New Hampshire Public Utilities Commission

NEW HAMPSHIRE RENEWABLE ENERGY FUND

ANNUAL REPORT

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Submitted to:

THE LEGISLATIVE OVERSIGHT COMMITTEE

ON ELECTRIC UTILITY RESTRUCTURING

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THE SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

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THE HOUSE SCIENCE, TECHNOLOGY AND ENERGY COMMITTEE

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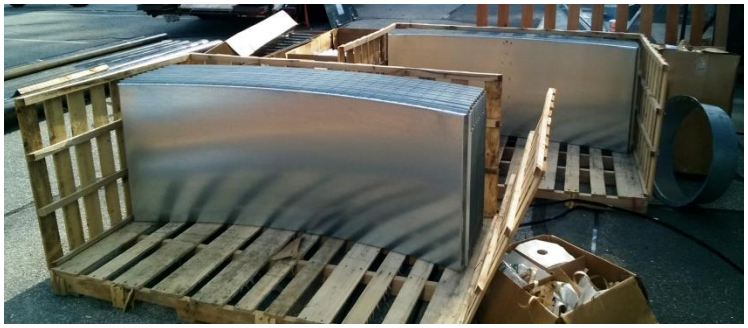
Executive Summary

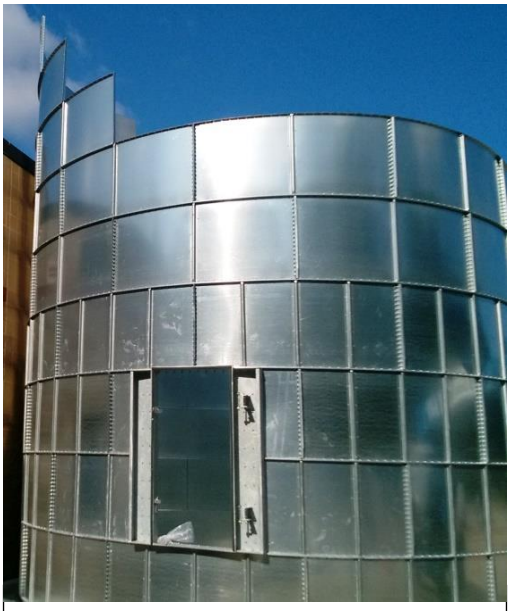
A decade ago, New Hampshire established a renewable energy policy, the Electric Renewable Portfolio Standard (RPS). The New Hampshire General Court has determined that it is in the public interest to stimulate investment in low emission renewable energy generation technologies within the state. The Public Utilities Commission (Commission) is required to make an annual report to the Legislative Oversight Committee on Electric Utility Restructuring, the Senate Energy and Natural Resources Committee and the House Science, Technology and Energy Committee, detailing how the Renewable Energy Fund (REF) is being used. The report that follows is the October 1, 2018, New Hampshire Renewable Energy Fund Annual Report.

Renewable Energy Fund Programs

Competitive Grant Program



As required by RSA 362-F:10, XI, the Commission issued the annual Request for Proposals (RFP) on October 5, 2017, for non-residential renewable energy projects located in New Hampshire and eligible to generate renewable energy certificates (RECs). The Commission received four proposals requesting a total of over one million dollars in grant funds. Proposed projects included a variety of technologies: biomass for schools and county buildings, and hydro-electric facility expansions and redevelopment. Three projects were selected to receive $895,000 in funding, and grant contracts were presented to and approved by the Governor and Executive Council.



The project at John Stark High School began construction of the silo necessary to store precision dried chip fuel for the new biomass boiler.

New Low Moderate Income Solar Program

With the passage of Senate Bill 129 in 2017, and the "New Hampshire Clean Energy Jobs and Opportunity Act of 2017," several amendments to the RPS law were enacted to "promote customer choice and energy independence by eliminating market barriers to solar energy that low-to-moderate income residential customers face, by sustaining and promoting local renewable energy resources and New Hampshire jobs in the

solar and wood products industries, by promoting the stabilization and lowering of future energy costs with more clean energy supply and greater energy diversification, and by further reducing energy costs by reducing New Hampshire's peak demand, including our share of regional electric transmission costs, which recently went up due to our increased share of the regional peak demand." [1]

The legislation specifically included a new funding allocation requirement for a new program intended to reduce market barriers to solar energy participation by low and moderate income residential customers. Working closely with stakeholders and the net metering working group, a new low moderate income (LMI) program was designed and implemented.

For the program's inaugural year, the Commission issued a RFP on March 23, 2018, seeking proposals for community solar photovoltaic (PV) projects providing direct benefits to New Hampshire LMI residential electric customers. The Commission received five proposals requesting a total of $680,675 in grant funds for projects with a combined estimated project value of $1.2 million. Proposed projects included a variety of system design and program models, including: resident-owned community solar, roof-top solar on multi-family income restricted housing, and community solar gardens. Three solar projects that will provide direct benefits to sixty-one LMI families in New Hampshire were selected to receive $404,721 in grant funding. The grant contracts were presented to and approved by the Governor and Executive Council.

Solar Rebate Programs

Even with reduced incentive levels relative to prior fiscal years, demand for solar PV incentives continued in fiscal year 2018 (July 1, 2017 through June 30, 2018). Due to funding limitations and continued high demand, the solar PV rebate programs were closed to new applicants prior to the end of the fiscal year. When closed, the residential program had a waitlist totaling approximately $100,000 in rebate requests and the commercial and industrial (C&I) program had a waitlist totaling approximately $150,000. However, because the construction cycle for large C&I projects is, on average, approximately one year and many residential projects were scheduled for summer installation, the REF is carrying forward a balance of reserved and encumbered funds. The expectation is these projects will be built and become operational during the upcoming fiscal year.

Wood Pellet Rebate Programs

The growth and stability of the wood pellet industry in New Hampshire continues to depend, in part, on the wood pellet rebate programs. During fiscal year 2018, the incentive levels of the wood pellet furnace and boiler programs remained at 40% of eligible project costs, up to a maximum $10,000 for residential installations and $65,000 for C&I installations. To encourage larger and more economical wood pellet deliveries, the residential program offers a supplemental rebate adder of $100 per ton for fuel storage systems larger than the three ton minimum requirement, up to a maximum of $500. The C&I program offers additional incentives for the

[1] Senate Bill 129 (2017), http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2017&id=957&txtFormat=pdf&v=current

installation of a thermal storage tank and/or production meter to track thermal generation for REC certification.

As a result of funding limitations, the pellet rebate programs were also closed to new applicants prior to the end of the fiscal year. When closed, the residential program had a waitlist totaling approximately $80,000 in rebate requests and the C&I program had a waitlist totaling approximately $20,000.

State Building Project

Through a grant provided from the REF, the Department of Administrative Services installed a solar PV system at the New Hampshire Correctional Facility for Women. The 100 kilowatt (kW AC) PV system located on the main building generates renewable electricity for the new correctional facility. The system is expected to generate approximately 10% of the building's annual electricity usage. Since its initial date of operation (May 15, 2018), the PV system has generated over 63 megawatt-hours (MWh) of electricity; enough electricity to power over 187,500 LED light bulbs for one day. The environmental benefits include saving over 103,365 pounds of carbon dioxide emissions, the equivalent of planting over 1,215 trees.

The renewable attributes of this project will help the state meet its 2020 goal of reducing fossil fuel use in state facilities by 30 percent over 2005 levels.

Solar PV system on the roof of the new Correctional Facility for Women in Concord, New Hampshire

Sustainable Energy Division Non-Program Updates

Amendments to Puc 2500 Administrative Rules Relative to the RPS

In 2016, the RPS law, RSA 362-F, was amended through the passage of Senate Bill 386[2] to include useful thermal energy from the production of biodiesel fuel sold into the thermal energy market as an eligible source for RPS compliance. The renewable energy certificates (RECs) associated with the production of biodiesel fuel by any facility located in New Hampshire may be used to meet no more than one-eighth of an electricity provider's non-thermal Class I requirement in any given year, provided that all applicable air emission and water discharge standards are met by the biodiesel production facility. The biodiesel production facility must document the sale

[2] Senate Bill 386 (2016), http://gencourt.state.nh.us/bill_Status/billText.aspx?sy=2016&id=1135&txtFormat=pdf&v=current

of the biodiesel fuel into the thermal energy market and provide documentation of end-user efficiency rating, or, where such documentation is not practicable, assume the average end-user efficiency rating by customer class.

The Commission opened a rulemaking proceeding, Docket DRM 16-829, to consider potential amendments of the Commission's rules relative to the RPS (Puc 2500 Administrative Rules). Commission Staff convened several technical sessions to solicit stakeholder input regarding potential amendments to the rules for the inclusion of the production of biodiesel and changes relative to the requirements for independent monitors and aggregators, and miscellaneous revisions necessitated by other legislative amendments. Staff also worked with the New England Power Pool (NEPOOL) Markets Committee to establish changes necessary to NEPOOL's Generator Information System (GIS) operating rules in order to accommodate the creation, tracking, and sale of biodiesel production RECs. The NEPOOL Markets Committee approved the necessary revisions to the GIS operating rules. On September 12, 2017, draft Puc 2500 rules were filed with the Office of Legislative Services Administrative Rules Division. The amended rules were adopted on February 1, 2018.[3]

Net Energy Metering

Staff continued work with the net energy metering (net metering) pilot and study working groups on the various docket-related initiatives. Sustainable Energy Division Staff worked collaboratively with the Electric Division and working group members to develop the scope and timeline for the Value of Distributed Energy Resources (VDER) study ordered through the "Development of New Alternative Net Metering Tariffs and/or Other Regulatory Mechanisms and Tariffs for Customer-Generators" docket (DE 16-576). On May 9, 2018, Staff filed a final report regarding the proposed VDER study scope and timeline.[4] A public comment hearing on the proposed VDER study scope and timeline was held on June 29, 2018, with an opportunity for written comments to be submitted until July 10, 2018.

Working in conjunction with stakeholders, Staff also conducted technical working group sessions to inform the design and development of utility proposed pilots, including a Non-Wires Alternative Pilot, Real-Time Pricing Pilot, Time-of-Use Pilot Programs, and Low Income Pilot Programs.

