

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 18-0086-INV

In re: biennial update of the net-metering program	
--	--

Order entered: 05/01/2018

Table of Contents

I. Introduction 1

II. Procedural History 5

III. Background and Legal Framework 5

IV. Summary of Stakeholder Comments 13

V. REC Adjustor Factors 28

VI. Siting Adjustor Factors 50

VII. Determination of the Statewide Blended Residential Rate 55

VIII. Other Issues 56

IX. Order 59

I. INTRODUCTION

In 2017, the Vermont Public Utility Commission (“Commission”) adopted a net-metering rule consistent with the following statutory directives: (1) advance Vermont’s ambitious renewable energy and greenhouse gas reduction goals in a manner consistent with the Comprehensive Energy Plan (“CEP”), (2) ensure that net-metering does not shift costs between net-metering customers and other customers, (3) account for all costs and benefits of net-metering, (4) ensure that all customers who want to participate in net-metering have the opportunity to do so, (5) balance the pace of deployment and cost of the program with the program's impact on rates, and (6) account for changes over time in the cost of technology. The rule provides for a biennial update of the net-metering program in which the Commission can

review whether the program continues to achieve these requirements.¹ This proceeding is the first such biennial update.

Based on our review of the information presented in this proceeding, the Commission has determined that adjustments are necessary to ensure that the net-metering program remains financially sustainable and consistent with the above principles.

There continues to be robust interest in net-metering since the current rule went into effect for applications received after January 1, 2017. In addition, the incentives in the rule have been successful in encouraging many projects to be built on “preferred sites,” such as rooftops and previously disturbed terrain, and in customers transferring their renewable energy credits (“RECs”) to Vermont utilities to count toward the State’s renewable energy requirements. In calendar year 2017, the Commission received more than 2,500 applications, the second-highest number ever. These applications tended to be smaller in size and located on preferred sites. However, we have also seen substantial interest in building larger net-metering systems. For example, we have received advance notice of approximately 30 applications that could be filed in the next few months for several megawatts of new net-metering capacity. The Commission also received applications for a substantial amount of non-net-metered solar projects in 2016 and 2017.

As the amount of distributed renewable energy in Vermont has grown significantly over the past several years, the cost of installing solar generation has also decreased dramatically. Financial incentives for net-metered solar, however, have remained high, making it the most expensive of Vermont’s renewable energy programs. Solar net-metering systems receive up to 18.9 cents per kilowatt-hour (kWh) compared to solar prices under the State’s standard-offer program of 10-13 cents and roughly similar prices for power purchase agreements and utility-built systems.

At the same time, the rapid buildout of distributed generation has caused important changes in the state’s electric system. One positive effect of this development, particularly as a result of increased solar capacity, has been that Vermont’s system peak is no longer occurring during mid-day, which means that Vermont avoids regional capacity charges. On the other hand,

¹ Commission Rule 5.128.

the expansion of distributed generation has led to stress on some portions of the distribution grid, necessitating costly investments to interconnect additional generation.

The CEP and Vermont's Renewable Energy Standard ("RES") create an explicit framework for distributed energy to contribute to Vermont's power supply. Net-metering is only one of several ways to develop solar and other types of local renewable energy to meet the RES requirements, but because of the substantial financial incentives that have been available, net-metering has played the most prominent role in the expansion of Vermont's renewable energy portfolio. The amount of net-metering commissioned in 2016 and 2017, if continued, would exceed the level necessary to meet Tier II of the RES.² However, more cost-effective sources of solar and other types of local renewable power are available to meet the RES requirements and the goals of the CEP, which recommends planning "carefully to meet all three tiers of the RES in a least-cost manner" and to "strive to lower both energy bills and electric rates."

