New Hampshire Public Utilities Commission

# NEW HAMPSHIRE
# RENEWABLE ENERGY FUND

## ANNUAL REPORT

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Submitted to:

LEGISLATIVE OVERSIGHT COMMITTEE TO MONITOR THE TRANSFORMATION OF DELIVERY OF ELECTRIC SERVICES

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THE SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

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# Executive Summary

Twelve years ago, New Hampshire established a renewable energy policy, the Electric Renewable Portfolio Standard (RPS). The New Hampshire General Court found it to be in the public interest to stimulate investment in low emission renewable energy generation technologies within the state. The Public Utilities Commission (PUC or Commission) is required to make an annual report to the Legislative Oversight Committee to Monitor the Transformation of Delivery of Electric Services, the Senate Energy and Natural Resources Committee, and the House Science, Technology and Energy Committee, detailing how the Renewable Energy Fund (REF) is used. The report that follows is the New Hampshire Renewable Energy Fund Annual Report which describes program results for fiscal year 2019 (July 1, 2018 through June 30, 2019) and summarizes compliance data for calendar year 2018.

## Renewable Energy Fund Programs

University of New Hampshire Thompson School of Applied Science Wood Chip District Heating System
(Project details on page 24)

### Competitive Grant Program

As required by RSA 362-F:10, XI, the Commission issued an annual request for proposals (RFP) to fund renewable energy projects. The RFP for fiscal year 2019 (FY19) was issued on October 1, 2018, for certain non-residential renewable energy projects located in New Hampshire that are eligible to generate certain renewable energy certificates (RECs) and not eligible to receive funds from other REF incentive programs.

The Commission received three proposals requesting a total of $1.45 million in grant funds. Two projects were selected for funding: a heat recovery system for an existing biomass-fueled electricity generator which captures waste heat to heat greenhouses, and a wood-chip fueled co-generation system that will be used to dry wood chips and generate electricity for on-site use. The two projects selected received $950,000 in funding through grant contracts approved by the Governor and Executive Council on May 15, 2019.

Left to Right: New Hampshire Solar Shares, Avery Hill, and Mascoma Meadows
Low-Moderate Income Community Solar Projects

## Low-Moderate Income Solar Program

The "New Hampshire Clean Energy Jobs and Opportunity Act of 2017,"[1] included a funding allocation requirement for a program intended to reduce market barriers to solar energy participation by low and moderate income (LMI) residential customers. Working closely with stakeholders and the net metering working group, a new LMI competitive grant program was designed and implemented during FY18.

The FY19 RFP was issued on February 2, 2019, seeking proposals for community solar photovoltaic (PV) projects providing direct benefits to New Hampshire LMI residential electric customers. The Commission received four proposals requesting a total of $700,000 in grant funds for projects with a combined estimated value of $1.3 million. Three community solar projects were selected to receive $500,000 total in grant funding, and were approved by the Governor and Executive Council on May 15, 2019. These projects represent various program models, including: resident-owned community (ROC) solar PV utilizing a power purchase agreement with benefits provided as lot rent reductions, roof-top solar on income restricted housing with benefits provided as electric bill elimination, and a solar array owned by a ROC with benefits provided as lot rent reductions. In total, these projects will provide direct benefits to sixty-two LMI families in New Hampshire.

## Solar Rebate Programs

Solar PV continues to increase in New Hampshire. An additional 14 MW of solar PV was interconnected during calendar year 2018. Net metering, the RPS, and REF programs are incentives and drivers for participants in this market. During FY19, the incentive levels of the residential solar program remained at $0.20 per watt, up to a maximum $1,000, and $0.40 per watt, up to a maximum $50,000 for commercial and industrial (C&I) installations. 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 C&I solar rebate program experienced continued demand, and

[1] See www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2017&id=957&txtFormat=pdf&v=current.

program budgets were fully committed at the end of the fiscal year. On July 3, 2019 the C&I solar rebate program was closed to new applications with a waitlist totaling approximately $20,000.

The construction cycle for large C&I projects is, on average, approximately one year, and many residential projects were scheduled for summer installation; therefore, the REF is carrying forward a balance of reserved 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 FY19, the incentive levels for 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 installation of a thermal storage tank and/or production meter to track thermal generation for REC certification.

Instead of heating oil, these homes and businesses are using wood pellets, a renewable fuel that is often locally sourced. Over 350 incentivized residential systems are operational in more than 100 municipalities, and the bulk storage containers installed with these systems have a total combined capacity of 1,643 tons. On average, each residential wood pellet heating system replaces an estimated 627 gallons of heating oil each year.[2] In total, incentivized residential systems are reducing New Hampshire's heating oil consumption by approximately 234,500 gallons each year, and reducing $CO_2$emissions by approximately 2,084 metric tons, or the equivalent of the annual emissions created by 442 passenger cars.[3]

Fifty-six incentivized C&I systems are located in 35 New Hampshire municipalities, and the bulk storage containers installed with these systems have a total combined capacity of 977 tons. C&I wood pellet heating systems replace the consumption of an average of 400,000 gallons of fuel oil each year. [4] The 400,000 gallons of fuel oil contains approximately 4,140 metric tons of CO2 emissions, or the equivalent of the annual emissions created by 879 passenger cars.[5]

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[2] U.S. Energy Information Agency's 2015 Residential End-Use Consumption Survey, Table CE 4.7, available at www.eia.gov/consumption/residential/data/2015/. Average oil-heated New England home uses 627 gallons/yr.

[3] Based on EPA assumptions and calculator, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

[4] U.S. Energy Information Agency's 2012 Commercial Buildings End-Use Consumption Survey, Table 10, available at www.eia.gov/consumption/commercial/data/2012/index.php?view=consumption#e1-e11 estimates the average commercial building in New England that uses fuel oil for space heating uses 240 gallons/sq. ft. The buildings heated with these incentivized systems have a total combined area of ~1,900,000 sq. ft. as reported on incentive applications.

[5] Based on EPA assumptions and calculator, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

## 2018 Renewable Portfolio Standard Review

Pursuant to RSA 362-F:5, on November 1, 2018, a review of the electric renewable portfolio standard program was completed. The 2018 RPS Review concluded that the program is accomplishing the statutory goals and purpose defined by the legislature. Specifically, the RPS has increased use of renewable fuels and the development of renewable technologies, and has provided both economic and environmental benefits.

The report provided background information on the structure of New Hampshire's RPS, legislative history, and amendments, followed by a synopsis of the process undertaken by the Commission. The report considered and reported on each of the nine topics, listed below, required for review under the statute.

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.**

The Commission's report concludes with legislative and rule recommendations, and includes appendices, references, and supporting data. The 2018 Review showed that New Hampshire's in-state energy resources are increasingly renewable and that technological innovations are helping consumers and businesses produce more of their own energy. The RPS has promoted fuel diversity while providing economic opportunities and environmental benefits.

The report concluded that major changes are not needed at this time to further advance the RPS statutory goals, but limited legislative improvements could provide greater flexibility and efficiency in the administration and operation of the RPS program. Perhaps most importantly, this report was developed to serve as a resource for decision-makers facing choices about the future of New Hampshire's renewable energy policies and programs. The full report is available on the Commission's website.[6] The next review is required in 2025.

[6] See www.puc.nh.gov/20181101-RPS-Review-2018-FINAL-REPORT-2018-11-01.pdf.

