



# **The New England Energy Market What Does the Future Hold?**

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# Introduction

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## *New England Energy Market Today*

- Energy market pricing
- Capacity market pricing
- Supply/demand balance
- Renewable portfolio standards

## *New England Energy Market Tomorrow*

- Generation
  - Environmental pressures
  - Capacity market changes
  - Nuclear retirements?
  - RPS
- Transmission
  - Regional projects
  - FERC developments

## *Conclusions*



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# *The New England Power Market Today*



# New England Power System Overview

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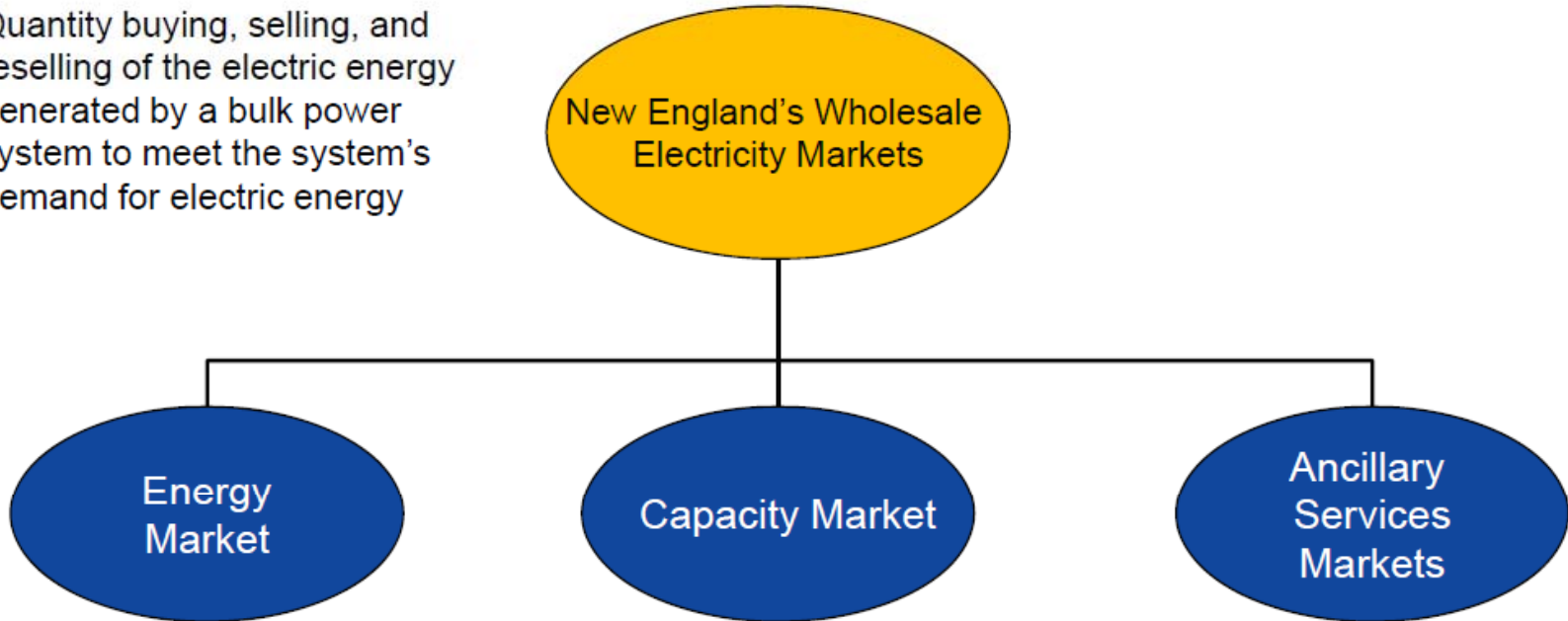
- 6.5 million households and businesses; population 14 million
- More than 300 generators
- Over 8,000 miles of high-voltage transmission lines
- 13 interconnections to electricity systems in New York and Canada
- More than 31,000 megawatts (MW) of total supply
- More than 2,300 megawatts of demand response (February 2010)
- All-time peak demand of 28,130 megawatts, set on August 2, 2006
- Over 400 participants in the market
- \$5.4 billion annual total energy market value (2010)



# New England's Wholesale Electricity Markets

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Quantity buying, selling, and reselling of the electric energy generated by a bulk power system to meet the system's demand for electric energy



