



Regional Planning Update

*NPCC Governmental/Regulatory Affairs
Advisory Group*

Anne George

VICE PRESIDENT, EXTERNAL AFFAIRS AND CORPORATE COMMUNICATIONS



ISO New England's Strategic Planning Initiative

Focused on developing solutions to the top five challenges facing the region

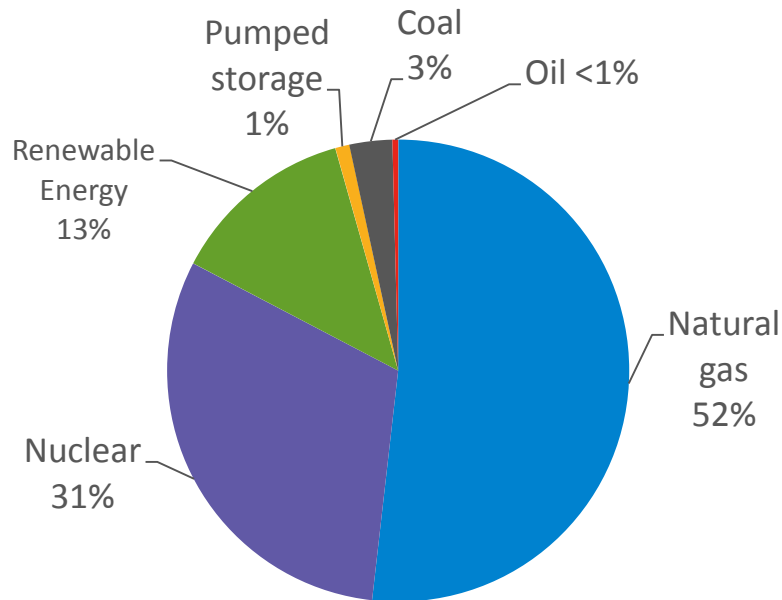


1. Resource Performance and Flexibility
2. Increased Reliance on Natural Gas-Fired Capacity
3. Retirement of Generators
4. Integration of a Greater Level of Variable Resources
5. Alignment of Markets with Planning

Natural Gas has Become the Dominant Fuel for Power Generation in New England

Existing Generation

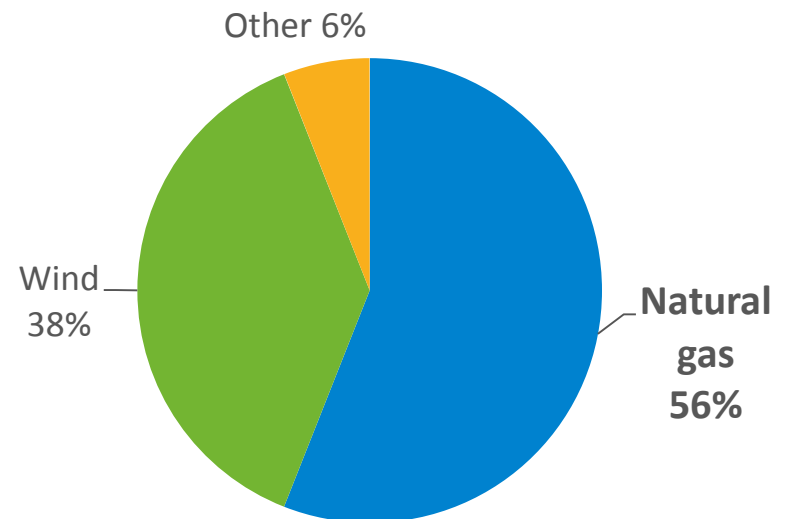
Natural gas has largely displaced oil- and coal-fired generation