## Sustainable Energy Division Non-Program Updates

### Net Energy Metering

The Sustainable Energy Division continued work on the various docket-related initiatives ordered through the "Development of New Alternative Net Metering Tariffs and/or Other Regulatory Mechanisms and Tariffs for Customer-Generators" docket (DE 16-576, Order No. 26,029). Work completed during FY19 is summarized below.

#### Locational Value of Distributed Generation Study

In support of the Locational Value of Distributed Generation (LVDG) study, the Sustainable Energy Division entered into a Memorandum of Understanding with Clean Energy States Alliance (CESA) to work collaboratively on understanding the locational value of solar. The collaborative research effort was administered by the National Renewable Energy Laboratory (NREL) and supported by a grant from the U.S. Department of Energy, Solar Energy Technologies Office. As part of the Solar Energy Innovation Network, five states—Connecticut, New Hampshire, Rhode Island, Washington, and Wisconsin, with coordination and support from CESA—forged the *Multistate Initiative to Develop Solar in Locations that Provide Benefits to the Grid* in 2018. This multi-state initiative collectively aimed to advance state decision-making for identifying high-value locations for Distributed Energy Resource (DER) development.

Specifically, the Sustainable Energy Division Staff worked collaboratively with the CESA initiative, other PUC Staff, and working group members to develop the scope and timeline for the LVDG study. The identified objective of the LVDG study is to determine avoided costs of deferred capacity investments at the distribution level.

Staff filed a proposed study scope, which was followed by a public hearing and written comment period and approved with modifications by the Commission through Order No. 26, 221 on February 20, 2019. The study approach will closely follow current utility planning methods and practices to best represent investment decision-making in the New Hampshire context. Consultants will work closely with the state's three regulated utilities through three high-level steps: identifying locations for detailed analysis, determining avoided or deferred investment costs, and assigning values using load profiles to map against generation profiles. This study scope formed the basis of the April 4, 2019 request for proposals to solicit a vendor to conduct the study.

#### Low-Moderate Income Solar Pilot

In May 2019, Eversource Energy (Eversource) filed its Clean Innovation Community Solar pilot program for the benefit of LMI customers. "Eversource's proposed Clean Innovation Community Solar pilot program is largely based upon the existing model for group net metering, but is intended to explore a different shared solar model that has the potential to make financial savings from solar programs more accessible to LMI customers by

removing or reducing existing financial and administrative barriers to LMI participation in shared solar."[7] On July 11, 2019, representatives of Eversource, the Office of the Consumer Advocate, Clean Energy NH, Conservation Law Foundation, and Staff met to discuss preliminary issues relevant to this proceeding, including the development of a procedural schedule for the docket.

## Outlook for Fiscal Year 2020

### Renewable Energy Fund Programs

For compliance year 2018, alternative compliance payments (ACPs) decreased significantly compared to the prior compliance year. Given limited funding associated with ACPs, it is expected that rebate and grant programs will be underfunded to meet anticipated demand. Due to anticipated continued strong demand for program funds, program waitlists and closures should be expected. To alleviate some pressure on available funds, Staff may propose revisions to current rebate levels, and program terms and conditions.

Sustainable Energy Division Staff will investigate the possibility of establishing a loan loss reserve to support a residential loan program, and will analyze the costs of providing interest rate buy-downs for residential customer-owned solar electric systems and bulk-fed pellet heating systems. If combined with a rebate, such a finance offering may enable more moderate-income households to install solar and/or pellet whole-house heating systems. Pursuant to RSA 362-F:10, VIII, any program changes will be considered as part of a public hearing process with stakeholder involvement, and would require notice and hearing.

The FY20 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. If the C&I Solar Rebate program is not allocated funding in FY20, then Staff has recommended the competitive grant RFP be open to solar proposals. The RFP would seek proposals for solar projects which have certain specific characteristics, such as: 1) sited on a brownfield; 2) owned by school or municipal entity; or 3) developed as a carport or parking garage. Although currently there is no need for additional Class II (solar) RECs, Class II RECs may be used to satisfy Class I obligations, and New Hampshire's Class I requirement increases by 0.9% annually.

**Given limited funding associated with ACPs, it is expected that rebate and grant programs will be underfunded to meet anticipated demand. Due to anticipated continued strong demand for program funds, program waitlists and closures should be expected.**

**To alleviate some pressure on available funds, Staff may propose revisions to current rebate levels, and program terms and conditions.**

Staff will continue to manage REF monies and programs efficiently, and according to statutory requirements.

[7] Eversource's petition and other related documents available at www.puc.nh.gov/Regulatory/Docketbk/2019/19-104.html.

## Net Energy Metering

PUC Staff will continue to work with the net energy metering pilot and study working groups to move the various docket-related initiatives forward. The Sustainable Energy Division in conjunction with a consultant will lead the development of the Locational Value of Distributed Generation study. Staff will also continue to conduct technical sessions to inform the design and execution of the Value of Distributed Energy Resources study, 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 complete the updates to the Net Metering Rules[8] to account for changes to the net metering tariff and legislative amendments that impact 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;
- Reducing the administrative requirements related to group net metering; and
- Making changes necessitated by the enactment of Senate Bill 165 including establishing procedures for on-bill credits, the LMI adder, and new reporting requirements.

[8] See N.H. Code of Administrative Rules Puc 900 (Net Metering for Customer-Owned Renewable Energy Generation Resources of 1,000 Kilowatt or Less) at www.puc.nh.gov/Regulatory/rules.htm.

# 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 region 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.

The use of local and renewable fuels also allows more energy dollars to be retained in the state instead of 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). Class I is split into a separate electricity requirement and thermal energy requirement. Electricity suppliers must obtain RECs for each of the four classes as a set percentage of their retail electric load. One REC represents renewable attributes of one megawatt-hour of electricity or the equivalent amount of thermal energy.

**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.
- The production of biodiesel in New Hampshire meeting all requirements.

**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;
- Renewable forms of Methane gas if the output is in the form of useful thermal energy.

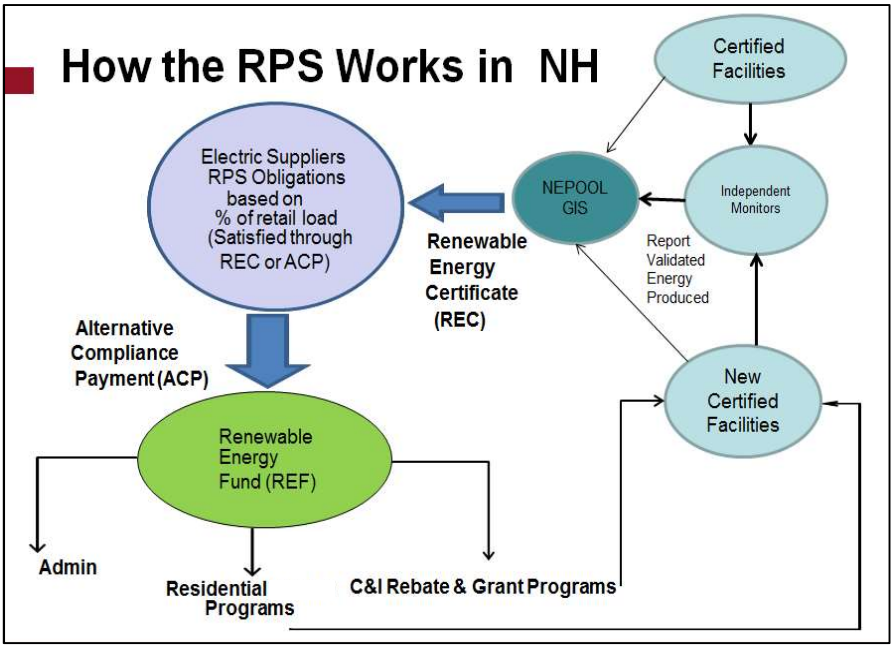
**Class II - New Solar.** Solar technologies; provided the electric generator began operation after January 1, 2006.

