

New Hampshire Public Utilities Commission



NEW HAMPSHIRE RENEWABLE ENERGY FUND

ANNUAL REPORT

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THE LEGISLATIVE OVERSIGHT COMMITTEE
ON ELECTRIC UTILITY RESTRUCTURING

Representative Herbert Richardson, Chair

THE SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

Senator Jeb Bradley, Chair

THE HOUSE SCIENCE, TECHNOLOGY AND ENERGY COMMITTEE

Representative Robert Introne, Chair

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Executive Summary

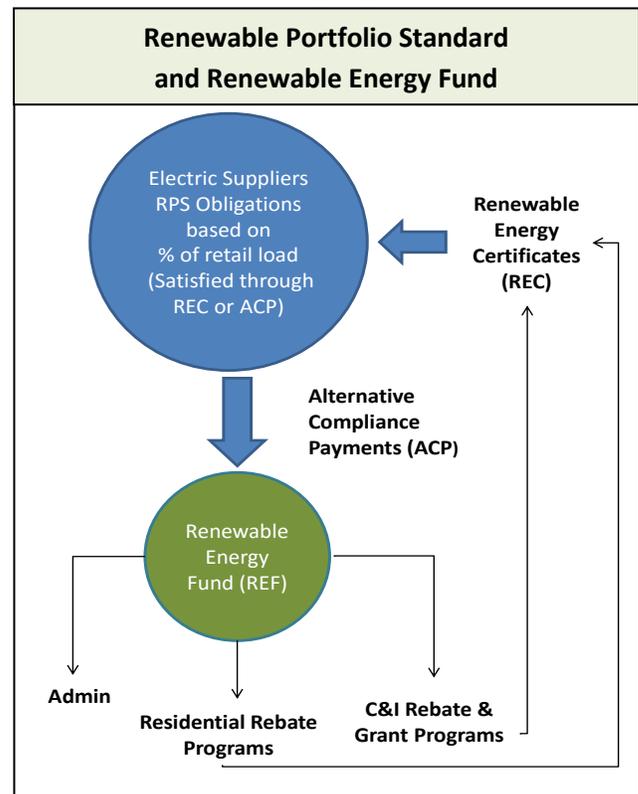
The New Hampshire Renewable Energy Fund Annual Report provides an overview of the Renewable Energy Fund, established pursuant to RSA 362-F, New Hampshire’s Renewable Portfolio Standard law, and managed by the Public Utilities Commission. It also addresses renewable energy facilities whose electricity production is net metered or group net metered. The report is filed annually to the Legislative Oversight Committee on Electric Utility Restructuring, the Senate Energy and Natural Resources Committee and the House Science, Technology and Energy Committee by October 1st.

Renewable Portfolio Standard Policy in New Hampshire

New Hampshire’s Renewable Portfolio Standard (RPS) statute establishes the renewable energy policy for the state. Renewable energy comes from an energy source that is rapidly replaced or renewed through a natural process. Common renewable energy sources are solar, wind, hydropower, biomass, and geothermal. These energy sources provide a sustainable, affordable, and relatively unlimited power supply. Renewable energy enables New Hampshire municipalities, schools, businesses, and residents to realize economic and energy security benefits. The industries associated with designing, building and installing these systems increase economic activity in the state.

Renewable energy generation technologies can provide fuel diversity to the state and the New England generation supply through the use of renewable fuels sourced locally, thereby lowering regional dependence on fossil fuels. This has the potential to lower and stabilize future energy costs by reducing exposure to rising and volatile fossil fuel prices. Usage of local and renewable fuels also allow more energy dollars to be retained in state rather than spent on imported fuels. In addition, employing low emission forms of such technologies can reduce the amount of greenhouse gases, nitrogen oxides, and particulate matter emissions transported into New Hampshire and also generated in the state, thereby improving air quality and public health, and mitigating the risks of climate change.

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



RECs generated in one state may be sold in another provided they are certified in that state. If electricity suppliers 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 Renewable Energy Fund (REF). The REF is a dedicated, non-lapsing fund, the purpose of which is to support electrical and thermal renewable energy initiatives. The Sustainable Energy Division of the Public Utilities Commission administers three residential rebate programs, two commercial and industrial rebate programs and one competitive grant program with funding from the REF. ACPs are the sole source of funding for the REF and fluctuate from year to year, depending on the price and availability of RECs in the regional market (comprising CT, RI, MA, ME, VT and NH).

Fiscal Year 2016 Legislation

Renewable Energy Portfolio Standard Legislation

In 2016, RSA 362-F, the RPS law, was amended through the passage of Senate Bill 386¹ to include the production of biodiesel fuel sold into the thermal energy market as an eligible source for RPS compliance. The legislation further requires the Public Utilities Commission to establish procedures for the metering, verification, and reporting of useful thermal energy output for producers of biodiesel fuel no later than December 31, 2017. The RECs associated with the production of biodiesel fuel by any facility in New Hampshire may be used to meet no more than one-eighth of a supplier's non-thermal Class I requirements in any given year, provided all applicable air emission and water discharge standards are met by the facility producing the biodiesel fuel. The facility producing the biodiesel fuel will need to document the sale of the biodiesel fuel into the thermal energy market, provide documentation of end-user efficiency rating, or where such documentation is not practicable, assume the average end-user efficiency rating by customer class.

Net Metering Legislation

New Hampshire's net metering policy (RSA 362-A:9) provides a compensation mechanism for the electricity generated "behind the meter" by solar (PV) and other interconnected electric renewable systems. Under net metering, when a system produces more electricity than the facility is using, the excess electricity flows back onto the grid. This effectively reverses the direction of the meter, "netting out" that production so the customer-generator's overall kilowatt hour usage is lower at the end of the billing cycle. If the usage in the cycle is negative, the customer gets a bill credit that can be carried forward to future billing cycles.

The original statute set a total of 50 megawatts (MW) for the rated generating capacity owned or operated by eligible customer-generators for net metering. To determine individual utility caps, the 50 MW was multiplied by each utility's percentage share of the total 2010 annual coincident peak energy demand. In fiscal year 2015, the New Hampshire Electric Cooperative reached its net metering capacity as prescribed by statute and implemented new "Above the Cap" Net Metering Export Rates. Early in fiscal year 2016, Liberty Utilities and Eversource Energy saw their respective net metering interconnection application queue reach their net metered capacity allocation. Throughout 2016, Unitil Energy Systems, Inc.'s, net metering interconnection application

¹ Senate Bill 386 http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2016&id=1135&txtFormat=pdf&v=current

queue continued to grow and approach its net metering capacity allocation. Both Eversource Energy and Liberty Utilities decided to continue to interconnect renewable systems but established waitlists for net metering. Customers who chose to move forward and interconnect while waitlisted were able to offset their energy usage with the energy their system produced, but they did not receive compensation for any excess production.

