Analyzing New England Power Market Activity and its Path Forward

The Canadian Institute's Atlantic Power Symposium

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Introduction

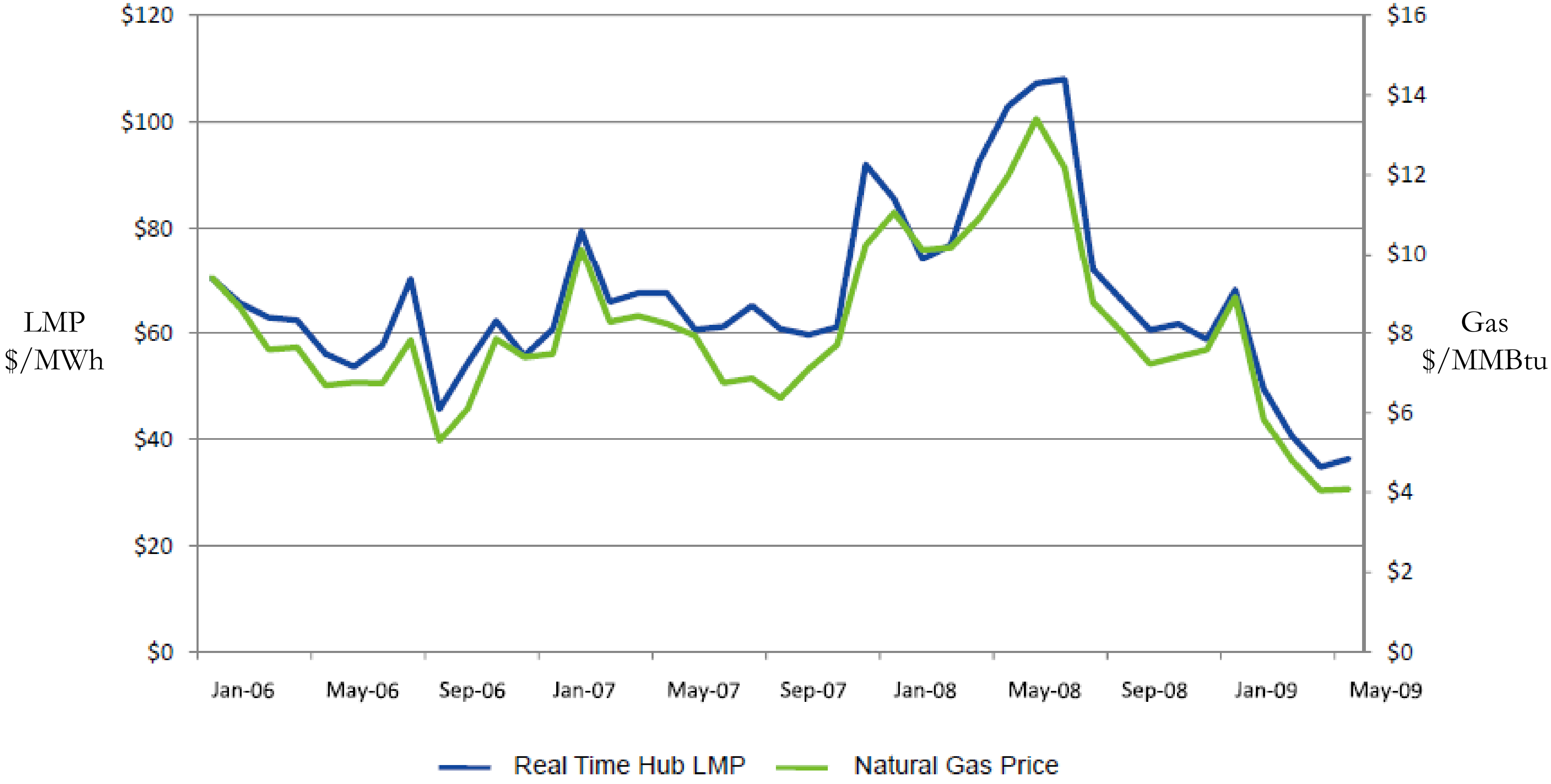
- What does the New England power market look like today?
- Regional renewable requirements
- How will New England get there from here?
- Opportunities and challenges for imports into New England
- Other interesting developments to watch
- Conclusions

