

MAINE PUBLIC UTILITIES COMMISSION

ANNUAL REPORT ON NEW RENEWABLE RESOURCE PORTFOLIO REQUIREMENT

**Presented to the
Joint Standing Committee on
Energy, Utilities and Technology
March 31, 2013**

TABLE OF CONTENTS

I.	INTRODUCTION	3
II.	BACKGROUND	3
	A. <u>New Renewable Resource Portfolio Requirement (Class I)</u>	3
	B. <u>Class I Implementing Rules</u>	5
	C. <u>Maine’s Eligible Resource Portfolio Requirement (Class II)</u>	5
	D. <u>Renewable Energy Credits</u>	6
III.	IMPLEMENTATION AND COMPLIANCE	6
	A. <u>Certified Generators</u>	6
	B. <u>Exempt Sales</u>	6
	C. <u>New Renewable Portfolio Requirement (Class I); Resources and Cost Impacts</u>	7
	D. <u>Eligible Resource Portfolio Requirement (Class II); Resource and Cost Impacts</u>	8
	E. <u>Portfolio Requirement Percentage Suspension</u>	9
	F. <u>Status of Renewable Resource Development</u>	10
IV.	CONCLUSION	10
V.	ATTACHMENTS	
	1. <u>Generation Facilities Certified by the Commission as Class I New Renewable Resource</u>	
	2. <u>Renewable Resource Assessment Section of the ISO-NE Regional System Plan 2010</u>	

I. INTRODUCTION

During its 2007 session, the Legislature enacted an Act to Stimulate Demand for Renewable Energy (Act).¹ The Act added a mandate that specified percentages of electricity that supply Maine's consumers come from "new" renewable resources. Generally, new renewable resources are renewable facilities that have an in-service date, resumed operation or were refurbished after September 1, 2005. The percentage requirement began at one percent in 2008 and increases in annual one percent increments to ten percent in 2017 and remains at ten percent thereafter, unless the Commission suspends the requirement pursuant to the provisions of the Act.

The Act contains an annual reporting requirement on the status of Class I renewable resource development and compliance with the portfolio requirement. The reporting provision specifies:

Annual Reports. No later than March 31, 2008 and annually thereafter, the Commission shall submit a report regarding the status of new renewable capacity resources in the State and New England, and compliance with the portfolio requirement required by this section to the joint standing committee of the Legislature having jurisdiction over utilities and energy matters. The report shall include, but is not limited to, a description of new renewable capacity resources available to meet the portfolio requirement required by this section, documentation of the loss of any existing renewable generation capacity in the State, the status of implementation of the new renewable resources portfolio requirement, including any suspensions pursuant to subsection D, and recommendations to stimulate investment in new renewable resources.

The Commission hereby submits its report to the Energy, Utilities and Technology Committee to describe the status of Maine's new renewable resource portfolio requirement. The Commission notes that this report is based on the most recently filed Competitive Electricity Provider annual compliance reports, which were filed in July 2012 for calendar year 2011. Therefore, this report generally presents information on implementation and compliance with the portfolio requirement for calendar year 2011.

II. BACKGROUND

A. New Renewable Resource Portfolio Requirement (Class I)

As stated above, the new renewable resource portfolio requirement, referred to as Class I,² requires that specified percentages of electricity that supply

¹ P.L. 2007, ch. 403 (codified at 35-A M.R.S. § 3210(3-A)).

² The "new" renewable resource requirement was designated as Class I in the Commission's implementing rules (Chapter 311) because the requirement is similar to portfolio requirements in other New England states that are referred to as "Class I." Maine's pre-existing "eligible" resource portfolio requirement is designated as Class II.

Maine's consumers come from "new" renewable resources.³ The percentage requirement began at one percent in 2008 and increases in annual one percent increments to ten percent in 2017 and remains at ten percent thereafter. The Act specifies the resource type, capacity limit and the vintage requirements for the new renewable resource requirement. As specified in the Act, a new renewable resource used to satisfy the Class I portfolio requirement must be of the following types:

- fuel cells;
- tidal power;
- solar arrays and installations;
- wind power installations;
- geothermal installations;
- hydroelectric generators that meet all state and federal fish passage requirement; or
- biomass generators, including generators fueled by landfill gas.

In addition, except for wind power installations, the generating resource must not have a nameplate capacity that exceeds 100 MW. Moreover, the resource must satisfy one of four vintage requirements. These are:

- 1) Renewable capacity with an in-service date after September 1, 2005;
- 2) Renewable capacity that has been added to an existing facility after September 1, 2005;
- 3) Renewable capacity that has not operated for two years or was not recognized as a capacity resource by the ISO-NE or the NMISA and has resumed operation or has been recognized by the ISO-NE or NMISA after September 1, 2005; and
- 4) Renewable capacity that has been refurbished after September 1, 2005 and is operating beyond its useful life or employing an alternate technology that significantly increases the efficiency of the generation process.

The Act also includes an "alternative compliance mechanism" (ACM) that allows suppliers to pay specified amounts into the Energy Efficiency and Renewable Resource Fund⁴ in lieu of compliance with the new renewable resource portfolio requirement, and states that the Commission shall set the alternative compliance payment rate in its implementing rules. In addition, the Act allows the Commission to suspend scheduled percentage increases in the portfolio requirement if it finds that investment in new renewable resources has not been sufficient for suppliers to satisfy the requirement, the requirement has burdened electricity customers without providing the benefits from new renewable resources or that there has been an over reliance on the ACM.

³ Contracts or standard offer arrangements that pre-date the effective date of the Act, 35-A M.R.S. § 3210(3-A)(D), and sales to qualified Pine Tree Development Zone businesses, 35-A M.R.S. § 3210-B(4), are exempt from the portfolio requirement.

⁴ The Energy Efficiency and Renewable Resource Fund was established to fund research, development and demonstration projects related to energy technologies. 35-A M.R.S. § 10121.

B. Class I Implementing Rules

As required by the Act, the Commission modified its portfolio requirement rule (Chapter 311) to implement the “new” renewable resource requirement.⁵ The implementing rules establish a certification process that requires generators to pre-certify facilities as a new renewable resource under the requirements of the rule and provide for a Commission determination of resource eligibility on a case-by-case basis.⁶ The rule also specifies that the Commission may revoke a certification if there is a material change in circumstance that renders the generation facility ineligible as a new renewable resource. Under the rules, a generator does not have to be located in Maine to be eligible as long as its power is used to serve load in New England.

As required by the Act, the rules establish an ACM that allows suppliers to make a payment in lieu of compliance with the new renewable resource portfolio requirement.⁷ The rule established a base alternative compliance payment rate of \$57.12 per megawatt-hour that is adjusted annually based on the Consumer Price Index. The alternative compliance payment rate in 2011 was \$62.13 per MWh.

Finally, the implementing rules allow suppliers to satisfy or “cure” a compliance deficiency in one calendar year during the following calendar year. This cure provision only applies only if the supplier has satisfied at least two-thirds of its calendar year requirement. In addition, a supplier may “bank” any excess renewable credits in a calendar year for use in the next calendar year. However, a supplier may not use banked credits to satisfy more than one-third of the requirement in any year.⁸

C. Maine’s Eligible Resource Portfolio Requirement (Class II)

Maine’s original restructuring legislation, which became effective in March 2000, included a 30% eligible resource portfolio requirement.⁹ The eligible resource portfolio requirement, now referred to as Class II, mandated that each retail competitive electricity supplier meet at least 30% of its retail load in Maine from “eligible resources.” Eligible resources are defined in statute as either renewable resources or efficient resources. Renewable resources are defined in statute as fuel cells, tidal power, solar arrays, wind power, geothermal installations, hydroelectric generators, biomass generators, and municipal solid waste facilities. Renewable resources may not exceed a production capacity of 100 megawatts. “Efficient” resources are cogeneration facilities that were constructed prior to 1997, meet a statutory efficient standard and may be fueled by fossil fuels.

⁵ *Order Adopting Rule and Statement of Factual and Policy Basis*, Docket No. 2007-391 (Oct. 22, 2007).

⁶ Chapter 311, § 3(B)(4).

⁷ Chapter 311, § 3(C).

⁸ Chapter 311, § 7(A) and (B).

⁹ 35-A M.R.S. § 3210(3).

D. Renewable Energy Credits

Most of the compliance with Maine's portfolio requirements occurs through the purchase of renewable energy credits (RECs). The New England Power Pool (NEPOOL) has established a REC creation and tracking mechanism referred to as the Generation Information System (GIS). This system allows for the trading of the renewable attribute separate from the energy commodity. This mechanism serves to significantly simplify compliance by suppliers and verification by regulatory commissions, and avoids double counting. Consistent with statutory direction,¹⁰ the Commission requires suppliers in the ISO-NE to verify compliance with the portfolio requirement through the GIS. Because of its small size, northern Maine does not have REC system and therefore compliance is verified through contractual documentation and settlement data.

III. IMPLEMENTATION AND COMPLIANCE

A. Certified Generators

The implementing rules require generation facilities to be certified by the Commission as a Class I new renewable resource before such facilities can be used to satisfy Maine's new renewable resource portfolio requirement. To date, the Commission has certified approximately 70 facilities, with a total capacity of approximately 915 MW. However, not all of the facilities that have been certified are in-service and many of the facilities are also eligible for portfolio requirements in other New England states.¹¹

B. Exempt Sales

Electricity suppliers are required to demonstrate compliance with the four percent new renewable resource portfolio requirement for calendar year 2011. However, any retail electricity sales made pursuant to a supply contract or a standard offer service arrangement executed on or before September 20, 2007 (the effective date of the Act) are exempt from portfolio requirement compliance until the end of the current term of the arrangement.¹² During 2011, approximately 107,796 MWh, or 0.9% of Maine's electricity sales, were exempt from the new renewable resource portfolio requirement as a result of the pre-existing contract exemption.