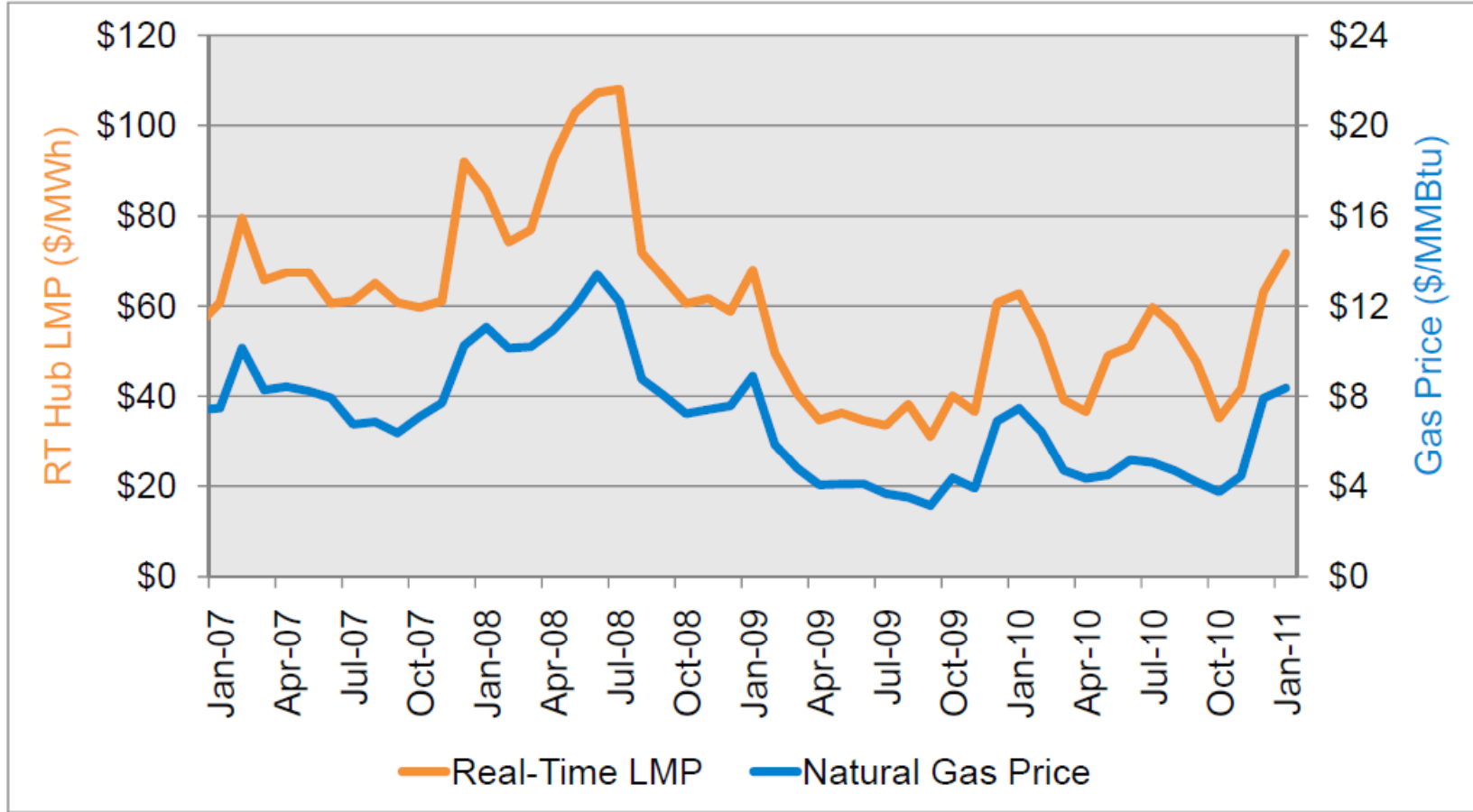
System for purchasing and selling electricity using supply and demand to set the price

Market where resources receive compensation for having invested in capacity and delivers in the capacity commitment period(s)

Services that ensure the reliability of production and transmission of electricity