Energy by Fuel Type, 2012

Proposed Capacity

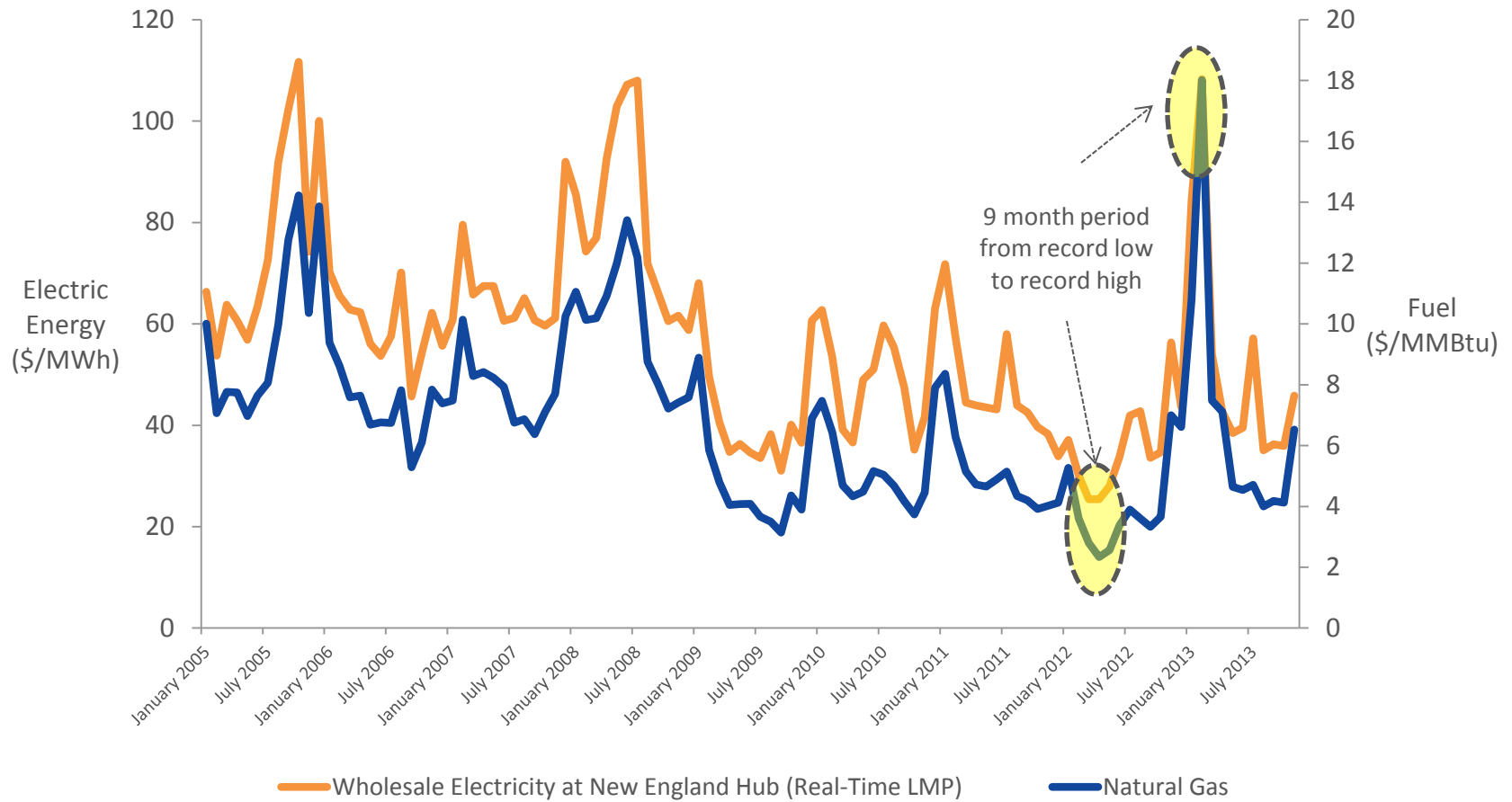
Natural gas is the fuel of choice for new capacity and gas-fired generators will be needed to balance variable energy resources



ISO Generator Interconnection Queue (April 2013)



Wholesale Electricity Prices Track Natural Gas



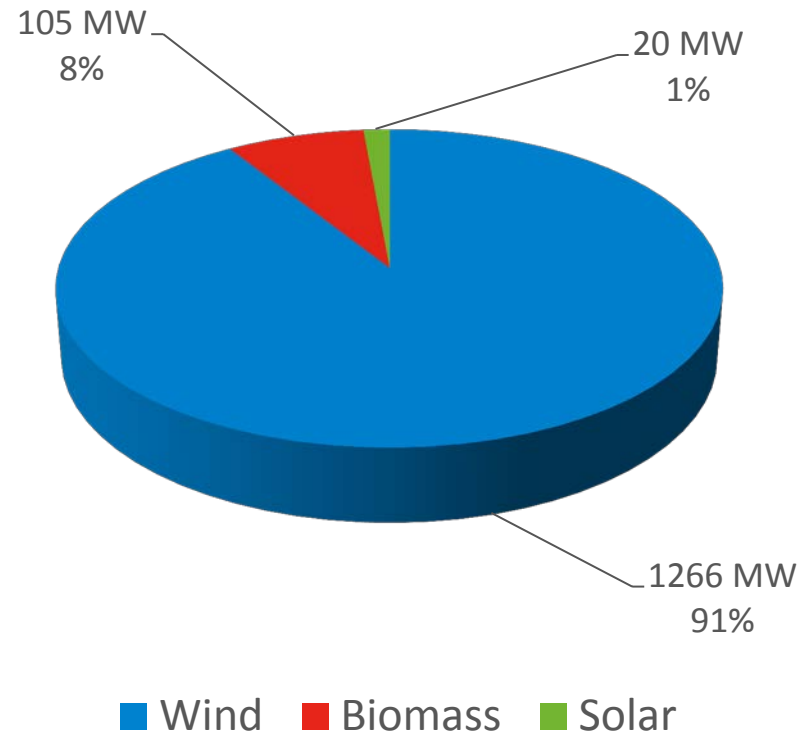
States Pursue Long-Term Contracts to Achieve Renewable Energy Goals