**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.

RECs are generated by certified renewable energy facilities and sold into a regional market. Renewable energy facilities must apply for New 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 administrative 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 suppliers cannot, or choose not to, purchase or obtain sufficient RECs to comply with the RPS law, they must make ACPs to the REF. On an annual basis, the Commission reviews electricity suppliers' compliance with the previous calendar year's RPS requirements. Electricity suppliers include New Hampshire's competitive electric power suppliers 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 which is used 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 C&I 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 2019: Legislative Summary

In 2019, the RPS and group net metering laws were amended through the passage of the legislative amendment summarized below.

## Group Net Metering and Low-Moderate Income Community Solar Legislation

Senate Bill 165 (SB 165),[9] known as the Low-Income Community Solar Act of 2019, modifies the method for calculating net energy metering credits for low and moderate income community solar group host projects, modifies the definition of low-moderate income community solar project, and provides for on-bill credits allocated to the group host and members.

With the enactment of SB 165, group hosts may elect to receive on-bill credits rather than receiving compensation by check for excess generation at the end of each billing cycle. Members of those groups will also receive on-bill credits.

The definition of a "low-moderate income community solar project" was amended to include a requirement that no more than 15% of the projected load may be attributable to non-residential end-user customers. Members of low-moderate income community solar projects that elect on-bill credits will receive a three-cent adder per kilowatt-hour through June 30, 2021, and 2.5 cent adder per kilowatt-hour thereafter.

The Commission must issue a report on the costs and benefits of low-moderate income community solar projects on or before June 1, 2020. By July 1, 2022, the Commission must report on the development of the low-moderate income community solar project market and recommend whether the additional monetary credit (i.e., the per kilowatt-hour adder) should be increased or decreased.

The Commission is required to authorize at least two new low-moderate income community solar projects per year in each utility's service area starting on January 1, 2020.

As a result of SB 165, the Commission will amend the Puc 900 administrative rules relative to net metering to establish procedures for on-bill credits, the LMI per kilowatt-hour adder, and new reporting requirements.

[9] See gencourt.state.nh.us/bill_status/billText.aspx?sy=2019&id=1054&txtFormat=pdf&v=current.

# RPS Revenues and Costs

## Revenues

Alternative compliance payments are the only source of revenue for the REF. The ACP rate is paid for each megawatt hour of RPS compliance obligation not met by purchasing a REC. The ACP rate serves as a ceiling price in the REC market. 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. In accordance with RSA 362-F:10, III (c), the 2020 Class III ACP rate will equal 2013 ACP rate adjusted by each year's CPI for the years 2014 through 2019.

**Basic Class Definitions**

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

**Class I Thermal**
- New Useful Thermal

**Class II**
- New Solar PV

**Class III**
- Existing Biomass
- Existing Methane

**Class IV**
- Existing Hydro

*(See RSA 362-F for detailed 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 | 2019 |
| Class I (Non-thermal) | $ 64.02 | $ 55.00 | $ 55.37 | $ 55.75 | $ 55.72 | $ 56.02 | $ 56.54 | $ 57.15 |
| Class I Thermal | | $ 25.00 | $ 25.17 | $ 25.34 | $ 25.33 | $ 25.46 | $ 25.69 | $ 25.97 |
| Class II | $ 168.13 | $ 55.00 | $ 55.37 | $ 55.75 | $ 55.72 | $ 56.02 | $ 56.54 | $ 57.15 |
| Class III | $ 31.39 | $ 31.50 | $ 31.93 | $ 45.00 | $ 45.00 | $ 55.00 | $ 55.00 | $ 55.00 |
| Class IV | $ 31.39 | $ 26.50 | $ 26.86 | $ 27.23 | $ 27.20 | $ 27.49 | $ 28.00 | $ 28.60 |

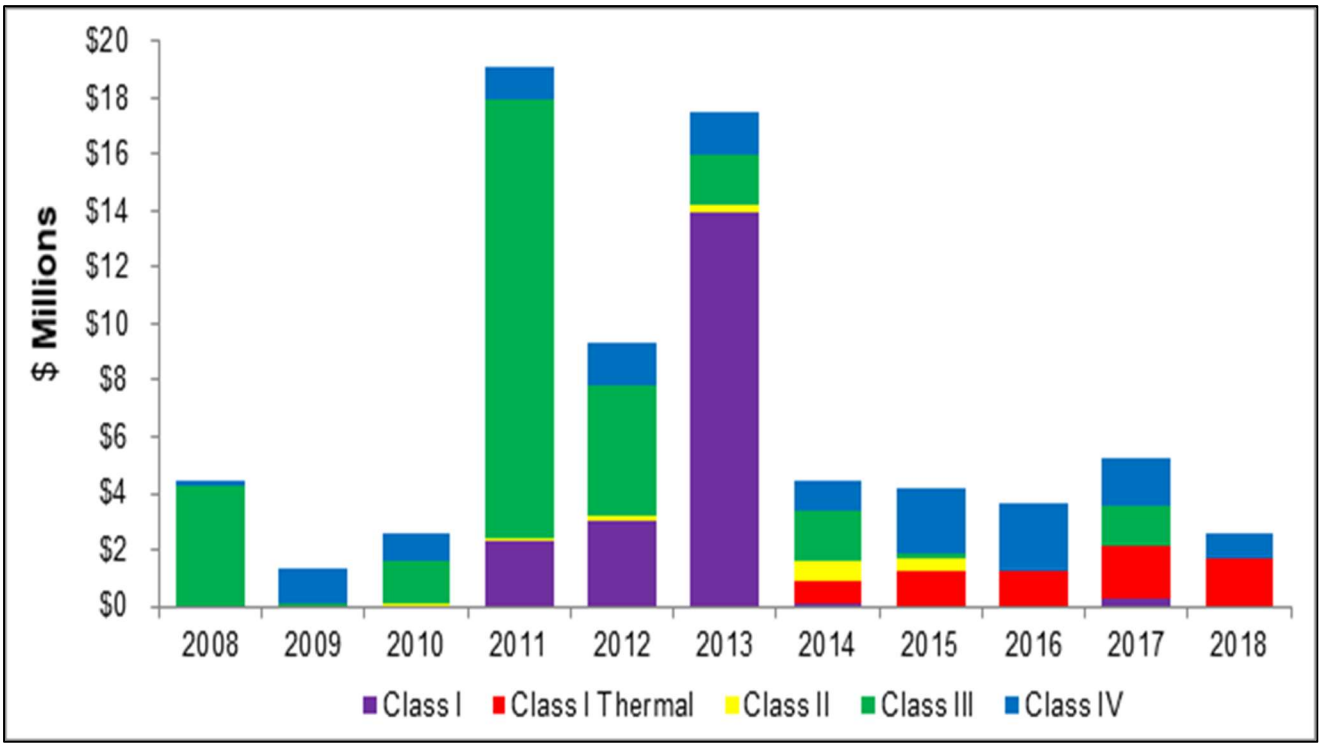
ACPs from electricity suppliers are made annually by July 1 for the prior calendar year. For example, ACPs for calendar year 2018 (CY18) were to be paid by July 1, 2019. Entities with RPS compliance obligations who might pay ACPs include New Hampshire's electric utilities as well as competitive electric power suppliers. The ACP funding to the REF, as designed, is expected to, and does, fluctuate over time. CY18 compliance saw a decrease in total ACPs. ACP revenues received in 2019 (for compliance year 2018) were $2,601,432 as compared to the prior year's revenue of $5,258,420. This decrease shows the high supply level in the renewable energy certificate market given that the overall compliance obligation increased from 17.6% for calendar year 2017 (CY17) to 18.7% for CY18. The increased RPS obligation was due to the annual, legislatively defined increases for Class I and Class I Thermal.

