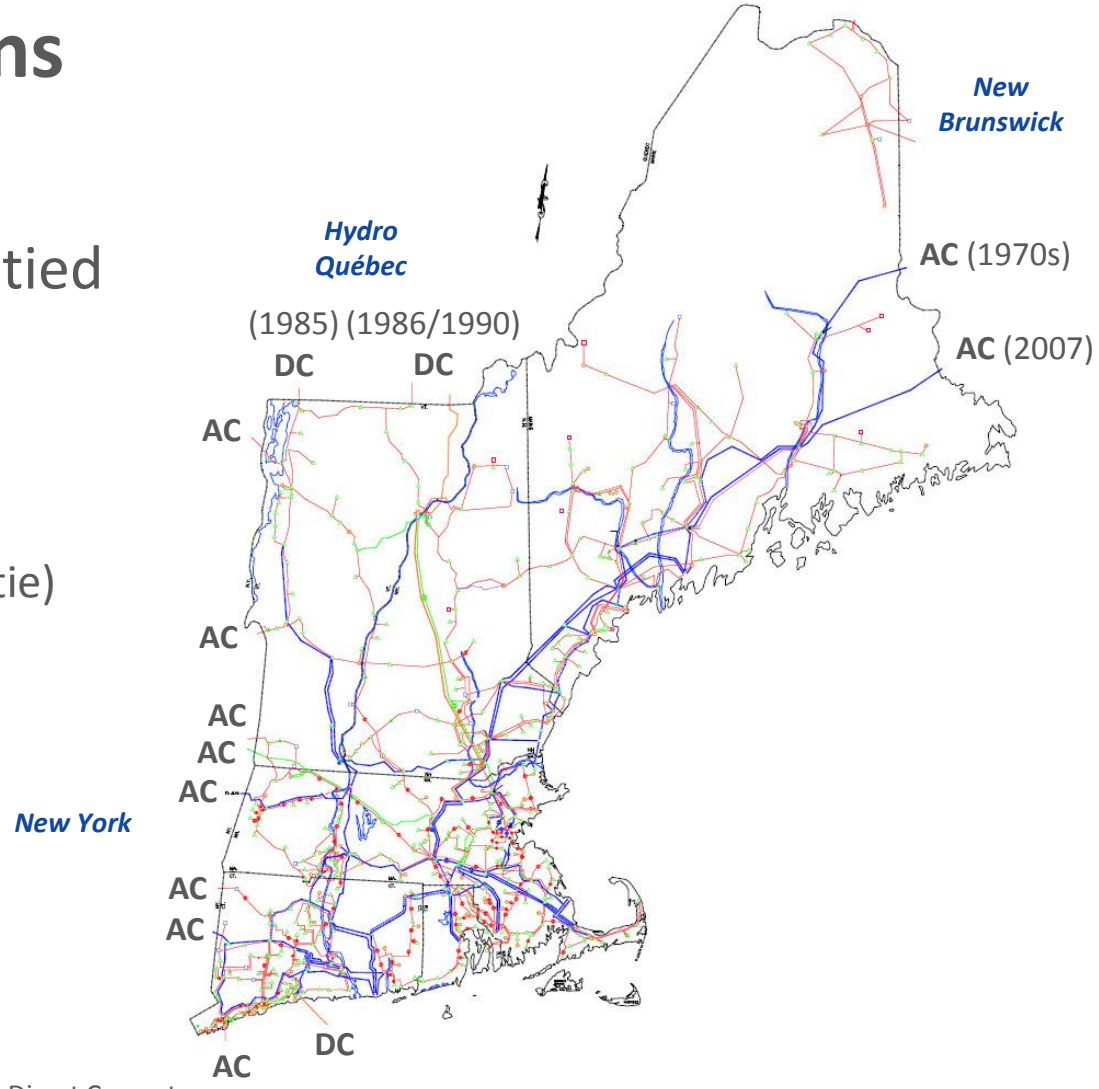
ISO New England is Part of a Larger Electric Power System

- Eastern Interconnection spans from Rocky Mountains to East Coast and Canadian Maritimes
  - Primarily alternating-current (AC) transmission
  - New England linked to rest of Eastern Interconnection via transmission ties to New York and New Brunswick
- Tied to Quebec only through direct-current (DC) transmission
- 2003 Blackout ushered in wide-area monitoring and mandatory reliability standards



New England has Multiple Ties to Neighboring Regions

- Transmission system is tied to neighboring power systems in the U.S. and Eastern Canada:
  - New York (8 AC ties, 1 DC tie)
  - Hydro Québec (2 DC ties)
  - New Brunswick (2 AC ties)



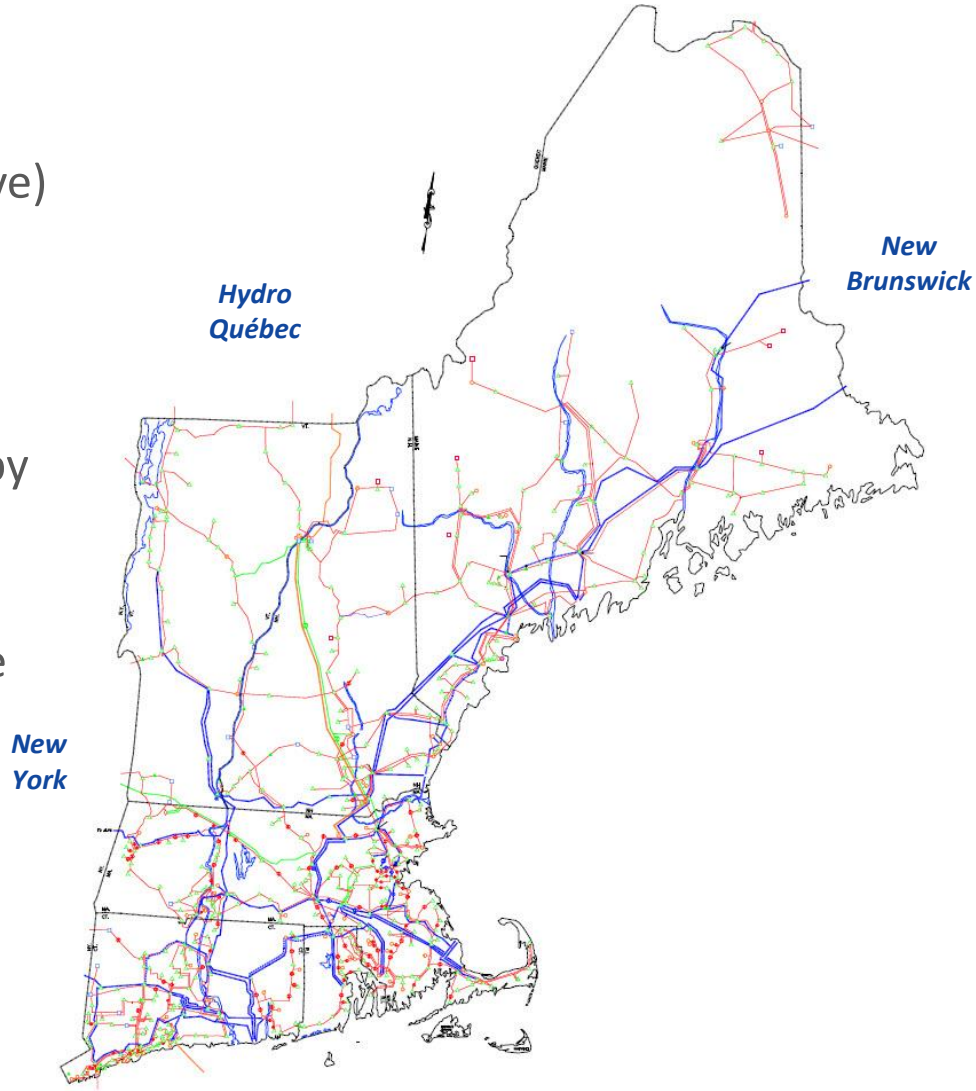
Note: AC stands for Alternating Current and DC stands for Direct Current

New England's Energy Use at a Glance

- **6.5 million** households and businesses; **14 million** population
- **28,130 MW** all-time summer peak demand set on August 2, 2006
- **22,818 MW** all-time winter peak demand set on January 15, 2004
- Region's *peak* demand forecasted to grow **1.3%** annually
- Region's *overall* electricity demand forecasted to grow **1.0%** annually
- Energy efficiency slows growth in peak demand and flattens overall electricity demand

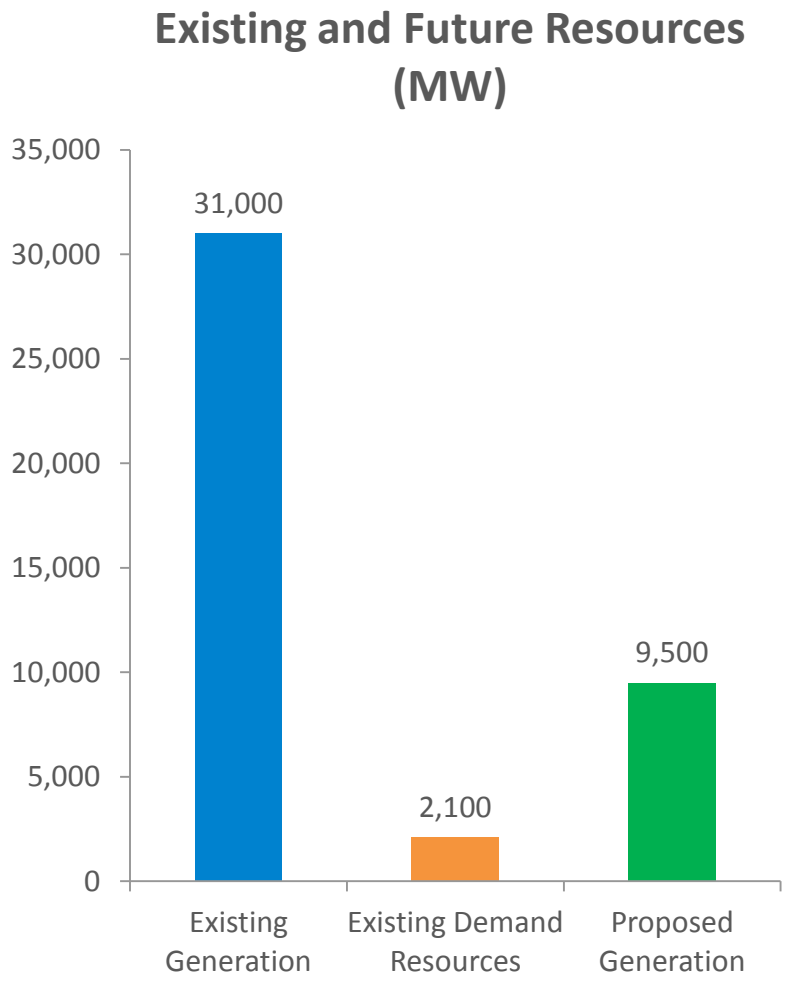
New England's Transmission Grid at a Glance

- **8,500 miles** of high-voltage transmission lines (115 kV and above)
- **13 transmission interconnections** to power systems in New York and Eastern Canada
- **16%** of region's energy needs met by imports in 2014
- **$7 billion** invested to strengthen transmission system reliability since 2002; **$4.5 billion** planned
- Developers propose multiple transmission projects to access non-carbon-emitting resources



New England's Generation and Demand Resources at a Glance

- **350** generators in the region
- **31,000 MW** of generating capacity
- **9,500 MW** of proposed generation
- **3,500 MW** of generation capacity retiring over the next five years
- **700 MW** of active demand response and **1,400 MW** of energy efficiency with capacity supply obligations



New England's Wholesale Markets at a Glance

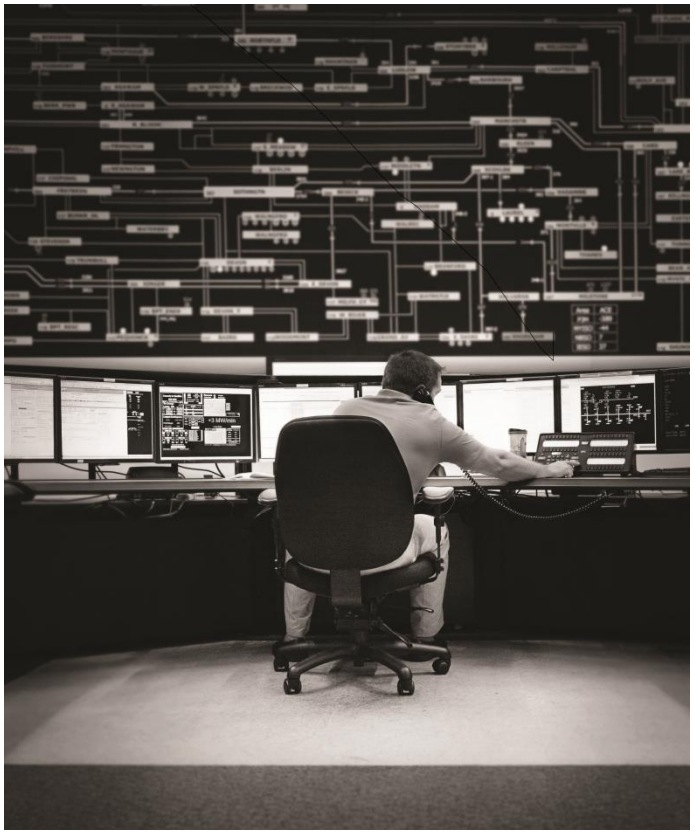
- More than **400** buyers and sellers in the markets
- **$10.4 billion** traded in wholesale electricity markets in 2014
  - **$9.1 billion** in energy markets
  - **$1.3 billion** in capacity and ancillary services markets
- Forward and spot markets
- Prices vary by time and location, and by changes in demand and available resources
- Extensive analysis and reporting of market results

Note: 2014 wholesale electricity market data is still preliminary and subject to reconciliation

Major Responsibility: Operations

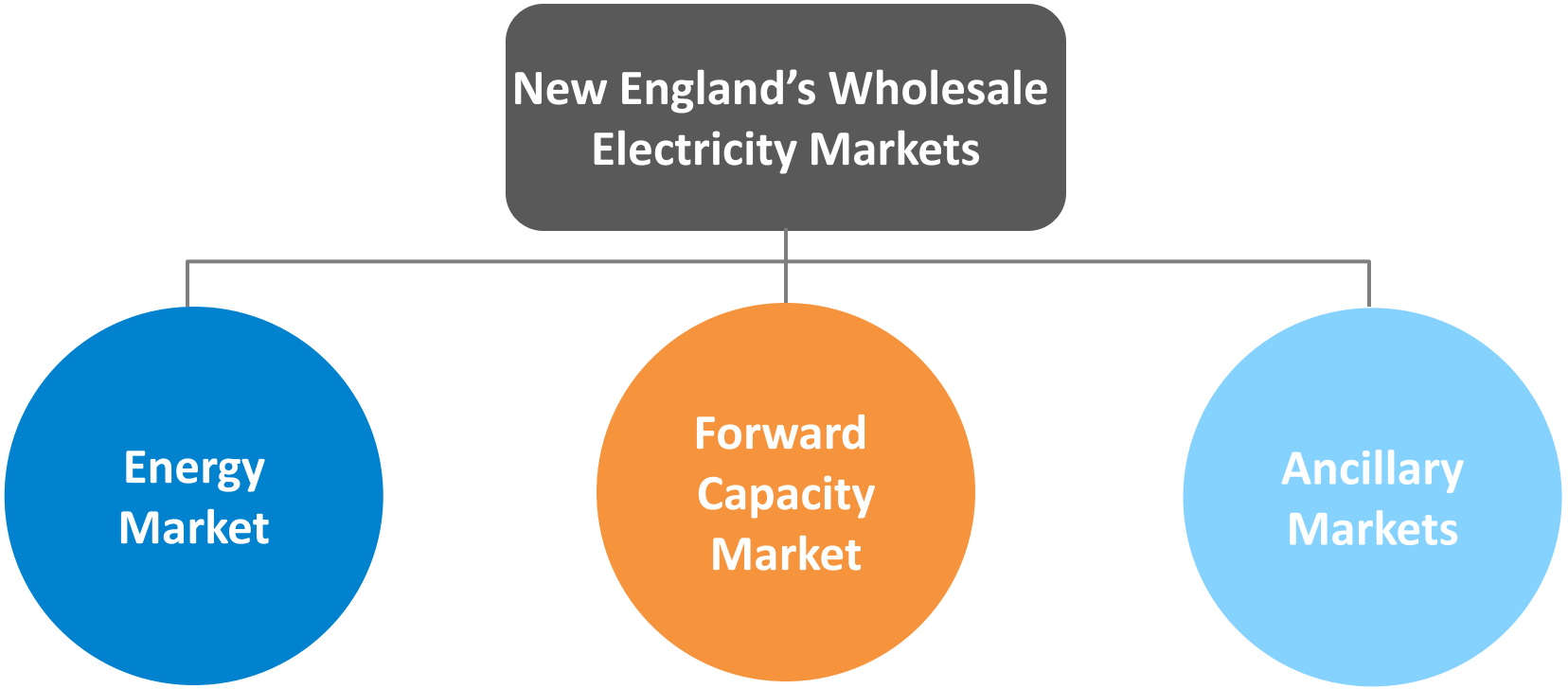
Overseeing the day-to-day operation of New England's electric power generation and transmission system