Electricity sales to serve qualified Pine Tree Development Zone businesses established under Title 30-A are exempt from the portfolio requirements.¹³ During 2011, approximately 77,726 MWh, or 0.65% of Maine's electricity sales, were exempt from the new renewable resource portfolio requirement as a result of the Pine Tree Zone exemption.

¹⁰ The portfolio requirement statute states that the Commission shall allow competitive providers to satisfy the portfolio requirements through the use of RECs if it determines that a reliable system of electrical attribute trading exists. 35-A M.R.S. § 3210(8). The Commission has determined that the GIS is such a reliable system.

¹¹ A list of the certified facilities is attached to this Report as Attachment 1.

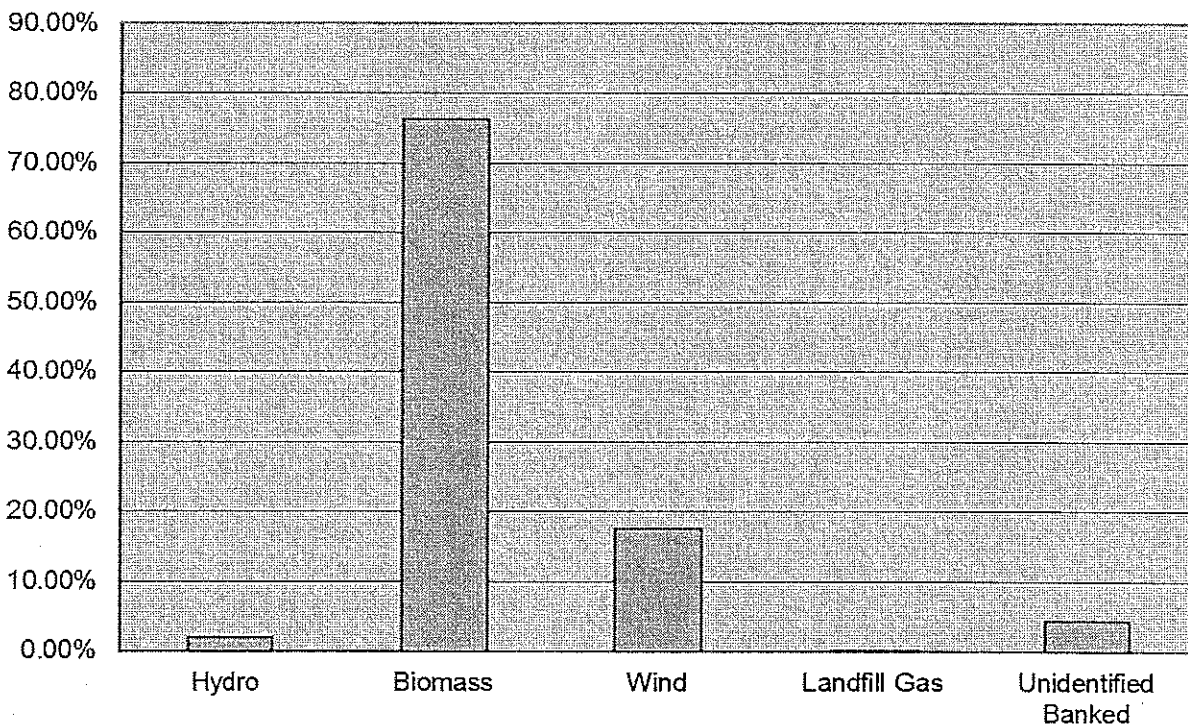
¹² 35-A M.R.S. § 3210(3-A)(D).

¹³ 35-A M.R.S. § 3210-B(4).

C. New Renewable Portfolio Requirement (Class I); Resources and Cost Impacts

The following chart shows the mix of resources used to satisfy Maine's new renewable resource portfolio requirement during 2011.

Resources Used to Satisfy Class I Renewable Portfolio Requirements 2011



As the table below shows, the RECs from twelve facilities were used by suppliers to comply with the 2011 new renewable resource requirement. Ten of the facilities are biomass, four are hydro, three are wind facilities and one is a landfill gas facility. Thirteen of the eighteen facilities are located in Maine, two are located in Connecticut, two are located in New York, and one is located in New Hampshire. Of the approximately 453,630 RECs purchased to meet the portfolio requirement in 2011, 97% came from facilities located in Maine.

**REPORT ON NEW RENEWABLE RESOURCE
PORTFOLIO REQUIREMENT**

March 31, 2013

Fuel Type and State	No. of Facilities	GIS Certificates	% of Total
Hydro - ME	1	1,014	0.22%
Hydro - NH	1	168	0.04%
Hydro - CT	2	7,288	1.61%
Biomass - ME	10	365,387	80.55%
Wind - ME	2	74,782	16.49%
Wind - NY	1	4,401	0.97%
Landfill Gas - NY	1	590	0.13%
Total - Overall	18	453,630	100%
Total - ME	13	441,630	97.26%

The cost to ratepayers of Maine's new renewable resource portfolio requirement is represented by the cost of compliance by suppliers, either through the purchase of RECs or payment under the ACM. For calendar year 2011, for which the 4% new renewable resource portfolio requirement applied, 92.85% of the requirement was satisfied through the purchase of RECs, 0.19% was satisfied through the ACM, 5.08% was satisfied using RECs banked from 2010 and 1.88% will be satisfied during the 2012 cure period allowed by the rule.

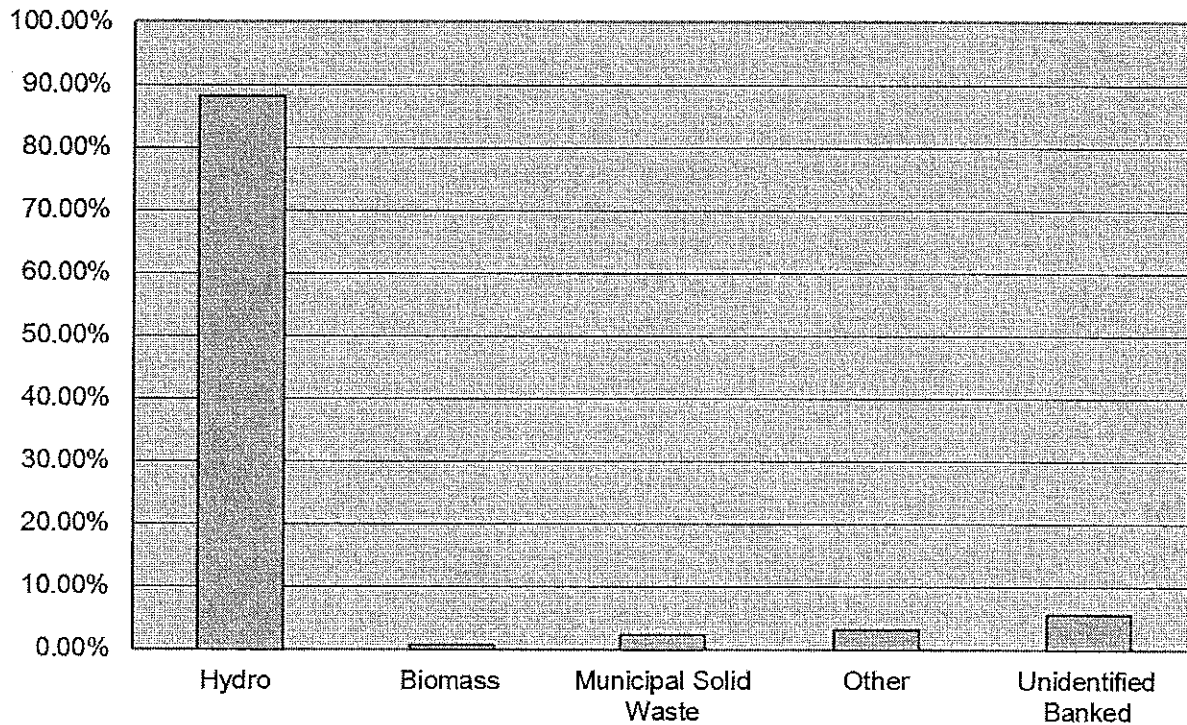
During 2011, the cost of RECs used for compliance ranged from approximately \$7.00 per MWh to \$60 per MWh, with an average cost of \$27.46 per MWh and a total cost of \$12,356,981. One supplier chose to satisfy the portfolio requirement through the ACM at the rate of \$62.13 per MWh for a total cost of \$54,680. Thus, the total cost to ratepayers during 2011 was \$12,406,841, which translates into a rate impact of .10 cents per kWh (or about 50 to 55 cents monthly for a typical residential bill). In percentage terms, the rate impact of .10 cents per kWh on average rates for CMP ratepayers of 15.1 cents per kWh in 2011 is less than one percent (0.66%).