The New England Power Market Today

New England Power System Overview

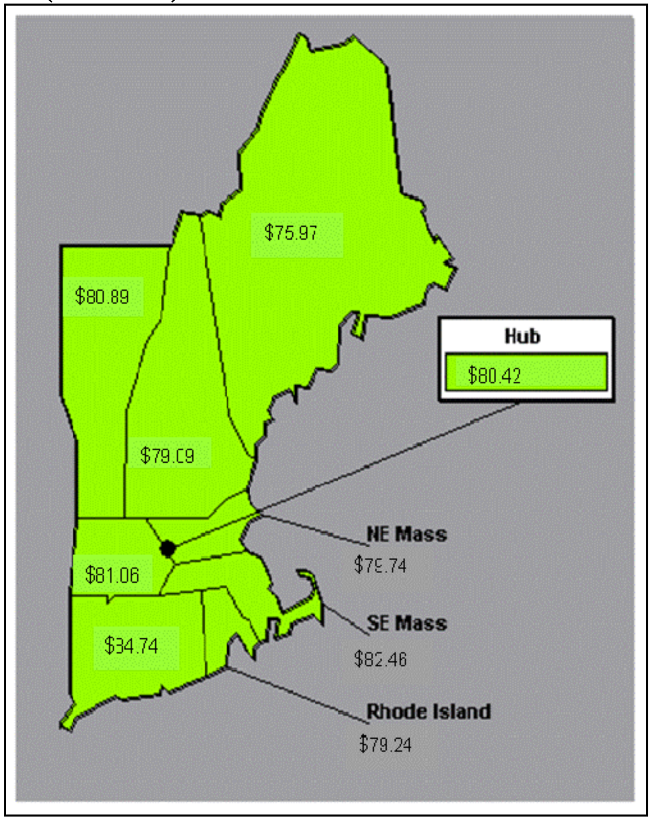
- 6.5 million households and businesses; population 14 million
- More than 350 generators
- Over 8,000 miles of high-voltage
- transmission lines
- 13 interconnections to electricity systems in New York and Canada
- More than 31,000 megawatts (MW) of total supply
- More than 2,300 megawatts of demand 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 (2009)