In response to the utilities reaching or nearing their queue allocations, both the House and the Senate introduced bills relative to net energy metering. In May of 2016, Governor Hassan signed into law House Bill 1116². This bill amended the State's net metering statute by increasing the net metering cap to 100 MW, which provided an additional 50 MW of capacity to Eversource Energy, Liberty Utilities and Unitil Energy Systems. It 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. The purpose of HB 1116 is

“[to] meet the objectives of electric industry restructuring pursuant to RSA 374-F, including the overall goal of developing competitive markets and customer choice to reduce costs for all customers, and the purposes of RSA 362-A and RSA 362-F to promote energy independence and local renewable energy resources, the general court finds that it is in the public interest to continue to provide reasonable opportunities for electric customers to invest in and interconnect customer-generator facilities and receive fair compensation for such locally produced power while ensuring costs and benefits are fairly and transparently allocated among all customers. The general court continues to promote a balanced energy policy that supports economic growth and promotes energy diversity, independence, reliability, efficiency, regulatory predictability, environmental benefits, a fair allocation of costs and benefits, and a modern and flexible electric grid that provides benefits for all ratepayers. “

An order of notice was issued to initiate the proceeding directed by HB 1116 on May 19, 2016, and the Commission held a pre-hearing conference on June 10, 2016. The proceeding is under way and, as required by statute, a final order is expected no later than March 3, 2017. It is important to note that New Hampshire Electric Cooperative (NHEC) is not a party to the proceeding. As a rural electric cooperative with a certificate of deregulation on file with the Commission in accordance with 362:2 II, NHEC determines the rates which apply to its members and has already developed and implemented a net metering tariff for interconnected customer-generators over the cap.

Renewable Energy Programs

Fiscal year 2016 was a year of continued expansion and increased demand across the solar PV incentive programs and the grant program. The Commission, with stakeholder input, reduced the incentive levels for both the Commercial and Industrial (C&I) and Residential Solar Rebate programs. Even with the lower incentive levels, overall demand for residential and commercial-scale PV projects continued to remain strong and increased again this year. As the charts and tables in the body of the report illustrate, available fiscal year funding was almost fully reserved for qualified projects in all rebate programs. However, because the

² House Bill 1116 http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2016&id=293&txtFormat=pdf&v=current

construction cycle for larger C&I projects is long (on average, approximately one year), the REF is carrying forward a balance of reserved/encumbered funds. The expectation is these projects will be built and become operational in the upcoming fiscal year.

The Commission issued the annual Request for Proposals (RFP) on September 25, 2015, for non-residential renewable energy projects located in New Hampshire and eligible to generate Class I, Class I Thermal, or Class IV renewable energy certificates. The Commission received eight proposals requesting a total of \$3.2 million in grant funds for projects with a combined estimated project value of \$8.9 million. Proposed projects included a variety of technologies: biomass for schools, hydro-electric facility expansions and redevelopment, and varied projects using



Steels Pond Hydro – FY14 Grant Recipient

biomass and steam generated from landfill gas. Four projects were selected to receive a total of \$1,025,000 in this funding round and grant contracts were presented to and approved by the Governor and Executive Council.

Conversely, demand for the biomass pellet boiler/furnace programs decreased due to low oil and propane prices. The continued growth and stability of the pellet industry in New Hampshire depends, in part, on the pellet rebate programs, which are necessary for the industry to grow and build its distribution networks. As a result of the program's performance, the Commission took input from stakeholders and increased the incentive levels of the Wood Pellet Furnace and Boiler programs from 30% of eligible project costs to 40%, up to a maximum \$10,000 for residential installations and \$65,000 for commercial-industrial installations. The following additional rebates are also available in the commercial and industrial program:

- 30% of a thermal storage tank and related components costs, up to \$5,000
- \$5,000 if a meter is installed to track generation for RECs

To encourage larger and more economical pellet deliveries, the residential program now 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 increased incentive levels and rebate adders became effective on July 9, 2016, and the Commission expects to see an increase in demand for the programs in fiscal year 2017.

Finally, the Commission entered into an agreement with the Department of Administrative Services (DAS) to fund the installation, commissioning and operation of a photovoltaic (PV) solar energy system associated with the Department of Motor Vehicles Contingent Project, which was approved at the February 11, 2015, Governor and Executive Council meeting (Item #56). The PV system located on the Department of Motor Vehicles building in the Hazen Drive Complex in Concord will generate renewable electricity for facilities connected to the Hazen Drive master meter. The system is expected to generate approximately 10% of the building's annual electricity usage. The renewable attributes of the project will be used by the State to meet its goal of reducing fossil-fuel use in state facilities by 30 percent over 2005 levels by 2020³.

³ Executive Order 2016-3 <http://sos.nh.gov/ExecOrdersHassan.aspx>

Outlook for Fiscal Year 2017

Fiscal year 2017 will be busy and challenging for the Commission and its Sustainable Energy Division. With continued strong demand in the solar market and hydro-electric facilities participating in net metering, the utilities' queues for net metering lengthened and, in the case of the large-scale project queue, the amended net metering allocation cap has already been exceeded. A proceeding is currently underway at the Commission to evaluate and establish new alternative net metering tariffs for customer-generator projects under one-megawatt in capacity with a final order expected by March 3, 2017.

Alternative compliance payments were basically level with last year's payments at approximately four million dollars limiting the funding available for the rebate and grant programs. With level funding and continued strong demand for programs, the fiscal year 2017 grant offering will focus solely on thermal and hydro projects that create Class I, Class I-Thermal, or 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 fund and manage its program to ensure funds are properly allocated, and applications and deadlines are met to ensure projects move from approval to completion as efficiently and quickly as possible.

