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March 1, 2019

Members of the Vermont General Assembly
115 State Street
Montpelier, VT 05633-5301

Re: Biennial Report on Vermont Renewable Energy Programs

Dear Senators and Representatives:

I am pleased to submit a report addressing renewable energy programs in the state, conducted pursuant to 30 V.S.A. § 8005b. This report addresses retail sales, requirements of the Renewable Energy Standard (RES), progress toward meeting RES targets, implementation of the standard-offer program, an assessment of energy efficiency, market conditions for renewable energy, and retail electric rates.

If you have any questions or concerns upon reading this report please do not hesitate to contact me or the Director of Energy Policy and Planning, Ed McNamara.

Very truly yours,

June E. Tierney
Commissioner

Report on Vermont Renewable Energy Programs

A Biennial Report to the Vermont General Assembly Prepared by the Department of Public Service

March 1, 2019

The General Assembly requires the Public Service Department (Department) to submit a biennial report addressing renewable energy programs in the state (30 V.S. A. § 8005b(c)). This report addresses retail sales, requirements of the Renewable Energy Standard (RES), progress toward meeting RES targets, implementation of the Standard Offer program, an assessment of energy efficiency, market conditions for renewable energy, and retail electric rates.

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Introduction

There are three inter-related renewable programs in Vermont: the Renewable Energy Standard (RES), the standard-offer program, and net-metering. RES is the overarching renewable policy, with the other programs complimenting and helping to satisfy it. Each program is in a different stage of maturity. RES, which requires Vermont utilities to supply a percent of their load with renewable resources, became effective in 2017. The standard-offer program, a renewable energy economic development program, began in 2009 and is scheduled to end in 2022 with a program capacity of 127.5 MW; this program has undergone several changes since its implementation, with the most notable being an expansion of the initial 50 MW cap and a transition to a competitive procurement process. Net-metering has been available to Vermont electric customers for over 20 years to provide an avenue to reduce electric purchases from the utility with their own on-site, often solar, generation.

Vermont's renewable programs are helping the state achieve its renewable goals, all while Vermont retail electric rates remain among the lowest and most stable in the region. In its early stages, RES has demonstrated great success with limited cost implications to date. The standard-offer program and net-metering programs, while helping to advance renewable development, however, carry higher costs both in terms of dollars and planning challenges for utilities.

Pursuant to 30 V.S.A. § 8005b, the Department of Public Service provides this biennial report. This report, as set forth in subsection (c) of Section 8005b[1], must address the following issues:

> (1) The retail sales, in kWh, of electricity in Vermont during the two preceding calendar years.
>
> (2) RES requirements for the two preceding calendar years.
>
> (3) A summary of the Renewable Energy Credit (REC) retirements and energy transformation projects costs and benefits for the two preceding calendar years.
>
> (4) A summary of the Standard Offer Program including the technology, number, capacity and average annual generation of the participating projects, and the prices paid. The report also shall identify the number of applications received, the number of participating plants under contract, and the number of participating plants actually in service.
>
> (5) An assessment of the energy efficiency and renewable energy markets and recommendations to the General Assembly regarding strategies that may be necessary to encourage the use of these resources to help meet upcoming supply requirements.
>
> (6) An assessment of whether Vermont retail electric rates are rising faster than inflation, and a comparison of Vermont's electric rates with electric rates in other New England states and in New York. If statewide average rates have risen faster than inflation over the preceding two or more years, then additional assessments shall be included with any recommended statutory changes.

[1] Appendix I of this document contains the relevant language of Section 8005b.

(7)(A) Commencing with the report to be filed in 2019, an assessment of whether strict compliance with the requirements of sections 8004 and 8005 (RES) and section 8005a (standard offer) of this title:

(i) has caused one or more providers' rates to rise faster than the statewide average;

(ii) will cause retail rate increases particular to one or more providers; or

(iii) will impair the ability of one or more providers to meet the public's need for energy services in the manner set forth under subdivision 218c(a)(1) of this title (least-cost integrated planning).

(B) Based on this assessment, consideration of whether statutory changes should be made to grant providers additional flexibility in meeting requirements of sections 8004 and 8005 or section 8005a of this title.

(8) Any recommendations for statutory change related to sections 8004, 8005, and 8005a of this title.

Public Engagement

The General Assembly directed the Department to "provide an opportunity for the public to submit relevant information and recommendations."[2] The Department requested comments from the public on February 12, 2019. Two sets of comments were received and are included in Appendix 4.

Background

Renewable Energy Standard

Section 8 of Public Act No. 56 of 2015 (Act 56) directed the Public Utility Commission (PUC) to implement a renewable energy standard, by means of "an order, to take effect on January 1, 2017." This requires Vermont's distribution utilities (DUs) to acquire and retire a minimum quantity of renewable energy attributes or Renewable Energy Credits (RECs),[3] and to achieve fossil-fuel savings from energy transformation projects.[4] Utilities may obtain RECs from net-metering projects, standard-offer projects, ownership of utility-scale resources, long-term PPAs, or REC-only purchases. The structure of the RES is divided into three tiers.

Tier I requires DUs to retire qualified RECs or attributes from any renewable resource to cover at least 55% of their annual retail electric sales starting in 2017. There is no limit on the age or location of the resource, provided that it can physically deliver energy to New England. The Tier I requirement increases by 4% every third January 1 thereafter, up to 75% in 2032.

[2] 30 V.S.A. § 8005b(d).
[3] A REC is the renewable attribute associated with a MWh of generation from a qualified renewable resource. With each MWh of electric generation, an environmental attribute is also created, that can then be traded independent of the energy.
[4] 30 V.S.A. § 8005(b).

Tier II requires DUs to retire qualified RECs equivalent to 1% of their annual retail sales starting in 2017. Tier II eligible resources must have a nameplate capacity of less than 5 MW, be commissioned after June 30, 2015, and be connected to a Vermont distribution or subtransmission line. The Tier II requirement increases by three-fifths of a percent each year, up to 10% in 2032. Pursuant to Section 8005(a)(1)(C), Tier II is a carve-out and resources also count towards a DU's Tier I requirement. Additionally, to the extent that a DU is 100% renewable, the DU is not required to meet the annual Tier II requirements but must continue to accept new net-metering systems and retire the associated RECs.[5]

Alternatively, a utility can make an Alternative Compliance Payment (ACP) in lieu of retiring RECs. In 2017, the Tier I ACP was $10/MWh, and the Tier II ACP was $60/MWh; these rates are adjusted annually by Consumer Price Index (CPI). ACP payments are made to the Clean Energy Development Fund (CEDF), which "promotes the development and deployment of cost-effective and environmentally sustainable electric power and thermal energy or geothermal resources for the long-term benefit of Vermont consumers."[6]

The implementation of REC retirements for RES Tier I and Tier II compliance brings Vermont in line with all other New England states. Starting in 2003, other states in the region began implementing renewable portfolio standards (RPS). By 2008, all states in the region, except for Vermont, had an RPS to be met with REC retirements or an ACP. During that time, Vermont encouraged renewable development through the Sustainably Priced Energy Enterprise Development (SPEED) program, which required DUs to enter into long-term contracts with generators but did not require utilities to serve their load with renewable energy or to retire RECs. The use of RECs to track renewability has become the generally accepted standard across the country.

The REC markets in New England are all related and driven by state renewable policies and eligibility criteria. "Existing" REC markets (e.g. Vermont Tier I, and Class II or existing in other states) are intended to provide incentives to existing resources to remain operational. "New" REC markets (e.g. Vermont Tier II, and Class I or "new" in other states) are designed to stimulate renewable development and provide a greater incentive than existing RECs. Vermont Tier I resources include any renewable generator in the region and imports from neighboring control areas (e.g. Hydro Quebec (HQ) and New York Power Authority (NYPA) hydro). Vermont Tier I RECs are generally consistent with Class II or "existing" RECs in neighboring states, and in their short history, Tier I RECs have traded at similar prices to Class II RECs. Since the implementation of renewable standards in the region, there has been excess supply of these types of resources in the region, resulting in prices around $1/REC. In the region, Class I RECs have unique eligibility criteria by state, but generally, new renewable resources qualify, regardless of size, except in Vermont. Vermont Tier II, however, has a much narrower eligibility criteria than other states, and a resource that qualifies as Class I in neighboring states will not necessarily qualify as Vermont Tier II. When there is sufficient supply of Tier II RECs, it is expected that Tier II and Class I will trade at similar prices. However, if there is a shortage of Tier II RECs, then Vermont Tier II will trade at a premium to Class I in other states. Many Vermont utilities have resources in their portfolio that qualify as Class I (high-priced) and Vermont Tier I (low-priced), but not Vermont Tier II, resulting in the out of state sale of Class I RECs from Vermont resources (e.g. McNeil biomass, Kingdom Community Wind, pre-July 2015 standard-offer projects, etc) and the purchase of lower priced Vermont Tier I RECs from out of state.

[5] Net-metering RECs must be retired per Section 5.127(B)(1) of Rule 5.100 and 30 V.S.A. § 8010(c)(1)(H)(ii).
[6] 30 V.S.A. § 8015(c).

Act 56 also created Tier III, which requires DUs to achieve fossil-fuel savings from energy transformation projects or retire Tier II RECs. For Tier III, the RES requires savings of 2% of a DU's annual retail sales in 2017 increasing to 12% by 2032, except for municipal electric utilities serving less than 6,000 customers, which had a delayed start and no obligation until 2019. Energy transformation projects implemented on or after January 1, 2015 are eligible to be counted towards a DU's Tier 3 obligation. Energy transformation projects include weatherizing buildings, installing air source or geothermal heat pumps, biomass heating systems and other high-efficiency heating systems, switching industrial processes from fossil fuel to electric, increased use of biofuels, and deployment of electric vehicles or related charging infrastructure. The Tier III requirements are additional to the Tier I requirements; an ACP option or retirement of Tier II RECs are also available for Tier III compliance.

The PUC held several workshops and issued a resulting order related to the establishment of RES that address matters including REC banking, the process for qualifying facilities, and measurement and verification.[7] By August 31 of each year, utilities must submit a compliance filing for the previous year demonstrating compliance with each Tier. The Department holds the primary responsibility for verifying utility demonstration of compliance, including Tier III. The Department will continue to be an active participant in evaluating utility compliance filings, and also evaluates utility plans for RES compliance through the Integrated Resource Planning process, which utilities undertake every three years.[8]

Careful implementation of the RES has been a major focus of the Department, Commission, and the utilities for several years. As utilities continue to build their portfolios of renewable energy and energy transformation projects, the Department looks forward to continued work on monitoring program implementation and assessing the benefits.

Standard-Offer Program

The standard-offer program, established in 2009, was designed to provide a financing mechanism for small-scale renewable energy projects of 2.2 MW or less by entering into long-term fixed price contracts with the state, through the standard-offer program administrator, which is currently VEPP Inc (VEPPI).

The standard-offer program initially had a 50 MW program capacity that was expanded to 127.5 MW in 2012. The 2012 statutory changes set an annual schedule that allowed for 5 MW to be contracted in the first three years, 7.5 MW for 2016-2018 and 10 MW in 2019-2022 until the cap of 127.5 MW is reached.[9] Prior to 2012, there was a centralized procurement process that resulted in an administratively determined fixed-price long-term contract. This approach resulted in rapid deployment of solar resources at a significant cost. In 2012, the program was modified to allow for a market mechanism to set the contract price. Contracts are now awarded to generators annually through a Request for Proposal (RFP) process which includes a price cap for each technology type including solar, wind, biomass, landfill gas, and food-waste methane digesters, and hydroelectric facilities of up to 2.2 MW.[10]

[7] Docket 8550, June 28, 2016 Order
[8] 30 V.S.A. 218c.
[9] Pursuant to 30 V.S.A. § 9005a(c)(1)(A), "The amount of the annual increase shall be five MW for the three years commencing April 1, 2013, 7.5 MW for the three years commencing April 1, 2016, and 10 MW commencing April 1, 2019."
[10] Standard Offer rates are also available for farm methane digesters. These projects do not count toward the 127.5 MW programmatic cap.