In this proceeding, a number of Vermont utilities expressed concern about the impact on electric rates from the high prices paid for net-metering. Vermont Electric Cooperative ("VEC") and Washington Electric Cooperative ("WEC") each reported that in 2017, the total number of net-metering applications and their capacity exceeded the totals during the prior three and four years combined in their respective territories. According to Green Mountain Power Corporation ("GMP"):

A single year of net-metered deployment at this pace . . . would add roughly an additional \$2.3 million/year of upward rate pressure for GMP customers. . . . In total, continued deployment of net-metered generation at current payment rates would likely increase GMP's retail rates by tens of millions of dollars for new development. When added to existing active and proposed projects, the net cost to our customers over a ten-year period will likely be in the hundreds of millions of dollars.³

For these reasons, and based on our review of the information presented in this proceeding, the Commission has determined that the changes to net-metering compensation announced in today's order are appropriate. Specifically, the Commission determines that it is appropriate to gradually reduce the \$0.03/kWh REC adjustor available to customers who transfer

² Tier II is a requirement that each utility acquire a certain portion of its power supply from small, in-state renewable energy sources. A more detailed discussion of the RES is contained in pages 29-30, below.

³ GMP Comments of March 15, 2018, at 7.

their RECs to their utility by \$0.01/kWh in each of the next two years for new applications. The Commission makes no changes to most of the siting adjustors, which will remain constant with the exception of a \$0.01 reduction in the price paid to the very largest net-metering systems (over 150 to 500 kW), which have better economies of scale than residential-sized systems. For many customers, these reductions will be partially offset by an increase in the blended residential rate of approximately \$0.005/kWh.⁴

The changes we approve today will better align the costs and benefits of net-metering. They will also reduce, though not eliminate, the extent by which the cost of net-metered power exceeds the cost of other sources of renewable power, thereby helping to ease some of the upward pressure on electric rates paid by residential and business customers statewide. In addition, these changes will help allow the selection of resources to meet the requirements of the RES to be primarily driven by competitive forces, not incentives set by the Commission.

Many commenters in this proceeding criticized the current application process for net-metering systems. The Commission agrees that its processes can be improved, and as part of this order will take steps to simplify and improve that process, which in turn should reduce the cost of the permitting process. This will include clarifying the definition of “preferred sites.”

The Commission acknowledges the concerns of some stakeholders that recent developments at the federal level may slow the development of net-metering in Vermont. However, as noted above, review of the information presented in this proceeding shows that the pace of net-metering deployment remains robust and that net-metering will continue to be a viable choice for Vermonters. Still, in response to these concerns, the Commission is phasing in the changes to the REC adjustor, so their effect is not abrupt and the Commission can assess how such changes affect the pace of net-metering deployment. The Commission will continue to monitor the net-metering program to ensure that it is financially sustainable and contributing appropriately to Vermont’s renewable energy supply.

⁴ This statement does not apply to customers of utilities whose retail rates are less than the blended residential rate.

II. PROCEDURAL HISTORY

On or before February 1, 2018, the Vermont electric distribution utilities (collectively the “DUs”) filed the information and data required by Rule 5.128(D).

On February 8, 2018, the Vermont Department of Public Service (the “Department”) requested additional information from the DUs. The request also sought input from any stakeholder about the information contained in the Department’s filing.⁵

Between February 15 and 21, 2018, stakeholders filed responses to the Department’s supplemental information request.

On March 1, 2018, the Department and the Agency of Natural Resources (“ANR”) filed proposed updates to the items specified in Rule 5.128(A)(1)-(4) and reasons therefor.

Pursuant to Commission Rule 5.128(F), comments on the recommendations of the Department and ANR were required to be filed by no later than March 15, 2018. The Commission received approximately 400 comments from members of the public, including a number of solar installation company employees and customers. The Commission also received comments from the DUs, numerous solar installation businesses, and other interested organizations. A list of persons and entities that submitted public comments is attached to this order.⁶

III. BACKGROUND AND LEGAL FRAMEWORK

Net-metering “means measuring the difference between the electricity supplied to a customer and the electricity fed back by the customer’s net-metering system during the customer’s billing period.”⁷ In 1998, the General Assembly enacted a net-metering law requiring electric utilities to permit customers to generate their own power using a small-scale

⁵ While this step was not required by Rule 5.128, the Commission appreciates the Department’s proactive efforts to initiate a dialogue with relevant stakeholders and to identify issues prior to making its recommendation on March 1, 2018.