Historical LMPs and Gas Prices

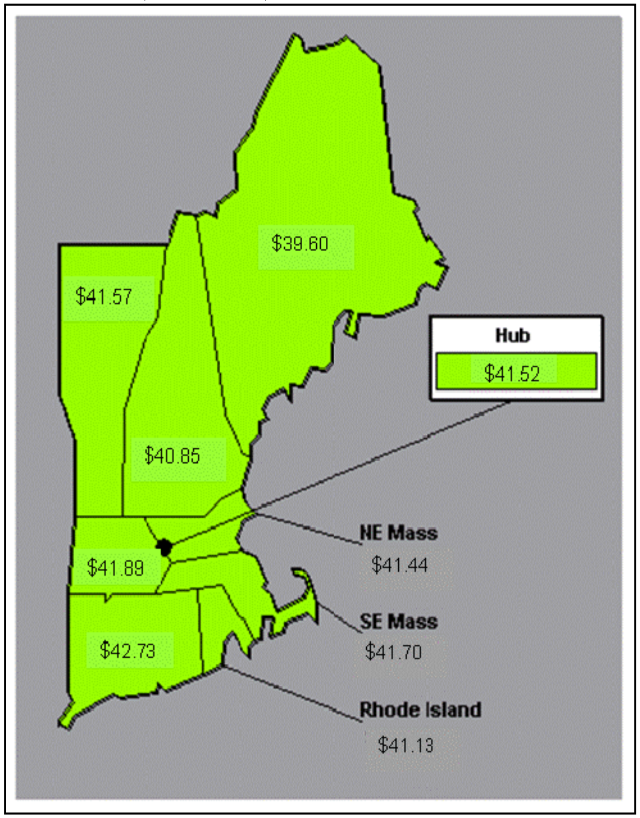


ISO-NE – Energy Prices

2008 ISO-NE Average Day Ahead LMP ($/MWH)



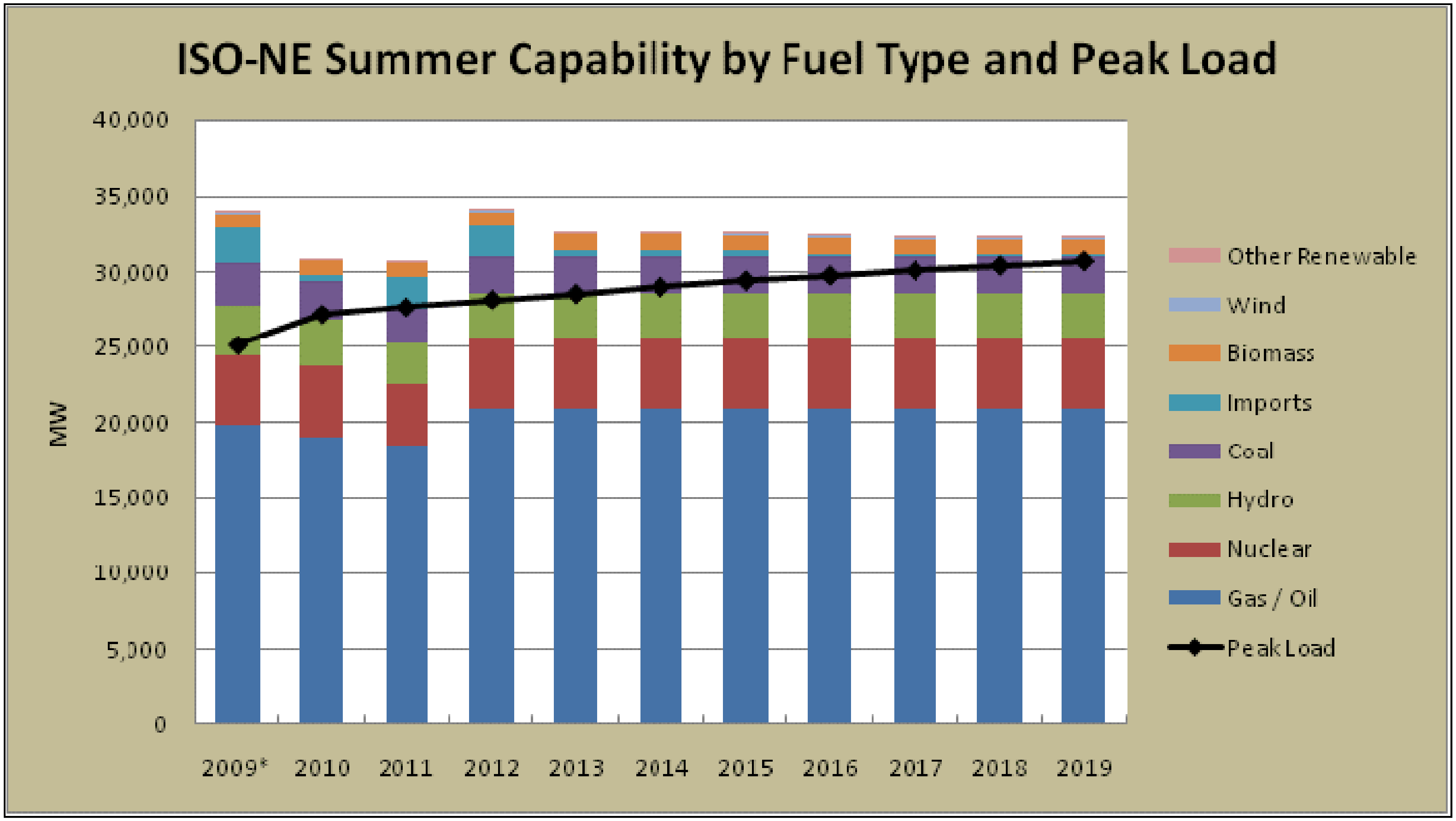
2009 ISO-NE Average Day-Ahead LMP ($/MWH)



Southeast Massachusetts and Southwest Connecticut had the highest average day-ahead prices in 2009, while Maine had the lowest prices.

