

Update on New England Renewable Portfolio Standards (RPS) and Renewable Resources Outlook

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Objectives

1. Provide an update on the Renewable Portfolio Standards (RPS) requirements for New England states by 2020
2. Summarize currently proposed renewable projects in New England (ISO Queue projects)
3. Determine if there are sufficient renewable resources planned for New England
4. Potential renewable resource development in neighboring control areas
 - New York Independent System Operator (NYISO)
 - Quebec
 - Atlantic Provinces

What are RPS?

- RPS are state legislative requirements generally applicable to competitive retail electric suppliers to furnish a specific percentage of their energy from renewable resources
- This requirement usually grows each year and for some states is broken down by specific classes for existing and new resources and special technology categories
- The classes of RPS of most interest for regional electric system planning, are those which require increasing amounts of renewable resources for a states supply mix
- States also have related goals for energy efficiency

New England States' RPS Classes and Related Goals

State	Classes	RPS Target by 2020 (%)
Maine	"Existing"	30
	New Capacity	10% of capacity by 2017
New Hampshire	I New	11
	II Solar	0.3
	III Existing biomass	6.5
	IV Existing small hydro	1.0
Massachusetts	New	15
	EE	All new energy growth
Rhode Island	Existing	2
	New	15.5
Connecticut	I New	20
	II Existing	3
	III CHP and EE	4
Vermont	No RPS	20% by 2017

EE – Energy Efficiency

New England States' RPS Technologies

State	Common Technologies	Special Technologies or Restrictions
Maine	Solar thermal, photovoltaic, ocean thermal, wave, tidal, wind, biomass, hydro (except in MA), landfill gas, fuel cells	Municipal Solid Waste (MSW) with recycling, cogeneration, and geothermal
Massachusetts		Biomass with advanced technology and low emissions, fuel cells only with renewable fuels
Connecticut		Hydro < 5 MW, sustainable biomass, MSW, fuel cells, energy efficiency and combined heat and power
Rhode Island		Fuel cells only with renewable fuels, geothermal
Vermont*		Agricultural wastes, no ocean thermal, wave or tidal power
New Hampshire		Geothermal, no fuel cells

* Vermont does not have a RPS. A program SPEED develops renewables to meet all energy growth by 2012

New England Renewable Energy Supply* to the Grid – 2007

Type Resource	Capacity (MW)	Energy (GWH)
Hydro	1,666	6,680
Refuse	461	4,016
Wood	411	2,908
Landfill and Bio Gas	40	406
Wind	5	17
Solar	< 0.5	1
Total	2,583 (8.3%)	14,028 (10.4%)

* Data based on ISO-NE CELT and 2007 energy production

RSP Projection of RPS Requirements

1. Extrapolate state energy growth from ISO 2008 forecast to 2020
2. Deduct energy for “non-competitive” energy suppliers that are exempt from RPS
3. Apply annual RPS percentage requirements to energy forecast of competitive suppliers by class if appropriate
4. Group RPS requirements into the following categories
 - Existing renewables: ME, RI, NH III & IV
 - New renewables: CT I & II, MA, RI, NH I & II
 - Other renewable requirements: ME new capacity, VT
 - Energy efficiency requirements: CT III, MA EE goal
5. RSP focus is on the requirements for new resources

Total RPS and Related Requirements as Percent of New England Energy Use

	Total New England			
	2008	2012	2016	2020
2008 ISO Forecast of Energy (GWh)	135,000	140,425	144,395	147,947
Total RPS Requirement (GWh)	11,560	19,479	26,866	34,314
Total RPS Requirement as portion of NE Energy (%)	8.6	13.9	18.6	23.2

New England's RPS New Supply Requirements

Based on ISO's 2008 Energy Forecast

	New RPS Requirements (GWh)			
	2008	2012	2016	2020
CT (Class I & II)	2,588	4,041	5,899	8,184
MA	1,861	3,861	6,179	8,576
RI New	128	397	858	1,435
NH (Classes I & II)	–	407	999	1,629
RPS Total New Supply Required	4,577	8,695	13,935	19,824
2007 CT,RI & MA RPS	3,731	3,731	3,731	3,731
RPS Incremental New Supply Requirement	845	4,964	10,204	16,093

Renewable Energy Projects in the ISO-NE Queue

Queue as of March 15, 2008

	Size – MW	Assumed Capacity Factor %*	GWh
Type (#) of Projects	26	25	57
Landfill Gas (4)	36	90	292
Biomass (12)	499	90	3,934
Wind Onshore (23)	1,383	32	3,877
Wind Offshore (1)	462	37	1,497
Fuel Cells (3)	59	95	491
Total (43)	2,465		10,148

* These are consistent with the capacity factors used in ISO-NE's Scenario Analysis, but wind is adjusted for 90% turbine availability.

Outlook for Meeting New RPS Category with New England Supply Projects from Queue

1. By 2016

- 43 proposed renewable projects in the Queue would just meet the new supply-side RPS requirements if all are operating by that year
- 24 of these are wind projects and could provide over half of the energy required for meeting the RPS requirements

2. By 2020

- The proposed projects in the Queue, if all are built, would provide about 63% of new supply-side RPS requirements in that year
- This leaves a gap of 37% for new projects to fill
- Projects in neighboring control regions could help to meet New England's RPS needs assuming these become state-certified
- If sufficient projects are developed to meet the required growth in supply-side RPS energy, they would provide 10.9% of New England's total energy by 2020

What's the Outlook* for Renewable Resources Growth in Neighboring Regions?

1. The New York ISO Queue has over 8,000 MW of wind projects which, if they are all built, would more than meet the NY RPS requirement of 25%
2. The Eastern Canadian provinces are developing over 13,000 MW of wind and hydro projects and more are being planned. Wind makes up over 7,000 MW
 - NE RPS programs allow only small hydro (generally < 5 MW) so changes to the RPS would be needed to take advantage of large Canadian hydro projects
 - Generally the states' RPS allow Renewable Energy Certificates (RECs) with deliverability from adjacent control areas which include the Canadian Provinces. MA has already qualified RECs from Prince Edward Island wind projects

* Based on NYISO Queue and NICE Information

Observations

1. If all the renewable projects currently in the ISO-NE Queue would be operating by 2020, there would be a shortage of almost 40% in meeting the RPS for that year
2. This shortage could be met by
 - Building additional renewable projects in New England
 - Buying RECs from neighboring regions. Eastern Canada is developing a large amount of renewable projects whose energy could be available for export
 - Load Serving Entities (LSE's) paying the alternative compliance payment to increase state funds that support renewable resource development
 - Small renewable projects behind the meter and not in the Queue may also contribute to meeting RPS