2018 Renewable Portfolio Standard Review

Pursuant to RSA 362-F:5, a mandated review of the class requirements and other aspects of the electric renewable portfolio standard program is required in 2018, and again in 2025. The statute outlines nine specific areas for review. Additionally, there are a number of topics to be considered for exploration in their relationship to the RPS. The 2018 review commenced in January, and the Commission hosted three stakeholder sessions in

[3] Puc 2500 Administrative Rules relative to the RPS, http://www.puc.nh.gov/Regulatory/Rules/Puc2500.pdf

[4] Value of Distributed Energy Resources Scope and Timeline Report, http://www.puc.nh.gov/Regulatory/Docketbk/2016/16-576/LETTERS-MEMOS-TARIFFS/16-576_2018-05-09_STAFF_VDER_STUDY_SCOPE_TIMELINE_RPT.PDF

April, May and June. During the first stakeholder session, the Clean Energy States Alliance (CESA) presented a national overview of the current status and trends of RPS, and Staff provided a summary of New Hampshire's RPS, and the process and timeline for the 2018 RPS Review. Subsequent stakeholder sessions focused on specific topics related to the RPS as outlined in statute. An opportunity for written comments to be submitted was provided through September 7, 2018. All presentations, meeting summary notes and written comments are available on the Commission's 2018 RPS Review webpage.[5]

Outlook for Fiscal Year 2019

2018 Renewable Portfolio Standard Review

RSA 362-F:5 directs the Commission to make a report of its 2018 RPS review findings to the General Court by November 1, 2018, including any recommendations relative to the class requirements or other aspects of the RPS program.

Renewable Energy Fund Programs

Alternative Compliance Payments (ACPs) increased compared to the last fiscal year; however, it is expected that funding for the rebate and grant programs will continue to be less than necessary to meet program demand. With limited funding, potential program waitlists, and continued strong demand, Commission staff may propose revisions to current rebate levels and program terms and conditions in 2019. All program changes will be considered as part of a public hearing process with stakeholder involvement.

The fiscal year 2019 grant offering will focus on thermal and hydro projects that create Class I, Class I-Thermal, and Class IV RECs to spur growth in classes in which RECs are expected to be in shorter supply. The Sustainable Energy Division will continue to manage the REF to ensure funds are properly allocated to programs, and applications and deadlines are met to ensure projects move from approval to completion as efficiently and quickly as possible.

Net Energy Metering

Staff will continue work with the net energy metering pilot and study working groups to move the various docket-related initiatives forward. The Sustainable Energy Division will lead the development of the scope and timeline for the Locational Value of Distributed Generation study. In June 2018, the Governor and Executive Council approved a memorandum of understanding (MOU) to allow Staff to work with CESA on a collaborative research effort administered by the National Renewable Energy Laboratory (NREL) and supported by a grant from the U.S. Department of Energy, Solar Energy Technologies Office, to explore new ways solar energy can improve the affordability, reliability, and resiliency of the nation's electric grid. Through this multistate initiative, CESA will assist states in the identification of locations for distributed energy resources that provide benefits to the grid. Under the MOU, NREL will provide guidance and expertise to Commission Staff in its

[5] 2018 RPS Review Webpage, http://www.puc.nh.gov/Sustainable%20Energy/Review%20RPS%20Law.html

development of a New Hampshire specific study of the locational value of distributed generation for consideration in the development of future net metering tariff(s) as required by Commission Order No. 26,124. New Hampshire's contribution consists of a cost-share match of Commission Staff time. More specifically, CESA and the NREL will provide the following:

- Advise Commission Staff in their development of locational value study objectives and scope outline; including review of draft documents and participation in working group session(s);
- Provide education on locational value studies during a working group session; and
- Review and comment on drafts of the Locational Value final report.

Working in conjunction with stakeholders, Commission Staff will also continue to conduct technical working group sessions to inform the design and execution of the VDER and locational value studies, and the design and development of utility proposed pilots, including a Real-Time Pricing Pilot, Time-of-Use Pilot Programs, and Low Income Pilot Programs.

Amendments to Puc 900 Administrative Rules Relative to Net Metering

The Commission will also undertake updating the Puc 900 Administrative Rules, Net Metering for Customer-Owned Renewable Energy Generation Resources of 1,000 Kilowatt or Less, required due to changes to the net metering tariff and legislative amendments impacting net metering and group net metering. Necessary changes include, but are not limited to:

- Eliminating the 100 MW net metering cap;
- Making revisions necessitated by the alternative net metering tariff;
- Eliminating the requirement for group hosts and members to take default service; and
- Reducing in the administrative requirements related to group net metering.

Amendments to Puc 2500 Administrative Rules Relative to the RPS

In 2018, the Renewable Portfolio Standard law was amended through the passage of Senate Bill 577[6] (SB 577) to include useful thermal energy from methane gas as an eligible source for RPS compliance. The Commission will amend the Puc 2500 rules to establish procedures for the metering, verification, and reporting of useful thermal energy output from methane gas.

House Bill 225[7] (HB 225) modifies the requirements for RPS annual reports by providers of electricity concerning the RPS and the disclosure compliance information by the Commission. The Commission will amend the Puc 2500 rules to establish new or revised reporting requirements. Finally, the Commission will submit requests to the administrator of the NEPOOL GIS that are necessary to implement HB 225 no later than April 1, 2019.

[6] Senate Bill 577, http://gencourt.state.nh.us/bill_status/Results.aspx?q=1&txtbillnumber=sb577&txtsessionyear=2018
[7] House Bill 225, http://gencourt.state.nh.us/bill_status/Results.aspx?q=1&txtbillnumber=hb225&txtsessionyear=2018

Overview of New Hampshire's Renewable Portfolio Standard Policy

New Hampshire's Renewable Portfolio Standard statute establishes the renewable energy policy for the State. Common renewable energy sources are solar, wind, hydropower, biomass, and geothermal. These energy sources provide a sustainable and affordable power supply. Renewable energy enables New Hampshire municipalities, schools, businesses, and residents to realize economic and energy security benefits. Renewable energy generation technologies provide fuel diversity to the state and the New England generation supply through the use of renewable fuels sourced locally, lowering regional dependence on fossil fuels. Renewable resources also have the potential to lower and stabilize future energy costs by reducing exposure to rising and volatile fossil fuel prices. Use of local and renewable fuels also allows more energy dollars to be retained in the state rather than being spent on imported fuels. In addition, utilizing renewable technologies can help reduce the amount of greenhouse gases, nitrogen oxides, and particulate matter emissions generated in the state, which helps improve air quality and public health.

The RPS statute established four classes of renewable energy resources (summarized in the box to the right). Electricity providers must obtain RECs for each of the four classes as a set percentage of their retail electric load. One REC represents one megawatt-hour of electricity or the equivalent amount of thermal energy (3,412,000 Btu), generated from a renewable source.

RECs are generated by certified renewable energy facilities and sold into a regional market. Renewable energy facilities must apply for New

New Hampshire RPS Class Definitions*

Class I - New Renewable Energy. Sources producing electricity or "useful thermal energy" (i.e., Class I Thermal) generated by any of the following resources, provided the generator began operation after January 1, 2006, except as noted below:

- Wind energy;
- Hydrogen derived from biomass fuels or methane gas;
- Ocean thermal, wave, current, or tidal energy;
- Methane gas;
- Eligible biomass;
- Class II solar electric energy not used to satisfy the minimum Class II obligation;
- The incremental new production of electricity in any year from an eligible biomass, eligible methane source, or hydroelectric generating facility of any capacity, over its historical generation baseline;
- The production of electricity from Class III or IV sources that have been restored through significant investment.

Class I Thermal - Useful Thermal Energy. Class I Thermal resources must be used to meet a set percentage of the total Class I RPS obligation as outlined in RSA 362-F:3. Eligible Class I Thermal sources include the following technologies that began operation after January 1, 2013 except as noted below:

- Geothermal systems that began producing thermal energy;
- Solar-thermal systems that produce useful thermal energy only;
- Eligible biomass generators that meet emissions criteria;
- The production of useful thermal energy from certain biomass thermal sources which began operation prior to January 1, 2013 and have been upgraded or replaced through significant investment;
- Methane gas if the output is in the form of useful thermal energy.

Class II - New Solar. Solar technologies; provided the electric generator began operation after January 1, 2006.

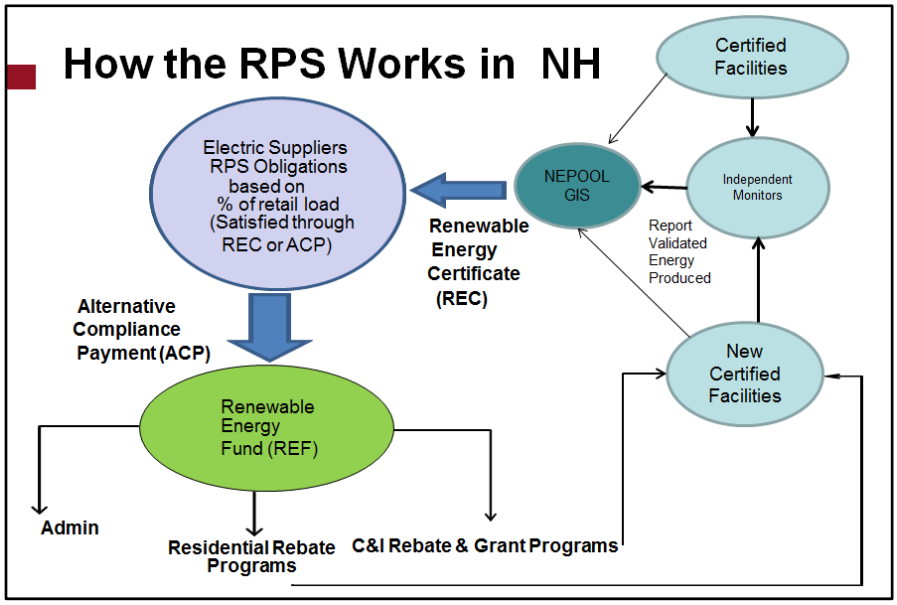
Class III - Existing Biomass/Methane. Eligible biomass systems of 25 megawatts (MW) or less, and methane gas, provided the generator began operation before January 1, 2006. Methane gas sources which began operation prior to 2006 and exceed an aggregated gross nameplate capacity of 10 MW at any single landfill site are not eligible.