- Maintain minute-to-minute reliable operation of region's power grid
- Perform centralized dispatch of the lowest-priced resources
- Coordinate and schedule maintenance outages
- Coordinate operations with neighboring power systems



Major Responsibility: Markets

Developing and administering the region's competitive wholesale electricity markets



Daily market for wholesale customers to buy and sell electric "energy"

Three-year forward market that commits "capacity" resources to meet system resource-adequacy needs

Reserves and regulation provide support for system operations

Major Responsibility: Planning

Managing comprehensive regional power system planning

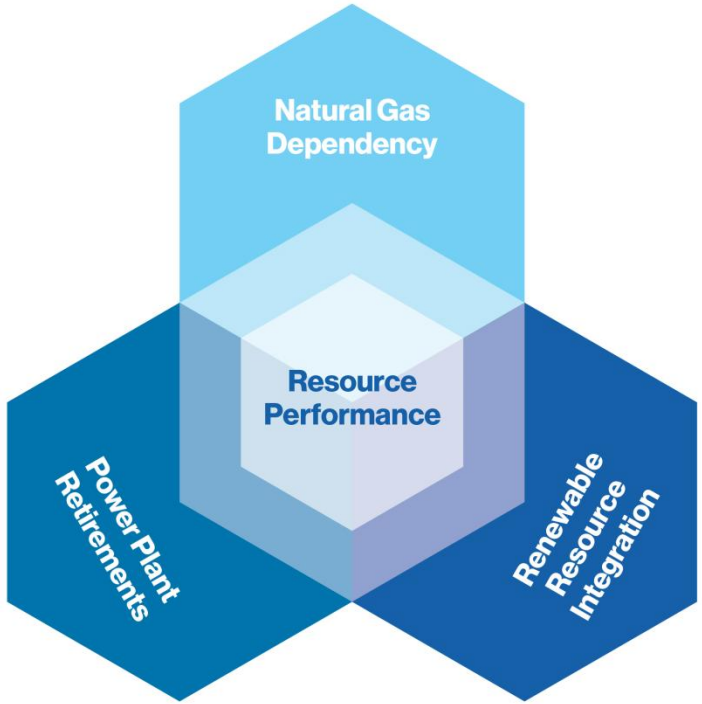
- Manage regional power system planning in accordance with mandatory reliability standards
- Administer requests for interconnection of generation, and regional transmission system access
- Conduct transmission system needs assessments
- Plan regional transmission system to provide regional network service
- Develop annual Regional System Plan (RSP) with a ten year planning horizon

ISO New England's Strategic Planning Initiative

Focused on developing solutions to the region's top reliability risks

Reliability requires a flexible, high-performance fleet:

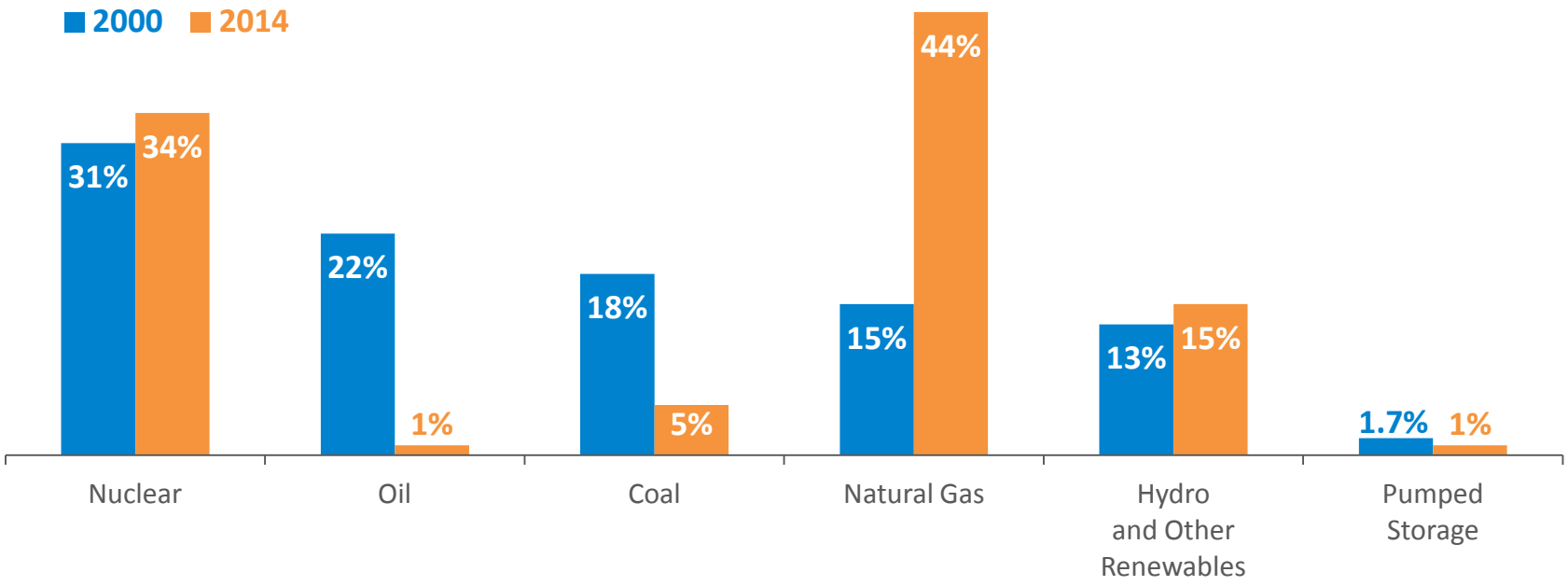
- Natural Gas Dependency
  - "Just-in-time" fuel delivery presents an immediate risk to reliability
- Power Plant Retirements
  - New England will need new ways to meet peak demand as aging plants close
- Renewable Resource Integration
  - Balancing variable generation with reliability will require changes in system operations



Dramatic Changes in the Energy Mix

The fuels used to produce New England's electric energy have shifted as a result of economic and environmental factors

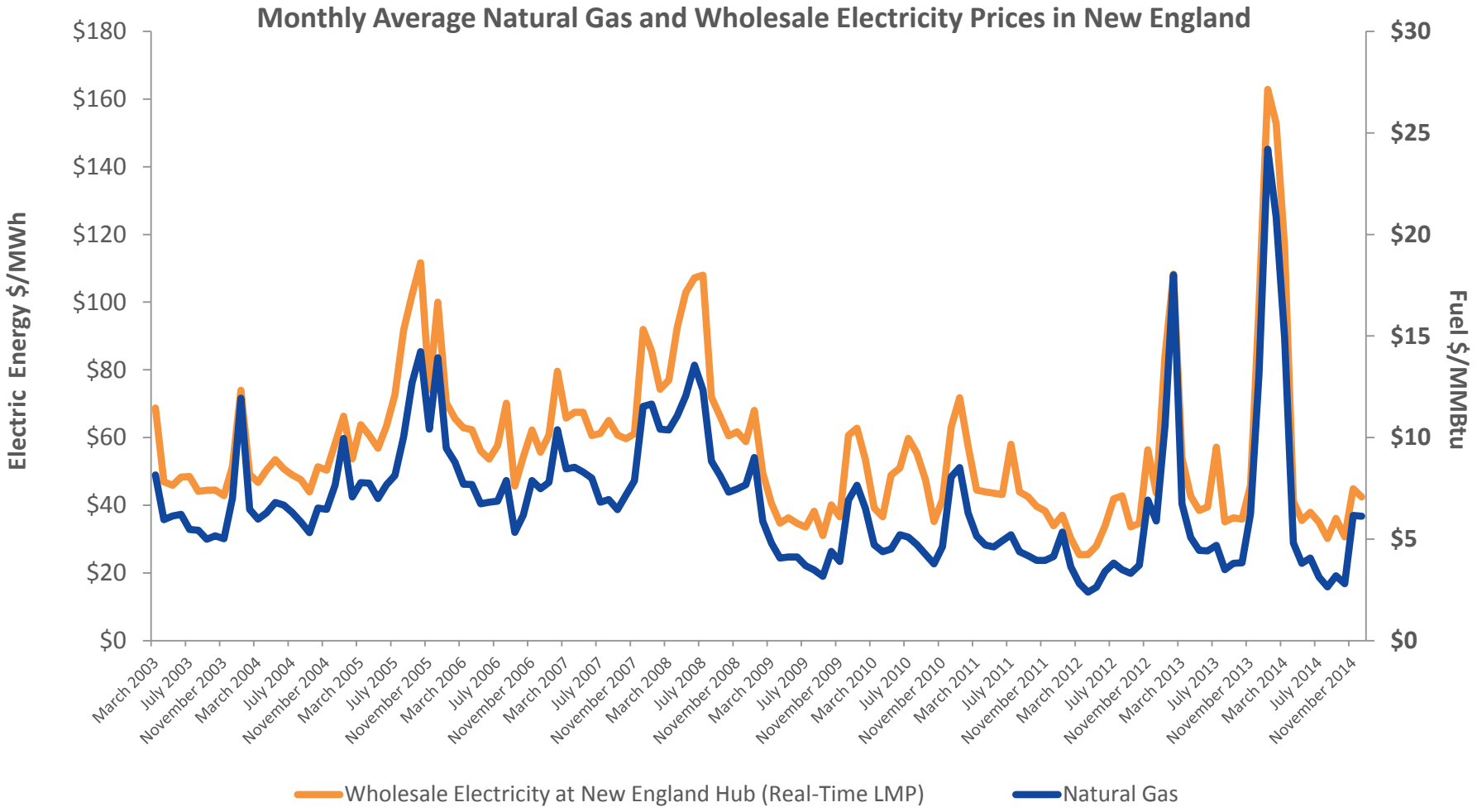
Percent of Total **Electric Energy** Production by Fuel Type
(2000 vs. 2014)



Source: ISO New England Net Energy and Peak Load by Source
Other renewables include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and miscellaneous fuels

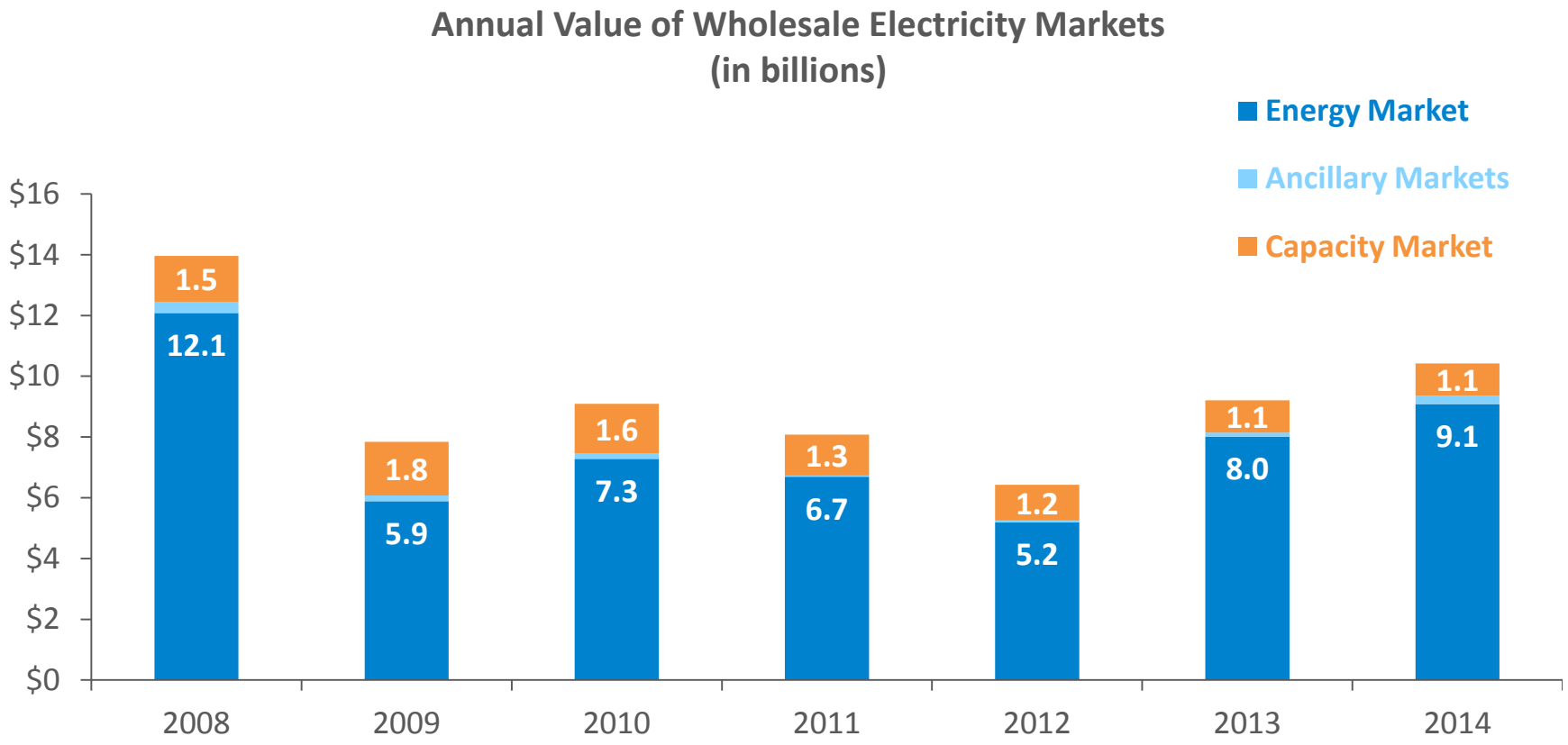
Natural Gas and Wholesale Electricity Prices are Linked

Because of New England's heavy reliance on natural gas as a fuel source, natural gas typically sets the price for wholesale electricity



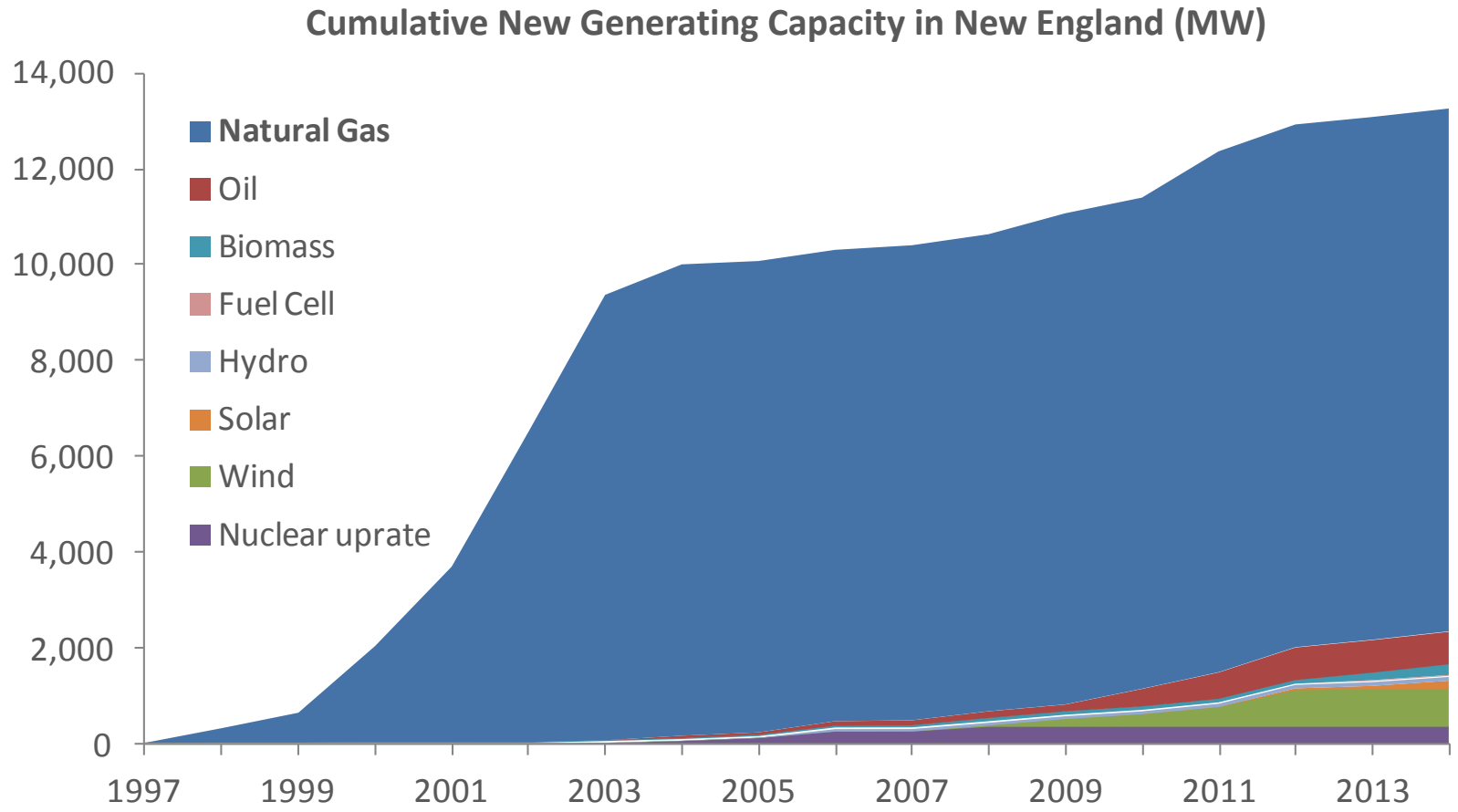
Total Value of Markets Varies with Fuel Costs

