STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island
Renewable Energy Standard

Annual RES Compliance Report
for Compliance Year 2016

April 2018

Rhode Island Public Utilities Commission

89 Jefferson Boulevard

Warwick, Rhode Island 02888

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Introduction

Compliance Year 2016, from January 1, 2016 through December 31, 2016, was the tenth compliance year of the Rhode Island Renewable Energy Standard (RES).[E1] Under R.I. Gen. Laws § 39-26-6, the Rhode Island Public Utilities Commission (PUC) is charged with implementing the RES and ensuring compliance by Obligated Entities.[E2] In 2016, each Obligated Entity was required to obtain at least 10.0% of electrical energy (including line losses) sold to Rhode Island end-use customers from Eligible Renewable Energy Resources, with no less than 8.0% of that obligation sourced from New Renewable Energy Resources.

This tenth Annual RES Compliance Report (Report) is intended to satisfy the requirement in R.I. Gen. Laws § 39-26-6(f) to report "the status of the implementation of the renewable energy standards in Rhode Island and other states." The legislation specifically requests a summary of the role of renewable energy certificates (RECs) and alternative compliance payments (ACPs) in meeting the RES obligation, as well as the amount of rate increases authorized to recover costs arising from implementation of the RES. New this year, this Report includes information about continuing and developing issues regarding the administration of the RES.

2016 RES Obligation and Compliance

The State's 2016 RES-obligated retail sales totaled 7,954,467 megawatt-hours (MWh) of electrical energy, which was served by twenty-eight Obligated Entities.[E3] As shown in Table E.1 below, the total minimum obligation to be satisfied by New Renewable Energy Resources was 636,372 MWh (8.0% of each Obligated Entity's retail sales).[E4] The obligation to be satisfied by either Existing or New Renewable Energy Resources was 159,103 MWh (2.0% of each Obligated Entity's retail sales). Almost all (99.9%) of the combined New and Existing resource obligation was met through retirement of Rhode Island-eligible NEPOOL GIS Certificates, also referred to more generally as Renewable Energy Certificates or RECs.[E5]

The total number of New RECs procured by Obligated Entities in Compliance Year 2016 was 692,845, which includes 27,277 RECs banked from Compliance Years 2014 and 2015. This is an 8.9% surplus of New RECs across all Obligated Entities, up significantly from the 4.2% and 7.4% surpluses in Compliance Years 2014 and 2015, respectively. With this surplus in Compliance Year 2016, twenty-two Obligated Entities combined to bank 56,576 RECs for use in Compliance Years 2017 or 2018. This record-setting total was up 47.0% from the previous record set in Compliance Year 2015. This surplus reflects a sustained increase in regional renewable energy supply through the construction of additional capacity, the retrofitting of existing resources throughout the NEPOOL region, and a significant increase in the quantity of RES-eligible imports during this period.

[E1] Renewable Energy Certificates (RECs) are generated during a compliance year in real time, but trading runs from July through June. Thus, trading and compliance for Compliance Year 2016 runs from July 2016 through June 2017.

[E2] Per R.I. Gen. Laws § 39-26-2, Obligated Entities, including but not limited to non-regulated power producers and electric utility distribution companies, sell electrical energy to end-use customers in Rhode Island. Block Island Power Company and Pascoag Utility District are specifically exempt from the RES.

[E3] An individual Obligated Entity's load obligation is rounded to the nearest whole megawatt-hour (MWh).

[E4] An individual Obligated Entity's New and Existing obligation is rounded up to the nearest whole MWh.

[E5] NEPOOL GIS refers to the New England Power Pool Generation Information System, which as explained on its website, "issues and tracks certificates for each MWh of generation produced in the ISO New England control area, including imports from adjacent control areas, and all load served." The terms "GIS Certificate" and "Renewable Energy Certificate," or "REC," are often used interchangeably in the marketplace. REC is a more general term, while it is the settlement of GIS Certificates that substantiates RES compliance.

Table E.1: Composition of 2016 RES Compliance

	New RES Obligation	Existing RES Obligation
2016 Minimum Obligations (MWh) [a]	636,372 MWh	159,103 MWh
GIS Certificates Retired for 2016 RI RES Compliance (MWh, %)	635,796 MWh, (99.91%) [b]	159,101 MWh, (99.99%)
RI RES Compliance by Alternative Compliance Payments (MWh, $)	576 MWh, $38,592	2 MWh, $134
Banked for Future Compliance	56,576 Certificates	Not Applicable
Over-compliance / RECs Not Banked	1 [c]	15,576 Certificates
Outstanding REC / ACP obligation	0	0

[a] *See* note E3 of the text.
[b] This value includes the application of 27,277 RECs banked from Compliance Years 2014 and 2015 plus the application of RECs minted and retired in Compliance Year 2016.
[c] Upon reviewing compliance filings, one Obligated Entity was found to have one additional, unaccounted-for REC. The Obligated Entity was notified, but chose to not to bank the REC, letting it expire rather than amending the filing.

Nearly 100% of the State's 2016 Existing RES obligation was met through retiring RECs. Cumulatively, Obligated Entities combined to procure a net excess of 15,576 RECs above the 2016 Existing REC requirement. Banking of Existing RECs is not allowed under Rhode Island's Renewable Energy Standard.

Taken as a whole, there was a New and Existing REC surplus among Obligated Entities. Taken individually, only three Obligated Entities chose to comply, partially, by making ACPs totaling $38,726 in lieu of retiring 576 New and two New or Existing RECs.[E7] This continues a recent trend of relatively low total ACP costs paid by Obligated Entities.

Together, the increased reliance on RECs, decreased reliance on ACPs, and increase in banking of RECs is evidence that the 2016 NEPOOL GIS REC market supply of RECs eligible to be used for compliance with the RES was less constrained than in previous compliance years.

2016 RES Resources

Most of the New RECs settled in 2016 were generated at facilities fueled by landfill gas (35.2%), followed by biomass (28.6%), wind (25.2%), hydro (6.2), solar photovoltaic (4.0%), and digester gas (0.8%).[E8] This represents a sustained reliance on landfill gas with a significant increase in reliance on wind (Figure E.1). There was also a moderate but steady increase in reliance on solar photovoltaic resources. In terms of location, most of the New RECs settled in 2016 were sourced from Rhode Island (36.6%), holding steady compared to 2015 in terms of total RECs (Figure E.2) from Rhode Island, but down about 6.5% in terms of the share of RECs sourced from Rhode Island. The remaining RECs came from New Hampshire (21.0%), Maine (20.9%), New York imports (13.1%), Vermont (8.1%), Massachusetts (0.3%), and Connecticut (0.1%).

As in previous compliance years, all of the Existing RECs were generated at hydro facilities. This year, the hydro facilities were located in Maine, New Hampshire, and Massachusetts.[E9] Finally, sixty-nine projects were approved as Renewable Energy Resources by the PUC since last year's Report. The current total is 255 resources approved or conditionally approved as New, Existing, or partial New and partial Existing.[E10] Notably, 2,373 small scale solar installations (16.1 MW) enrolled in the Renewable Energy Growth Program have been aggregated and registered as a single resource.

[E7] In Compliance Year 2016, Alternative Compliance Payments (ACPs) in lieu of both New and Existing RECs were valued at $67.00 per MWh.

[E8] Not all of the RECs purchased, minted, and settled in Compliance Year 2016 were used to meet Compliance Year 2016 obligations. Some RECs were banked for use in Compliance Years 2017 and 2018. Additionally, this summary excludes voluntary REC purchases above and beyond the RES. Voluntary clean energy programs are summarized in Appendix 4 of this Report.

[E9] Additional information on the composition of 2016 RES compliance by fuel type and geographic location is provided in Section III of this Report.

[E10] A monthly status report on RES approvals and applications can be accessed here: http://www.ripuc.org/utilityinfo/res.html.

Figure E.1: Historical New RECs by Fuel Source

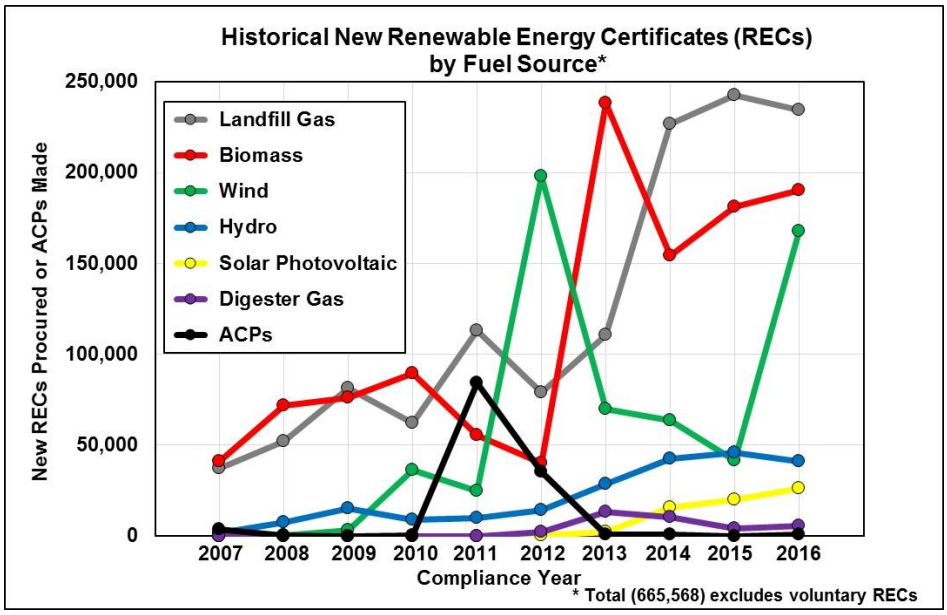
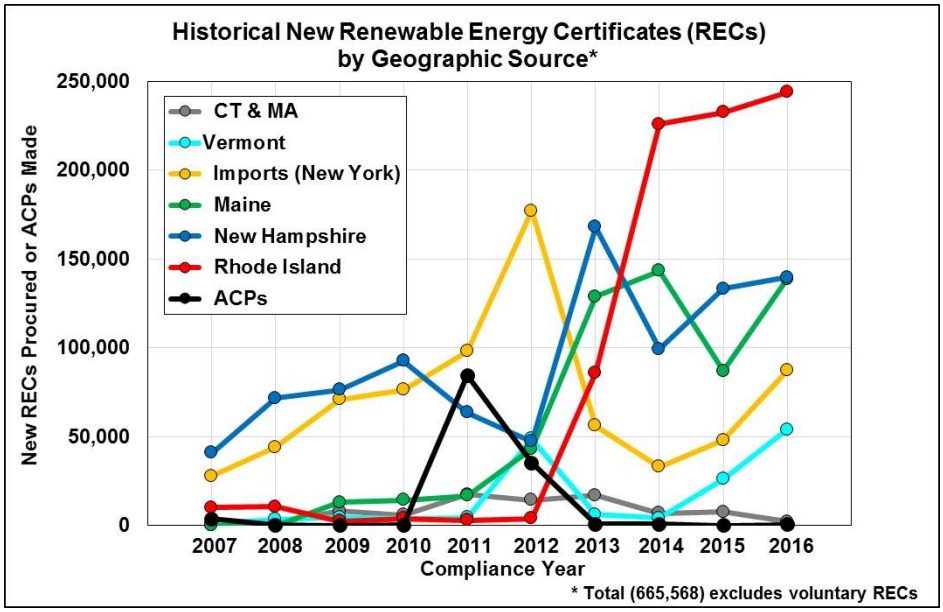


Figure E.2: Historical New RECs by Geographic Source



2016 Customer Charges

The Narragansett Electric Company d/b/a National Grid (National Grid) is the only Obligated Entity for which the PUC collects data on the charges to ratepayers for complying with the RES.[E11] Early in a calendar year, National Grid proposes a RES charge designed to collect the costs of compliance during the upcoming compliance year, outstanding costs for the remainder of the current compliance year, and to true up any outstanding cumulative under- or over-collection made during previous compliance years.[E12] The charge of $0.00288 per kilowatt-hour (kWh), effective April 1, 2016 through March 31, 2017, comprises a $0.00405 per kWh factor for projected

[E11] The complete history of RES charges to National Grid's Standard Offer Service customers is provided below in Table 4.

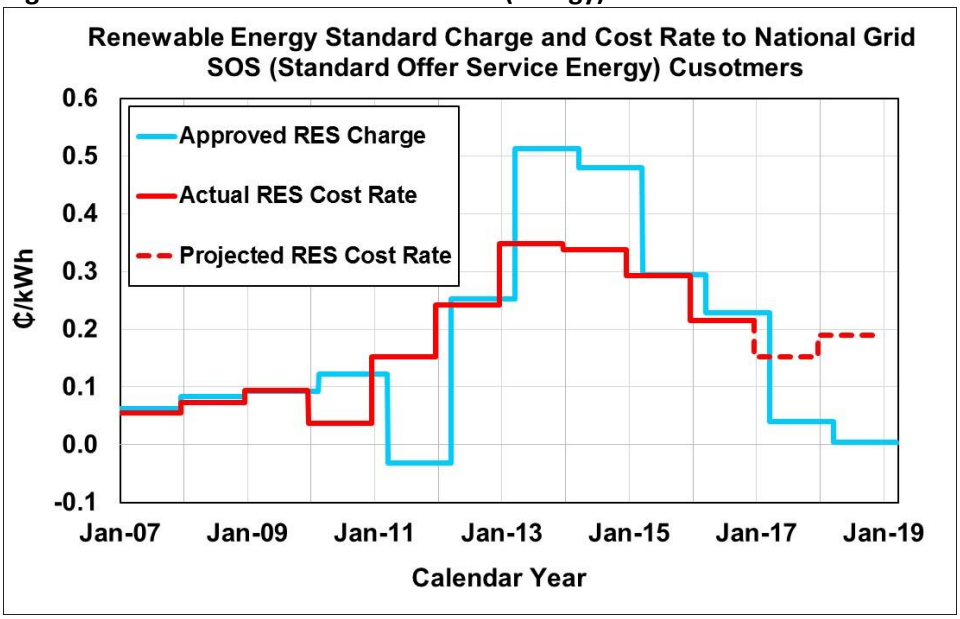
[E12] National Grid typically files for a rate change to the Renewable Energy Charge in late winter for effect on April 1st. Therefore, the timing of changes in the RES charge occurs three months into the Compliance Year, and three months before the REC trading year turns over. For the 2016 example, *see*: http://www.ripuc.org/eventsactions/docket/4556-NGrid-RESFiling-2016_2-24-16.pdf.

Table E.2: Estimated Rate Impact for RES Compliance to National Grid SOS (Energy) Customers

Effective Date	Projected REC Procurement Cost (per kWh)[a]	Adder for previous and current costs (per kWh)	Authorized RES Charge (per kWh)	Monthly/ Annual Charge to 500-kWh Ratepayer
April 2018 – Report Date [b]	$0.00190	($0.00186)	$0.00004	$0.02/$0.24
April 2017 – March 2018	$0.00264	($0.00224)	$0.00040	$0.20/$2.40
April 2016 – March 2017	$0.00405	($0.00117)	$0.00288	$1.44/$17.28
April 2015 – March 2016	$0.00366	($0.00072)	$0.00294	$1.47/$17.64
April 2014 – March 2015	$0.00430	$0.00050	$0.00480	$2.40/$28.80
April 2013 – March 2014	$0.00371	$0.00141	$0.00512	$2.56 / $30.72

[a] The projected REC procurement cost is for current year costs. The projected compliance rate for Compliance Year 2016 was $0.00405/kWh, and was collected from April 2016 through March 2017.
[b] *See* National Grid 2018 Renewable Energy Standard Charge and Reconciliation, Attachment 1, http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf

Figure E.3: RES Charges and Cost Rate to National Grid SOS (Energy) Customers



costs for Compliance Year 2016 and a negative $0.00117 reconciliation factor for a cumulative over-collection of costs for previous Compliance Years, including costs for Compliance Year 2015 (*see* the yellow row in Table E.2; Figure E.3). This charge represents an approximately 2.0% decrease in the RES charge authorized in 2015.

While this Report focuses on Compliance Year 2016, it should be noted that in April 2017, the RES charge was reduced again to $0.00040 per kWh. The substantial decrease reflects a large over-collection factor and a falling cost projected for New REC compliance in 2017.[E13] In March 2018, the PUC approved National Grid's proposal to decrease the RES charge again, for effect on April 1, 2018, to $0.00004 per kWh. Again, the cause is falling New REC prices and a significant over-collection factor. [E14]

[E13] National Grid 2017 Renewable Energy Standard Charge and Reconciliation, Attachment 1, http://www.ripuc.org/eventsactions/docket/4605-NGrid-RESReconciliation(2-24-17).pdf.