Class IV - Existing Small Hydroelectric. Hydro facilities up to 5 MW, provided the generator began operation before January 1, 2006, and complies with certain environmental protection criteria; and hydroelectric facilities up to 1 MW that are interconnected to the distribution grid in New Hampshire.

*refer to RSA 362-F for detailed Class definitions

Hampshire RPS eligibility. Facilities submit to the Commission a class-specific application for review and approval. The Sustainable Energy Division certifies the systems as eligible under state statutes and rules (Puc 2500 rules) to generate RECs. Per the Puc 2500 rules, facility owners must purchase and install a revenue quality meter to record the gross output and retain the services of an independent monitor to be eligible for certification. All classes of applications that are considered complete must be approved or rejected within 45 days of receipt.

Upon certification, Commission Staff notifies the New England Power Pool Generation Information System (NEPOOL GIS), which issues and tracks RECs for the region. Gross output from certified customer-sited facilities is verified and reported by independent monitors to NEPOOL GIS. On a quarterly basis, NEPOOL GIS issues RECs for reported generation and administers a two-month trading period. RECs generated in one state may be sold in another provided the facility is certified in that state as well.



If electricity providers cannot, or choose not to, purchase or obtain sufficient RECs to comply with the RPS law, they must make alternative compliance payments (ACPs) to the REF. On an annual basis, the Commission reviews electricity providers' compliance with the previous calendar year's RPS requirements. Electricity providers include New Hampshire's competitive electricity providers and electric distribution utilities (Eversource, Liberty Utilities, Unitil Energy Systems, Inc. and the New Hampshire Electric Cooperative).

The REF is a dedicated, non-lapsing fund, the purpose of which is to support electrical and thermal renewable energy initiatives. ACPs are the only source of funding for the REF and fluctuate from year to year, depending on the price and availability of RECs in the regional market.

The Commission's Sustainable Energy Division administers three residential rebate programs, two commercial and industrial rebate programs and two competitive grant programs with funding from the REF. Projects installed with incentives from the REF are eligible facilities which may become certified, thereby generating additional RECs to trade in the NEPOOL GIS market. Incentivizing the installation of new renewable facilities enables New Hampshire to continue to meet its increasing RPS goals.

Fiscal Year 2018: Legislative Summary

In 2018, the RPS and group net metering laws were amended through the passage of the legislative amendments summarized below.

Renewable Portfolio Standard Legislation

Senate Bill 577 makes useful thermal energy from methane gas an eligible source for RPS compliance. To be eligible the facility must have begun operation after January 1, 2013. The RECs associated with the production thermal energy for an end-use customer in New Hampshire will be issued as Class I Thermal RECs.

House Bill 1550[8] requires providers of electricity to include with customers' December bills the Commission's estimated cost on a per kilowatt-hour basis for compliance with the RPS for the prior compliance year. Each customer's bill must identify the cost as an estimate and provide a link to information about the RPS, including its benefits, on the Commission's website.

House Bill 225 modifies the requirements for RPS annual reports by providers of electricity and the disclosure of RPS compliance information by the Commission. Beginning October 1, 2019, the Commission must disclose the information collected under electric supplier's annual compliance reports as public information in the Commission's Renewable Energy Fund annual report. No information may be disclosed to the public that is confidential as defined by Commission or NEPOOL GIS rules. In addition, the Commission must provide as part of the annual REF report RPS compliance costs and average electric rate impact; renewable energy certificate versus alternative compliance payments comparison; and alternative compliance payments by class and provider of electricity. The report must also include the number of renewable energy certificates that were purchased during the prior compliance year by class. Finally, the Commission must complete the rulemaking process and submit requests to the administrator of the NEPOOL GIS that are necessary to implement HB 225 no later than April 1, 2019.

Group Net Metering Legislation

Senate Bill 321[9] removes the requirement that net metering group host customers (i.e., hosts and members) be default service customers. However, the host and the members must still be located in the same distribution utility service territory.

Senate Bill 367[10] removes the review by the Commission of net metering group host agreements, and eliminates certain reporting and payment adjustments for small residential group host systems with an interconnected capacity less than 15 kilowatts.

[8] House Bill 1550, http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2018&id=1050&txtFormat=pdf&v=current
[9] Senate Bill 321, http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2018&id=1882&txtFormat=pdf&v=current
[10] Senate Bill 367, http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2018&id=1877&txtFormat=pdf&v=current

RPS Revenues and Costs

Revenues

Alternative compliance payments are the only source of revenue for the REF. One ACP is paid for each megawatt hour of compliance obligation not met by purchasing a REC. The ACP rate serves as a ceiling price in the market for RECs. Generally, REC prices trading at or near the ACP rate indicate an under supply of RECs in the market, whereas RECs trading well below the ACP rate indicate an ample supply of RECs in the market. ACP rates are defined by RPS Class and are adjusted annually. In accordance with RSA 362-F:10, III (a), the ACP rate for Class IV is adjusted by the Consumer Price Index (CPI) and for Classes I and II by one-half of the CPI. In accordance with RSA 362-F:10, III (b), the Class III ACP is $45 for 2015 and 2016, and $55 for 2017, 2018 and 2019.

Basic Class Definitions

Class I (Non-Thermal)
- New Renewable
- Production of Biodiesel

Class I Thermal
- New Useful Thermal

Class II
- New Solar

Class III
- Existing Biomass
- Existing Methane

Class IV
- Existing Hydro

(Refer to RSA 362-F for detailed Class definitions)

Table 1: Inflation Adjusted Alternative Compliance Payment Rates ($ per Megawatt Hour)

Inflation Adjusted Alternative Compliance Payment Rate ($ per Megawatt Hour)							
	2012	2013	2014	2015	2016	2017	2018
Class I (Non-thermal)	$ 64.02	$ 55.00	$ 55.37	$ 55.75	$ 55.72	$ 56.02	$ 56.54
Class I Thermal		$ 25.00	$ 25.17	$ 25.34	$ 25.33	$ 25.46	$ 25.69
Class II	$ 168.13	$ 55.00	$ 55.37	$ 55.75	$ 55.72	$ 56.02	$ 56.54
Class III	$ 31.39	$ 31.50	$ 31.93	$ 45.00	$ 45.00	$ 55.00	$ 55.00
Class IV	$ 31.39	$ 26.50	$ 26.86	$ 27.23	$ 27.20	$ 27.49	$ 28.00

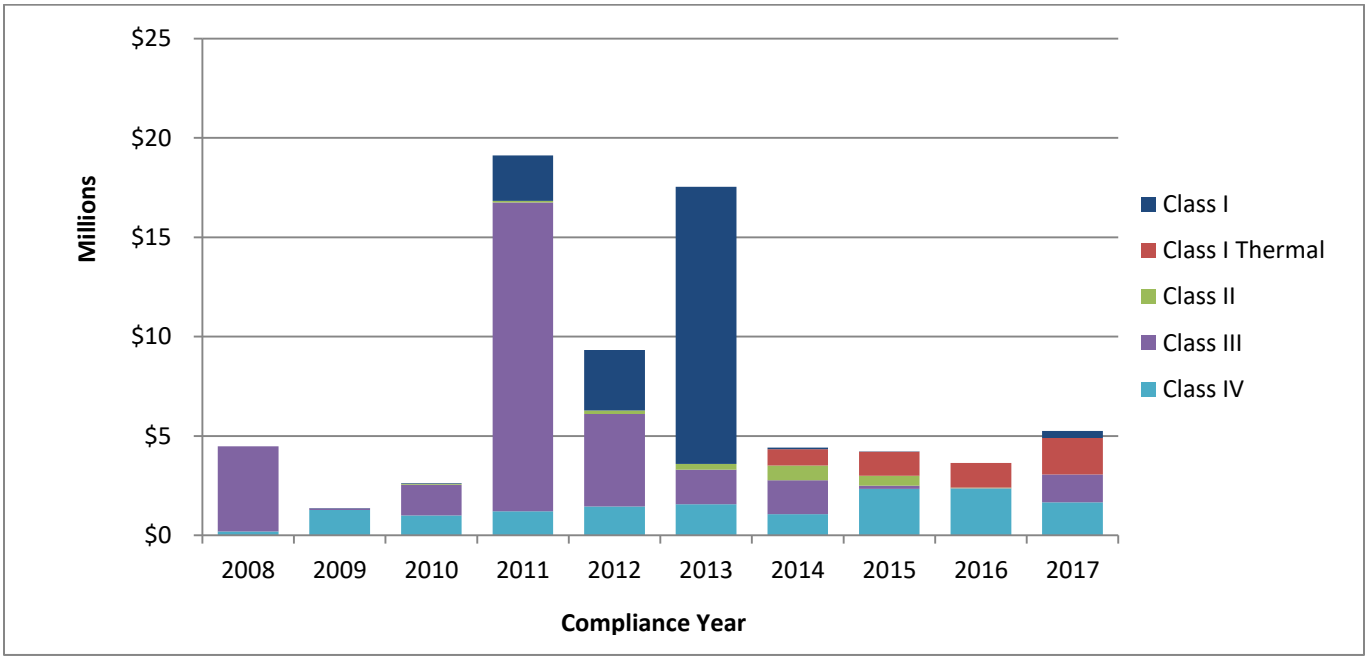
Alternative compliance payments from electricity providers are made annually by July 1, for the prior calendar year. For example, ACPs for calendar year 2017 (CY17) were to be paid by July 1, 2018. Entities paying ACPs include New Hampshire's electric utilities as well as competitive electric power suppliers. As designed, the ACP funding to the REF is expected to, and does, fluctuate over time. CY17 saw an increase in total ACPs. ACP revenues received in 2018 (for compliance year 2017) were $5,258,420 as compared to the prior year's revenue of $3,633,342. This increase was relatively small given the overall compliance obligation was 8.50% for CY 2016 and 17.6% for CY17. The increased obligation was due to the annual, legislatively defined, increases for Class I and Class I Thermal, and due to the Commission not reducing the Class III obligation.