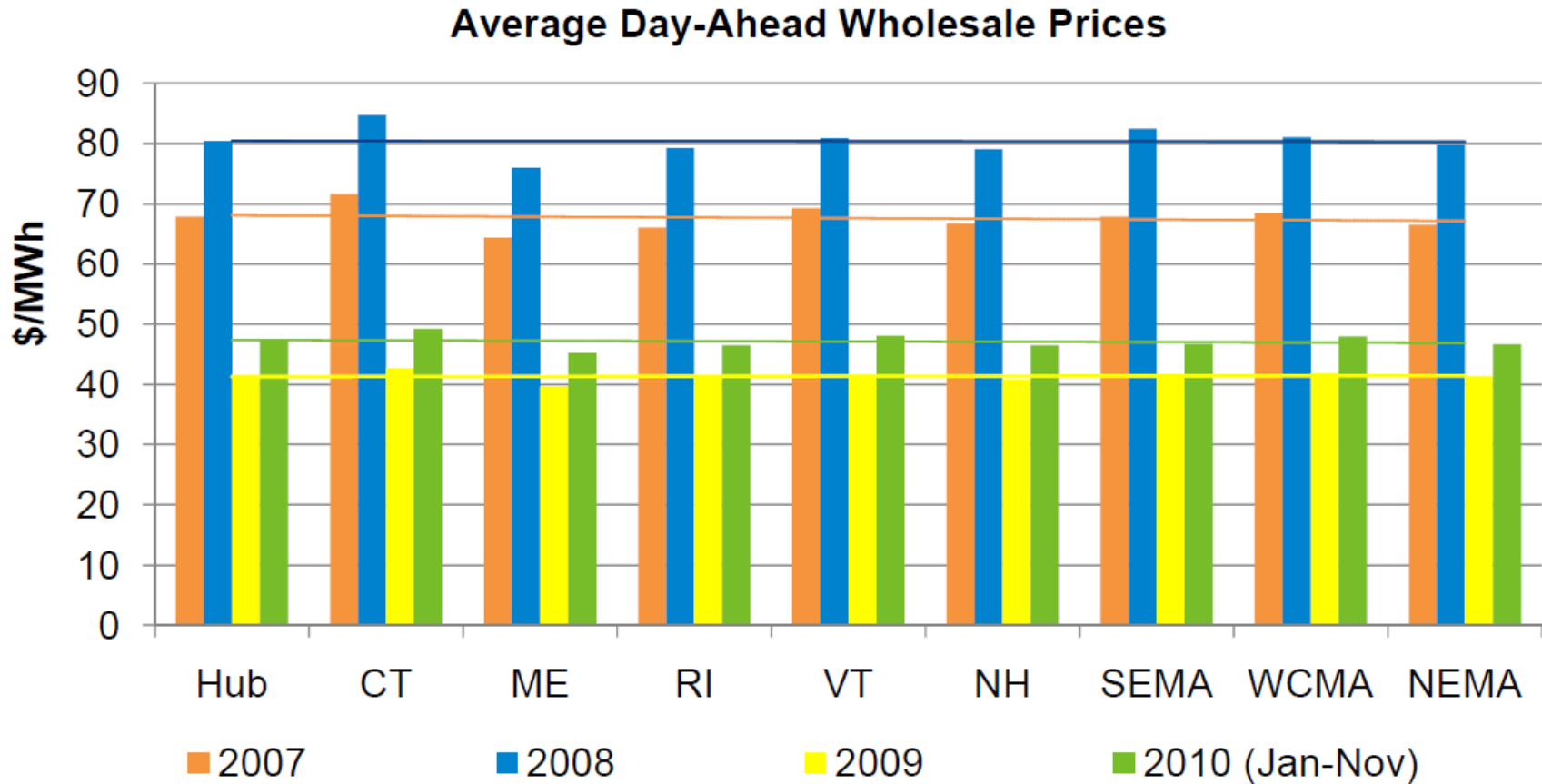


# Wholesale Electricity Prices Track Natural Gas Prices



# Average Day-Ahead Wholesale Prices

Maine Typically has the Lowest Day Ahead and Real-Time Prices in the Region



## Forward Capacity Market Auction Results

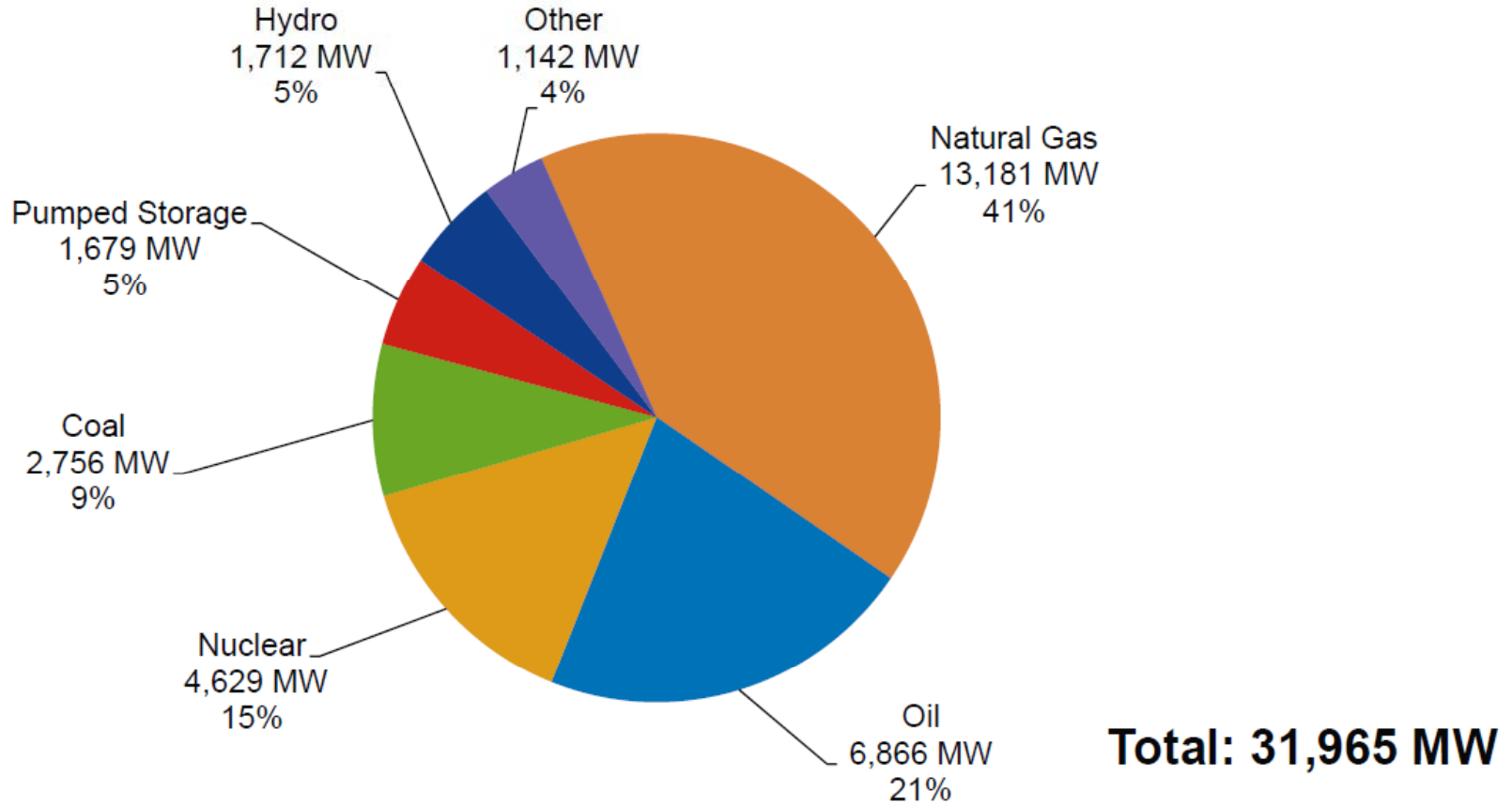
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<b>AUCTION</b> <i>Commitment Period</i>	<b>Total Capacity Acquired</b> (MW)	<b>Capacity Required</b> (MW)	<b>Excess Capacity</b> (MW)	<b>New Demand Resources</b> (MW)	<b>New Supply</b> (MW)	<b>Clearing Price</b> (\$/kW-month)
<b>FCA 1</b> <i>2010-2011</i>	34,077	32,305	1,772	1,188	626	\$4.50* <i>Floor price</i>
<b>FCA 2</b> <i>2011-2012</i>	37,283	32,528	4,755	448	1,157	\$3.60* <i>Floor price</i>
<b>FCA 3</b> <i>2012-2013</i>	36,996	31,965	5,031	309	1,670	\$2.95* <i>Floor price</i>
<b>FCA 4</b> <i>2013-2014</i>	37,501	32,127	5,374	515	144	\$2.95* <i>Floor price</i>