Predominantly wind projects located in Maine and New Hampshire

Projects by State

Generator Location	Approximate MW
Connecticut	20 MW
Maine	826 MW
Massachusetts	158 MW
New Hampshire	> 317 MW
Rhode Island	30 MW
Vermont	40 MW
Total	> 1,391 MW

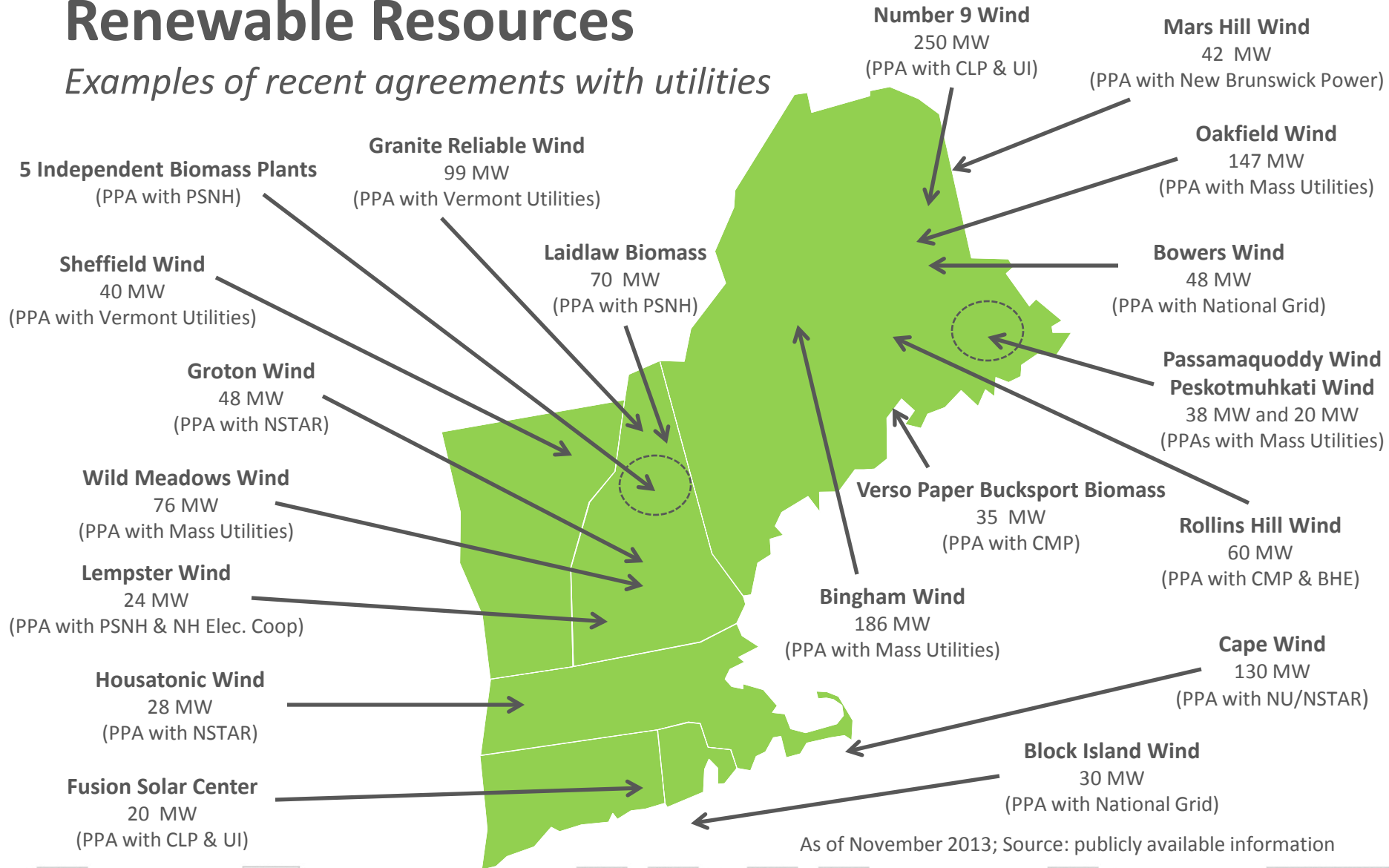
Projects by Type



As of November 2013; Source: publicly available information

Long-Term Contracts Spur Development of Renewable Resources