⁶ On April 19, 2018, the Commission received reply comments from Renewable Energy Vermont. These comments were filed outside the time period set forth in Commission Rule 5.128(F). It would not be fair to accept this filing given that the other participants in this proceeding were not afforded an opportunity to file reply comments. Therefore, the Commission has not considered this filing. Even if the Commission had considered REV’s untimely filing, the information contained in it would not change the Commission’s conclusions in this proceeding. The figures provided by REV show that Vermont is obtaining a significant portion of its power from solar energy systems. Furthermore, the Commission does not agree with the conclusions of the Synapse Report cited by REV.

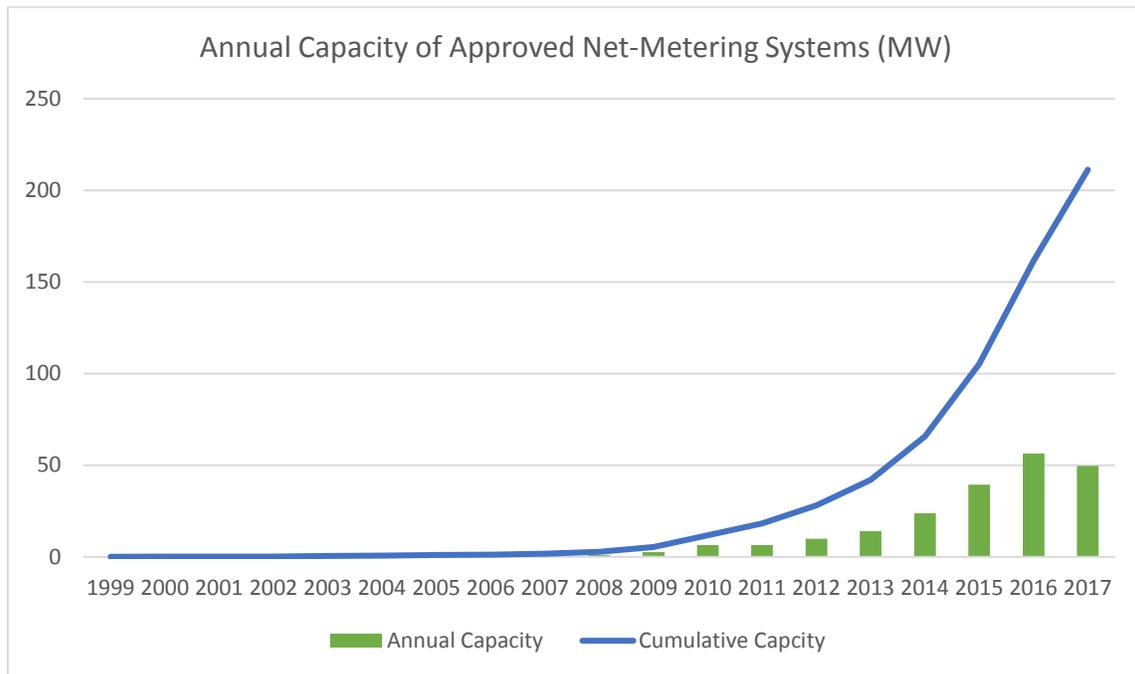
⁷ 30 V.S.A. § 8002(15).

renewable energy system with a capacity of up to 15 kW. Larger systems of up to 100 kW were allowed on farms. Any power generated by a net-metering system could be fed back to the utility, running the customer's electric meter backwards if generation exceeded load at any given time. The cumulative capacity of the program was limited to 1% of a utility's peak capacity.