# New England Capacity by Fuel Type, 2010

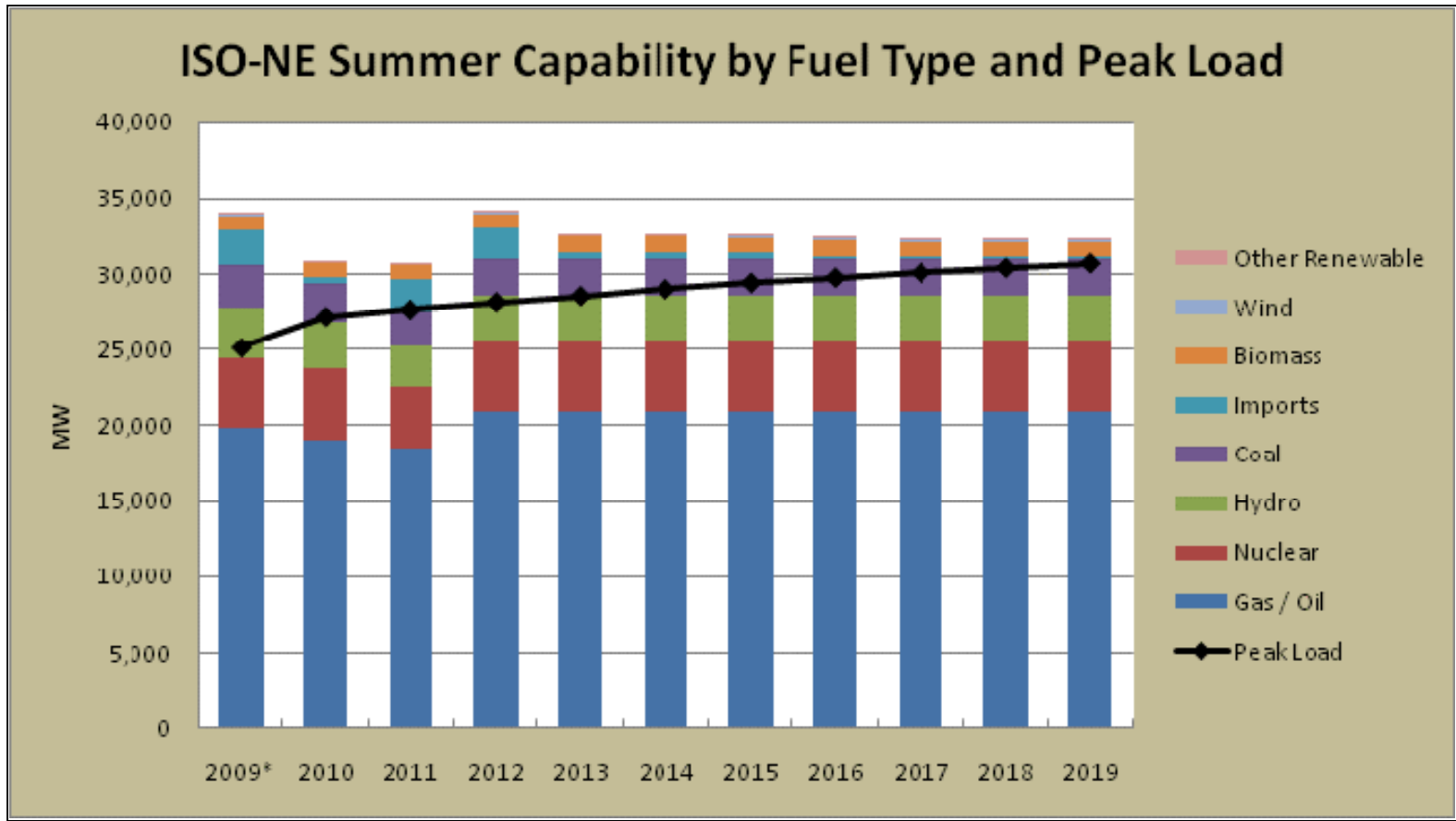
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Source: RSP10. "Other" includes landfill gas, other biomass gas, refuse, wood and wood waste, wind, and misc. fuels.



# Projected Demand Versus Supply



Notes:

\*2009 Reflects Actual Demand

Source: CELT 2010 Report: 2010-2019 Forecast Report of Capacity, Energy, Loads, and Transmission. April 2010. Table 1.3 - Summary Summer Capability by Fuel/Unit Type (MW) (1)



# Renewables Requirements by State

STATE		2008	2009	2010	2011	2012	NOTES
Connecticut	Class 1	5%	6%	7%	7%	7%	
	Cl. 1 or 2	3%	3%	3%	3%	3%	
	Class 3	2%	3%	4%	4%	4%	
Maine		30% of LSE sales					10% increase in renewables as a share of total gen in Maine by 2017
Massachusetts		3.5%	4%	5%	6%	7%	Max % to be determined by DOER
New Hampshire	Class I	0%	0.5%	1%	2%	3%	16% by 2025 0.3% by 2025
	Class II	0%	0%	0.04%	0.08%	0.15%	
	Class III	4.5%	5.5%	6.5%	6.5%	6.5%	
	Class IV	1%	1%	1%	1%	1%	
Rhode Island		3.5%	4%	4.5%	5.5%	6.5%	16% by 2019 and beyond



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# *The New England Market Tomorrow*



# What Does the Future Hold for Generation?

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*The capacity surplus may not be as robust as it looks*

- Environmental Pressures
  - Revised SO<sub>2</sub> standard adopted in 2010 with compliance by 2017
  - Transport Rule expected to be finalized in June 2011
    - Required reductions in SO<sub>2</sub>, NO<sub>x</sub> and fine particulates by 2014
  - Utility Mercury and Air Toxics Standards – expected to be finalized by November 2011
    - Required reductions in mercury, chromium and nickel in 3 – 4 years
- Forward Capacity Market
  - Floor price has propped up clearing prices and revenues
  - Generators depend on the revenues from this market to cover their fixed costs
  - Floor price expected to go away in time for June 2012 auction (for 2016 delivery yr)
- Over 8,600MW of coal and oil units in NE are over 50 years old
- Retirement may be the only realistic option

*Future of nuclear units is somewhat uncertain*

- VT Yankee (510MW) original license expires March 31, 2012
  - NRC Renewed License to 2032 on 03/21/2011, 11 days after the Japanese tsunami and related incidents at Fukushima



## What Does the Future Hold for Generation? (cont'd)

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- Has a containment vessel identical to the ones at the crippled Fukushima Dai-Ichi nuclear power plant
- VT Legislature and environmental groups have opposed relicensing from the outset, and pursuant to a 2002 pre-acquisition agreement with Entergy, the state can prevent continued operations; Fukushima has further catalyzed opposition
- Years of law suits between Entergy and the State seem likely
- Recent efforts to sell the plant have failed
- Plant closure will likely create significant reliability problems in VT that must be addressed through transmission AND generation solutions (including imports)
- Pilgrim (685MW) license expires 6/8/2012; Entergy applied for a renewal to 2032 back in 2006; prolonged process likely dragged out further due to Fukushima, with more opposition to renewal