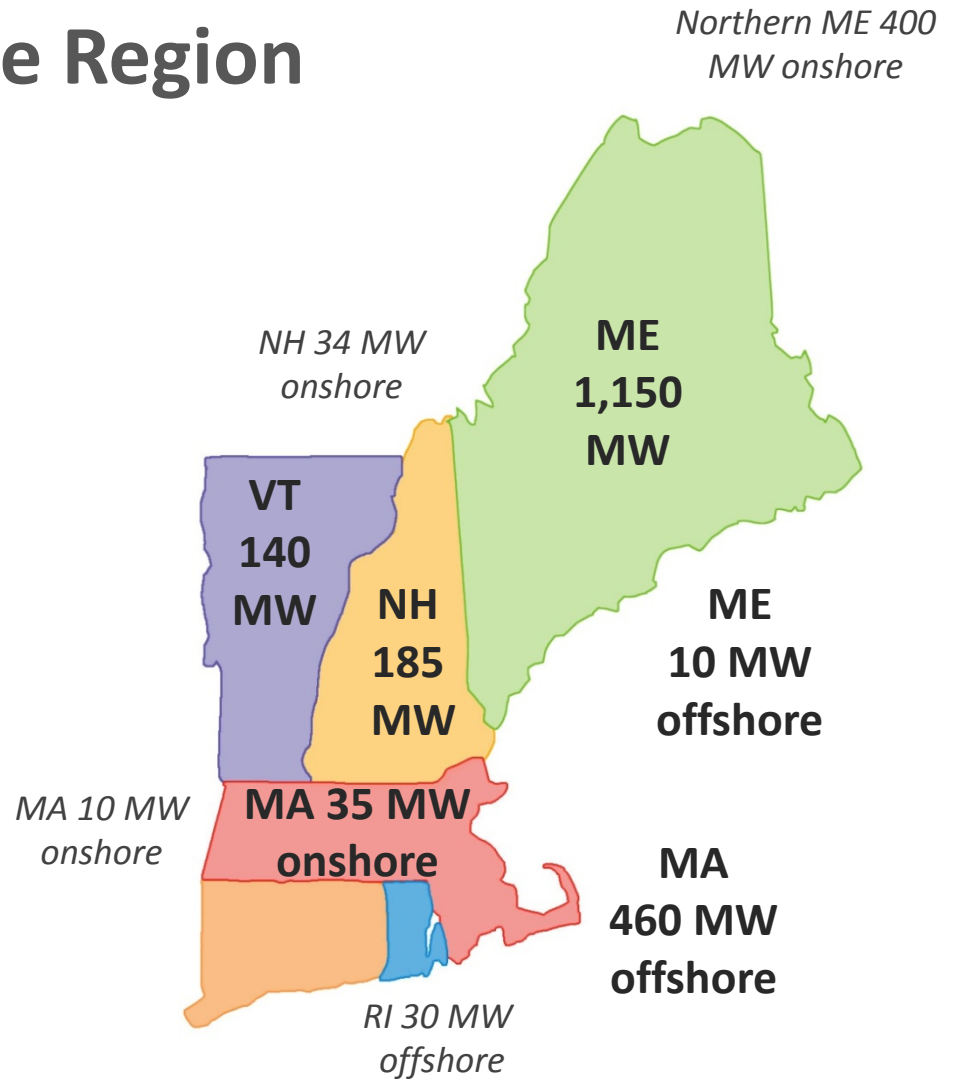
Examples of recent agreements with utilities



As of November 2013; Source: publicly available information

Wind Proposed for the Region

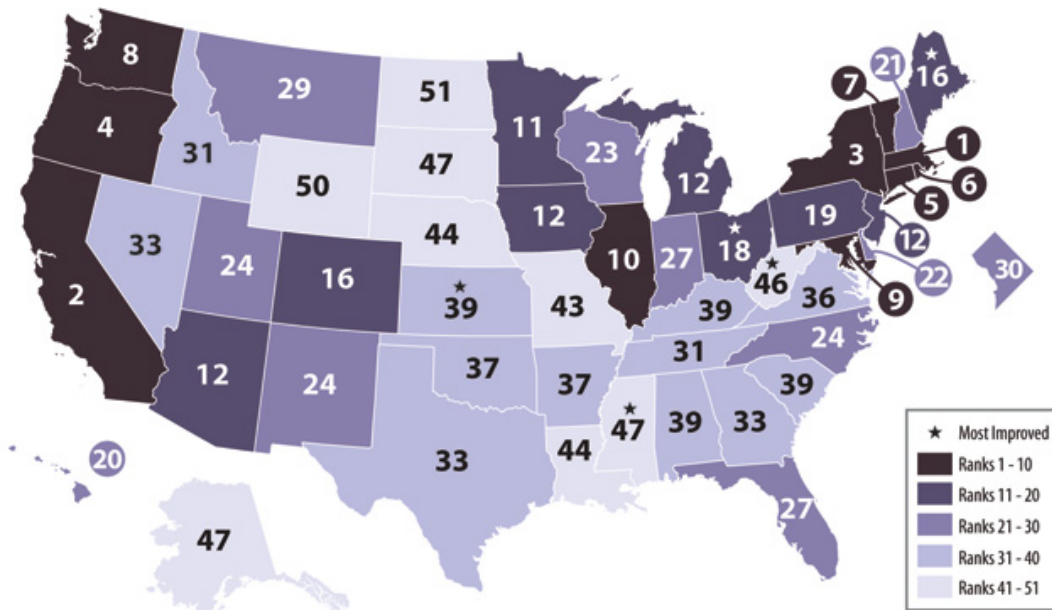
- About 2,400 MW proposed (*includes non-FERC jurisdictional*)
- Majority of wind development proposals in Maine and northern New England
- Large-scale offshore project proposed in Massachusetts