## Table 2: ACP Revenues Received by Compliance Year

| Compliance Year | 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% |
| **2018** | **$ 2,601,432** | **18.70%** |

## 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 2018 ACP revenues by class.



## Revenues Received by RPS Class

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

ACPs for Class I decreased from $309,735 for CY17 to $47,662 for CY18, with an increased obligation requirement of 7.5% for CY18 versus 6.8% for CY17.

In addition, pursuant to RSA 362-F:6, II-a and Puc 2503.04(d), each year the Commission computes an estimate of a percentage credit an electricity supplier 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 CY18, the credit for Class I was 0.005% against a total obligation of 7.5%. At the time of its RPS compliance filing, an electricity supplier 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 supplier.

ACPs for the Class I Thermal were $1,611,766 for CY18 compared to $1,870,903 for CY17. The obligation for Class I Thermal increased to 1.2% from 1.0%. In CY18, approximately 62,000 RECs were purchased to meet compliance obligations. In CY17, approximately 30,000 RECs were purchased to meet compliance obligations. This increase in available RECs indicates that the REF investments in rebate and grant programs to incentivize thermal projects are increasing the supply of RECs as anticipated.

### Class II: New Solar Electric ACPs

ACPs for Class II were very small at $2,884 due to the credit for Class II net metered facilities that are not Class II REC-certified, similar to that described above for Class I, which was very close to the Class II obligation. For CY18, the credit for Class II which an electricity supplier may claim at the time of its RPS compliance filing was 0.4673% compared to the total obligation of 0.50%. The ACPs paid were likely due to decisions by competitive electric power suppliers not to pursue purchase of small quantities of RECs but to expedite their compliance process by paying small ACP amounts.

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

The Commission did not reduce the Class III requirement for compliance year 2017 or 2018. With a Class III obligation equal to 8% in CY17 and CY18, ACP revenue was $0 in CY18 compared to $1,358,225 for CY17.

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

Class IV ACPs decreased to $939,120 in CY18 from $1,719,554 in CY17.

Table 3 lists the distribution utilities and competitive electric power suppliers (CEPS) that filed compliance reports for calendar (compliance) year 2018, 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 Received by Supplier and RPS Class for Compliance Year 2018

| Company | Class I | Class I Thermal | Class II | Class III | Class IV | Total |
|---|---|---|---|---|---|---|
| Liberty Utilities | $ - | $ 33,037 | $ - | $ - | $ - | $ 33,037 |
| New Hampshire Electric Coop. | $ - | $ - | $ - | $ - | $ - | $ - |
| Eversource Energy | $ - | $ 279,482 | $ - | $ - | $ 29,456 | $ 308,938 |
| Unitil Energy Systems, Inc. | $ - | $ - | $ - | $ - | $ 30,576 | $ 30,576 |
| **Distribution Utilities Subtotal** | **$ -** | **$ 312,519** | **$ -** | **$ -** | **$ 60,032** | **$ 372,551** |
| Agera Energy, LLC * | $ - | $ - | $ - | $ - | $ - | $ - |
| Ambit Energy, L.P. | $ - | $ 15,748 | $ - | $ - | $ - | $ 15,748 |
| Calpine Energy Solutions LLC | $ - | $ 35,401 | $ 2,092 | $ - | $ 48,216 | $ 85,709 |
| Champion Energy Services LLC | $ - | $ - | $ 396 | $ - | $ 8,036 | $ 8,432 |
| Clearview Energy | $ - | $ 3,622 | $ - | $ - | $ 1,288 | $ 4,910 |
| Constellation New Energy, Inc. | $ - | $ 459,697 | $ - | $ - | $ - | $ 459,697 |
| Devonshire (Fidelty) | $ - | $ 10,970 | $ - | $ - | $ - | $ 10,970 |
| Direct Energy Business, LLC | $ - | $ 129,812 | $ - | $ - | $ - | $ 129,812 |
| Direct Energy Services, LLC | $ - | $ 58,214 | $ - | $ - | $ - | $ 58,214 |
| EDF Energy Services, LLC | $ - | $ 78,894 | $ - | $ - | $ - | $ 78,894 |
| Ethical Electric, Inc. | $ - | $ - | $ - | $ - | $ - | $ - |
| ENGIE Resources LLC | $ - | $ 81,257 | $ - | $ - | $ 110,712 | $ 191,969 |
| ENH Power | $ - | $ 270,644 | $ - | $ - | $ 368,704 | $ 639,348 |
| Energy Rewards | $ - | $ 22,659 | $ - | $ - | $ 30,856 | $ 53,515 |
| First Point Power, LLC | $ - | $ 5,189 | $ - | $ - | $ 113,064 | $ 118,253 |
| Mega Energy of New Hampshire | $ - | $ 4,496 | $ - | $ - | $ 5,656 | $ 10,152 |
| Mint Energy, LLC | $ 3,505 | $ 6,423 | $ - | $ - | $ 3,780 | $ 13,708 |
| NextEra Energy Services NH LLC | $ - | $ - | $ - | $ - | $ - | $ - |
| North American Power & Gas, LLC | $ - | $ 38,304 | $ - | $ - | $ 115,640 | $ 153,944 |
| PNE Energy Supply, LLC | $ - | $ 257 | $ - | $ - | $ - | $ 257 |
| Smart Energy Holdings, LLC | $ 40,143 | $ 4,290 | $ - | $ - | $ 5,852 | $ 50,285 |
| South Jersey Energy Company | $ - | $ 14,592 | $ - | $ - | $ 19,908 | $ 34,500 |
| Summer Energy Northeast | $ 4,014 | $ 7,938 | $ - | $ - | $ 336 | $ 12,288 |
| Texas Retail Energy | $ - | $ 27,925 | $ 396 | $ - | $ 38,024 | $ 66,345 |
| Think Energy (ENGIE Retail, LLC) | $ - | $ 6,525 | $ - | $ - | $ 9,016 | $ 15,541 |
| Town Square Energy, LLC | $ - | $ - | $ - | $ - | $ - | $ - |
| TransCanada Power Marketing, Ltd. | $ - | $ 16,390 | $ - | $ - | $ - | $ 16,390 |
| Xoom Energy New Hampshire, LLC | $ - | $ - | $ - | $ - | $ - | $ - |
| **CEPS Subtotal** | **$ 47,662** | **$ 1,299,247** | **$ 2,884** | **$ -** | **$ 879,088** | **$ 2,228,881** |
| **Totals** | **$ 47,662** | **$ 1,611,766** | **$ 2,884** | **$ -** | **$ 939,120** | **$ 2,601,432** |

*Agera Energy LLC submitted the E-2500 as required but has not yet paid ACP amounts owed. Collection activities are in progress.