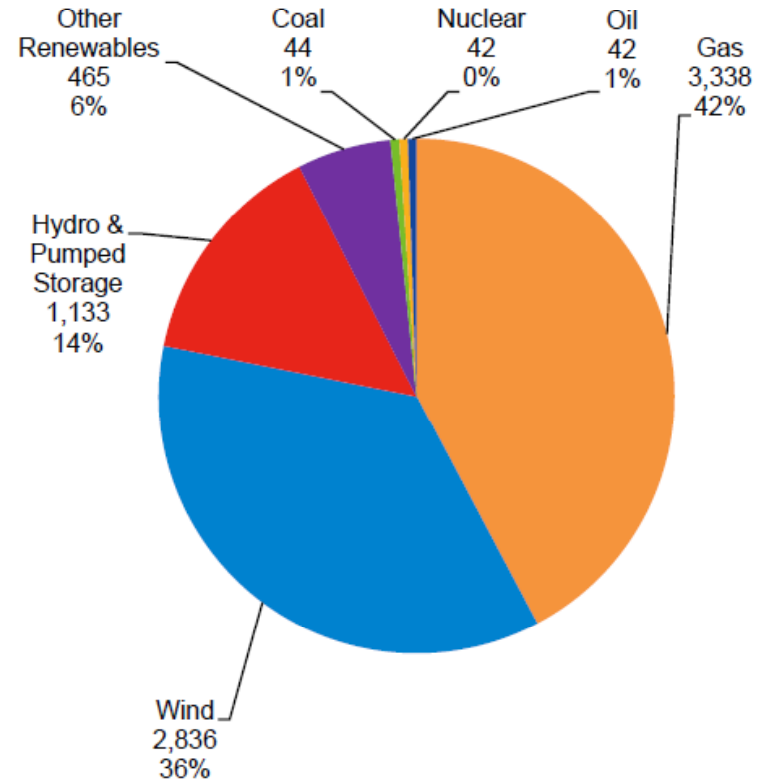
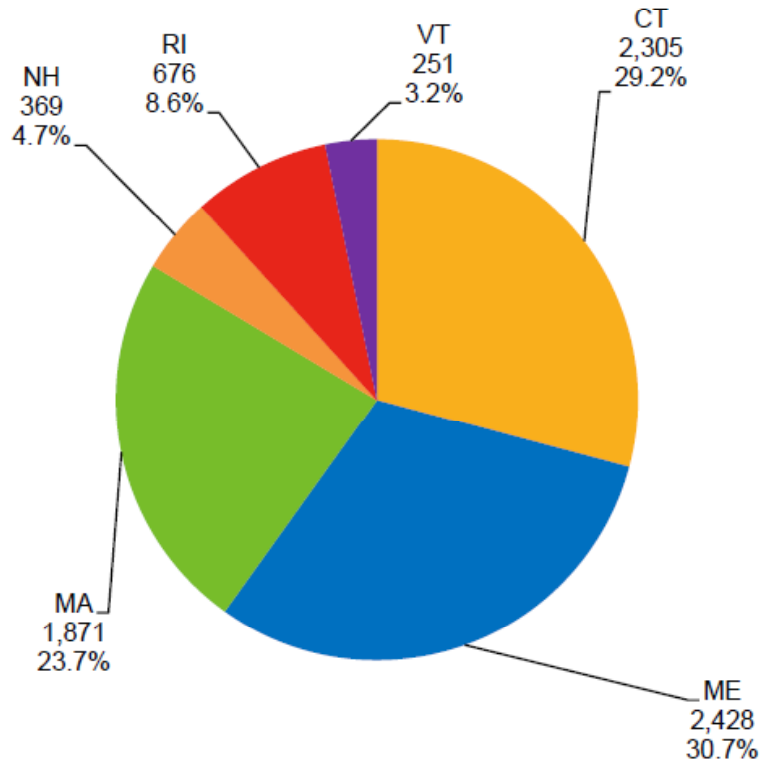
*The energy mix in the future will continue to revolve around natural gas*

- Gas is abundantly available
- Gas units are efficient and flexible
- Capacity mix will be augmented by renewables



# Queue Reflects Region's Interest in Building New Capacity

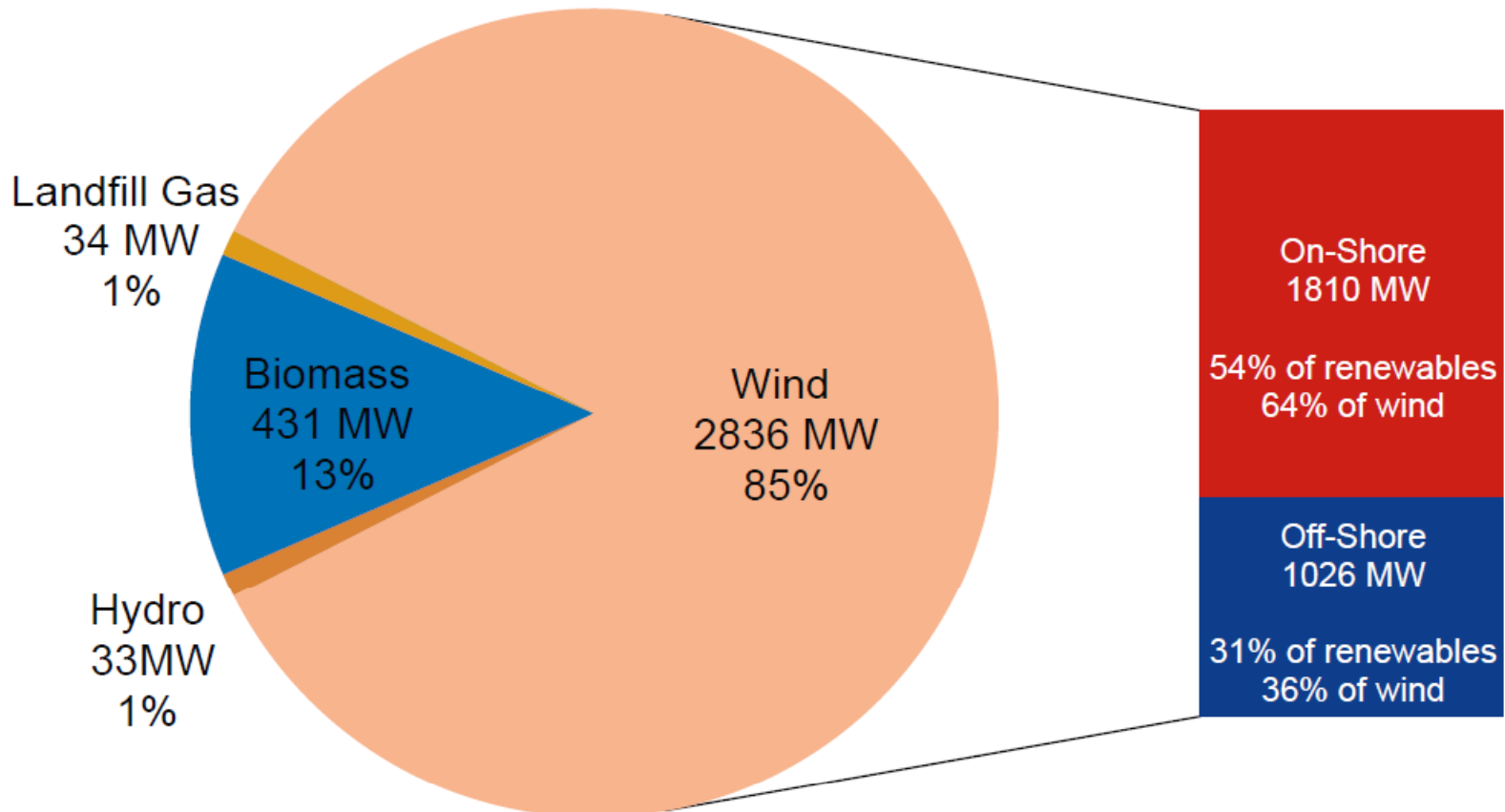
Almost 8,000MW in the Interconnection Queue as of January 2011