Amendments to the statute in 1999, 2002, and 2008 increased the allowed cumulative capacity of net-metering systems in a utility's service territory and increased the allowable size of systems. Beginning in 2002, the Legislature authorized so-called "group net-metering," whereby the excess generation from a net-metering system could be shared among multiple customers or accounts, but this service was restricted to farmers. By 2008, all customers could participate in group net-metering, the maximum plant capacity was 250 kW, and the ceiling on the total installed capacity was 2% of peak load.

In 2011, the General Assembly increased the allowed capacity of net-metering systems to 500 kW, created a registration process for small photovoltaic systems, increased the allowed cumulative net-metering capacity in a utility service territory to 4% of that utility's peak capacity, and created an incentive payment for customers using photovoltaic systems. Customers receiving this incentive payment are credited up to \$0.20/kWh for power generated by their photovoltaic system for ten years after their system began operating.

Throughout this period, the cost of installing photovoltaic systems decreased dramatically. The confluence of declining costs, the liberalization of the net-metering program, and increased incentives resulted in the rapid growth of the amount of net-metering capacity installed in Vermont. Figure 1 shows the amount of capacity of net-metering projects that received CPGs in each year of the program and the cumulative capacity of net-metering CPGs approved under the program.

Figure 1.⁸

In 2014, the Legislature enacted Act 99, which increased the program’s cumulative capacity cap to 15% of each utility’s peak capacity. The trends described in the preceding paragraph accelerated and this capacity was rapidly subscribed. After reaching its own 15% capacity cap in 2015, Green Mountain Power Corporation (“GMP”) continued to accept small net-metering systems and sought approval to accept a limited number of additional large projects up to 150 kW in capacity, which was granted.⁹ Vermont Electric Cooperative Inc. (“VEC”) closed its net-metering program to larger projects over 15 kW.¹⁰

Act 99 also repealed the solar incentive payment and directed the Commission to establish a successor net-metering program for effect in 2017. Pursuant to State law, the Commission was required to create a net-metering program that:

⁸ For reference, a megawatt (MW) is equal to 1,000 kilowatts (kW). Net-metering CPG data may be obtained via ePUC at <https://epuc.vermont.gov/?q=node/83>. Net-metering registration CPGs deemed issued in a given year can be obtained at <https://epuc.vermont.gov/?q=node/95>.

⁹ *Petition of Green Mountain Power Corp. for Approval to Offer Customers Net-Metering Above the Statutory Cap Pursuant to 30 V.S.A. S 219a(h)(1)(a)*, Docket 8652, Order of June 24, 2016.

¹⁰ *Application of Fish Hatchery Solar, LLC*, 16-0004-NMP, Order of May 5, 2016 at 1.

(A) advances the goals and total renewables targets of this chapter and the goals of 10 V.S.A. § 578 (greenhouse gas reduction) and is consistent with the criteria of subsection 248(b) of this title;

(B) achieves a level of deployment that is consistent with the recommendations of the Electrical Energy and Comprehensive Energy Plans under sections 202 and 202b of this title, unless the Commission determines that this level is inconsistent with the goals and targets identified in subdivision (1)(A) of this subsection (c). Under this subdivision (B), the Commission shall consider the Plans most recently issued at the time the Commission adopts or amends the rules;

(C) to the extent feasible, ensures that net-metering does not shift costs included in each retail electricity provider's revenue requirement between net-metering customers and other customers;

(D) accounts for all costs and benefits of net-metering, including the potential for net-metering to contribute toward relieving supply constraints in the transmission and distribution systems and to reduce consumption of fossil fuels for heating and transportation;

(E) ensures that all customers who want to participate in net-metering have the opportunity to do so;

(F) balances, over time, the pace of deployment and cost of the program with the program's impact on rates;

(G) accounts for changes over time in the cost of technology; and

(H) allows a customer to retain ownership of the environmental attributes of energy generated by the customer's net-metering system and of any associated tradeable renewable energy credits or to transfer those attributes and credits to the interconnecting retail provider, and:

(i) if the customer retains the attributes, reduces the value of the credit provided under this section for electricity generated by the customer's net-metering system by an appropriate amount; and

(ii) if the customer transfers the attributes to the interconnecting provider, requires the provider to retain them for application toward compliance with sections 8004 and 8005 of this title.