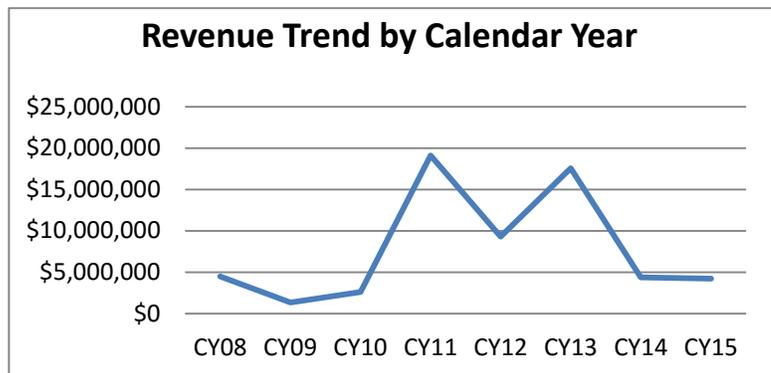
I. Revenues and Administrative Costs

Revenues

Alternative compliance payments (ACPs) from electricity suppliers are made annually by July 1, for the prior calendar year. Thus, ACPs for calendar year 2015 were to be paid by July 1, 2016. Entities paying ACPs include New Hampshire’s electric utilities as well as competitive electric power suppliers. ACPs are paid to the Renewable Energy Fund (REF) and are the fund’s sole source of revenue.

Table 1 – ACP Revenues and Trend Graph by Calendar Year

| ACP Paid by July 1 st for Calendar Year | Amount |
|--|--------------|
| July 2009 for CY 2008 | \$ 4,483,917 |
| July 2010 for CY 2009 | \$ 1,348,294 |
| July 2011 for CY 2010 | \$ 2,625,499 |
| July 2012 for CY 2011 | \$19,121,853 |
| July 2013 for CY 2012 | \$9,323,198 |
| July 2014 for CY 2013 | \$17,458,196 |
| July 2015 for CY 2014 | \$4,406,804 |
| July 2016 for CY 2015 | \$4,224,339 |



Revenues by RPS Class

As designed, the ACP funding to the REF is expected to, and does, fluctuate over time. Calendar year 2015 saw a slight reduction in total ACPs. ACP revenues in 2016 (for compliance year 2015) were \$4,224,339, as compared to the prior year’s revenue of \$4,406,804.

A year-to-year comparison of ACP revenues by RPS Class follows along with discussions of possible market conditions contributing to the 2015 ACP revenues.

New Hampshire RPS Classes Resource Definitions*

Class I (New) production of electricity or useful thermal energy from any of the following, provided the source began operation after January 1, 2006, except as noted: wind energy; geothermal energy (after 1/1/2013); hydrogen derived from biomass fuel or methane gas; ocean thermal, wave, current, or tidal energy; methane gas; or eligible biomass technologies; solar thermal energy (after 1/1/2013).

Class II sources include generation facilities that produce electricity from solar technologies and began operation after January 1, 2006.

Class III sources include generation facilities that began operation on or before January 1, 2006 and produce electricity from eligible biomass technologies having a gross nameplate capacity of 25 megawatts or less, or methane gas facilities.

Class IV sources include hydroelectric generation facilities that began operation on or before January 1, 2006 and meet specified requirements.

*refer to RSA 362-F for specific details

Class I & Class I Thermal - New Production of Electricity or Useful Thermal ACPs

ACPs for Class I decreased from \$67,994 for calendar year (CY) 2014 to \$18,676 for CY 2015 even with an increased obligation requirement of 6% versus 5% for calendar year 2014. This may be due in part to more facilities becoming certified to produce renewable energy credits (RECs). 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 a provider of electricity may take for Class I based on the capacity of customer-sited sources that are net metered and are not certified to create Class I renewable energy certificates. For calendar year 2015, the credit for Class I was 0.0062% (total obligation 6.00%). At the time of its renewable portfolio standard 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 carve-out were \$1,204,232 for CY 2015 compared to \$822,480 for CY 2014. This may be due in part to the increased obligation for Class I Thermal of 0.4% to 0.6%. The Commission continues to modify programs and target the competitive grant program toward the development of projects which generate thermal RECs.

Class II - Solar Electric ACPs

Solar installations and Class II REC certified facilities increased in 2015 thereby reducing ACP revenues for Class II from \$743,674 (CY 2014) to \$499,299 (CY 2015). The reduction in ACPs may be due in part to the significant increase in solar PV installations and a credit for Class II net metering similar to that described above for Class I. For calendar year 2015, the credit for Class II was 0.1784% (total obligation 0.30%) which an electricity provider may claim at the time of its renewable portfolio standard compliance filing.

Class III – Biomass Electric Technologies (Prior to January 1, 2006) ACPs

Class III revenues decreased from \$1,703,816 (CY 2014) to \$174,240 (CY 2015) due to the reduction in the 2015 Class III REC requirement and the fact that the NH Class III ACP rate in 2015 was closer to that of other New England states.

Recent changes in the Class III obligations, reducing requirements for 2014 from 3.0% to 0.5% of an electricity supplier's retail sales, and for 2015 from 8.0% to 0.5% of an electricity supplier's retail sales, were made to prevent a substantial shortfall of Class III RECs for 2014 and 2015 and significantly higher ACPs, the cost of which would ultimately be borne by New Hampshire ratepayers. The Commission also changed the Class III obligations for calendar year 2016⁴, maintaining the requirement at the current level of 0.5% of retail sales for 2016 as there has been no significant change in the Class III REC market in New England. Because the New Hampshire RPS law operates in conjunction with the regional REC market operated through the New England Power Pool Generation Information System, New Hampshire eligible facilities may certify and sell their RECs in other states. In recent years, New Hampshire facilities producing Class III RECs have been able to sell the RECs they produce at a higher price in Connecticut and Massachusetts than in New Hampshire, a situation that is likely to continue

⁴ Docket DE 15-477; [Order No. 25,844](#)

through 2016. In addition, new biomass facilities are not eligible for Class III certification; facilities eligible for Class III RECs must have begun operation prior to January 1, 2006, and produce power from methane gas or from eligible biomass technologies that have a gross nameplate capacity of 25 megawatts or less.

Class IV – Hydro Electric (Prior to January 1, 2006) ACPs

Class IV revenues increased from \$1,068,840 (CY 2014) to \$2,327,892 (CY 2015). This increase may be due in part to the Class IV obligation requirement increasing from 1.4% in 2014 to 1.5% in 2015 but also because New Hampshire certified facilities can sell RECs in other New England states.

Table 2 lists the utilities and other electricity suppliers that filed compliance reports for calendar year 2015, documents each company's total alternative compliance payments, 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.