# Renewable Projects Proposed by Fuel Type

Over 3,300 MW of Renewables in ISO Queue – Wind is the Dominant Fuel

### MW Renewables, February 2011 Queue by Fuel Type

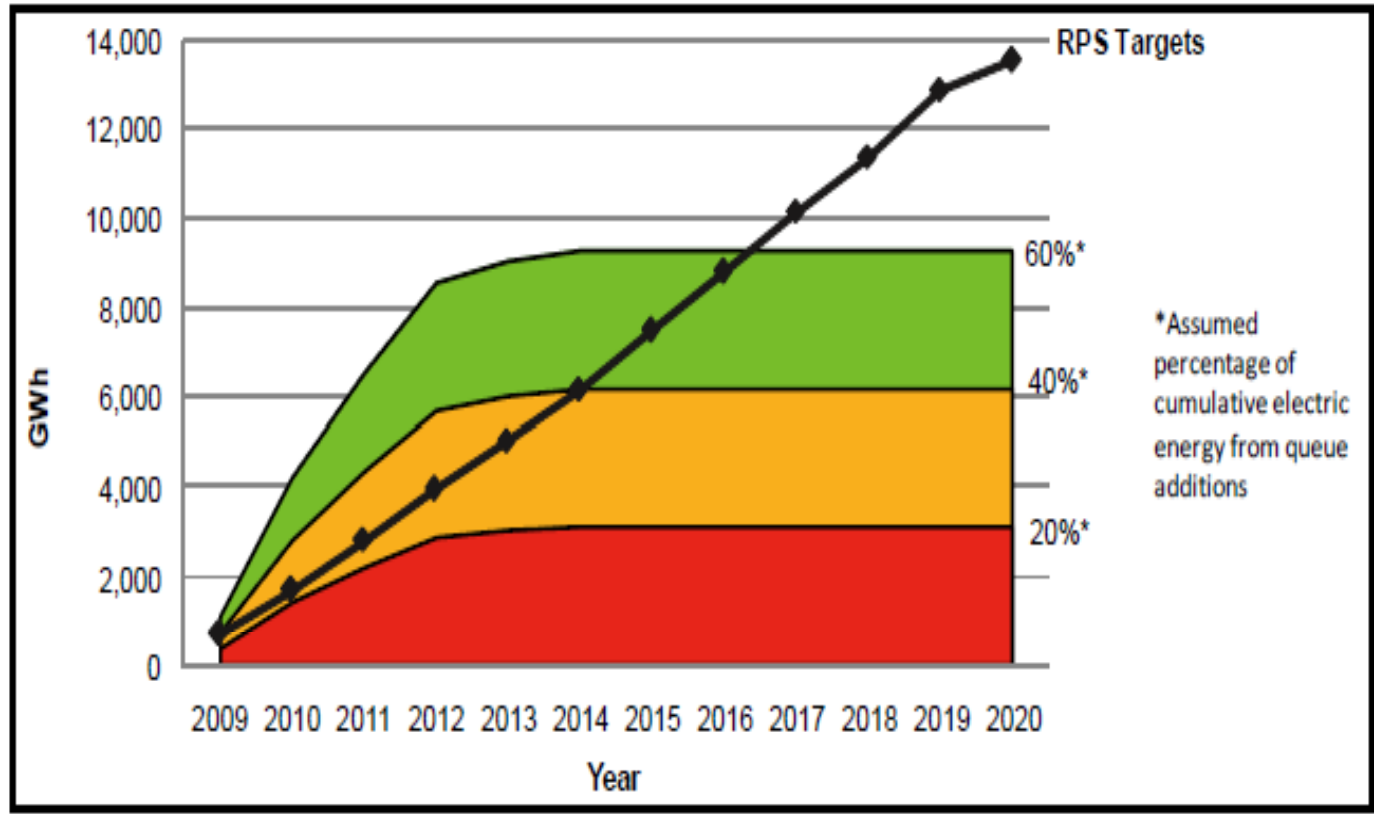


Includes: Landfill Gas, Hydro, Wind, Solar and Biomass. Pump Storage projects in the ISO Queue are not included.