Source: ISO Generator Interconnection Queue (April 2013)

Energy-Efficiency is a Priority for New England

2013 State Energy-Efficiency Scorecard



Source: American Council for an Energy-Efficient Economy

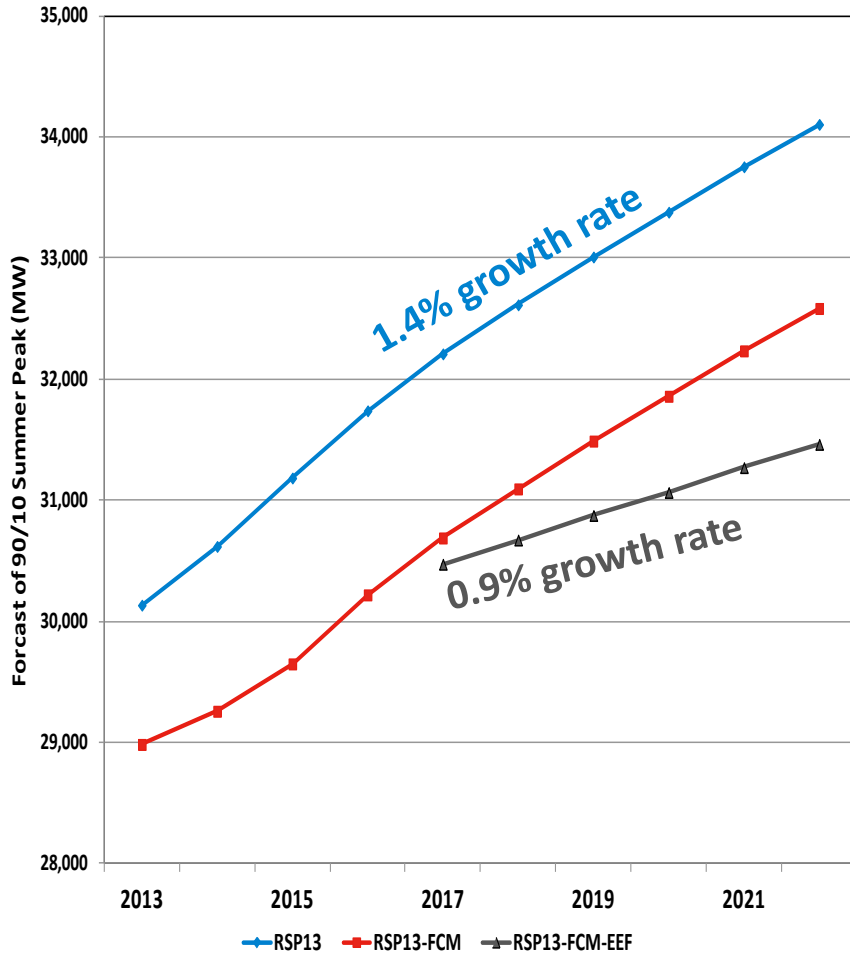
Ranking of state EE efforts by the *American Council for an Energy-Efficient Economy*:

- Massachusetts 1
- Vermont 7
- Connecticut 5
- Rhode Island 6
- New Hampshire 21
- Maine 16