It appears that Maine's new renewable resource requirement is providing a substantial source of revenue to qualified Maine Class 1 renewable generation resources. In 2011, the requirement created an average premium of 2.7 cents per kWh, amounting to a 57% premium over the average wholesale market price of 4.7 cents per kWh. The fact that a very small percentage of the requirement has been satisfied through the ACM indicates that most of the ratepayer premium is going directly to eligible renewable generators, most (97.26%) of which were, for 2011, located in Maine.

D. Eligible Resources Portfolio Requirement (Class II); Resources and Cost Impacts

The following chart shows the mix of resources used to satisfy Maine's Class II renewable resource portfolio requirement during 2011.

Resources Used to Satisfy Class II Renewable Portfolio
Requirements 2011



During 2011, the costs of RECs used to satisfy the eligible resource portfolio requirement ranged from \$0.00 per MWh (some RECs were provided for free as part of an energy transaction) to \$1.03 per MWh, with an average cost of \$0.18 per MWh and a total cost of \$627,094. This translates into less than a 3 cents monthly impact on a typical residential bill.

E. Portfolio Requirement Percentage Suspension

The Act allows the Commission to suspend scheduled percentage increases in the Class I portfolio requirement if it finds that investment in new renewable resources has not been sufficient for suppliers to satisfy the requirement, the requirement has burdened electricity customers without providing the benefits from new renewable resources or that there has been an over reliance on the ACM. As specified in section III(C) above, most of the compliance with the Class I portfolio requirement occurred through the purchase of RECs with very little reliance on the ACM. In addition, the REC prices during 2011 (an average cost of \$27.46 per MWh) were substantially lower than the alternative compliance payment (\$62.13 per MWh). This indicates that renewable resource development has been sufficient for suppliers to satisfy the Class I portfolio requirement without significant reliance on the ACM. Accordingly, the Commission did not act to suspend percentage increases in the portfolio requirement in 2011.

F. Status of Renewable Resource Development

Maine's portfolio requirement operates in conjunction with the portfolio requirements in the other New England states to promote the development of renewable resources in Maine and New England.¹⁴ The New England Independent System Operator (ISO-NE) annually publishes a "Regional System Plan," that includes an assessment of the development of renewable resources that are necessary to satisfy the portfolio requirements of the New England states.¹⁵ In the most recent plan, issued October 2012, the ISO concluded that the renewable resources in the ISO interconnection queue¹⁶ represent a significant potential physical supply for RPS compliance in New England.¹⁷ Recognizing that not all of the projects in the queue will be successfully completed, the ISO indicates that projects in the queue would likely meet incremental RPS demand over the next five years. The ISO also recognized that renewable resources other than those in the queue (such as on-site and behind the meter renewable resources, renewable projects not yet in the queue, eligible renewable fuels in existing generators, and imported energy from renewable project in adjacent regions) will be available to meet some of the RPS future demand in New England.

The primary indicator of whether new renewable resource development has been sufficient to meet Maine's portfolio requirement is the degree to which compliance is satisfied through the ACM. In the event that a significant degree of compliance occurs through ACM over a number of years, this would indicate that the portfolio requirements in Maine and the other New England states are not satisfying their goals of fostering new renewable resource development in the region.¹⁸ There has been very little reliance on the ACM by suppliers in 2011 as well as in prior years.

At this time, the Commission makes no recommendations regarding mechanisms to stimulate investment in renewable resources beyond those that already exist on the State and federal levels.

IV. CONCLUSION

Maine's new renewable resource portfolio requirement is providing a substantial source of revenue to some Maine generation resources. Since it was enacted in 2008, the new renewable resource portfolio requirement has created a significant premium over market prices to help promote renewable project development. The price impact on customers is roughly \$0.001/KWh. In the Commission's view, there appears to be a

¹⁴ Generally, newly developed renewable resources located within or adjacent to New England can be used to satisfy the various New England state's portfolio requirements.

¹⁵ A copy of the renewable resource assessment section of the ISO-NE's Regional System Plan is attached to this Report as Attachment 2.

¹⁶ The ISO interconnection queue represents proposed generation projects that have initiated the review process for interconnection to the regional grid.

¹⁷ As of April 1, 2012, there were a total of 3052 MW of renewable resources in the ISO queue (wind projects, both onshore and offshore—84.5%; biomass projects—10.4%, remaining projects comprised of landfill gas, hydroelectric, and fuel cell projects—1.7%).

¹⁸ As required by the Act, the implementing rules specify that the Commission shall temporarily suspend the scheduled percentage increases in the new renewable resource requirement if reliance on the ACM in the aggregate is more than 50% of the statewide obligation in three consecutive years. Chapter 311, § 3(D)(1).

reasonable relationship between the new renewable resource portfolio requirement and financial support provided to new and refurbished renewable resources and, therefore, the Commission does not recommend any corrective statutory changes.

The Commission will continue to monitor the operation of the new renewable resource portfolio requirement and the development of new renewable resources in the region, and will act to notify the Legislature of any significant issues with the implementation and operation of Maine's portfolio requirement.

Attachment 1

**Generation Facilities Certified by the Commission as
Class I New Renewable Resource**

Docket Number	Applicant	Order
Docket No. 2007-619	Greenville Steam Co. (19 MW; Greenville, ME; biomass)	<u>Order (word 44 kb)</u>
Docket No. 2008-049	PPL EnergyPlus (4.8 MW; Orono, ME; hydroelectric project)	<u>Order (word 46 kb)</u>
Docket No. 2008-078	Town of Kittery (50 kW; Kittery, ME; wind facility)	<u>Order (word 42 kb)</u>
Docket No. 2008-105	Loring Bioenergy (55 MW; Limestone, ME; biofuel/natural gas/diesel facility)	<u>Order (word - 52 kb)</u>
Docket No. 2008-173	Lincoln Pulp and Paper (13.5 MW; Lincoln, ME; wood and process waste)	<u>Order (word 67 kb)</u>
Docket No. 2008-213	Evergreen Wind Power (42 MW; Mars Hill, ME; wind facility)	<u>Order (word 36 kb)</u>
Docket No. 2008-330	Seneca Energy II, LLC (6.4 MW; Seneca Falls, NY; landfill gas)	<u>Order (word 40 kb)</u>
Docket No. 2008-332	Modern Innovative Energy, LLC (6.4 MW; Youngstown, NY; landfill gas)	<u>Corrected Order (word 43 kb)</u>
Docket No. 2008-333	Innovative Energy Syst., Inc.; DANC Landfill (4.8 MW; Rodman, NY; landfill gas)	<u>Corrected Order (word 39 kb)</u>
Docket No. 2008-334	Innovative Energy Syst., Inc.; Colonie Landfill (4.8 MW; Cohoes, NY; landfill gas)	<u>Corrected Order (word 43 kb)</u>
Docket No. 2008-336	Indeck Energy-Alexandria, LLC (16 MW; Alexandria, NH; biomass)	<u>Order (word 38 kb)</u>
Docket No. 2008-395	Pine Tree Landfill (3 MW; Hampden, ME; landfill gas)	<u>Order (word 42 kb)</u>
Docket No. 2008-414	Hyland Innovative Energy Systems (4.8 MW; Angelica, NY; landfill gas)	<u>Order (word 42 kb)</u>
Docket No. 2008-432	University System of New Hampshire (4.0 MW; Durham, NH; landfill gas)	<u>Order (word 37 kb)</u>
Docket No.	Evergreen Wind Power V, LLC (57 MW; Washington County,	<u>Order (word 37</u>

2008-466	ME; wind)	kb
Docket No. 2008-467	Wm Renewable Energy, LLC; High Acres 2 (6.4 MW; Fairport, NY; landfill gas)	Order (word 39kb)
Docket No. 2008-468	Madison Power Industries (3.0 MW; Madison, ME; hydro)	Order (word 43 kb)
Docket No. 2008-469	Wm Renewable Energy, LLC; Mill Seat Facility (6.4 MW; Bergen, NY; landfill gas)	Order (word 39 kb)
Docket No. 2008-472	Wm Renewable Energy, LLC; Chaffee Facility (4.8 MW; Chaffee, NY; landfill gas)	Order (word 38 kb)
Docket No. 2008-478	Lempster Wind, LLC (Iberdrola Renewables); Lempster Wind (24 MW; Lempster, NH; wind)	Order (word 38 kb)
Docket No. 2008-516	Innovative Energy Systems; Clinton Landfill (4.8 MW; Morrisonville, NY; landfill gas)	Order (word 42 kb)
Docket No. 2009-066	Wm Renewable Energy, LLC; Fitchburg Landfill (4.8 MW; Westminster, MA; landfill gas)	Order (word 40 kb)
Docket No. 2009-074	Innovative Energy Systems, Inc; Chautaugua Landfill Gas Facility (6.4 MW; Jamestown, NY; landfill gas)	Order (word 41 kb)
Docket No. 2009-077	Innovative Energy Systems, Inc; Fulton Landfill Gas Facility (1.6 MW; Johnstown, NY; landfill gas)	Order (word 41 kb)
Docket No. 2009-093	Wm Renewable Energy, LLC; Crossroads Landfill (3.2 MW; Norridgewock, ME; landfill gas)	Order (word 40 kb)
Docket No. 2009-094	Wm Renewable Energy, LLC; Madison County Landfill (1.6 MW; Canastota, NY; landfill gas)	Order (word 40 kb)
Docket No. 2009-120	Sheldon Energy, LLC; High Sheldon Wind Energy Center (112.5 MW; Sheldon, NY; wind)	Order (word 40 kb)
Docket No. 2009-184	University of New Hampshire; UNH Power Plant (7.9 MW; Durham, NH; landfill gas)	Order (word 49 kb)
Docket No. 2009-197	Richey Properties, LLC; (600 kW; Newburyport, MA; wind)	Order (word 46 kb)
Docket No. 2009-208	Red Shield Acquisition, LLC; Old Town Fuel & Fiber (14.5 MW; Old Town, ME; biomass)	Order (pdf 124 kb)
Docket No. 2009-223	Canandaigua Power Partners; Dutch Hill Wind Farm (37.5 MW; Cohocton, NY; wind)	Order (word 38 kb)
Docket No. 2009-224	Canandaigua Power Partners; Cohocton Wind Farm (87.5 MW; Cohocton, NY; wind)	Order (word 38 kb)
Docket No. 2009-278	FPL Energy Maine Hydro LLC, Gulf Island Project (614 kW; Lewiston/Auburn, ME; hydro)	Denied (Order word - 50 kb)
Docket No. 2009-279	Beaver Ridge Wind, LLC (4.5 MW; Freedom, ME; wind facility)	Order (word 38 kb)
Docket No. 2009-288	PPL Renewable Energy, LLC; PPL Colebrook LFGTE (800 kW; Colebrook, NH; landfill gas)	Order (word 38 kb)
Docket No. 2009-303	Seaman Energy, LLC; Gardner Landfill (1MW; Gardner, MA; landfill gas)	Corrected Order (word 38 kb)