On July 1, 2017, the Commission's revised net-metering rule took effect. In adopting the rule, the Commission found that net-metered power was more expensive than comparable alternative sources of renewable energy.¹¹ The Commission also found that the prior net-metering program was not necessarily effective at supporting Vermont's renewable energy goals because net-metered generators were electing to keep the renewable energy certificates ("RECs") generated by their systems. A portion of these RECs were sold out of state, which meant that Vermont could not count the energy generated by those systems towards its renewable energy or greenhouse gas reduction goals.¹²

Accordingly, the new rule was intended to calibrate the incentive payments in a manner that balanced the interests of ratepayers, net-metering customers, and the businesses that install net-metering systems. Despite the dramatic reduction in the cost of installing solar net-metering systems since the program began, the rule made only minor adjustments to net-metering incentives. The Commission created an incentive for new net-metering customers to transfer their RECs to their utility to be retired in furtherance of Vermont's renewable energy goals. In addition, the Commission designed the rule to create incentives for net-metering systems to be installed in previously disturbed terrain, on rooftops, and on sites preferred by municipalities.

The primary mechanism for achieving this balance was the use of "REC adjustors" and "siting adjustors." There are two REC adjustor values: (1) a "positive" REC adjustor for customers who transfer RECs to their utility, and (2) a "negative" adjustor for customers who retain RECs.¹³ This feature of the rule implements 30 V.S.A. § 8010(c)(1)(H)(i), which requires the Commission to reduce the value of a net-metering credit by an "appropriate amount" when a customer elects to retain ownership of RECs. In adopting the initial REC adjustor values, the Commission chose a positive adjustor of \$.03/kWh for customers who transfer RECs to their utility and a negative adjustor of -\$0.03/kWh for customers who retain ownership of RECs. The difference between these two values (\$0.06) was based on the statutory alternative compliance price for Tier II RECs under the RES. The Commission chose to have positive and negative

¹¹ Vermont Public Utility Commission, *Report to the Vermont General Assembly on the Net-Metering Program Pursuant to Act 99 of 2014* ("Act 99 Report") January 20, 2017, at 5.

¹² *Id.* at 10.

¹³ Commission Rule 5.127(B)(1)-(3).

adjustors (instead of, for example, just a positive adjustor of \$0.06 cents) to ensure that the overall incentive available to net-metering customers was appropriate.¹⁴

The REC adjustors serve purposes beyond reflecting the appropriate value of a REC. First, the REC adjustors allow the Commission to appropriately balance the costs and benefits of net-metering. Second, the Commission can also use the REC adjustors to moderate the pace of development to ensure that rate impacts from the net-metering program are not unreasonable. Therefore, in this proceeding the Commission must consider whether the current \$0.06 difference between the positive and negative REC adjustor values remains appropriate. Additionally, the Commission reviews how any changes to the REC adjustors will affect overall net-metering customer incentives, considering the costs and benefits of net-metering and the pace of net-metering development.

Turning to siting adjustors, the Commission's rules define four "categories" of net-metering systems. Category I net-metering systems are residential systems with capacities of 15 kW or less. Category II is comprised of medium-sized facilities (>15 kW to 150 kW) that are located on so-called "preferred sites." Category III is for large net-metering systems (>150 kW to 500 kW) located on preferred sites. Finally, Category IV includes medium-sized facilities that are not located on preferred sites. Each of these categories is subject to a siting adjustor that is intended to reflect whether the project is on a preferred site and the lower cost of development enjoyed by larger projects due to economies of scale.