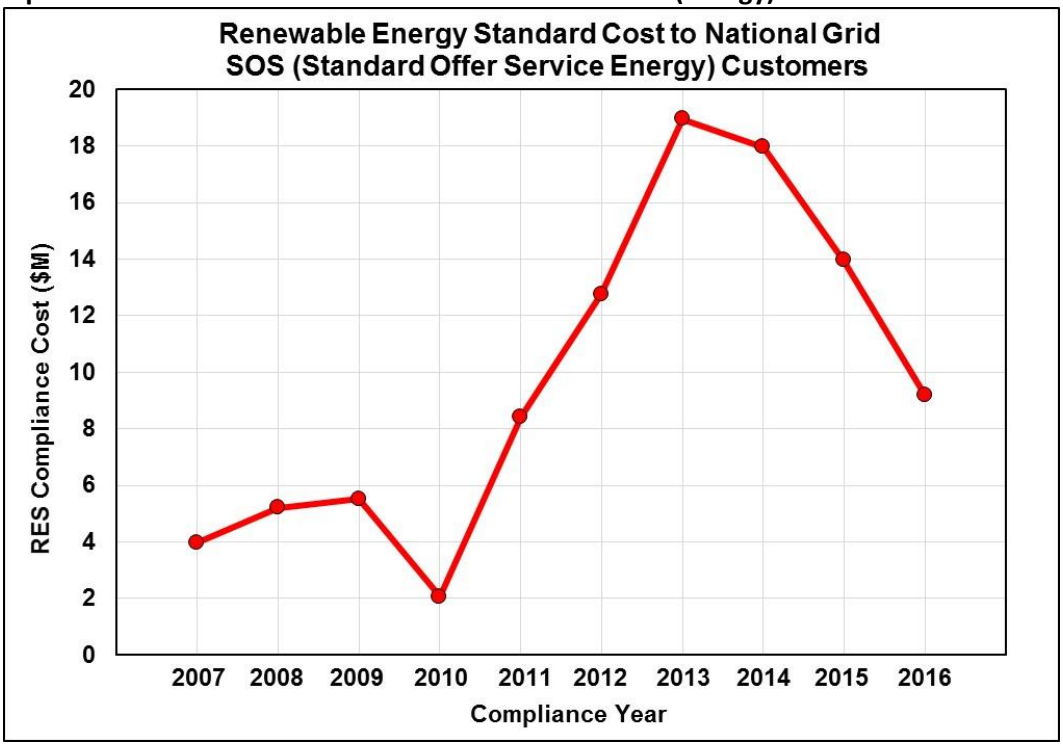
[E14] National Grid 2018 Renewable Energy Standard Charge and Reconciliation, Attachment 1, http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf

Table E.3: Summary of National Grid's 2016 RES Compliance Costs [a]

Compliance Year	Total RES Costs (Millions)	New REC Costs (Millions)	Existing REC Costs (Millions)	ACP Costs (Millions)	Obligated Load (MWh)
2016	$8.97	$9.10	$0.10	$0	4,282,268
2015	$13.96	$13.80	$0.08	$0	4,773,192
2014	$17.95	$17.93	$0.07	$0	5,317,349
2013	$18.96	$18.90	$0.06	$0	5,541,409
2012	$12.8	$12.75	$0.05	$0	5,272,388

[a] *See* note E16.

Figure E.4: Compliance Costs to National Grid Standard Offer Service (Energy) Customers



2016 Compliance Costs

National Grid is also the only Obligated Entity for which the PUC collects cost-of-compliance data.[E15] To meet its 2016 New and Existing RES obligations, National Grid incurred $9.2 million in compliance costs (Table E.3; Figure E.4).[E16] This is a decrease of approximately 33.7% from the cost incurred to comply with 2015 RES targets. Approximately $6.44 million (70.8%) of that expense was for purchases of RECs generated by projects in National Grid's Long-term Contracting and Renewable Energy Growth programs.[E17] This decrease in compliance cost to National Grid may reflect an increasing supply in Rhode Island-eligible RECs, which was also described above in relation to a surplus in New RECs retired by Obligated Entities and a low reliance on ACPs. The current cost rate of the RES obligation to National Grid's Standard Offer Service energy customers (Total

[E15] The complete history of RES cost to National Grid's Standard Offer Service customers is provided below in Table 5.

[E16] The $9.2 million sum of New REC and Existing REC costs, which are based on communications with National Grid and may include the costs of RECs purchased and banked previous Compliance Years that were used for Compliance Year 2016, among other minor factors. "Total RES Cost" of $8.97 million reported in Table E.3 represents the funds expended by National Grid in Compliance Year 2016. These descriptions apply to all years in Table E.3.

[E17] R.I. Gen. Laws § 39-26.1, § 39-26.2, and § 39-26.6.

RES Costs divided by Obligated Load) was approximately 0.00215 $/kWh in Compliance Year 2016, continuing down as in the previous two years (Figure E.3), and lower than National Grid's original projection of 0.00405 $/kWh. The company's latest projection, for Compliance Year 2018, is 0.00190 $/kWh.

It must be noted that this data only represents expenses incurred by Standard Offer Service customers of National Grid, accounting for approximately 53.8% of all retail energy served statewide in 2016. The remaining 46.2% of statewide electric load is serviced by competitive suppliers for whom the PUC does not have access to compliance cost data. A REC surplus would potentially lower compliance costs to other Obligated Entities. It should also be noted that National Grid passes unpredicted savings and expenses resulting from changes in the REC market onto Standard Offer Service customers and distribution customers. Other Obligated Entities (non-regulated competitive energy suppliers) may pass some of the REC market risk to their company's profits and losses rather than pass it onto their customers dollar-for-dollar. Finally, in addition to the costs enumerated above, the Commission incurred approximately $120,000 in expenses related solely to the administration of the RES for Compliance Year 2016.

2016 Conclusions

This analysis concludes that the Rhode Island RES continues to operate successfully. The cost of the RES has certainly decreased for National Grid Standard Offer Service customers and also likely decreased for customers of competitive suppliers. There is some evidence that compliance costs will not increase and will potentially decrease in the short term due to a surplus of RECs in Rhode Island. But, regional demand for renewable energy could counter this potential.

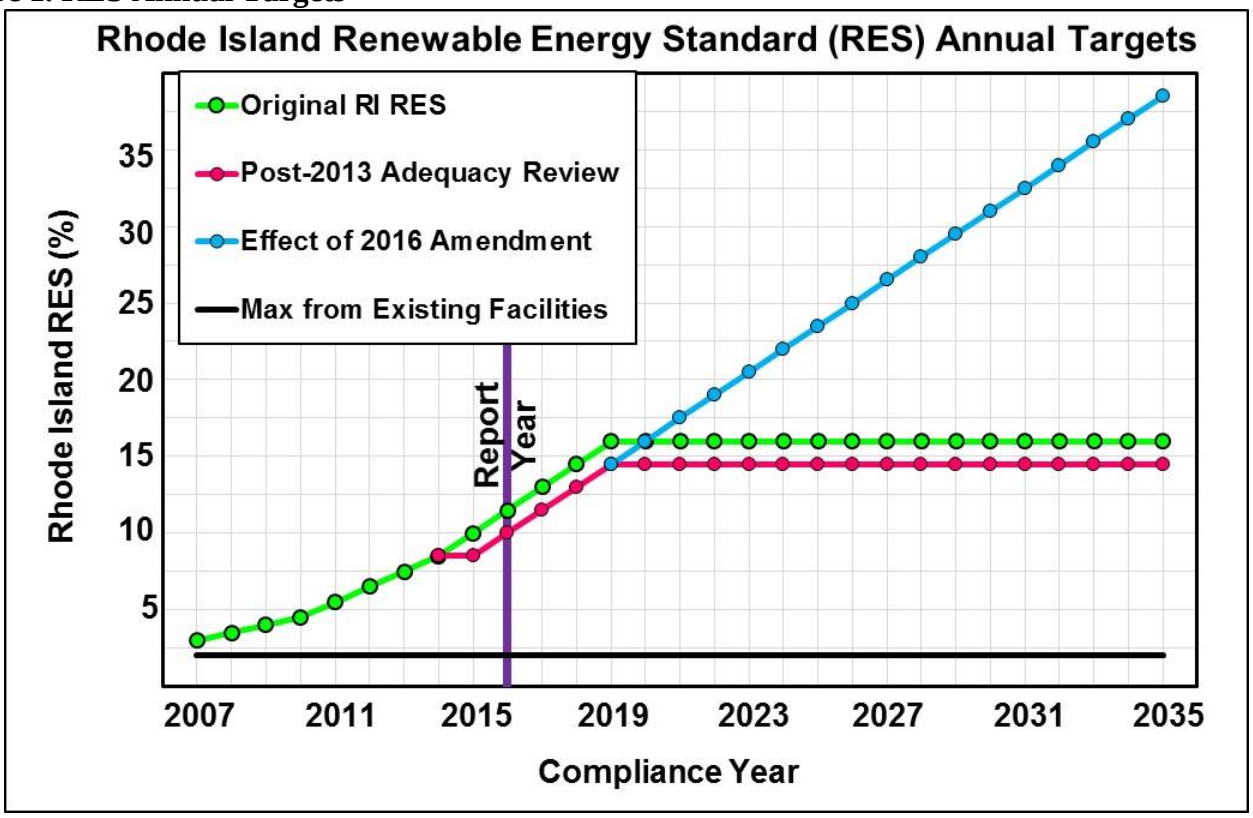
The number of Rhode Island-eligible generating units continues to grow, including facilities located within the State, as does the number of new renewable energy projects proposed throughout the region and adjacent control areas. The PUC remains optimistic that the supply of Rhode Island-eligible New RECs will continue to grow and that Obligated Entities will be able to source RECs in a balanced marketplace over the next few years, with sustained and minor reliance on ACPs. Economic conditions, various permitting and interconnection issues, uncertainty over the long-term availability of federal incentives, availability of long-term contracting for renewable projects, and other factors that impact investment decisions, however, all have the potential to delay the large pipeline of projects currently under development. As a result, it is difficult to predict in which years supply will balance with demand and in which years a gap between the two will exist.

I. Introduction to the Renewable Energy Standard

The Rhode Island Renewable Energy Standard (RES) was enacted in 2004 via R.I. Gen. Laws §§ 39-26-1 to 10 and requires the State's retail electricity providers (referred to as Obligated Entities), excluding Pascoag Utility District and Block Island Power Company, to supply a defined proportion of their annual retail electricity sales from Eligible Renewable Energy Resources. The Rhode Island Public Utilities Commission (PUC) is the state agency that regulates and administers the RES. The PUC is required to report annually on the RES, as is provided in this document.

Legislative and regulatory actions have altered the annual RES targets since its original passage in 2004 (Figure 1). The original RES target was 16.0% renewable energy by 2019, remaining in effect thereafter, unless and until the PUC determined that the standard was no longer necessary.[1] Subsequently, in 2013, the PUC conducted a statutory review of the adequacy of renewable energy supplies and, because of that investigation, ordered a delay in the 1.5% increase in Compliance Year 2015. This decision resulted in a revised final target of 14.5% renewable energy in 2019.[2] In 2016, the RES statute was amended to require annual increases of 1.5%, to continue from 2020 through 2035, resulting in a final target of 38.5% renewable energy.[3]

Figure 1. RES Annual Targets



[1] P.L. 2016, ch. 144, § 1 and P.L. 2016, ch. 155, § 1 deleted R.I. Gen. Laws § 39-26-4(a)(5), which previously provided: "In 2020 and each year thereafter, the minimum renewable energy standard established in 2019 shall be maintained unless the commission shall determine that such maintenance is no longer necessary for either amortization of investments in new renewable energy resources or for maintaining targets and objectives for renewable energy." For P.L. 2016, ch. 155, § 1, *see* http://webserver.rilin.state.ri.us/PublicLaws/law16/law16155.htm.

[2] This review was mandated by R.I. Gen. Laws § 39-26-6(d). This section of the law was amended by P.L. 2016, ch. 144, § 1 and P.L. 2016, ch. 155, § 1. *See also* note 1.

[3] R.I. Gen. Laws §§ 39-26-1 to 10, as amended, do not explicitly maintain an RES proportion in 2036 and thereafter.

Compliance Year 2016 was the tenth compliance year for Rhode Island's RES.[4] The RES required all Obligated Entities to obtain at least 10.0% of electricity sold in 2016 to Rhode Island end-use customers (inclusive of losses) from Eligible Renewable Energy Resources. No more than 2.0% could be from Existing Renewable Energy Resources and a minimum of 8.0% must have been obtained from New Renewable Energy Resources (Table A5 in Appendix 5).

Additional design elements of the RES were developed through a stakeholder process and adopted via the Rules and Regulations Governing the Implementation of a Renewable Energy Standard, which first became effective on December 7, 2005. Revised RES Regulations became effective on July 25, 2007. The RES Regulations require, among other provisions, that all Obligated Entities submit annual compliance filings to the PUC. This Report is based on an aggregated summary of these compliance filings and is intended to satisfy the reporting requirements related to the enabling legislation at §39-26-6(f), which directs the PUC to report annually to the Governor, the Speaker of the House, and the President of the Senate "the status of the implementation of the renewable energy standards in Rhode Island and other states." The annual Reports must also include "the level of use of renewable energy certificates by eligible renewable energy resources and the portion of renewable energy standards met through alternative compliance payment."

The RES statute defines Eligible New and Existing Renewable Energy Resources at §39-26-5. All Renewable Energy Resources must be certified by the PUC (and the certification maintained) to participate in the RES program. An up-to-date status of all approved and pending eligibility applications can be found on the PUC website at www.ripuc.org/utilityinfo/res.html.

All Renewable Energy Resources must also establish and maintain an account with the New England Power Pool Generation Information System (NEPOOL GIS). NEPOOL GIS maintains a record of each generator's monthly production as well as the generator's descriptive characteristics, such as generator location, fuel type, and actual emissions. One GIS Certificate is created for each megawatt-hour (MWh) of electrical energy production generated within, or imported into, the ISO New England (ISO-NE) control area, which includes Rhode Island. A single GIS Certificate for one MWh of eligible renewable energy generation is also commonly known as a Renewable Energy Certificate (REC).[5] The GIS Certificate is the currency used to demonstrate compliance with the RES, as well as mandatory renewable energy requirements in other states, and voluntary renewable energy transactions throughout the ISO-NE control area. Through the use of GIS Certificates, which are created and transferred exclusively within the NEPOOL GIS, and the annual submission of RES Reports, the PUC ensures that a GIS Certificate used for RES compliance has not also been used to satisfy another obligation in Rhode Island or any other jurisdiction. In this way, the PUC guards against any "double counting" of RECs.

[4] January 1, 2016 through December 31, 2016.

[5] As explained on its website, NEPOOL GIS "issues and tracks certificates for each megawatt-hour (MWh) of generation produced in the ISO New England control area, including imports from adjacent control areas, and all load served." The terms "GIS Certificate" and "Renewable Energy Certificate," or "REC," are often used interchangeably in the marketplace. While REC is the more general term used to denote a generator's descriptive characteristics (i.e. fuel type, vintage and geographic location), it is the settlement of GIS Certificates within the Obligated Entity's NEPOOL GIS account that substantiates RES compliance.

II. Compliance Year 2016: Obligation and Sources of Compliance

Rhode Island's actual 2016 RES-obligated retail sales totaled 7,954,467 MWh of electrical energy. As a result, the aggregate minimum New RES obligation (8.0%) was 636,372 MWh, while the aggregate New or Existing RES obligation (2.0%) was 159,103 MWh.[6] Obligated Entities were required to meet the RES either through the purchase and retirement of NEPOOL GIS RECs[7] or through the provision of Alternative Compliance Credits, obtained by making Alternative Compliance Payments (ACPs) to the Rhode Island Commerce Corporation. The Rhode Island Commerce Corporation sets these funds aside in the Renewable Energy Development Fund, established under R.I. Gen. Laws § 39-26-7, to support investments in renewable energy. In 2015, the ACP rate was $67.00 per MWh of obligation.[8] The rate is the same for both New and Existing RES obligations. Additional information regarding ACP rates is found in Appendix 1.

Table 1: Obligated Entities Submitting 2016 RES Compliance Filings to the PUC

Distribution Utilities	
The Narragansett Electric Company d/b/a National Grid	
Competitive Retail Providers (Non-regulated power producers)	
Agera Energy, LLC	First Point Power (BP Energy Company)
Ambit Northeast, LLC	Gexa Energy, LLC (NextEra)
Archer Energy, LLC	Liberty Power Holdings, LLC
Calpine Energy Solutions (formerly Noble Americas Gas and Power Corp.)	Mint Energy, LLC
Clearview (South Jersey Energy)	Moore Energy, LLC
Consolidated Edison Solutions, Inc.	North American Power and Gas (BP Energy Company)
Constellation New Energy, Inc.	Public Power, LLC
Constellation Energy Services, Inc.	South Jersey Energy Company (Halifax America Operating Co. and Emera Energy)
Devonshire Energy, LLC	Town Square Energy, LLC
Direct Energy Business, LLC	TransCanada Power Marketing, Ltd.
Direct Energy Business Marketing (Hess Energy Marketing)	Viridian Energy, LLC
EDF Energy Solutions, LLC	Westerly Hospital Energy Company, LLC (Freedom Energy Logistics)
ENGI Resources, LLC	XOOM Energy, LLC
ENGI Retail, LLC (Think Energy)	-

In total, twenty-eight entities were obligated to submit RES Compliance Filings to the PUC, including National Grid and twenty-seven competitive retail energy providers, as shown in Table 1. Appendix 2 lists all entities from which Compliance Filings were received and provides a detailed summary of RES compliance for National Grid along with a more limited summary for competitive retail energy providers.