Table 2 - ACP Revenue by Supplier and RPS Class for Compliance (Calendar) Year 2015

| Alternative Compliance Payment Revenue by Supplier and RPS Class for Compliance (Calendar) Year 2015 | | | | | | |
|--|------------------|---------------------|-------------------|-------------------|---------------------|---------------------|
| Company | Class I | Class I Thermal | Class II | Class III | Class IV | Total |
| Distribution Utilities | | | | | | |
| Liberty Utilities (Granite State) | \$ - | \$ 70,775 | \$ - | \$ - | \$ - | \$ 70,775 |
| New Hampshire Electric Cooperative | \$ - | \$ - | \$ - | \$ - | \$ 54 | \$ 54 |
| Eversource Energy (PSNH) | \$ - | \$ 392,263 | \$ 199,585 | \$ - | \$ 493,843 | \$ 1,085,691 |
| Unitil Energy Systems, Inc. | \$ - | \$ 11,175 | \$ - | \$ - | \$ - | \$ 11,175 |
| Competitive Suppliers | | | | | | |
| Agera Energy LLC | \$ - | \$ 11,935 | \$ - | \$ - | \$ 32,050 | \$ 43,985 |
| Ambit Energy, L.P. | \$ - | \$ 4,054 | \$ 1,784 | \$ - | \$ 10,892 | \$ 16,730 |
| Consolidated Edison Solutions, Inc. | \$ - | \$ 47,082 | \$ 20,962 | \$ - | \$ 113,876 | \$ 181,920 |
| Constellation Energy Services, Inc. (Integrus Energy) | \$ - | \$ 115,880 | \$ 51,680 | \$ - | \$ 311,321 | \$ 478,881 |
| Constellation New Energy, Inc. | \$ - | \$ 158,856 | \$ 47,555 | \$ - | \$ 334,629 | \$ 541,040 |
| Devonshire (Fidelity) | \$ - | \$ 8,286 | \$ 3,680 | \$ 12,240 | \$ 22,247 | \$ 46,453 |
| Direct Energy Business, LLC | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Direct Energy Business Marketing (Hess) | \$ - | \$ 48,830 | \$ 19,847 | \$ - | \$ 95,496 | \$ 164,173 |
| Direct Energy Services, LLC (First Choice Power) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Ethical Electric, Inc. | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Engie Resources Inc | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| ENH Power | \$ - | \$ 69,938 | \$ 31,164 | \$ - | \$ 187,914 | \$ 289,016 |
| Fairpoint Energy, LLC | \$ - | \$ 8,083 | \$ - | \$ 1,395 | \$ 12,961 | \$ 22,439 |
| First Point Power, LLC | \$ - | \$ 35,755 | \$ 15,945 | \$ - | \$ 96,040 | \$ 147,740 |
| Glacial Energy LLC | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Gulf Oil Limited Partnership | \$ - | \$ 1,470 | \$ - | \$ 2,160 | \$ 3,948 | \$ 7,578 |
| Mega Energy of New Hampshire | \$ - | \$ 3,548 | \$ 1,561 | \$ 5,220 | \$ 9,503 | \$ 19,832 |
| Mint Energy, LLC | \$ - | \$ 2,078 | \$ 948 | \$ 3,060 | \$ 5,555 | \$ 11,641 |
| NextEra Energy Services New Hampshire, LLC | \$ - | \$ 65,453 | \$ 29,213 | \$ 4,995 | \$ 175,879 | \$ 275,540 |
| Noble Americas Energy Solutions, LLC | \$ - | \$ 8,920 | \$ 3,958 | \$ - | \$ 23,935 | \$ 36,813 |
| North American Power and Gas, LLC | \$ - | \$ 46,093 | \$ 20,572 | \$ - | \$ 107,613 | \$ 174,278 |
| PNE Energy Supply, LLC (Power New England) | \$ - | \$ 1,520 | \$ - | \$ 2,250 | \$ 163 | \$ 3,933 |
| Reliant Energy Northeast, LLC | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| REP Energy, LLC | \$ 18,676 | \$ 938 | \$ 446 | \$ 1,395 | \$ 2,532 | \$ 23,987 |
| South Jersey Energy Company | \$ - | \$ 4,789 | \$ 558 | \$ - | \$ 12,853 | \$ 18,200 |
| Texas Retail Energy | \$ - | \$ 14,089 | \$ 6,300 | \$ - | \$ 37,850 | \$ 58,239 |
| Think Energy (Engie Retail, LLC) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Town Square Energy, LLC (Twin Cities Power) | \$ - | \$ 1,166 | \$ 502 | \$ - | \$ - | \$ 1,668 |
| TransCanada Power Marketing, Ltd. | \$ - | \$ 70,344 | \$ 42,649 | \$ 141,525 | \$ 234,260 | \$ 488,778 |
| Xoom Energy New Hampshire, LLC | \$ - | \$ 912 | \$ 390 | \$ - | \$ 2,478 | \$ 3,780 |
| TOTAL | \$ 18,676 | \$ 1,204,232 | \$ 499,299 | \$ 174,240 | \$ 2,327,892 | \$ 4,224,339 |

Notes:

New Hampshire Electric Cooperative used 2,257 of 3,055 Class II 2015 RECs acquired for Class I compliance. The 2015 Class I RECs used as presented above includes the 34,225 Class I plus the 2,257 Class II.

TransCanada Power Marketing, Ltd. had grandfathered sales of 166,238.214 MWh.

Agera Energy LLC transferred 5,877 Class III RECs that were retired in NH, and used them in MA and CT.

Totals may not add due to rounding.

Table 3: Alternative Compliance Payment Rates

In accordance with RSA 362-F:10, III. (a), the ACPs for Class IV are adjusted by the Consumer Price Index and for Classes I and II by ½ of the Consumer Price Index. In accordance with RSA 362-F:10, III. (b), the Class III ACP is \$45 for 2015, 2016, and 2017.

| Inflation Adjusted Alternative Compliance Payment Rates (\$ per Megawatt Hour) | | | | | |
|--|-----------|----------|----------|----------|----------|
| | 2012 | 2013 | 2014 | 2015 | 2016 |
| Class I | \$ 64.02 | \$ 55.00 | \$ 55.37 | \$ 55.75 | \$ 55.72 |
| Class I Thermal | | \$ 25.00 | \$ 25.17 | \$ 25.34 | \$ 25.33 |
| Class II | \$ 168.13 | \$ 55.00 | \$ 55.37 | \$ 55.75 | \$ 55.72 |
| Class III | \$ 31.39 | \$ 31.50 | \$ 31.93 | \$ 45.00 | \$ 45.00 |
| Class IV | \$ 31.39 | \$ 26.50 | \$ 26.86 | \$ 27.23 | \$ 27.20 |

Administrative Costs

REF administrative expenditures cover the cost of managing the various rebate and grant programs, and overseeing the resulting projects funded by the REF. Administrative costs since REF inception are provided in Table 4.