Under the program, the standard-offer facilitator is required to enter into fixed price, long-term contracts for the output of awarded projects. The costs associated with the program, as well as the energy, capacity and RECs from the projects are allocated to each DU based on their pro-rata share of load.[11] Vermont utilities may use RECs from standard-offer projects commissioned after July 1, 2015 to satisfy Tier II of the RES. RECs from standard-offer projects built before this date may be used to satisfy Tier I. However, RECs from standard-offer projects commissioned prior to July 1, 2015 are generally qualified as Class I resources in neighboring states. As described earlier, Class I prices are typically similar to Vermont Tier II and more valuable than Vermont Tier I. Therefore, those RECs would most likely be sold out of state as Class I RECs rather than used for Tier I compliance in Vermont.

Net-Metering Program

Net-metering provides a mechanism for Vermont electric customers to generate their own electricity to offset electric bills. In 1997 the Vermont legislature allowed net-metering in Vermont, with the law being updated in 2014 with Act 99. As a result of declining solar costs and the favorable net-meter rates, Vermont has seen tremendous net-metering deployment, which is helping Vermont achieve its renewable goals, but also comes with cost implications.

The amount of net-metering in Vermont has grown exponentially in recent years, making it the primary mechanism for deployment of distributed generation to date. Although net-metering meets many of the goals laid out in 30 V.S.A. § 8001, it is currently the most expensive type of renewable energy available to fulfill the RES requirements, in addition to being highly unpredictable and uncontrollable by utilities, which are the obligated parties to purchase the generation under RES.

Net-metering is currently governed by PUC Rule 5.100: Rule Pertaining to the Construction and Operation of Net-Metering Systems, which went into effect on July 1, 2017. [12] As outlined in the rule, in 2017, net-metered customers received $0.06 per kWh ($60 per MWh) more for generation when the RECs are transferred to the host utility, compared to if the customer decides to retain the RECs.[13] Given the significant financial incentive for customers to transfer the RECs to the utility, it is expected that most net-metering projects going forward will transfer their RECs to the utility, which will then be counted towards Tier II obligations. RECs from net-metering customers reduce the amount of RECs that utilities would have otherwise acquired from other sources, which would generally carry a lower cost. For example, the 2019 Vermont Tier II requirement is expected to be around 115,000 RECs. If that requirement were satisfied entirely by net-metering projects with a $0.06 per kWh adder, the cost would be $6,900,000. Conversely, if the requirement was instead satisfied with owned generation and bilateral purchases at a price of $20/REC, the cost of compliance would be $4,600,000 less, or $2,300,000.[14] Further, because most DUs expect to have excess Tier II RECs and REC price forecasts are currently low, revenues from the sale of excess RECs will be minimal.

[11] A utility may seek exemption from the standard-offer program if during the previous year it had renewable energy, through either ownership or contracts, that was not less than its amount of retail sales. The PUC has recommended a statutory change such that only utilities that have previously been exempt can continue to be exempt, and RECs must also be retired in the demonstration of renewability.

[12] Available at https://puc.vermont.gov/sites/psbnew/files/doc_library/5100-PUC-nm-effective-07-01-2017_0.pdf

[13] The PUC ordered a decline in the REC adjustor for projects built after 7/1/2018, and another decrease to the REC adjustor is scheduled for projects built after 7/1/2019.

[14] A price of $20/REC is illustrative only.

Net-metered generation reduces the volume of electricity that utilities would otherwise sell to ratepayers. In some cases, when more power is generated than consumed by an individual or group of customers, the excess power flows back onto the grid and the customer is compensated at the retail rate plus adjustors. The price that net-metered generation is compensated is greater than the price that the utility could procure the same products (e.g. energy and RECs). Regional capacity and transmission (RNS) costs are allocated based on a utility's load at the time of the peak load. Historically, the value of solar generation included the value for avoided costs associated with capacity and transmission. However, as more solar comes online, and peak hours shift later in the day to hours when solar is not generating, the value of new solar has diminished. While solar continues to reduce capacity costs, which is based on the regional annual peak hour, the value of RNS from new projects has been eroded. Additionally, high net-metering deployment leads to lower retail sales revenues, more RECs from high-priced net-metering projects, and higher overall power supply costs.

From a DU power supply perspective, net-metering generation can be very difficult to forecast in large part due to changing rules and tax credits; therefore, DUs have tried to limit their reliance on net-metering RECs for RES compliance. In preparation for RES, many utilities invested in Tier II-eligible projects or entered into long-term bundled PPAs. This proactive approach to ensure avoidance of a $60/MWh penalty assessed through the ACP has resulted in an oversupply of Tier II RECs, with the excess that will be sold into MA or CT Class I REC markets or banked. While the excess RECs can be banked or sold, record low REC prices in the region leave utilities, and thus ratepayers, at a financial loss in many cases. Over the course of the past year, REC prices have plummeted, so while DUs are acquiring net-metered RECs at $60/REC, they are selling equivalent RECs for less than $10/REC.

Retail sales

30 V.S.A. § 8005b(c)(1)

Retail sales for Vermont utilities have been flat, and in many cases declining. State-wide electric sales declined by 1.7% from 2016 to 2017 and have declined in each of the past 5 years, primarily due to energy efficiency measures as well as net-metering, to a lesser extent. Retail sales for calendar years 2016 and 2017 are presented in Table 1. These are the most recent years for which data are available. When 2018 data become available, it will be available in the Department's annual *Utility kWh Report*.[15]

Electric Retail Sales in Vermont (2016-2017)

Utility	2016 kWh	2017 kWh	Change
Barton	13,851,539	13,512,505	-2.4%
Burlington	340,281,192	332,090,724	-2.4%
Enosburg Falls	26,804,996	26,172,402	-2.4%
GMP	4,222,833,000	4,146,863,000	-1.8%
Hardwick	33,035,247	33,404,789	1.1%
Hyde Park	11,337,855	11,288,213	-0.4%
Jacksonville	4,983,706	4,954,389	-0.6%

[15] Annual *Utility kWh Reports* are available on the Department of Public Service website at http://publicservice.vermont.gov/publications-resources/publications.

Johnson	12,946,230	12,248,884	-5.4%
Ludlow	46,201,302	47,420,364	2.6%
Lyndonville	60,845,404	60,915,880	0.1%
Morrisville	44,306,409	44,052,192	-0.6%
Northfield	28,365,532	27,599,988	-2.7%
Orleans	13,061,106	12,996,112	-0.5%
Stowe	80,189,117	76,208,931	-5.0%
Swanton	54,466,879	53,000,317	-2.7%
VEC	446,266,517	444,169,071	-0.5%
WEC	69,809,811	68,821,561	-1.4%
Vermont State Total	**5,509,585,842**	**5,415,719,322**	**-1.7%**

Table 1: Retail Sales of Electricity in Vermont (2016-2017), as reported by the Vermont electric distribution utilities to the Public Service Department.

Load forecasts prepared for the 2018 VELCO Long-Range Transmission Plan project load to remain relatively flat to declining in the near-term with slight increases in annual sales by 2024.[16] These projections relied on assumptions related to economic growth, net-metering deployment, energy efficiency, electrification of heating and transportation, technology, regulation, weather, and many other factors. Based on the forecasted loads, Tier I, II and III requirements forecasts follow. Figure 1 shows Vermont's projected retail sales and RES requirements through 2032.

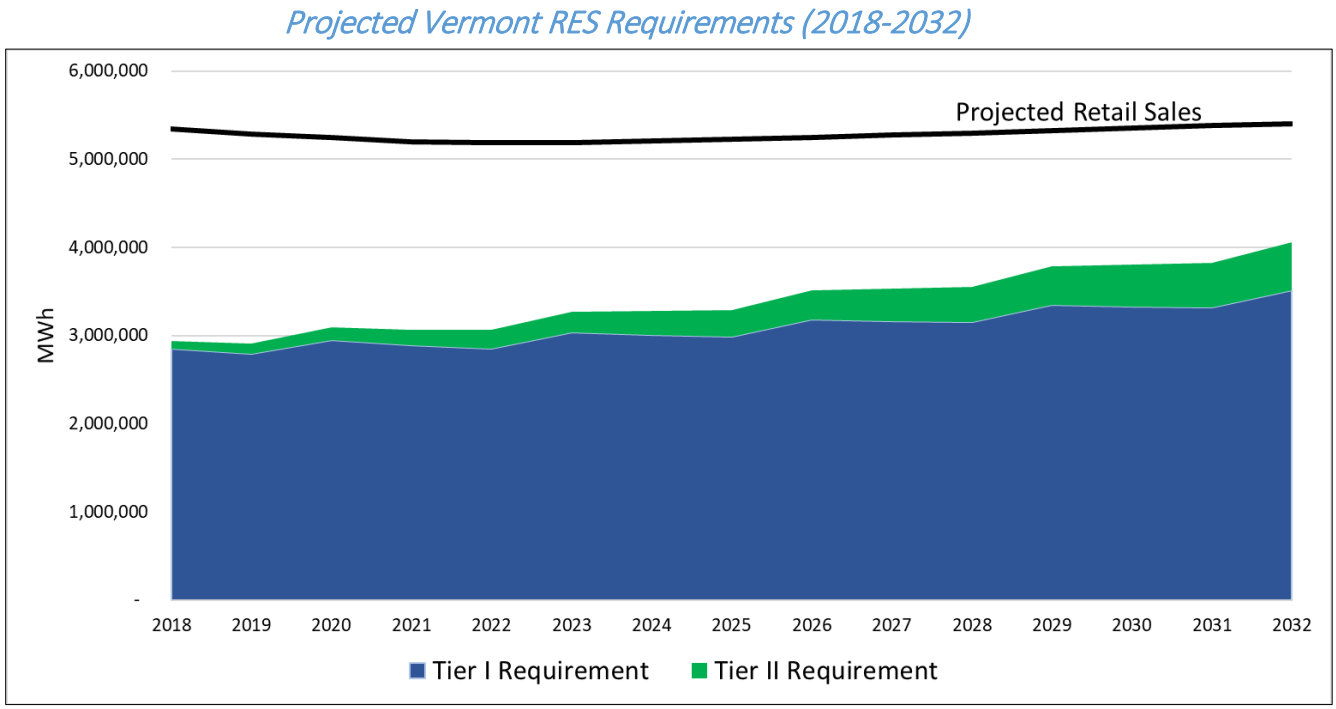

Figure 1: Projected Sales (2018-2032) based on VELCO 2018 Long Range Transmission Plan.

[16] VELCO Long Range Plan available at https://www.velco.com/our-work/planning/long-range-plan

Required amount of renewable energy

30 V.S.A. § 8005b(c)(2)

The two most recent calendar years available for this 2019 report are 2016 and 2017. In 2016, Vermont utilities did not have a RES obligation. In 2017, Vermont DUs were required to retire qualified Tier I RECs or attributes equivalent to 55% of their retail sales, including Tier II RECs equivalent to 1% of their retail sales. Tier 3 required utilities to achieve fossil-fuel savings from energy transformation projects or retire Tier II RECs equivalent to 2% of their retail sales for 2017. Municipal electric utilities serving less than 6,000 customers have a delayed start and no Tier III obligation until 2019. RES requirements for 2017 are presented in the table below.

2017 RES Requirements

Utility	Tier I[17]	Tier II	Tier III[18]
Barton	7,432	135	n/a
Burlington	182,650	3,321	6,642
Enosburg Falls	14,395	262	n/a
GMP	2,280,775	41,469	82,937
Hardwick	18,373	334	n/a
Hyde Park	6,209	113	n/a
Jacksonville	2,725	50	n/a
Johnson	6,737	122	n/a
Ludlow	26,081	474	n/a
Lyndonville	33,504	609	n/a
Morrisville	24,229	441	n/a
Northfield	15,180	276	n/a
Orleans	7,148	130	n/a
Stowe	41,915	762	n/a
Swanton	29,150	530	n/a
VEC	244,293	4,442	8,883
WEC	37,852	688	1,376
Vermont State Total	**2,978,646**	**54,157**	**99,839**

Table 2: 2017 RES requirements.