Table 2: ACP Revenues by Compliance Year

Compliance Year[11]	ACP Revenue	Total RPS Obligation
2008	$ 4,483,917	4.00%
2009	$ 1,348,294	6.00%
2010	$ 2,625,499	7.54%
2011	$ 19,121,853	9.58%
2012	$ 9,323,198	5.55%
2013	$ 17,458,196	5.80%
2014	$ 4,406,804	7.20%
2015	$ 4,224,339	8.30%
2016	$ 3,633,342	8.50%
2017	**$ 5,258,420**	**17.60%**

ACP Revenues by Class, and Trend by Compliance Year

The chart below illustrates the fluctuating nature of the annual ACP revenue while providing a year-to-year comparison of ACP revenues by RPS Class. The next section provides a discussion of possible market conditions contributing to the 2017 ACP revenues by class.



[11] The RPS Compliance Year is a calendar year (i.e., January 1 through December 31). ACPs are due by July 1 for the previous compliance (calendar) year.

Revenues by RPS Class

Class I & Class I Thermal: New Renewable Energy Production of Electricity or Useful Thermal ACPs

ACPs for Class I increased from zero for compliance year 2016 (CY16) to $309,735 for CY17, with an increased obligation requirement of 6.8% versus 5.6% for CY16.

In addition, pursuant to RSA 362-F:6, II-a and Puc 2503.04(d), every year the Commission computes an estimate of a percentage credit an electricity provider may take for Class I based on the capacity of customer-sited sources that are net metered but are not certified to create Class I RECs. For CY17, the credit for Class I was 0.0052% (total obligation 6.8%). At the time of its RPS compliance filing, an electricity provider may claim this Class I REC credit in an amount equal to the percentage credit for Class I times the total electricity (MWh) provided to end-use customers by that electricity provider.

ACPs for the Class I Thermal were $1,870,903 for CY17 compared to $1,237,644 for CY16. The obligation for Class I Thermal increased to 1.0% from 0.6%. In CY16 approximately 15,000 RECs were purchased to meet compliance obligations. In CY17, over 30,000 RECs were purchased to meet compliance obligations. This increase in available RECs indicates that the funds invested in rebate and grant programs incentivize thermal projects is increasing the supply of RECs.

Class II: New Solar Electric ACPs

ACPs for Class II remained at zero due to a credit for Class II net metering, similar to that described above for Class I, which exceeded the Class II obligation. For CY17, the credit for Class II was 0.4026% (total obligation 0.30%), which an electricity provider may claim at the time of its RPS compliance filing.

Class III: Existing Biomass/Methane Electric Technologies (Prior to January 1, 2006) ACPs

During previous years, New Hampshire facilities producing Class III RECs were able to sell the RECs they produced at a higher price in the Class I REC markets in Connecticut and Massachusetts than in the Class III REC market in New Hampshire. For compliance years 2013, 2014, 2015, and 2016, the Commission modified the Class III obligations reducing the requirement from 8.0% to at 0.5% of an electricity provider's retail sales. This action prevented a substantial shortfall of Class III RECs and significantly higher ACPs, the cost of which is ultimately borne by New Hampshire ratepayers.

Due to changed market conditions resulting from policy changes in other states, the Commission did not reduce the Class III requirement for compliance year 2017. With a Class III obligation equal to 8% in CY17, ACP revenue was $1,358,225 compared to $24,480 for CY16 (obligation equal to 0.5%).

Class IV: Existing Small Hydroelectric (Prior to January 1, 2006) ACPs

Class IV ACPs decreased from $2,348,039 (CY16) to $1,719,554 (CY17).

Table 3 lists the distribution utilities and other electricity suppliers that filed compliance reports for calendar (compliance) year 2017, documents each company's total ACPs, and further breaks down these payments by renewable energy class. Where no revenue appears for a class, it is because the company obtained RECs to satisfy its obligation for that class. Totals may not sum due to rounding.

Table 3: ACP Revenue by Supplier and RPS Class for Compliance Year 2017

2017	Alternative Compliance Payments (ACPs)					
Company	**Class I**	**Class I Thermal**	**Class II**	**Class III**	**Class IV**	**Total**
Liberty Utilities	$ -	$ 15,531	$ -	$ -	$ -	$ 15,531
New Hampshire Electric Cooperative	$ -	$ -	$ -	$ -	$ -	$ -
Eversource Energy	$ -	$ 470,577	$ -	$ -	$ 115,843	$ 586,420
Unitil Energy Systems, Inc.	$ -	$ -	$ -	$ -	$ 2,062	$ 2,062
Distribution Companies Subtotal	**$ -**	**$ 486,108**	**$ -**	**$ -**	**$ 117,905**	**$ 604,012**
Agera Energy, LLC	$ -	$ 38,012	$ -	$ -	$ 61,550	$ 99,562
Ambit Energy, L.P.	$ -	$ 11,788	$ -	$ -	$ 19,106	$ 30,894
Calpine	$ -	$ 25,689	$ -	$ -	$ 41,620	$ 67,309
Champion	$ -	$ 229	$ -	$ -	$ -	$ 229
CleanChoice Energy	$ -	$ -	$ -	$ -	$ -	$ -
Clearview Energy	$ -	$ 14,207	$ -	$ 1,045	$ 23,009	$ 38,261
Consolidated Edison Solutions, Inc.	$ -	$ -	$ -	$ -	$ -	$ -
Constellation Energy Services, Inc. (Integrys Energy)	$ -	$ -	$ -	$ -	$ -	$ -
Constellation New Energy, Inc.	$ -	$ 499,041	$ -	$ -	$ 506,888	$ 1,005,930
Devonshire (Fidelty)	$ -	$ -	$ -	$ -	$ -	$ -
Direct Energy Business, LLC	$ -	$ 101,815	$ -	$ -	$ 164,885	$ 266,700
Direct Energy Business Marketing (Hess)	$ -	$ 27,370	$ -	$ -	$ 44,341	$ 71,711
Direct Energy Services, LLC (First Choice Power)	$ -	$ 36,179	$ -	$ -	$ 58,609	$ 94,787
EDF Energy Services, LLC	$ -	$ 4,456	$ -	$ -	$ 137	$ 4,593
Ethical Electric, Inc.	$ -	$ -	$ -	$ -	$ -	$ -
Engie Resources, Inc.	$ -	$ 23,627	$ -	$ -	$ 35,160	$ 58,787
ENH Power	$ -	$ 142,245	$ -	$ -	$ 230,394	$ 372,639
Energy Rewards f/k/a Viridian and Fairpoint Energy, LLC	$ -	$ 16,778	$ -	$ -	$ -	$ 16,778
First Point Power, LLC	$ -	$ 81,166	$ -	$ -	$ 104,297	$ 185,464
Glacial Energy, LLC	$ -	$ -	$ -	$ -	$ -	$ -
Gulf Oil Limited Partnership	$ -	$ -	$ -	$ -	$ -	$ -
Mega Energy of New Hampshire	$ -	$ 3,972	$ -	$ -	$ -	$ 3,972
Mint Energy, LLC	$ -	$ 23,551	$ -	$ 10,945	$ 33,373	$ 67,868
NextEra Energy Services New Hampshire, LLC	$ -	$ 100,567	$ -	$ -	$ 40,988	$ 141,555
Noble Americas Energy Solutions, LLC	$ -	$ -	$ -	$ -	$ -	$ -
Nordic Energy Services	$ -	$ -	$ -	$ -	$ -	$ -
North American Power and Gas, LLC	$ -	$ 82,185	$ -	$ -	$ -	$ 82,185
PNE Energy Supply, LLC (Power New England)	$ -	$ 2,521	$ -	$ -	$ -	$ 2,521
Reliant Energy Northeast, LLC (NRG)	$ -	$ -	$ -	$ -	$ -	$ -
REP Energy, LLC	$ -	$ -	$ -	$ -	$ -	$ -
Smart Energy Holdings, LLC	$ -	$ 2,470	$ -	$ -	$ 3,986	$ 6,456
South Jersey Energy Company	$ -	$ 6,798	$ -	$ -	$ 10,996	$ 17,794
Summer Energy	$ 21,792	$ 1,451	$ -	$ -	$ 2,364	$ 25,607
Texas Retail Energy	$ -	$ 24,238	$ -	$ -	$ 30,459	$ 54,697
Think Energy (Engie Retail, LLC)	$ -	$ 3,233	$ -	$ -	$ 5,223	$ 8,457
Town Square Energy, LLC (Twin Cities Power)	$ -	$ -	$ -	$ -	$ 7,065	$ 7,065
TransCanada Power Marketing, Ltd.	$ 287,943	$ 107,619	$ -	$ 1,346,235	$ 177,201	$ 1,918,998
Xoom Energy New Hampshire, LLC	$ -	$ 3,590	$ -	$ -	$ -	$ 3,590
Competitive Energy Suppliers Subtotal	**$ 309,735**	**$ 1,384,795**	**$ -**	**$ 1,358,225**	**$ 1,601,677**	**$ 4,654,409**
TOTAL	**$ 309,735**	**$ 1,870,903**	**$ -**	**$ 1,358,225**	**$ 1,719,554**	**$ 5,258,420**