[6] Note that the total New and Existing RES obligations are slightly higher than 8.0% and 2.0% of total obligated retail sales due to rounding protocols for individual Obligated Entities.

[7] RECs are issued about seven months after they are generated. Thus, January 2016 RECs are issued June 15, 2016. Because of this lag, trading for 2016-vintage RECs and the costs incurred by Obligated Entities for Compliance Year 2016 continued through June 15, 2017.

[8] *See* http://www.ripuc.org/utilityinfo/RES-ACPRate.pdf

Table 2: Summary of 2016 RES Compliance

Results for Compliance Year 2016		(MWh) [a]
A	**2016 RES Obligated Retail Sales**	7,954,467
A.1	National Grid	4,282,268
A.2	Competitive Suppliers (27 total)	3,672,199
New RES Obligations and New Renewable Energy Certificates		
B	**Total 2016 New RECs Settled in Rhode Island [b]**	**692,845**
B.1	2016 New RECs Purchased	665,568
B.2	Banked 2014 and 2015 New RECs Applied	27,277
C	**New RES Obligations (8.0% of "A")**	**636,372**
C.1	Banked RECs Applied to 2016 New Obligations (from B.2)	27,277
C.2	2016 New RECs Applied to 2016 New Obligations (subset of B.1)	608,519
C.3	Alternative Compliance Payment Credits Applied to 2016 New RES Obligations	576
C.4	Outstanding Obligation (RECs or ACPs)	0
D	**Banked RECs Available for Compliance Year 2017 or 2018**	
D.1	Remaining RECs Available after Meeting New RES Obligations	57,049
D.2	2016 New RECs Applied to 2016 Existing RES Obligations	473
D.3	RECs Banked for Future Use in Compliance Years 2017 or 2018	56,576 [c]
D.4	2016 New RECs Purchased above 30% Banking Cap (not eligible for banking)	0
Existing RES Obligations and Existing Renewable Energy Certificates		
E	**Existing RES Obligations (2.0% of "A")**	**159,103**
E.1	2016 Existing RECs Applied to 2016 Existing RES Obligations	158,628
E.2	2016 New RECs Applied to 2016 Existing RES Obligations (from D.2)	473
E.3	Alternative Compliance Payment Credits Applied to 2016 Existing RES Obligations	2
E.4	Outstanding Obligation (RECs or ACPs)	0
F	**Total 2016 Existing RECs Settled in Rhode Island**	**174,204**
F.1	2016 Existing and New RECs Applied to 2016 Existing RES Obligations (E.1 plus E.2)	159,101
F.2	2016 Existing RECs Purchased above 2016 RES Obligations (not eligible for banking)	15,576

a. Values may not be additive due to rounding protocol with individual Obligated Entities.

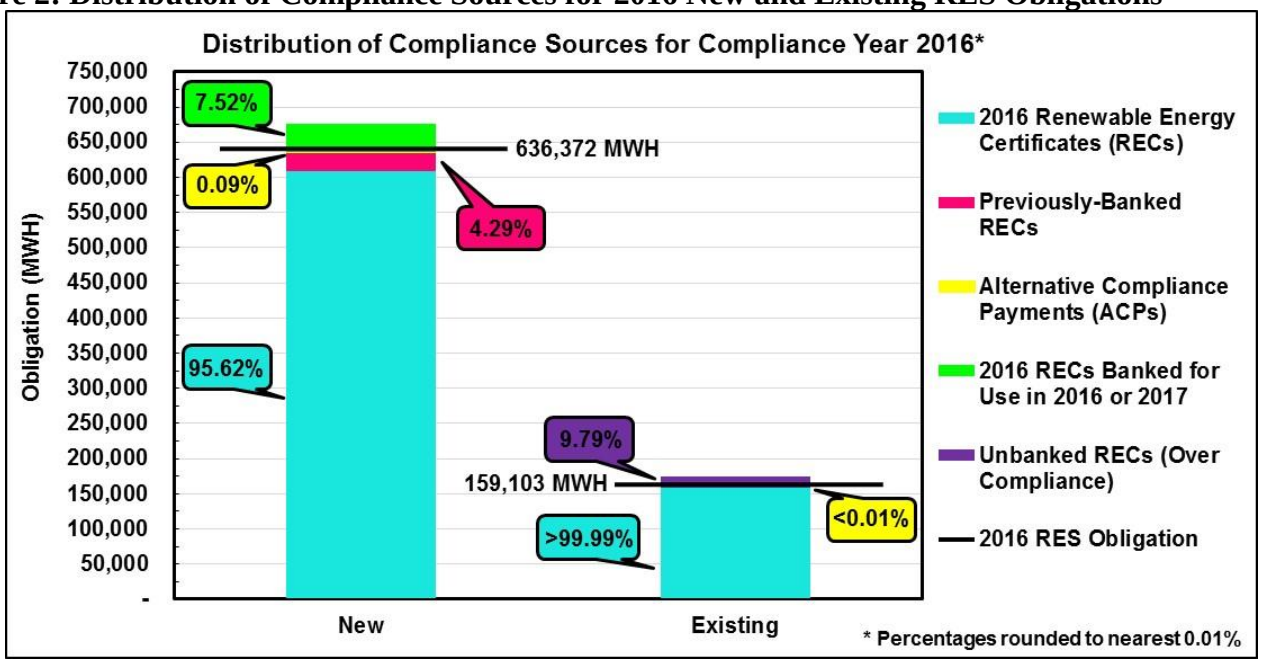
b. Does not include RECs purchased on behalf of end-use customers for voluntary clean energy programs. *See* Appendix 4 for details on RECs purchased for voluntary programs.

c. This figure represents newly-banked RECs. It does not include 11,897 previously-banked RECs that were not used for compliance in 2016 and may still be used for compliance in 2017, but after which they will expire.

Twenty-five of these entities met their entire RES obligation by retiring RECs. Three competitive energy suppliers met a portion of their 2016 individual RES obligations by making ACPs to the Rhode Island Commerce Corporation; no Obligated Entities complied entirely with ACPs. Eighteen Obligated Entities utilized some of their Banked Compliance to meet their 2016 obligation. Twenty-two Obligated Entities banked RECs minted in 2016 for use in 2017 or 2018. The number of Obligated Entities choosing to bank RECs continues to climb, from eleven in 2014 to eighteen in 2015. A breakdown of compliance by the numbers is presented in Table 2.

For Compliance Year 2016, RECs were used to meet more than 99.9% of Rhode Island's New RES obligation (Figure 2). The total number of New RECs retired by Obligated Entities was 692,845, including 27,277 Certificates banked from Compliance Year 2014 or 2015 and 56,576 New RECs (minted in 2016) that were banked for use toward compliance in either Compliance Year 2017 or 2018. This represented an 8.9% surplus compared to the 2016 New RES obligation for all Obligated Entities. This surplus is significantly higher than the 7.4% and 2.2% surpluses for Compliance Years 2015 and 2014, respectively. This surplus in New RECs reflects a sustained increase in regional renewable energy supply through the construction of additional capacity and the retrofitting of existing resources throughout the NEPOOL region, as well as a significant increase in the quantity of RES-eligible imports during this period.

Figure 2: Distribution of Compliance Sources for 2016 New and Existing RES Obligations



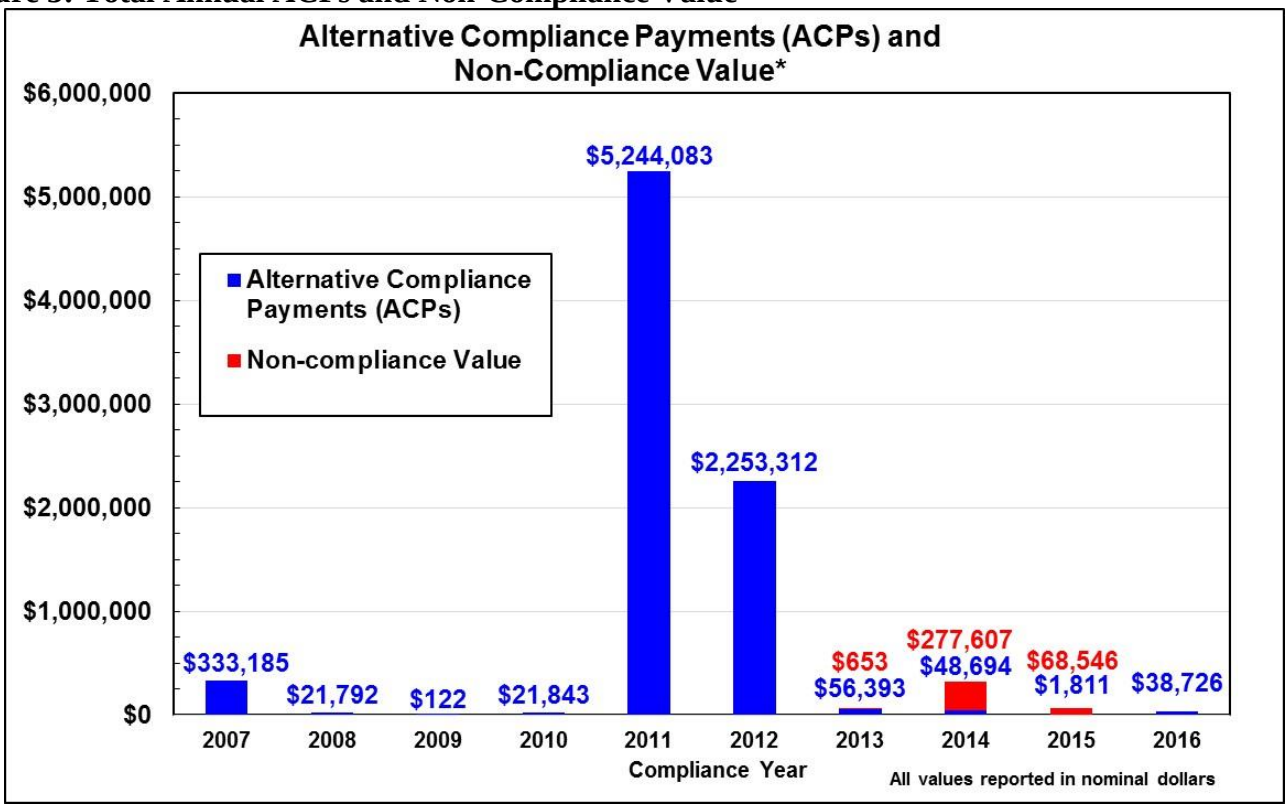
Nearly 100% of the State's 2016 Existing or New RES obligation was met through retiring RECs (Figure 2). In total, Obligated Entities combined to procure an excess of 15,576 RECs above the 2016 Existing REC requirement, a 9.8% surplus.[9] Unlike New RECs, banking of Existing RECs is not allowed under Rhode Island's Renewable Energy Standard Rules and Regulations.

Taken as a whole, there was a New and Existing REC surplus among Obligated Entities. Taken individually, three Obligated Entities chose to comply, partially, by making ACPs totaling approximately $38,726 in lieu of retiring 576 New and two Existing RECs.[10] This continues a recent trend of relatively low total ACP costs paid by Obligated Entities (Figure 3).

[9] National Grid was not one of these entities. It is possible that these companies injudiciously over-procured RECs, or they purchased these RECs intentionally for some other purpose.

[10] In Compliance Year 2016, ACPs in lieu of both New and Existing RECs are valued at $67.00 per MWh.

Figure 3: Total Annual ACPs and Non-Compliance Value

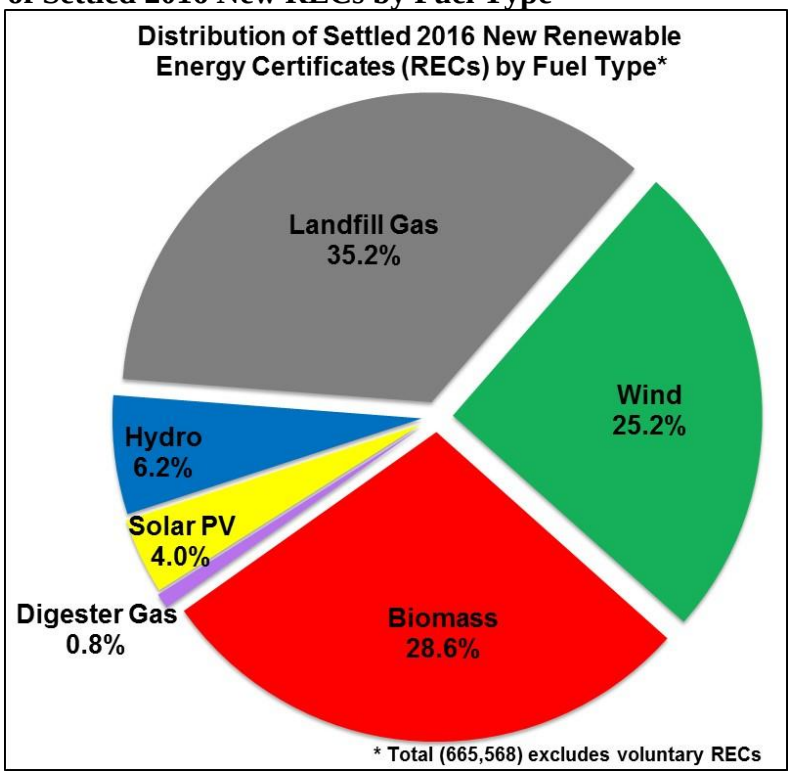


III. 2016 RES Compliance by Fuel Type and Geographic Location

In 2016, New RECs minted, purchased, and settled in Compliance Year 2016 were generated by six types of renewable energy generators: biomass, digester gas, hydroelectric, landfill gas, solar photovoltaic, and wind (Figure 4).[11] As in Compliance Year 2015, most of the New RECs settled in 2016 were generated at facilities fueled by landfill gas (35.2%). The remaining New RECs were generated by biomass (28.6%) wind (25.2%), hydro (6.2%), solar photovoltaic (4.0%), and digester gas (0.8%) facilities. Again, as in Compliance Year 2015, in terms of location, most of the New RECs settled in 2016 were sourced from Rhode Island (36.6%), with the rest coming from New Hampshire (21.0%); Maine (20.9%); New York imports (13.1%); Vermont (8.1%); Massachusetts (0.3%); and Connecticut (0.1%) (Figure 5).

Compliance Year 2016 saw a significant increase of New RECs generated from wind resources, with all other facility types holding relatively steady (Figure 6). Compared to Compliance Year 2015, Compliance Year 2016 saw 126,533 additional wind RECs retired — notably , this number is greater than the growth in New Renewable Energy required by the RES from Compliance Year 2015 to 2016 (115,129 MWh). In other words, the growth in New Renewable Energy required by the RES, as depicted in Figure 1, was more than met by the increase in the retirement of wind RECs alone. Meanwhile, New RECs obtained from facilities located in Rhode Island continued into a fourth year of growth, but there were larger increases in New RECs coming from Maine, New York imports, and Vermont (Figure 7).

Figure 4: Distribution of Settled 2016 New RECs by Fuel Type



[11] Not all of the New RECs purchased, minted, and settled in Compliance Year 2016 were used to meet Compliance Year 2016 obligations. Some RECs were banked for use in Compliance Years 2017 and 2018, while others were purchased in excess of the obligation. This summary of New and Existing REC resources excludes RECs retired for the purpose of substantiating renewable energy claims associated with voluntary purchases, for example, to serve clean energy choices of end-use customers, above and beyond the RES. Voluntary clean energy programs are summarized in Appendix 6 of this Report.

The continued prevalence of New RECs sourced from Rhode Island, and of landfill gas as a resource, is largely driven by a single project, the Rhode Island LFG Genco, LLC landfill gas generation plant in Johnston, Rhode Island (Genco Plant). Pursuant to R.I. Gen. Laws § 39-26.1-9, the Genco Plant owners executed a power purchase agreement (PPA) in May 2010 with National Grid.[12] The plant achieved commercial operation in May 2013 and was subsequently approved by the PUC as a Rhode Island-eligible Renewable Energy Resource on June 11, 2013.[13] Thus, the Genco Plant's third full year of operation was Compliance Year 2016, during which National Grid would have expected the plant's annual energy output to be 199,649 MWh.[14] The PPA included the sale of RECs generated from the Genco Plant to National Grid, all of which were in turn were sold to Standard Offer Service energy supply customers to help meet National Grid's 2016 RES obligation.[15] Therefore, the plant was expected to produce approximately 31.4% of the 636,372 New REC obligation in Compliance Year 2016. Indeed, approximately 30.8% of New RECs were sourced from landfill gas facilities located in Rhode Island, most of which were generated by the Genco Plant.[16]

The resurgence in wind RECs was driven by a significant increase in the use of wind RECs from Maine, New Hampshire, New York Imports, Rhode Island, and Vermont. This trend should continue with Deepwater Wind's Block Island Offshore Wind Farm having its first full year of operation during Compliance Year 2017, along with an influx of eligibility approved for wind resources enrolled in Vermont's Sustainably Priced Energy Enterprise Development (SPEED) program seeking eligibility as New Renewable Resources. Further, 2017 will also include RECs generated by a 15 MW onshore windfarm in Rhode Island.