[17] Tier I is inclusive of Tier II (i.e. the state total Tier I requirement of 2,978,646 RECs is 55% of total retail sales, and the Tier II requirement of 54,157 RECs is 1% of total retail sales).

[18] Tier III compliance is determined based on lifetime MWh equivalent savings.

Progress toward Meeting Targets

30 V.S.A. § 8005b(c)(3)

Pursuant to the PUC's *Order Implementing the Renewable Energy Standard*, issued in Docket 8550 on June 28, 2016, Vermont utilities were required to submit the first annual RES filings by August 31, 2018 demonstrating compliance for 2017. On December 10, 2018, the PUC issued an order in Docket 17-4632 concluding that all Vermont utilities met their 2017 RES requirements. Utilities demonstrated compliance with Tiers I and II of the RES by retiring RECs in the NEPOOL GIS, which closed its accounting period for 2017 on June 15, 2018, or paid an ACP to CEDF. Due to an oversight, one utility was one REC short of its Tier I compliance requirement, resulting in a $10 payment to CEDF for the 2017 compliance period. Additionally, utilities submitted Tier 3 compliance claims to PSD on March 15, 2017 demonstrating compliance with 2017 requirements; the Department evaluated Tier III performance and presented those findings in a Tier III Report filed on June 1, 2018.

Total RES compliance costs for 2017 were estimated to be about $5.5 million, compared to maximum potential costs of $38.5 million.[19] Carbon Dioxide (CO2) emissions were reduced by approximately 579,000 tons from 2016 emissions.[20] This shift to more renewables brings Vermont's average emissions rate down to 205 pounds of CO2 compared to the regional New England average of 682 pounds per MWh in 2017.[21]

Tier I was met with RECs from a variety of resources including owned hydro facilities, long-term Hydro-Quebec purchases, and regional hydro REC-only purchases, among others. In 2017, Tier II was satisfied with RECs from net-metering projects, standard-offer projects, and in-state solar, both utility and merchant owned. Tier III was met with a variety of measures including electrification of transportation and heating, weatherization, and the retirement of Tier II RECs.

[19] Maximum potential costs reflect what the costs would have been if ACP was paid for all compliance in 2017.
[20] Emissions reductions for 2017 are based on Vermont's overall power supply portfolio that included 63% renewable and 13% nuclear, both of which are zero emissions; the remaining 24% is assumed to have the ISO-NE marginal emissions rate of 842 lbs/MWh. The 2016 Vermont emissions assumed roughly 52% of Vermont's load was served by system mix energy at the marginal emissions rate. Tier 3 credits are based on lifetime savings, but when calculating emissions, only annual emissions offsets are considered, making the Tier 3 contribution to emissions reductions minimal in 2017.
[21] http://isonewswire.com/updates/2018/12/20/regional-air-emissions-2017-long-term-reduction-trends-conti.html

2017 REC Retirements as a Percent of Retail Sales

Utility	Tier I[22]	Tier II[23]	Tier III
Barton	56%	1%	0%
Burlington	104%	0%	2%
Enosburg Falls	56%	1%	0%
GMP	60%	1%	2%
Hardwick	56%	1%	0%
Hyde Park	56%	1%	0%
Jacksonville	56%	1%	0%
Johnson	56%	1%	0%
Ludlow	56%	1%	0%
Lyndonville	56%	1%	0%
Morrisville	56%	1%	0%
Northfield	56%	1%	0%
Orleans	56%	1%	0%
Stowe	55%	1%	0%
Swanton	100%	0%	0%
VEC	55%	1%	2%
WEC	100%	0%	2%
Vermont State Total	**63%**	**1%**	**2%**

Table 3: 2017 Tier I and Tier II REC retirements and Tier III savings claims and/or Tier II REC retirements.

RES allows for the banking (of up to 3-years) of excess RECs to then be used for compliance in future years. In 2017, several utilities acquired RECs in excess of their RES requirements, with the intention of using those RECs for compliance in one of the next three years. REC retirements shown in Table 3 reflect only those RECs being used in 2017, and do not report on RECs being banked for future years.

In 2017, Burlington Electric Department (BED), Green Mountain Power (GMP), Vermont Electric Cooperative (VEC), and Washington Electric Cooperative (WEC) had Tier III obligations; all other Vermont utilities have a deferred starting compliance year of 2019. Utilities with a 2017 obligation offered programs to promote the adoption of cold climate heat pumps, electric vehicles, electric vehicle charging stations, weatherization, and wood heat starting in 2017. Additionally, several utilities developed custom projects to meet their first year of obligations, which were both cost effective and delivered significant fossil-fuel savings, while other DUs met portions of their Tier III obligation with the retirement of Tier II RECs. Custom projects included extending electric lines to saw mills and maple sugaring operations

[22] Tier I percentages reflect total renewable percent, inclusive of Tier II (i.e. in 2017 served 63% of the retail load with renewable resources). Several utilities elected to retire RECs in excess of their statutory requirement.
[23] If a DU demonstrates that it is 100% renewable through Tier I REC retirements, then the DU is not required to meet the annual requirements set forth in Tier II but is required to accept net-metering systems and retire the associated RECs per Section 5.127(B)(1) of Rule 5.100 and 30 V.S.A. § 8010(c)(1)(H)(ii).

previously dependent on diesel or gasoline generators. Figure 2 shows the measures used to meet Tier III compliance in 2017.

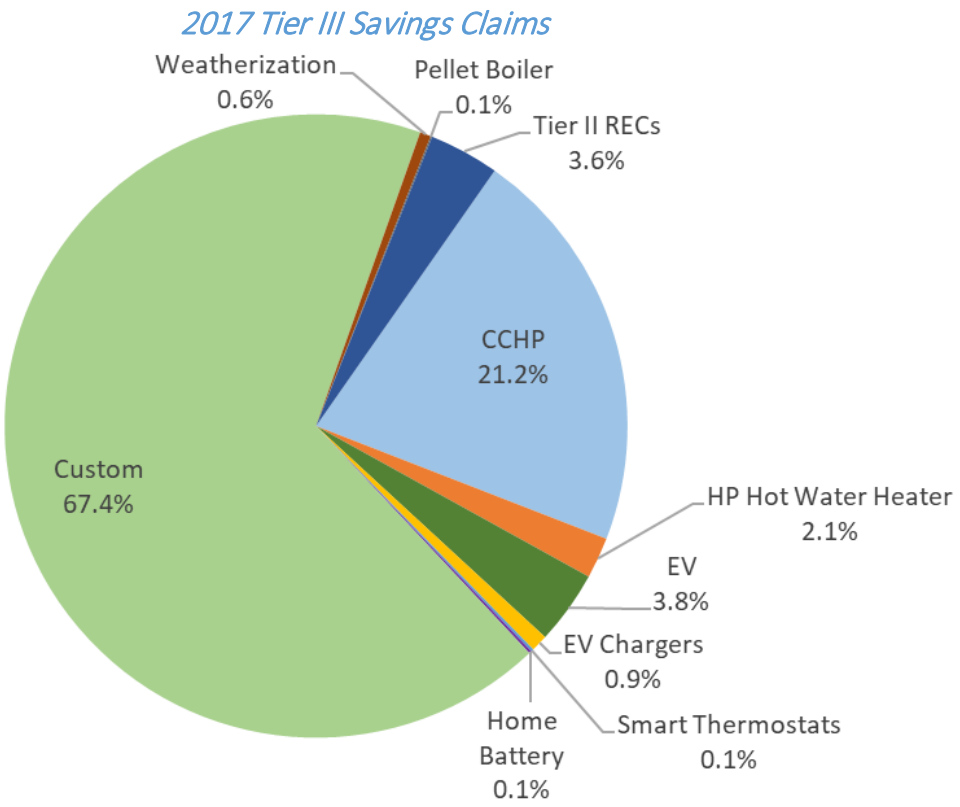

Figure 2: 2017 Tier III savings claims by measure

For 2017 Tier III compliance, utilities reported a total cost of $2.2 million. It is estimated that almost 15 million pounds of carbon dioxide emissions and roughly 82,000 MMBtu of fossil fuel consumption were avoided in 2017 as a direct result of Tier III measures.[24]

Utilities will submit their 2018 annual Tier III compliance filing by March 15, 2019. It is expected that much of the 2018 requirement will again be met with custom projects, as well as banked credits from 2017,Tier II RECs, and a suite of measures similar to those used in 2017. Going forward, the Department expects to see an increase in EVs and decrease in CCHP from 2017 levels.

Utilities submitted plans for their 2019 Tier III programs to the PUC in November 2018. Utilities plan to offer a variety of incentives and programs to customers to reduce their fossil fuel consumption including programs for weatherization, high-efficiency cold climate heat pumps, heat pump water heaters, electric vehicles, charging stations, and electrification of industrial processes. Utilities are also offering some bundled services that include several products. For example, weatherization paired with a heat pump and a smart thermostat. Several utilities have indicated that as the Tier III requirements increase each

[24] Public Service Department. June 1, 2018. Evaluation of Electric Distribution Utilities Compliance with Tier III Obligations: Tier III Report.

year, and "low-hanging fruit" custom projects are exhausted, the goals will become increasingly challenging to meet.

There are several areas of Tier 3 that overlap with programs offered by Efficiency Vermont. In these cases, utilities negotiated with Efficiency Vermont regarding methods for sharing savings associated with measures in their service territory. In general, the incentives and programs offered by the utilities are growing the potential of these programs.

The Standard Offer Program

30 V.S.A. § 8005b(c)(4)

The standard-offer program was established in 2009 to stimulate the development of small, in-state renewable resources. Under the program, a third-party entity contracts with developers and allocates the energy, capacity and RECs to utilities, along with the corresponding costs, based on each utility's load ratio share. Vermont utilities are required to purchase the output of the projects at the contracted prices. The program allows a utility to be exempt from the program by demonstrating 100% renewableness.

At the end of 2018, the program had contracted for 91.9 MW of renewable resources, with 65.3 MW of those resources commissioned as of January 2019. A summary of the standard-offer projects that have been contracted, built, and in development is shown in Table 4.

Standard-Offer Project Summary

Technology	Contracted		Online		In Development	
	Capacity (kW)	Number of Projects	Capacity (kW)	Number of Projects	Capacity (kW)	Number of Projects
Biomass	865	1	865	1	0	0
Farm Methane	5,394	15	5,394	15	0	0
Food Waste	1,314	2	0	0	1,314	2
Hydroelectric	4,939	6	4,939	6	0	0
Landfill Methane	560	1	560	1	0	0
Large Wind	2,200	1	0	0	2,200	1
Small Wind	164	3	0	0	164	3
Solar PV	76,497	48	53,542	36	22,955	12
TOTAL	**91,933**	**77**	**65,300**	**59**	**26,633**	**18**

Table 4: Standard-Offer Summary for projects on-line courtesy of VEPPI, Inc. See Appendix 2 for detail.

In 2018, standard-offer projects generated 103,658 MWh, which was then purchased by Vermont utilities. The total program cost in 2018 was about $21.3 million, with an average cost of $205/MWh. It is important to note that Standard Offer contracts for all technologies, except farm methane, are for the entire plant output of a project, including energy, capacity and RECs. Utilities can then sell the RECs out-of-state, which during robust REC markets, can help to reduce the cost of the program. Actual generation, costs, average price per MWh and average capacity factor for the past four years are shown in Table 5.

Historical Standard Offer Performance

Year	MWh Generation	Program Cost	Average Price per MWh	Avg. Capacity Factor
2015	90,126	$ 20,100,371	$ 223	20.1%
2016	101,377	$ 22,042,023	$ 217	19.8%
2017	103,519	$ 21,342,884	$ 206	18.8%
2018	103,658	$ 21,250,884	$ 205	18.1%

Table 5: Source: VEPPI, Inc.