Annual wholesale market costs have ranged from $6 billion to $14 billion



Source: 2013 Report of the Consumer Liaison Group, Appendix C; 2014 data is still preliminary and subject to reconciliation

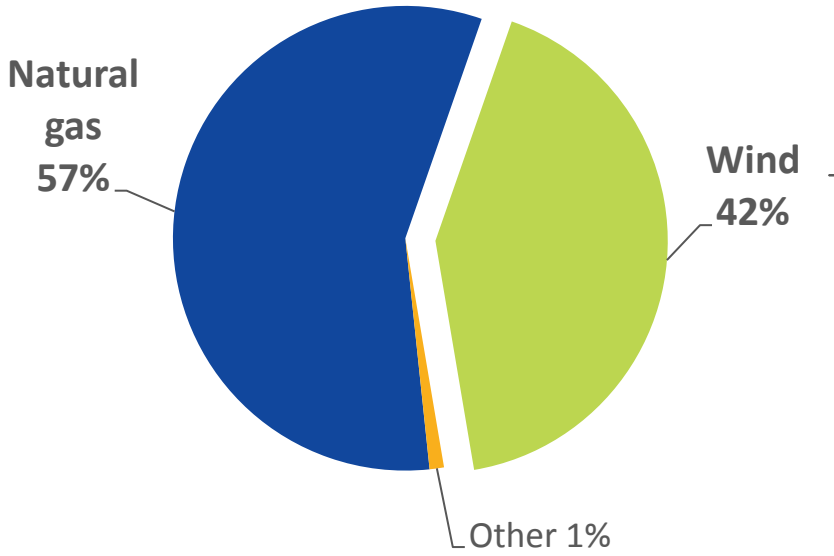
Region Has Not Developed Gas Pipeline Infrastructure to Keep Pace With Growth of Gas-fired Generation



Proposed Generation Is Primarily Gas and Wind

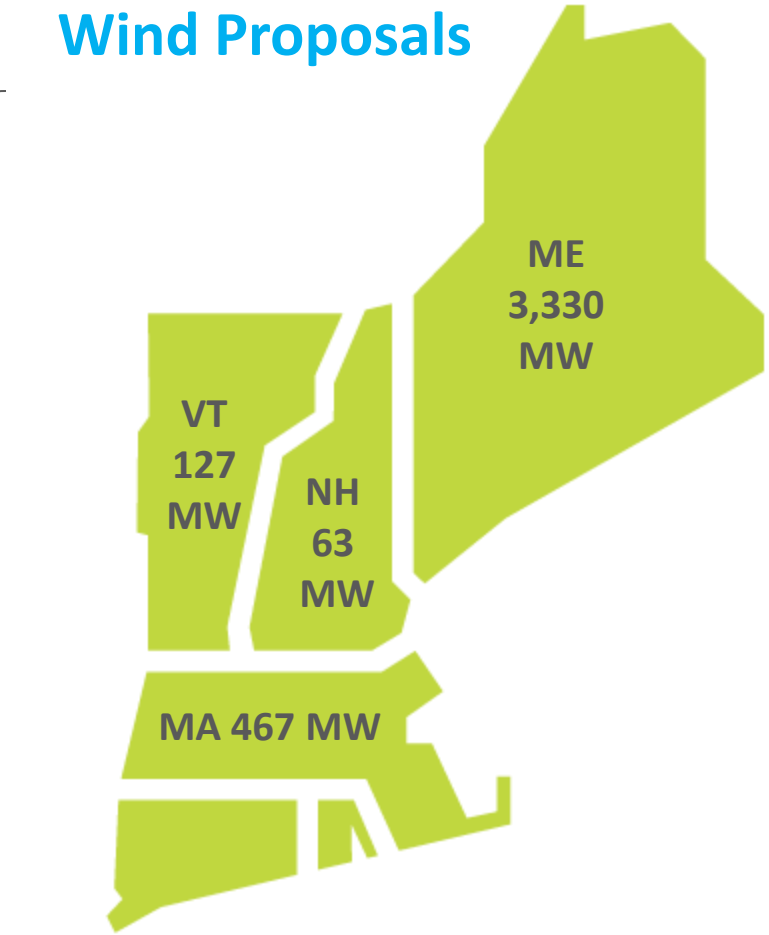
All Proposed Generation

Developers propose >5 GW of gas-fired generation and approximately 4 GW wind; wind is mostly onshore in northern New England and offshore in southern New England



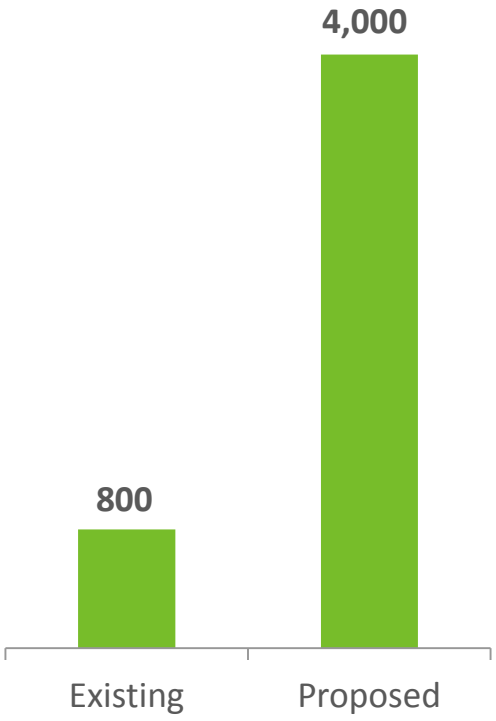
Source: ISO Generator Interconnection Queue (January 2015)
FERC Jurisdictional Proposals Only

Wind Proposals



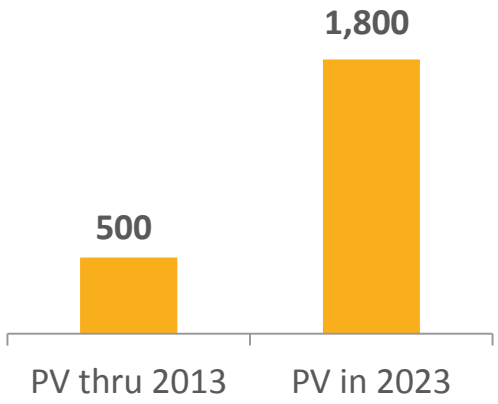
Renewable and EE Resources Are Trending Up

Wind
(MW)



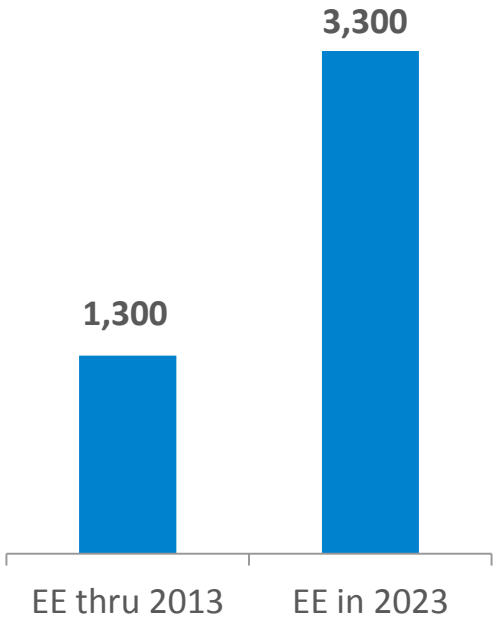
Nameplate capacity of existing wind resources and proposals in the ISO-NE Generator Interconnection Queue; megawatts (MW).

Solar
(MW)



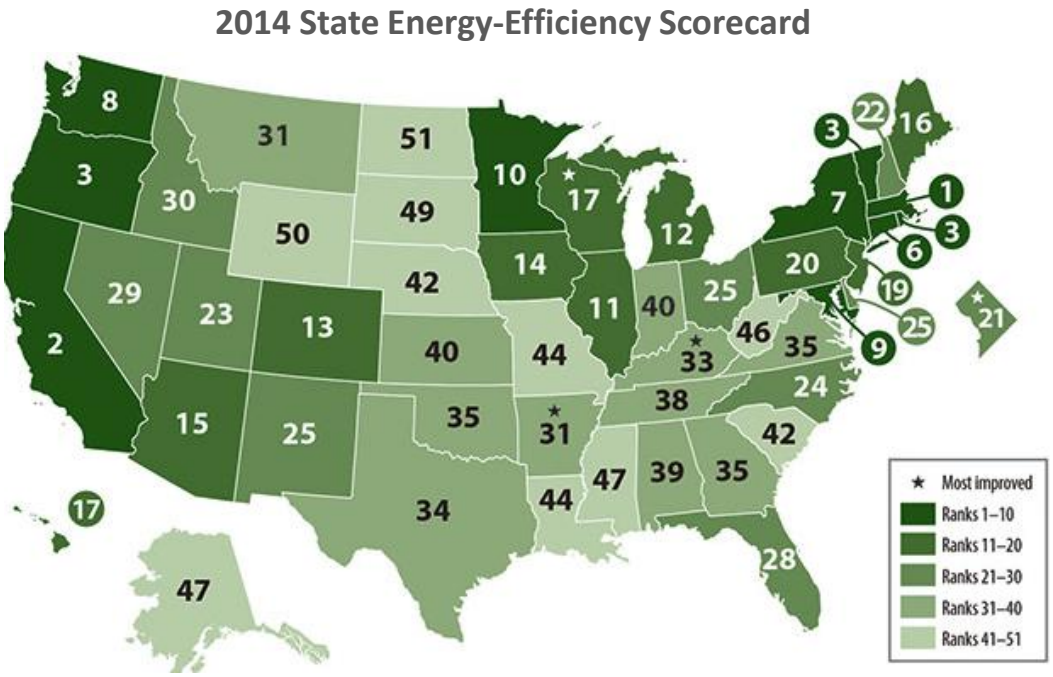
2014 Final Interim ISO-NE Solar PV Forecast, nameplate capacity, based on state policies.

Energy Efficiency
(MW)



2014 CELT Report, EE through 2013 includes EE resources participating in the Forward Capacity Market (FCM). EE in 2023 includes an ISO-NE forecast of incremental EE beyond the FCM.

Energy Efficiency is a Priority for New England



Source: American Council for an Energy-Efficient Economy

Ranking of state EE efforts by the *American Council for an Energy-Efficient Economy*:

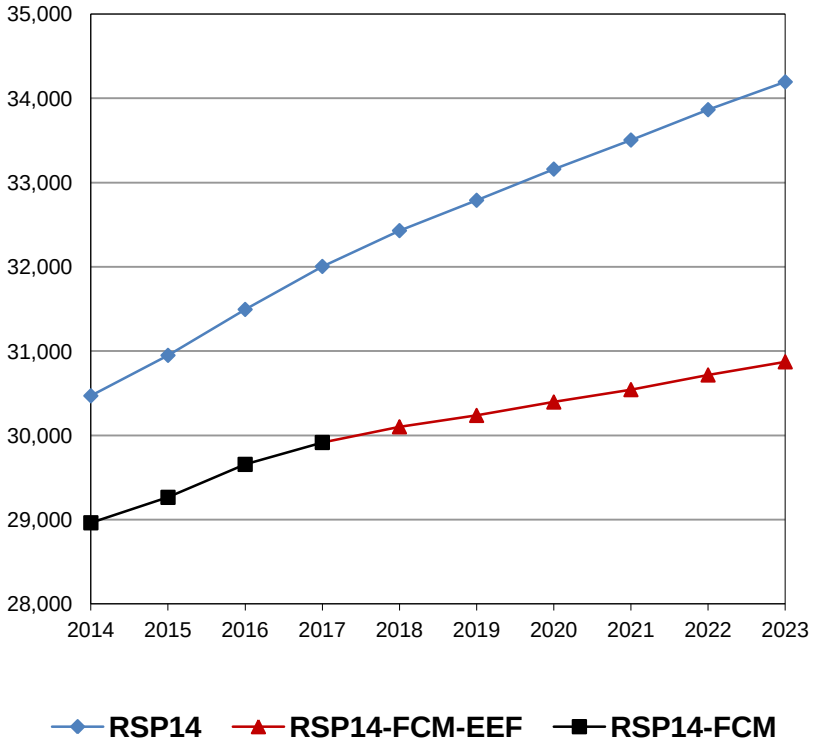
– Massachusetts	1
– Vermont	3
– Rhode Island	3
– Connecticut	6
– Maine	16
– New Hampshire	22

- Billions spent over the past few years and more on the horizon
  - Approximately $2.3 billion invested from 2009 to 2012
  - ISO estimates $6.3 billion to be invested in EE from 2017 to 2023

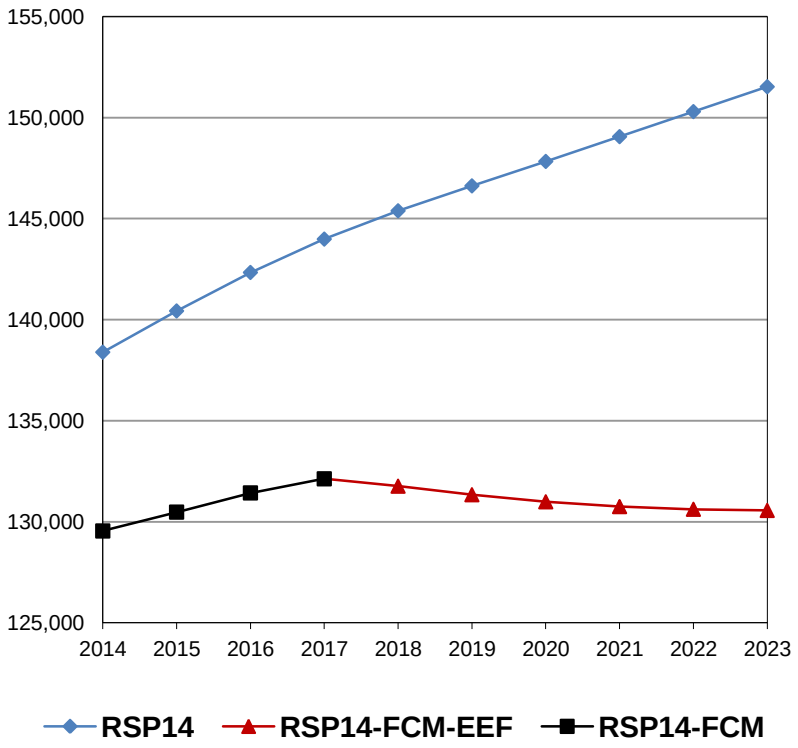
EE Affects New England's Electricity Consumption

Peak demand growth is lower; energy use is flat

New England: Summer 90/10 Peak (MW)



New England: Annual Energy Use (GWh)