Accordingly, under the initial siting adjustor values, small and medium-sized projects located on preferred sites (Categories I and II) receive the most favorable treatment, each being eligible to receive an additional \$0.01/kWh as an incentive to encourage these types of systems. Large systems over 150 kW (Category III) must be located on preferred sites to be eligible to participate in the net-metering program. These systems can be built at an economy of scale more like that of commercial generation systems. Therefore, while they are located on preferred sites, they currently are subject to a negative \$0.01/kWh adjustor. The Commission selected this adjustor value so that the overall compensation received by large net-metering systems was

¹⁴ Act 99 Report at 36.

closer to alternative pricing for renewable energy, such as the standard-offer program.¹⁵ Finally, medium-sized systems that are not located on a preferred site (Category IV) may net-meter, but are subject to a negative \$0.03 adjustor. This reflects the fact that these projects have some economy of scale and are located on non-preferred sites, such as greenfields, often far from the load they serve.

The overall purpose of the adjustors is to encourage the beneficial siting of net-metering systems and to provide a mechanism for the Commission to better tailor net-metering compensation to reflect the cost of technology.¹⁶ Additionally, the siting adjustor provides another tool for the Commission to ensure that overall compensation of net-metering systems is appropriate.

The cumulative effect of the initial REC and siting adjustors is that the incentive payments available to new net-metering customers are only modestly less than the \$0.19 or \$0.20/kWh that customers received under the prior net-metering rule. The following table summarizes the incentives currently available.¹⁷

¹⁵ See, Investigation into programmatic adjustments to the standard-offer program, Docket No. 8817, Order of 6/20/17 (summarizing solar proposals submitted in 2017 RFP process with prices ranging between \$0.089 and \$0.125/kWh). See also Act 99 Report at 36-37.

¹⁶ *Id.*

¹⁷ A summary of the changes to the incentives announced in this order can be found in Table 6 on page 56, below. The total compensation available to net-metering customers will be slightly less than those shown above (for example, a reduction of \$.005 for residential customers) after July 1, 2018. This is because the reductions in incentives are offset by the increase to the blended residential rate.

Table 1. Summary of initial adjustor values (\$0.00/kWh)

Category	Blended Residential Rate	Siting Adjustor	Positive REC Adjustor	Total
Category I (up to 15 kW)	\$0.149	\$0.010	\$0.030	\$0.189
Category II (>15 to 150 kW on preferred site)	\$0.149	\$0.010	\$0.030	\$0.189
Category III (>150 to 500 kW on preferred site)	\$0.149	-\$0.010	\$0.030	\$0.169
Category IV (>15 to 150 kW on non-preferred site)	\$0.149	-\$0.030	\$0.030	\$0.149

These incentives still exceeded the cost of other sources of renewable energy, and therefore had the potential to cause additional upward rate pressure.¹⁸ At the same time, however, the Commission received substantial public input during the rulemaking that suggested that abrupt decreases in the amount of incentives could harm businesses that install and market net-metering systems. In that rulemaking, the Commission “recognize[d] that the net-metering program provides benefits to the state through increased economic development and jobs, but these benefits must be balanced against the costs of offering the program.”¹⁹ These costs include the potential for higher electric rates for all Vermont businesses. Accordingly, the Commission created a mechanism to reevaluate the initial REC and siting incentive amounts to achieve the goals of Section 8010(c)(1)(A)-(H) as conditions changed.

Commission Rule 5.128 requires the Commission to conduct a biennial update in 2018 and every two years thereafter to update the following: (1) REC adjustors, (2) siting adjustors, (3) the statewide blended residential rate, and (4) the eligibility criteria applicable to Categories I, II, III, and IV net-metering systems. The Commission must consider the following factors when updating the REC adjustors:

¹⁸ Act 99 Report.at 37.