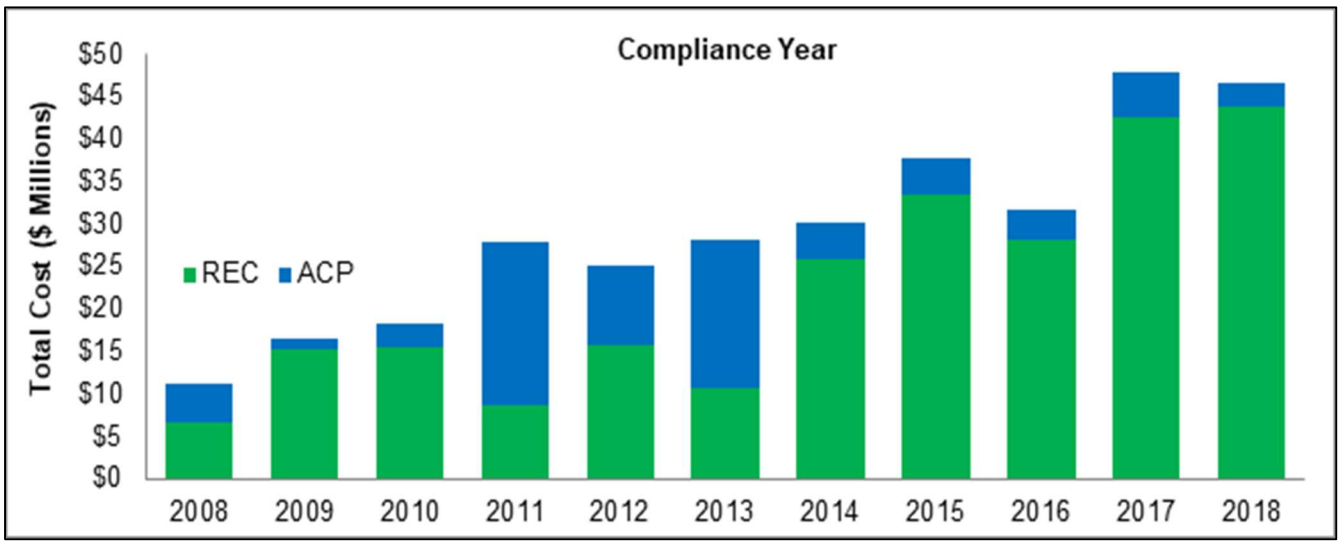
## RPS Compliance Costs

The RPS is a market-based policy where RECs are 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 suppliers 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 CY 2018 RPS compliance costs is $0.0043 per kWh. As the tables illustrate, ACPs have generally declined while REC purchases have increased in recent years. Between calendar year 2008 and 2018, the annual RPS obligation has increased from 4% to 18.7%.

### 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 |
| **2018** | **18.70%** | **$ 43.9** | **$ 2.6** | **$ 46.5** | **$ 0.0043** |
| Totals | | $ 246.2 | $ 74.3 | $ 320.5 | |

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



## REC Purchases

In accordance with RSA 362-F:8, IV, the annual REF report includes the number of RECs that were purchased during the prior compliance year by RPS class. 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 supplier's RPS requirements for a given class obligation.

Table 5 below presents the quantity of RECs purchased during calendar year 2018.

### Table 5: RECs Purchased During 2018 by Class

| Class I Non-thermal | Class I Thermal | Class II | Class III | Class IV | Total |
|---|---|---|---|---|---|
| 691,209 | 62,254 | 18,193 | 789,859 | 127,253 | 1,688,768 |

## Administrative Costs

Administrative costs are estimated during the state biennium budget process and include, for example, personnel, consultants, and industry-related 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 are provided in Table 6.

### Table 6: Budgeted and Actual Administrative Costs by Fiscal Year

| Fiscal Year | Biennium Budget | Actual | Difference |
|---|---|---|---|
| 2018 | $ 894,835 | $ 683,341 | $ 211,494 |
| 2019 | $ 916,102 | $ 696,411 | $ 219,691 |
| 2020 | $ 768,750 | | |

# 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 grant 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<br><br>(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<br><br>(*Effective January 2, 2018*) | RSA 362-F:10, V<br><br>July 2009<br><br>*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/hour or greater | $1,500, $1,700, or $1,900 depending on system capacity | RSA 362-F:10, VIII<br><br>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.<br><br>The program also provides a supplemental adder of $100 per ton for fuel storage systems larger than the 3 ton minimum requirement, up to a maximum of $500. | RSA 362-F:10, VIII<br><br>April 2010<br><br>*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) 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:<br>• $0.40/watt (lower of AC and DC) for new solar electric facilities<br>• Up to a maximum rebate of $50,000<br>• Expansions to existing solar systems are not eligible<br><br>Incentive levels for solar thermal systems are as follows:<br>• $0.12/rated or modeled kBtu/year for new solar thermal facilities fifteen collectors in size or fewer;<br>• $0.07/rated or modeled kBtu/year for new solar thermal facilities greater than fifteen collectors in size; and<br>• Expansions to existing solar systems are not eligible | RSA 362-F:10, VIII<br><br>October 2010<br><br>*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 MMBtus/hour 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.<br><br>(*Effective July 9, 2016*) | RSA 362-F:10, VIII<br><br>December 2013<br><br>*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. On July 3, 2019 the commercial and industrial solar rebate program was closed to new applications with a waitlist totaling approximately $20,000. Specific program results for the REF rebate programs in FY19 are summarized in Table 8.

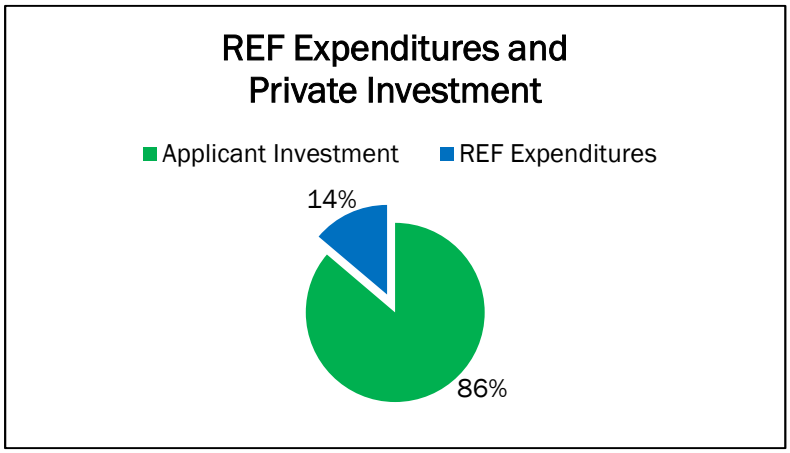
### Table 8: REF Rebate Program Results for Fiscal Year 2019

| REF Rebate Program | Number of Applications Received | Number Rebates Awarded | Rebate Funds Disbursed | Average Rebate Award |
|---|---|---|---|---|
| Residential Electrical Renewable Energy (PV and Wind) | 847 | 630 | $649,594 | $1,031 |
| Residential Solar Water Heating | 0 | 0 | $0 | $0 |
| Residential Wood Pellet Furnace/Boiler | 31 | 24 | $224,497 | $9,354 |
| C&I Solar Technologies (Electric and Thermal) | 102 | 71 | $1,685,497 | $23,739 |
| C&I Wood Pellet Furnace/Boiler | 7 | 4 | $151,671 | $37,918 |
| **Totals** | **987** | **729** | **$2,711,259** | **n/a** |