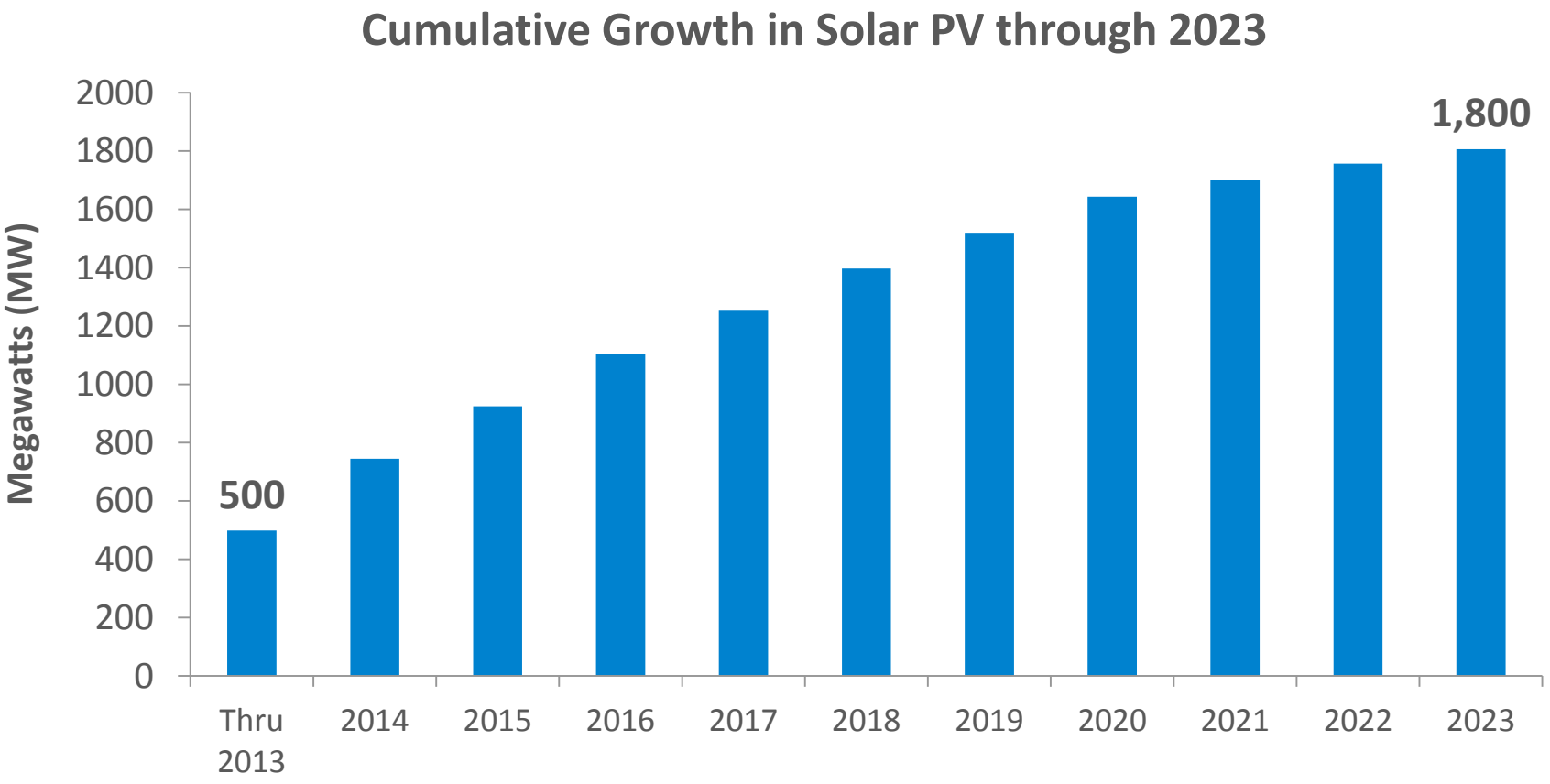


Source: Final ISO New England EE Forecast for 2018-2023 (April 2014)

ISO New England Developed a Distributed Generation Forecast

- The ISO began an initiative in September 2013, working with the states and regional utilities, to forecast long-term incremental DG growth in New England
- The ISO created a regional Distributed Generation Forecast Working Group (DGFWG) to collect data on DG policies and implementation from the states and regional utilities
- DGFWG assisted the ISO in developing a forecast methodology
- DGFWG focused on the following types of DG resources
  - Under 5 MW
  - Connected to the distribution system
  - Not visible to the ISO directly
  - Focused on solar PV, the largest DG component
- The ISO's April 2014 interim DG forecast shows steady growth in solar PV through 2023
  - Interim forecast is based on state policy goals for DG

ISO's Interim DG Forecast Shows Growth in Solar PV through 2023



Source: Final Interim PV Forecast (April 2014); Note: MW values are AC nameplate

Resource Shift Creates Reliability Challenges

- **ISO New England** is increasingly reliant on resources with uncertain performance and availability
  - **Intermittent resource growth** with inherently uncertain output
  - **Natural gas resources** lack fuel storage and rely on "just-in-time" fuel
  - **Coal, oil-steam fleet** is being displaced by more efficient resources
- ISO estimates **up to 8,300 MW of non-gas-fired generation is "at risk" for retirement by 2020** (28 older oil and coal units)
  - If all retire, ISO estimates 6,300 MW of new or repowered capacity will be needed in the region
- More than **3,500 MW of generation are retiring over the next five years**
  - Source: Status of Non-Price Retirement Requests; November 21, 2014

Region Is Losing Non-Gas Resources

Major Retirements Underway:

- Salem Harbor Station (749 MW)
  - 4 units (coal & oil)
- Vermont Yankee Station (604 MW)
  - 1 unit (nuclear)
- Norwalk Harbor Station (342 MW)
  - 3 units (oil)
- Brayton Point Station (1,535 MW)
  - 4 units (coal & oil)
- Mount Tom Station (143 MW)
  - 1 unit (coal)
- *Additional retirements are looming*

Source: *Generator Retirement Study*, ISO New England, 2012.

U.S. Department of Energy Is Examining New England's Energy Infrastructure Challenges

- U.S. Department of Energy (DOE) is studying energy infrastructure challenges as part of its Quadrennial Energy Review (QER)
- ISO-NE has worked extensively with DOE throughout 2014 to articulate New England's challenges
  - ISO-NE has highlighted the region's increasing reliance on natural gas-fired resources and the need for additional energy infrastructure
- DOE's initial report is expected in February 2015 (focused on transmission, storage, and distribution of energy)

For More Information…

- Subscribe to the ***ISO Newswire***
  - *ISO Newswire* is your source for regular news about ISO New England and the wholesale electricity industry within the six-state region
- Log on to **ISO Express**
  - ISO Express provides real-time data on New England's wholesale electricity markets and power system operations
- Follow the ISO on **Twitter**
  - @isonewengland
- Download the **ISO to Go App**
  - ISO to Go is a free mobile application that puts real-time wholesale electricity pricing and power grid information in the palm of your hand

Questions

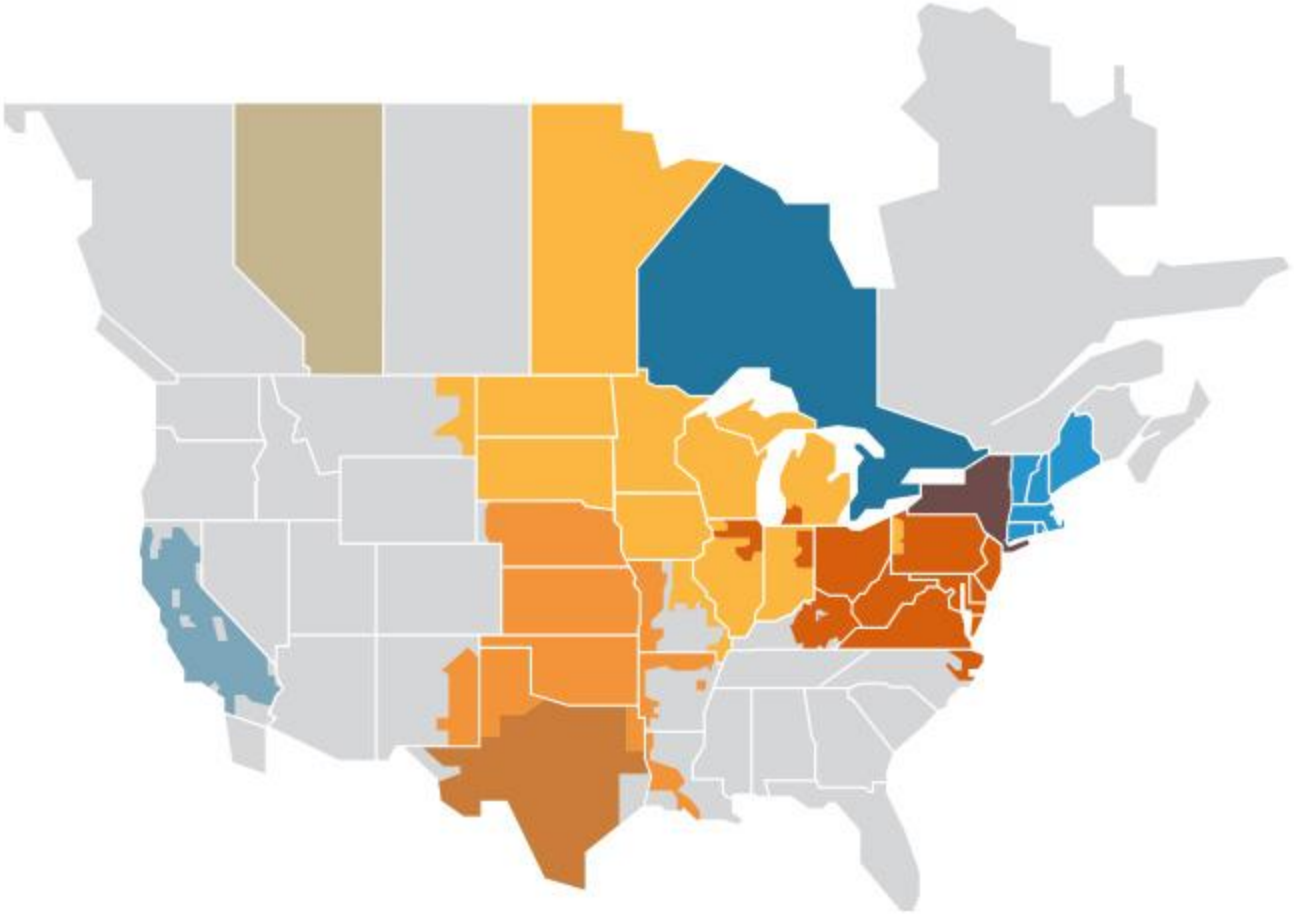
APPENDIX: BACKGROUND INFORMATION

ISO New England Is Part of the ISO/RTO Council

There are Nine ISOs and RTOs in North America

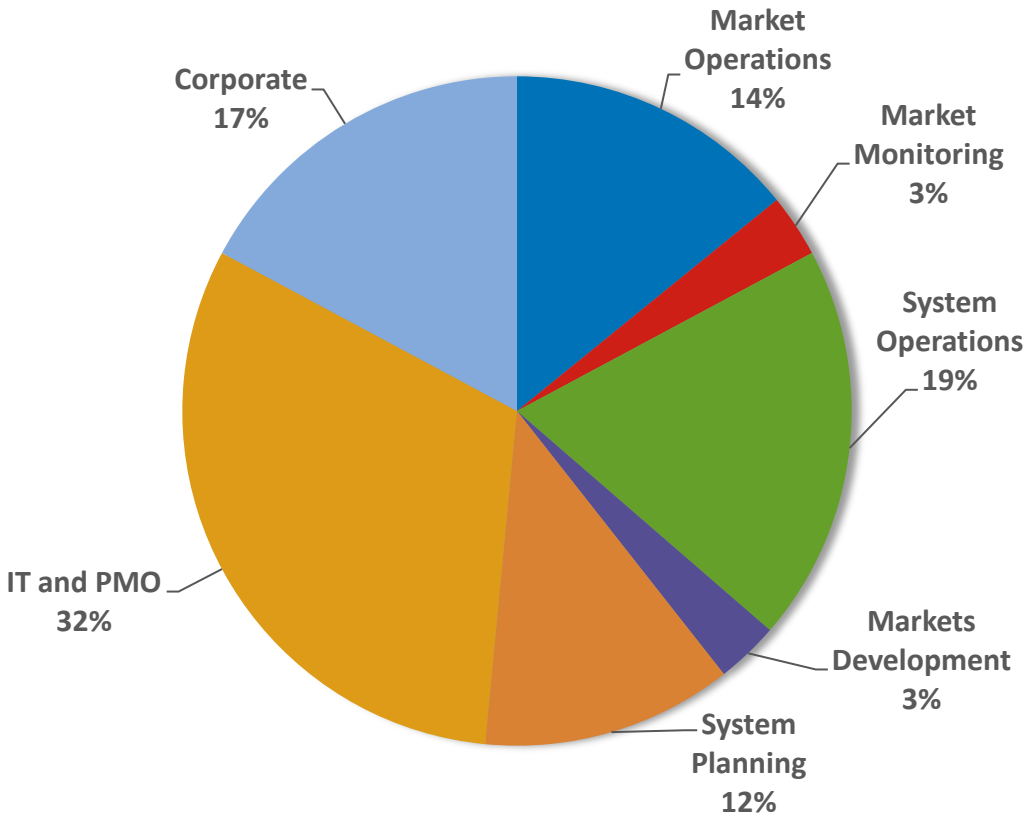
ISO New England covers the six states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

- California ISO
- Alberta Electric System Operator
- Electricity Reliability Council of Texas (ERCOT)
- Southwest Power Pool
- Midcontinent ISO
- Ontario Independent Electricity System Operator
- PJM Interconnection
- New York ISO
- ISO New England



ISO New England's Workforce at a Glance

- Key technical roles:
  - Engineers
  - Operators
  - Analysts
  - Economists
  - Forecasters
  - Trainers

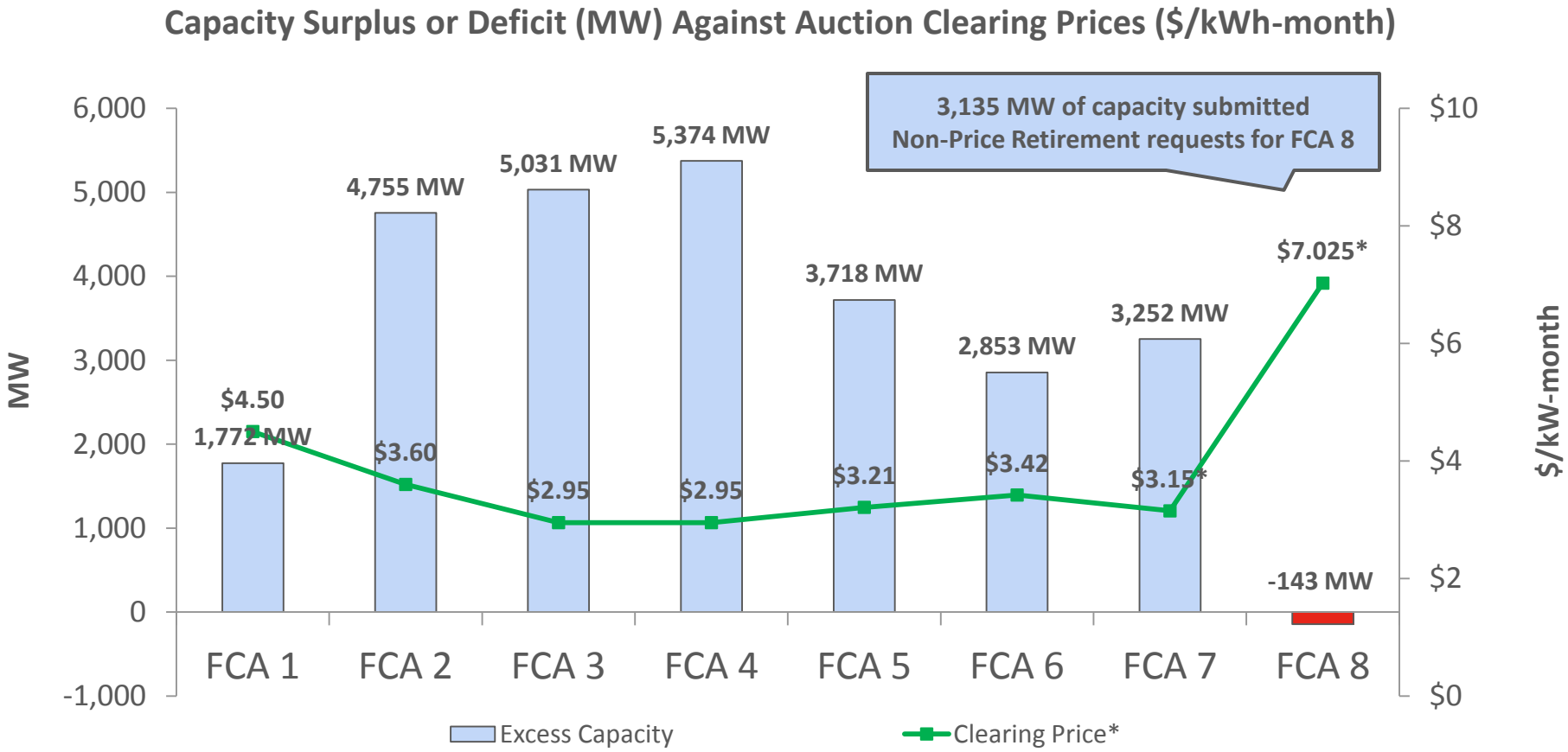


Corporate: Finance, HR, Communications, External Affairs, and Legal; IT and PMO: Information Technology and Program Management Office