Source: ISO-NE 2008 Annual Markets Report. June 16, 2009

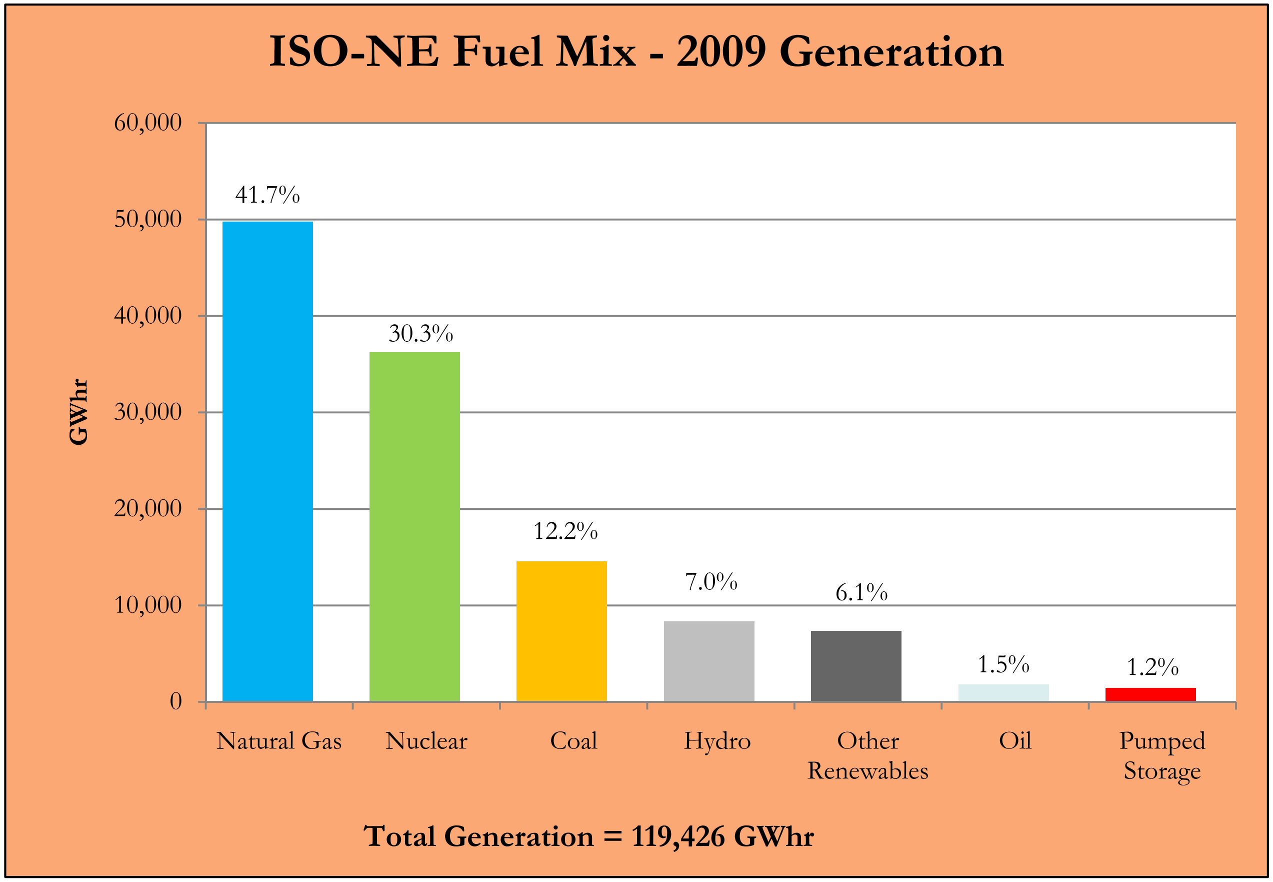
Projected Demand Versus Supply



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)