Additionally, there was a minor decrease in New RECs generated from hydroelectric facilities throughout the region, representing the first decrease since Compliance Year 2010. The steady increase in solar photovoltaic RECs from Rhode Island, which was the only source of solar photovoltaic RECs, continued into its fifth year. The use of these solar RECs is primarily the direct result of National Grid's statutory long-term contracting and feed-in tariff programs,[17] rather than a direct result of the RES.

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[12] The statute exempted the project from PUC review and approval under certain project conditions that were met by the proposed project. The statute required certification of the PPA by the Division of Public Utilities and Carriers, the Department of Administration, the Commerce Corporation (formerly the Economic Development Corporation), and the Office of Energy Resources, all of which were issued in July 2010. The PPA can be found at http://www.ripuc.org/eventsactions/docket/D-10-36-NGrid-PPA-LFG(6-7-10).pdf.

[13] PUC Amended Effective Date Pursuant to Order No. 21165, http://www.ripuc.org/eventsactions/docket/4201-PUC-LFGGenco-AmendedEffectiveDate(10-4-13).pdf.

[14] *See, e.g.*, National Grid Long-Term Contracting for Renewable Energy Recovery Factor, Docket No. 4775, Attachment 1 at 2, http://www.ripuc.org/eventsactions/docket/4775-NGrid-LTCRER-Jan-June2018_11-15-17.pdf.

[15] In Compliance Year 2016, National Grid filed a RES compliance plan that included using all RECs from all contracts signed pursuant to R.I. Gen. Laws § 39-26.1 and § 39-26.2 to meet the RES obligation for Standard Offer Service customers, and later amended that compliance plan to include using RECs from tariff projects enrolled in the Renewable Energy Growth Program pursuant to R.I. Gen Laws § 39-26.6. *See* National Grid 2016 Standard Offer Service Procurement Plan 2016 Renewable Energy Standard Procurement Plan Docket No. 4556, Schedule 7, http://www.ripuc.org/eventsactions/docket/4556-4605-NGrid-AmendRES_2-23-17.pdf and National Grid's March 23, 2017 Motion to Amend the 2016-2017 RES Plans, http://www.ripuc.org/eventsactions/docket/4673-NGrid-LTCRER-July2017(5-15-17).pdf.

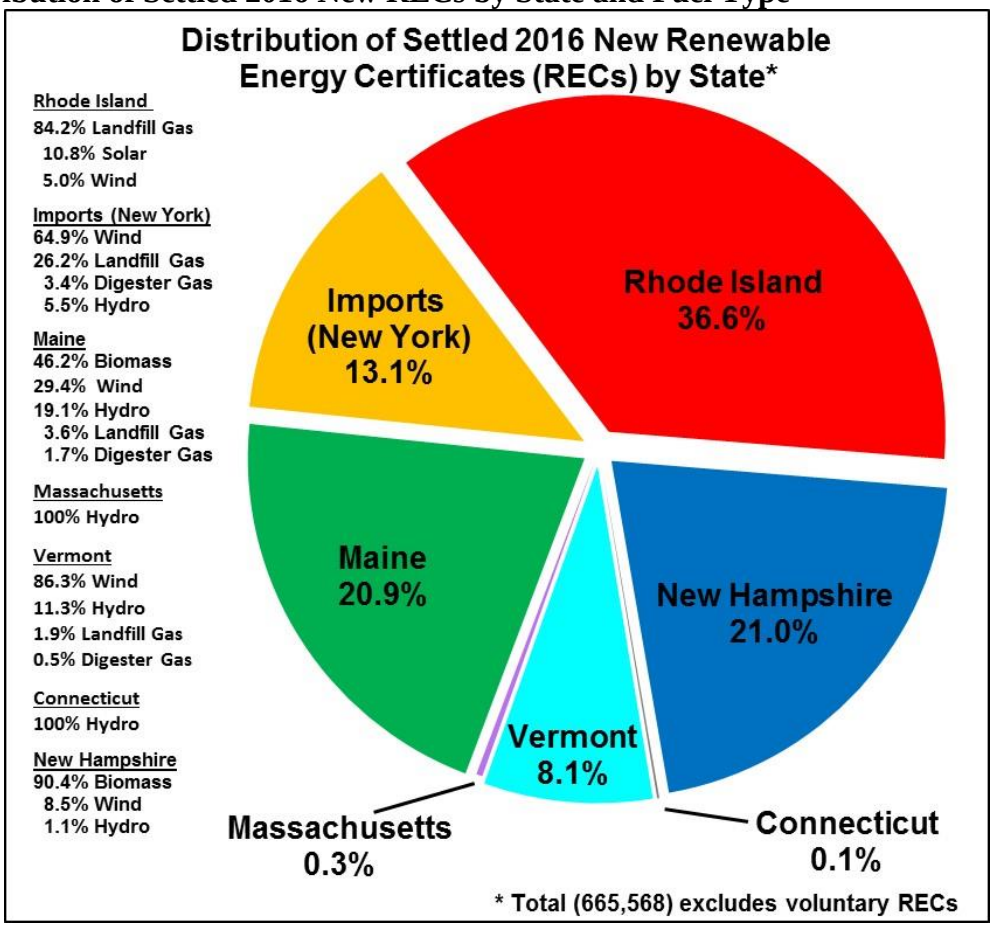
[16] In Compliance Year 2016, the only other RES-eligible landfill gas facilities located in Rhode Island were Johnston Landfill Expansion Phases I and II, also located in Johnston, Rhode Island, with 2.4 MW and a 6 MW nameplate capacity, respectively. This Report does not investigate to whom RECs from these facilities, if any, were sold or transferred.

[17] R.I. Gen. Laws § 39-26.1, § 39-26.2, and § 39-26.6.

Altogether, the historical view of the number of New RECs procured from all jurisdictions is presented in Figure 6, along with ACPs for comparison.[18] While this chart does not show exactly which RECs were used for compliance and which were banked for future compliance, this view does help illustrate the continued reliance on RECs from Rhode Island and a sustained lack of reliance on ACPs in Compliance Year 2016.

Finally, as in all previous compliance years, all the Existing RECs minted, purchased, and settled in Compliance Year 2016 were generated at hydroelectric facilities. This year, the Existing RECs were sourced from Maine (73.2%), New Hampshire (11.8%), and Massachusetts (15.0%).[19]

Figure 5: Distribution of Settled 2016 New RECs by State and Fuel Type



[18] Appendix 5 contains additional information of historical data for the distribution of New and Existing RECs by fuel type and location for 2007 through 2016.

[19] These percentages include purchases for voluntary programs and over-compliance.

Figure 6: Historical New RECs by Fuel Source

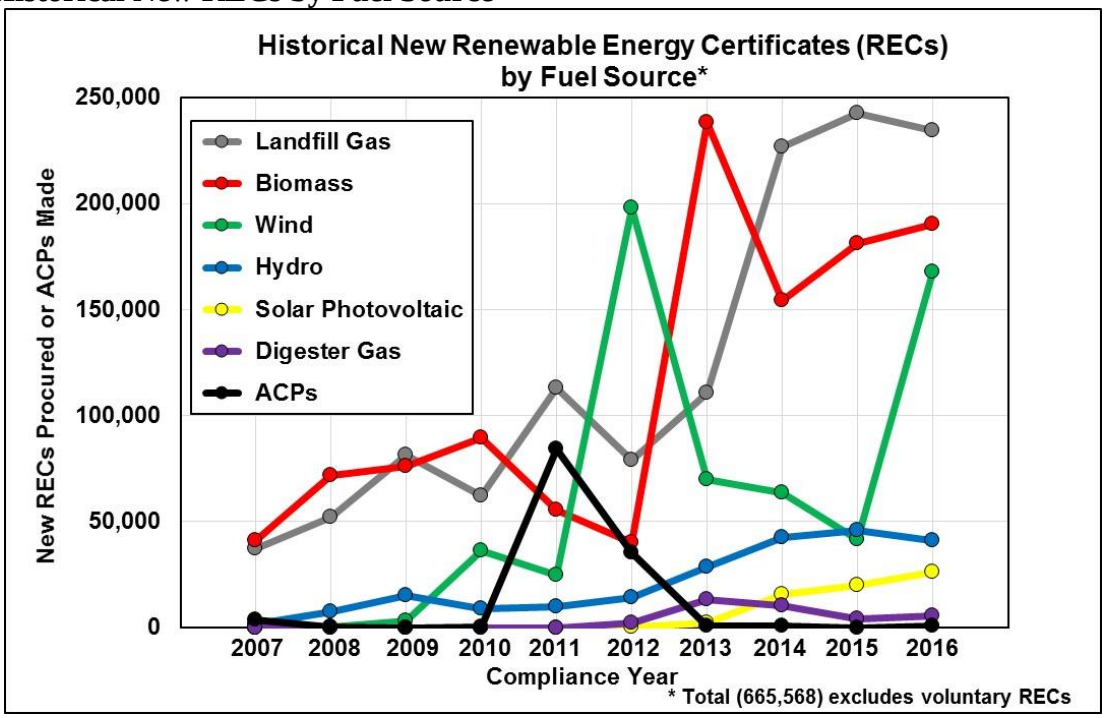
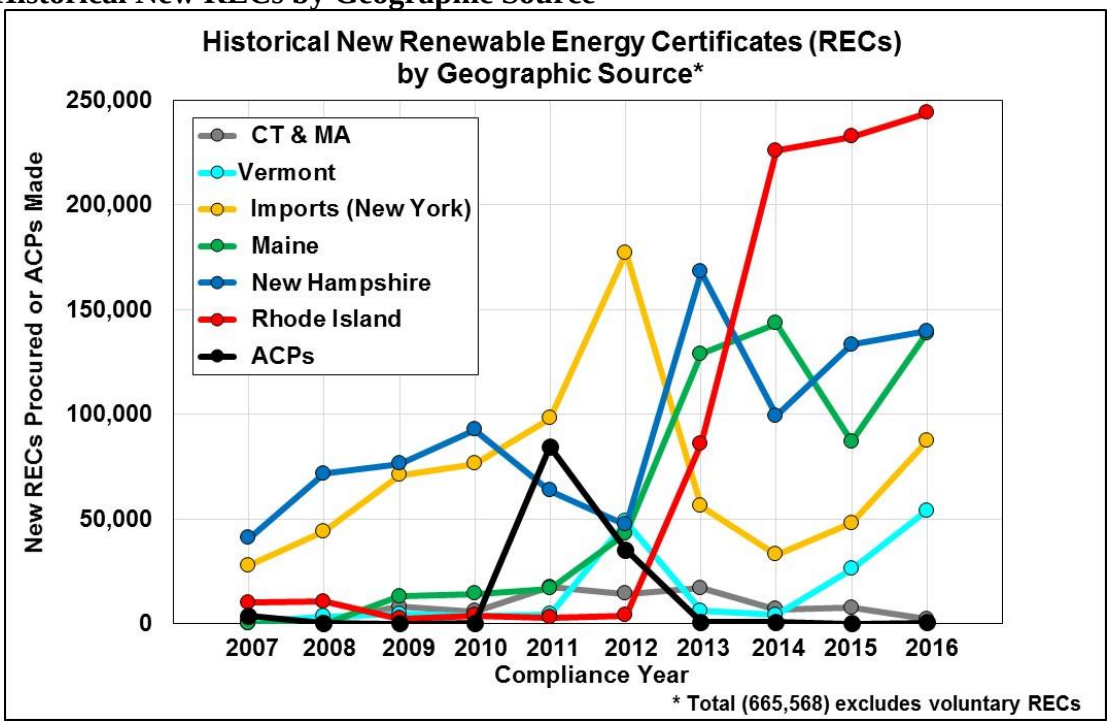


Figure 7: Historical New RECs by Geographic Source



IV. Renewable Energy Standard – Future Obligations

The RES enabling legislation at §39-26-4 establishes annual targets for both New and Existing RES obligations through 2035. At § 39-26-4(a)(3), the enabling legislation provides for an additional one percent (1.0%) of "retail electricity sales in each of the following compliance years 2011, 2012, 2013, 2014, provided that the commission has determined the adequacy, or potential adequacy, of renewable energy supplies to meet these percentage requirements." At § 39-26-4(a)(4), the legislation provides for an additional 1.5% per year through 2035, resulting in a final target of 38.5% renewable energy, with a similar requirement that the PUC periodically determine the adequacy of supply.[20]

The way the PUC fulfilled the requirement to determine supply adequacy, as well as the timing and implications of the PUC's decision-making authority, is articulated in the RES Regulations under § 39-26-6(d). In a January 2010 Order for Docket No. 4050, the PUC determined that adequate renewable energy supplies existed to meet the RES target increase scheduled for 2011. Additional information on this proceeding and the PUC's complete Order can be found at the PUC website.[21] In a February 2014 Order for Docket No. 4404, the PUC determined there was potential inadequacy of renewable energy supply to meet the target increase of 1.5% scheduled for 2015. The result of this determination was to delay the scheduled increase in the RES by a period of one year, thereby capping the escalation of the New RES target at 12.5% rather than 14.0% (with an additional 2.0% to come from Existing or New RECs). Additional information on this proceeding and the PUC's complete Order can be found at the PUC website.[22] Finally, in 2016, the RES statute was amended to require annual increases of 1.5% to continue from 2020 through 2035, resulting in a final target of 38.5% renewable energy. The next determination will occur on or before January 1, 2019, and then every five years thereafter.

The percentage targets shown above in Figure 1 and in the calculated future RES obligations shown below in Table 3 are adjusted to reflect the PUC's one-year delay of the 1.5% increase to Compliance Year 2015 and the RES amendments of 2016 that increase the targets through 2035. The quantity (in MWhs) of future years' RES obligations are estimated by multiplying the forecasted value of total obligated sales in Rhode Island by the RES target for each year. The forecast of Rhode Island's obligated sales is based on the Forecast Data File of ISO-NE's 2017 Capacity, Energy, Loads, and Transmission ("CELT") Report[23] and exempted load, including some wholesale transmission losses, as well as both Pascoag Utility District and Block Island Power Company retail sales.[24]

[20] R.I. Gen. Laws §§ 39-26-1 to 10, as amended, does not explicitly maintain a RES proportion in 2036 and thereafter.

[21] For additional information, refer to materials filed in Commission Docket No. 4050 at: www.ripuc.org/eventsactions/docket/4050page.html

[22] For additional information, refer to materials filed in Commission Docket No. 4404 at: http://www.ripuc.org/eventsactions/docket/4404page.html. In particular, Commission Report and Order No. 21353 can be viewed at: http://www.ripuc.org/eventsactions/docket/4404-RES-Adequacy-Ord21353_2-10-14.pdf.

[23] ISO-NE 2017 CELT Forecast Data. *See* tab 2, column X– GROSS-PV-PDR, Gross Energy in gigawatt-hours less Behind-the-Meter PV and Passive Demand Resources. ISO-NE 2017 Forecast Data File, available at https://www.iso-ne.com/static-assets/documents/2017/05/forecast_data_2017.xlsx.

[24] Here we assume exempted load is 2.5% in all future years. Historical load for Block Island and Pascoag can be found at http://www.eia.gov/electricity/data/eia826/.