ISO New England Follows Best Practices to Address Cybersecurity Risks

- Physical and cyber security are a top priority for the ISO
- The nine Independent System Operators and Regional Transmission Organizations (ISOs/RTOs) in North America are subject to mandatory NERC Critical Infrastructure Protection (CIP) reliability standards that address cybersecurity
- The ISO is actively engaged in NERC grid security exercises that test the readiness of the electricity subsector to respond to physical and cybersecurity threats (e.g., GridEx II)

Capacity Prices Vary with Changes in Supply

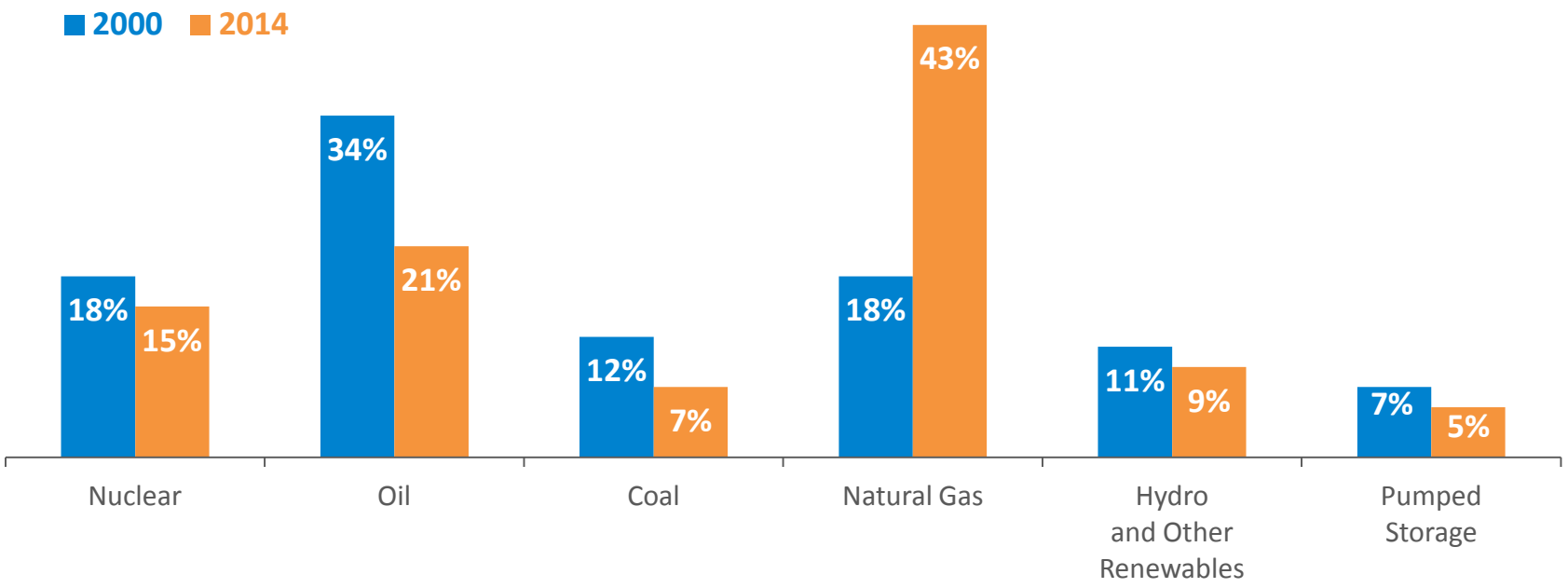


* Prices cleared at the floor price in the first seven auctions due to excess capacity; therefore, resources were paid a slightly lower prorated price. The clearing price in NEMA/Boston was $14.999/kW-month for FCA 7 (new capacity received $14.999/kW-month and existing capacity received an administrative price of $6.66/kW-month). The clearing price in FCA 8 was $15.00/kW-month (new capacity in all zones and existing capacity in NEMA/Boston received $15.00/kW-month and existing capacity in all other zones received an administrative price of $7.025/kW-month).

Dramatic Changes in Power System Resources

The resources making up the region's installed generating capacity have shifted from nuclear, oil and coal to natural gas

Percent of Total System **Capacity** by Fuel Type
(2000 vs. 2014)



Source: 2014 CELT Report, Summer Seasonal Claimed Capability (SCC) Capacity
Other renewables include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and miscellaneous fuels

Power Plant Emissions have Declined with Changes in the Fuel Mix

Reduction in Aggregate Emissions (ktons/yr)

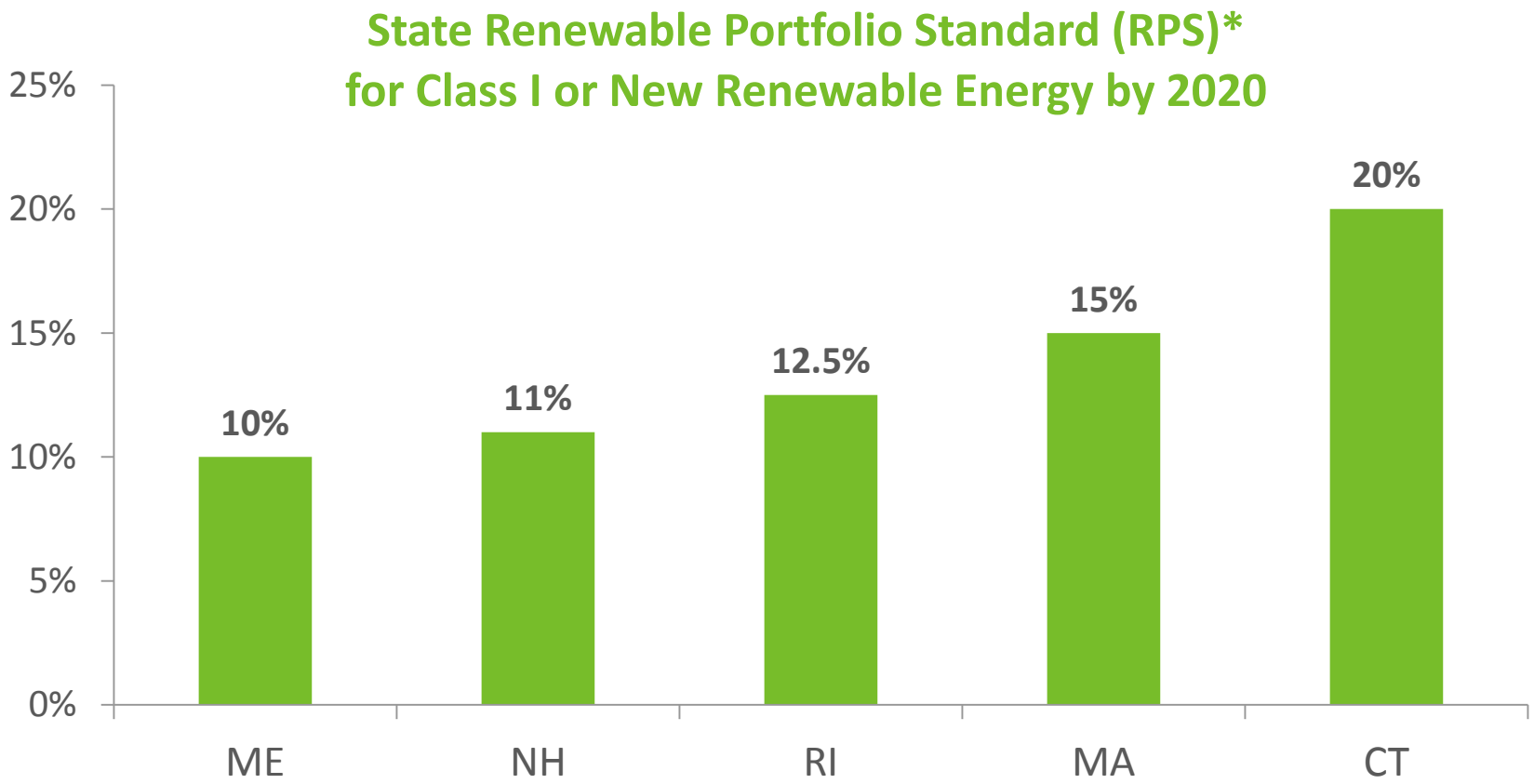
Year	NO_x	SO_2	CO_2
2001	59.73	200.01	52,991
2013	20.32	18.04	40,901
% Reduction, 2001–2013	**⬇ 66%**	**⬇ 91%**	**⬇ 23%**

Reduction in Average Emission Rates (lb/MWh)

Year	NO_x	SO_2	CO_2
1999	1.36	4.52	1,009
2013	0.36	0.32	730
% Reduction, 1999–2013	**⬇74%**	**⬇ 93%**	**⬇ 28%**

Source: 2013 ISO New England Electric Generator Air Emissions Report, December 2014

State Requirements Drive Proposals for Renewable Energy

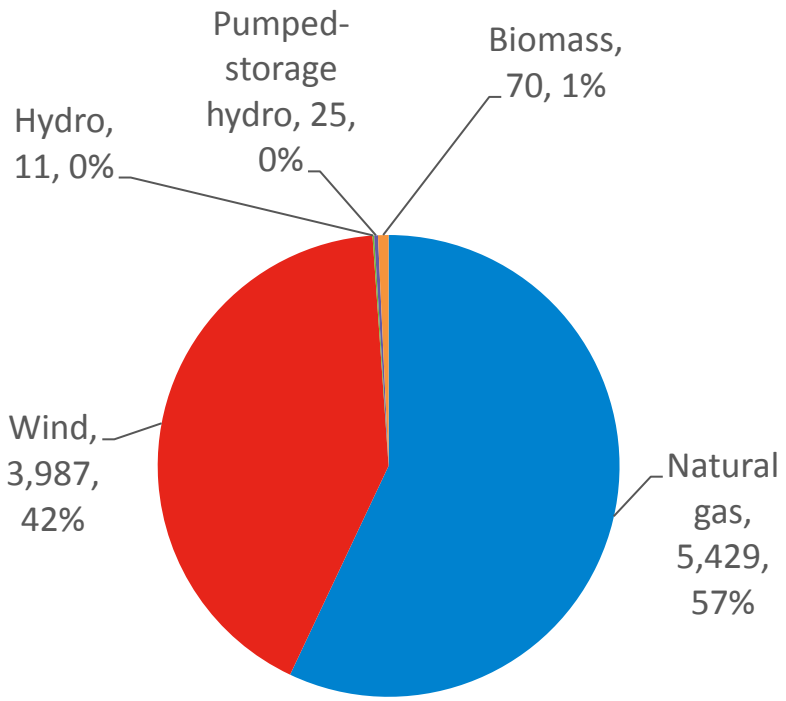


* State Renewable Portfolio Standards (RPS) promote the development of renewable energy resources by requiring electricity providers (electric distribution companies and competitive suppliers) to serve a minimum percentage of their retail load using renewable energy. Vermont does not have a formal RPS program. It relies on a program known as 'Sustainably Priced Energy Enterprise Development' (SPEED) to promote renewable energy development in the state.

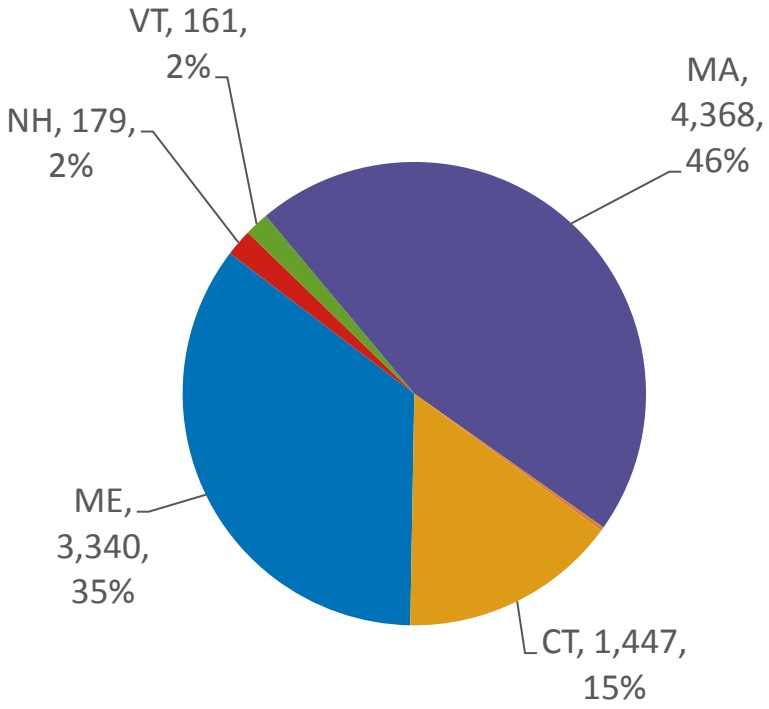
Generator Proposals in the ISO Queue

Approximately 9,500 MW

By Type



By State

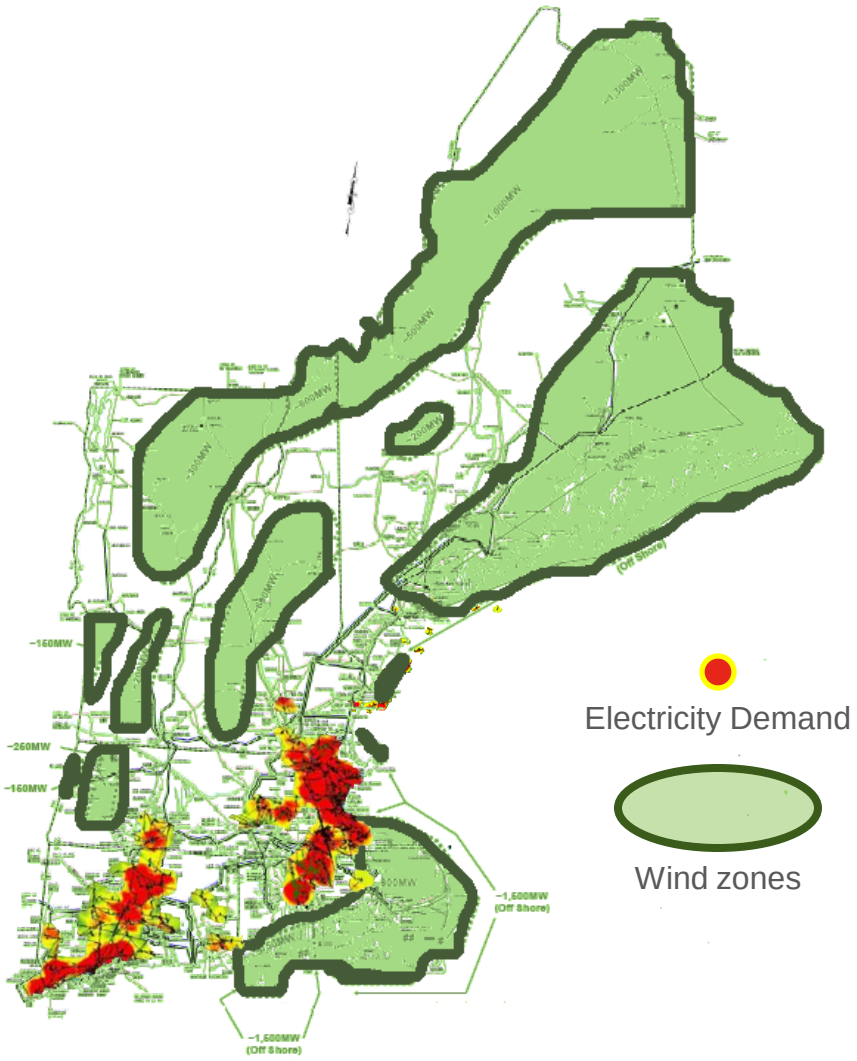


Note: Some natural gas include dual-fuel units (oil)