# Renewables Target Against Projected Supply

Various levels of assumed generation versus RPS demand by year



Source: ISO-NE Regional System Plan 2010



## Scenario Examples Based on ISO-E Studies

<b>Description</b> <i>Partial list of scenarios</i>	<b>New Capacity</b> <b>(Megawatts)</b>	<b>Percent of New England Energy (%)</b>	<b>Preliminary Transmission Cost Estimates</b>
<b><i>From New England:</i></b>			
4,000 MW of offshore wind <i>plus</i> 1,500 MW of inland wind	5,500 MW	12%	\$6 B
12,000 MW of wind	12,000 MW	23%	\$19 B to \$25 B
<b><i>From New England and Eastern Canada:</i></b>			
5,500 MW of wind (from above) <i>plus</i> 3,000 MW of additional imports from Québec and New Brunswick*	8,500 MW	15%	\$10 B
12,000 MW of New England wind <i>plus</i> 3,000 MW of additional imports from Québec and New Brunswick*	15,000 MW	26%	\$23 B to \$29 B



## What Does the Future Hold for Transmission?

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*Transmission needs to be built to address existing reliability needs and deliver renewables to load centers*

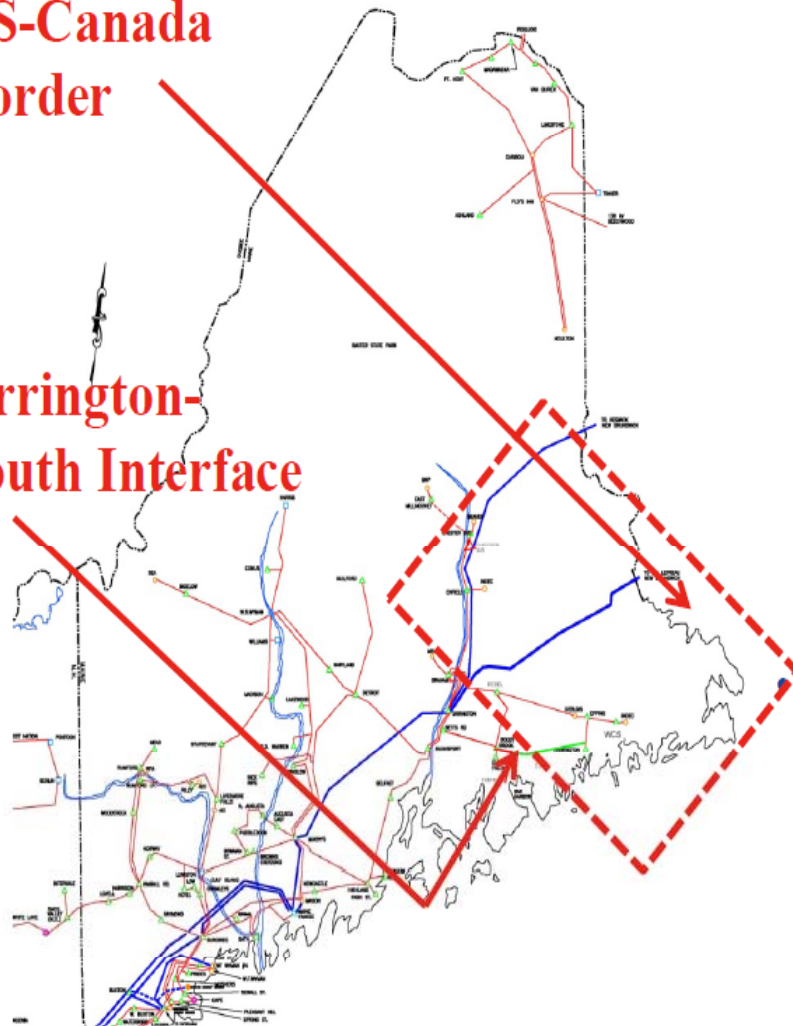
- Existing planning process identifies reliability needs in the region
- Allows for non-transmission alternatives, but the market does always send the appropriate signals to cite generation where it is needed
- How does a generation project that assumes all financial risk compete with a transmission project where costs are recovered through tariff rates?
- Projects needed to link renewables to load centers are not reliability based, so...
  - Who benefits?
  - Who pays?
- Until these questions are answered, any building of transmission beyond that need to meet reliability needs identified in the planning process will not get built



# Issues in Northern Maine (NME)

**US-Canada  
Border**

**Orrington-  
South Interface**






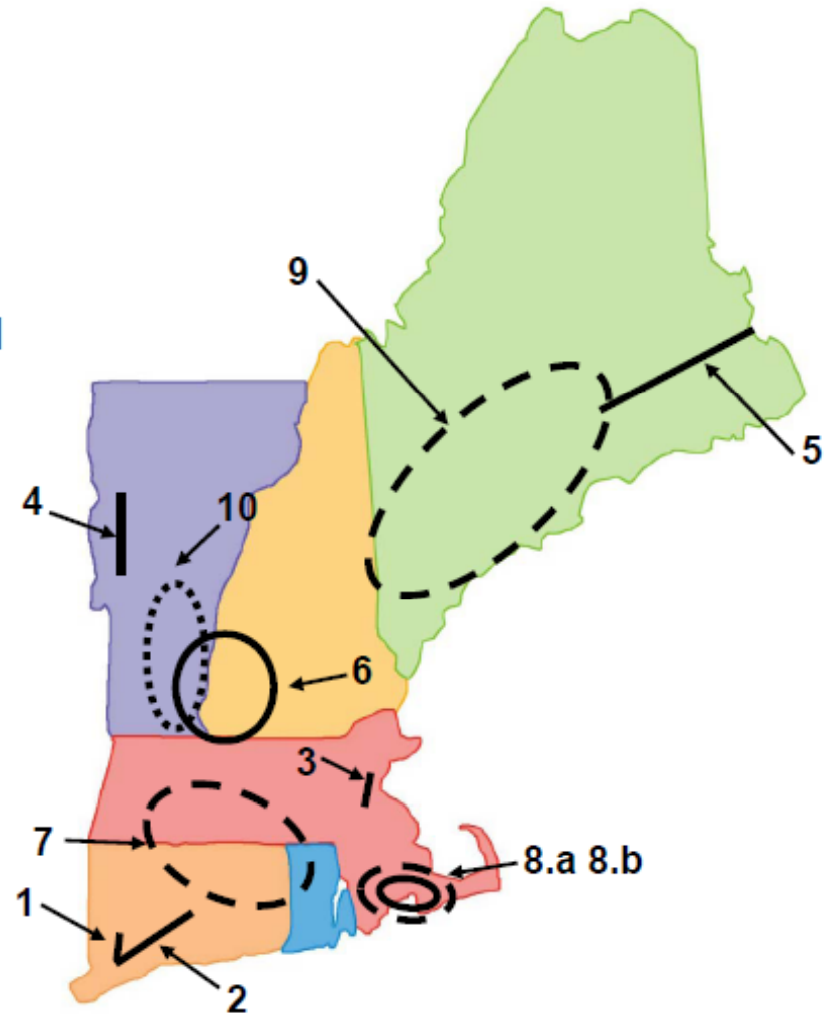
- NME, including Bangor area and MEPCO line are weak part of Maine transmission system
- Reliable operation of system in NME requires special protection systems
  - Most SPS's eliminated through MPRP, expected to be completed in early 2015
- Generators are seeking to interconnect here, but their generation is locked in (can't get down to load centers) and the pursuit of an elective expansion of the transmission system is cost prohibitive