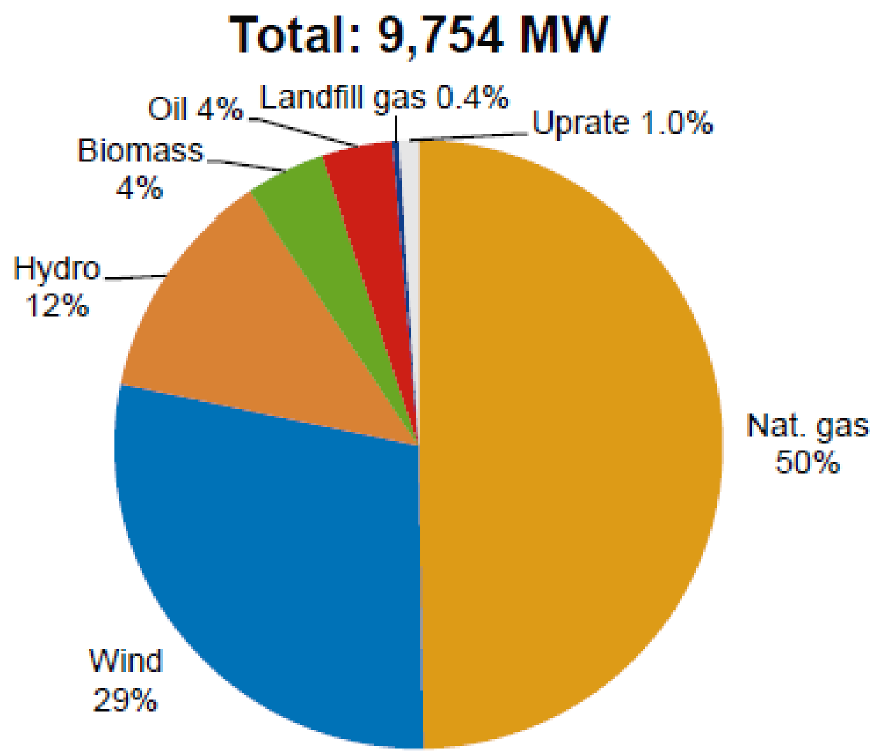
ISO-NE 2009 Fuel Mix Generation



Source: ISO-NE Regional System Plan: System Overview. March 18, 2010. Slide 9.

Proposed New Generation

Proposed projects are primarily natural gas and wind.



Source: ISO New England Generator Interconnection Queue, January 1, 2010

Projected New Generation by Fuel Type

Fuel Type	Total		Green		Yellow	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
Biomass/Wood Waste	12	430	1	38	11	392
Coal	2	53	0	0	2	53
Hydro	10	1,208	1	8	9	1,200
Landfill Gas	2	36	0	0	2	36
Natural Gas	13	1,116	1	2	12	1,114
Natural Gas/Oil	15	3,886	5	1,182	10	2,704
Nuclear Uprates	2	45	0	0	2	45
Oil	3	366	0	0	3	366
Wind	34	2,913	6	206	28	2,707
Total	93	10,053	14	1,436	79	8,617

- Green denotes projects with a high probability of going into service
- Yellow denotes projects with a lower probability of going into service or new applications