Table 3: Forecast of RES Compliance Year Obligations for New and Existing Resources

Compliance Year	Actual/Forecasted RES-Obligated Retail Sales [a] (MWhs)	Minimum MWhs from New Renewable Energy Resources [b] (per Figure 1 targets)[c]	MWhs from *either* New *or* Existing Renewable Energy Resources [b] (2.0%)
2007 (Actual)	8,335,706	83,357	166,715
2008 (Actual)	8,279,006	124,190	165,584
2009 (Actual)	7,910,112	158,212	158,212
2010 (Actual)	8,242,937	206,082	164,866
2011 (Actual)	8,157,796	285,531	163,165
2012 (Actual)	8,123,025	365,545	162,469
2013 (Actual)	8,193,979	450,678	163,891
2014 (Actual)	7,985,473	519,067	159,720
2015 (Actual)[d]	8,018,905	521,243	160,392
2016 (Actual)	7,954,467	636,372	159,103
2017	*8,180,000*	*758,000*	*164,000*
2018	*8,067,000*	*866,000*	*161,000*
2019	*7,961,000*	*970,000*	*159,000*
2020 [e]	*7,766,000*	*1,060,000*	*155,000*
2021	*7,626,000*	*1,152,000*	*153,000*
2022	*7,516,000*	*1,246,000*	*150,000*
2023	*7,423,000*	*1,339,000*	*148,000*
2024	*7,351,000*	*1,433,000*	*147,000*
2025	*7,296,000*	*1,530,000*	*146,000*
2026 [f]	*7,257,000*	*1,636,000*	*145,000*

[a] Assumes 2.5% of load exempted from RES obligation in future years.
[b] Note that the total New and Existing RES obligations are slightly higher than the % New and % Existing of total obligated retail sales due to rounding protocols for individual Obligated Entities.
[c] The annual targets are also listed in Table A5 of Appendix 5.
[d] After conducting a review pursuant to R.I. Gen. Laws § 39-26-6(d), in Docket No. 4404, the PUC delayed implementation of the scheduled 1.5% increase in 2015. This resulted in a delay of all subsequent increases for a period of one year.
[e] The RES was amended in 2016 to continue with a 1.5% increase annually from 2020 to 2035.
[f] The 2017 ISO-NE CELT forecast ends in 2026.

V. Authorized Rate Increases and RES Compliance Costs

Per R.I. Gen. Laws § 39-26-6(b), the PUC is required to authorize rate recovery by electric distribution companies for prudent incremental costs arising from the RES, including the purchase RECs, the payment of ACPs, required payments to support the NEPOOL GIS, assessments made for the Renewable Energy Development Fund pursuant to R.I. Gen. Laws § 39-26-7(c), and the incremental costs of complying with energy source disclosure requirements." To track the recovery of these costs, R.I. Gen. Laws § 39-26-6(f) requires that the annual Report includes the amount of rate increases authorized pursuant to subsection (b), described above. The only electric distribution company that qualifies as an Obligated Entity is National Grid, as the statutory definition of "Obligated Entity" specifically excludes Block Island Power Company and the Pascoag Utility District.[25]

Table 4: Estimated Rate Impact for RES Compliance National Grid SOS (Energy) Customers

Effective Date	Projected REC Procurement Cost (per kWh)[a]	Adder for previous and current costs (per kWh)	Authorized RES Charge (per kWh)	Monthly/ Annual Charge to 500-kWh Ratepayer
April 2018 – Report Date [b]	$0.00190	($0.00186)	$0.00004	$0.02/$0.24
April 2017 – March 2018	$0.00264	($0.00224)	$0.00040	$0.20/$2.40
April 2016 – March 2017	$0.00405	($0.00117)	$0.00288	$1.44/$17.28
April 2015 – March 2016	$0.00366	($0.00072)	$0.00294	$1.47/$17.64
April 2014 – March 2015	$0.00430	$0.00050	$0.00480	$2.40/$28.80
April 2013 – March 2014	$0.00371	$0.00141	$0.00512	$2.56 / $30.72
April 2012 – March 2013	$0.00209	$.00044	$0.00253	$1.265 / $15.18
April 2011 – March 2012	$0.00064	($0.00095)	($0.00031)	($0.156) / ($1.86)
March 2010 – March 2011	$0.00095	$0.00028	$0.00123	$0.615 / $7.38
January 2009 – February 2010	$0.00105	($0.00012)	$0.00093	$0.465 / $5.58
2008	$0.00084	[c]	$0.00084	$0.42 / $5.04
2007	$0.00062	N/A	$0.00062	$0.31 / $3.72

[a] The projected REC procurement cost is for current year costs; i.e., the projected compliance rate for Compliance Year 2016 was $0.00405/kWh and was collected from April 2016 through March 2017.
[b] Proposed for effect April 1, 2018. *See also* http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf.
[c] In 2008, a specific RES reconciliation charge was not proposed in the RES Charge filing. Reconciliation of over- or under-collection would have occurred through Standard Offer Service and Last Resort Service reconciliation filings.

[25] R.I. Gen. Laws § 39-26-2(16).

Regarding National Grid's rates, it is important to note that the company generally has two types of distribution customers: customers who get their energy supply from National Grid's Standard Offer Service and customers who get their energy supply from a competitive supplier. Only Standard Offer Service customers pay National Grid's charges related to RES compliance. These Standard Offer Service customers accounted for approximately 53.8% of the energy used in Rhode Island in 2016. RES compliance costs (and related rates) of competitive suppliers for providing the remaining 46.2% of energy is unknown.

Early in each calendar year, National Grid proposes a RES charge designed to collect the costs of RES compliance for Standard Offer Service customers during the upcoming compliance year, outstanding costs for the remainder of the current compliance year, and to true up any outstanding cumulative under- or over-collection made during previous compliance years.[26] The reconciling nature of this charge ensures that when compliance costs are lower than National Grid anticipates, the over-collections are returned to ratepayers. Symmetrically, when compliance costs are higher than anticipated, National Grid can recover under-collections.

Table 4 provides data on the authorized RES charge (in dollars per kWh) billed to National Grid's Standard Offer Service customers from 2007 through this Report date, as well as the total charges to a 500-kWh Residential Class ratepayer by month and year (*see also* the blue line on Figure 8). The factors of the approved charge are based on projected market conditions, anticipated REC pricing, estimates of electricity consumption, and estimates of market share, among other prudent considerations.[27] Projected cost for the upcoming compliance year (mostly controlled by New REC cost rather than Existing REC cost) is found in the second column; the reconciliation factor for previous compliance years is found in the third column. The charge of $0.00288 per kWh, effective April 1, 2016 through March 31, 2017, comprises a $0.00405 per kWh factor for projected costs for Compliance Year 2016 and a negative $0.00117 reconciliation factor for a cumulative over-collection of costs for previous years, including costs for Compliance Year 2015 (*see* the yellow row in Table 4). This charge represents an approximately 2.0% decrease in the RES charge authorized in 2015.

While this Report focuses on Compliance Year 2016, it should be noted that in April 2017, the RES charge was reduced again to $0.00040 per kWh. The large decrease reflects National Grid's decreasing cost to comply with the RES and an increasing over-collection factor. In February 2018, National Grid filed a proposed factor of $0.00004 per kWh for affect April 1, 2018, which was approved by the PUC.[28] This most recent decrease is mostly due to National Grid's projection that compliance costs will continue to decrease, while the over-collection factor has also decreased.

National Grid successfully executed its proposed REC procurement plan for Compliance Year 2016. Based on the data reported below in Table 5 and in Appendix 2 Table A2, during the 2016 trading year, National Grid procured Rhode Island-eligible New RECs at an average price of approximately $26.56. This is below National Grid's February 2016 projection of $47.50, well below National Grid's average cost in Compliance

[26] National Grid typically files for rate change to the Renewable Energy Charge in late winter for effect on April 1st. Therefore the timing of changes in the RES charge occurs three months into the Compliance Year, and three months before the REC trading year turns over. For the 2016 example, *see here*: http://www.ripuc.org/eventsactions/docket/4556-NGrid-RESFiling-2016_2-24-16.pdf.

[27] For additional information regarding 2016 projections and charges, refer to National Grid's "2016 Renewable Energy Standard Charge and Reconciliation," Attachment 1, http://www.ripuc.org/eventsactions/docket/4556-NGrid-RESFiling-2016_2-24-16.pdf.

[28] National Grid's "2018 Renewable Energy Standard Charge and Reconciliation," Attachment 1, http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf.

Year 2016 of $44.00, and well below the ACP level of $67.00. National Grid's most recent estimate of New REC prices is an average cost of $15.83 for New RECs in Compliance Year 2018.[29]

Figure 8: RES Charges and Cost Rate to National Grid SOS (Energy) Customers

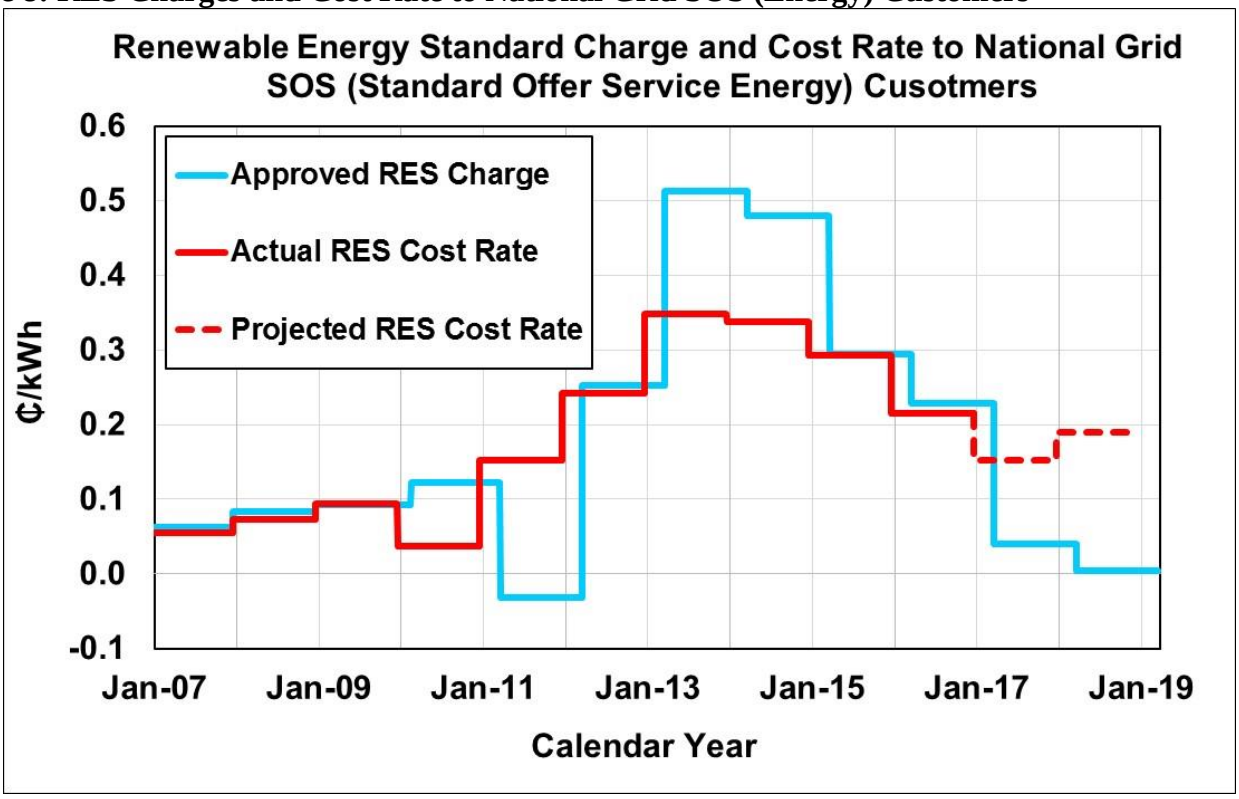


Table 5: Summary of National Grid's RES Compliance Costs, 2007 - 2016

Compliance Year	Total RES Costs (Millions)[a]	New REC Costs (Millions)[a]	Existing REC Costs (Millions)[a]	ACP Costs (Millions)	Obligated Load (MWh)
2016	$8.97	$9.10	$0.10	$0	4,282,268
2015	$13.96	$13.80	$0.08	$0	4,773,192
2014	$17.95	$17.93	$0.07	$0	5,317,349
2013	$18.96	$18.90	$0.06	$0	5,541,409
2012	$12.8	$12.75	$0.05	$0	5,272,388
2011	$8.43	$3.85	$0.05	$4.53	5,554,272
2010	$2.07	$2.02	$0.05	$0	5,695,951
2009	$5.51	$5.28	$0.22	$0	5,902,667
2008	$5.21	$5.02	$0.19	$0	7,123,559
2007	$3.97	$3.79	$0.19	$0	7,177,538

[a] Total RES costs reported here are based on data found in National Grid's Renewable Energy Standard Charge and Reconciliation filings (*for Compliance Year 2016, see* http://www.ripuc.org/eventsactions/docket/4605-NGrid-RESReconciliation(2-24-17).pdf. These values represent the funds expended by National Grid in a given Compliance Year. Total RES costs may not equal the sum of New REC and Existing REC costs, which are based on communications with National Grid and may include the costs of RECs purchased and banked in one Compliance Year that were later used for compliance in a following Compliance Year, among other minor factors.

[29] National Grid 2018 Renewable Energy Standard Charge and Reconciliation, Attachment 1, http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf.

For Compliance Year 2016, most of the RECs National Grid purchased to fulfill the RES obligation incurred by their Standard Offer Service customers were from renewable generation projects that have long-term renewable energy power purchase agreements (PPAs) with National Grid pursuant to R.I. Gen. Laws § 39-26.1 and § 39-26.2. National Grid also uses RECs generated by projects enrolled in the Renewable Energy Growth Program (RE Growth Program) feed-in tariff (R.I. Gen. Laws § 39-26.6). As part of these programs, project owners receive a contract or tariff price payment from National Grid, and National Grid receives the projects' energy and REC generation.[30]

Importantly, the costs of these programs' projects are paid for by charges to all of National Grid's distribution customers, which includes both Standard Offer Service customers and competitive supply customers. Thus, simply retiring these RECs on behalf of Standard Offer Service customers would deprive competitive supply customers of the value of the RECs from these programs (for which they are also charged). To prevent this inequity, each quarter National Grid collects spot market data regarding New REC prices in the Rhode Island-eligible market and uses that to provide an estimated spot market value for the RECs from the PPAs and RE Growth Program. This estimated spot market rate is then charged to Standard Offer Supply energy customers for the RECs generated by the PPA and RE Growth Program resources that quarter. Meanwhile, the revenue from that charge to Standard Offer Service customers is used to offset the cost of the PPAs and RE Growth Program to benefit all of National Grid's distribution customers.[31]

National Grid's remaining REC needs are purchased through a request-for-proposal procurement process approved annually by the PUC through a docketed proceeding.[32] In addition to RES charges and rate impacts, a more accurate and complete picture of compliance costs includes REC procurement expenses, since these reflect actual costs rather than projected costs and reconciliations. To meet its 2016 New and Existing RES obligations, National Grid incurred $9.2 million in compliance costs (Table 5; Figure 9).[33] This is a decrease of approximately 33.7% from the cost incurred to comply with 2015 RES targets ($13.88 million). This decrease in compliance cost to National Grid likely reflects an increasing supply in Rhode Island-eligible RECs, which was also described above (in Section II) in relation to a surplus in New RECs retired by Obligated Entities and a low reliance on ACPs in Compliance Year 2016. Finally, approximately $6.44 million of the $9.1 million expense (70.8%) for New RECs in Compliance Year 2016 was for purchases of RECs minted and purchased through National Grid's PPAs and REG Program, described above.[34]

The actual cost rate of compliance for National Grid's Standard Offer Service customers was lower than originally projected. The final cost rate of the 2016 RES obligation to National Grid's Standard Offer

[30] Some PPAs and RE Growth Program arrangements include transfer the project's capacity value from the project to National Grid.

[31] The remaining over- or under-recovery for these PPAs is then reconciled through a charge to all National Grid distribution ratepayers. Distribution customers are all electric customers in National Grid's territory; Standard Offer Supply customers are the subset of distribution customers that buy their energy supply from National Grid rather than from a competitive supplier.

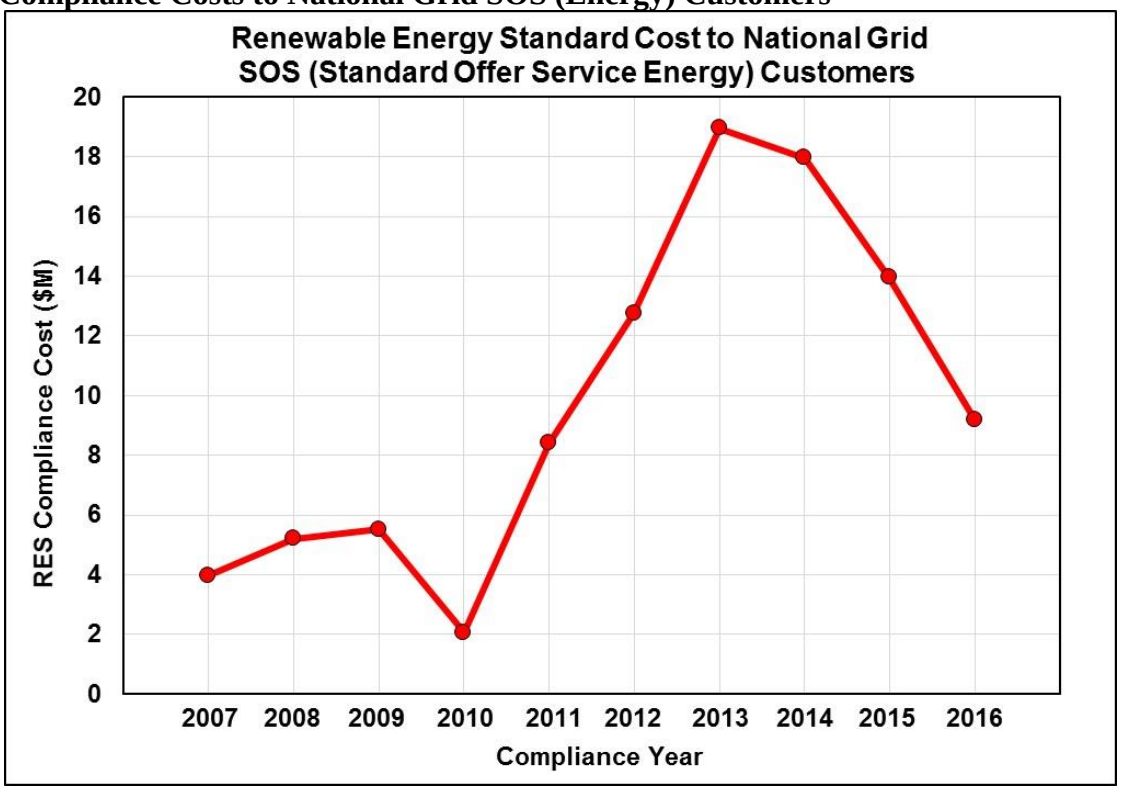
[32] *See, e.g.*, National Grid 2016 Standard Offer Service Procurement Plan 2016 Renewable Energy Standard Procurement Plan Docket No. 4556, Schedule 7, http://www.ripuc.org/eventsactions/docket/4556-4605-NGrid-AmendRES_2-23-17.pdf and National Grid's March 23, 2017 Motion to Amend the 2016-2017 RES Plans, http://www.ripuc.org/eventsactions/docket/4673-NGrid-LTCRER-July2017(5-15-17).pdf.