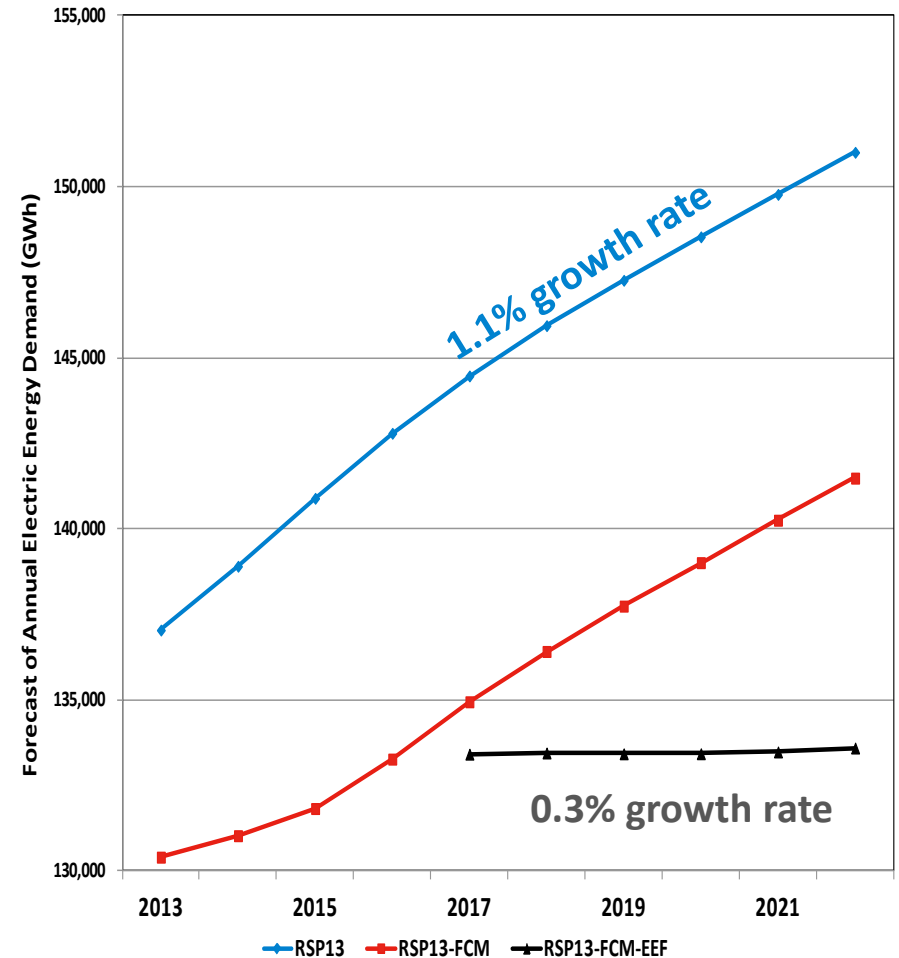
- Billions spent over the past few years and more on the horizon
 - Approximately \$1.5 billion invested from 2009 to 2011
 - ISO estimates \$5.7 billion to be invested in EE from 2016 to 2022

Energy-Efficiency Forecast

New England: Summer 90/10 Peak (MW)



New England: Annual Energy Use (GWh)



Source: ISO-NE EE Forecast for 2016-2022, February 2013

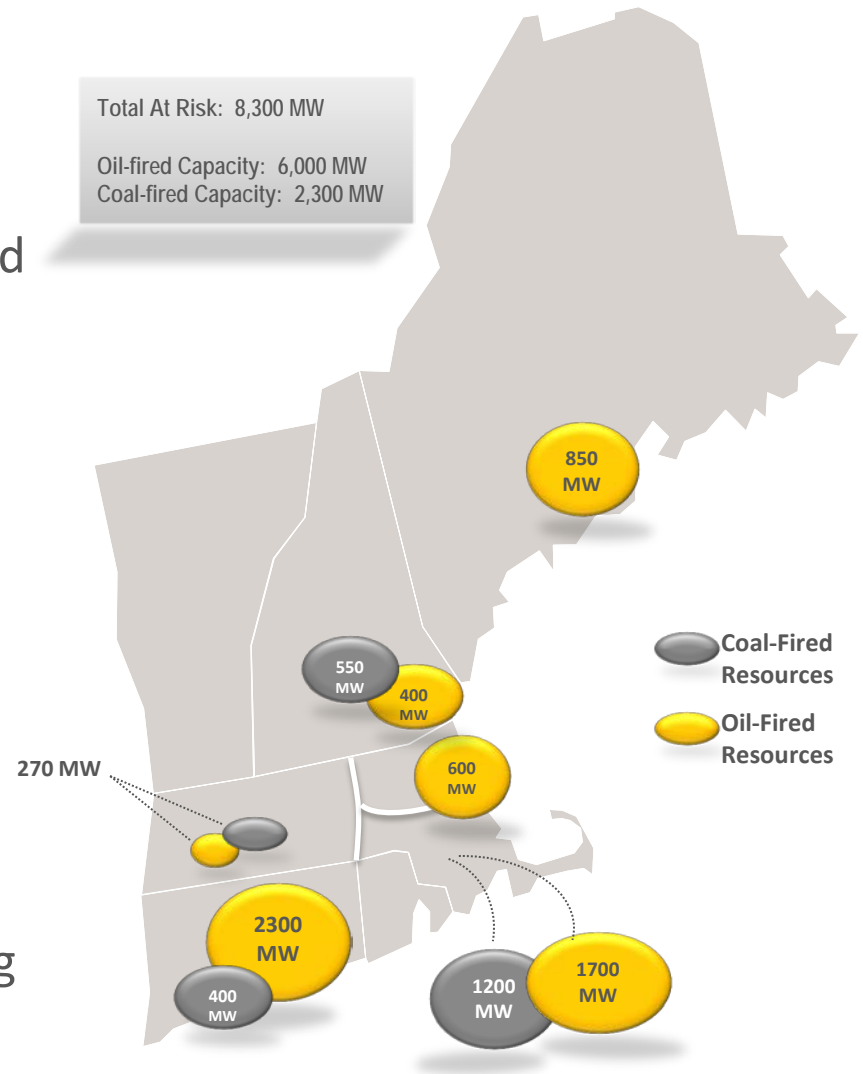
Distributed Generation Forecast Working Group