Source: ISO-NE, April 2010

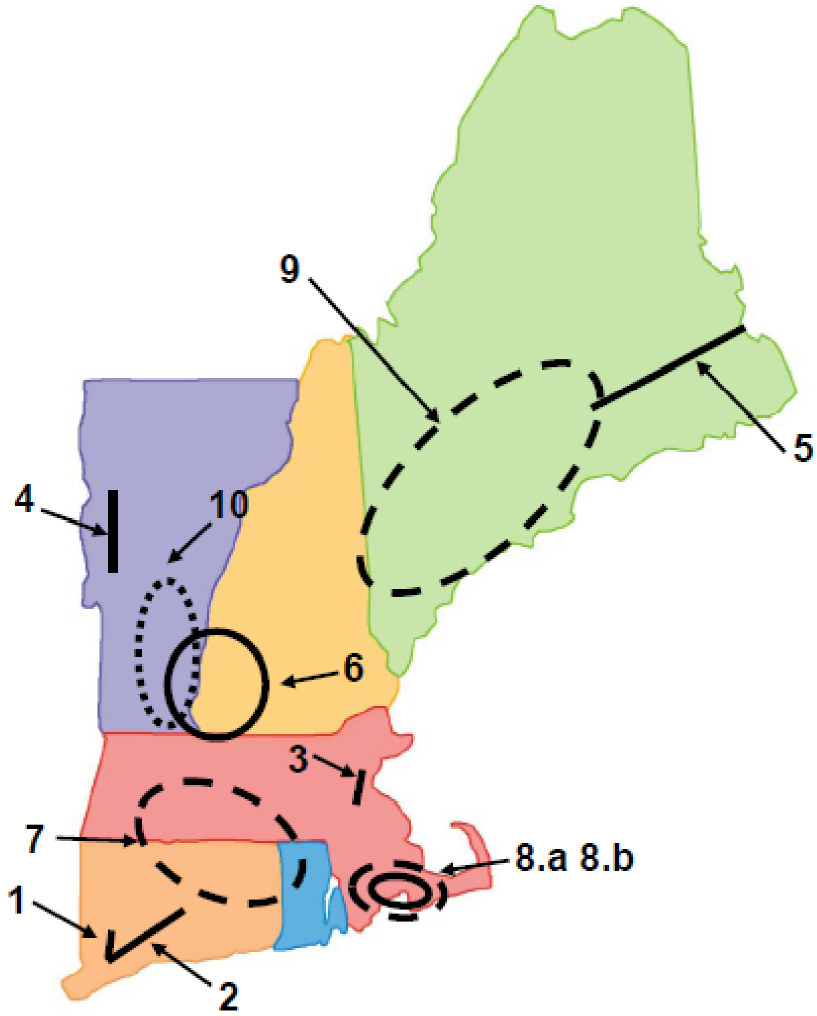
Proposed Transmission Projects

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



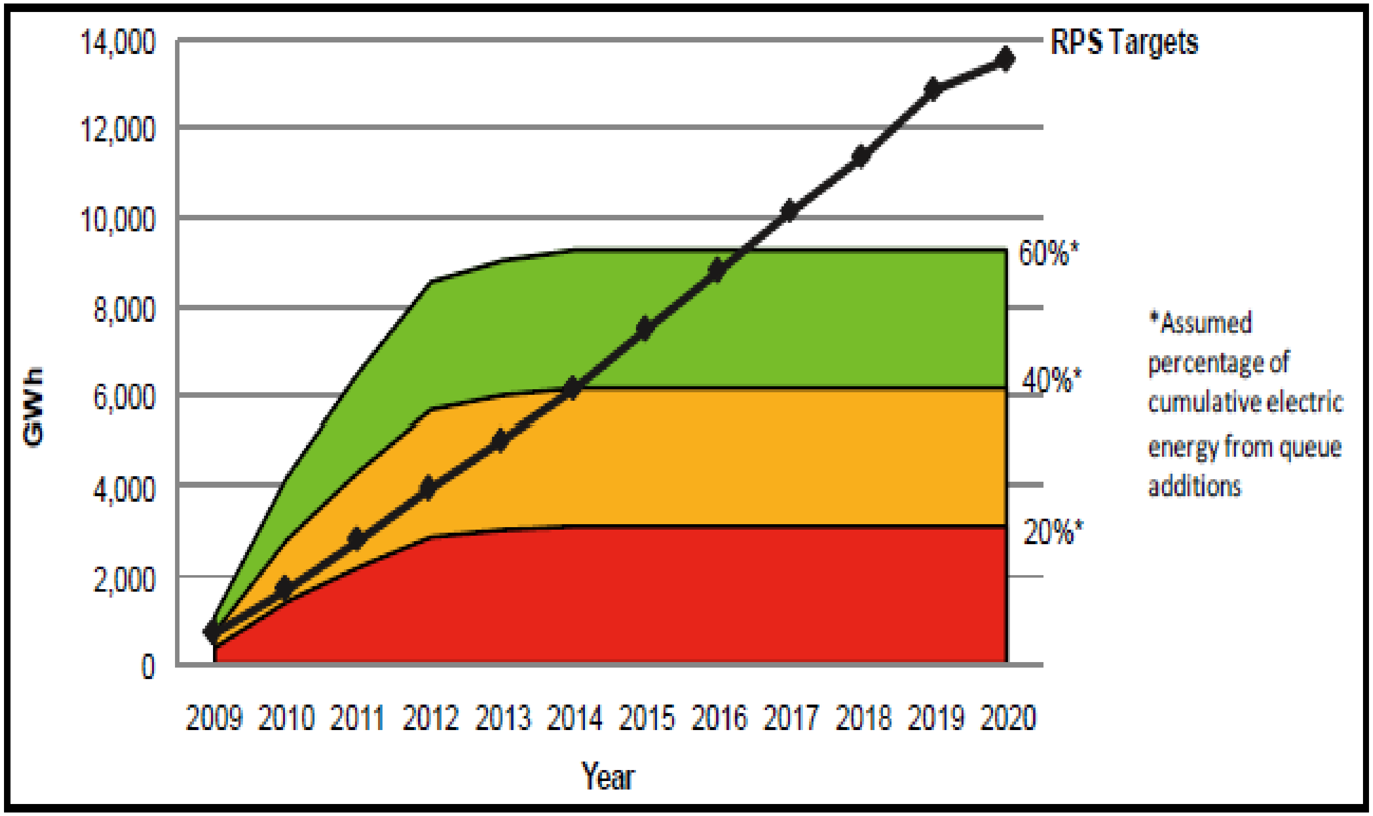
Regional Renewables Requirements

Renewables Requirements by State

STATE		2008	2009	2010	2011	2012	NOTES
Connecticut	Class 1 Cl. 1 or 2 Class 3	5% 3% 2%	6% 3% 3%	7% 3% 4%	7% 3% 4%	7% 3% 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 Class II Class III Class IV	0% 0% 4.5% 1%	0.5% 0% 5.5% 1%	1% 0.04% 6.5% 1%	2% 0.08% 6.5% 1%	3% 0.15% 6.5% 1%	16% by 2025 0.3% by 2025
Rhode Island		3.5%	4%	4.5%	5.5%	6.5%	16% by 2019 and beyond

Renewables Target Against Projected Supply

Various levels of assumed generation versus RPS demand by year



Source: ISO-NE Regional System Plan 2009

How Can New England Meet These Renewables Requirements?