The Standard Offer program is projected to grow over the next five years to reach a total capacity target of 127.5 MW in 2022, at which point the program will have run its course. Figure 3 shows the actual installed capacity at the end of each year, and the targeted cumulative capacity for each year going forward.[25]

Standard-Offer Capacity

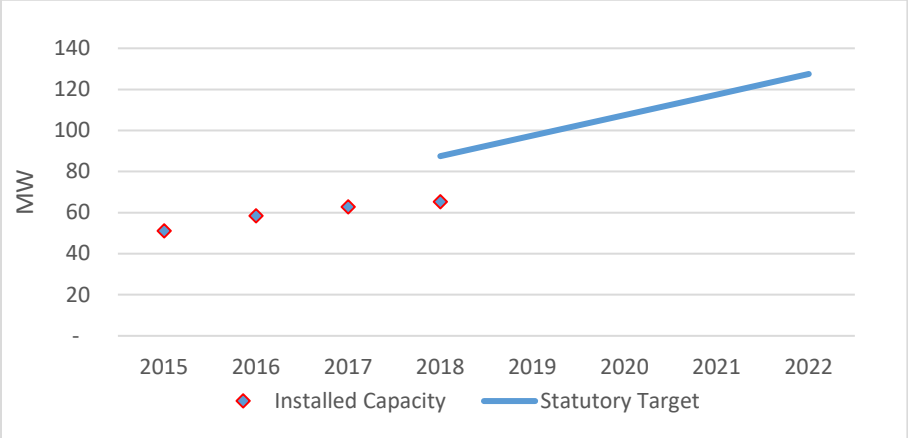

Figure 3: Actual historical installed capacity through 2018, and cumulative targets through 2022. The targeted amounts are for contracted capacity.

Interest and participation in the Standard Offer Program have been strong since the program's inception. Initially the program offered rates that were set in statute. However, it quickly became clear that lower prices could be achieved through a competitive market solicitation, resulting in Act 170, which enabled the Commission to conduct an annual RFP to procure the desired capacity. The annual RFP, which awards contracts to the lowest bidding resources has resulted in lower contract prices, as evidenced by the decreasing average price per MWh shown in Table 5. Below is a summary of the number of offers received in each RFP.

[25] The targeted cumulative capacity reflects the contracted capacity, whereas the installed capacity is the projects that have been commissioned by December 31 of each year.

Standard-Offer RPF Participation

Year	Developer Offer	Utility Offer
2013	34	1
2014	18	1
2015	22	2
2016	25	0
2017	30	2
2018	13	1

Table 6: Source: VEPPI, Inc.

The RFP bid process has resulted in significantly lower prices for newer projects. Solar projects that were awarded a contract in the early years of the program received a rate of $0.30/kWh compared to newer projects that are on-line with prices as low as $0.11/kWh. Projects have been awarded contracts at prices as low as $0.088/kWh, but it is unclear whether that project will be built. This declining price trend is a result of both declining solar costs, as well as the implementation of the competitive market solicitation.

The statute provides a clear directive to encourage the development of different technologies through technology allocations. However, it has been difficult for technologies other than solar to be awarded a contract, reach all the milestones, and achieve commissioning. While many of the first standard-offer contracts were awarded to farm methane projects, almost all the projects built in recent years have been solar, as shown in Figure 4. The PUC has attempted to address this concern through instituting technology allocations (set-aside for technologies other than solar), yet the standard-offer portfolio of new acquisitions remains heavily reliant on solar PV.

Total Installed Capacity of Standard Offer Projects by Fuel Type

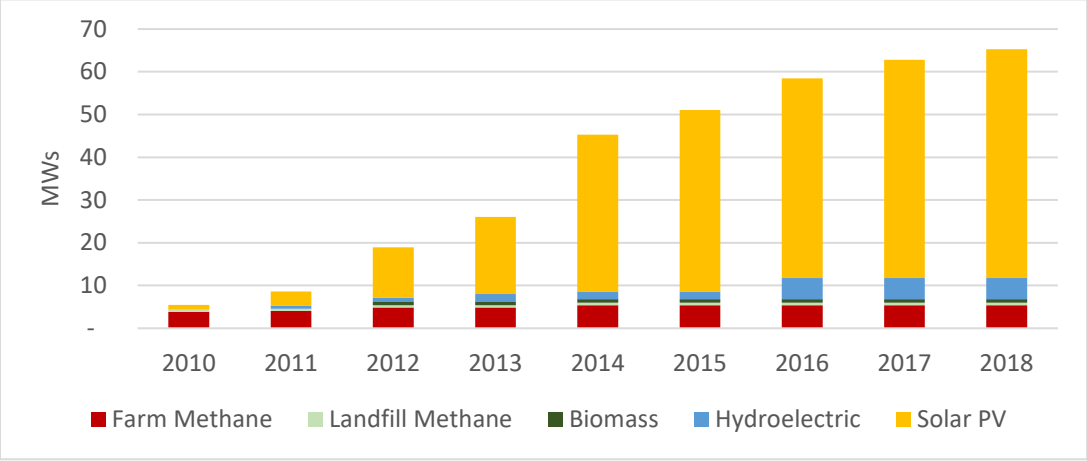

Figure 4: Capacity and Energy Provided by Standard Offer Projects by Fuel Type

In the fall of 2018, the PUC held a workshop where it sought recommendations on how to improve the standard-offer program. Department recommended that the program not be extended, in either length or capacity, and end as scheduled in 2022 for several reasons. The enactment of the standard-offer program in 2009 came at a time when the development of renewable energy within the state was moving relatively slowly, and before the enactment of the RES in 2015. Since that time, the environment for renewable energy development has changed enormously. Additionally, some of the

grid benefits of distributed generation have declined considerably as constraints are now more likely to result from excess generation rather than load.

The Department views the RES as the overarching state-level electric renewable policy, with the standard-offer program contributing to the achievement of Tier II requirements. However, with the evolving renewable landscape, the Department does not believe the program, in its current form, is in the best interest of Vermont ratepayers and instead inhibits progress toward the goals of the Comprehensive Energy Plan. Utilities cannot control the pacing of standard-offer projects, which makes planning for RES obligations highly uncertain and can result in higher costs. Historically, there has been a high percent of awarded projects that did not ultimately get built. Currently, the standard-offer contract requires a $15/kw refundable deposit, which does not provide adequate incentive for legitimate offers in the RFP. The Department continues to support VEPPI's recommendation that the deposit be forfeited if a project withdraws from the program prior to commissioning, except if its certificate of public good is denied. In addition to the unpredictability of standard-offer projects, the value that the projects provide has eroded as a result of the state's declining loads and increased distributed generation, that in some cases, these projects impose distribution costs rather than obviating the need for system upgrades, as originally intended. Another area with negative consequences is the imposition of unnecessary cost of wheeling power from the remote locations and out of the service territories of utilities that are hosting a disproportionate share of generation. More generally, the Department recommends phasing out the existing administratively burdensome standard-offer program as soon as practical and enacting instead a requirement for an open and transparent utility procurement process that fits within the framework of RES.

Market Assessment

30 V.S.A. § 8005b(c)(5)

Renewable Energy Markets

Renewable energy markets in New England are driven by state renewable portfolio standards (RPS). Throughout New England, compliance with RPS requirements is demonstrated with the retirement of RECs in NEPOOL Generator Information System (NEPOOL GIS). A REC is the renewable attribute associated with a MWh of generation from a qualified renewable resource. With each MWh of electric generation, an environmental attribute is also created. An eligible renewable resource can qualify its generation in different states and attributes associated with that resource receive a "REC" designation for each state (e.g. an attribute can be qualified for VT Tier II, MA Class I, and CT Class I). The energy (MWh) and attributes (RECs) can be separated and traded independent of each other so that a DU can achieve RES compliance by purchasing RECs and does not necessarily need the physical energy from the renewable resources. RECs are the currency used to demonstrate compliance, and NEPOOL GIS is the platform used in New England that tracks the characteristics of all generators in the region. It is in this system that all RECs in the region are created, traded and retired.

With the implementation of Vermont's RES in 2017, all six New England states now have active RPS or RES policies. Each RPS program has multiple classes—referred to in Vermont as tiers—which are used to differentiate incentives by energy technology, vintage, emissions, and other criteria, based on state-specific policy objectives. Regional premium REC requirements are intended to create demand for new

renewable energy and stimulate development. [26] In order to achieve continued growth of renewable energy, the RPS targets for these classes increase annually. Existing REC classes focus on resources that were in service prior to the implementation of the RPS and are generally described as "maintenance tiers." [27] They are designed to provide just enough financial incentive to keep the existing fleet of renewable resources in reliable operation. Generally, RPS requirements for the existing tiers remain flat, except for Vermont's Tier I requirement, which increases every third year.

REC markets provide utilities an opportunity to obtain RECs and comply with renewable requirements without having to make a long-term commitment of purchasing or generating physical power. However, REC markets can be volatile, illiquid and lack transparency. Adding to the complexity of the markets, RPS eligibility by state and class varies, which can result in convergence (e.g. when eligibility is similar in multiple states) or divergence (e.g. when eligibility is unique to a state) of REC prices by state. For example, Vermont Tier II eligibility requires the generator to be less than 5 MW and interconnected to a Vermont DU, whereas MA Class I has broader eligibility requirements, thus greater supply, which may result in Vermont Tier II RECs trading at a premium to MA Class I if there is a tight supply of Tier II RECs in Vermont.

Theoretically, REC prices should be the revenue, in addition to energy and capacity, required by renewable resources to make a project economically viable. When energy and capacity revenues are high, then REC prices should be low; when energy and capacity revenues are low, then REC prices should be high. However, in reality, prices are a function of supply and demand. Supply is the qualified renewable generation in the region, which increases with additional new renewable resources, but can also change with a change in eligibility criteria (e.g. the disallowance of biomass). Demand is a function of load and renewable requirements, which can change significantly with a change in legislation. Early renewable markets experienced a shortage of supply as RPS requirements increased faster than resources could come online, resulting in prices near the ACP. In recent years, however, renewable development has outpaced demand, resulting in very low REC prices.

All RPS programs in New England have an ACP, which is the price paid when insufficient RECs are retired. The ACP acts as a price ceiling for trading prices. Historically, RECs have traded at a wide range of prices, with Class I RECs trading as high as the $64/REC in 2014 and as low as $2/ REC in 2017. In 2017, the Tier I ACP was $10/REC and Tiers II and III were $60/REC; each will escalate annually with the consumer price index (CPI). Historical MA Class I REC prices are shown in Figure 5.

[26] Premium RECs include VT Tier II, CT Class I, MA Class I, ME Class I, NH Class II, and RI New.
[27] Existing RECs include VT Tier I, CT, MA & ME Class II, III & IV, and RI Existing.

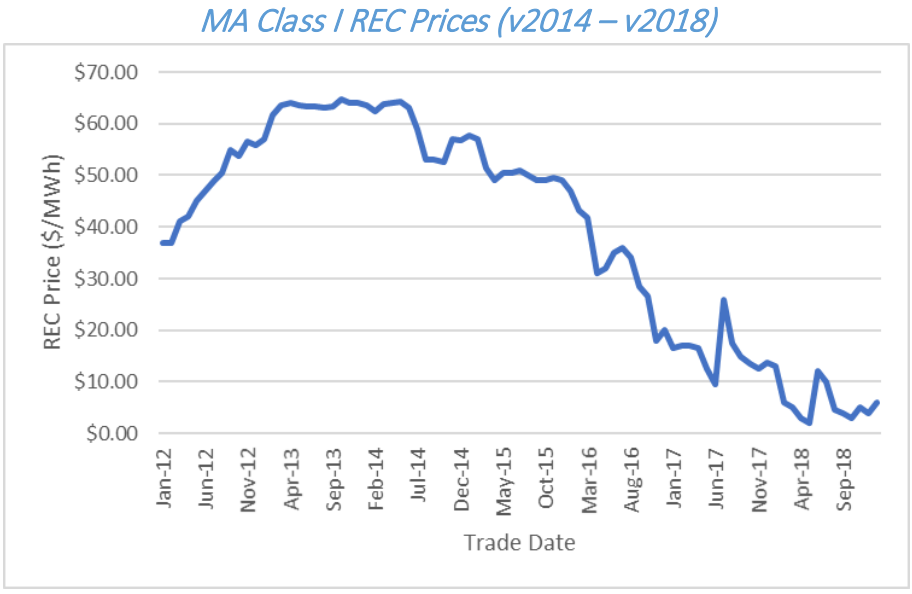

Figure 5: MA Class I REC Prices in New England (vintages 2014-2018), courtesy of GT Environmental REC Brokers.