RPS Compliance Costs

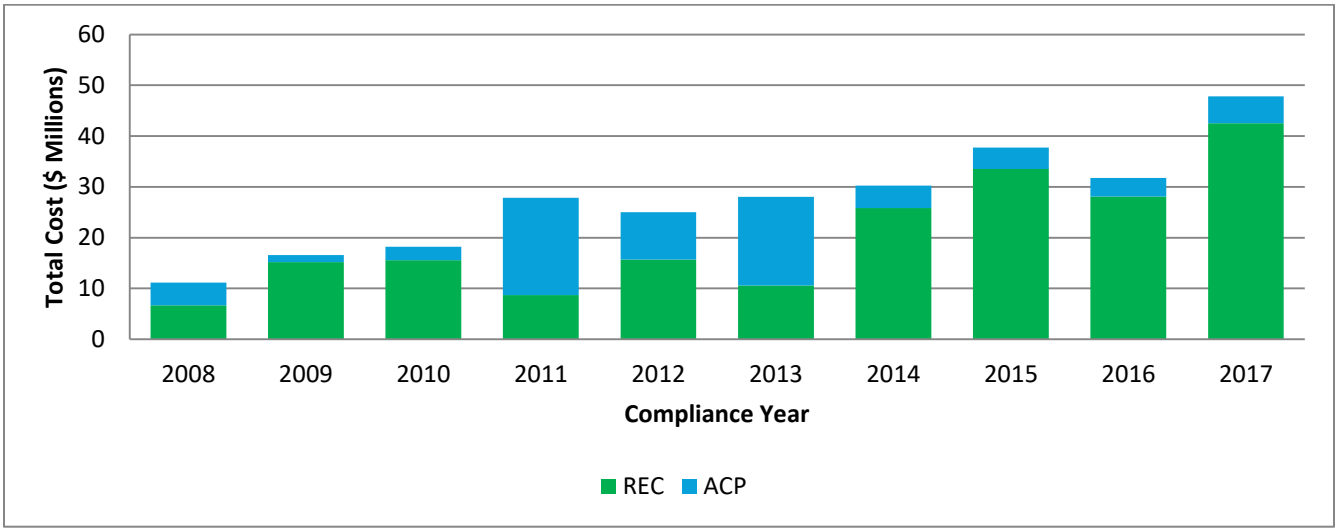
The RPS is a market based policy with RECs being traded through the NEPOOL GIS. NEPOOL GIS issues and tracks certificates for all megawatt-hours (MWh) of generation and load produced in the ISO New England control area, as well as imported MWh from adjacent control areas. Electricity providers comply with RPS requirements by purchasing RECs or making ACPs. Therefore, the total cost of RPS compliance is equal to the cost of RECs plus the ACPs. The average rate impact for 2017 RPS compliance costs is $0.0046 per kWh.

As the charts illustrate, ACPs have generally declined while REC purchases have increased in recent years. Between 2008 and 2017, the annual RPS obligation has increased from 4% to 17.6%.

Table 4: Annual RPS Compliance Costs and Rate Impact

Compliance Year	Total RPS Obligation	Total REC Costs	Total ACP Costs	Total RPS Compliance Cost	Average per kWh Rate Impact
2008	4.00%	$ 6.6	$ 4.5	$ 11.1	$ 0.0011
2009	6.00%	$ 15.2	$ 1.3	$ 16.5	$ 0.0016
2010	7.54%	$ 15.6	$ 2.6	$ 18.2	$ 0.0017
2011	9.58%	$ 8.7	$ 19.1	$ 27.8	$ 0.0026
2012	5.55%	$ 15.7	$ 9.3	$ 25.0	$ 0.0023
2013	5.80%	$ 10.6	$ 17.5	$ 28.1	$ 0.0026
2014	7.20%	$ 25.8	$ 4.4	$ 30.2	$ 0.0028
2015	8.30%	$ 33.5	$ 4.2	$ 37.7	$ 0.0035
2016	8.50%	$ 28.1	$ 3.6	$ 31.7	$ 0.0030
2017	**17.60%**	**$ 42.5**	**$ 5.2**	**$ 47.7**	**$ 0.0046**
Total		$ 202.1	$ 71.7	$ 274.0	

All costs presented in millions and rounded to the hundred thousand.



REC Purchases

In accordance with HB 1550, the annual REF report includes the number of RECs that were purchased during the prior compliance year by RPS class. Table 5 below presents the quantity of RECs purchased during calendar year 2017.

Table 5: RECs Purchased During 2017 by Class

Class I Non-thermal	Class I Thermal	Class II	Class III	Class IV	Total
802,784	30,684	14,405	839,625	93,834	1,779,472

Pursuant to RSA 362-F:7, I, purchased RECs not used for compliance may be banked for up to two years. Banked RECs may be used in future compliance years to meet up to 30% of a provider's RPS requirements for a given class obligation.

Administrative Costs

Administrative costs are estimated during the state biennium budget process and include, for example, personnel, consultants, and membership dues. REF administrative expenditures cover the cost of managing the various rebate and grant programs, monitoring and validating facility and supplier compliance with the RPS, and working on RPS-related dockets such as Puc 2500 rules, Puc 900 rules, net metering, and REF program revisions. Administrative budgeted and actual costs since REF inception are provided in Table 6.

Table 6: Budgeted and Actual Administrative Costs by Fiscal Year

Fiscal Year	Biennium Budget	Actual	Delta
2016	$ 790,136	$ 612,511	$ 177,625
2017	$ 847,325	$ 633,965	$ 213,360
2018	$ 894,835	$ 683,341	$ 211,494
2019	$ 916,102		

Rebate and Grant Program Summaries and Results

Pursuant to RSA 362-F:10, the Commission administers three residential renewable energy rebate programs, a low moderate income program, two commercial and industrial renewable energy rebate programs, and a competitive grant program for non-residential renewable energy projects. For all rebate programs and grants, projects funded must be located in New Hampshire.

Renewable Energy Fund Rebate Programs

Rebate programs funded by the REF are described in Table 7.

Table 7: Summary of Renewable Energy Fund Rebate Programs

Rebate Program	Eligible Technologies and Capacity Limits	Incentive Levels (Rebate)	Authority, Date of Inception
Residential Electrical Renewable Energy Rebate (PV and Wind)	Solar electric (PV) and wind turbines systems	$0.20 per watt up to a maximum of $1,000, or 30% of the total cost of the facility, whichever is less (*Began January 2, 2018*)	RSA 362-F:10, V July 2009 *Program was modified in November 2017 per Order No. 26,075 in Docket DE 15-302.*
Residential Solar Water Heating Rebate	Solar water heating systems with annual production capacity of 5.5 MMBtus or greater	$1,500, $1,700, or $1,900 depending on system capacity	RSA 362-F:10, VIII April 2010
Residential Wood Pellet Boiler/Furnace Rebate	High efficiency, bulk-fed wood pellet central furnaces/boilers	40% of the eligible system cost and installation, up to a maximum rebate of $10,000. The program also provides a supplemental adder of $100 per ton for fuel storage systems larger than the three ton minimum requirement, up to a maximum of $500. (*Began July 9, 2016*)	RSA 362-F:10, VIII April 2010 *Program was modified in July 2016 per Order No. 25, 921 in Docket DE 16-614.*

Rebate Program	Eligible Technologies and Capacity Limits	Incentive Levels (Rebate)	Authority, Date of Inception
Commercial & Industrial (C&I) Expanded Solar Technologies Rebate	PV systems less than or equal to 500 kW (AC), and solar thermal systems less than or equal to 100 kW (AC) or thermal equivalent	Incentive levels for PV systems are as follows: •$0.40/watt (lower of AC and DC) for new solar electric facilities •Expansions to existing solar systems are not eligible. Incentive levels for solar thermal systems are as follows: •$0.12/rated or modeled kBtu/year for new solar thermal facilities fifteen collectors in size or fewer; •$0.07/rated or modeled kBtu/year for new solar thermal facilities greater than fifteen collectors in size; and •Expansions to existing solar systems are not eligible. (*Began March 19, 2018*)	RSA 362-F:10, VIII October 2010 *Program modified and opened on March 8, 2018 through Order DE10-212, Order No. 26,111.*
Commercial and Industrial Wood Pellet Furnace/Boiler Rebate	Non-residential bulk-fuel fed wood pellet boilers and furnaces rated 2.5 million Btus or less	40% of the eligible system cost and installation, up to a maximum rebate of $65,000. The program also provides supplemental adders for storage and metering. (*Began July 9, 2016*)	RSA 362-F:10, VIII December 2013 *Program was modified in July 2016 per Order No. 25,922 in Docket DE 13-298.*

New Hampshire's solar electric market continues to grow. Net metering, the RPS, and REF programs are incentives and drivers for participants in this market. As a result of market conditions, including the continuing decline in the cost of solar technology and installation, available incentives, and increased consumer awareness, both the residential electrical renewable energy rebate program and the commercial and industrial solar rebate program experienced continued demand, and program budgets for both programs were fully committed at the end of the fiscal year. The waitlist totaled approximately $100,000 in the residential solar program and almost $150,000 in the commercial and industrial solar rebate program. Specific program results for the REF rebate programs in FY18 are summarized in Table 8.

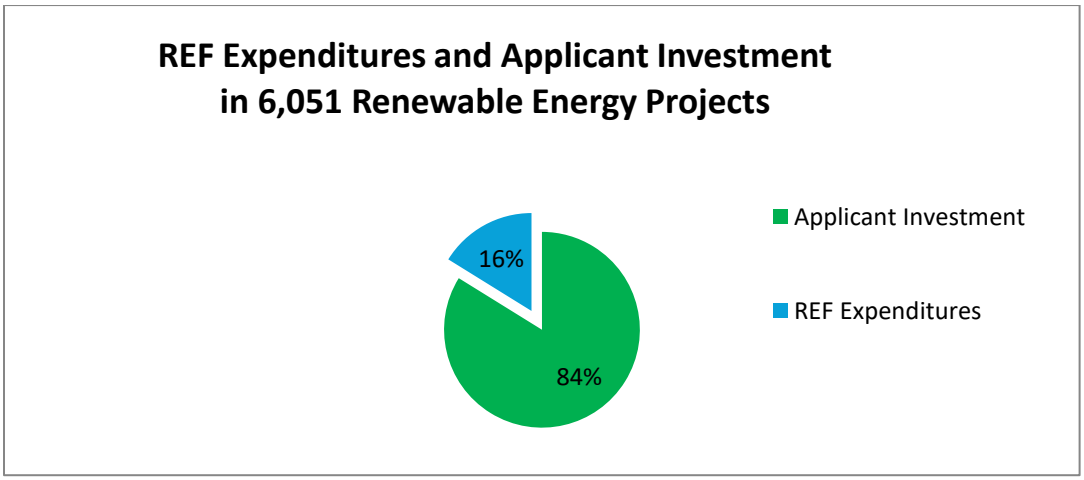
Table 8: REF Rebate Program Results for Fiscal Year 2018

REF Rebate Program	Number of Applications Received	Number Rebates Awarded	Rebate Funds Disbursed
Residential Electrical Renewable Energy (PV and Wind)	577	865	$ 1,482,566
Residential Solar Water Heating	0	2	$ 3,200
Residential Wood Pellet Furnace/Boiler	29	29	$ 253,346
C&I Solar Technologies (Electric and Thermal)	86	90	$ 3,705,982
C&I Wood Pellet Furnace/Boiler	5	8	$ 298,198
Totals	**697**	**994**	**$ 5,743,293**

Cumulative results for the rebate programs, since their inception through June 30, 2018, are shown below in Table 9. The program rebates have leveraged private investment in a ratio greater than six to one.