Source: ISO Generator Interconnection Queue (January 2015)
FERC Jurisdictional Proposals Only

New England has Significant Wind Potential

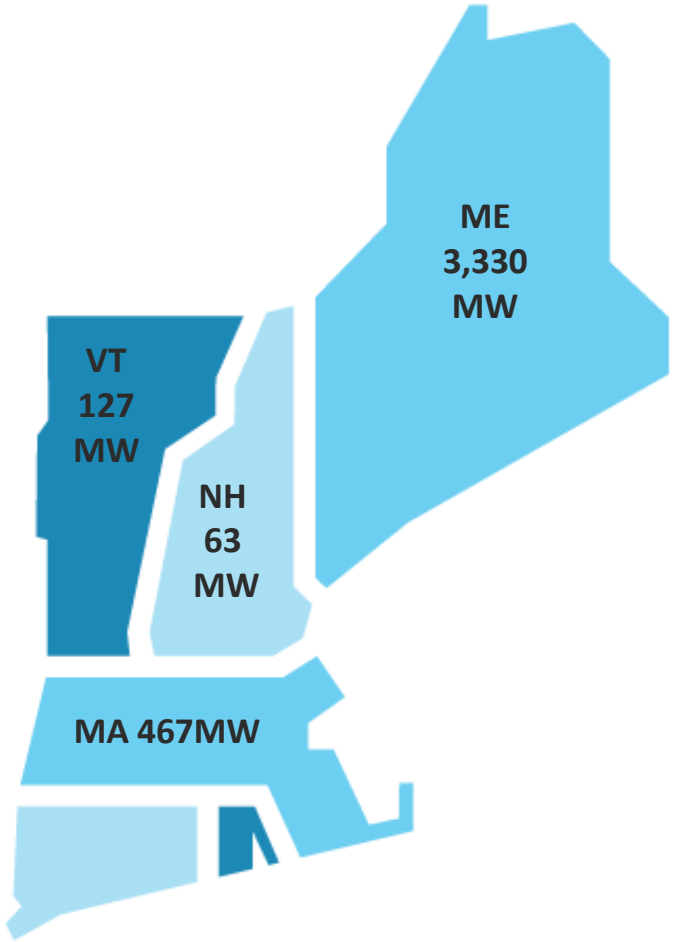
- Population and electric demand are concentrated along the coast in central and southern New England
- 12,000 MW of onshore and offshore wind potential
  - Preliminary screening eliminated wind sites near urban areas and sensitive geographic locations (e.g., Appalachian Trail)
- Transmission will be required to connect potential wind resources to load centers in New England



On- and Off-shore Wind is Being Proposed

Represents almost half of proposed generation

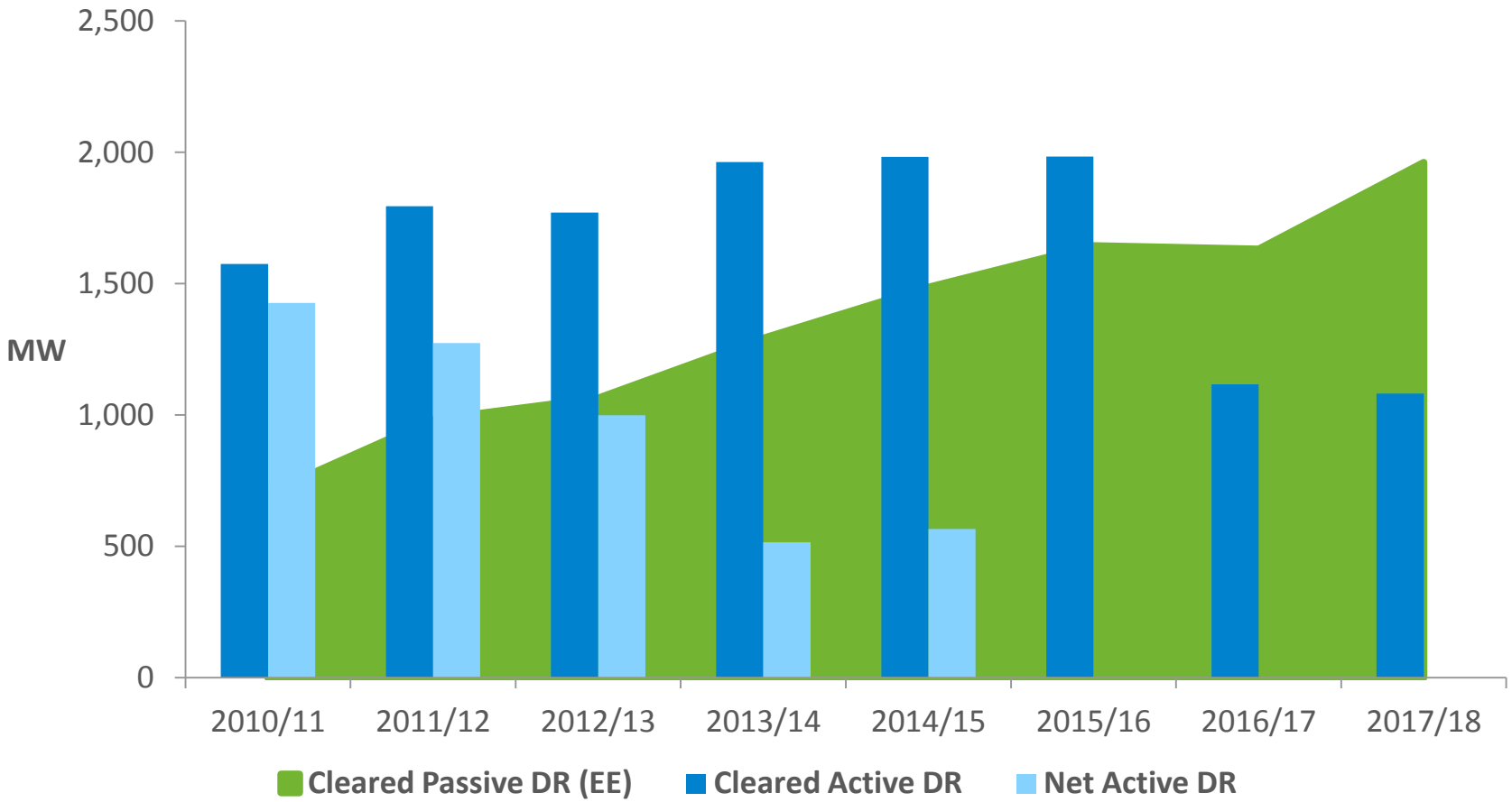
- Almost 4,000 MW of wind proposed
- Majority of wind development proposals in Maine and northern New England
- Offshore projects proposed in Maine, Massachusetts and Rhode Island



Source: ISO Generator Interconnection Queue (January 2015)
FERC Jurisdictional Proposals Only

FCM Has Attracted Significant Demand Resources

EE is growing, but a lot of "Active" DR has dropped out



Notes: *Cleared Active DR* represents Real-Time DR and RT Emergency Generation that cleared in the primary auction. *Net Active D*R represents Active DR remaining at the start of commitment period, net of resources that shed Capacity Supply Obligations after the primary auction.

Resources Assumed to be "At Risk" of Retirement

Unit	Unit Type	MW Maximum Assumed	In-service Date	Age in 2020
BRAYTON POINT 1	Coal	261	01-Aug-63	57
BRAYTON POINT 2	Coal	258	01-Jul-64	56
BRAYTON POINT 3	Coal	643	01-Jul-69	51
BRAYTON POINT 4	Oil	458	01-Dec-74	46
BRIDGEPORT HBR 2	Oil	190	01-Aug-61	59
BRIDGEPORT HBR 3	Coal	401	01-Aug-68	52
CANAL 1	Oil	597	01-Jul-68	52
CANAL 2	Oil	599	01-Feb-76	44
MERRIMACK 1	Coal	121	01-Dec-60	60
MERRIMACK 2	Coal	343	30-Apr-68	52
MIDDLETOWN 2	Oil	123	01-Jan-58	62
MIDDLETOWN 3	Oil	248	01-Jan-64	56
MIDDLETOWN 4	Oil	415	01-Jun-73	47
MONTVILLE 5	Oil	85	01-Jan-54	66
MONTVILLE 6	Oil	418	01-Jul-71	49
MOUNT TOM 1	Coal	159	01-Jun-60	60
MYSTIC 7 GT	Oil	615	01-Jun-75	45
NEW HAVEN HBR	Oil	483	01-Aug-75	45
NEWINGTON 1	Oil	424	01-Jun-74	46
NORWALK HBR 1	Oil	173	01-Jan-60	60
NORWALK HBR 2	Oil	179	01-Jan-63	57
SCHILLER 4	Coal	51	01-Apr-52	68
SCHILLER 6	Coal	51	01-Jul-57	63
W. SPRINGFIELD 3	Oil	111	01-Jan-57	63
YARMOUTH 1	Oil	56	01-Jan-57	63
YARMOUTH 2	Oil	56	01-Jan-58	62
YARMOUTH 3	Oil	122	01-Jul-65	55
YARMOUTH 4	Oil	632	01-Dec-78	42

TOTAL 8,281 MW

Source: Strategic Transmission Analysis, Generator Retirements Study, December 2012

Generator Non-Price Retirement Requests

More than 3,500 MW of generation are retiring over the next five years

Major Retirements Underway:

- **Salem Harbor Station (749 MW)**
  - 4 units (coal & oil)
- **Vermont Yankee Station (604 MW)**
  - 1 unit (nuclear)
- **Norwalk Harbor Station (342 MW)**
  - 3 units (oil)
- **Brayton Point Station (1,535 MW)**
  - 4 units (coal & oil)
- **Mount Tom Station (143 MW)**
  - 1 unit (coal)
- *Additional retirements are looming*

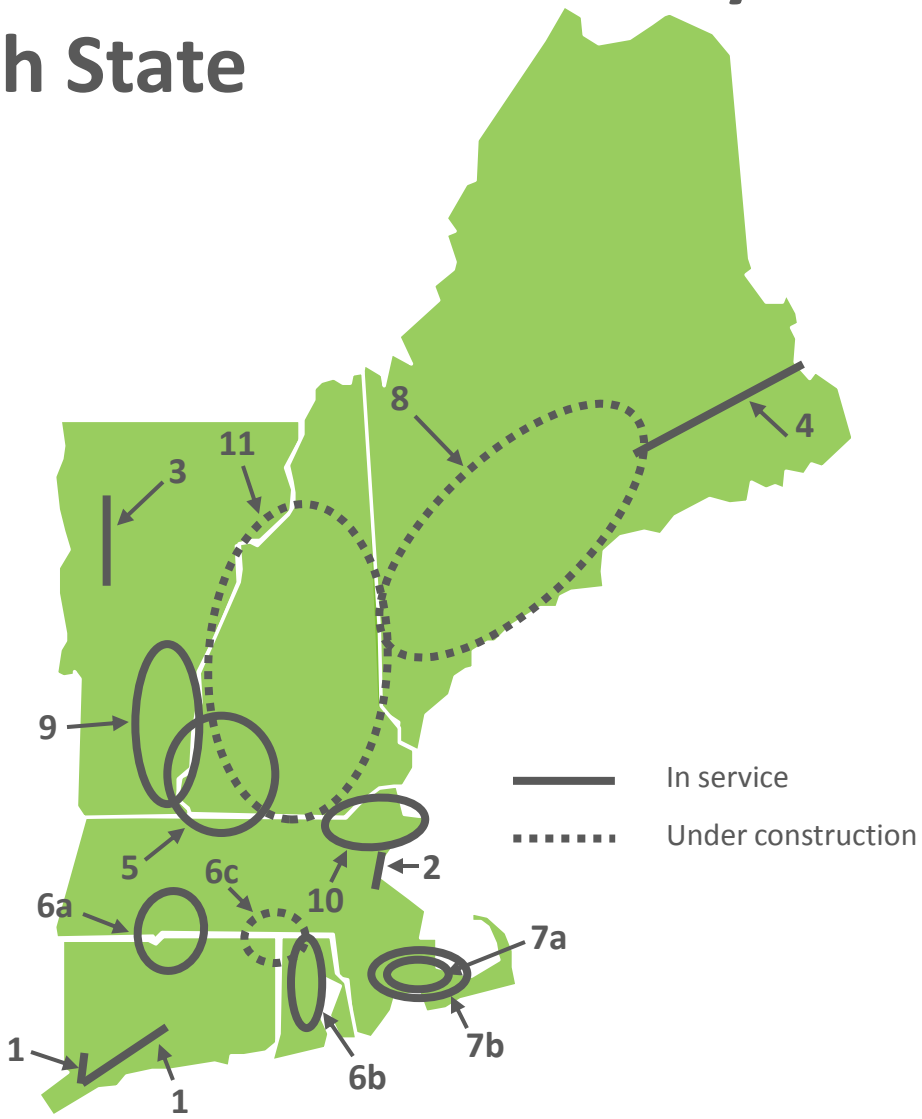
Total MW Retiring in New England*	
Connecticut	354 MW
Maine	35 MW
Massachusetts	2,502 MW
New Hampshire	5 MW
Rhode Island	13 MW
Vermont	634 MW
Total	**3,543 MW**

*Megawatts based on relevant Forward Capacity Auction (FCA) summer qualified capacity (NOTE: total includes full and partial generator Non-Price Retirement (NPR) requests for Capacity Commitment Period (CCP) 2014-2015 through CCP 2018-2019; does not include NPRs for demand response (DR) resources)

Source: Status of Non-Price Retirement Requests; November 21, 2014

Transmission Projects to Maintain Reliability Have Progressed in Each State

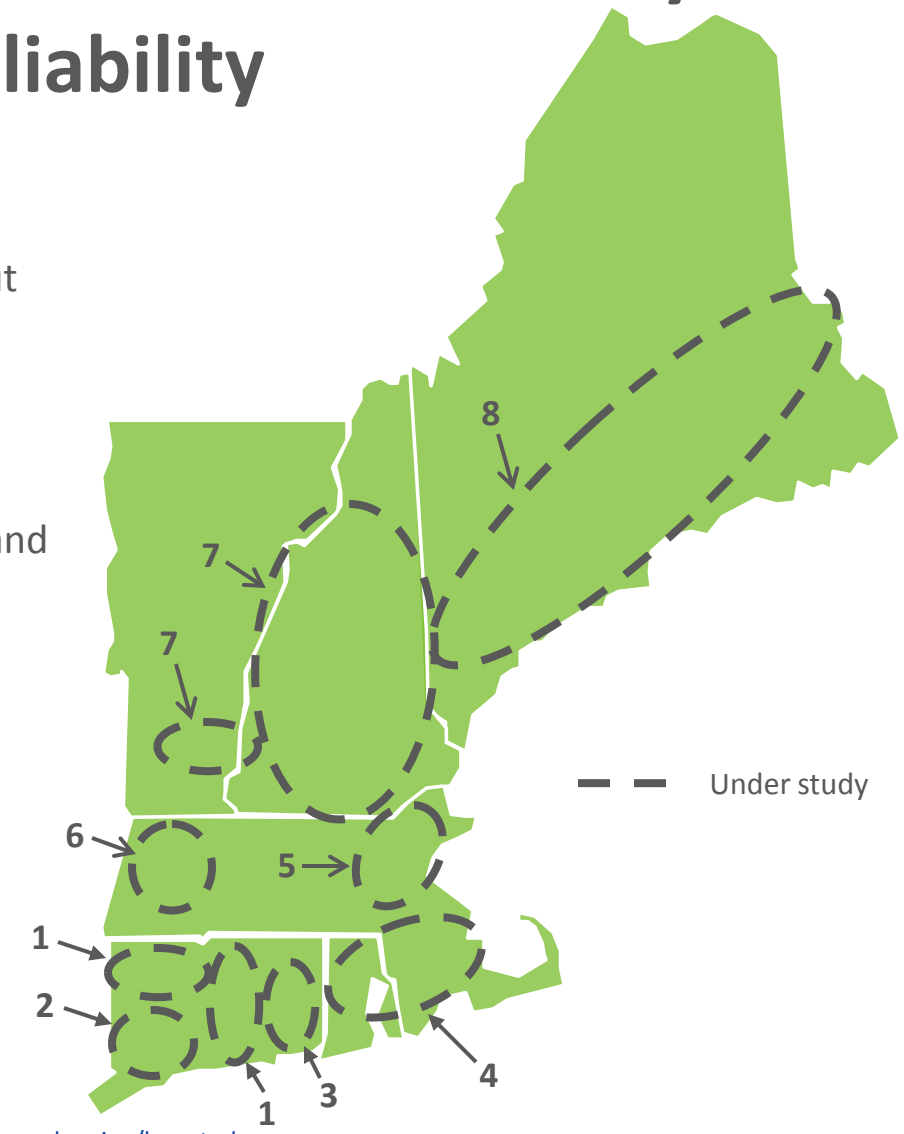
1. Southwest CT Phases I & II
2. Boston NSTAR 345 kV Project, Phases I & II
3. Northwest Vermont
4. Northeast Reliability Interconnect
5. Monadnock Area
6. New England East-West Solution
   a. Greater Springfield Reliability Project
   b. Rhode Island Reliability Project
   c. Interstate Reliability Project
7. Southeast Massachusetts
   a. Short-term upgrades
   b. Long-term Lower SEMA Project
8. Maine Power Reliability Program
9. Vermont Southern Loop
10. Merrimack Valley/North Shore Reliability
11. New Hampshire/Vermont Upgrades