In Vermont, Tier I resources include any renewable generator in ISO-NE and renewable imports from Quebec and New York. This category of RECs has consistently been in excess supply since the inception of renewable standards in the region, as there generally is no requirement that the eligible resources be new or limited to a certain size. Tier I RECs traded at a wide range of prices in 2017, from about $0.75/ REC to $10.00/REC.[28] The emergence of the Vermont Tier I market has increased demand slightly and caused modest price increases in the existing market, but additional substantive increases are not expected as Tier I requirements continue to increase because Vermont allows for the use of HQ and NYPA attributes for compliance, which are not currently eligible in other states. The Department expects utilities will be able to meet most of their obligations over the next 10 years with the RECs produced by their owned resources, those they are entitled to by long-term contracts, and the balance from short-term REC-only purchases.

Tier II of the RES defines eligible resources as renewable generators with a nameplate capacity of less than 5 MW, commissioned after June 30, 2015, and connected to a Vermont distribution or subtransmission line. These narrow criteria are a limiting factor on the tradable Tier II REC supply going forward and may result in Vermont Tier II RECs trading at a premium to other comparable REC markets in the region. The Department expects there to be limited opportunity for utilities to purchase unbundled Tier II RECs in the long-term. Instead, most Tier II RECs will come from net-metering, standard-offer, utility-owned resources, and long-term bundled purchases. Given the recent pace of net-metering adoption, many utilities expect to meet most, or all, Tier II compliance needs for the next five years with RECs from net-metering projects.[29] Standard-offer projects, from which utilities are required to purchase their pro-rata load share (except DUs that are exempt) also include Tier I and/or Tier II RECs.[30] However, even though

[28] Not all Tier I traded RECs were used for Vermont compliance; Tier I RECs are generally qualified in other New England states and used for compliance outside of Vermont.

[29] Net-metering RECs must be retired per Section 5.127(B)(1) of Rule 5.100 and 30 V.S.A. § 8010(c)(1)(H)(ii)

[30] Pursuant to 30 V.S.A. § 8005a(k)(2)(B), a DU may be exempt if "the amount of renewable energy supplied to the provider by generation owned by or under contract to the provider, regardless of whether the provider owned the

standard-offer projects commissioned prior to July 1, 2015 are eligible for Tier I compliance, as previously described, the Department expects utilities to sell these higher value RECs out of state as Class I resources. Additionally, several utilities own or have existing contracts to purchase the output from Tier I and/ or Tier II qualified generators. If a utility does not have sufficient RECs to cover its obligation, in the near-term, PSD expects sufficient excess RECs will be available for purchase at prices lower than the ACP and similar to Massachusetts and Connecticut Class I markets. However, looking further out, as RES requirements increase and cannot be met with net-metering and standard-offer projects alone, additional Tier II RECs will be needed to meet the requirements and greater price separation between Vermont and other states may emerge because only a subset of the total New England REC supply qualifies as Vermont Tier II.

Energy Efficiency Markets

Robust energy efficiency efforts in Vermont will drive down the cost of compliance with the RES. Efficiency measures not only reduce the energy that utilities must purchase, they also reduce the RES obligation of the utility.

The most recent Potential Study for efficiency prepared by the Department showed that cost-effective electric energy efficiency resources can play a significant role in the Vermont energy resource mix over the next 20 years with a maximum achievable potential of 16.6% of energy as a percent of forecasted Vermont electricity sales in 2037.[31] The realistic achievable potential, based on historical incentive levels and corresponding program adoption rates, is approximately 14.4% of the forecast kWh sales in 2037. The potential for efficiency improvements remains high in the state.

Efficiency programs in Vermont and other larger states have helped move the market more generally, helping lower costs of efficient appliances and lighting faster than would have otherwise occurred. Federal appliance and lighting standards reflect this movement toward affordability when they require efficient appliances and lighting.

Retail Electric Rates

30 V.S.A. § 8005b(c)(6)

Over the past five years, Vermont rates have been stable. While inflation averaged 1.5% over the past five years, Vermont rates experienced an average annual increase of 0.6%. Over the last 5-year period, from 2013 through 2018, Vermont rates did not rise faster than inflation, and therefore, additional assessments of the contributions on rate changes are not addressed in this report.

energy's environmental attributes, was not less than the amount of energy sold by the provider to its retail customers."

[31] This analysis appears in the most recent Vermont Energy Efficiency Potential study conducted in 2017. The Department is conducting a similar study this year, with results expected in the fall. The 2017 study is available at https://publicservice.vermont.gov/content/energy-efficiency-potential-study-2017 p. 94

Vermont Electric Rates

	2013	2014	2015	2016	2017	2018	5-Year Avg
Vermont Retail Rates: all sectors	$14.62	$14.57	$14.41	$14.47	$14.60	$15.06	**$14.62**
Change in Electric Rates		-0.35%	-1.12%	0.41%	0.95%	3.09%	**0.6%**
Inflation Rate	1.5%	0.8%	0.7%	2.1%	2.1%	1.9%	**1.5%**

Table 7: Nominal Retail Electric Rates in Vermont. Source: EIA.

The Federal Energy Information Administration (EIA) reports total retail revenue and total retail energy sales of utilities in the U.S. Based on this information, the Department compared the average price of electricity among states in the Northeast. Vermont prices are generally lower than those in the rest of New England, as shown in Figure 66. In 2018, the most recent year for which data are available, Vermont's retail prices were the third lowest among the six New England states and New York.

Average Retail Rates (all sectors)

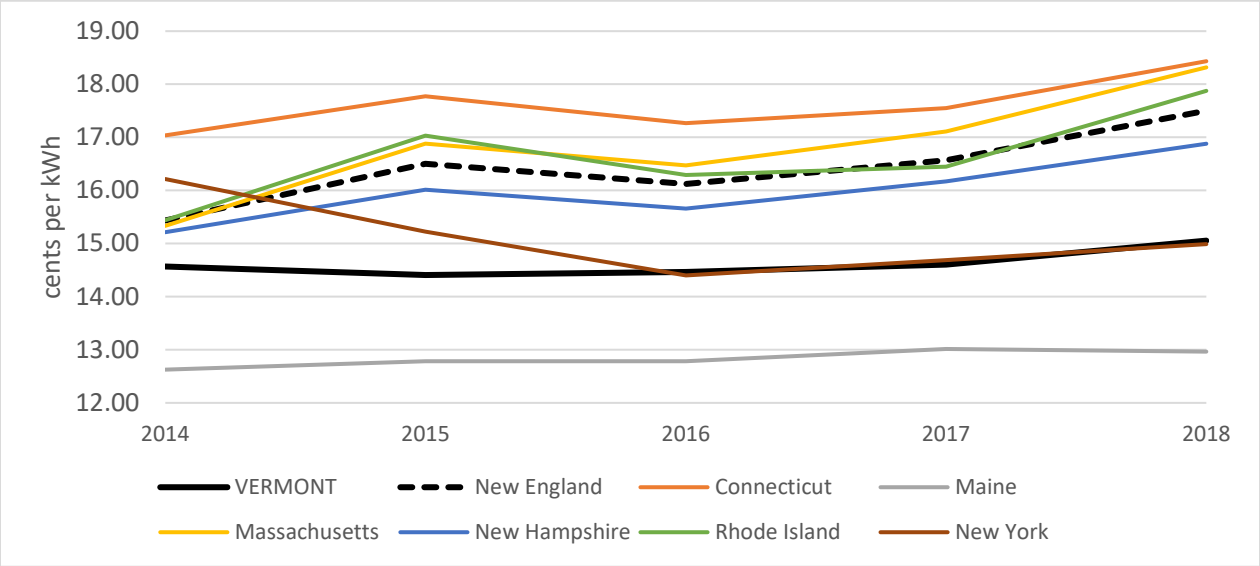

Figure 6: Average Retail Costs in New England and New York. Source: Energy Information Agency.

Vermont electric utilities are vertically integrated, which means that they provide complete service within their territory. Vermont DUs own generation, transmission and distribution systems used to serve retail customers. However, most other New England states deregulated in the late 1990s, in a move away from traditionally-regulated monopoly utilities towards a paradigm of retail choice. In these states, utilities generally own and operate the distribution grid, while third party providers acquire and sell electricity. Vermont utilities have certainty that they will be serving load in the long-term and can therefore make long-term power procurements such as generation ownership investments or long-term power purchase agreements (PPAs). Conversely, retail providers in deregulated states do not have long-term certainty in the amount of load they will be providing and have therefore been limited to short-term procurements.[32] The ability for Vermont utilities to make long-term procurements results in retail rates that tend be less volatile than neighboring states. While Vermont ratepayers do not realize the full benefits of low market

[32] This dynamic is beginning to shift with the implementation of long-term statewide renewable procurements in Massachusetts and Connecticut.

prices, their exposure to high market prices is also limited. This is a result of the Vermont regulatory structure, which enables Vermont DUs to make long-term power procurements that can stabilize rates. Figure 7 illustrates that while other states have had annual rate increases in excess of 12%, Vermont's rates never changed by more than 3% in a single year.

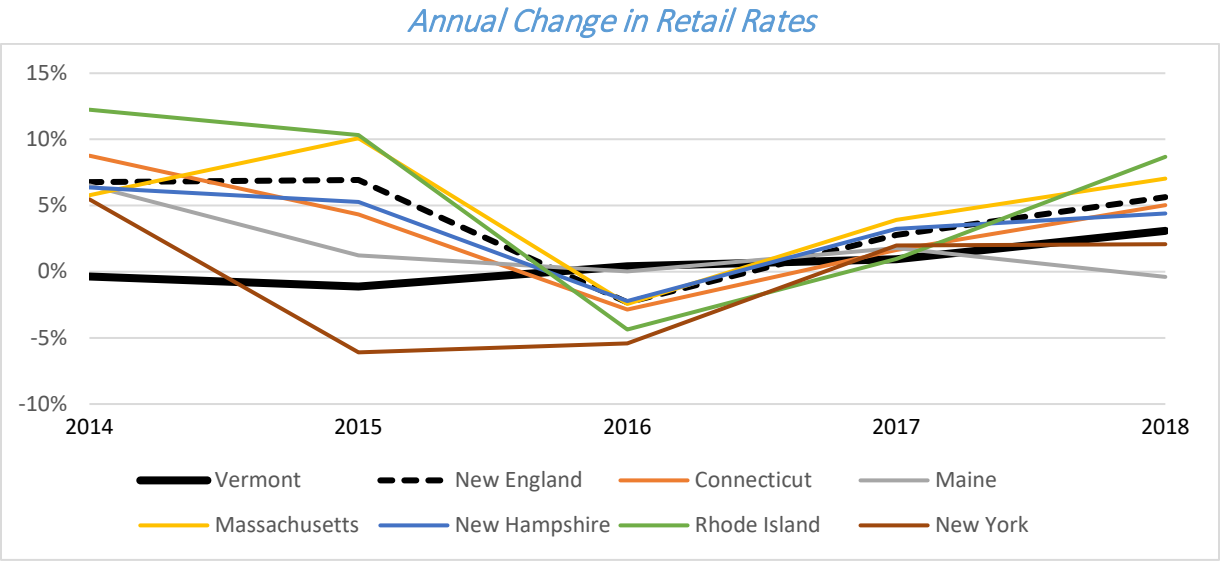

Figure 7: Average Retail Costs in New England and New York. Source: Energy Information Agency.

Programmatic Rate Impacts

30 V.S.A. § 8005b(c)(7)

In the past two years, there have been five rate increases by three utilities. None of the rate increases were directly caused by compliance with RES or standard-offer. However, tied to Vermont's energy goals is the net-metering program, which has put some upward pressure on rates. While rate increases to date resulting from the cost of net-metering have been limited, utilities with high net-metering adoption rates could be vulnerable to rate increases in the near future.