[33] This value is based on communications with National Grid and may include the costs of RECs purchased and banked in an earlier Compliance Year that were later used for compliance in Compliance Year 2016, among other minor factors. *See also* note [a] in Table 5.

[34] Underlying data comes from National Grid 2018 Renewable Energy Standard (RES) Charge and Reconciliation, Docket No. 4692, Attachment 2 at 1, http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf, and National Grid 2017 Renewable Energy Standard (RES) Charge and Reconciliation, Docket No. 4605, Attachment 2 at 1, http://www.ripuc.org/eventsactions/docket/4605-NGrid-RESReconciliation(2-24-17).pdf.

Service energy customers, calculated as 2016 Total RES Costs divided by Obligated Load,[35] was approximately 0.00215 $/kWh in Compliance Year 2016, continuing a steady decrease from the previous three years (*see* the red line on Figure 7), and below National Grid's original projection of 0.00405 $/kWh (Table 4). Similarly, National Grid originally projected 2017 RES costs would be 0.00264 $/kWh. But, data contained in National Grid's 2018 Renewable Energy Standard Charge and Reconciliation filing in PUC Docket No. 4692[36] signals that the final Compliance Year 2017 cost rate may be nearer to 0.00150 $/kWh, which is illustrated by the first dashed segment of the cost rate line (drawn in red) in Figure 8.[37] Furthermore, National Grid projects the cost rate will continue to stay below 0.00200 $/kWh in Compliance Year 2018 (Figure 8 and Table 4).

Figure 9: Compliance Costs to National Grid SOS (Energy) Customers



Notably, National Grid has filed information with the PUC that projects, beginning in Compliance Year 2017, that the company will have more New RECs supplied through long-term renewable energy contracts (PPAs) and the RE Growth Program than their projected annual New REC obligation.[38] National Grid currently proposes (in its RES Procurement Plan for approval by the PUC) to include sales options should the amount of RECs from the contracts and RE Growth Program exceed the company's obligation and banking allowance.[39]

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[35] We note that cost rate as defined here is not the same as the price of New RECs.

[36] National Grid 2018 Renewable Energy Standard (RES) Charge and Reconciliation, Docket No. 4692, http://www.ripuc.org/eventsactions/docket/4692-NGrid-RESReconciliation2018_2-27-18.pdf

[37] As of the filing and Report date, National Grid is still incurring costs for compliance in Compliance Year 2017.

[38] *See, e.g.*, National Grid 2018 Renewable Energy Standard Procurement Plan at 3, http://www.ripuc.org/eventsactions/docket/4692-NGrid-2018-RES-ProcurementPlan(3-1-17).pdf.

[39] Per R.I. Gen. Laws § 39-26-6(a)(3)(ii), banking of excess compliance in a compliance year is allowed for two subsequent compliance years and is capped at 30% of the current compliance year's obligation. For REC sales plan, *see* National Grid's

It must be again noted that this data only represents expenses incurred by Standard Offer Service customers of National Grid, accounting for approximately 53.8% of all retail load statewide in 2016. Competitive suppliers serve the remaining 46.2% of statewide electric, and the PUC does not have access to compliance cost data for these Obligated Entities.[40] Lacking data from these businesses, it can still be presumed that a REC surplus would potentially lower compliance costs to these other Obligated Entities. It should also be noted that National Grid passes unpredicted savings and expenses resulting from changes in the REC market onto Standard Offer Service customers and distribution customers. Competitive suppliers, on the other hand, may pass some of the REC market risk to their company's profits and losses rather than pass it onto their customers dollar-for-dollar. Finally, in addition to the costs enumerated above, the Commission incurred approximately, and at least, $120,000 in expenses related solely to the administration of the RES for Compliance Year 2016.

2019 Standard Offer Service (SOS) Procurement Plan and 2019 Renewable Energy Standard (RES) Procurement Plan, Schedule 7; http://www.ripuc.org/eventsactions/docket/4809-NGrid-2019-SOS-RES-Plans(3-1-18).pdf.

[40] Notably, the share of load served by competitive suppliers increased from 33.4% in 2014, to 40.5% in 2015, to 46.2% in 2016.

VI. Renewable Energy Standard Implementation in New England

The RES enabling legislation requests a report on "the status of the implementation of the renewable energy standards in Rhode Island **and other states**" [Emphasis added]. This section provides an update on the implementation of similar programs in the other five New England states.

All six New England states have active Renewable Energy Standards (RES, as known in Rhode Island and Vermont) or Renewable Portfolio Standards (RPS, as known in Massachusetts, Connecticut, New Hampshire, and Maine). Each of the established RES programs (referring to both RES and RPS programs) has multiple classes that are used to differentiate the compliance obligations associated with each state's programmatic objectives. Class I requirements (equivalent to Rhode Island's New RES obligation) focus on supply that has either been constructed after a specified date or which meets maximum emissions thresholds, as well as other eligibility criteria. Existing RES requirements[41] generally focus on supply that was in operation prior to the creation of the applicable state's RES program. Compliance targets are generally intended to provide the minimum amount of additional revenue believed to be necessary to keep these existing renewable energy facilities in operation. Thus, RES requirements for Existing resources are intended to maintain the current fleet rather than spur the development of new generating facilities.

In addition to distinguishing between New and Existing renewable energy obligations, some New England RES program classes include specific requirements for solar, biomass, hydroelectric, combined heat and power (CHP), waste-to-energy, thermal resources, and energy efficiency. These technology-specific requirements are implemented differently by states. In Massachusetts, the solar obligation has historically been calculated annually and subtracted from the Class I requirement. This is referred to as a solar carve-out.[42] New Hampshire's solar requirement stands alone, rather than as a carve-out of the Class I requirement, and is referred to as its Class II obligation. Connecticut has a Class III requirement for conservation and load management resources, as well as CHP. In addition to its primary Class II requirement, Massachusetts also has a secondary Class II requirement dedicated to waste-to-energy, as well as an Alternative Energy Portfolio Standard (APS) for CHP, flywheel storage, coal gasification, and efficient steam technologies. Connecticut also has incentive programs for zero- and low-emission distributed energy systems, as well as a residential solar program. While not explicitly within Connecticut's RES, these programs effectively create solar and fuel cell "carve-outs" within Connecticut's Class I RPS. Vermont's RES includes a Class I obligation for existing renewable electricity resources and a Class II obligation specified for distributed generation (up to 10 MW) interconnected to the state's distribution system.

The remainder of this section focuses exclusively on the class or portion of each state's RES requirement that is most analogous to Rhode Island's New RES requirement, including the interaction between these classes and other classes in certain limited circumstances.

Massachusetts

Massachusetts has New England's longest-running RES. The Massachusetts Class I market has experienced periods of shortage (2004 to 2006 and 2011 to 2013) and periods of approximate equilibrium (2007 to 2010, 2014, and 2015). The Massachusetts Class 1 market transitioned from equilibrium to surplus in 2016, with REC prices starting that year near the ACP value and ending below $20/MWh. Due to unequal distribution

[41] Including Class II in Massachusetts, Connecticut, and Maine; Class III in New Hampshire; Class IV in New Hampshire; Class 1 in Vermont; and Existing in Rhode Island.

[42] Massachusetts is currently drafting a regulation that would create a separate long-term carve-out to support new emerging technologies. In addition, it is also designing a third solar program, which will not be a carve-out.

of RECs and banking, some Obligated Entities hold surpluses even during times of overall market equilibrium or shortage, while others make ACPs. Table 6 summarizes aggregate Massachusetts Class I ACPs from 2004 to 2015.

The Massachusetts Department of Energy Resources (MA DOER) also administers a Class I solar carve-out, which yielded 1,600 MW of installed solar that is eligible to generate Solar Renewable Energy Certificates, known as SRECs. All SRECs generated under the program will count towards the SREC target. After ten years, SREC generators will generate Class I RECs which will count toward the Class I RES target. MA DOER finalized the regulations for the SREC successor program, known as the Solar Massachusetts Renewable Target (SMART). SMART is designed as a declining-block incentive program to incentivize the installation of an additional 1,600 MW of solar facilities. The Massachusetts Department of Public Utilities (MA DPU) is currently reviewing the electric distribution companies' model tariffs, and the program is likely to begin in the third quarter of 2018. SMART is not a Class I carve-out, and the additional supply incentivized under the program will generate standard Massachusetts Class I RECs, and thus serve as a substantial source of incremental Massachusetts Class I supply.

Recent legislative efforts in several New England states have focused on long-term renewable energy contracting through the regulated distribution utilities to satisfy RES obligations as cost effectively as possible. Massachusetts, Connecticut, and Rhode Island concluded a long-term procurement solicitation known as the Clean Energy Request for Proposals (Clean Energy ERFP). The Clean Energy RFP was issued in November 2015. Responses were collected at the end of January 2016, and 461 MWs of successful proposals were announced in October 2016. The MA DPU is currently reviewing executed contracts, but there is an expectation that MA DPU will approve all contracts, as did the Connecticut Public Utilities Regulatory Authority (CT PURA) in 2017 and the (Rhode Island) PUC in 2018. The legislative authority underlying the Clean Energy RFP allows for substantial additional procurement from Massachusetts and Connecticut. At this time, the magnitude and timing of additional potential procurements is not clear and may depend on market conditions.

Finally, omnibus energy legislation passed in 2016 will require Massachusetts's electric distribution companies to conduct several future procurements, through 2022, for nearly 3,000 MW of clean energy generation, including Class I-eligible RECs and Class I-eligible offshore wind, without a substantial increase in the rate of growth for the RES Class I requirements. While these dynamics will not likely make a substantial impact in near-term supply and demand dynamics, these procurements seem likely to push the market even further towards long-term oversupply without a substantial increase in the state's RES requirements. Three developers submitted bids under an offshore wind solicitation. MA DOER and the electric distribution companies are expected to announce a winning bid (or bids) in April 2018. In January 2018, MA DOER and the electric distribution companies selected the proposed Northern Pass Transmission line (Northern Pass) to advance to contract negotiations under another solicitation. Since that selection, Northern Pass has been unable to secure a siting permit from the New Hampshire Site Evaluation Committee to begin construction. As of the Report date, it is unclear how Massachusetts will proceed.

The Massachusetts General Court will likely be discussing renewable energy throughout 2018. It is unclear what shape such conversations will take, but the Massachusetts General Court may discuss legislative proposals dedicated to increasing the annual escalation of the RES (from 1.0% annually to 2.0% or 3.0% annually). Also, the Massachusetts Clean Energy Standard was finalized in late 2017 and could represent an outlet to absorb some of the existing oversupply in the next two to four years.

Connecticut

Connecticut had its first RES compliance year in 2004. Due to variations in its RES eligibility standards compared to the rest of the region (Connecticut does not have a vintage requirement), Connecticut has historically had access to a larger pool of eligible supply. As RES targets increase over time, however, new supply is required to fulfill New England's aggregate obligations, and Connecticut competes for supply with all other states. In 2010, as the regional market began to trend towards REC shortage, the differential between Connecticut's Penalty Payment (Connecticut did not formally adopt the term ACP), which is fixed at $55/MWh, and the other New England states' ACPs (approximately $67.00 in 2016 and escalating each year with the Consumer Price Index) caused REC owners to seek higher value markets outside of Connecticut, leaving obligated entities in Connecticut to rely on alternative compliance mechanisms to fulfill their RES obligations. However, that trend is reversing as supply resulting from several years of policy and development efforts began affecting the market between 2014 and 2016, leading to a convergence in regional REC prices that began at the end of 2014 and has continued through 2017. Total annual Connecticut Class I Penalty Payments are summarized in Table 6.

Pursuant to Public Connecticut Act 13-303, which made several changes to the RES that were described in the 2013 Compliance Report, the CT PURA concluded an investigation into whether RECs generated from resources eligible for Vermont's Sustainably Priced Energy Enterprise Development (SPEED) program and used toward Connecticut Class I RPS compliance constituted "double-counting." CT PURA found that RECs generated to date in Vermont should not be disqualified from use toward Connecticut Class I compliance because the SPEED requirement in effect at the time was not set up to measure compliance until 2017. The risk for future years has been eliminated now that Vermont has adopted a RES, which becomes effective in 2017.

As referenced in the Massachusetts section above, Connecticut has significant legislative authority for long-term contracting and participated in the recent Clean Energy RFP and conducted an RFP for distributed generation between 2 and 20 MW. CT PURA ultimately approved executed contracts for 335.25 MW of capacity. Connecticut additionally recently released an RFP pursuant to its authority under Section 8 of Public Act 13-303 to solicit offshore wind and fuel cell generation. The Connecticut Department of Energy and Environmental Protection is expected to select winning bids in June 2018.

Maine

Maine's first compliance year for its Class I RES[43] requirement was 2008. While Maine's eligibility requirements provided for ample supply to meet the early year RES targets, an uneven distribution of REC ownership and banking has led to a modest amount of ACPs in recent years. Beginning in 2011, the certification of refurbished biomass projects (whose RES eligibility is unique to Maine) caused a sharp decline in ACP collections, as shown in Table 6.

In the 2016 legislative session, the state passed into law LD 1676 - An Act to Establish a Process for the Procurement of Biomass Resources, which allocated $13.4 million in surplus budget money to subsidize two-year electricity contracts with up to 80 MW of biomass plants. In December 2016, awards were announced for the purchase of approximately 80 MW across four facilities. Two of the facilities, owned by Stored Solar, have underperformed relative to their contractual requirements, and the legislature is currently considering a measure that would prevent the Maine Public Utilities Commission (ME PUC) from paying for above-market power from these facilities and would require the ME PUC to solicit contracts for 40 MW of replacement biomass from the next-highest conforming bids (LD 1676). In the 2017 legislative session,

[43] Maine has had an "Existing" RPS requirement since 2000. An abundance of qualifying in-state supply has enabled the state to easily satisfy this requirement each year.

the state passed into law LD 1147 – An Act to Modernize the Renewable Portfolio Standard, which terminates the Class I RES in 2022. Additionally, in the 2018 session, the legislature has been considering a bill that would make any hydro facility relicensed by the Federal Energy Regulatory Commission and smaller than 30 MW eligible as a Class I facility, regardless of vintage (LD 1699).

New Hampshire

New Hampshire's first compliance year for Class I was 2009. Beginning in 2011, New Hampshire experienced dramatic ACPs for Class III, the category designated for biomass resources less than or equal to 25 MW and beginning operation prior to January 1, 2006, because New Hampshire Class III generators are also eligible for Connecticut Class I and elected to sell into the Connecticut market at any time during which the Connecticut Class I REC price is greater than the New Hampshire Class III ACP.

To stem ACP payments, in April 2015 the New Hampshire Public Utilities Commission (NH PUC) ordered the Class III RES target reduced from 8.0% to 0.5% through 2016. The target reverted to 8.0% in 2017. It is also important to note that, like Connecticut, New Hampshire's ACP rate has been well below that of other New England states' ACPs ($55.75 in 2015 for Class I). As in Connecticut, this can leave New Hampshire's load-serving entities to rely on alternative compliance mechanisms to fulfill their RES obligations, as owners of eligible RECs may seek to sell their RECs for higher prices in other states. In 2017, New Hampshire's RES statute was amended, and changes included increasing the ACP for Class III facilities in compliance years 2017, 2018 and 2019 from $45 to $55, provided that the NH PUC does not adjust the ACP using the Consumer Price Index. For compliance years after 2019, ACPs will be set by using the Consumer Price Index to modify the prior year's rate. The passage of this bill is likely to provide support for the biomass industry in New Hampshire, as the increase in the ACP values may lead to higher valuation of the Class III REC prices.