Source: RSP Transmission Project Listing, October 2014; (does not include "concept" projects)

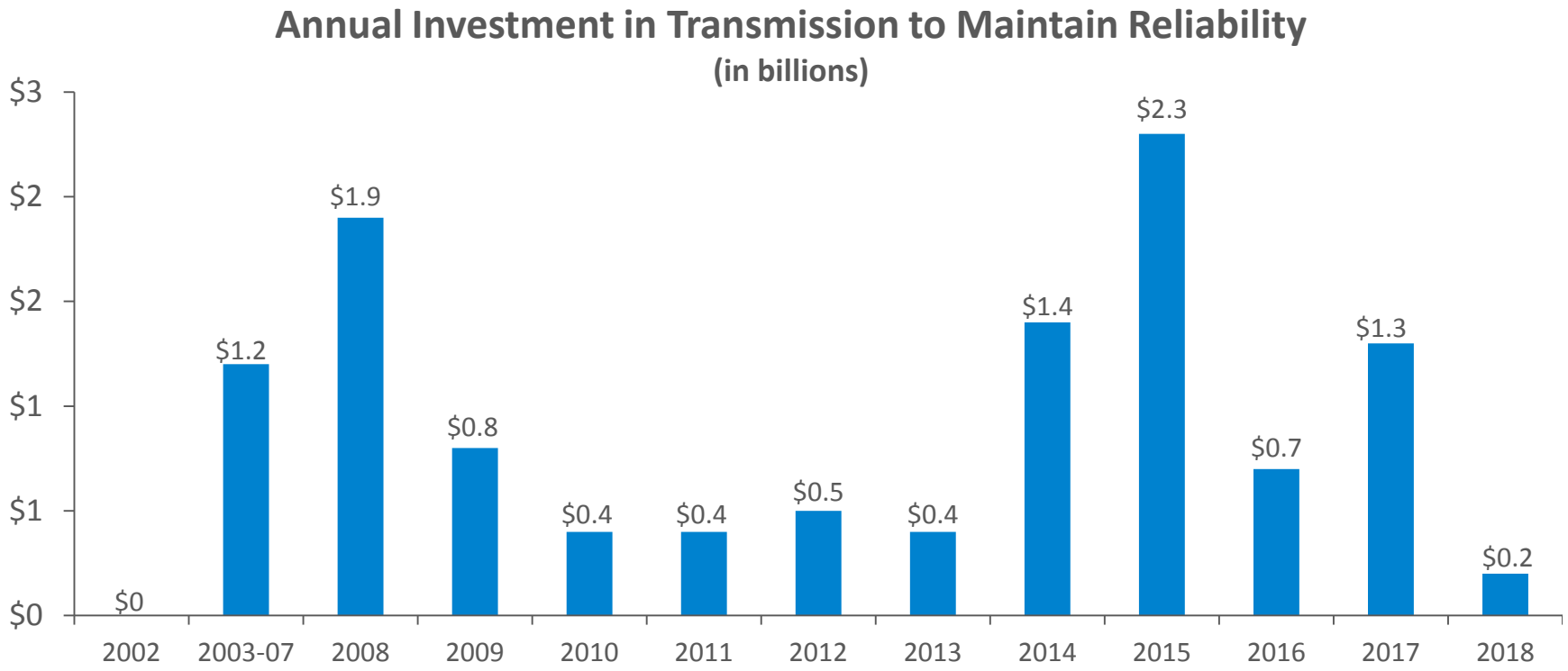
ISO Continuously Studies Transmission System Needs to Maintain Reliability

1. Greater Hartford and Central Connecticut
2. Southwest Connecticut
3. Eastern Connecticut
4. Southeast Massachusetts and Rhode Island
5. Greater Boston
6. Pittsfield and Greenfield
7. New Hampshire and Vermont
8. Maine



Source: ISO New England Key Study Areas at http://www.iso-ne.com/system-planning/key-study-areas

New Transmission Investment in New England

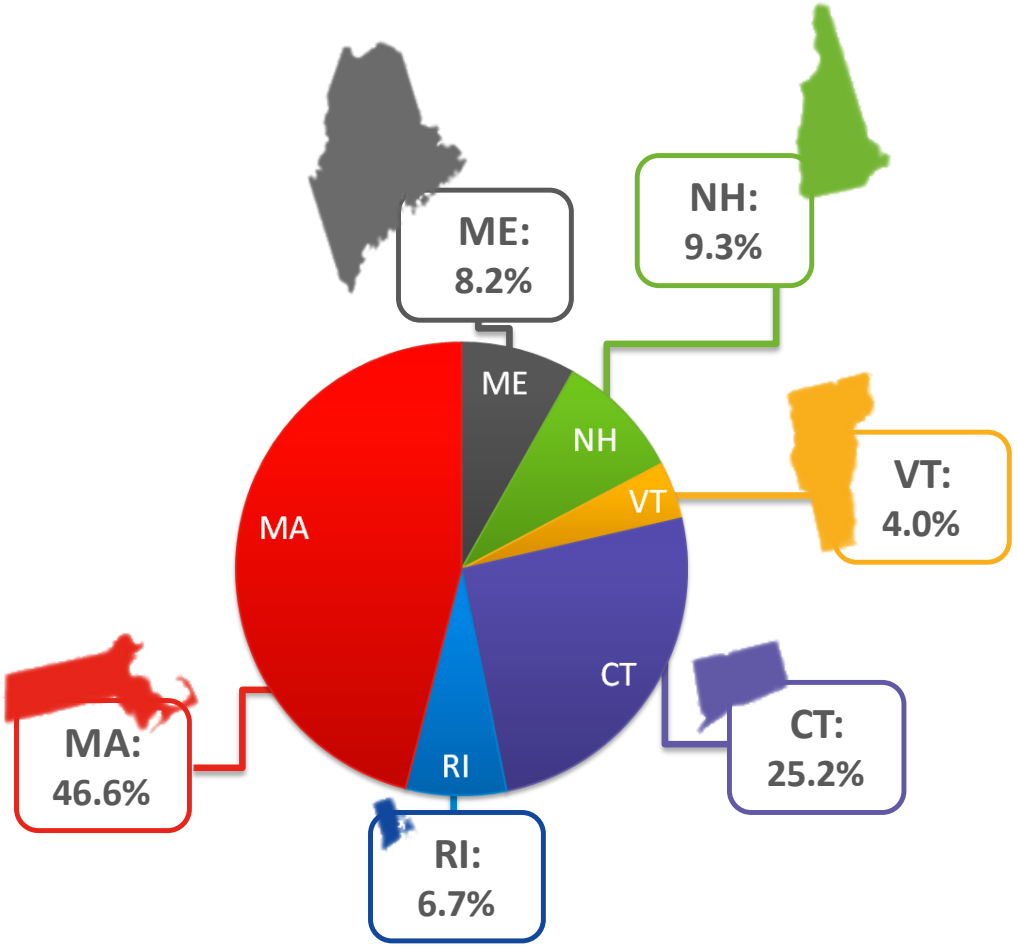


Cumulative Investment through 2014	$7.0 billion
Estimated Future Investment through 2018	$4.5 billion

Source: ISO New England RSP Transmission Project Listing, October 2014
Estimated future investment includes projects under construction, planned and proposed

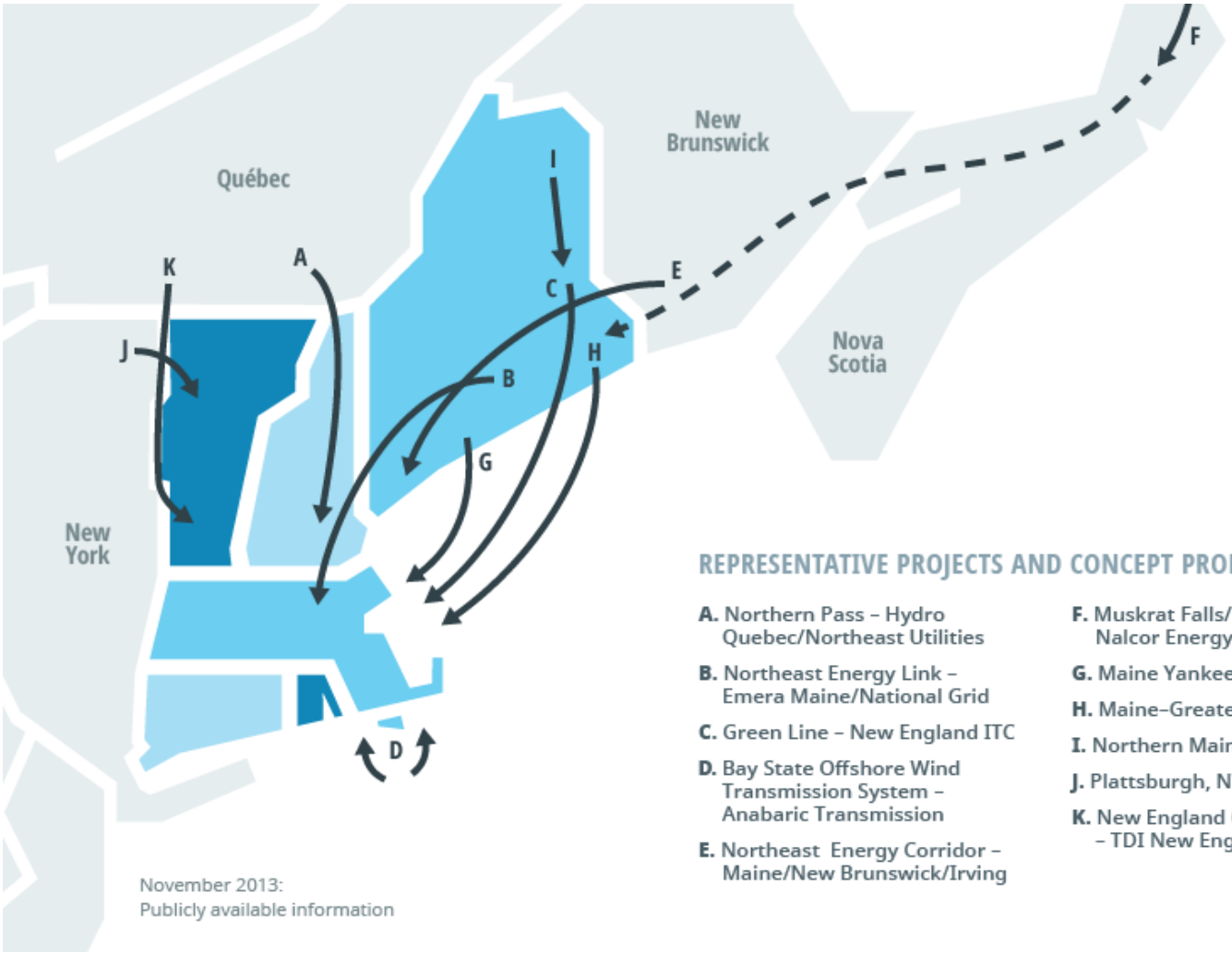
How are Transmission Costs Allocated?

- The New England electric grid is a tightly interconnected system; each state shares in the benefits of reliability upgrades
- The amount of electricity demand in an area determines its share of the cost of new or upgraded transmission facilities needed for reliability



Source: 2013 Network Load by State

On- and Off-shore Transmission Proposals are Vying to Move Renewable Energy to New England Load Centers



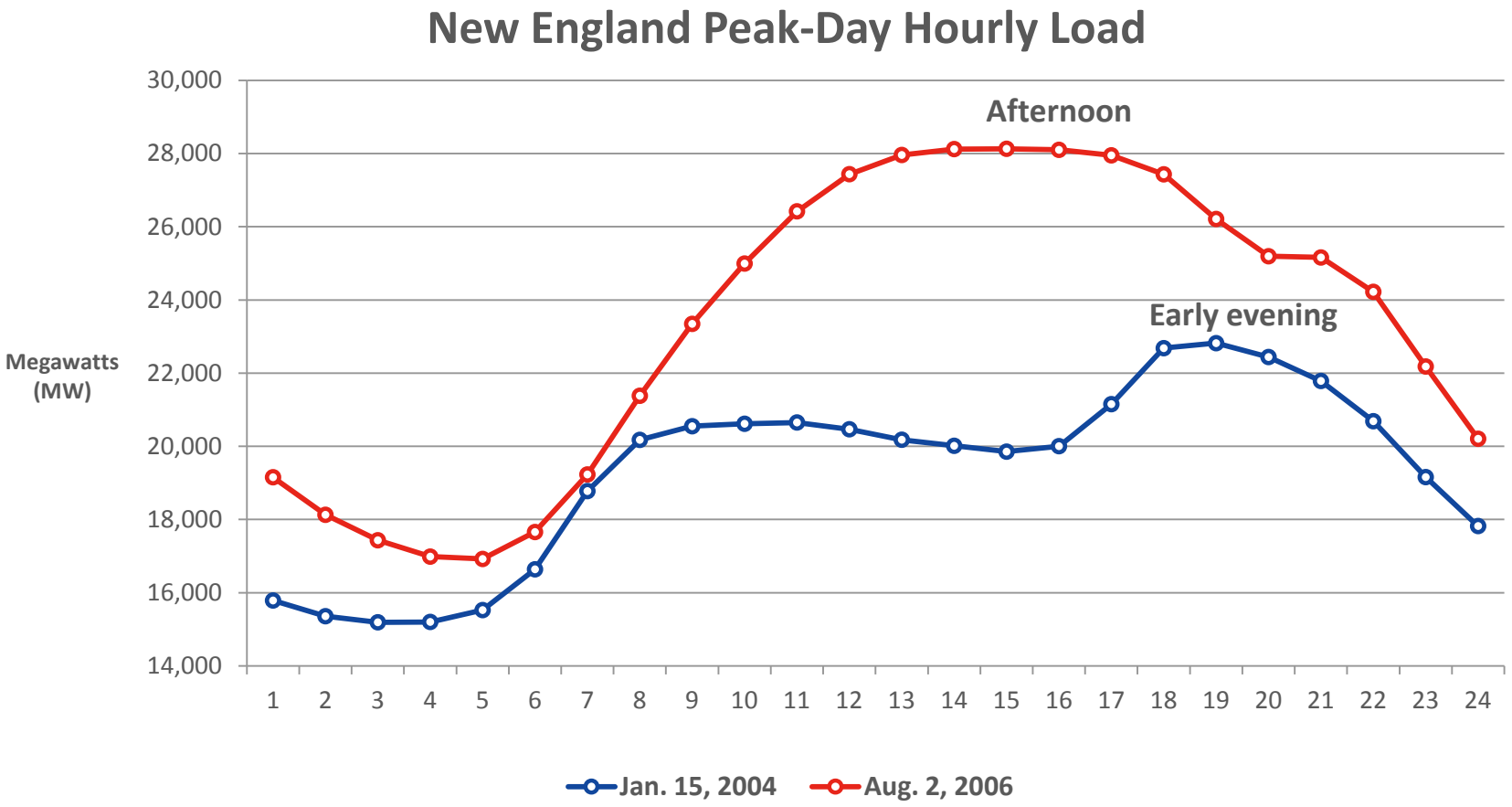
REPRESENTATIVE PROJECTS AND CONCEPT PROPOSALS

- **A.** Northern Pass – Hydro Quebec/Northeast Utilities
- **B.** Northeast Energy Link – Emera Maine/National Grid
- **C.** Green Line – New England ITC
- **D.** Bay State Offshore Wind Transmission System – Anabaric Transmission
- **E.** Northeast Energy Corridor – Maine/New Brunswick/Irving
- **F.** Muskrat Falls/Lower Churchill – Nalcor Energy
- **G.** Maine Yankee–Greater Boston
- **H.** Maine–Greater Boston
- **I.** Northern Maine–New England
- **J.** Plattsburgh, NY–New Haven, VT
- **K.** New England Clean Power Link – TDI New England

Note: These projects are NOT reliability projects, but ISO New England' s role is to ensure the reliable interconnection of these types of projects.