Table 4 – Administrative Costs by Fiscal Year

| Fiscal Year | Appropriation | Actual |
|-------------|---------------|-------------|
| 2010 | \$376,735 | \$217,581* |
| 2011 | \$360,326 | \$226,042* |
| 2012 | \$237,594 | \$224,754* |
| 2013 | \$391,670 | \$369,260 |
| 2014 | \$528,499 | \$522,656** |
| 2015 | \$657,913 | \$596,940 |
| 2016 | \$790,136 | \$612,511 |
| 2017 | \$847,325 | |

* Administrative costs were partially offset during these fiscal years with ARRA funds made available by the New Hampshire Office of Energy and Planning, and the federal Department of Energy.

** Administrative costs increased in FY14, reflecting an increase in the number of rebate programs administered, and a substantial increase in the amount of rebate and grant funds disbursed.

II. Rebate and Grant Program Summaries and Results

Pursuant to RSA 362-F:10, the Commission administers three residential renewable energy rebate programs, 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 5.

Table 5 – 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 up to and including 10 kilowatts (kW) DC in capacity | \$0.50 per watt up to a maximum of \$2,500, or 30% of the total cost of the facility, whichever is less | RSA 362-F:10, V July 2009 |
| 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 | 30% of the system cost and installation, or \$6,000, whichever is less Beginning July 9, 2016, the rebate increases to 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. | RSA 362-F:10, VIII April 2010 <i>Program was modified in July 2016 per Docket DE 16-614, Order No. 25, 921.</i> |

| Rebate Program | Eligible Technologies and Capacity Limits | Incentive Levels (Rebate) | Authority, Date of Inception |
|--|--|---|--|
| <p>**Commercial & Industrial (C&I) Expanded Solar Technologies Rebate</p> <p>Category 1 - PV and Thermal</p> | <p>PV systems and solar thermal systems less than or equal to 100 kW (AC) or thermal equivalent</p> | <p>\$0.70 per watt (AC and DC) for new solar electric facilities with Step 1 application received prior to Sept. 1, 2016, and \$0.65 with applications received after Sept. 1, 2016.</p> <p>\$0.12/rated or modeled kBtu/year for solar thermal facilities 15 collectors in size or fewer, and \$0.07/rated or modeled kBtu/year for solar thermal facilities greater than 15 collectors.</p> <p>Incentives are limited to 25% of the total project cost.</p> <p>Expansions to existing solar systems are not eligible.</p> | <p>RSA 362-F:10, VIII</p> <p>October 2010</p> <p><i>Program modified and opened through DE10-212 Order No. 25,764 on April 17, 2015.</i></p> <p><i>Program modified and opened on May 6, 2016 through Order DE10-212, Order No.25,878.</i></p> |
| <p>Category 2 - PV</p> | <p>PV systems greater than 100 kW (AC) and less than or equal to 500 kW (AC)</p> | <p>\$0.55 per watt (AC) for new electric facilities.</p> <p>Expansions to existing solar systems are not eligible.</p> | |
| <p>***Commercial and Industrial Wood Pellet Furnace/Boiler Rebate</p> | <p>Non-residential bulk-fuel fed wood pellet boilers and furnaces rated 2.5 million Btus or less</p> | <p>30% of heating appliance(s) and installation cost, up to a maximum of \$50,000; additionally, a rebate of 30% up to \$5,000 is available for thermal storage tanks and related components</p> <p>Beginning July 9, 2016, the rebate increases to 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.</p> | <p>RSA 362-F:10, VIII</p> <p>December 2013</p> <p><i>Program was modified in July 2016 per Docket DE 13-298, Order No. 25,922.</i></p> |

*Residential Wood Pellet program was modified in July 2016 per Docket DE 16-614, Order No. 25, 921
<http://www.puc.nh.gov/Regulatory/Orders/2016orders/25921e.pdf>.

** Program opened on May 6, 2016 through Order DE 10-212, [Order No. 25,878](#)
<http://www.puc.nh.gov/Regulatory/CASEFILE/2010/10-212/ORDERS/10-212%202015-02-20%20ORDER%20NO%2025-764.PDF>

*** Commercial and Industrial Wood Pellet program was modified in July 2016 per Docket DE 13-298, Order No. 25,922
<http://www.puc.nh.gov/Regulatory/Orders/2016orders/25922e.pdf>.

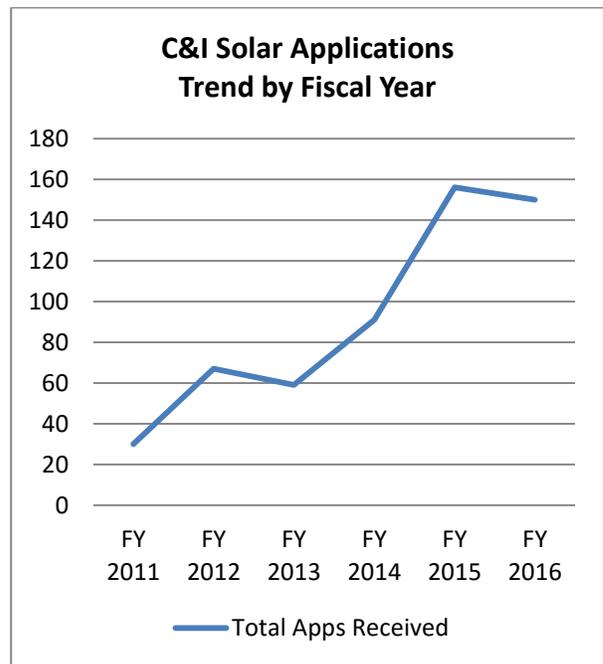
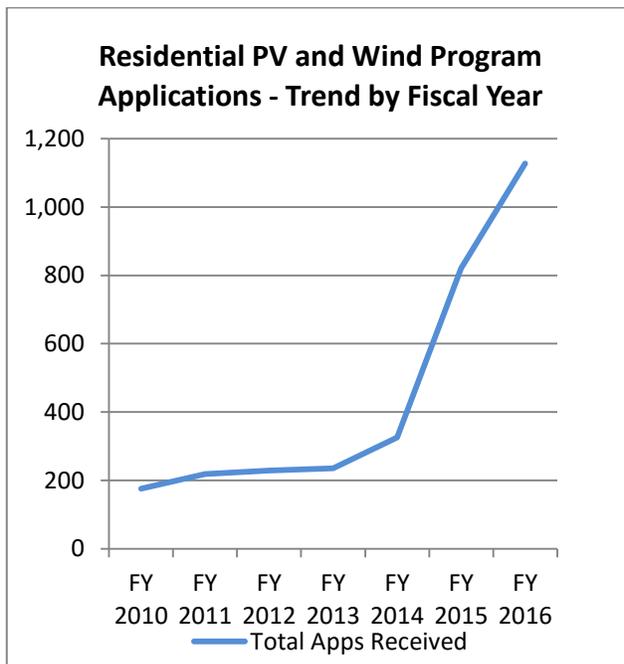
Program results for the REF rebate programs in FY16 are summarized in Table 6.