Table 9: Cumulative Rebate Program Results through June 30, 2018

REF Rebate Program	Number of Applications Received	Number of Rebates Awarded	Rebate Funds Reserved or In - Process	Rebate Funds Disbursed	Applicant Investment *(rounded to nearest thousand)*
Residential Electrical Renewable Energy (PV and Wind)	4,976	4,648	$ 342,625	$ 14,148,216	$ 128,522,000
Residential Solar Water Heating	510	494	$ 1,700	$ 1,008,100	$ 3,292,000
Residential Wood Pellet Boiler/Furnace	383	380	$ 44,805	$ 2,166,249	$ 4,179,000
C & I Solar Technologies (Electric and Thermal)	748	470	$ 2,677,525	$ 11,243,265	$ 44,929,000
C&I Wood Pellet Boiler/Furnace	78	59	$ 125,004	$ 1,681,078	$ 6,161,000
Totals	**6,695**	**6,051**	**$ 3,191,659**	**$ 30,246,909**	**$ 187,083,000**



Commercial and Industrial Competitive Grant Program

RSA 362-F:10, XI requires the Commission to issue an annual RFP for non-residential (commercial and industrial) renewable energy projects that are not eligible to participate in incentive and rebate programs developed under RSA 362-F:10, V and RSA 362-F:10, VIII.

The Commission issued the annual RFP for renewable energy projects on October 5, 2017, stating that the RFP program had a minimum of $800,000 in available grant funds. This RFP sought project proposals which would increase the supply of RECs from thermal renewable energy or non-photovoltaic electric renewable energy projects located in New Hampshire. Specifically, projects which will generate Class I, Class I Thermal, or Class IV Renewable Energy Certificates were eligible to apply. Four grant proposals were received by the Commission, and these proposals represented $2.952 million of total investment and requested approximately $1 million in grant funds. The Commission recommended, and the Governor and Executive Council approved, three grant awards totaling $895,000. Once installed and certified, these projects are estimated to create over 6,000 RECs annually. A complete list of grants awarded in fiscal year 2018 is shown in Table 10.

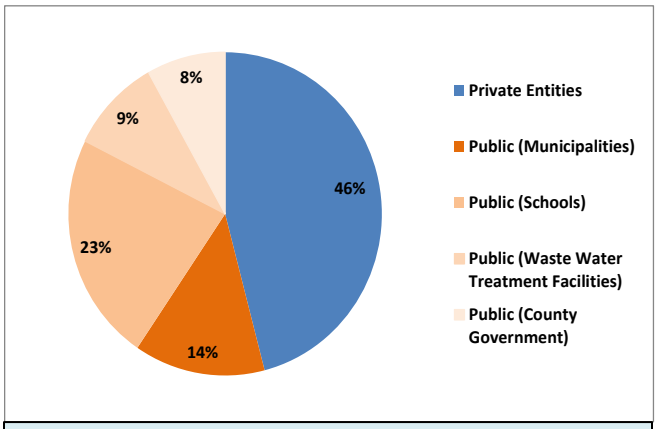
Table 10: REF Competitive Grants Awarded in Fiscal Year 2018

Grantee	Technology	Project Description	Total Project Costs	Leveraged Funds	Grant Amount	Estimated Annual RECs
County of Cheshire	Biomass Thermal Heating	Install a wood chip biomass heating system at the Maplewood Nursing Home in Westmoreland	$ 1,177,000	$ 782,000	$ 395,000	4,117 Class I Thermal
Peterborough Town Library	Biomass Thermal Heating & Cooling	Install a wood chip biomass heating and cooling system at the Town Library	$ 575,000	$ 275,000	$ 300,000	568 Class I Thermal
SAU 24	Biomass Thermal Heating	Install a wood chip biomass heating system at John Stark Regional High School in Weare	$ 800,000	$ 600,000	$ 200,000	1,527 Class I Thermal
Totals			**$ 2,552,000**	**$ 1,675,000**	**$ 895,000**	

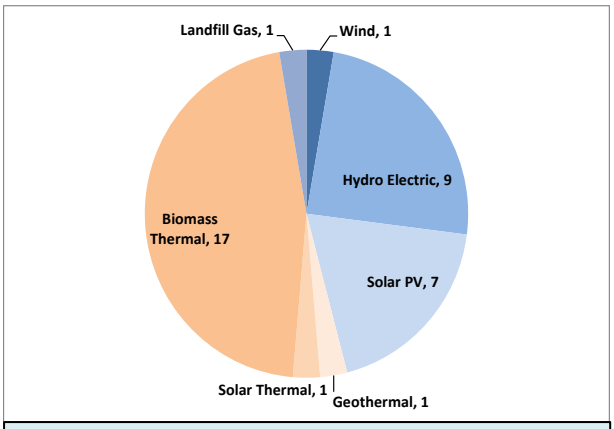
Table 11 and the subsequent charts summarize all grant awards since program inception.

Table 11: REF Competitive Grant Program Summary

Year	Number of Grants Awarded	Total Grant Amount	Total Value of Projects
2011	4	$ 650,890	$ 1,280,923
2012	6	$ 654,750	$ 4,035,424
2013	9	$ 3,637,890	$ 28,888,905
2014	5	$ 2,107,199	$ 7,683,400
2015	4	$ 1,025,000	$ 2,927,000
2016	6	$ 1,272,425	$ 6,106,790
2017	3	$ 895,000	$ 2,552,000
Totals	**37**	**$ 10,243,154**	**$ 53,474,442**



Grant Award Recipients
Private Entities in blue;
Public Entities in oranges



Grants by Technology
Electricity Generation in blues;
Thermal Generation in oranges

REF Competitive Grant Completed in Fiscal Year 2018

Several projects that were awarded grants during previous fiscal years became operational in fiscal year 2018.

The Lower Village Hydroelectric Project received a grant in 2016 to rebuild a 1.35 MW generating station located on the Sugar River in Claremont. The facility had been offline since late 2011. The station has two generating units each capable of producing 800 kW with a combined generation capacity of 1.35 MW. The first of the two units was rebuilt and came back online in May, 2017. The second generator was completed and commissioned in January, 2018. The project is estimated to produce in excess of 5,000 MWH of energy and over 2,800 Class I RECs.

Lower Village Hydroelectric Turbines & Project

The University of New Hampshire received a grant in 2016 to build a wood chip biomass fired district heating system to serve five buildings associated with the Thompson School of Applied Science. The new biomass boiler has been installed in the new building and while there is work remaining to do within the boiler room including piping, wiring, and controls, the biomass boiler is expected to be operational by the end of October. The natural gas backup boilers will be operational by October. The project is projected to use 750 tons of processed dry chips (PDCs) annually from a New Hampshire supplier. The PDCs will be stored in a newly constructed building attached to the boiler room. The project is estimated to produce 1,600 Class I Thermal RECs per year.

UNH Biomass Boilers & PDC Storage

Low Moderate Income Program

Under Senate Bill 129, enacted as 2017 N.H. Laws Chapter 226 (SB 129), and pursuant to RSA 362-F:10, X, the Commission is required to develop program(s) for Low Moderate Income (LMI) residential electric customers. The program(s) must "directly benefit a group of at least 5 residential customers, where at least a majority of the residential customers are at or below 300 percent of the federal poverty guidelines" (i.e., at least 3 LMI participants). The program(s) may finance or leverage financing for low moderate income community solar projects in manufactured housing communities or in multi-family rental housing.

Based on multiple stakeholder meetings and extensive direct public comment, the Commission issued Order No. 26,113, which found that "issuance of an RFP represents a reasonable and appropriate means of meeting the statutory requirements of SB 129" and provides "an efficient vehicle for implementing a program for the current fiscal year." Further, "the RFP approach should permit review and evaluation of multiple project models and potentially facilitate the implementation of a non-RFP LMI program in future years."

The Commission issued an RFP in March 2018 for "Community Solar Photovoltaic Projects Providing Direct Benefits to Low and Moderate Income Residential Electric Customers", stating that the LMI program had $405,000 in available grant funds. The RFP process led to the selection of three projects, each using a different program model. Through follow up reporting from Grantees, the Commission will gain insight into the implementation and effectiveness of each program model. Data from these projects may be used to further refine future LMI program offerings.

Five grant proposals were received by the Commission, and these proposals represented $1.2 million of total investment and requested approximately $680,000 in grant funds. The Commission recommended, and the Governor and Executive Council approved, three grant awards totaling $404,721. Once installed, these projects will provide direct benefit to 61 LMI families. Refer to Table 12 for a complete list of grant awards.

Table 12: REF Low Moderate Income Grants Awarded in Fiscal Year 2018

Grantee	Town	Total Project Costs	Grant Funding	Total Projected Annual Benefits	Number of LMI Participants
Laconia Area Community Land Trust Inc.	Laconia	$ 275,398	$ 150,000	$ 7,741	12
Mascoma Meadows Cooperative Inc.	Lebanon	$ 300,000	$ 168,000	$ 16,800	39
NH Solar Shares LLC	Plymouth	$ 133,417	$ 86,721	$ 2,820	10

Laconia Area Community Land Trust, Inc.

The Laconia Area Community Land Trust, Inc. d/b/a Lakes Region Community Developers (LRCD), program model is structured to maximize direct benefits to LMI residents residing in the Avery Hill community housing. The Avery Hill community consists of six buildings, each with two 2- or 3-bedroom affordable, income-restricted, housing units. A roof-mounted PV system will be installed on each building. The energy generated from the solar PV on each building will power the units in that building.

Currently, residents pay their own electrical costs. Under this program, LRCD will increase monthly tenant rent by a nominal amount of $20 to cover debt service costs. In addition, LRCD will assume full responsibility of the twelve residents' electric bills. This will provide the LMI residents with net positive monthly savings and will not impact their eligibility for other assistance programs.