- Background
 - Strong growth in distributed generation (DG) anticipated, in large part due to state policies promoting DG
 - About 250 MW today
 - Possibly 2000 MW by 2021
 - Like EE, ISO is starting a forecast of long-term impacts of DG (solar PV)
 - Formed Distributed Generation Forecast Working Group, an open stakeholder process to help inform ISO
- Schedule
 - Kick-off meeting held September 30, 2013
 - Data collection, synthesis and forecast methodology development anticipated in 2013-2014

Generator Retirement Study

"At Risk" Capacity Resources in New England

- Objective
 - Evaluate reliability impact associated with the assumed retirement of 28 coal- and oil-fired resources with 8,300 MW of capacity by 2020
- Primary Concerns
 - Resource Adequacy
 - Load-Resource Energy Balance
 - Area Transmission Security
- Another Issue
 - Consequence of constraints impacting deliverability of existing capacity resources to load



Generator Non-Price Retirement Requests

Almost 3,400 MW of generation plan to retire within the next five years

Major Retirement Requests:

- **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)

Total MW Retiring in New England*	
Connecticut	348 MW
Maine	37 MW
Massachusetts	2,360 MW
New Hampshire	1 MW
Rhode Island	13 MW
Vermont	634 MW
Total	3,393 MW

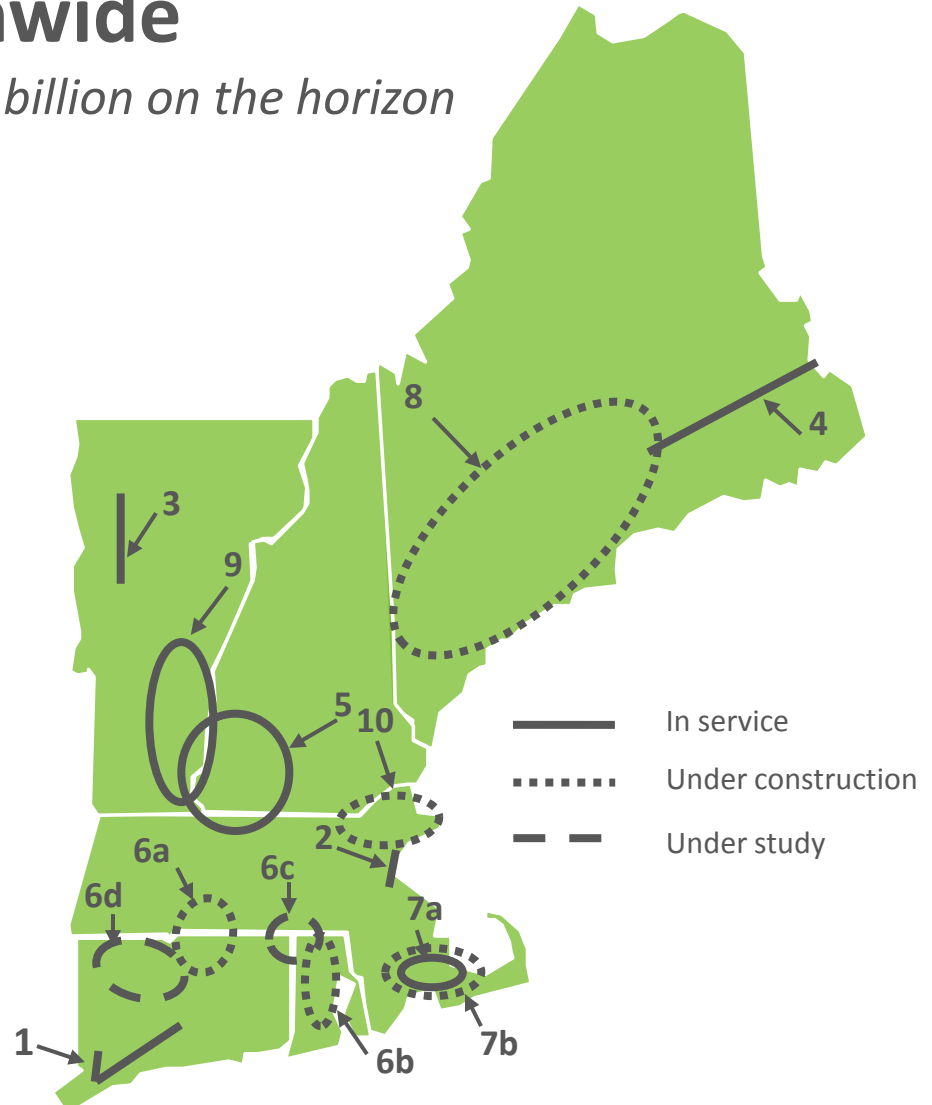
*Megawatts based on relevant Forward Capacity Auction (FCA) summer qualified capacity (NOTE: total includes full and partial generator Non-Price Retirement (NPR) requests for Capacity Commitment Period (CCP) 2013-2014 through CCP 2017-2018; does not include NPRs for demand response (DR) resources)