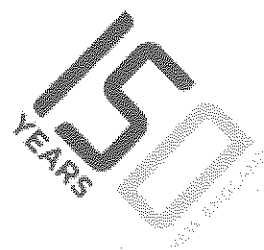
Docket No. 2009-370	Fox Island Wind, LLC (4.5 MW; Vinalhaven, ME; wind)	Order (word 39 kb)
Docket No. 2009-386	MM Lowell Energy, LLC; Westford Street Landfill (0.5 MW; Lowell, MA; landfill gas)	Order (word 40 kb)
Docket No. 2009-389	Commonwealth New Bedford Energy, LLC; Greater New Bedford Landfill Gas Utilization Facility (3.3 MW; New Bedford, MA; landfill gas)	Order (word 42 kb)
Docket No. 2009-395	Sappi Fine Paper North America (50 MW; Westbrook, ME; biomass)	Order (word 55 kb)
Docket No. 2010-042	Stetson Wind II, LLC (25.5 MW; T8R3, ME; wind)	Order (word 42 kb)
Docket No. 2010-060	Avery Hydro LLC, (479 kW; Laconia, NH; hydro)	Order (word 38 kb)
Docket No. 2010-104	Summit Hydropower, Inc. ,Wyre Wynd (2.8 MW; Jewett City, CT; hydro)	Order (word 38kb)
Docket No. 2010-127	Red Shield Acquisition, LLC; Old Town Fuel & Fiber (2 MW; Old Town, ME; biomass)	Order (word 36 kb)
Docket No. 2010-224	Talmage Solar Engineering, Inc.; George Roberts Step Guys Precast Concrete Company Photovoltaic Array (111 kW; Alfred, ME; solar)	Order (word 37 kb)
Docket No. 2010-254	Thundermist Hydro LLC, (1.2 MW; Woonsocket, RI; hydro)	Order (word 39 kb)
Docket No. 2011-055	Essex Hydro Associates, Messalonskee Stream Hydro, LLC; Union Gas (1.8 MW; Waterville, ME; hydro)	Order (pdf 162kb)
Docket No. 2011-102	Verso Bucksport LLC (10 MW; Bucksport, ME; biomass)	Order (pdf 2.7MB)
Docket No. 2011-159	Evergreen Wind Power III, LLC ,Rollins Wind Farm (60 MW; Lincoln, ME, wind)	Order (pdf 135kb)
Docket No. 2011-166	Exeter Agri-Energy (980 kW; Exeter, ME; biogas)	Order (pdf 134kb)
Docket No. 2011-325	Vermont Wind, LLC ,Sheffield Wind Plant (40 MW; Sheffield, VT, wind)	Order (pdf 187kb)
Docket No. 2011-374	Borex Fort Fairfield, LP (36 MW; Fort Fairfield, ME; biomass)	Under Review
Docket No. 2011-379	Record Hill Wind, LLC (50.6 MW; Roxbury, ME; wind)	Order (word 39 kb)
Docket No. 2011-460	Christopher M. Anthony, d/b/a Pioneer Dam, Marsh Power (400 kW; Frankfort, ME; hydro)	Denied (Order pdf - 1.8 MB)
Docket No. 2012-039	Casella Waste Systems, Inc., Southbridge Landfill (1.6 MW; Southbridge, MA, landfill gas)	Order (pdf, 875kb)
Docket No. 2012-081	Mini-Watt Hydroelectric LLC (455 kW; Orange, MA; hydro)	Order (pdf, 65kb)

Docket No. 2012-087	Moose River Lumber Co., Moose River (465 kW; Moose River, ME; biomass)	Order - Supp (pdf 98kb)
Docket No. 2012-108	ORPC Maine, LLC, Cobscook Bay Tidal Energy Project (900 kW; Lubec, ME; tidal)	Order (pdf, 71 kb)
Docket No. 2012-166	EPICO USA Inc., Middle Kezar Falls (150 kW; Porter and Parsonfield, ME, hydro)	Order (pdf, 1.7MB)
Docket No. 2012-203	KEI (Maine) Power Management (IV) LLC, York Hydro Project (1.1 MW; Sanford and Kennebunk, ME; hydro)	Under Review
Docket No. 2012-231	ReVision Energy, LLC/GWH Solar, LLC, Good Will Hinckley School (26 kW; Hinckley, ME, solar)	Order (pdf, 947kb)
Docket No. 2012-240	Vermont Public Power Supply Authority, Swanton Village Electric Department, Highgate Falls (800 kW; Highgate, VT; hydro)	Order (pdf 32kb)
Docket No. 2012-276	SREC Generating Co., Steuben (3.2 MW; Bath, NY, landfill gas)	Order (pdf, 872kb)
Docket No. 2012-282	Irving Forest Products, Unit # 1 (720 kW; Dixfield, ME; biomass)	Order (word 45 kb)
Docket No. 2012-301	Verso Androscoggin LLC (15 MW; Jay, ME; biomass)	Order (pdf, 220 kb)
Docket No. 2012-457	Essex Hydro Associates LLC, North Hartland (4.1MW; Hartland, VT; hydro)	Order (word 64kb)
Docket No. 2012-502	Granite Reliable Wind (99 MW; Drummer, NH; wind)	Order (word 59kb)
Docket No. 2012-549	Lewiston-Auburn Water Pollution Control Authority(460 kW; Lewiston, ME, biogas)	Order (word 54 kb)
Docket No. 2012-552	Jackson Laboratories (610 kW; Bar Harbor, ME, biomass)	Order (word, 59 kb)
Docket No. 2012-590	Ice House Partners, Inc. (280 kW; Ayer, MA; hydro)	Order (pdf, 86kb)



2012 Regional System Plan

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November 2, 2012



1.1 Renewable Portfolio Standards and Renewable Project Development

Renewable resources can enhance the diversity of the region's fuel supply and reduce the regional dependence on natural gas resources. Five New England states have Renewable Portfolio Standards (RPSs), and Vermont has a goal for increasing total generation from renewable resources. These RPSs represent state policy targets that load-serving entities must achieve.¹ As discussed in this section, these LSEs can meet their states' targets in a variety of ways. Developing renewable resources in the ISO Generation Interconnection Queue will likely be a major source for RPS compliance in the New England states.

This section summarizes the projections for RPSs and related targets through 2021, recognizing the impact of the ISO energy-efficiency forecast (see Section **Error! Reference source not found.**). The section also projects the renewable energy projects in the queue that typically would be RPS-compliant resources. The section compares the RPS targets with the queue resources, considering the uncertainty of successfully developing all these resources, and discusses other ways LSEs can meet their RPS targets. The information developed in this section does not reflect any ISO assessment of the potential of future projects to qualify for meeting the states' RPSs.

1.1.1 Renewable Resources in the ISO Generation Queue

Figure **Error! No text of specified style in document.**-1 shows the megawatts of the renewable resource projects in the April 1, 2012, queue.² The 57 projects represent 3,052 MW, with wind projects making up the largest share at 84.5%. Biomass projects account for 10.4% of the total renewable capacity; hydroelectric is 3.4%; and landfill gas, solar PV, and fuel cell projects make up the remaining 1.7%. Onshore wind makes up 69.0% of the total renewable project capacity.

¹ Municipally owned utilities that sell basic electric energy service to end-use customers are exempt from compliance with RPSs.

² Non-FERC-jurisdictional projects, including wind projects located in northern Maine and therefore outside the area administered by the ISO, are included in the renewable queue resources summarized in this section.