In terms of meeting RES Tier II requirements, net-metering is the most expensive resource (equal to the year 1 ACP), followed by standard offer projects, and finally new utility owned projects or long-term purchases. Compounding the impact is that net-metering reduces a utility's kWh sales, which results in higher rates because the same fixed costs are spread over few kWh sales.

Net-metering is making a significant contribution in achieving Vermont's renewable requirements. While RES is the overarching framework in Vermont, both the standard-offer program and net-metering programs compliment those goals. However, the current net-metering program requires that Vermont DUs purchase net-metering RECs. In the current REC low-priced REC environment, this leads to paying an excess price premium for RECs, and in certain instances can lead to purchases that are in excess of both quantity and price of their RES requirements. Therefore, the Department believes the program is out of alignment with RES and should be reconfigured to reduce the burden on ratepayers, while still advancing our renewable goals in ration to the standard.

Over time, the Department believes that programs like net-metering, that are designed to foster distributed generation and other resources on the customer side of the meter, can be reconfigured to provide a better alignment of benefits between participating and non-participating customers.

Statutory Recommendations

30 V.S.A. § 8005b(c)(8)

At this time, the Department is not recommending any statutory changes to 30 V.S.A § 8004, 8005, or 8005a. As these programs move forward, the Department will continue to assess issues including the ones raised in this report.

The Department notes that while implementation in the first year generally went smoothly, there is room for improvement, outside of statutory changes. The PUC is currently conducting a formal rulemaking process in Docket 18-3810-INV, where more consistent reporting is proposed for both compliance filings and annual reports. Additionally, the Department has proposed that Tier III Annual Plans be approved by the PUC in order to provide clarity and ensure that all plan requirements are met. Separate from the current rulemaking process, is a "2020 Review" of Tier III, which will provide an opportunity for improvements after three years of RES experience.

Public Comment

30 V.S.A. § 8005b(d)

The Department requested public comment regarding this report and received two comments.

Mr. Gordesky, of DC Energy Innovations, provided comments that "any accounting of renewable energy resources, for the RES program should not include nuclear power or Hydro-Quebec." The Department appreciates his comments, but notes that Tier III "encourages" the distribution utilities to support distributed generation and "other projects that reduce fossil fuel consumed by their customers and the emission of greenhouse gases attributable to that consumption."[33] To be eligible to be an energy transformation project, a project must "result in a net reduction in fossil fuel consumed by" the utility's customers.[34] The conversion methodology then obligates the utility to "convert the net reduction in fossil fuel consumption resulting from the energy transformation project to a MWH equivalent of electric energy."[35] The statutory scheme elsewhere distinguishes between renewable and nuclear energy,[36] further indicating that the Legislature intentionally used the terms "renewable," "fossil fuel," and "nuclear" in 30 V.S.A. § 8005. The Department does not conflate "renewable" and "nuclear."

[33] 30 V.S.A. § 8005(a)(3)(A).
[34] 30 V.S.A. § 8005(a)(3)(C)(ii).
[35] 30 V.S.A. § 8005(a)(3)(D).
[36] 30 V.S.A. §§ 8002(21) & 21(B) (defining renewable energy and declaring that "no form of nuclear fuel shall be considered renewable").

Consequently, Tier III requires utilities to reduce customers' fossil fuel consumption. Tier III's plain language is therefore more consistent with calculating savings against the non-fossil fuel power supply than against the renewable energy power supply.

Related to HQ energy, prior to the implementation of RES, Vermont utilities had contracts with HQ and the statute was written with that in consideration and hydro electric energy from Quebec is clearly eligible as a Tier I resource in Vermont.

Green Mountain Power (GMP) provided responses to the statutory requirements of this report for their utility, which were consistent with the state as a whole. Additionally, GMP is supportive of RES, and notes that given the limited experience to date, no changes are appropriate at this time. Related to standard-offer, they do not think any changes or extensions to the standard-offer program are appropriate either.

The comments in their entirety are attached in Appendix 4.

Appendix 1: Statutory Reporting Requirement

§ 8005b. Renewable energy programs; reports

(c) The biennial report under this section shall include at least each of the following:

(1) The retail sales, in kWh, of electricity in Vermont during the two preceding calendar years. The report shall include the statewide total and the total sold by each retail electricity provider.

(2) Commencing with the report to be filed in 2019, each retail electricity provider's required amount of renewable energy during the two preceding calendar years for each category of the RES as set forth in section 8005 of this title.

(3) For the two preceding calendar years, the amounts of renewable energy and tradeable renewable energy credits eligible to satisfy the requirements of sections 8004 and 8005 of this title actually owned by the Vermont retail electricity providers, expressed as a percentage of retail kWh sales. The report shall include the statewide total and the total owned by each retail electricity provider for each of these amounts and shall discuss the progress of each provider toward achieving each of the categories set forth in section 8005 of this title. The report shall summarize the energy transformation projects undertaken pursuant to section 8005 of this title, their costs and benefits, their claimed avoided fossil fuel consumption and greenhouse gas emissions, and, if applicable, claimed energy savings.

(4) A summary of the activities of the Standard Offer Program under section 8005a of this title, including the number of plants participating in the Program, the prices paid by the Program, and the plant capacity and average annual energy generation of the participating plants. The report shall present this information as totals for all participating plants and by category of renewable energy technology. The report also shall identify the number of applications received, the number of participating plants under contract, and the number of participating plants actually in service.

(5) An assessment of the energy efficiency and renewable energy markets and recommendations to the General Assembly regarding strategies that may be necessary to encourage the use of these resources to help meet upcoming supply requirements.

(6) An assessment of whether Vermont retail electric rates are rising faster than inflation as measured by the CPI, and a comparison of Vermont's electric rates with electric rates in other New England states and in New York. If statewide average rates have risen faster than inflation over the preceding two or more years, the report shall include an assessment of the contributions to rate increases from various sources, such as the costs of energy and capacity, costs due to construction of transmission and distribution infrastructure, and costs due to compliance with the requirements of sections 8004 and 8005 (RES) and section 8005a (standard offer) of this title. Specific consideration shall be given to the price of renewable energy and the diversity, reliability, availability, dispatch flexibility, and full life cycle cost, including environmental benefits and greenhouse gas reductions, on a net present value basis of renewable energy resources available from suppliers. The report shall include any recommendations for statutory change that arise from this assessment. If electric rates have increased primarily due to cost increases attributable to nonrenewable sources of electricity or to the electric transmission or distribution systems, the report shall include a recommendation regarding whether to increase the size of the annual

increase described in subdivision 8005a(c)(1) (standard offer; cumulative capacity; pace) of this title.

(7)(A) Commencing with the report to be filed in 2019, an assessment of whether strict compliance with the requirements of sections 8004 and 8005 (RES) and section 8005a (standard offer) of this title:

(i) has caused one or more providers to raise its retail rates faster over the preceding two or more years than statewide average retail rates have risen over the same time period;

(ii) will cause retail rate increases particular to one or more providers; or

(iii) will impair the ability of one or more providers to meet the public's need for energy services in the manner set forth under subdivision 218c(a)(1) of this title (least-cost integrated planning).

(B) Based on this assessment, consideration of whether statutory changes should be made to grant providers additional flexibility in meeting requirements of sections 8004 and 8005 or section 8005a of this title.

(8) Any recommendations for statutory change related to sections 8004, 8005, and 8005a of this title.

Appendix 2: Standard Offer Program Details

Data for this appendix were provided by VEPPI, the Standard Offer Program Administrator.

Projects On-Line

Technology	ProjectName	Capacity (kW)	Rate ($/kWh)
Biomass	Cersosimo Lumber Biomass	**865**	0.1248
Biomass Average*			0.1248
Farm Methane	Audets Cow Power (Inside 50 MW)	**190**	0.1407
Farm Methane	Central Vermont Recovered Biomass	**375**	0.1386
Farm Methane	Chaput Family Farms	**300**	0.1600
Farm Methane	Dubois Energy, LLC	**450**	0.1600
Farm Methane	Four Hills Digester	**450**	0.1600
Farm Methane	Gervais Farm Engine 2	**200**	0.1400
Farm Methane	Kane's Cow Power	**225**	0.1600
Farm Methane	Maplehurst Farm Methane	**150**	0.1393
Farm Methane	Riverview Farm Digester	**189**	0.1386
Farm Methane Average*			0.1486
Hydroelectric	Ball Mountain Hydroelectric	**2,200**	0.1250
Hydroelectric	Factory Falls	**150**	0.0930
Hydroelectric	North Hartland	**138**	0.1224
Hydroelectric	Townshend Dam Hydroelectric	**960**	0.1250
Hydroelectric	Troy Hydro Project	**816**	0.1250
Hydroelectric	West Charleston Hydro	**675**	0.1250
Hydroelectric Average*			0.1192
Landfill Methane/ Organic Waste	Brattleboro Landfill Gas and Brattleboro Organic Energy	**560**	0.1200
Landfill Methane/Organic Waste Average*			0.1200
Solar PV	100 Bobbin Mill Road	**50**	0.2400
Solar PV	Advance Transit Building Expansion	**32**	0.3000
Solar PV	Barton Solar Farm	**1,890**	0.2710
Solar PV	Bridport West Solar Farm	**2,000**	0.2710
Solar PV	Butternut Mountain Farm Solar	**103**	0.2400
Solar PV	Champlain Valley Solar Farm	**2,000**	0.1441
Solar PV	Charlotte Hinesburg Rd Project	**2,000**	0.2400
Solar PV	Chester Solar Farm	**2,000**	0.2400
Solar PV	Claire Solar Farm	**2,200**	0.2710
Solar PV	Clarendon Solar Project	**2,000**	0.2400

Solar PV	Clarke Solar Center, LLC	**800**	0.2710
Solar PV	Coventry Solar Project	**2,200**	0.2710
Solar PV	Cross Pollination One	**2,000**	0.3000
Solar PV	Ferrisburgh Solar Farm Project	**1,047**	0.3000
Solar PV	IRA Rentals Solar	**37**	0.2710
Solar PV	Kingsbury Solar	**48**	0.2400
Solar PV	Leunig's Building	**26**	0.3000
Solar PV	Limerick Road Solar Farm	**2,166**	0.2710
Solar PV	Lyndonville Solar 1 West (VPPSA)	**480**	0.1540
Solar PV	Lyndonville Solar 2 East (VPPSA)	**495**	0.1550
Solar PV	MartinBrookPV Solar (formerly Triland BlueWave-Williamstown)	**1,500**	0.1097
Solar PV	Next Generation Solar Farm	**2,200**	0.1287
Solar PV	Northshire	**16**	0.2400
Solar PV	Otter Valley Solar Farm	**2,180**	0.1338
Solar PV	Pownal Park Solar	**2,200**	0.1096
Solar PV	Sheldon Springs Solar	**2,200**	0.2400
Solar PV	South Burlington Solar Farm	**2,206**	0.3000
Solar PV	Southern VT Energy Park Solar	**2,000**	0.3000
Solar PV	Springfield Solar Alliance I	**1,000**	0.2710
Solar PV	St Albans Solar Farm	**2,000**	0.2400
Solar PV	Sudbury Solar	**2,000**	0.1440
Solar PV	SunGen1Solar	**2,100**	0.3000
Solar PV	Technology Drive Solar	**2,000**	0.2710
Solar PV	Whitcomb Farm Solar	**2,200**	0.2710
Solar PV	White River Junction Solar Farm	**2,166**	0.2400
Solar PV	Williamstown Solar Project	**2,000**	0.3000
Solar PV Average*			0.2386
	TOTAL	**62,435**	

** The value of the renewable energy credits reduces these rates to the Vermont utilities*

Farm Methane Projects On-Line - Outside 50 MW Tranche

Technology	Project Name	Capacity (kW)	Rate ($/kWh)
Farm Methane	Audets Cow Power (Outside cap)	**490**	0.1407
Farm Methane	Berkshire Cow Power	**600**	0.1407
Farm Methane	Gervais Digester	**200**	0.1407
Farm Methane	Green Mountain Dairy	**600**	0.1399
Farm Methane	Neighborhood Energy	**225**	0.1407
Farm Methane	Rail City Cow Power	**300**	0.1407
Farm Methane	Westminster Energy Group	**450**	0.1393
Farm Methane Average*			0.1404
	TOTAL	**2,865**	