Table 6 – REF Rebate Program Results for Fiscal Year 2016

| REF Rebate Program | Number of Applications Received | Number Rebates Awarded* | Rebate Funds Disbursed | Average Rebate Award |
|---|---------------------------------|-------------------------|------------------------|----------------------|
| Residential Electrical Renewable Energy (PV and Wind) | 1,127 | 1,080 | \$3,557,352 | \$3,294 |
| Residential Solar Water Heating | 8 | 12 | \$18,200 | \$1,517 |
| Residential Wood Pellet Furnace/Boiler | 25 | 32 | \$186,213 | \$5,819 |
| C&I Solar Technologies (Electric and Thermal) | 150 | 98 | \$2,280,498 | \$14,528 |
| C&I Wood Pellet Furnace/Boiler | 12 | 20 | \$750,890 | \$37,545 |
| Totals | 1,322 | 1,242 | \$6,793,153 | n/a |

*The number of rebates awarded may exceed the number of rebate applications in instances where payments are made on applications received during the prior fiscal year.

New Hampshire’s solar electric (PV) market continues to grow. Net metering, the Renewal Portfolio Standard, and REF programs are all drivers for participants in this market, setting policy and providing incentives. As a result of market conditions, including the continuing decline in solar hardware and soft costs, available incentives, and increased consumer awareness, the REF residential electrical renewable energy rebate programs experienced an increase in demand as illustrated below. Demand in the Commercial and Industrial (C&I) program remained relatively constant.



Cumulative results for the rebate programs, since their inception through June 30, 2016, are shown below.

Table 7 – Cumulative Rebate Program Results through June 30, 2016

| REF Rebate Program | Number of Applications Received | Number of Rebates Awarded | Rebate funds disbursed | Rebate Funds Reserved or In-Process | Aggregate Applicant Investment <i>(rounded to nearest thousand)</i> |
|---|---------------------------------|---------------------------|------------------------|-------------------------------------|--|
| Residential Electrical Renewable Energy (PV and Wind) | 3,319 | 2,792 | \$10,780,204 | \$1,033,583 | \$75,900,000 |
| Residential Solar Water Heating | 505 | 485 | \$998,700 | \$3,200 | \$3,232,000 |
| Residential Wood Pellet Boiler/Furnace* | 317 | 301 | \$1,666,590 | \$60,000 | \$3,549,000 |
| C & I Solar Technologies (Electric and Thermal) | 543 | 284 | \$4,941,560 | \$4,743,780 | \$21,782,000 |
| C&I Wood Pellet Boiler/Furnace | 61 | 43 | \$1,227,625 | \$215,077 | \$3,553,000 |
| Totals | 4,745 | 3,905 | \$19,614,679 | \$6,055,640 | \$108,016,000 |

*Includes ARRA funded projects.

Commercial and Industrial Competitive Grant Program

RSA 362-F:10, XI requires the Commission to issue an annual request for proposals (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 its annual RFP for renewable energy projects on September 25, 2015 stating that the RFP program had a minimum of \$750,000 in available grant funds. Eight grant proposals were received by the Commission. These proposals represented \$8.9 million of total investment and requested over \$3 million in grant funds. The Commission recommended, and Governor and Executive Council approved, four grant awards totaling \$1.025 million. Once installed and certified, these projects are estimated to create over seven thousand RECs annually.

Table 8 – REF Competitive Grants Awarded in Fiscal Year 2016

| Grantee | Technology (Capacity) | Project Description | Total Project Costs | Leveraged Funds | Grant Amount | Estimated Annual RECs |
|--|---------------------------|--|---------------------|--------------------|--------------------|-----------------------------|
| Even Better Hydro | Hydro (415 kW) | Restore retired hydro facility to provide Even Better Eating with energy and create jobs | \$600,000 | \$400,000 | \$200,000 | 1,400 Class IV (or Class I) |
| Froling LLC | Biomass Thermal (1000 kW) | Expansion of precision dry wood chip operation | \$627,000 | \$327,000 | \$300,000 | 3,186 Class I Thermal |
| Pemi-Baker Cooperative School District | Biomass Thermal (733 kW) | Providing heat and energy for Plymouth High School | \$1,100,000 | \$775,000 | \$325,000 | 1,909 Class I Thermal |
| University of New Hampshire | Landfill Gas (200 KW) | Steam turbine to provide energy for campus buildings | \$600,000 | \$400,000 | \$200,000 | 402 Class IV |
| Totals | | | \$2,927,000 | \$1,902,000 | \$1,025,000 | 7,706 RECs |

REF Competitive Grant Completed in Fiscal Year 2016

Several projects that were awarded grants during previous fiscal years became operational in fiscal year 2016. In June, Steels Pond Hydro completed its rebuild and re-connection to the grid of a 900kW small hydro generation facility on the North Branch of the Contoocook River in Antrim. Grant funding was used to install two 300 kW hydro-electric turbine generators and triple the installed capacity to bring the project to its full



Steels Pond Hydro

potential. The electricity generated is sold to the University of New Hampshire (UNH) at a rate below retail electric rates and Steels Pond Hydro, in turn, leases the site from the State of New Hampshire with lease payments supporting the general fund. As lease payments are a percentage of gross, increasing the kWh generated/sold increases the lease payment to the State. Both of these provide direct savings to New Hampshire taxpayers. This project is expected to generate 2,066 Class IV renewable energy certificates (RECs) per year.

Durham Solar also came online this year. This 640 kW DC and 504 kW AC solar array, located at an unused gravel pit site owned by the Town of Durham, is a brownfield redevelopment with a new aquifer designed to provide water to the town during the dry season. The solar project will power the new aquifer and provide 100% of the Town's electricity with the exception of the school and sewer districts. The commercial scale photovoltaic system will provide immediate cost savings to the Town and is expected to generate 809 Class II RECs annually.