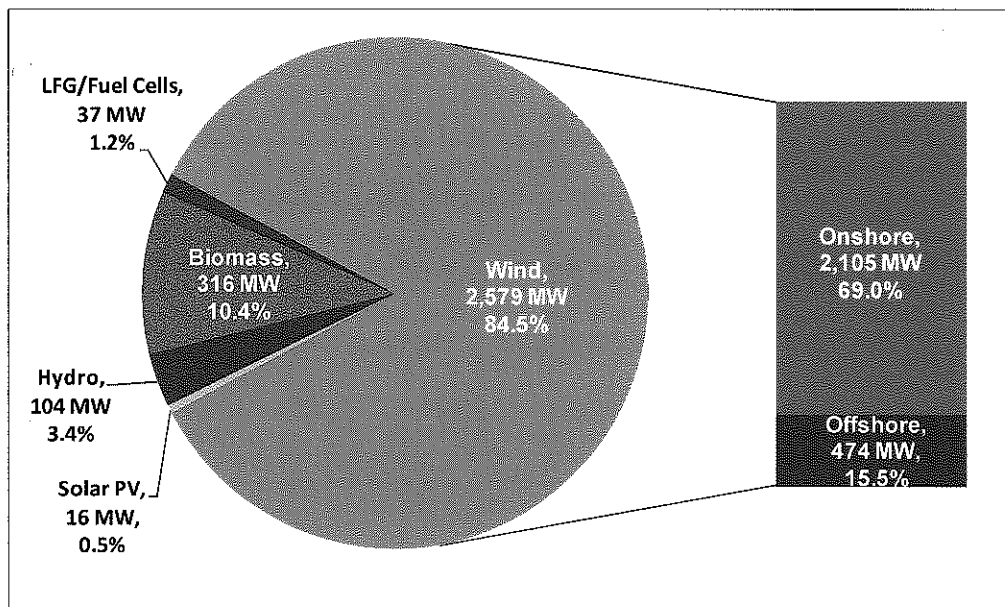


Figure Error! No text of specified style in document.-1: Proposed New England capacity from renewable resources in the ISO Generation Interconnection Queue, including non-FERC jurisdictional projects, as of April 1, 2012 (MW and %)

Note: Totals include all queue wind projects located in New England, including non-FERC-jurisdictional wind projects located outside the area administered by the ISO.

To estimate the outlook for RPS compliance from these queue projects, the ISO estimated the electric energy they typically could generate, as shown in Table Error! No text of specified style in document.-1. Using assumptions for typical capacity factors for the various types of renewable projects, as shown in the table, and assuming all the projects are developed and fully operating by 2021 without transmission constraints, these resources could provide approximately 10,636 GWh annually.

**Table Error! No text of specified style in document.-1
Estimated Energy from New England Renewable Energy Projects in the ISO Queue,
as of April 1, 2012**

Type (#) of Projects	Size (MW) ^(a)	Capacity Factor (%) ^(b)	Estimated Annual Energy Production (GWh)
Hydro (9)	104	25%	228
Landfill gas (1)	28	90%	221
Biomass (9)	316	90%	2,491
Wind—onshore (32)	2,105	32%	5,901
Wind—offshore (2)	474	41%	1,702
Fuel cells (1)	9	95%	75
Solar PV (3)	16	13%	18
Total (57)	3,052		10,636

(a) A facility's size is its megawatt value listed in the ISO queue.

(b) Capacity factors are based on the ISO's 2007 Scenario Analysis and ISO's NEWIS study. See http://www.iso-ne.com/committees/comm_wkgrps/otr/sas/mtrls/elec_report/scenario_analysis_final.pdf and http://www.iso-ne.com/committees/comm_wkgrps/prtcpts_comm/pac/reports/2010/newis_report.pdf.

Figure Error! No text of specified style in document.-2 shows the percentage of electric energy from proposed New England renewable resources in the queue, including non-FERC-jurisdictional projects, as of April 1, 2012.

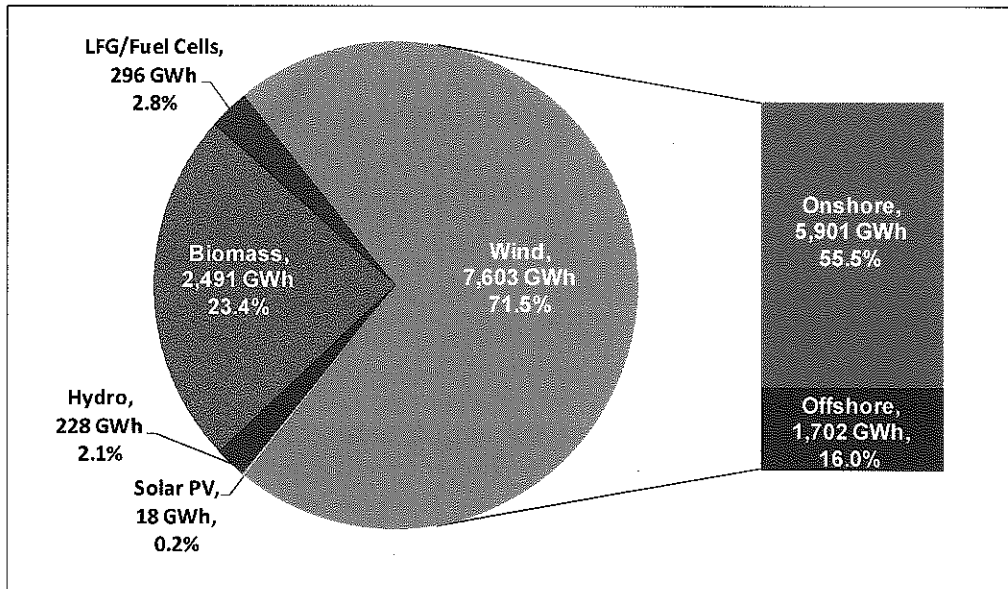


Figure Error! No text of specified style in document.-2: Estimated annual electric energy from proposed New England renewable resources in the ISO's Generator Interconnection Queue, including non-FERC-jurisdictional projects, as of April 1, 2012 (GWh).

Note: Totals include all queue wind projects located in New England, including non-FERC-jurisdictional wind projects located outside the area administered by the ISO.

1.1.2 Project Development Uncertainty

Previous RSP reports noted that many of the projects in the queue are not built for a variety of reasons, and the ISO has quantified the historical attrition of projects in the queue. Table Error! No text of specified style in document.-2 summarizes all projects in the ISO queue as of April 1, 2012, showing this attrition. The table shows that 55% of all projects that have entered the queue since it began have been withdrawn, including 46% of wind projects. The amounts of capacity withdrawn is 74% for wind projects compared with 70% for projects withdrawn from the queue overall.

Table Error! No text of specified style in document.-2
Summary of All Projects and Wind Projects in the ISO Queue as of April 1, 2012^(a)

Project Category	All Projects				Wind Projects ^(b)			
	No.	%	MW	%	No.	%	MW	%
Commercial	87	25	14,432	20	10	12	524	4
Active	72	21	6,974	10	34	42	2,579	22
Withdrawn	193	55	50,821	70	37	46	8,767	74
Total^(c)	352	100	72,227	100	81	100	11,870	100

- (a) Because these queue values include non-FERC jurisdictional projects located outside of the area administered by ISO, they are not consistent with those presented in **Error! Reference source not found..**
- (b) This category includes projects in New England (including external non-FERC-jurisdictional queue projects) and ignores duplicate listings for projects with more than one potential interconnection point.
- (c) Percentages may not sum to 100 because of rounding.

1.1.3 Update of Renewable Projects Indicated by NESCOE

A NESCOE request for information (RFI) issued at the end of 2010 confirmed New England’s sufficient potential for developing and importing renewable resources for meeting the region’s renewable energy goals.³ The RFI identified strong interest from potential transmission and renewable resources that could be operational by 2016 to help the states cost effectively satisfy their RPSs and similar goals.

In 2011, the New England governors passed a resolution at the New England Governors Conference (NEGC) confirming the governors’ continued interest in the coordinated and competitive procurement of renewable resources as a way to identify resources able to serve customers at the lowest overall delivered cost.⁴ The resolution directed NESCOE to continue to investigate the potential for the joint or separate, but coordinated and competitive, procurement of renewable resources that satisfy the New England states’ RPSs or goals. In response to this resolution, NESCOE contracted for the development of renewable resource supply curves for two study years (2016 and 2020). The study provided cost estimates for both onshore and offshore wind development and, on a high level, estimates of the transmission required to facilitate the delivery of the electricity from these resources to New England loads.⁵ This work was conducted to help signal to the states the potential ranges of “all-in” costs associated with meeting regional RPSs with new renewable projects and not ACPs.

In July 2012, the New England governors adopted another resolution directing NESCOE to take steps to implement the work plan NESCOE developed in 2012 for this coordinated procurement and directing regulatory and policy officials and the governors’ energy policy staffs to implement regulatory proceedings, procedures, or policies as necessary for executing the procurement.⁶ NESCOE plans to issue a request for proposals by December 2013 for competitive coordinated procurement of a significant amount of renewable energy. NESCOE will convene a procurement team made up of energy officials and

³ NESCOE, “Coordinated Procurement,” website (2011), http://www.nescoe.com/Coordinated_Procurement.html.

⁴ New England Governor’s Conference, Inc., *A Resolution Endorsing the Continued Investigation into the Potential for Coordinated Regional Renewable Power Procurement*, Resolution No. 204 (July 11, 2011), http://www.nescoe.com/uploads/NEGC_Coord_Procure_Res_.pdf.

⁵ NESCOE, *Renewable Resource Supply Curve Report* (January 2012), http://www.nescoe.com/Renewable_Supply_Curve.html.