Table 6: Summary of New England States' RES ACP/Penalty Payments

Year	MA ($M)	CT ($M)	ME ($M)	NH [a] ($M)
2005	$19.6	$0.0	NA	NA
2006	$17.8	$3.5	NA	NA
2007	$0.6	$0.1	NA	NA
2008	$0,1	$0.1	$0.7	NA
2009	$0.0	$0.05	$0.3	$0.0
2010	$0.2	$3.0	$0.3	$0.03
2011	$6.6	$22.0	$0.05	$2.2
2012	$16.4	$39.0	$0.002	$3.0
2013	$2.1	$31.0	$0.004	$14.0
2014	$0.4	$7.0	$0.2	$0.9
2015	$0.6	$2.0	$0.003	$1.2
2016	-	-	-	$1.2

[a] Includes Class I and Class I Thermal ACP

Vermont

Vermont's RES has both Total Renewable Energy and Distributed Renewable Generation requirements. The minimum obligation for Total Renewable Energy is 55.0% of each retail electricity provider's electricity sales during the year beginning January 1, 2017, increasing to 75.0% on January 1, 2032; the target will maintain at 75.0% thereafter. It is expected that this obligation can be met with existing resources, particularly in early years. For Distributed Renewable Generation, which more closely resembles

the New Resources requirement of the Rhode Island RES, the minimum obligation is set at 1.0% for the year beginning January 1, 2017, increasing to 10.0% on January 1, 2032 and thereafter.

Summary Projection of Regional RES Targets and Demand

Table 7 provides a summary of RES targets throughout New England. Table 8 provides an estimate of the corresponding gigawatt-hours (GWh) of RES demand through 2026. The forecasted RES obligations are based upon ISO-NE's forecast of Annual Energy Net of Behind the Meter PV and Passive Demand Resources, found in their 2017 CELT Report,[44] and adjusted to exclude an estimate of public or other utilities and load exempted from the states' RES obligations. For example, some transmission losses and both Pascoag Utility District and Block Island Power Company have been removed from the forecast of Rhode Island REC demand.

As can be seen in Figure 10, Massachusetts and Connecticut represent the majority of New England's RES demand through 2026. In 2016, these two states accounted for 45.4% and 34.5% of demand, respectively. Rhode Island represented 5.6% of the region's 2016 New Renewable RES demand (Figure 11). By 2026, the allocation of New Renewable RES demand across the region is projected as follows: Massachusetts – 51.7%; Connecticut – 29.5%; Rhode Island –9.0%; New Hampshire – 7.9%; Vermont – 1.9%; and Maine – 0.0% (Figure 12).

Table 7: Projection of New England States' New RES Demand (%)

Year	MA Class I	CT Class I	RI New [a]	VT DG	ME Class I	NH Class I [b]
2016	11.0%	14.0%	8.0%	0.0%	9.0%	5.6%
2017	12.0%	15.5%	9.5%	1.0%	10.0%	6.8%
2018	13.0%	17.0%	11.0%	1.6%	10.0%	7.5%
2019	14.0%	19.5%	12.5%	2.2%	10.0%	8.2%
2020	15.0%	20.0%	14.0%	2.8%	10.0%	8.9%
2021	16.0%	20.0%	15.5%	3.4%	10.0%	9.6%
2022	17.0%	20.0%	17.0%	4.0%	10.0%	10.3%
2023	18.0%	20.0%	18.5%	4.6%	0.0%	11.0%
2024	19.0%	20.0%	20.0%	5.2%	0.0%	11.9%
2025	20.0%	20.0%	21.5%	5.8%	0.0%	12.8%
2026	21.0%	20.0%	23.0%	6.4%	0.0%	12.8%

[a] After conducting a review pursuant to R.I. Gen. Laws § 39-26-6(d), in Docket 4404, a majority of the PUC voted to delay implementation of the scheduled 1.5% increase of the minimum RES percentage from New Renewable Energy Resources in 2015. This resulted in a delay of all subsequent increases for a period of one year.

[b] Beginning in 2013, a set percentage of the annual New Hampshire Class 1 incremental demand must come from qualifying renewable producing useful thermal energy. The set percentage is 0.4% in 2014, 0.6% in 2015, 1.3% in 2016, increasing annually thereafter by 0.1% from 2017 through 2023. As a result, the renewable electricity obligation is reduced. The net RPS requirement for electric power is shown here.

[44] The ISO-NE 2017 CELT Report is available at: http://www.iso-ne.com/system-planning/system-plans-studies/celt. Additional data can be found in the ISO-NE 2017 Forecast Data File, available at https://www.iso-ne.com/static-assets/documents/2017/05/forecast_data_2017.xlsx.

Table 8: Projection of New England States' New RES Demand (GWh)

Year	MA Class I	CT Class I	RI New	VT DG	ME Class I	NH Class I	Total
2016	5,163	3,922	638	-	1,039	601	11,363
2017	5,784	4,473	758	57	1,145	741	12,958
2018	6,218	4,908	865	92	1,150	824	14,057
2019	6,666	5,537	970	128	1,157	906	15,363
2020	7,050	5,562	1,060	165	1,176	983	15,996
2021	7,405	5,503	1,152	197	1,174	1,060	16,491
2022	7,769	5,459	1,246	228	1,175	1,139	17,015
2023	8,144	5,423	1,339	258	0	1,219	16,383
2024	8,533	5,393	1,433	288	0	1,322	16,969
2025	8,940	5,368	1,530	317	0	1,426	17,580
2026	9,387	5,368	1,636	350	0	1,426	18,167

Figure 10: Forecast of New England States' New or Class I RES Obligations (GWh)

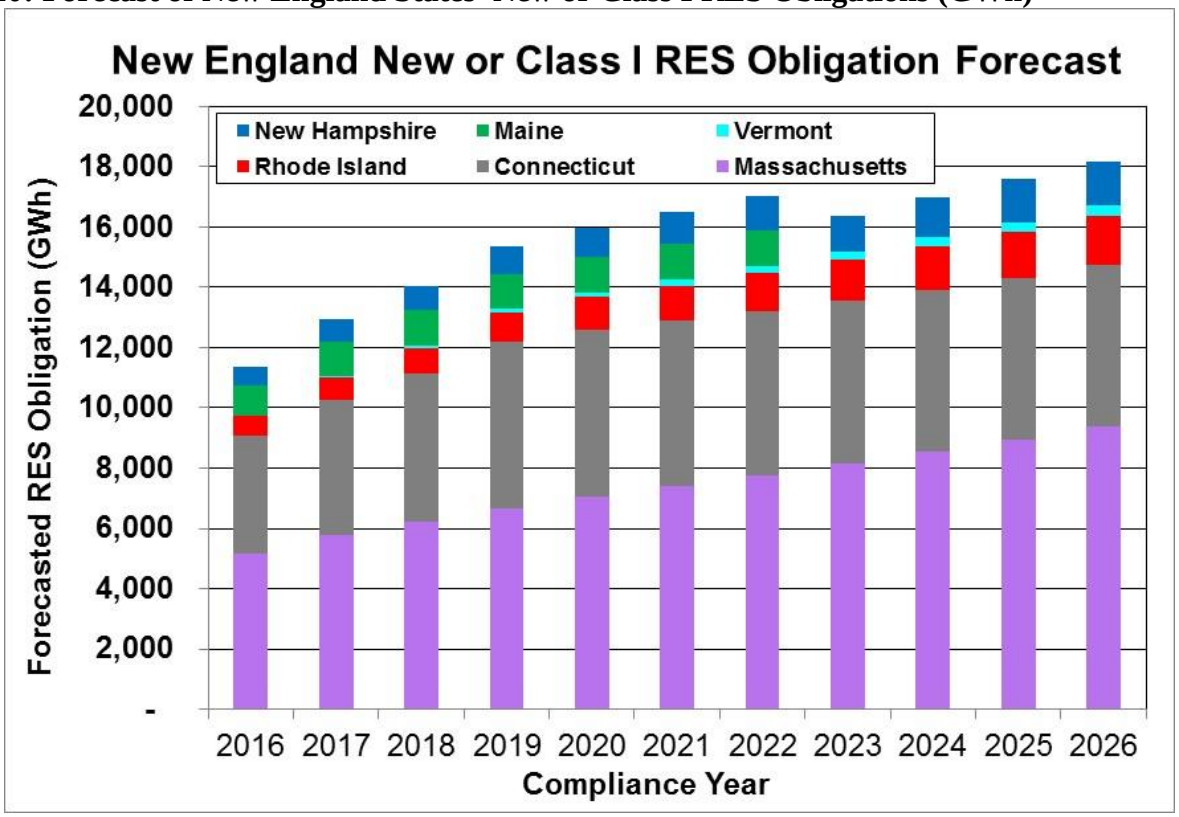


Figure 11: 2016 Composition of Aggregate New or Class I RES Demand in New England

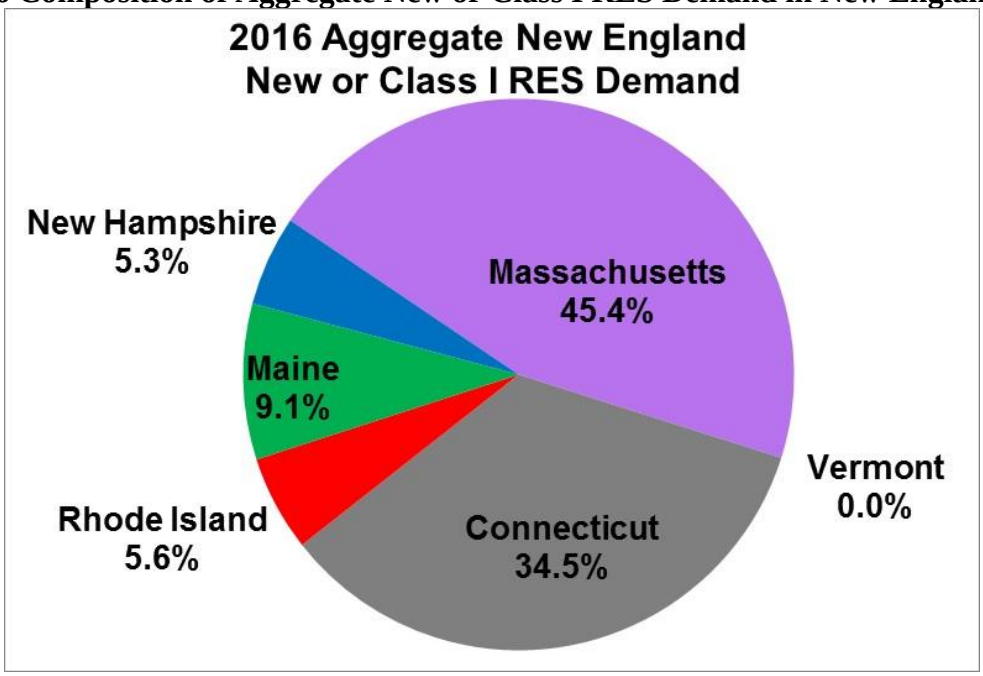
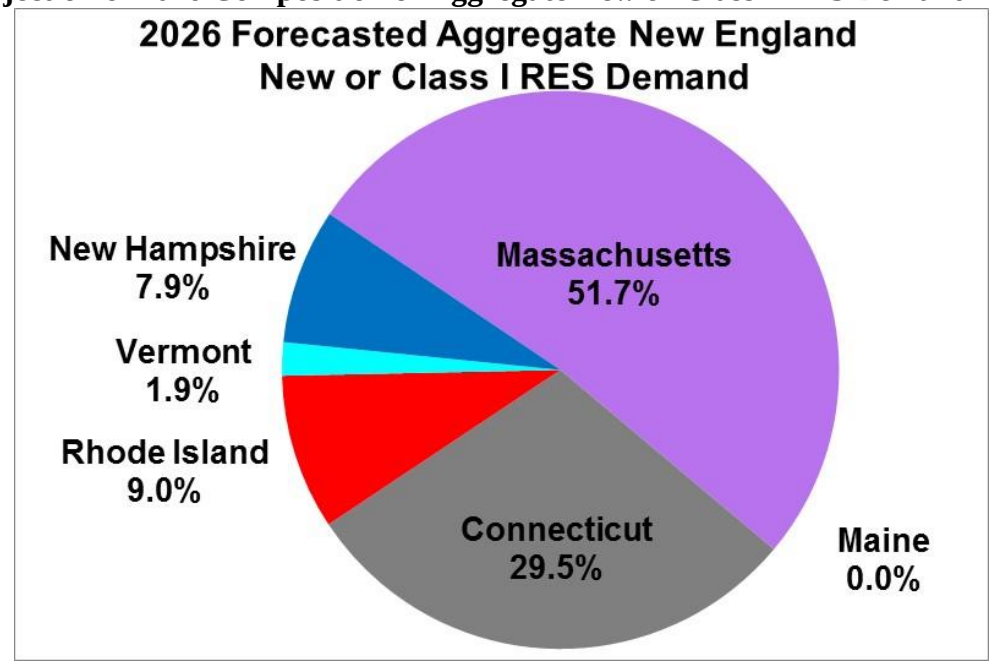


Figure 12: Projection of 2026 Composition of Aggregate New or Class I RES Demand in New England



VII. Continuing and Developing Issues Related to the RES

For a second year, the PUC has chosen to include a new section of the annual Report to describe important issues that the PUC has identified, worked on, and in some cases, resolved, in its role of administering and regulating the RES from the previous year. The issues here are not related only to the compliance year that is the focus of the Report (in this case Compliance Year 2016); rather, these are issues identified since the last Report was published (in this case June 2017).

Non-Compliance

In 2013, the first known instance of an Obligated Entity's failure to comply with its RES Obligation occurred. In that compliance year, a competitive supplier failed to cover its entire obligation, which would have required an additional 10 RECs to be retired, or $653 to be paid in ACPs (Figure 3). Because of this failure, the RES target for Compliance Year 2013 was technically not met in full. Similar non-compliance occurred, with larger non-compliance balances, in 2014 and 2015. Thus, the RES target technically was not met for three consecutive years (compliance was fully met in 2016). After reviewing these cases, the PUC was concerned its authority to ensure compliance at the end of a Compliance Year, when the Obligated Entities' data can be collected, may be limited.

As a result, after raising this concern to the General Assembly, in 2016, the PUC and the Division of Public Utilities and Carriers (Division) supported Rhode Island legislation requiring nonregulated power producers to post financial assurance, subject to forfeiture for failure to comply with consumer protection rules and laws, as well as for non-compliance with RES rules and laws.[45] The Division has promulgated and adopted regulations regarding these new requirements.[46] The PUC is optimistic that these consumer protection requirements will improve the PUC's ability to administer and regulate the RES. The 2016 law will create a funding source to allow ACPs to be transferred to Commerce Rhode Island in the event of noncompliance by Obligated Entities, thus reducing or eliminating shortfalls in meeting the annual RES targets.

Energy Source Disclosure and Voluntary REC purchases

The Renewable Energy Standard Act requires the PUC to "establish and enforce right-to-know regulations requiring any [O]bligated [E]ntity to distribute energy source disclosures to all customers of each electrical energy product offered."[47] The PUC is currently working to improve Obligated Entities' (non-regulated power producers') understanding of this requirement, as well as ensure that energy customers understand what energy products they have purchased.

Beginning in 2015 and continuing through the Report date, the PUC has noted that some non-regulated power producers in the residential market were advertising up to 100% renewable energy products at prices very near or below National Grid's Standard Offer Supply rate, which, for example, was only 10.0% renewable during 2016. Upon receiving the RES compliance filings of these Obligated Entities, the number of voluntary RECs retired by these same suppliers (if any) were vastly insufficient to achieve the high percentage of renewable energy advertised. Furthermore, the Energy Source Disclosure labels that were filed with the PUC by many of these Obligated Entities did not reflect the advertised percentages.

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[45] *See* R.I. Gen. Laws § 39-1-27.1(c)(9), as amended by 2016 P.L 483; 2016 P.L 487.

[46] Rules Applicable to Nonregulated Power Producers, effective March 7, 2018, http://www.ripuc.org/rulesregs/divrules/Rules_Applicate_NPP.pdf and Nonregulated Power Producer Consumer Bill of Rights, effective April 12, 2018, http://www.ripuc.org/rulesregs/divrules/npp%20bill%20of%20rights.pdf.

[47] R.I. Gen. Laws § 39-26-9(a).

The apparent inconsistencies could have several explanations. One possible explanation is that none of these products advertised were actually sold to customers. Another is that the products were sold, but the Obligated Entities are not properly disaggregating these sales from their other energy products. Yet another is that the companies are using other tradable renewable commodities that are generated outside of the NEPOOL GIS renewable market to deliver the energy as advertised, and do not report the use of these commodities to the PUC or on their Energy Source Disclosure label. Regarding this possibility, we note that the Energy Source Disclosure rules require that "NE-GIS certificates shall be used for the calculation of the Energy source disclosure."[48] The PUC continues to investigate this issue, has discussed similar findings with RES administrators in other New England states, and is looking for ways to resolve any market confusion and eliminate any inconsistent and improper reporting by Obligated Entities.