¹⁹ *Id.* at 39.

- (1) the pace of renewable energy deployment necessary to be consistent with the Renewable Energy Standard program, the Comprehensive Energy Plan, and any other relevant State program;
- (2) the total amount of renewable energy capacity commissioned in Vermont in the most recent two years;
- (3) the disposition of RECs generated by net-metering systems commissioned in the past two years; and
- (4) any other information deemed appropriate by the Commission.²⁰

The Commission must consider the following factors when updating the siting adjustors:

- (1) the number and capacity of net-metering systems receiving CPGs in the most recent two years;
- (2) the extent to which the current siting adjustors are affecting siting decisions;
- (3) whether changes to the qualifying criteria of the categories are necessary;
- (4) the overall pace of net-metering deployment; and
- (5) any other information deemed appropriate by the Commission.²¹

The Commission must consider the above-listed factors and set any revised adjustor values “to ensure that net-metering deployment occurs at a reasonable pace and in furtherance of State energy goals.”²²

In the following sections of this order, the Commission reviews the comments submitted by stakeholders in this proceeding (Section IV) and then considers the factors specified in Rule 5.128 and responds to the issues raised by stakeholders (Section V).

IV. SUMMARY OF STAKEHOLDER COMMENTS

General Public Comments

The Commission begins this discussion by acknowledging the substantial number of public comments filed in this proceeding. Most of these comments were general in nature. Given the number of these comments, the Commission cannot respond individually to each of them. The general sentiment expressed was that the Commission should “keep net-metering strong.” Many of these comments were submitted by employees of solar installation companies or customers who have net-metering systems. They expressed concern about the apparent

²⁰ Commission Rule 5.128(B)(1)-(4).

²¹ Commission Rule 5.128(C)(1)-(5).

²² Commission Rule 5.128(G).

decrease in solar systems approved in 2017 as compared to 2016. These comments also focused on the general economic benefits that net-metering can provide through local employment and savings to customers using net-metering systems. They stated that solar installation companies face “headwinds” that include a recent federal tariff on solar panels, changes to the tax code, and increased permitting expenses. Another common theme was the important role local renewable energy will play in meeting the State’s renewable energy and greenhouse gas goals and combating climate change. Another perspective was that of landowners and farmers who supported the development of more solar projects because of the revenue they can receive for leasing land to such projects.

Many commenters called for an end to the 500-kW limit on cumulative net-metering capacity that an individual customer may have. They asserted that this requirement hindered the development of solar projects and prevented large customers, including schools, towns, and businesses, from “going 100% solar.” Finally, others asked the Commission to “simplify the permitting process.”

Next, the Commission addresses the more specific comments filed by the Department, ANR, the DUs, Renewable Energy Vermont, the Vermont Law School Energy Clinic, Bob Amelang, the Towns of Hartford and Wesford, the Two Rivers Ottauquechee Regional Planning Commission, and a number of solar installation companies.

The Department

The Department recommended that the Commission decrease the REC adjustor by half a penny to \$0.025/kWh. The Department stated that this reduction would be offset by proposed upward revisions to the blended residential rate, which is the base amount for determining the credit for net-metered customers. The two primary reasons for its recommendation are: (1) the fact that the new net-metering rule has been in effect for only a short period of time and, therefore, the effect of the siting adjustors is not yet known; and (2) within the past few months there have been relevant changes to the federal tax laws and the imposition of a tariff on imported solar modules.

Along with its recommendation, the Department provided a discussion of the CEP and the RES. The Department views the RES “as the crucial policy tool that sets the stage for

achieving the goals articulated in the Comprehensive Energy Plan” because “creating renewable requirements for the electric industry is the cornerstone for meeting the goal of 90% renewable energy by 2050.”²³ Based on forecasts of Vermont load, the Department expects that 25-30 MW of distributed generation would be required each year to meet Tier II of the RES, assuming the new generation is predominantly solar. The Department stated that while net-metering should continue to play an important role in meeting this standard, “the Department places a high priority on ensuring that the State’s renewable energy policies continue to deliver renewable energy at least cost, and net-metering has historically been Vermont’s highest-cost source of renewable generation.”