⁶ NEGC, “Resolution No. 205—A Resolution Directing the New England State Committee on Electricity (NESCOE) to Implement a Work Plan for the Competitive Coordinated Procurement of Regional Renewable Power,” NESCOE web page (July 30, 2012), http://nescoe.com/uploads/CP_Resolution_July_2012.pdf. Information about the draft work plan is available at http://nescoe.com/2013_Solicitation.html.

other representatives from each state that will finalize the details of this regional procurement over the course of the next year.

1.1.4 Update on Meeting State RPSs and Other Targets

The Renewable Portfolio Standards reflected in RSP12 were the standards in effect in New England through April 2012 and had not changed since being summarized in previous RSP reports.⁷ Basically, the standards set targets for LSEs to meet the future demand for electric energy using new or existing renewable energy resources. The LSEs can satisfy their RPS obligations by obtaining generation from a variety of renewable technologies, located either within New England or within adjacent balancing authority areas. They can accomplish this by acquiring Renewable Energy Certificates (RECs) from eligible renewable resources qualified by each state.⁸ REC transactions are managed using NEPOOL Generation Information System (GIS) reporting on emissions and RECs for generators in the region.⁹ LSEs that obtain insufficient RECs can make alternative compliance payments (ACPs), which also serve as a cap on the price of the RECs.

The New England states' RPSs include technology classes for new and existing resources, and LSEs must provide their customers a specified percentage of electric energy generated by each class each year. Renewables designated as "new" resources (typically Class I RPS resources) are state specific but typically include wind, solar, hydro, biomass, landfill gas, and ocean thermal.¹⁰ Although the required percentage for "new" renewable resources varies by state, it increases each year and accounts for most of the growth of RPS targets in New England. Figure **Error! No text of specified style in document.-3** shows the RPS percentage targets for "new" resources in 2021 for the five New England states with RPSs. Vermont's Sustainably Priced Energy Development Program (SPEED), while not an RPS, includes a state goal of satisfying 20% of the state's load with renewable energy by 2017.¹¹ Technologies classified in the RPSs as "existing" technologies (typically Class II) often include hydro, biomass, and municipal solid waste plants built before a specified year. The required percentage of electric energy that LSEs must provide from this technology class is fixed. The basic RPS structure for the individual New England states has not changed significantly since RSP11 was published.¹²

⁷ Previous RSPs are available at <http://www.iso-ne.com/trans/rsp/index.html>. Changes to New Hampshire's RPS for Class I and Class III resources, implemented in June 2012, are not included in the RPS discussion herein. Refer to Section **Error! Reference source not found.** for more information about these changes.

⁸ *Renewable energy certificates* are tradable, nontangible commodities, each representing the eligible renewable generation attributes of 1 MWh of actual generation from a grid-connected renewable resource.

⁹ Additional information about NEPOOL GIS reporting is available at *NEPOOL Generation Information System Operating Rules* (July 1, 2011), http://www.iso-ne.com/committees/comm_wkgrps/mrktts_comm/geninfo_sys/operating/.

¹⁰ The states have occasionally modified the definitions of eligible Class I renewable resources qualifying for individual state RPSs. One example is Massachusetts's reassessment of new biomass eligibility as a Class I renewable resource.

¹¹ More information about the SPEED program is available at <http://vermontspeed.com/>.

¹² See Section 11 of RSP11, available at http://www.iso-ne.com/trans/rsp/2011/rsp11_final_102111.doc.

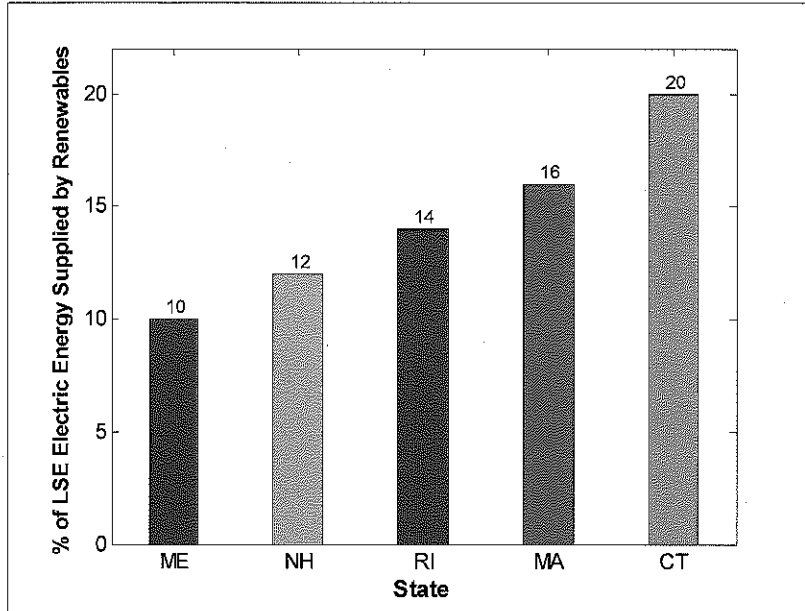


Figure Error! No text of specified style in document.-3: RPS state targets for "new" renewable resources in 2021.

Table Error! **No text of specified style in document.-3** summarizes the technologies designated in the various RPSs in New England. Table Error! **No text of specified style in document.-4** shows the annual percentages of electric energy that affected LSEs are required to provide their customers to satisfy each statewide RPS class through 2021.

Table Error! No text of specified style in document.-3
Technologies Designated in Renewable Portfolio Standards in New England, as of April 1, 2012

Technology	CT Classes			MA Classes ^(f)		ME Classes		NH Classes				
	I	II	III	I	IIa	Ib	I	II	I	II	III	IV
Solar thermal	✓			✓	✓		✓		✓			
Photovoltaic (PV)	✓			✓	✓		✓		✓			
Ocean thermal	✓			✓	✓				✓			
Wave	✓			✓	✓				✓			
Tidal	✓			✓	✓				✓			
Marine or hydrokinetic				✓	✓							
Hydro	<5 MW	<5 MW		<25 MW ^(a)	<5 MW ^(a)		✓ ^(b)	✓	<30 MW	incremental		<5 MW
Wind	✓			✓	✓		✓		✓			
Biomass, biofuels	Sustainable, advanced conversion, low NO _x emissions ^(c)	✓		Low-emission, advanced technology ^(d)	✓ ^(d)		✓	✓ ^(e)	✓ Includes cofiring with fossil fuels	Low NO _x and PM emissions	<25 MW, low NO _x and PM emissions	
Landfill gas	✓			✓	✓		✓		✓ ^(f)		✓ ^(f)	
Anaerobic digester				✓	✓				✓		✓	
Fuel cells ^(g)	✓			w/ renewable fuels	✓		✓		w/ renewable resources			
Geothermal				✓	✓		✓		✓			
Municipal solid waste		✓				✓		✓ w/ recycling				
Cogeneration, combined heat and power (CHP)			Customer sites, minimum 50% fuel efficiency	✓				✓ ^(e)				
Energy efficiency			✓									

(a) The Massachusetts *Green Communities Act* (<http://www.mass.gov/legis/laws/seslaw08/s1080169.htm>) divides the state's RPS into Class I and Class II resources, each of which allows primarily the same renewable technologies. Resources that began operating after December 31, 1997, are Class I renewables, and those in operation on or before that date are Class II renewables. The act also provided for an Alternative Energy Portfolio Standard (APS) for which the currently active technologies are (1) natural gas and renewably fueled CHP located in state and (2) flywheel storage. Hydropower must be certified by the Low-Impact Hydropower Institute. APS-eligible technologies are not included in the ISO's RPS projections. On August 3, 2012, Massachusetts enacted legislation that increased the eligibility of individual hydroelectric power facilities for Class I from 25 MW to 30 MW, and for Class II facilities from 5 MW to 7.5 MW. See *An Act Relative to Competitively Priced Electricity in the Commonwealth*, <http://www.malegislature.gov/Bills/187/Senate/S02395>, (b) These resources can be pumped hydro units, and they must meet all federal and state fish-passage requirements. (c) These terms are explained in the state's RPS legislation and regulations: Gen. Stat. of Conn. Ch. 277, §16-1. (a) 45 (Revised January 1, 2011). NO_x refers to nitrogen oxides. (d) Renewable Energy Portfolio Standard-Class I, CMR, Ch. 225, Sec. 14.05.7 and 225 CMR 14.00. Massachusetts adopted more stringent eligibility requirements for new and existing woody biomass projects, including overall project efficiency and requirements to reduce GHGs (see Section Error! Reference source not found.). <http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html>. (e) These can be high-efficiency units built through December 31, 1997. (f) This category also includes biologically derived methane gas from sources such as biodiesel, yard waste, food waste, animal waste, sewage sludge, and septage. (g) Fuel cells are a relatively new "renewable" energy technology. These units emit negligible amounts of sulfur dioxide (SO₂), NO_x, and particulates such that Connecticut does not require fuel cell installations to obtain air permits. For Massachusetts, an RPS fuel cell using an "eligible biomass fuel" includes landfill or anaerobic digester methane gas, hydrogen derived from such fuels, or hydrogen derived using the electrical output of a qualified renewable generation unit. As shown in the table, RPS fuel cells in Rhode Island must use eligible renewable resources.