Green Gas

The PUC continues to examine the use of "green" or "renewable" gas in other jurisdictions. This gas could be used to generate renewable electric energy or could be used to generate renewable thermal energy. The current RES rules, however, do not allow such electric generation to be registered as renewable if the gas is transported on the gas distribution system. This is because tracking the delivery and sale of the renewable gas was determined to be too difficult and unreliable when the RES rules were promulgated. Notably, gas utilities in other jurisdictions in the United States, and National Grid in the United Kingdom, offer green gas products. The PUC has asked National Grid for data and information regarding its role in any such programs, and is examining the National Grid's responses.

[48] Rule V.D, Rules Governing Energy Source Disclosure; http://www.ripuc.org/rulesregs/commrules/3642-FinalESD(2-18-05).pdf.

VIII. Conclusion

Based upon the PUC's analysis of regulated utility data; competitive supplier data; and general market trends, the supply of, and demand for, New RECs were in equilibrium for the Compliance Year 2016, with a good possibility that there was an oversupply of New RECs. The evidence for equilibrium or oversupply manifested through the sustained reduced reliance on ACPs for RES compliance as in 2015, coupled with a continued and significant increase in the banking of New RECs.

As new capacity comes on-line and renewable energy imports increase, there is potential for this trend to sustain a mild market surplus for a short period. This is further supported by National Grid's projection that the utility's PPAs with renewable projects and RE Growth Program projects will potentially over supply the company with New RECS beginning in Compliance Year 2017. These conditions are likely what caused the decrease in RES cost to National Grid energy customers (down approximately $4.8 million from Compliance Year 2015). National Grid also projects a decrease in cost of the RES per kWh through Compliance Year 2018. Since National Grid is likely to remain the supplier with the greatest demand for New RECs over the next few compliance years, any oversupply the company has would likely help decrease REC prices in the market. It should be noted, however, that demand for RECs across the region is increasing, as states expand their renewable portfolio targets, and this regional demand could drive up compliance costs in Rhode Island.

The number of facilities and the amount of potential generation certified under the Rhode Island RES also continues to increase. Since the last RES Report, the PUC has approved or conditionally approved sixty-nine renewable energy facilities for RES certification — all with the RES "New" eligibility designation. These generators combined for approximately 316 MW of additional certified New nameplate capacity. As of this Report, 255 qualified renewable energy resource facilities have been approved or conditionally approved under the Rhode Island RES, accounting for over 3,215 MW of renewable energy nameplate capacity certified as New or Existing. This includes more than twelve MW (direct current nameplate) of small-scale solar PV capacity pre-approved by the PUC for National Grid's Small Scale Solar Aggregation.[49] Growth should continue as new policy initiatives supporting the renewable energy industry take hold, and local and regional economic conditions improve. The PUC will continue to examine and report on these trends in future Reports.

The PUC is optimistic that new consumer protection laws that took effect in 2016 and rules in promulgation will help reduce the risk of non-compliance. The PUC is also optimistic that it will make progress on continuing and emerging issues related to the RES.

The success of the state's Renewable Energy Standard and growth in the number of qualified renewable energy facilities since 2007 leaves the PUC cautiously optimistic that the RES and similar programs throughout New England will continue to spur renewable energy development in the region. It is important to note, however, that the continued availability of long-term contracts – for both large-scale and distributed resources – and access to renewable energy financing are important to sustaining regional RPS success. Based on recent policies established and revised within Rhode Island, the State remains in a good position to support local and regional renewable energy resource growth. These policies include long-term contracting statutes, the Renewable Energy Growth program, and cooperative long-term contracting initiatives between Massachusetts, Connecticut, and Rhode Island.

[49] The PUC recently pre-approved increasing the solar PV capacity of this project to 140 MW. At the time of this Report, the actual capacity is approximately 16.1 MW, aggregated from 2,373 small solar facilities.

The PUC regards Compliance Year 2016 a success and the resources available in the marketplace as sufficient to meet RES demand. In the coming year, the PUC will continue to monitor the regional renewable energy marketplace and the State's continued ability to achieve its established targets in a just and reasonable manner.

Appendix 1: Alternative Compliance Payments

Section 7.3 of the Rhode Island Rules and Regulations Implementing a Renewable Energy Standard (RES Rules) permits Obligated Entities to meet the RES either through the purchase and retirement of NEPOOL GIS Certificates or through the provision of Alternative compliance payments (ACPs), obtained by making payment to the Rhode Island Commerce Corporation. The Rhode Island Commerce Corporation sets these funds aside in the Renewable Energy Development Fund to support renewable energy development. The ACP rate is the same for both New and Existing obligations.

Section 3.2 of the RES Rules states that ACPs must be made at a rate of $50 per MWh of renewable energy obligation, in 2003 dollars, adjusted annually by the annual change in the United States Bureau of Labor Statistics' Consumer Price Index. Additionally, Section 7.9 of the Rules states that the PUC will publish the ACP rate by January 31 of each Compliance Year. For Compliance Year 2016, the ACP rate was $67.00 per MWh of obligation.

Table A1.1: Historical Rhode Island ACP Rate

Compliance Year	ACP Rate
2007	$57.12
2008	$58.58
2009	$60.92
2010	$60.93
2011	$62.13
2012	$64.02
2013	$65.27
2014	66.16
2015	$67.07
2016	$67.00

Connecticut, Maine, Massachusetts, and New Hampshire all have similar ACP mechanisms. The Table below shows the 2016 ACP rates used by other New England states for the various REC classes defined in each state.

Table A1.2: Regional ACP Rates for Compliance Year 2016

2016 ACP Rates	CT	ME	MA	NH
Class I	$55	$67.00	$66.99	$55.72
Class II	$55	N/A	$27.79	$55.72
Class III	$31	N/A	N/A	$45.00
Class IV	N/A	N/A	N/A	$27.20

Appendix 2: Rhode Island RES 2016 Compliance Summary

Table A2: 2016 Compliance Summary by Obligated Entity [50]

Obligated Entity	Retail Sales (from filing)	RES Obligations (MWh)		NEPOOL GIS Certificates					Alternative Compliance Payments		Banked "New" RECs for Future Compliance
	Load (MWh)	8.0% "New" Obligation	2.0% "Existing" Obligation	"New" RECs	Banked from 2014 or 2015	Total "New" RECs	"Existing" RECs	"New" Applied to Existing	"New" (MWh)	"Existing" (MWh)	RECs Eligible for 2015 or 2016
Distribution Companies											
Narragansett	4,282,268	342,582	85,646	341,189	3,840	345,029	85,646	0	0	0	2,447
Competetive Suppliers											
Agera Energy, LLC											
Ambit Northeast, LLC											
Archer Energy, LLC											
Calpine Energy Solutions, LLC (formerly Noble)											
Clearview (South Jersey Energy ISO 1, LLC)											
ConEdison Solutions (includes load from Excelon Generation for December 2016)											
Constellation Energy Services, Inc.											
Constellation NewEnergy, Inc.											
Devonshire Energy, LLC											
Direct Energy Business, LLC (includes load for Energy America)											
Direct Energy Business Marketing (Hess Energy Marketing)											
EDF Energy Solutions, LLC											
ENGI Resources, LLC											
ENGI Retail, LLC d/b/a Think Energy											
First Point Power (BP Energy Company)											
Gexa Energy, LLC (NextEra)											
Liberty Power Holdings LLC											
Mint Energy, LLC											
Moore Energy, LLC											
North American Power and Gas (BP Energy Company)											
Public Power, LLC											
South Jersey Energy Co. (Halifax American Operating Co. and Emera Energy)											
Town Square Energy, LLC											
TransCanada Power Marketing Ltd.											
Viridian Energy, LLC											
Westerly Hospital Energy Company LLC (Freedom Energy Logistics, LLC)											
XOOM Energy, LLC											
Competitive Supplier Subtotal	3,672,199	293,790	73,457	324,379	23,437	347,816	88,558	473	576	2	54,129
Totals	**7,954,467**	**636,372**	**159,103**	**665,568**	**27,277**	**692,845**	**174,204**	**473**	**576**	**2**	**56,576**

[50] Please note that data for individual competitive suppliers is confidential and not subject to public release. The limited competitive supplier data presented in Appendix 2 is a result of the Commission's confidential treatment of their filings. Thus, competitive supplier information within this Report is only presented in a summarized fashion to avoid the potential identification of proprietary business activities.

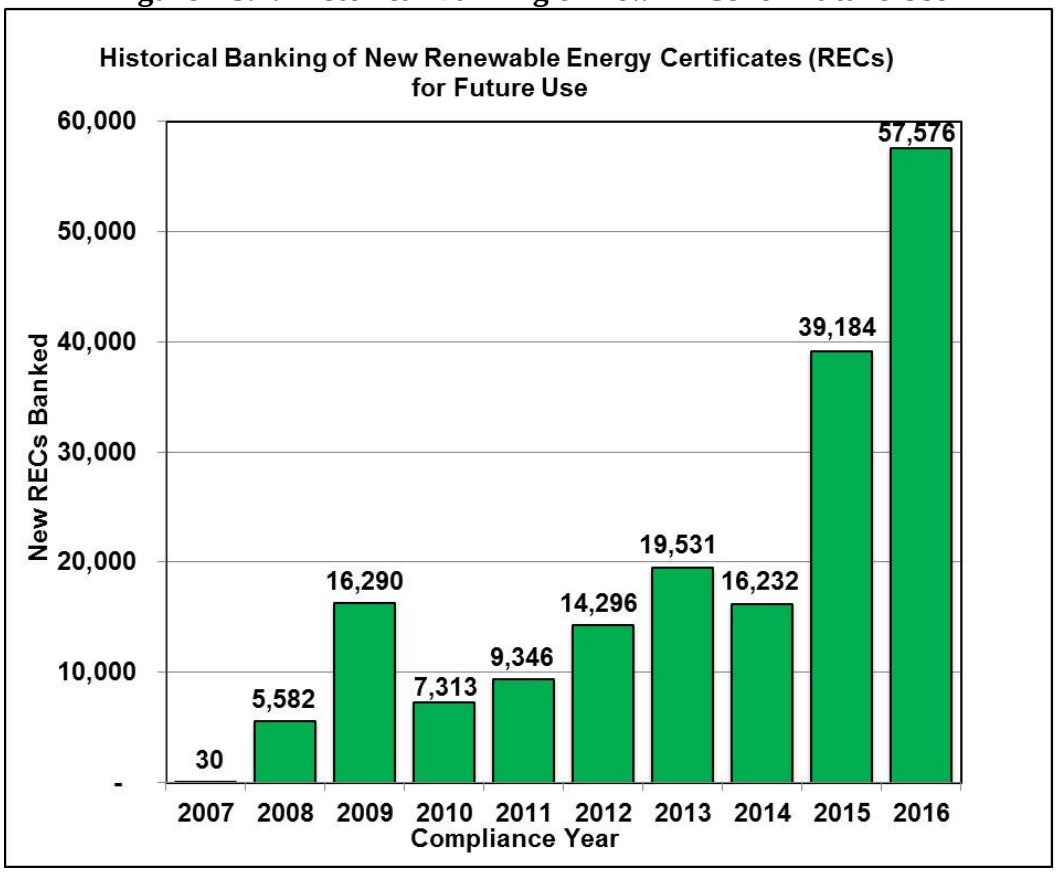
Appendix 3: Historical Use of ACPs and Banking

The charts below provide additional detail on the breakdown of New and Existing RECs purchased by Rhode Island's Obligated Entities for the period 2007-2016.

Table A3.1: Historic Utilization of Alternative Compliance Payments (ACPs)

	New		Existing		Total	
	MWh	$	MWh	$	MWh	$
2007	3,563	203,519	227	12,966	**3,790**	**216,485**
2008	295	17,281	77	4,511	**372**	**21,792**
2009	1	61	1	61	**2**	**122**
2010	192	11,699	166	10,114	**358**	**21,813**
2011	84,402	5,243,896	3	186	**84,405**	**5,244,083**
2012	35,195	2,253,184	2	128	**35,197**	**2,253,312**
2013	803	52,412	61	3,981	**864**	**56,393**
2014	732	48,429	4	265	**736**	**48,694**
2015	18	1,207	9	604	**27**	**1,811**
2016	576	38,592	2	134	**578**	**38,726**

Figure A3.1: Historical Banking of New RECs for Future Use



Appendix 4: Voluntary Clean Energy Programs

As a competitive retail electricity market, Rhode Island provides load serving entities with the opportunity to offer customized electric supply options to both their existing and prospective retail customers. One example of such an offer is for the voluntary purchase of renewable energy resources above and beyond the State's minimum RES requirements. Collectively, the offers of such products are known as voluntary clean energy programs or as the voluntary green power market.[51] National Grid's "GreenUp" program is just one example.

For Compliance Year 2016, National Grid reported the purchase of RECs on behalf of end-use customers as part of voluntary clean energy programs. The table below provides a summary of the quantities of voluntary REC purchases made on behalf of customers.

Table A4.1 History of Voluntary REC Purchases on Behalf of Rhode Island Customers

Voluntary New RECs	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Total	**5,350**	**7,480**	**6,642**	**3,750**	**689**	**111**	**513**	**502**	**964**
National Grid	*5,161*	*6,833*	*4,366*	*1,474*	*689*	*111*	*513*	*502*	*964*
All Competitive Suppliers	*189*	*647*	*2,276*	*2,276*	*0*	*0*	*0*	*0*	*0*
Voluntary Existing RECs	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Total	**7,624**	**2,603**	***0***	***0***	***538***	***2,181***	***119***	***718***	***759***
National Grid	*7,624*	*2,603*	*0*	*0*	*338*	*1,181*	*119*	*718*	*759*
All Competitive Suppliers	*0*	*0*	*0*	*0*	*200*	*1,000*	*0*	*0*	*0*

The NEPOOL GIS Certificate, or REC, is the currency used to demonstrate compliance not only with the mandatory RES, but also with voluntary renewable energy transactions. Through the use of GIS Certificates, which are created and transferred exclusively within the NEPOOL GIS, and the annual submission of RES Reports, the PUC ensures that a NEPOOL GIS Certificate used for RES compliance has not also been used to satisfy another obligation in Rhode Island or any other jurisdiction. For example, National Grid administers voluntary renewable energy programs in both Rhode Island and Massachusetts. While voluntary markets represent only a small fraction of NEPOOL GIS Certificates, it is nonetheless important to the integrity of both programs that all certificates are tracked and settled appropriately.

[51] By comparison, the RES is referred to as the "mandatory" or "compliance" renewable energy market.

Appendix 5: Current RES Annual Targets

Table A5: RES Compliance Year Targets for New and Existing Resources

Compliance Year	Total Target percentage	Minimum percentage from New Renewable Energy Resources	Percentage from *either* Existing *or* New Renewable Energy Resources
2007	3.0%	1.0%	2.0%
2008	3.5%	1.5%	2.0%
2009	4.0%	2.0%	2.0%
2010	4.5%	2.5%	2.0%
2011	5.5%	3.5%	2.0%
2012	6.5%	4.5%	2.0%
2013	7.5%	5.5%	2.0%
2014	8.5%	6.5%	2.0%
2015[a]	8.5%	6.5%	2.0%
2016	10.0%	8.0%	2.0%
2017	11.5%	9.5%	2.0%
2018	13.0%	11.0%	2.0%
2019	14.5%	12.5%	2.0%
2020[b]	16.0%	14.0%	2.0%
2021	17.5%	15.5%	2.0%
2022	19.0%	17.0%	2.0%
2023	20.5%	18.5%	2.0%
2024	22.0%	20.0%	2.0%
2025	23.5%	21.5%	2.0%
2026	25.0%	23.0%	2.0%
2027	26.5%	24.5%	2.0%
2028	28.0%	26.0%	2.0%
2029	29.5%	27.5%	2.0%
2030	31.0%	29.0%	2.0%
2031	32.5%	30.5%	2.0%
2032	34.0%	32.0%	2.0%
2033	35.5%	33.5%	2.0%
2034	37.0%	35.0%	2.0%
2035[c]	38.5%	36.5%	2.0%

[a] After conducting a review pursuant to R.I. Gen. Laws Sec. 39-26-6(d) (prior to the 2016 amendment), in Docket No. 4404, the PUC delayed implementation of the scheduled 1.5% increase in 2015. This resulted in a delay of all subsequent increases for a period of one year.

[b] R.I. Gen. Laws § 39-26-4 was amended to extend an annual 1.5% increase from 2020 through 2035.

[c] R.I. Gen. Laws §§ 39-26-1 to 10, as amended, does not explicitly maintain a RES proportion in 2036 and thereafter.