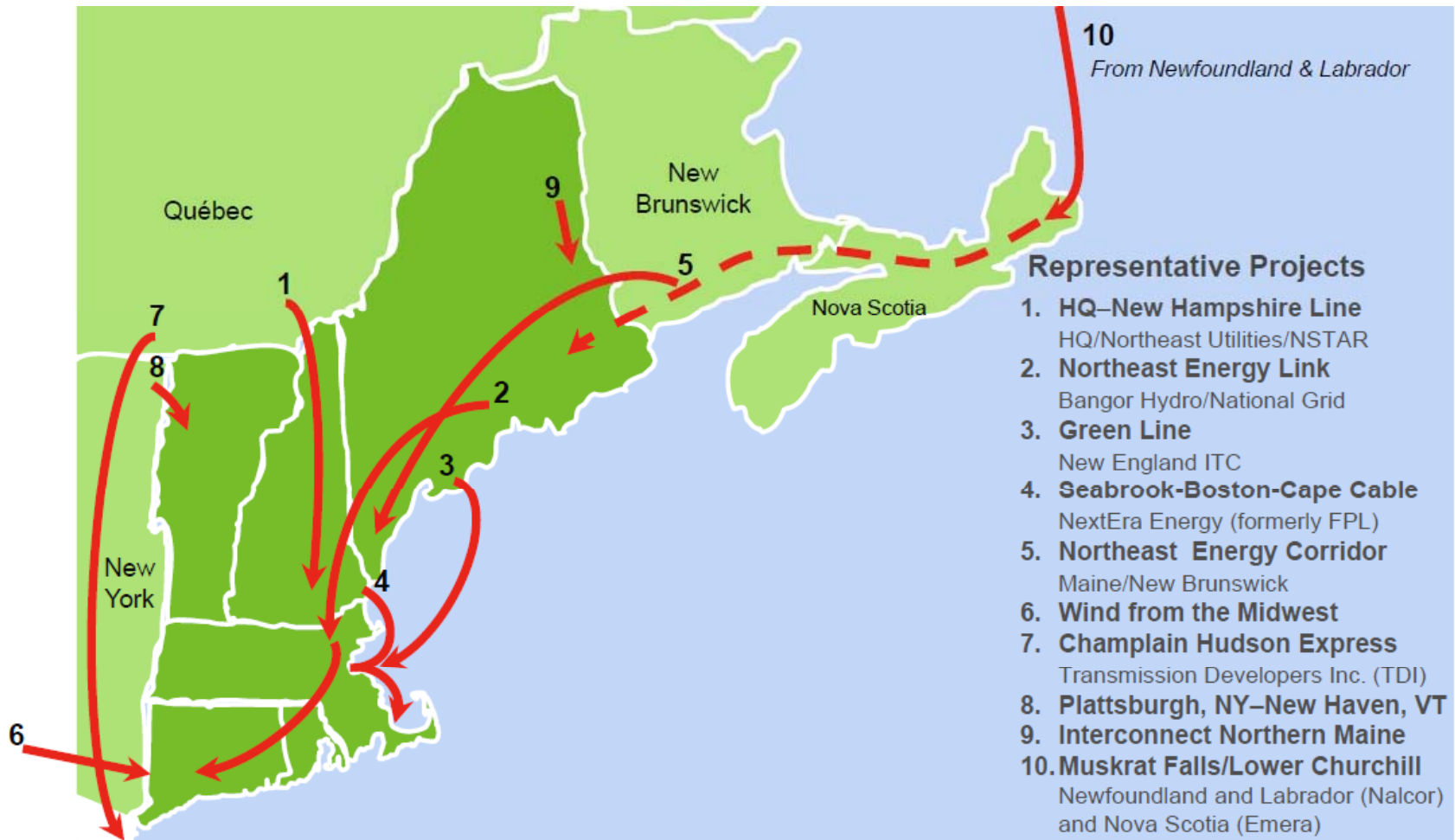
# Proposed Transmission Projects

1. Southwest CT Phase I
2. Southwest CT Phase II
3. NSTAR 345 kV Project, Phases I & II
4. Northwest Vermont
5. Northeast Reliability Interconnect
6. Monadnock Area
7. New England East-West Solution
8. Southeast Massachusetts
  - a. Short-term Upgrades
  - b. Long-term Upgrades
9. Maine Power Reliability Program
10. Vermont Southern Loop

-  In service
-  Under construction
-  Under study or in siting



# Proposed Transmission Projects Vying to Move Renewable Generation to Load Centers



# What Does the Future Hold for Transmission?

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*There is a sea change happening at the FERC in the transmission space*

- Notice of Proposed Rulemaking
  - Issued June 17, 2010
  - Set forth proposed rule changes in three areas
    - How transmission is planned
    - Which entities build transmission
    - How the costs of new transmission are allocated
  - First round of comments filed September 29, 2010
  - After final rule is promulgated
    - Regional compliance due in six months
    - Interregional compliance filings due in 12 months
- Notice of Inquiry
  - Issued May 19, 2011
  - Seeks comments on promoting transmission investment through pricing reform
  - Some questions clearly signal possible changes in FERC policy
    - Effects of the existing incentive policies
    - Whether those policies balance the need for regulatory certainty with changing investment climates
    - How best to promote investment "with the assurance of just and reasonable rates."
    - Outcome may well be a formal change in national policy goals for supporting the development of new independent transmission



## Wrap-up

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- Projected reserve margins are healthy, but may not stay that way
- Environmental policies have the potential to drastically change the resource mix in New England, and negatively affect projected reserve margins
- RPS mandates will continue to drive investment in renewables
- Longer term, the region will need resources from outside the region
- Transmission cost and cost allocation question will need to be answered

**Questions?**