Table Error! No text of specified style in document.-4
Annual Percentages of Electric Energy Provided by Affected Load-Serving Entities for Meeting the State's RPS Classes, 2012–2021, as of April 1, 2012

Year	CT Classes ⁽¹⁾		MA Classes ⁽²⁾			ME Classes ⁽³⁾		RI Classes ⁽⁴⁾			NH RPS Classes ⁽⁵⁾			
	I	I or II	I	Ia	Ib	I	II	Existing	New	I	II	III	IV	
2011	8.0		6.0			4.0			3.5	2.0	0.08			
2012	9.0		7.0			5.0			4.5	3.0	0.15			
2013	10.0		8.0			6.0			5.5	4.0	0.2			
2014	11.0		9.0			7.0			6.5	5.0				
2015	12.5		10.0			8.0			8.0	6.0				
2016	14.0	3.0	11.0	3.6	3.5	9.0	30	2.0	9.5	7.0		6.5	1.0	
2017	15.5		12.0						11.0	8.0	0.3			
2018	17.0		13.0			10.0			12.5	9.0				
2019	19.5		14.0						14.0	10.0				
2020	20.0		15.0						14.0	11.0				
2021	20.0		16.0							12.0				

Use GIS to track RECs? Connecticut, Massachusetts, Maine, Rhode Island, and New Hampshire all use the Generator Information System to track Renewable Energy Certificates.

Purchase of RECs from outside ISO New England allowed?	Yes, from adjacent areas, with confirmation of delivery of energy from the renewable energy source and reciprocal RPSs for NY, NJ, PA, MD, and DE	Yes, from adjacent areas, with confirmation of delivery of energy	Yes, from adjacent areas, with confirmation of delivery of energy	Yes, from adjacent areas	Yes, from adjacent areas of delivery of energy from the renewable energy source
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- (a) All Connecticut Class I technologies except LFG and fuel cells can be used to meet Class II requirements. For Class III, CHP facilities can be used to offset generation on the grid with the more efficient on-site use of fuel.
- (b) Class I includes a "carve-out" that must be satisfied by Solar RECs (SRECs) from post-2007, behind-the-meter PV resources, limited to no more than 6 MW (using the *nameplate capacity*—the megawatt capability designated by the manufacture per parcel of land. Class Iia is a minimum percentage for existing pre-1998 vintage resources using the same technologies as Class I but with hydro limited to no more than 5 MW (nameplate capacity) per facility. Class Iib is a minimum percentage for pre-1998 vintage waste-to-energy plants that meet certain Massachusetts-specified recycling and other regulations.
- (c) The 30% requirement refers to electric energy delivered to affected LSEs.
- (d) Existing resources can make up no more than 2.0% of the RPS percentage.
- (e) As of April 1, 2012, the NH RPS policy increases Class I resources an additional 1% per year from 2015 through 2025. Classes II to IV remain at the same percentages from 2015 through 2025. Legislation enacted in June 2012 designates a portion of the Class I requirement that must be met with "thermal energy resources," reduces the incremental increase in annual Class I requirements between 2015 and 2025, adds an incremental increase to the Class III requirements for 2014 and 2015, and adds an incremental increase to the Class IV requirements for 2013 through 2015. See Section Error! Reference source not found.

1.1.4.1 RPS Projection Method Overview

Using the ISO's 2012 state forecasts for energy use (see **Error! Reference source not found.**), the ISO has developed projections of the state RPS targets for the 10-year period, 2012 to 2021. The ISO generated the projections using an updated spreadsheet based on one first developed with stakeholder input in 2010, which details the New England regional RPS projections for the five states and Vermont's renewable goal.¹³ This section describes the assumptions used, explains how the 2012 projections were calculated, and summarizes the results.

The RPS projections for 2012 used the ISO's 2012 CELT forecast for states' growth in electric energy use and include assumptions for the total municipal suppliers' share of each statewide energy forecast, passive demand resource levels (through FCA #6), and statewide energy targets applicable to the RPS for each state. For 2015 to 2021, the 2012 energy-efficiency forecast (see Section **Error! Reference source not found.**) was used to project state energy-efficiency reductions beyond the FCA #6 timeframe. Figure **Error! No text of specified style in document.-4** illustrates the amount of passive demand resources in gigawatt-hours forecast for each New England state in the 2012 CELT, which total 17,409 GWh of energy reductions in 2021.

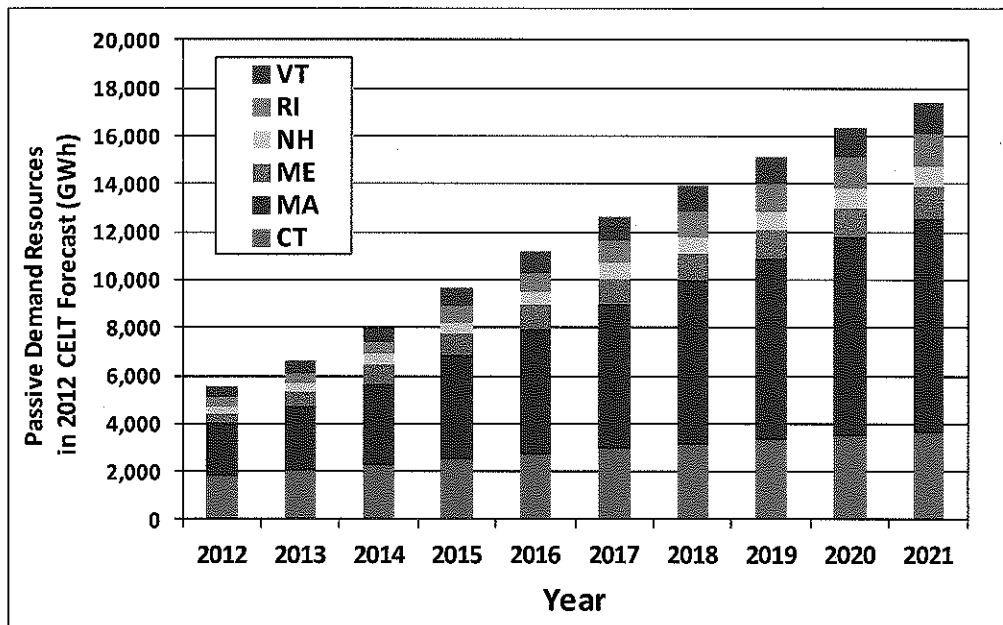


Figure Error! No text of specified style in document.-4: Passive demand resources in the 2012 CELT, 2012 to 2021 (includes energy-efficiency forecast, 2015 to 2021) (GWh).

1.1.4.2 Projection Results for Meeting State RPSs and Other Targets

Assuming the energy reductions from the passive demand resources in the 2012 CELT forecast, which for 2021 account for an 11.6% reduction in total energy use, LSEs would provide 30,420 GWh of supply-side renewable energy to meet the RPS targets and Vermont's renewable goals by 2021. This would represent 20.2% of the region's projected electric energy use. Thus by 2021, 31.8% of the region's projected electric

¹³ This spreadsheet enables ISO New England stakeholders to calculate the annual energy goals of the New England states' RPSs. It also includes Vermont's goals for growth in renewable resources. Users can review the ISO's calculations and make their own assumptions based on how load growth or state policies might affect the future RPS share of total energy demand. This spreadsheet provides all the assumptions and the results, by state and by class of renewables, extrapolated to 2031.

energy consumption (11.6% plus 20.2%) would be met by energy efficiency, RPS targets, and related goals for renewable energy.

Figure Error! No text of specified style in document.-5 illustrates the ISO’s total projected RPS electric energy targets for all RPS classes plus Vermont’s goal for renewable resources. The figure shows that by 2021 the RPS classes for “new” resources represent approximately two-thirds of all the RPS energy targets in the region.

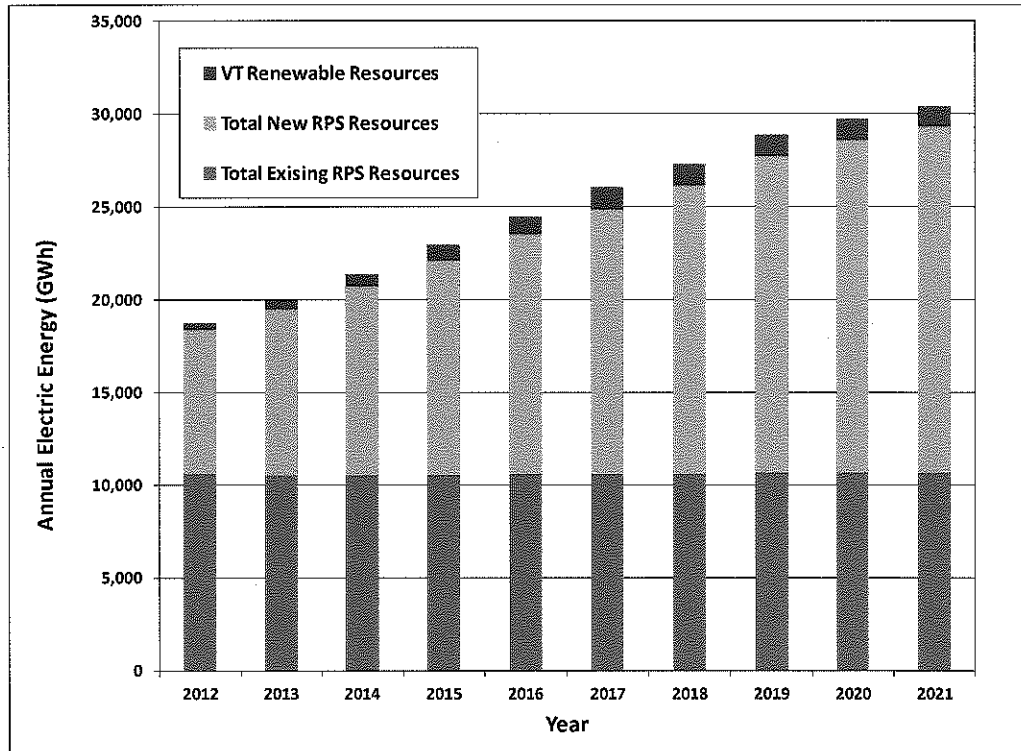


Figure Error! No text of specified style in document.-5: Total projected RPS targets (all classes) and goals for New England, 2012 to 2021 (GWh).