Cumulative results for the rebate programs, since their inception through June 30, 2019, 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, 2019

| REF Rebate Program | Number of Applications Received | Number of Rebates Awarded | Rebate Funds Reserved or In-Process | Rebate Funds Disbursed | Aggregate Applicant Investment *(rounded to nearest thousand)* | Total Capacity of Incentivized Systems |
|---|---|---|---|---|---|---|
| Residential Electrical Renewable Energy (PV and Wind) | 5,906 | 5,278 | $ 515,499 | $ 14,797,810 | $ 137,726,000 | 36.4 MW DC |
| Residential Solar Water Heating | 510 | 494 | $ 0 | $ 1,008,100 | $ 3,292,000 | 0.92 MMBtu/hr |
| Residential Wood Pellet Boiler/Furnace | 412 | 374 | $ 128,167 | $ 2,417,195 | $ 6,106,000 | 35.4 MMBtu/hr |
| C & I Solar Technologies (Electric and Thermal) | 850 | 541 | $ 2,005,763 | $ 12,928,762 | $ 52,761,000 | 24 MW DC |
| C&I Wood Pellet Boiler/Furnace | 82 | 56 | $ 279,087 | $ 1,816,842 | $ 5,899,000 | 26.7 MMBtu/hr |
| **Totals** | **7,760** | **6,743** | **$ 2,928,516** | **$ 32,968,709** | **$ 205,784,000** | **n/a** |



## Non-Residential (C&I) Competitive Grant Program

RSA 362-F:10, XI requires the Commission to issue an annual RFP for non-residential (C&I) 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 1, 2018, stating that the RFP program had $1,000,000 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 would qualify to generate Class I, Class I Thermal, or Class IV Renewable Energy Certificates were eligible to apply. Three grant proposals were received by the Commission. These proposals represented approximately $7.8 million of total investment and requested $1.45 million in grant funds. The Commission recommended, and the Governor and Executive Council approved, two grant awards totaling $950,000.[10] Once installed and certified, these projects are estimated to create approximately 20,000 Class I Thermal RECs annually. A complete list of grants awarded in FY19 is shown in Table 10.

### Table 10: REF Competitive Grants Awarded in Fiscal Year 2019

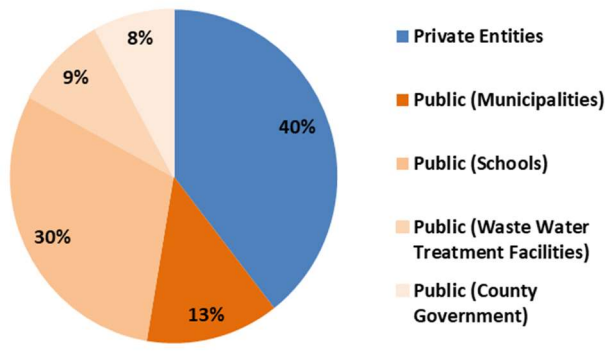
| Grantee | Technology | Project Description | Total Project Costs | Leveraged Funds | Grant Amount | Estimated Annual RECs |
|---|---|---|---|---|---|---|
| Burgess Biopower, LLC | Biomass Thermal Heat Recovery | Install a heat recovery system at existing biomass electric generator with useful thermal energy to be used for greenhouse operations | $ 4,000,000 | $ 3,500,000 | $ 500,000 | 15,371 Class I Thermal |
| Froling, LLC | Biomass Thermal Heating & Electric Generation | Install a wood chip steam boiler for process heat and co-generation at Froling chip processing facility | $ 1,077,300 | $ 627,300 | $ 450,000 | 4,421 Class I Thermal |
| **Totals** | | | **$ 5,077,300** | **$ 4,127,300** | **$ 950,000** | **19,792 Class I Thermal** |

[10] See sos.nh.gov/nhsos_content.aspx?id=8589988964, Governor and Executive Council agenda items #51 and #51A.

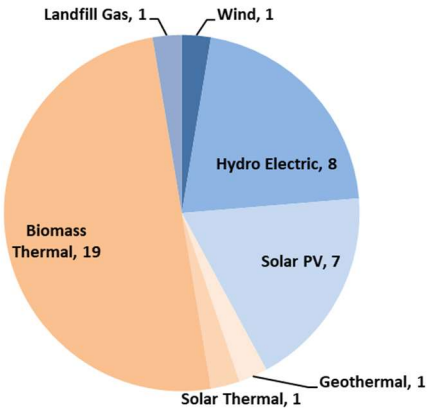
Table 11 and the subsequent charts summarize all grant awards since program inception.

## Table 11: REF Competitive Grant Program Summary

| Year | Number of Grants Awarded | Total Grant Amount | Total Value of Projects |
|---|---|---|---|
| **2011** | 4 | $ 467,890 | $ 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** | 3 | $ 825,000 | $ 2,327,000 |
| **2016** | 6 | $ 1,272,425 | $ 6,106,790 |
| **2017** | 3 | $ 895,000 | $ 2,425,000 |
| **2018** | 2 | $ 950,000 | $ 5,077,300 |
| **Totals** | **38** | **$ 10,810,154** | **$ 57,824,742** |




**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 2019

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 and became operational in late 2018, in time for the 2018-2019 heating season. During its first heating season, the boiler operated from October through the end of April, and burned approximately 800 tons of processed dry chips (PDCs) purchased from a New Hampshire supplier. The PDCs are stored in a newly constructed building (shown below) which is attached to the boiler room. The project produced nearly 2,000 Class I Thermal RECs during its first year of operation.

**From Construction**

**To Completion**

## 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 three 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.

Mascoma Meadows Community Solar

Based on multiple stakeholder meetings and direct public comment, the Commission issued Order No. 26,214 which approved the use of competitive solicitations to select projects to be funded by the Renewable Energy Fund Low and Moderate Income program in FY19 and FY20, and found that "implementation of the REF LMI program through the issuance of an annual RFP represents a reasonable and appropriate means of meeting the statutory requirements of SB 129." Further, "the RFP approach should permit review and evaluation of data from multiple project models, and potentially facilitate the implementation of an alternative program in future years." [11]

The Commission issued an RFP in February 2019 for Community Solar Photovoltaic Projects Providing Direct Benefits to Low and Moderate Income Residential Electric Customers, stating that the LMI program had $650,000 in available grant funds. Four grant proposals were received by the Commission representing $1.3 million of total investment, and requesting $700,000 in grant funds. The Commission recommended, and the Governor and Executive Council approved,[12] three grant awards totaling $500,000. Once installed, these projects will provide direct benefit to 62 LMI families. Table 12 on the next page provides a list of LMI grants awarded in FY19.