** The value of the renewable energy credits reduces these rates to the Vermont utilities*

Projects in Development

Technology	ProjectName	Capacity (kW)	Rate ($/kWh)
Large Wind	Dairy Air Wind	**2,200**	0.1160
Small Wind	Bailey Hill Wind	**24**	0.2530
Small Wind	Forgues Dairy	**50**	0.2520
Small Wind	Tomlinson Wind	**90**	0.2580
Food Waste	Brattleboro Organic Energy	**300**	0.2080
Food Waste	Middlebury Resource Recovery Ctr.	**1,014**	0.2050
Solar PV	Trombley Hill Solar (VPPSA)	**855**	0.1290
Solar PV	1861 Solar (VPPSA)	**1,000**	0.1250
Solar PV	Apple Hill Solar Project	**2,000**	0.1390
Solar PV	Battle Creek 1 Solar	**2,200**	0.1087
Solar PV	Chelsea Solar Project	**2,000**	0.1340
Solar PV	Golden Solar	**2,200**	0.0889
Solar PV	Otter Creek Solar 2	**2,200**	0.1020
Solar PV	Wallingford Solar	**2,200**	0.0946
Solar PV	Furnace Brook Solar	**1,700**	0.0884
Solar PV	Warner Solar	**2,200**	0.1087
Solar PV	Stark Solar	**2,200**	0.1106
Solar PV	Otter Creek 1 Solar	**2,200**	0.1112
	TOTAL	**26,633**	

Appendix 3: Summary of New England Renewable Portfolio Standards

State	Class/ Tier	Target	Target Year	Eligible Technologies	Vintage
Connecticut	1	20%	2020	Solar, wind, fuel cells, geothermal, landfill methane, anaerobic digestion, ocean, certain run of river hydro, certain biomass. End user DG also qualifies.	hydro post 7/1/03; otherwise none
	2	2%	2010	Trash to energy, certain biomass not in Class I, older run of river hydro	
	3	4%	2010	Certain customer sited CHP, EE and load management programs outside of EE charge, waste heat recovery systems.	post 1/06
Massachusetts	1	25%	2030	PV, solar thermal, wind, ocean, fuel cells w/ renewables, landfill gas, certain new hydro, certain incremental improvements to hydro, certain biomass, ag crops or vegetative material, geothermal, biogas, algae, marine.	post 12/97
	1-Solar	Initially 400MW; now 1600 MW (DC)	2020	Two separate carve outs within Class I RPS, on MW basis as directed to the left. Solar PV 6 MW DC or less	post 12/09 for first carve out, post 12/12 for second.
	2	3.6%	2020	Existing systems operating before 1998 in similar technologies as Class I.	pre 1/98
	2-WTE	3.5%	2020	Waste energy (from municipal solid waste)	pre 1/98
Maine	1	10%	2017	Solar, wind, fuel cell, tidal, geothermal, hydro, biomass - (all less than 100MW). PURPA eligible projects. New wind may exceed 100MW	post 9/05
	2	30%	2017	Existing renewables. Municipal Solid waste with recycling. Wind may exceed 100MW	none
New Hampshire	1	15% (including thermal % below)	2025	New Renewable. Wind, hydrogen from biomass or landfill, ocean, methane, geothermal post 12/12, solar thermal post 12/12, certain biomass, solar electric not used for Class II, incremental new production over an historical baseline from certain biomass, methane, and hydro, upgrades to class III or IV sources	post 12/05
	1-Thermal	2.0%	2025	The NH thermal carve out is a portion of the Class I requirement, not additional. Includes "useful thermal energy" that can be metered and for which fuel or electricity would be consumed.	post 12/12
	2	0.3%	2025	New solar	post 12/05
	3	8.0%	2025	Existing biomass, methane up to 25 MW	pre 1/06
	4	1.5%	2025	Existing small hydro up to 5 MW	pre 1/06
Rhode Island	New	14%	2019	Direct solar radiation, wind, ocean, geothermal, hydro up to 30MW, certain biomass, fuel cells using renewables.	post 12/97

	New or Existing	2%	2013	Direct Solar Radiation, Wind, ocean, geothermal, hydro up to 30MW, certain biomass, fuel cells using renewables	pre 1/98
Vermont	1	75%	2032	Existing hydro, solar, wind, biomass, landfill methane and others	none
	2	10%	2032	Under 5MW, built after July, 2015. Solar, low-impact hydro, wind, biomass, landfill methane and others	post 7/15
	3	12%	2032	Utility incentives for measures that reduce customer fossil fuel use. For example, heat pumps and electric vehicles	none

Appendix 4: Public Comments and Information

Public Comment 1

Received 2/13/2019 8:36 am

Hi Maria,

My comments are below. Thank you for your consideration.

Any accounting of renewable energy resources, for the RES program should not include nuclear power or Hydro-Quebec. Nuclear power is not a renewable resource. It relies on a mined fuel. The by-products require enormous amounts of resource and attention for centuries to come. While it, in its entirety produces less carbon emissions than the burning of fossil fuels, it's reliance on energy for the processing and transportation of the fuel as well as the transportation, treatment, etc. of the by-products is substantial. Estimates put nuclear as producing 25% of the carbon emissions as a coal generating plant.
Hydro-Quebec does produce electricity using hydroelectric facilities which do not require any fuel other than falling water. However, the environmental impacts of the construction and operations of the projects are far greater than for any in-state renewable energy resources. Impacts on the lives of the indigenous people who live in the area is enormous. The enormity of the projects combined with the wide and low relief river valleys has resulted in the mass killing of wildlife and large scale devegetation due to the fluctuations of water levels to provide energy to meet demand. If we are to have a standard that charts our conversion to a renewable energy future, it should not include projects like Hydro-Quebec. In addition, every investment in nuclear or Hydro-Quebec energy from out of Vermont, sends our money out of state. We need a standard that encourages investment in Vermont and grows jobs in Vermont.

Sincerely,

Ben Gordesky
Renewable Energy Manager
DC Energy Innovations, Inc.
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OR
12 North Street
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Public Comment 2

Received 2/20/2019 5:26 PM
From Carolyn Anderson, GMP

GMP Comments to DPS on 2019 Biennial RES and SO Report

Green Mountain Power ("GMP") appreciates the opportunity to provide comments regarding the Department of Public Service's report pursuant to 30 V.S.A. § 8005b(c) which pertain to the Renewable Energy Standard ("RES") and Standard Offer programs. GMP hopes that its responses are helpful to the Department in drafting its report.

(c) The biennial report under this section shall include at least each of the following:

(1) The retail sales, in kWh, of electricity in Vermont during the two preceding calendar years. The report shall include the statewide total and the total sold by each retail electricity provider.

According to the FERC Form 1, GMP's booked retail sales were 4,146,863,000 kWh in Calendar Year 2017 and 4,222,266,000 kWh in Calendar Year 2018.

(2) Commencing with the report to be filed in 2019, each retail electricity provider's required amount of renewable energy during the two preceding calendar years for each category of the RES as set forth in section 8005 of this title.

2017

Tier I

- GMP needed to retire 2,280,744 RECs or attributes. GMP exceeded its Tier I requirement of retiring RECs or attributes equal to 55% of its retail electric sales and elected to retire 2,446,594 RECs and attributes.

Tier II

- GMP met its obligation to retire RECs from distributed generation resources equivalent to 1% of its retail electric sales by retiring 41,469 RECs from distributed generation resources. Together with the Tier I-eligible sources above, GMP retired a total of 2,488,063 RECs or 60% of its retail electric sales.

Tier III

- GMP was required to provide 82,937 MWh of savings–the equivalent of 2% of its retail electric sales. GMP completed energy transformation projects achieving 129,932 MWh of Tier III savings towards its 82,937

Tier III obligation. GMP banked excess Tier III credits beyond its 82,937 MWh requirement for use in future years.

2018 Preliminary Information

GMP still is in the process of completing its 2018 RES evaluation so the information provided below is preliminary.

Tier I

- GMP anticipates needing to retire 2,322,246 RECs or attributes. GMP plans to again exceed its Tier I requirement of retiring RECs or attributes equal to 55% of its retail electric sales and elects to retire an anticipated 2,465,803 RECs and attributes.

Tier II

- GMP plans to meet its obligation to retire RECs from distributed generation resources equivalent to 1.6% of its retail electric sales by retiring an anticipated 67,556 RECs from distributed generation resources. Together with the Tier I-eligible sources above, this will result in retiring a total of 2,533,359 RECs or 60% of GMP's retail sales.

Tier III

- GMP will be required to provide 112,600MWh of savings– the equivalent of 2 + 2/3 of its retail electric sales. GMP completed energy transformation projects and anticipates achieving 55,689 MWh of Tier III savings towards its 112,600 Tier III obligation. GMP plans to use all 47,000 banked Tier III credits from 2017 as well as an anticipated 9.910 from excess 2018 Tier II credits to fulfill this requirement.

(2) For the two preceding calendar years, the amounts of renewable energy and tradeable renewable energy credits eligible to satisfy the requirements of sections 8004 and 8005 of this title actually owned by the Vermont retail electricity providers, expressed as a percentage of retail kWh sales. The report shall include the statewide total and the total owned by each retail electricity provider for each of these amounts and shall discuss the progress of each provider toward achieving each of the categories set forth in section 8005 of this title. The report shall summarize the energy transformation projects undertaken pursuant to section 8005 of this title, their costs and benefits, their claimed avoided fossil fuel consumption and greenhouse gas emissions, and, if applicable, claimed energy savings.

2017 and 2018

See above for GMP's share of the statewide RES savings. Regarding the energy transformation projects GMP undertook pursuant to section 8005, please see GMP's March 15, 2018 Tier III report filed in Case

No. 17-4632. Below is a summary of the transformation projects for each year.

2017 TIER 3 PROGRAM SUMMARY

GMP TIER 3 PROGRAM CATEGORY	Total Costs	2017 Tier 3 MWH	Cost/MWH
Pre-2017 Tier 3 Backlog	$ 30,000.00	22,513.87	$ 1.33
Cold Climate Heat Pump Program	$ -	9,356.68	$ -
Heat Pump Hot Water Heater Program	$ -	675.24	$ -
eWater Program	$ 9,675.54	196.56	$ 49.22
EV Purchase Program	$ 73,724.00	4,421.49	$ 16.67
EV Charging Program	$ -	97.07	
Commercial and Industrial Custom Projects (incl labor)	$ 619,869.00	92,671.10	$ 6.69
Tier 3 Program Non-Specific Costs			
2017 Promotion and advertising - all programs	$ 160,416.87		
2015-2017 Labor - Tier 3 Prescriptive Programs	$ 971,266.21	**129,932.00**	**$ 14.43**
Labor - Tier 3 C&I Project Charges	$ 10,513.00		
Tier 3 Program Totals	**$ 1,875,464.62**		
2017 Target		82,932.00	
Variance (Carry forward to 2018)		**47,000.00**	

2018 Preliminary Information

GMP has not yet completed its claimed savings calculations for 2018. Below is an estimate which will be updated in GMP's March 15, 2019 compliance filing. The requirements of the RES increase every year, meaning that meeting Tier III transformation goals will be more and more challenging each
year. GMP has banked credits in order to help smooth this impact. As shown in the chart below, GMP anticipates that it will utilize the 47,000.00 MWH savings carried forward from 2017 in order to fulfill 2018 requirements, and will also retire 9,910.19 Tier II RECs for this purpose.

2018 TIER 3 PROGRAM SUMMARY

GMP TIER 3 PROGRAM CATEGORY	2018 Tier 3 MWH
Cold Climate Heat Pump Program	2,602.81
Heat Pump Hot Water Heater Program	235.19
eWater Program	477.36
Battery Storage Program	2,569.64
EV Purchase Program	5,411.81
EV Charging Program	232.00
Commercial and Industrial Custom Projects (incl labor)	44,161.00
Tier 3 Program Totals	**55,689.81**
Balance Carried Forward from 2017	**47,000.00**
Tier II RECs Retired to Achieve 2018 Tier III Target	**9,910.19**
2018 Target	112,600.00

(4) A summary of the activities of the Standard Offer Program under section 8005a of this title, including the number of plants participating in the Program, the prices paid by the Program, and the plant capacity and average annual energy generation of the participating plants. The report shall present this information as totals for all participating plants and by category of renewable energy technology. The report also shall identify the number of applications received, the number of participating plants under contract, and the number of participating plants actually in service.