Mascoma Meadows Cooperative, Inc.

The Mascoma Meadows Cooperative, Inc., program model is structured to maximize direct benefits to LMI Resident-Owned Communities (ROCs). The project developer will design, build and own the community solar project for five years allowing the investor to leverage federal and state tax benefits to lower the overall cost of the project. After five years, the ROC may purchase the solar PV installation at fair market value using low interest financing from the New Hampshire Community Loan Fund. Direct ROC ownership will provide additional benefits to the LMI residents, including renewable energy certificate ownership and maximum compensation for energy produced.

Financing for the project during the first five years is structured as a power purchase agreement (PPA) through which the ROC residents are able to purchase electricity for a reduced rate per kilowatt hour for the first two years. After two years, the energy rate will increase by 2% annually. Under New Hampshire's Group Net Metering program, the ROC cooperative will qualify as a "host" and receive additional monetary benefits. The ROC, in turn, will provide direct benefits to its cooperative members (residents) in the form of lot rent reductions. By reducing lot rents, the LMI residents reduce their monthly expenses and avoid any unintended consequences to any other public benefits received.

NH Solar Shares, LLC

NH Solar Shares LLC is a not-for-profit charitable program recently established to build community solar PV arrays to benefit local LMI families through a "solar share" credit on their electric bill. This credit, otherwise known as "Solar Shares," will appear on the LMI participant's electric bill and will directly reduce each LMI participant's monthly electric bill by $22 to $25. These benefits reflect 85-100% of the solar production.

The community solar "garden" will be installed at the Frosty Scoops Ice Cream stand, on space donated by the Common Man Family of Restaurants. The project will consist of both roof-mounted arrays on top of picnic pavilions and ground-mounted arrays that are adjacent to a nature path. The pathway will be lined with signage highlighting educational energy facts.

Budgets, Expenditures, and Statutory Funding Requirements

Table 13 below summarizes the REF funds available for grant and rebate programs in fiscal year 2019, net of transfers, administrative costs, and funds previously committed.

Table 13: Analysis of Funds for Fiscal Year 2019

Funding Analysis	
$5,893,653	Renewable Energy Fund Balance as of June 30, 2018
$3,581,141	Calendar Year 2017 ACP received in Fiscal Year 2018
$1,690,751	Calendar Year 2017 ACP received in Fiscal Year 2019 (FY19)
-$13,472	ACP Compliance Adjustments
-$480,000	Transfer to Site Evaluation Committee
$10,672,073	**Fiscal Year 2019 Beginning REF Balance**
-$5,006,980	Carry Forward Rebate and Grant Program Funds Encumbered and Committed in Prior Fiscal Years
-$666,783	Non-lapsed Uncommitted Prior Fiscal Years Funds
$4,082,208	**Fiscal Year 2019 Funds Available for Rebate and Grant Programs** (FY19 Approved Appropriation Adjusted for Administrative Costs[12])

The section below summarizes the carry forward program funds and the statutorily required funding breakdown between the residential and non-residential sectors:

Fiscal Year 2019 Program Funding Allocations by Sector	
$4,082,208	**FY19 Funds Available for Rebate and Grant Programs**
$1,673,705	FY19 Funds allocated to Residential Sector (41%)
$2,408,503	FY19 Funds allocated to Commercial & Industrial (non-residential) Sector (59%)

[12] FY19 administrative costs were estimated during the State Biennium Budget process and include, e.g., personnel, consultants, membership dues, and other overhead such as rent, telephone, and technology.

Allocation of Funding Between Residential and Non-residential Sectors

In 2010, the New Hampshire legislature required the Commission to reasonably balance REF expenditures between the residential and non-residential sectors over each two-year period beginning July 1, 2010, in proportion to each sector's share of total retail electricity sales. In 2012, the legislature modified this requirement such that the Commission must reasonably balance the amounts expended, allocated or obligated during each two-year period. Refer to RSA 362-F:10, X.

In fiscal year 2019, which is the first year of the two-year period beginning July 1, 2018, new revenues deposited into the REF consist of ACP revenues less a transfer of funds to the Site Evaluation Committee. In 2017, retail electricity sales for the residential sector represented 41% of the total retail sales, while sales for the non-residential (commercial & industrial) sector accounted for 59% of total retail sales. Accordingly, based on these percentages, the new revenues (less ACP adjustments and administrative cost) were allocated as follows:

- Residential Programs: $1,673,705, or 41% of allocated funds
- Non-residential (C&I) Programs: $2,408,503, or 59% of allocated funds

Funding Cap for Residential Renewable Electricity Rebate Program

RSA 362-F:10, VI places a cap on spending for the residential rebate program for solar electric panels and wind turbines. No more than 40% of the REF can be allocated to this program, measured over two-year periods commencing July 1, 2010.

In fiscal year 2019, which is the first year of a next two-year cycle commencing July 1, 2018, the Commission allocated $500,000, not including carry-forward funds, for the above-referenced residential renewable energy rebate program. This amount represents approximately 12% of available REF program funds (i.e. ACP revenue) for fiscal year 2019, below the applicable biennial cap of 40%.

Use of Class II Revenues for Solar Technology Incentives

RSA 362-F:10, I requires that "Class II moneys shall primarily be used to support solar energy technologies in New Hampshire." For calendar year 2017, Class II ACPs were zero. Irrespective of zero Class II ACPs, FY19 funds will be budgeted to solar energy technology rebate programs according to statutory requirements.

Use of Renewable Energy Fund Revenues for Low Moderate Income Program

RSA 362-F:10, X requires allocating "no less than 15 percent of the REF annually to program(s) that benefit low-moderate income residential customers, including, but not limited to, the financing or leveraging of financing for low-moderate income community solar projects in manufactured housing communities or in multi-family rental housing." For calendar year 2017, $405,000 was allocated to the LMI program. This equated to 15% of 2017 REF revenues. In fiscal year 2019, approximately 16% of REF revenues were budgeted to the LMI program.

Net Metered Capacity, Net Metered Facilities and Group Net Metering

Net Metered Capacity and HB 1116 (2016) Update

New Hampshire's net metering policy, set forth in RSA 362-A:9, provides a billing, crediting, and compensation mechanism for electricity generated "behind-the-meter" by solar and other interconnected renewable energy generation systems. In May 2016, House Bill 1116[13] was signed into law. This legislation amended the State's net metering statute by increasing the net metering cap to 100 megawatts(MW), which provided an additional 50 MW of capacity to Eversource Energy, Liberty Utilities, and Unitil Energy Systems. It further stated that 80% of the additional 50 MW must be allocated to projects less than or equal to 100 kW capacity. Systems larger than 100 kW but less than or equal to the 1 MW capacity limit were allocated the remaining 20%. Table 14 illustrates the amended net metering allocations for each utility.

Table 14: Net Energy Metering (NEM) Allocations to Electric Utilities per Statute (RSA 362-A:9 as amended by HB 1116)

Electric Distribution Utility	2010 Peak Load (MW) [14]	Portion of 2010 Peak Load	NEM Amount of Original 50 MW	ADDT'L 50 MW of NEM Portion	ADDT'L 50 MW of NEM Amount	New Amount (MW) to Projects <= 100 kW (80%)	New Amount (MW) to Projects >100 kW (20%)	Total NEM Amount (MW)
Liberty Utilities	189	8.71%	4.12	9.24%	4.62	3.70	0.92	8.74
New Hampshire Electric Cooperative	124	5.72%	3.16	n/a	n/a	n/a	n/a	3.16
Eversource Energy	1,588	73.21%	36.55	77.65%	38.83	31.06	7.77	75.38
Unitil Energy Systems, Inc.	268	12.36%	6.17	13.11%	6.55	5.24	1.31	12.72
Total	**2,169**	**100%**	**50**	**100%**	**50**	**40**	**10**	**100**

kW = Kilowatt MW = Megawatt

[13] House Bill 1116 (2016), http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2017&id=293&txtFormat=pdf&v=current

[14] Based on the share of 2010 peak load pursuant to Puc 900 and RSA 362-A:9.

HB 1116 also directed the Commission to initiate a proceeding to develop new alternative net metering tariffs, which may include other regulatory mechanisms and tariffs for customer-generators. It is important to note that New Hampshire Electric Cooperative (NHEC) was not subject to this legislation. NHEC, as a rural electric cooperative with a certificate of deregulation on file with the Commission in accordance with RSA 362:2 II, had decided to continue net metering above its share of the original 50 MW cap on terms and conditions it determined to be reasonable and appropriate; therefore, it was not required to participate in the Commission's alternative net metering tariff development proceeding.

The proceeding[15] began in mid-2016 and on June 23, 2017, the Commission issued Order No. 26,029,[16] which accepted the common elements of two filed settlement proposals and resolved the differences between those two settlements, providing for the adoption of an alternative net metering tariff to be in effect for a period of years while further data is collected and analyzed, pilot programs are implemented, and a distributed energy resource (DER) valuation study is conducted. Beginning September 1, 2017, all new systems entering the net metering interconnection queue receive compensation based on the new alternative net metering tariff.

To facilitate the collection of data to inform the VDER study, the Commission authorized the development of several pilot programs, including Real-Time Pricing Pilot Program in the City of Lebanon; TOU Pilot Programs; NWA Pilot Programs; and a Low Income Pilot Programs.

During fiscal year 2018, Staff held several working group sessions for the pilot programs and studies.

Working group participants discussed alternative approaches for the design and implementation of TOU rate pilot programs and heard presentations regarding prior TOU pilot programs conducted in New Hampshire and in other New England states. One of the utilities previewed a potential approach to TOU rate implementation, and that approach was discussed by various stakeholders. Staff anticipates that a further meeting of the TOU pilot program working group will be scheduled during fiscal year 2019.

During the NWA pilot program working group session held on November 6, 2017, it became apparent there was a lack of consensus as to the fundamental scope and purpose of the proposed NWA pilot programs. In particular, a number of stakeholders expressed the view that the NWA pilots should not be limited to distributed generation (DG), but should permit participation by various other types of distributed energy resources, either individually or in the aggregate. The stakeholder representatives attending the working group session agreed that the Commission should be asked to solicit comments from parties and then provide clarification of the relevant issues before pilot program development efforts continue.