Figure Error! No text of specified style in document.-6 shows the incremental growth in the “new” RPS state targets in gigawatt-hours beyond 2011. Because the 2011 RPS targets are assumed to be met by “existing” renewable projects, the incremental growth in the “new” RPS targets indicates the amount of renewable projects that must be developed in the future. The results project that by 2021, the RPS targets for “new” resources will grow to 12,147 GWh.

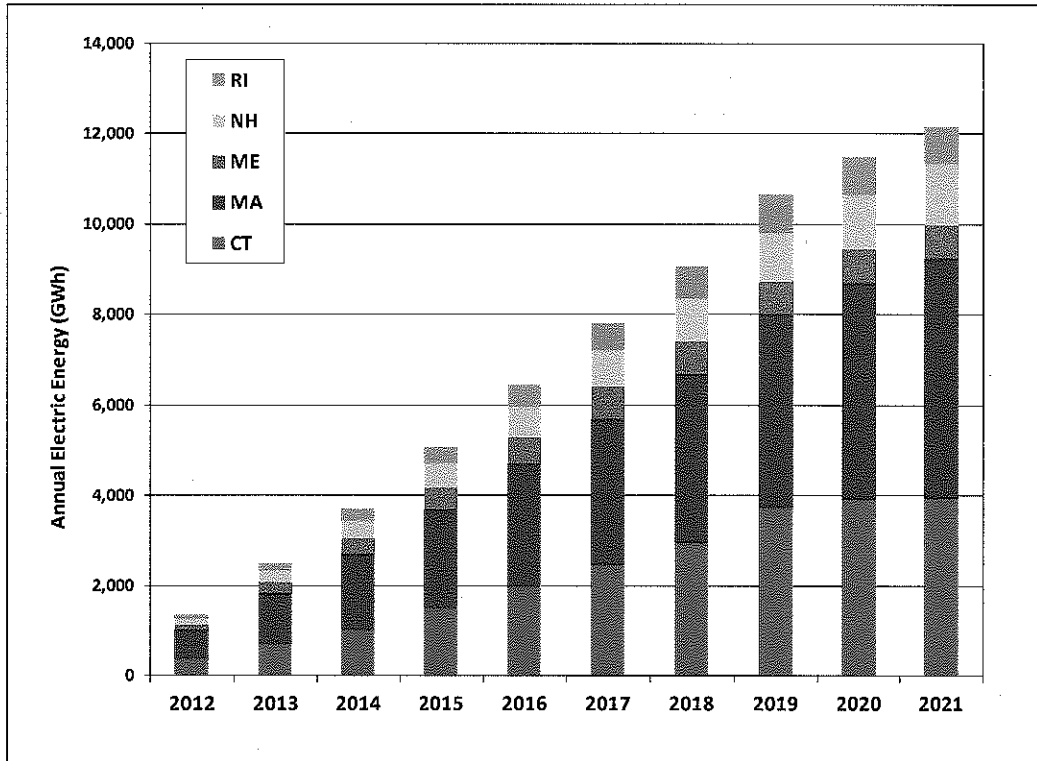


Figure Error! No text of specified style in document.-6: Incremental growth in the RPS class targets for the "new" renewable resources for the New England states, net of 2011 RPS targets, 2012 to 2021 (GWh).

While the ISO recognizes that generation from renewable resource projects outside the queue can meet the region’s RPSs, this section focuses on New England’s renewable projects in the ISO queue. These resources could provide the principal supply of projects for meeting the RPS growth over the next 10 years. However, given the historical attrition rate for projects in the queue (refer to Table **Error! No text of specified style in document.-2**), the number of these projects that ultimately will be built is uncertain.

Figure **Error! No text of specified style in document.-7** shows ranges of uncertainty in the amounts of electric energy that projects in the queue could provide for meeting the RPS targets over the planning period, assuming that projects may not be successful and are withdrawn from the queue. Although historical queue statistics indicate that a higher-percentage buildout of total queue renewable energy is unlikely, 80% and 100% values also are shown for comparison. The figure shows that 40% of the electric energy from queue projects would meet the increase in the RPS targets for renewable resources through 2014. Similarly, roughly 80% of the renewable energy in the queue would meet the RPSs through 2017, and a buildout of the entire queue would satisfy the RPSs and related targets for 2018. Note that because most renewable projects have a short lead time of a few years, they do not need to enter the queue until they are in the later stages of development. The development of renewable projects, such as those in the early stages of development that responded to the NESCOE RFI, would likely occur at a greater rate than the historical development of renewable projects in the queue.

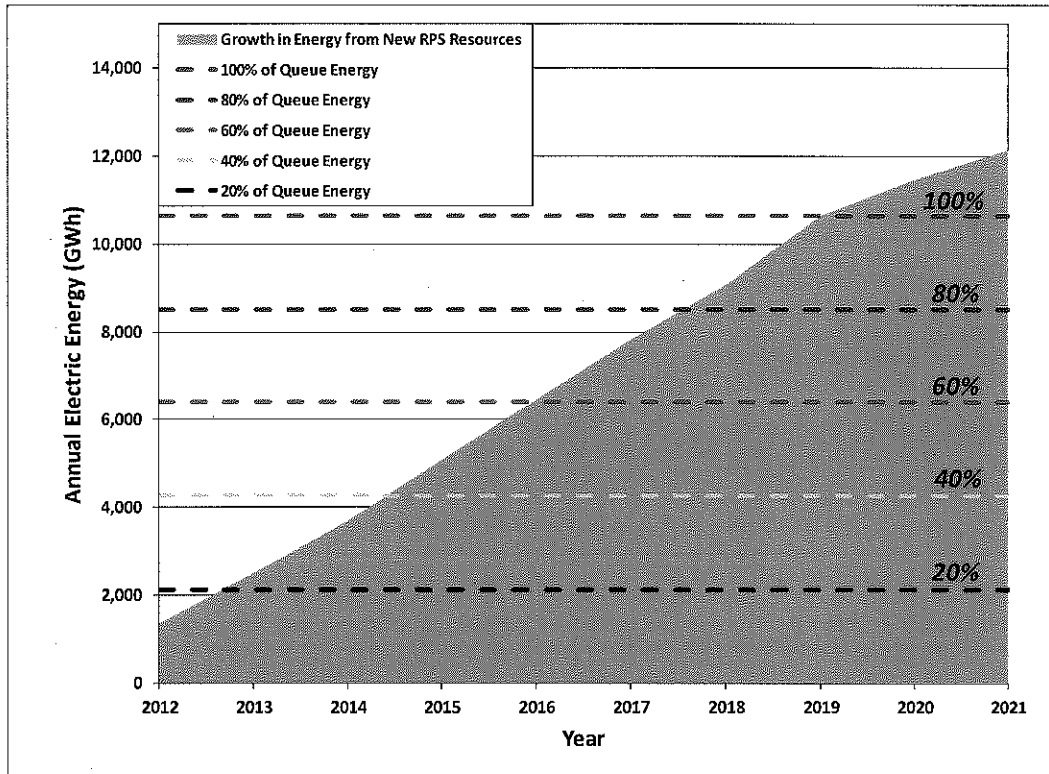


Figure Error! No text of specified style in document.-7: Estimated incremental electric energy from meeting new RPS targets (2012 to 2021) compared with estimated electric energy from various percentages of new renewable projects in the ISO queue as of April 1, 2012 (GWh).

In addition to queue resources, other potential contributions to satisfying the RPSs and other policy targets include the development of “behind-the-meter” distributed generation (DG) projects (see Section **Error! Reference source not found.**), the conversion of existing generation to use qualified REC-eligible fuels, and the purchase of RECs from projects in neighboring balancing authority areas.¹⁴ Additionally, energy-efficiency development in excess of the 2012 CELT passive demand resource forecast would further reduce the need for supply-side RPS resources. Alternatively, the affected LSEs can make alternative compliance payments to the states’ clean energy funds, which help finance new renewable projects.

While the development of renewable variable energy resources will help meet the RPS and other policy targets and will enhance fuel diversity, it may also increase the need for flexibility from system resources, especially during stressed operating conditions, as indicated in the ISO’s Strategic Planning Initiative. (Refer to Sections **Error! Reference source not found.** and **Error! Reference source not found.** for a discussion on how this concern is being addressed.) The ISO continues to analyze renewable resource development through its economic study requests (Section **Error! Reference source not found.**), resource developer requests for interconnection, and planning studies conducted in support of the Strategic Planning Initiative.

¹⁴ The existing Montville #5 unit, an 80 MW gas- and oil-fired thermal unit in southeastern Connecticut, has qualified for CT Class 1 RECs under a project to convert the unit to produce up to 40 MW using biomass fuel. Once converted, the Montville #5 biomass unit could contribute up to 300 GWh per year toward meeting the state’s and region’s RPS goals.