[11] See puc.nh.gov/Regulatory/Orders/2019Orders/26214e.pdf, Order No. 26,214, Docket DE 17-172.

[12] See sos.nh.gov/nhsos_content.aspx?id=8589988964, Governor and Executive Council agenda items #49, #50 and #51B.

### Table 12: REF Low-Moderate Income Grants Awarded in Fiscal Year 2019

| Grantee | Town | Total Project Costs | Grant Funding | Total Projected Annual Benefits to LMI | LMI Participant Households |
|---|---|---|---|---|---|
| **Laconia Area Land Trust Inc., d/b/a Lakes Region Community Developers** | Laconia | $ 269,461 | $ 150,000 | $ 5,076 | 12 |
| **Gaslight Village Cooperative** | Tilton | $ 296,833 | $ 150,000 | $ 8,700 | 29 |
| **White Rock Cooperative Estates** | Tilton | $ 201,798 | $ 200,000 | $ 9,324 | 21 |
| **Totals** | | **$ 768,092** | **$ 500,000** | **$ 23,100** | **62** |

The three selected projects each use a different program model. Through follow up reporting from grant recipients, the Commission will gain insight into the implementation and effectiveness of each program model. As necessary and appropriate, data from these projects will be used to further refine future LMI program offerings.

### 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 community housing. In 2016, LRCD received a grant to conduct a solar feasibility study of their affordable rental housing portfolio. Of the fifty buildings analyzed, six of LRCD's Pine Hill properties in Laconia were determined to be the most feasible for a roof-mounted solar PV system. The Pine Hill Solar project consists of the installation of roof-mounted PV systems on these six buildings, each with two units with between two and four bedrooms. The energy generated from the PV systems on each building will power the units in that building. Before program implementation, residents paid their own electrical costs. Under this program, LRCD will increase monthly tenant rent by a nominal amount of $20 to cover debt service costs and will assume full responsibility of the twelve residents' electric bills. As tenants' electric bills were regularly over $20, this will provide the LMI residents with net positive monthly savings and will not impact their eligibility for other assistance programs.

### Gaslight Village Cooperative

The Gaslight Village Cooperative Estates, Inc. program model is structured to maximize direct benefits to LMI ROC residents through a power purchase agreement. The project developer will design, build, and own the community solar project for at least the first five years, allowing the investor to leverage federal and state tax benefits to lower the overall cost of the project. Direct financing for the project during the first five years is

structured as a power purchase agreement through which the ROC residents are able to purchase electricity at a rate of $ 0.0530 per kilowatt-hour for the first two years. After two years, the energy rate will increase by 2% annually. After five years, the ROC may purchase the project at fair market value, using low interest financing from the New Hampshire Community Loan Fund. ROC ownership would provide additional benefits to the LMI residents, including renewable energy certificate ownership and maximum compensation for energy produced.

Under New Hampshire's Group Net Metering program, the ROC will also 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.

### White Rock Cooperative Estates

The White Rock Cooperative Estates program model is structured to maximize direct benefits to LMI ROC residents by providing direct ownership of the solar PV. The project developer will design and build the community solar project. Grant funds will be used to purchase the solar array, allowing the ROC to own the array outright and immediately receive maximum direct benefits from the energy generation. Direct ROC ownership will provide additional benefits to the LMI residents, including renewable energy certificate ownership and maximum compensation for energy produced.

Under New Hampshire's Group Net Metering program, the ROC will qualify as a "host" and receive monetary compensation for all energy generated. 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.

## Budgets, Expenditures, and Statutory Funding Requirements

Table 13 below summarizes the REF funds available for grant and rebate programs in FY20, net of transfers, administrative costs, and funds previously committed.

### Table 13: Analysis of Funds for Fiscal Year 2020

| Funding Analysis | |
|---|---|
| Renewable Energy Fund Balance as of June 30, 2019 | $6,410,212 |
| Calendar Year 2017 ACP received in Fiscal Year 2019 | $1,744,951 |
| Calendar Year 2017 ACP received in Fiscal Year 2020 (FY20)[13] | $852,000 |
| ACP Compliance Adjustments | ($9,227) |
| FY19 Balance Forward for Admin Expenses | ($5,324) |
| Reimbursement from Tri-County Community Action Agency | $323,052 |
| Reimbursement from Site Evaluation Committee | $100,434 |
| Interest Earned (July 1, 2017 through June 30, 2109) | $611,883 |
| **Fiscal Year 2020 Beginning REF Balance** | **$10,027,981** |
| Carry Forward Rebate and Grant Program Funds Committed in Prior Fiscal Years | ($2,907,616) |
| Carry Forward for Grants Encumbered and to be Encumbered (FY18 and FY19) | ($2,145,000) |
| **Fiscal Year 2019 Funds Available for Rebate and Grant Programs** (FY20 Appropriation Adjusted for Administrative Costs[14]) | **$4,206,615** |

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

| Fiscal Year 2020 Program Funding Allocations by Sector | |
|---|---|
| **FY20 Funds Available for Rebate and Grant Programs** | **$4,206,615** |
| FY20 Funds allocated to Residential Sector (42%) | $1,766,778 |
| FY20 Funds allocated to Commercial & Industrial (non-residential) Sector (58%) | $2,439,837 |

[13] Mint Energy, LLC's ACP of $13,708 was received in September 2019 but is not reflected in Table 13.

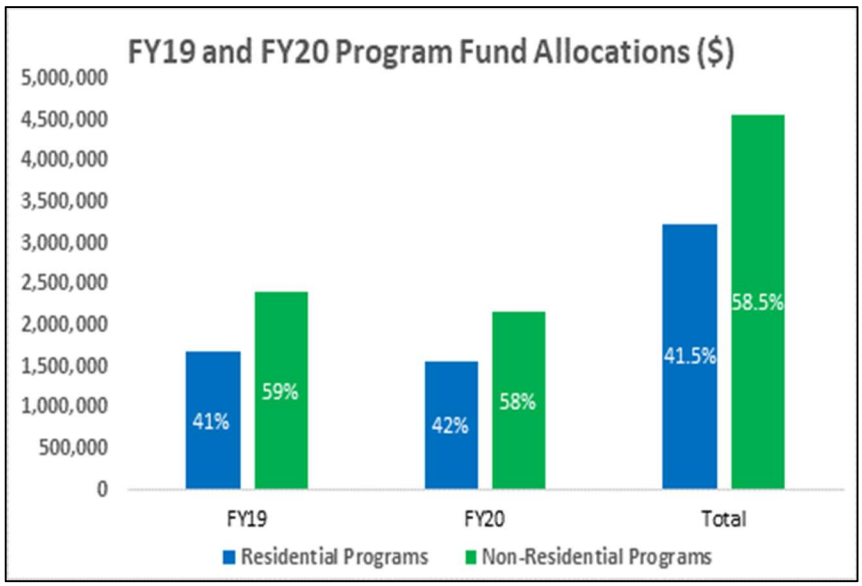
[14] FY20 administrative costs were estimated during the State Biennium Budget process and include, e.g., personnel, consultants, industry-related dues, and other overhead such as rent, telephone, and technology.

## Allocation of Funding Between Residential and Non-residential Sectors

In 2010, the New Hampshire Legislature required the Commission to 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 requirement was modified such that the Commission must reasonably balance the amounts expended, allocated, or obligated during each two-year period.[15]

In FY19, the first year of the two-year period, new revenues deposited into the REF consisted 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 (C&I) 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.