Source: Status of Non-Price Retirement Requests; October 23, 2013

Transmission Projects to Maintain Reliability are Progressing Regionwide

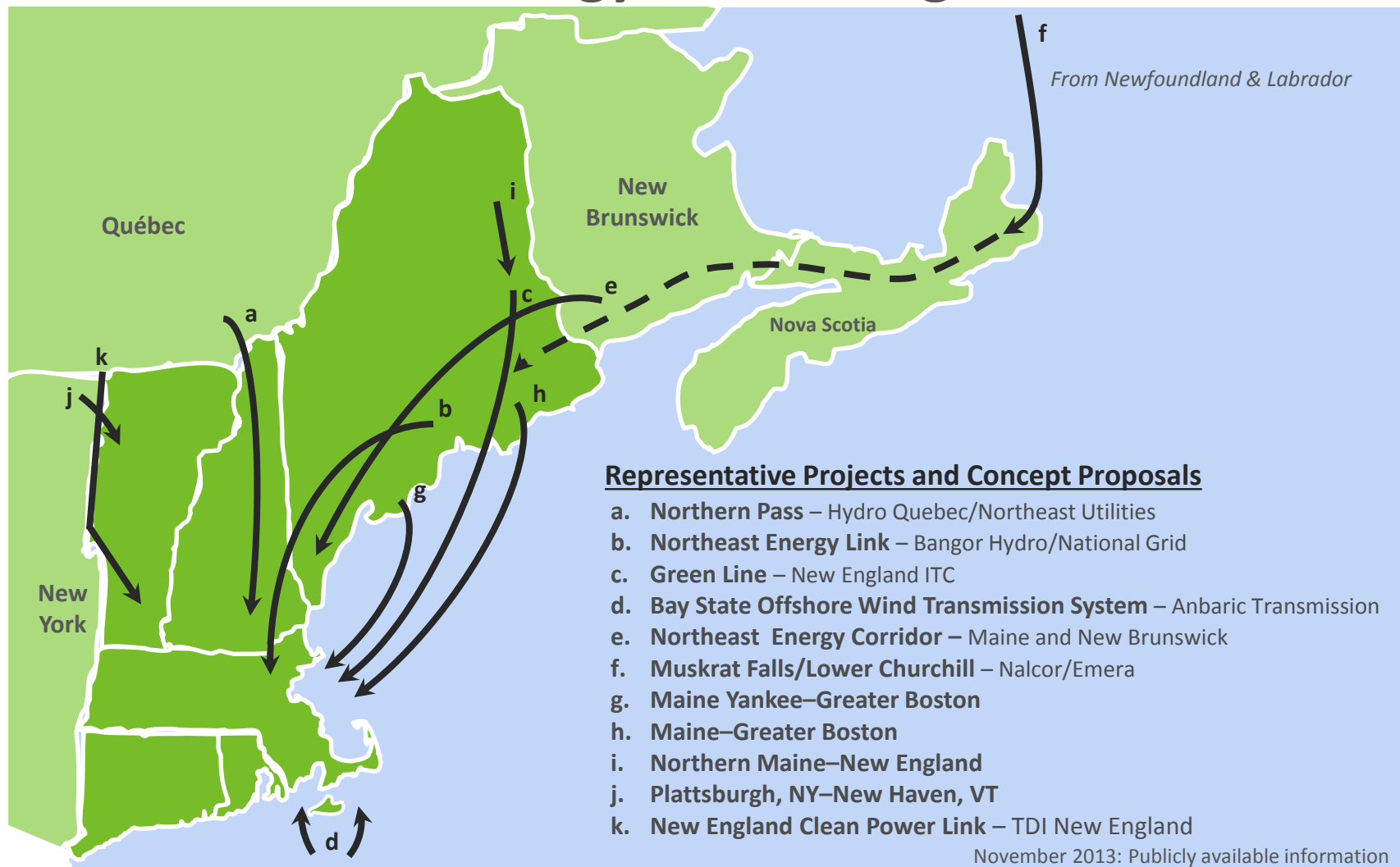
\$5.5 billion invested since 2002, \$5.7 billion on the horizon

1. Southwest CT Phases I & II
2. 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. Greater Rhode Island Reliability Project
 - c. Interstate Reliability Project
 - d. Central Connecticut 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



Source: RSP Transmission Project Listing, June 2013; (does not include "concept" projects)

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



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

2013-2014 WINTER RELIABILITY PROGRAM

Background, Overview, and Results

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



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 <i>MWh</i>	Price <i>\$ (Millions)</i>
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

Questions



For More Information

- ISO Training

<http://www.iso-ne.com/support/training/index.html>

- ISO Express data portal

<http://isoexpress.iso-ne.com/guest-hub>

- ISO to Go mobile app

– For iPhone and Android

<http://www.iso-ne.com/support/isotogo/>