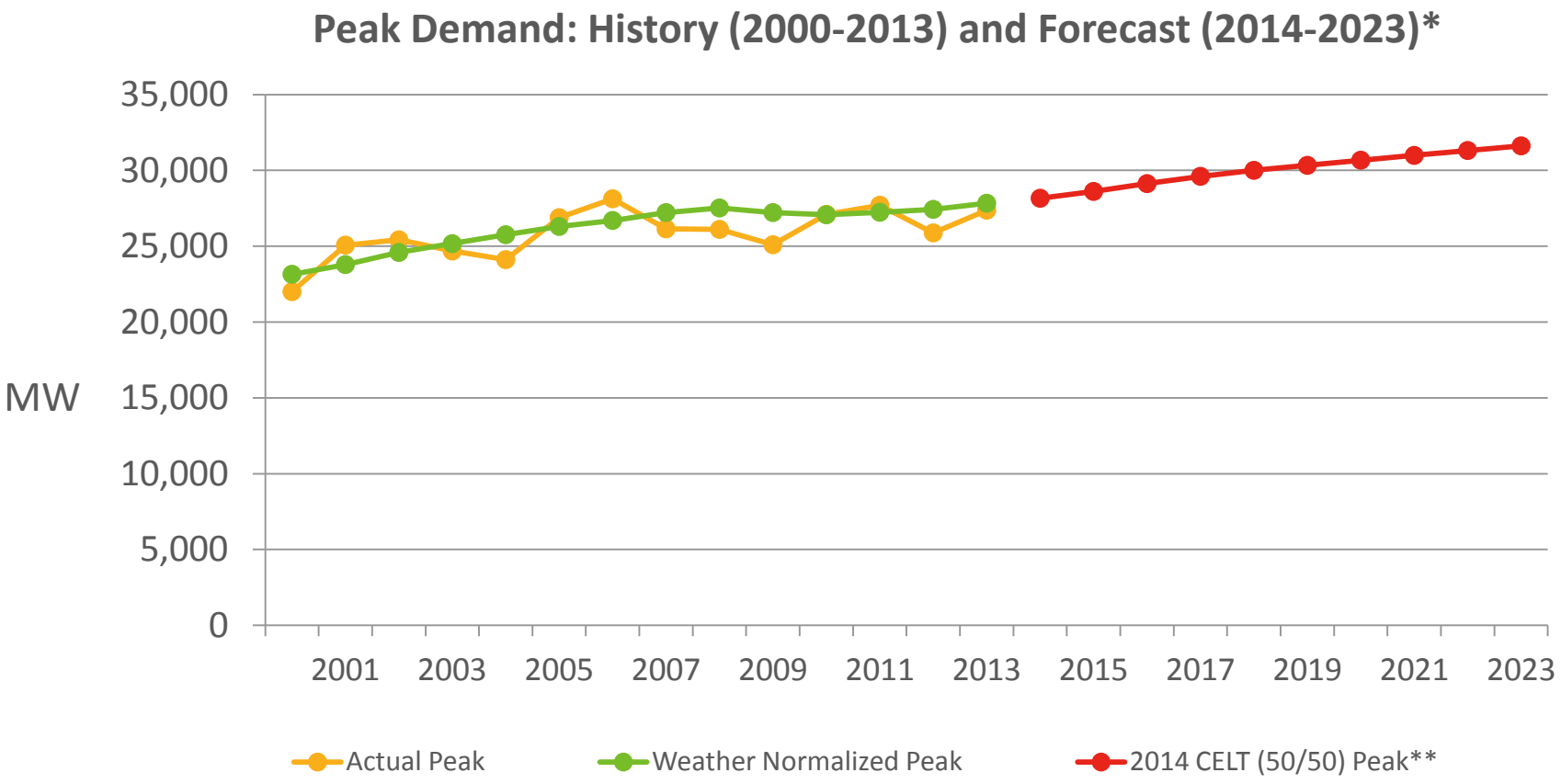
New England's Electricity Use Varies by Season

Air-conditioning and lighting loads drive seasonal peaks



Peak Demand is Growing

Summer peak demand forecasted to grow 1.3% annually to 2023



* NOTE: Forecasted peaks do not include passive demand response.

** Source: ISO-NE Annual Energy & Seasonal Peak Forecast 2014-2023

Wholesale Markets Have Resulted in Efficiency Gains in New England's Power Generation Fleet

- Markets reveal a resource's true operating cost
  - Fuel is the primary driver of operating costs
  - The dollar value of New England's energy markets fell from 2008-2013 as low-cost natural gas displaced older, fossil fuel-fired units
- Gas-fired generators are becoming more efficient
  - Improvements in technology have made newer generators more economic than earlier models
- Region has invested in cleaner technologies ahead of much of the rest of the country and has seen regional air emissions decline significantly over the past decade

Forward Capacity Market: Overview

- Procures capacity to meet New England's forecasted Installed Capacity Requirement (ICR) three years in the future
- Allows new capacity projects to compete in the market and set the price for capacity in the region
- Selects a portfolio of supply and demand resources through a competitive Forward Capacity Auction (FCA) process
  - Resources must be pre-qualified to participate in the auction
  - Resources must participate and clear in the auction to be paid for capacity
- Provides a long-term (up to 7-year) commitment to new supply and demand resources to encourage investment

FCM Objectives and Results

- New England's capacity market has two main objectives:
  - Ensure sufficient resources to meet New England's electricity demand and reliability standards, and
  - Ensure that sufficient resources are procured in a cost-effective manner
    - FCM aims to foster competition by creating a level playing field with respect to technology, investors, and existing versus new entrants
- Eight Forward Capacity Auctions have been conducted and four commitment periods completed
  - FCM has obtained sufficient resources in each auction to meet capacity requirements, except for FCA #8, which concluded in a slight shortfall
    - New England has not experienced outages due to lack of resources
  - Market has generated participation from diverse types of resources
    - This includes demand-response and energy-efficiency resources
  - Lowest-cost resources have been developed and brought to market
    - FCM has eliminated reliance on reliability arrangements with generators

Results of Forward Capacity Auctions

Auction Commitment Period	Total Capacity Acquired (MW)	Capacity Required (MW)	Excess Capacity (MW)	New Demand Resources (MW)	New Supply (MW)	Clearing Price ($/kW-month)	Prorated Price ($/kW-month)
FCA 1 2010/2011	34,077	32,305	1,772	1,188	626	$4.50 Floor price	$4.25
FCA 2 2011/2012	37,283	32,528	4,755	448	1,157	$3.60 Floor price	$3.12
FCA 3 2012/2013	36,996	31,965	5,031	309	1,670	$2.95 Floor price	ROP: $2.54 Maine: $2.47
FCA 4 2013/2014	37,501	32,127	5,374	515	144	$2.95 Floor price	ROP: $2.52 Maine: $2:34
FCA 5 2014/2015	36,918	33,200	3,718	263	42	$3.21 Floor price	$2.86
FCA 6 2015/2016	36,309	33,456	2,853	313	79	$ 3.43 Floor price	$3.13
FCA 7 2016/2017	36,220	32,968	3,252	245	800	$3.15 Floor price $14.999* NEMA/Boston	ROP: $2.74 Maine: $2.74 CT: $2.88
FCA 8 2017/2018	33,712	33,855	-143	394	30	$15.00*	n/a

* In FCA 7, the NEMA/Boston zone cleared at $14.999/kW-month. New capacity will receive $14.999/kW-month and existing capacity will receive an administrative price of $6.66/kW-month. In FCA 8, the auction cleared at $15.00/kW-month. New capacity in all zones and existing capacity in NEMA/Boston will receive $15.00/kW-month and existing capacity in all other zones will receive an administrative price of $7.025/kW-month.

Resource Performance Issues Drove ISO to Propose Changes to the Capacity Market Design

- Capacity payments are poorly linked to resource performance
- Consequences for non-performance are negligible
- We see pervasive and worsening performance problems with existing generators
- Resource owners lack incentive to make investments to ensure they can provide energy and reserves when needed
- Current design delays exit of poor performers from the market; creates a bias in the FCM to clear less-reliable resources
- Lack of investment poses serious threats to system reliability

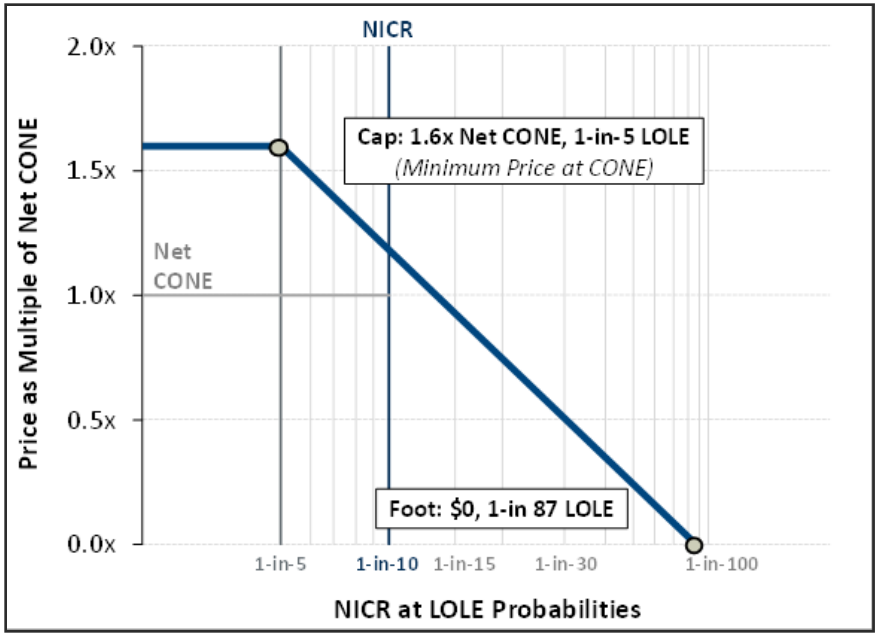
Pay-for-Performance (PFP) Effective for FCA #9

- FERC issued an order on May 30, 2014 that accepted, in large part, the ISO's proposal to tie capacity payments to resources' performance during stressed system conditions
- FERC accepted NEPOOL's proposal to increase the Reserve Constraint Penalty Factors (RCPFs)
- PFP will be implemented for the next capacity auction in February 2015 (FCA #9), and will be effective for the 2018-2019 commitment period

Sloped Demand Curve Effective for FCA #9

FERC approved ISO proposal in May for effect in February 2015 auction

- Proposal received strong support from NEPOOL and the New England States
- Parties did not agree on all elements, but supported the overall package
- Proposal struck a balance between limiting exposure to high prices when the market is not competitive and ensuring prices induce new entry into the market



Demand curve proposed by ISO New England and NEPOOL, and filed with FERC on April 1, 2014.

Demand Curve Changes: Key Features

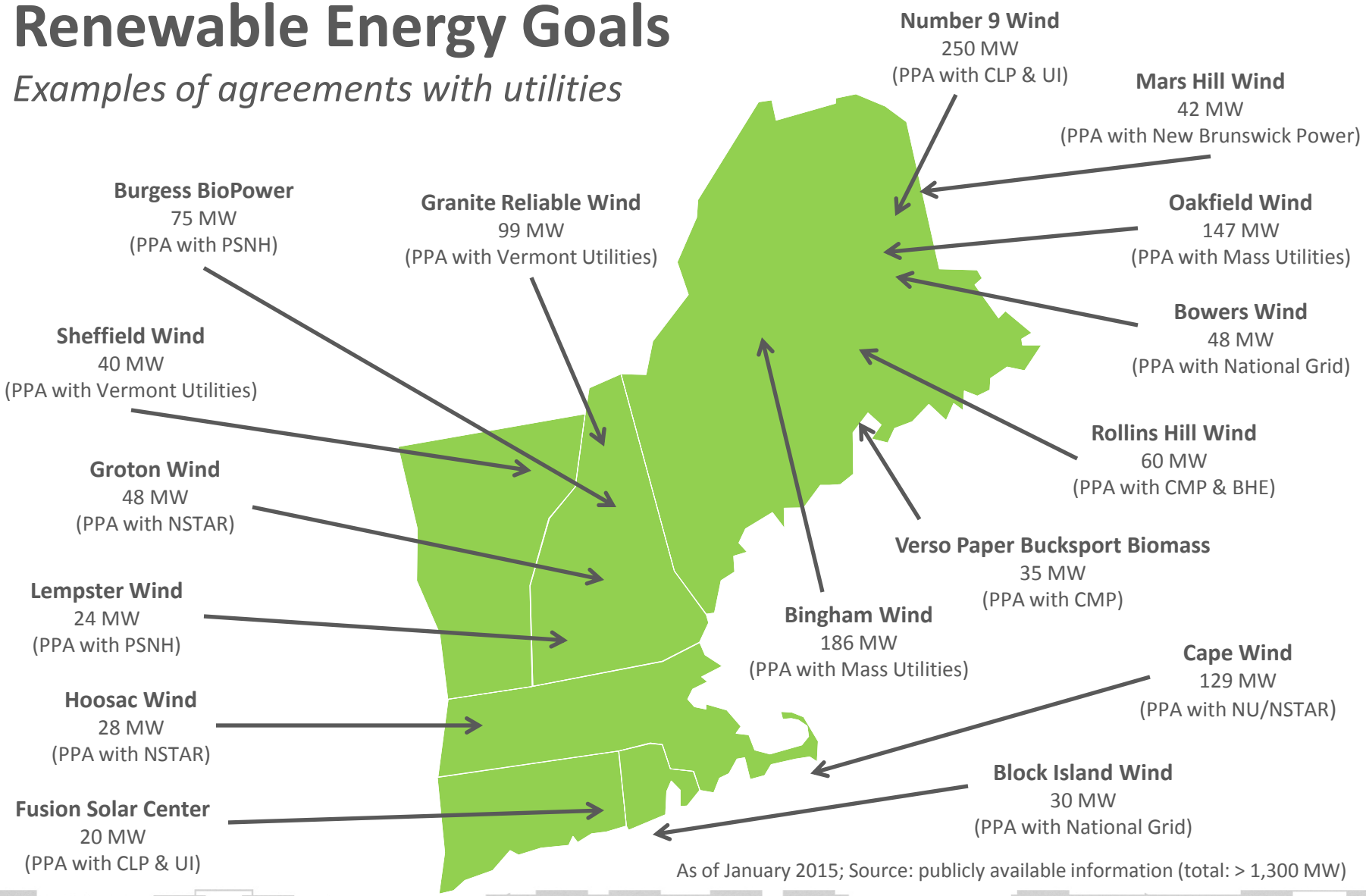
- Replace the vertical demand curve used in the first eight auctions with a system-wide sloped demand curve for the next auction (zonal curves to follow one year later)
- Reduce price volatility that occurs if the region is just short or long on capacity (this volatility is a symptom of a vertical demand curve)
- Achieve resource adequacy over the long term, although the market might clear more or less than the Installed Capacity Requirement (ICR) in a given auction
- Extend the period that new resources can “lock-in” the capacity price, from five years to seven years
- Exempt up to 200 MW of Renewable Technology Resources from buyer-side mitigation rules (minimum offer price rule)
- Eliminate the need for administrative pricing rules

Region is Taking Action to Improve Electric Market Efficiency and Enhance Gas-Electric Coordination

Recently Implemented (2012–2014)	Long-Term Actions (2015–2019)
• Ongoing improvements to information sharing with natural gas pipeline companies • Moved Day-Ahead Energy Market timeline in 2013 to better align electricity and natural gas markets • Increased forward reserve requirements in 2013 • FERC clarification of generator obligations (must purchase fuel unless physically unavailable – economics is not an excuse) • Tightened FCM Shortage Event trigger (effective November 2013) • Developed energy market offer-flexibility enhancements (effective December 2014) • Changed NCPC cost allocation to drive more load to Day-Ahead Energy Market (effective December 2014)	• Strengthen Forward Capacity Market Performance Incentives "Pay-for-Performance" (will apply to 2018-19 capacity commitment period) • Implement Demand Curve and improve zonal modeling in capacity market • Further improvements to energy market pricing • New England States are driving investments in additional natural gas pipelines, and transmission to enable additional renewable energy

States Pursue Long-Term Contracts to Achieve Renewable Energy Goals

Examples of agreements with utilities



As of January 2015; Source: publicly available information (total: > 1,300 MW)