In FY20, the second year of the two-year period, new revenues deposited into the REF consisted of ACP revenues, reimbursement from Tri-County Community Action Agency, reimbursement from the Site Evaluation Committee, and interest earned (July 2017 through June 2019). In 2018, retail electricity sales for the residential sector represented 42% of the total retail sales, while sales or the non-residential (C&I) sector accounted for 58% of total retail sales. Accordingly, based on these percentages, the new revenues (less ACP adjustments, existing program reservations and administrative cost) were allocated as follows: Residential Programs, $1,564,118, or 42% of allocated funds; Non-Residential (C&I) Programs, $2,159,973, or 58% of allocated funds.




The allocation of funds, over two-years, was budgeted as follows: Residential Programs, $3,237,823, or 41.5% of allocated funds; Non-Residential (C&I) Programs, $4,568,476, or 58.5% of allocated funds.

[15] See RSA 362-F:10, X.

## 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 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 FY19, the first year of the two-year period, the Commission allocated $612,000, not including carry-forward funds, for the above-referenced residential renewable energy rebate program. This amount represents approximately 24% of available REF program funds (i.e. ACP revenue) for FY19, below the applicable biennial cap of 40%.

In FY20, the second year of the two-year period, the Commission allocated approximately $668,000, not including carry-forward funds, for the above-referenced residential renewable energy rebate program. This amount represents approximately 26% of available REF program funds (i.e. ACP revenue) for FY20, 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 CY18, Class II ACPs equaled $2,884. FY20 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 FY20, $600,000 was allocated to the LMI program. This equated to approximately 16% of 2018 REF revenues.

In FY19, $150,000 of the funds allocated to the LMI program remained unspent, and unencumbered. These funds carried forward to FY20 and will be added to the newly allocated LMI program funds. The total budget for the LMI grant program will equal $750,000 in FY20.

# Net Metered Capacity, Net Metered Facilities and Group Net Metering

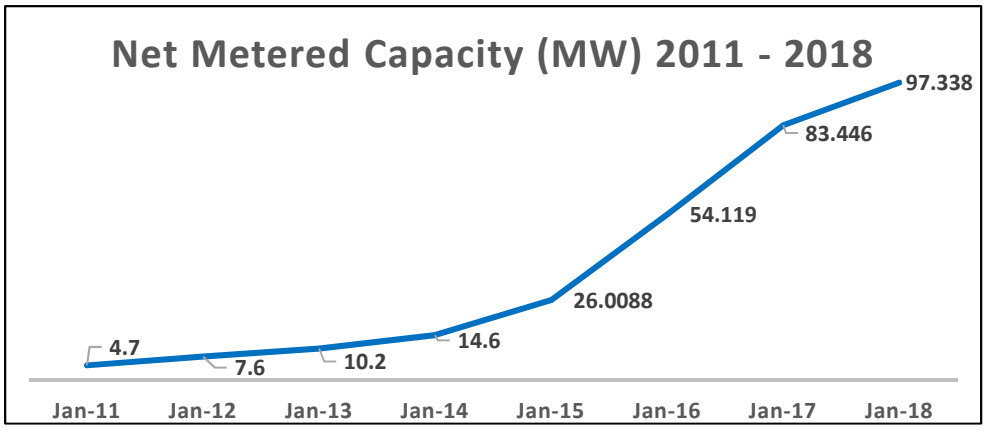
## Net Metered Facilities

Each utility's total installed capacity of net metered facilities is listed in Table 14. The facility data includes PV, small wind, and small hydroelectric net metered installations.

### Table 14: Total Net Metered Facilities as of December 31, 2018

| Electric Distribution Utility | Total Installs in CY2018 | Total Installs (End of CY2018)[16] | CY2018 Capacity Added (MW) | Total Capacity (End of CY2018)[17] |
|---|---|---|---|---|
| Liberty Utilities | 69 | 498 | 1.346 | 5.700 |
| New Hampshire Electric Cooperative | 144 | 1,031 | .714 | 8.269 |
| Eversource Energy | 711 | 6,064 | 10.432 | 75.189 |
| Unitil Energy Systems, Inc. | 82 | 839 | 1.4 | 8.18 |
| **Total Net Metered Facilities** | **1,006** | **8,432** | **13.892** | **97.338** |

The chart below illustrates the historic trend of installed net metered capacity in New Hampshire starting in January 2011 through December 2018. Overall, at the end of 2018, the total installed net metered capacity was 97.338 MW with 13.897 MW being added or installed in 2018.




[16] Based on the utility reports to DOE (EIA Form 861M (formerly Form 826) without adjustment) and includes system expansions.
[17] Based on the utility reports to DOE (EIA Form 861M (formerly Form 826) adjustment) 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 and rules were developed to govern group net metering in section 909 of Puc 900 administrative rules. 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 customers of the same distribution utility. Group net metering applications are reviewed and approved by the Commission.

During the FY18, Senate Bills 321 and 367 (SB 321 and SB 367 respectively) were signed into law. SB 321 allows group hosts and group members to procure energy from a competitive electric power supplier. SB 367 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 in RSA 362-A:9, XIV(a) which required the Commission to review agreements between group hosts and group members.

Table 15 provides information about group net metering applications registered by the Commission in CY18.

### Table 15: Group Net Metering Applications Registered as of December 31, 2018

| Electric Distribution Utility | Total Cumulative Number of Registrations | | Total Cumulative Capacity of Registered Host Installations (Kilowatts AC) | | CY2018 Net Generation By Host (kWh)[18] | CY2018 Total Member Load (excluding Host) (kWh) |
|---|---|---|---|---|---|---|
| | Solar | Hydro | Solar | Hydro | | |
| Eversource Energy | 185 | 31 | 5,841 | 13,108 | 48,512,962 | 53,838,211 |
| Liberty Utilities | 17 | -- | 634.55 | -- | 330,861 | 555,854 |
| New Hampshire Electric Cooperative | 11 | -- | 297 | -- | 218,223 | 714,675 |
| Unitil Energy Systems, Inc. | 19 | -- | 394 | -- | 282,588 | 494,898 |
| **Totals** | **232** | **31** | **7,167** | **13,108** | **49,344,634** | **55,603,638** |

[18] "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. The Renewable Energy Fund has been utilized to fund over 7,600 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 almost $11 million in funding for 39 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 $270 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 supply, reduce our reliance on fossil fuels, reduce greenhouse gas emissions, and increase our energy independence.

FY20 will be challenging for the Commission and its Sustainable Energy Division. Staff continues to monitor industry and renewable energy certificate market trends, and technological developments such as energy storage. With limited funding and continued strong demand for programs, Staff will be considering revisions to current rebate levels and program terms and conditions in 2020. Staff will also work with stakeholders to develop new methods and programs to support the renewable energy industry and incentivize renewable energy system installations. To make less funding go further, Staff will investigate the development of financial mechanisms such as loan loss reserves and interest rate buy-downs.

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.

**With limited funding and continued strong demand for programs, Staff will be considering revisions to current rebate levels and program terms and conditions in 2020. Staff will also work with stakeholders to develop new methods and programs to support the renewable energy industry**

**….**

**To make less funding go further, Staff will investigate the development of financial mechanisms such as loan loss reserves and interest rate buy-downs.**

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