Durham Solar Project



Bedford Library – Geothermal
Groundbreaking

The Town of Bedford is in the process of installing a closed-loop geothermal system for heating and cooling at the Bedford Town Library. The Town has completed extensive energy efficiency improvements at the library and now needs to replace an old, inefficient, oil-powered HVAC system. The Town expects this new system to become operational this fall. Once operational, the system is expected to generate 686 Class I Thermal RECs annually. As a public building and gathering place, the project will promote energy efficiency and renewable energy through displays, websites, press releases, and informational sessions.

All of the grant projects support fuel diversity, lowering dependence on fossil fuels thereby stabilizing energy costs by reducing exposure to rising and volatile fossil fuel prices. In September 2016, the Commission issued the annual RFP for fiscal year 2017 for non-residential renewable energy projects that are not eligible to participate in incentive and rebate programs. The RFP is currently open and is posted on the Commission's website (<http://puc.nh.gov/Home/requestforproposal.htm>).

III. Budgets, Expenditures, and Statutory Funding Requirements

Table 9 below summarizes the available REF available funds for grant and rebate programs in fiscal year 2017, net of transfers, administrative costs, and funds previously encumbered or committed.

Table 9 – Analysis of Funds for FY17

Fund Balance Analysis

| | |
|-------------------|---|
| \$12,605,252 | Renewable Energy Fund (REF) Balance as of June 30, 2016 |
| 3,876,307 | CY15 ACP Payments received in FY16 |
| 421,451 | CY15 ACP Payments received in FY17 |
| 700,000 | Tri-County Payment (July 2016) |
| 17,603,010 | FY 17 Beginning Fund Balance |

Budget Analysis

| | |
|-------------------|--|
| 12,539,542 | FY17 Authorized Program Budget |
| 4,216,143 | FY17 Budget & Expend for Program Increase |
| 847,325 | FY17 Budget Administrative |
| 17,603,010 | FY 16 Total Appropriation |
| 16,755,685 | FY 16 Program Appropriation (Adjusted for Administrative) |
| (169,696) | Prior Year ACP Adjustments (1) |
| (73,139) | FY 14 Grants Encumbered |
| (947,842) | FY 15 Grants Encumbered |
| (1,015,333) | FY 16 Grants Encumbered |
| (6,055,640) | FY 16 Rebates Committed |
| 8,494,035 | FY17 Rebate and Grant Funds Available |

(1) Estimated - FY17 ACP audit to be completed

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.

For calendar years 2014 and 2015, retail electricity sales for the residential sector accounted for 41% and 42%, respectively, of total retail sales, while sales for the non-residential (commercial & industrial) sector accounted for 59% and 58% of total retail sales, respectively.

In fiscal year 2015, which is the first year of the two-year period beginning July 1, 2014, ACP funds were allocated (budgeted) as follows:

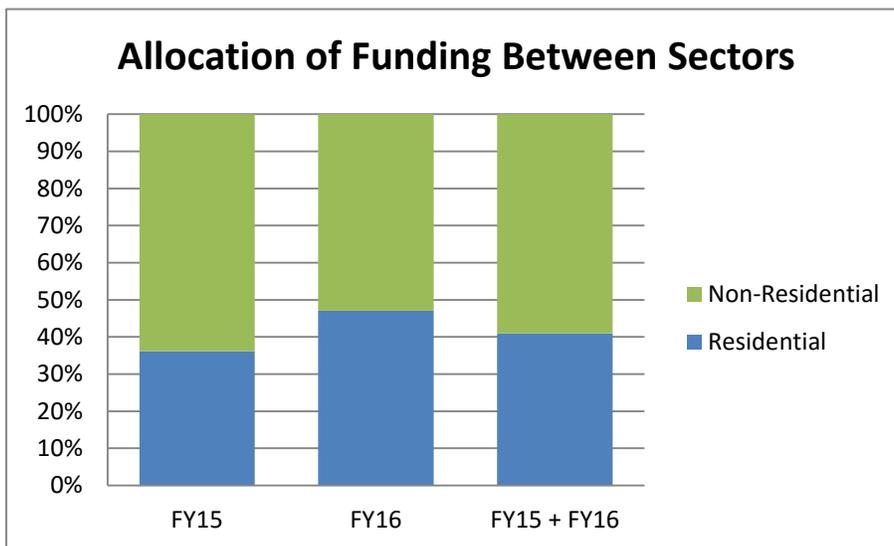
- Residential Programs: \$4,403,364 , or 36% of allocated funds
- Non-residential (C&I) Programs: \$7,779,357, or 64% of allocated funds

In fiscal year 2016, which is the second year of the two-year period beginning July 1, 2015, REF funds were allocated as follows:

- Residential Programs: \$4,578,501, or 47% of allocated funds
- Non-residential (C&I) Programs: \$5,145,766, or 53% of allocated funds

The allocation of funds, over two-years, was budgeted as follows:

- Residential Programs: \$8,981,865, or 41% of allocated funds
- Non-residential (C&I) Programs: \$12,925,123, or 59% of allocated funds



In fiscal year 2017, which is the first year of the next two-year period beginning July 1, 2016, new revenues deposited into the REF consist of ACP revenues and the repayment of funds provided to the Tri-County Community Action Program in 2013. In 2015, retail electricity sales for the residential sector represented 42% of the total retail sales, while sales in the non-residential (commercial & industrial) sector accounted for 58% of total retail sales. Accordingly, based on these percentages, the new revenues (less ACP adjustments and administrative cost) have been allocated as follows:

- Residential Programs: \$1,671,910, or 42% of allocated funds
- Non-residential (C&I) Programs: \$2,308,827, or 58% 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 up to and including 10 kilowatts in capacity. 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 2017, which is the first year of a next two-year cycle commencing July 1, 2016, the Commission expects to allocate approximately \$1,400,000, not including carry-forward funds, for the above-referenced residential renewable energy rebate program. This amount represents approximately 33% of available REF program funds (i.e. ACP revenue) for fiscal year 2017, well 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 2015, ACPs for Class II were received in July 2016 in the total amount of \$499,299. In fiscal year 2017, these funds, and more, will be budgeted and expended on various REF rebate and grant programs for solar energy technologies.