[15] DE 16-576, Development of New Alternative Net Metering Tariffs and/or Other Regulatory Mechanisms and Tariffs for Customer-Generators, http://puc.nh.gov/Regulatory/Docketbk/2016/16-576.html
[16] Order No. 26,029, Order Accepting Settlement Provisions, Resolving Settlement Issues, and Adopting a New NEM, http://www.puc.nh.gov/Regulatory/Docketbk/2016/16-576/ORDERS/16-576_2017-06-23_ORDER_26029.PDF

On February 16, 2018, Staff filed a memorandum recommending modifications to Order No. 26,029 to focus utility and stakeholder development efforts on study and analysis rather than the design and implementation of NWA pilot programs. A public comment hearing regarding the proposed modifications was held on March 13, 2018, and written comments were filed thereafter by a number of parties. On April 30, 2018, the Commission issued Order No. 26,124[17], modifying Order No. 26,029 to suspend efforts to develop NWA pilot programs in the context of net metering tariff development, while focusing instead on the potential to evaluate the locational value of DG to the utility distribution system through study and analysis of relevant data. The Commission directed that those issues continue to be addressed through the ongoing stakeholder working group process. Working group sessions will continue in fiscal year 2019.

The development of pilot programs for low and moderate income customers was considered together with the development of program(s) intended to meet the requirements of SB 129. The Commission opened Docket DE 17-172[18] to develop, review, and approve program(s) designed to meet the SB 129 requirements, and directed that initial efforts to develop such programs be undertaken concurrently with the LMI working group sessions in the net metering docket. Through docket DE 17-172, the REF LMI program was established.

Following the completion of the VDER study and the locational value of DG study, and with the availability of additional customer load and system data from the pilot programs, the Commission will open a new proceeding to determine whether and when further changes should be made to the net metering tariff structure.

[17] Order No. 26,124, Order Addressing Non-Wires Alternative Pilot Programs, http://www.puc.nh.gov/Regulatory/Docketbk/2016/16-576/ORDERS/16-576_2018-04-30_ORDER_26124.PDF
[18] Docket DE 17-172, Low Moderate Income Program, http://www.puc.nh.gov/Regulatory/Docketbk/2017/17-172.html

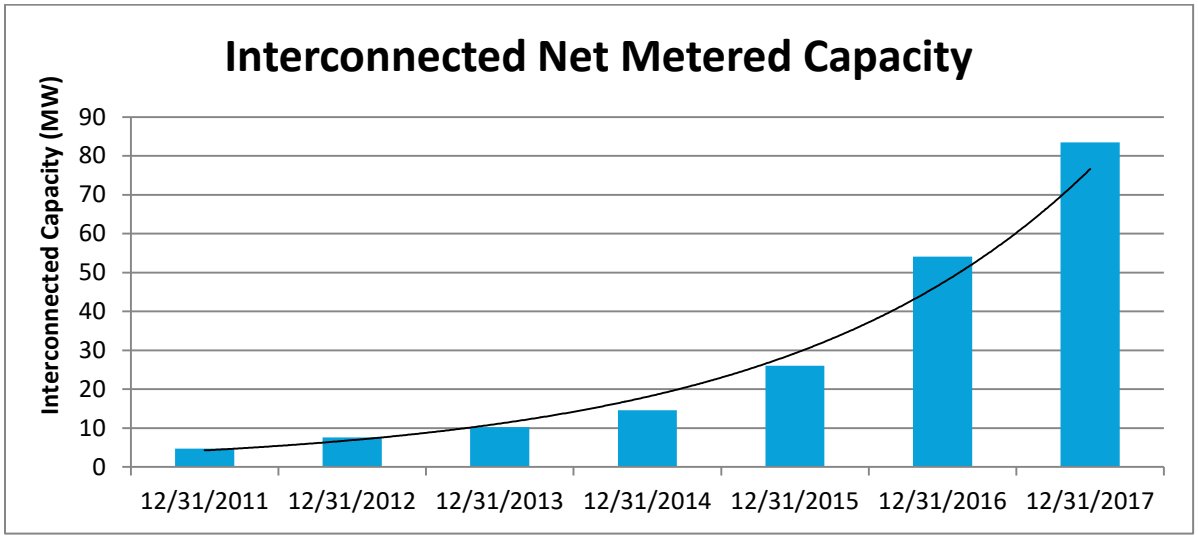
Net Metered Facilities

Each utility's total installed capacity of net metered facilities is listed in Table 15. The facility data includes PV, small wind, and small hydroelectric net metered installations.

Table 15: Total Net Metered Facilities as of December 31, 2017

Electric Distribution Utility	Total Installs in 2017	Total Installs (End of CY2017)[19]	2017 Capacity Added (MW)	Total Capacity (End of CY2017)[20]
Liberty Utilities	71	429	2.256	4.354
New Hampshire Electric Cooperative	111	887	5.693	7.555
Eversource Energy	1,195	5,353	34.693	64.757
Unitil Energy Systems, Inc.	116	757	4.504	6.780
Total Net Metered Facilities	**1,493**	**7,426**	**47.146**	**83.446**

The chart below illustrates the historic trend of installed net metered capacity in New Hampshire starting in January 2011 through December 2017. Overall, at the end of 2017, the total installed net metered capacity was 83.446 MW with 47 MW being added or installed in 2017.



[19] Based on the utility reports to DOE (EIA Form 826) and includes system expansions.
[20] Based on the utility reports to DOE (EIA Form 826) and includes system expansions.

Group Net Metering

In July 2009, the Legislature enacted SB 98, amending RSA 362-A:9 to allow for group net metering. The law permits net-metered renewable energy facilities, known as hosts, to share the proceeds from sales of surplus electricity generation with other electric utility account holders, known as group members. In some cases, the group host and the group members may be the same party. For instance, a town might net meter a solar array and use the proceeds to offset utility expenses associated with other town electric meters. The host and the group members must all be default service customers of the same distribution utility, meaning they may not procure energy from a competitive electric power supplier. Group net metering applications are reviewed and approved by the Commission. The Commission adopted final rules for group net metering that went into effect on January 7, 2016.

During the fiscal year 2018, Senate Bills 321 and 367 (SB 321 and SB 367 respectively) were signed into law. SB321 allows group hosts and group members may procure energy from a competitive electric power supplier. SB367 eliminates the requirement for group hosts to submit an annual report if their facility's capacity is less than 15 kW. The amendment also removed language to RSA 362-A:9, XIV(a) which required the Commission to review agreements between group hosts and group members.

Table 16 provides information about group net metering applications approved by the Commission in calendar year 2017.

Table 16: Group Net Metering Applications Approved

Electric Distribution Utility	Total Cumulative Number of Applications Approved		Total Cumulative Capacity of Approved Host Installations (Kilowatts AC)		2017 Net Generation By Host (kWh)[21]	2017 Total Member Load (excluding Host) (kWh)
	Solar	Hydro	Solar	Hydro		
Eversource Energy	195	28	7,693	12,395	39,208,457	40,001,479
Liberty Utilities	12	--	316	--	332,028	490,740
New Hampshire Electric Cooperative	11	--	297	--	144,666	1,170,906
Unitil Energy Systems, Inc.	12	--	252	--	218,604	285,512
Total	**230**	**28**	**8,558**	**12,395**	**39,903,755**	**41,948,637**

[21] "Net Generation by Host" is the amount of electricity generated and available for the group members, excluding any usage by the host.

Conclusion

Since its inception in July 2009, the Renewable Energy Fund has been used to establish seven grant and rebate programs that have experienced substantial demand and growth. The Renewable Energy Fund has been utilized to fund over 6,000 rebates for renewable energy systems to New Hampshire homeowners, businesses, schools, towns, non-profit organizations, and other eligible entities. In addition, the competitive grant program has provided more than $10 million in funding for 37 renewable energy projects for schools, businesses, and municipalities, featuring technologies from biomass heating systems to hydroelectric project upgrades to photovoltaic arrays and solar hot air, among others.

As this report illustrates, demand for rebates and grant awards continues to be strong. Rebate and grant funds have leveraged over $240 million in private investment, providing a boost to the state's economy and creating jobs for electricians, plumbers, and alternative energy businesses. In addition, there has been substantial growth in distributed generation renewable energy systems that serve to diversify our energy sources, reduce our reliance on fossil fuels, reduce greenhouse gas emissions, and increase our energy independence.

Fiscal year 2019 will be challenging for the Commission and its Sustainable Energy Division. Commission Staff continues to monitor industry and renewable energy certificate market trends, and technological developments such as energy storage. With limited funding, program waitlists and continued strong demand for programs, Commission staff will be considering revisions to current rebate levels and program terms and conditions in 2019. Staff will also work with the net metering working group to design and develop the Commission ordered Value of DER Study, Locational Value Study and net metering pilot programs. Data from the pilot programs and locational value study will be used to inform the Value of DER Study and future net metering tariffs.

The Commission will make a report of its findings to the legislature by November 1, 2018, and the report will include any recommendations to the class requirements or other aspects of the RPS program

2018 Renewable Portfolio Standard Review (RSA 362-F:5)

I. The adequacy or potential adequacy of sources to meet the class requirements of RSA 362-F:3;
II. The class requirements of all sources in light of existing and expected market conditions;
III. The potential for addition of a thermal energy component to the electric renewable portfolio standard;
IV. Increasing the class requirements relative to classes I and II beyond 2025;
V. The possible introduction of any new classes such as an energy efficiency class or the consolidation of existing ones;
VI. The timeframe and manner in which new renewable class I and II sources might transition to and be treated as existing renewable sources and if appropriate, how corresponding portfolio standards of new and existing sources might be adjusted;
VII. The experience with and an evaluation of the benefits and risks of using multi-year purchase agreements for certificates, along with purchased power, relative to meeting the purposes and goals of this chapter at the least cost to consumers and in consideration of the restructuring policy principles of RSA 374-F:3;
VIII. Alternative methods for renewable portfolio standard compliance, such as competitive procurement through a centralized entity on behalf of all consumers in all areas of the state; and
IX. The distribution of the renewable energy fund established in RSA 362-F:10.

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