Options to Meet Renewables Targets

Indigenous Resources

- According to NE Governors Blueprint, the New England region has a vast quantity of untapped renewable resources
- More than 10,000 MW (nameplate) on & off-shore wind power potential
- Challenges
  - Cost
    - Cape Wind: 20.7 cents/kwh starting in 2013 for half the power produced by the 130- turbine Cape Wind project ; price would go up by 3.5 percent annually; compared to the current cost of electricity of about 9 cents/kwh. Still requires approval from regulators
    - Deepwater Wind: RI regulators voted unanimously in April to reject a PPA between Deepwater Wind and National Grid. The 24.4 cents per kWh deal, rising by 3.5% a year, was not "commercially reasonable" at twice the price of conventional power.
  - Not in my backyard (NIMBY)
  - Requires an unprecedented level of collaboration between states
    - the fight over jobs and economic benefits

Options to Meet Renewables Targets (cont'd)

Imports from Midwest

- Urgency around climate change at the Federal level
- New England is feeling pressure from Washington to support the movement of geographically-challenged resources (Midwest wind) to the Northeast
- Requires massive amounts of transmission
- Lowers LMPs in Northeast by moving massive amounts of energy from Midwest fossil, nuclear, etc. generation to the East, displacing gas
- Lost generation revenues in East; gains in the Midwest

Imports from Neighboring Regions

- Significant renewable resource potential exists in:
  - Quebec
  - New Brunswick
  - Newfoundland and Labrador
- NU/NSTAR/Hydro-Quebec transmission project

Opportunities and Challenges for Imports

Opportunities and Challenges

Opportunities

- Significant renewable energy resource potential in Canada
- Pressure of large-scale midwest wind energy corridor (backed up by base load coal-fired generation) is driving New England to look for "in-region" solutions
- Challenges in siting renewable projects in New England
  - Cape Wind
  - Attrition in the interconnection queue
- Plans to reduce transmission congestion in southern Maine and NH (Maine Power Reliability Project)

Opportunities and Challenges (cont'd)

Challenges

- Limited export capacity
- Financing – need long term PPA (10-15 years)
- Potential push back on price under a PPA
  - Deepwater Wind
- Cost of transmission puts increased pressure on rising transmission rates in NE
- Current depressed natural gas and electricity markets
- State regulations requiring in state resources
  - TransCanada Power is challenging a state law that requires utilities to buy their future renewable energy from Massachusetts-based firms
  - Civil complaint asserts that the requirement violates the Commerce Clause of the U.S. Constitution by restricting cross-state trade.
- Tariff rules create unequal playing field

Forward Capacity Market Changes

- Capacity market represents a significant revenue stream in NE
- Recent market prices have cleared at the administrative floor price

Forward Capacity Market Auctions	
FCA1 2010-11	$4.50
Reconfiguration 2010-11	$1.50
Reconfiguration 2010-11	$1.43
FCA2 2011-12	$3.60
FCA3 2012-13	$2.95

- New Demand Resources totaling close to 2000MW in each of the first three auctions have eliminated the need for new resources
- ISO-NE has proposed several changes to the market design to correct market design flaws
  - Treatment of out of market capacity
  - Appropriate level of the Cost of New Entry
  - Modeling of Capacity zones
- FERC anticipates issuing an order in time for the 5th auction in June 2011
- Changes will affect the financial viability of a many existing and proposed resources

Wrap-up

- The need for new resources in New England for the foreseeable future will be driven by RPS mandates
- RPS requirements will be met with in-region resources in the near term
- Longer term, the region will need resources from outside the region
- Transmission cost and cost allocation question will need to be answered
- Tariff provisions will have to be modified to recognize imports from "non-traditional" generation
- Major operational questions will need to be addressed with the integration of large amounts of renewable resources
  - Reserves requirements
  - Affect on energy prices
  - Fuel diversity issues

Questions????