IV. Allowed Net Metered Capacity, Net Metered Facilities and Group Net Metering

Net Metering

As previously discussed, House Bill 1116 amended the net metering statute by increasing the allowed net metering capacity to 100 MW and allocating the additional 50 MW among the three regulated utilities. 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 10 – Net Energy Metering (NEM) Allocations to Electric Utilities per Statute (RSA 362-A as amended by HB1116)

| Electric Utility | 2010 Peak Load (MW) | Portion of 2010 Peak Load | NEM Amount of Original 50MW | ADDT'L 50 MW of NEM Portion | ADDT'L 50 MW of NEM Amount | New Amount (MW) to projects <=100kW (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 | | | | | 3.16 |
| Eversource Energy | 1588 | 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 |
| <i>* Projects under development</i> | | | | | | | | |

Each utility’s total installed capacity of net metered facilities is listed in Table 11. With the exception of New Hampshire Electric Cooperative, the amounts of energy net metered by each utility are below the net metered capacity per utility as set forth in RSA 362-A:9, I (amended).

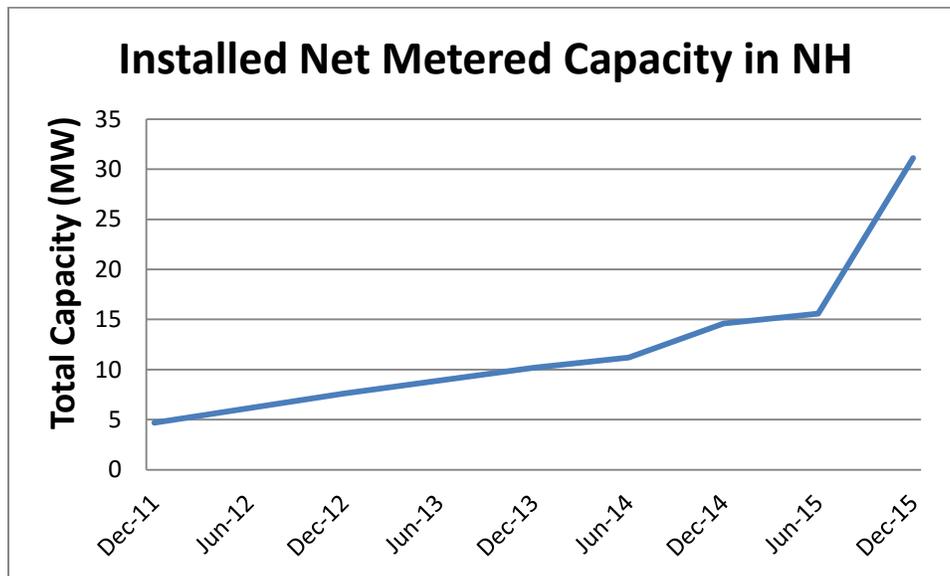
Table 11 – Total Net Metered Facilities as of December 31, 2015

| Electric Utility | 2015 Number of Installs | Total Installs to Date* | 2015 Capacity Added (MW) | Total Capacity to Date* | Peak Load (MW)** | Allowed Net Metered Capacity (100 MW cap)** |
|-------------------------------------|-------------------------|-------------------------|--------------------------|-------------------------|------------------|---|
| Liberty Utilities | 123 | 264 | 1.141 | 1.924 | 189 | 8.74 |
| New Hampshire Electric Cooperative | 184 | 652 | 2.130 | 5.110 | 124 | 3.16 |
| Eversource Energy | 1,036 | 2,262 | 11.592 | 21.085 | 1,588 | 75.38 |
| Unitil Energy Systems, Inc. | 179 | 329 | 1.695 | 3.000 | 268 | 12.72 |
| Total Net Metered Facilities | 1,522 | 3,507 | 16.558 | 31.119 | 2,169 | 100 |

*Based on the utility reports to DOE (EIA Form 826) and includes system expansions.

**Based on the share of 2010 peak load pursuant to Puc 900 and RSA 362-A:9

The chart below illustrates the historic trend of installed net metered capacity in New Hampshire starting in December 2011 through December 2015. Overall, at the end of 2015, the total installed net metered capacity was 31.119 MW with almost one-half of the total (16.558 MW) being installed in 2015. In calendar year 2015, New Hampshire installed approximately four times the capacity installed in 2014.



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, 2015.

During the fiscal year 2016 legislative session, Senate Bill 378 (SB378) was signed into law⁵. The amendment added language to RSA 362-A:9, XIV(a) which requires the Commission to review agreements between group hosts and group members. It also now requires the host be registered by the Commission prior to receiving a net metering queue allocation.

Table 14 provides information about group net metering applications approved by the Commission in calendar year 2015.

Table 12 – Group Net Metering Applications Approved

| Electric Distribution Utility | Total Cumulative Number of Applications Approved | | Total Cumulative Capacity of Approved Host Installations (Kilowatts AC) | | 2015 Net Generation By Host (kWh)** | 2015 Total Member Load (excluding Host) (kWh) |
|------------------------------------|--|----------|---|----------------|-------------------------------------|---|
| | Solar | Hydro | Solar | Hydro | | |
| Eversource Energy * | 77 | 8 | 4,062.45 | 2,727 | 1,503,079 | 5,261,117 |
| Liberty Utilities | 7 | -- | 228.15 | -- | 34,492 | 73,088 |
| New Hampshire Electric Cooperative | 10 | -- | 263.2 | -- | 11,985 | 69,388 |
| Unitil Energy Systems, Inc. | 4 | -- | 83.0 | -- | 44,484 | 81,507 |
| Total | 98 | 8 | 4,636.8 | 2,727.0 | 1,594,040 | 5,485,100 |

*Eversource’s number of applications and installation capacities include 8 systems that have not yet been installed, 6 that withdrew their interconnection requests, and 4 that only net meter.

**“Net Generation by Host” means the amount of electricity generated and available for the group members, excluding any usage by the Host.

⁵ Senate Bill 378 http://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2016&id=1013&txtFormat=pdf&v=current

V. Conclusion

Since its inception in July 2009, the Renewable Energy Fund has established six grant and rebate programs that have experienced substantial demand and growth over time. The Renewable Energy Fund has funded close to 4,000 rebates for renewable energy systems to New Hampshire homeowners, businesses, schools, towns, non-profit organizations, and other eligible entities. In addition, the Commission's competitive grant program has provided more than \$8 million in funding for 29 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. It is expected that additional funds will be awarded through new grants for renewable energy projects in early 2017.

Rebate and grant funds have been leveraged with tens of millions 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.

Demand for rebates and grant awards continue to be strong, as the 2015 and 2016 data set forth in this Report demonstrates. At this time, the Commission has no recommendations on changes on the use of the Renewable Energy Fund; however, Commission Staff continues to monitor industry and renewable energy certificate market trends, and technological developments such as energy storage.