N/A

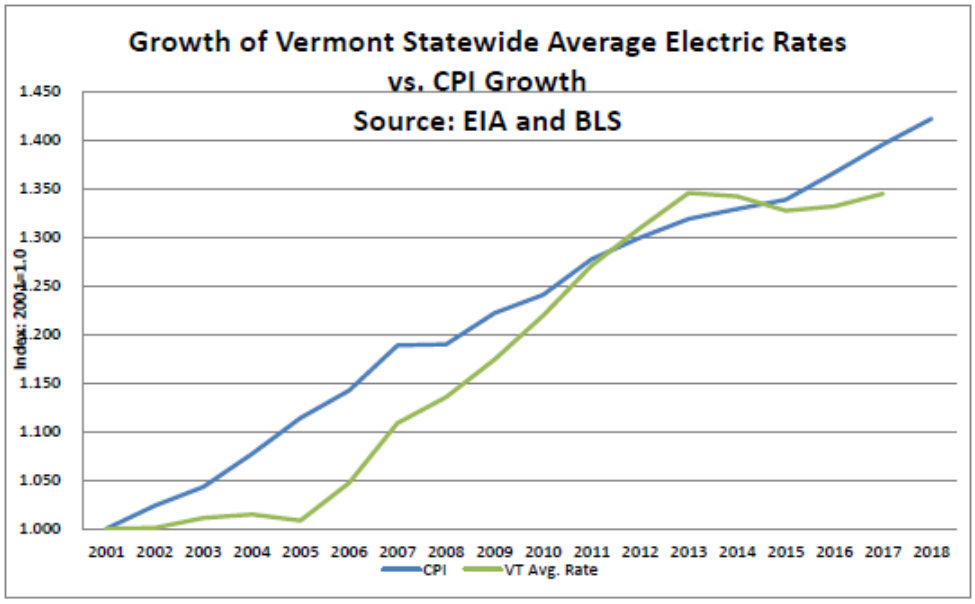
(5) An assessment of the energy efficiency and renewable energy markets and recommendations to the General Assembly regarding strategies that may be necessary to encourage the use of these resources to help meet upcoming supply requirements.

GMP recently filed its Integrated Resource Plan and does not have different or new information to offer on this subject for the DPS report.

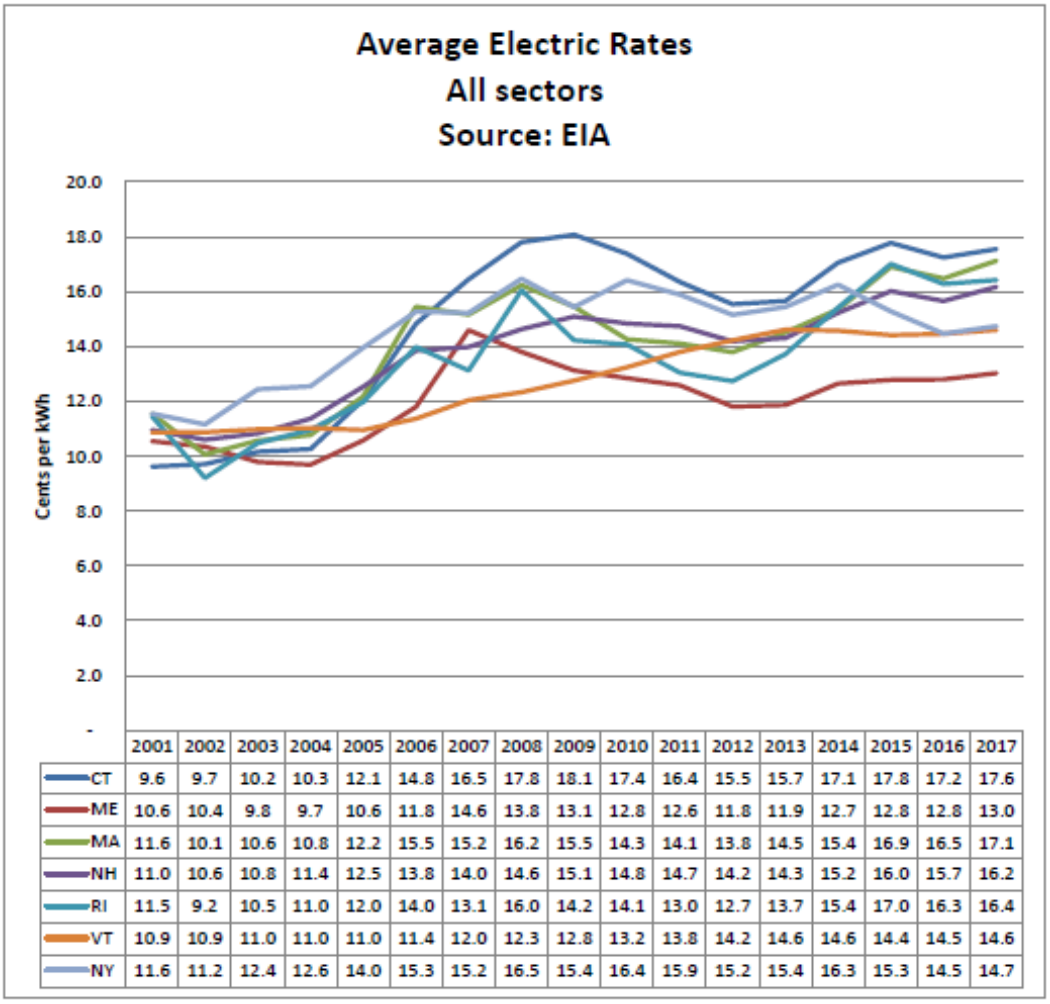
(6) An assessment of whether Vermont retail electric rates are rising faster than inflation as measured by the CPI, and a comparison of Vermont's electric rates with electric rates in other New England states and in New York. If statewide average rates have risen faster than inflation over the preceding two or more years, the report shall include an assessment of the contributions to rate increases from various sources, such as the costs of energy and capacity, costs due to construction of transmission and distribution infrastructure, and costs due to compliance with the requirements of sections 8004 and 8005 (RES) and section 8005a (standard offer) of this title. Specific consideration shall be given to the price of renewable energy and the diversity, reliability, availability, dispatch flexibility, and full life cycle

cost, including environmental benefits and greenhouse gas reductions, on a net present value basis of renewable energy resources available from suppliers. The report shall include any recommendations for statutory change that arise from this assessment. If electric rates have increased primarily due to cost increases attributable to nonrenewable sources of electricity or to the electric transmission or distribution systems, the report shall include a recommendation regarding whether to increase the size of the annual increase described in subdivision 8005a(c)(1) (standard offer; cumulative capacity; pace) of this title.

Below is a chart depicting the growth of Vermont's Statewide Average Electric Rates compared to CPI using data from the Energy Information Administration ("EIA") and the U.S. Bureau of Labor from 2001 through 2018 (spreadsheet attached). Please note that the statewide average electric rates for 2018 are not yet available. The data shows that over this period, statewide average electric rates increased less than the CPI did.



Below is a chart from the Energy Information Administration ("EIA") showing average electric rates for New England and New York from 2001-2017. Data for 2018 is not yet available. Vermont's average electric rates over this time frame compare favorably to most of the New England states as well as New York.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CT	9.6	9.7	10.2	10.3	12.1	14.8	16.5	17.8	18.1	17.4	16.4	15.5	15.7	17.1	17.8	17.2	17.6
ME	10.6	10.4	9.8	9.7	10.6	11.8	14.6	13.8	13.1	12.8	12.6	11.8	11.9	12.7	12.8	12.8	13.0
MA	11.6	10.1	10.6	10.8	12.2	15.5	15.2	16.2	15.5	14.3	14.1	13.8	14.5	15.4	16.9	16.5	17.1
NH	11.0	10.6	10.8	11.4	12.5	13.8	14.0	14.6	15.1	14.8	14.7	14.2	14.3	15.2	16.0	15.7	16.2
RI	11.5	9.2	10.5	11.0	12.0	14.0	13.1	16.0	14.2	14.1	13.0	12.7	13.7	15.4	17.0	16.3	16.4
VT	10.9	10.9	11.0	11.0	11.0	11.4	12.0	12.3	12.8	13.2	13.8	14.2	14.6	14.6	14.4	14.5	14.6
NY	11.6	11.2	12.4	12.6	14.0	15.3	15.2	16.5	15.4	16.4	15.9	15.2	15.4	16.3	15.3	14.5	14.7

Without information on Vermont's statewide average retail rates for 2018, it is difficult to assess whether the CPI outpaced Vermont's average retail electric rates in 2018 as it did in previous years or to determine whether any rate increases were primarily due to cost increases attributable to nonrenewable sources of electricity or to the electric transmission or distribution systems as the Legislature requests. GMP can only provide its information on its own retail rates for this time period. GMP had a 0.03% base rate decrease for Fiscal Year 2017 (October, 2016 – September, 2017) and a 5.37% base rate increase for Calendar Year 2018. This 27-month period does not perfectly overlap with Calendar Years 2017 and 2018. CPI-NE for the 12 months ending in December was a combined 3.4% for both 2017 and 2018 (1.7% per year).

The Legislature asks that the Department's report include a recommendation on whether to increase the size of the annual increase of the cumulative capacity and pace of the standard offer program if electric rates increased primarily due to cost increases attributable to nonrenewable sources of electricity or to the electric transmission or distribution systems over the past two or more years. While the precise drivers in any one year, for any one utility, will vary, GMP does not

recommend DPS suggest an increase in the cumulative capacity or pace of the standard offer program because, in essence, the regional transmission cost increases that do occur are largely driven by peak costs. With the peak hour shifting away from afternoon hours into evening hours, as has occurred in recent years, Vermont needs to continue innovating to find ways to address regional costs beyond those that have helped meet these challenges in prior years. The RES framework – which sets tiered goals, including in transformation
allows for this to occur. RES is already dramatically transforming the energy economy in Vermont and focusing all our efforts on climate change, and yet it is just in its infancy. The framework needs time to stabilize and continue before changes to it or other renewable programs are made.

(7)(A) Commencing with the report to be filed in 2019, an assessment of whether strict compliance with the requirements of sections 8004 and 8005 (RES) and section 8005a (standard offer) of this title:

(i) has caused one or more providers to raise its retail rates faster over the preceding two or more years than statewide average retail rates have risen over the same time period;

(ii) will cause retail rate increases particular to one or more providers; or

(iii) will impair the ability of one or more providers to meet the public's need for energy services in the manner set forth under subdivision 218c(a)(1) of this title (least-cost integrated planning).

(B) Based on this assessment, consideration of whether statutory changes should be made to grant providers additional flexibility in meeting requirements of sections 8004 and 8005 or section 8005a of this title.

(8) Any recommendations for statutory change related to sections 8004, 8005, and 8005a of this title.

GMP appreciates the opportunity to offer data and comments for the DPS to consider as it finalizes its legislative report. There is no doubt that climate change is the most critical challenge facing the world today. The RES framework is one important piece of the puzzle, and it is helping to transform our energy landscape. How GMP meets the increasing requirements of the RES depends in significant part on the metrics evaluated in GMP's recently filed IRP. For example, if trends lead to higher volumes of Electric Vehicles and/or heat pump adoption, the RES targets may remain in reach. If the trends do not reflect those outcomes, then the cost of Tier III compliance will increase and the likelihood of achieving the annual targets cost effectively will become much more challenging. The flexibility built into the RES will be helpful in enabling Vermont's utilities to meet these standards in an affordable way for all Vermonters as our experience matures, and the changes the RES creates, take hold.
We have no reason to suggest changing course at this time.