The Department represented that it is important for the Commission to consider the value of building additional distributed generation. The Department argued that the value of additional solar is declining due to changes to Vermont’s peak. The Department maintained that in the past three years, the average value of the avoided energy, transmission, and capacity costs of net-metered solar is \$0.063/kWh. The Department stated that “[t]here is a widening gap between the cost and value of these net-metering resources to ratepayers, which stands in stark contrast to the other policy pathways for achieving state goals for acquiring clean and distributed generation.”²⁴

The Department asserted that the rapid development of distributed generation, particularly in areas with high penetration of solar capacity, has created constraints on the Vermont grid because of excess generation. The Department cautioned that without cost-effective technology and policy interventions, renewable generation will engender prohibitive costs and physical limits on the ability to interconnect in Vermont, which in turn will potentially jeopardize the ability of the State to meet its renewable energy goals. The Department stated that stakeholders will need to revisit how net-metering systems are compensated to ensure that these resources are located and dispatched in a manner that best serves the ratepayers and the grid.

In considering what pace of renewable energy development is necessary to be consistent with the RES and the CEP, the Department modeled the customer economics of installing solar going back to 2009. The Department’s model showed that if adjustor values are left unchanged, and assuming preferred sites remain readily available (a “business as usual” scenario), between

²³ Department Comments of March 1, 2018, at 6.

²⁴ *Id.* at 11.

15 and 25 MW of net-metered solar generation is expected to come online annually through the end of 2020. This amount is comparable to the incremental net-metered solar capacity that came online in 2014 and 2015.

In addition to a “business as usual projection,” the Department projected solar deployment for a variety of scenarios where the REC adjustor values are reduced. Based on this analysis, the Department estimated that for every penny reduction to the positive REC adjustor, there will be 3 to 4 MW less in installation capacity per year in the study period. For example, if the REC adjustor were reduced to \$0.02 per kWh, the Department would expect between 12 and 22 MW of annual incremental installations.

The Department analyzed the total amount of renewable capacity commissioned in Vermont in the last two years and ultimately concluded that “it is difficult to draw conclusions about future deployment levels – or make recommendations to REC adjustor levels – based on past trends, which primarily reflect previous incentive programs.”²⁵ The Department considered exogenous factors that may affect levels of deployment, including changes to tax laws, new import tariffs, and costs associated with developing preferred sites. The Department also reviewed the extent to which the REC adjustor is affecting decisions and concluded that the REC adjustor was decisive in encouraging REC transfers to utilities. Based on these factors and considering the importance of solar jobs in the Vermont economy, the Department recommended a \$0.005/kWh reduction in the value of the REC adjustor.

With respect to the siting adjustors, the Department observed that the adjustors contribute to overall system compensation. Therefore, the Department did not recommend any significant changes to the siting adjustors for the same reasons that the Department did not recommend a significant change to the REC adjustor. The Department noted that adjustments to the siting adjustors could be made if the Commission desired more or less deployment in certain categories of net-metering systems.

Finally, the Department stated that the statewide blended residential rate should be recalculated because of rate increases by several utilities in the intervening year. The

²⁵ Department Comments of March 1, 2018, at 19.

Department recommended that the Commission set the statewide blended residential rate at \$0.15417/kWh, which is an increase of \$0.00495/kWh.

ANR

ANR made no specific recommendations about the amount of the REC or siting adjustors. ANR recommended that the Commission revise several of the definitions contained in Rule 5.100 for preferred sites. Finally, ANR recommended that the Commission develop a consistent process to track and disseminate, on an annual basis, data related to the number of net-metering systems that apply and are permitted in a given year, data related to the number of systems that apply and are permitted in each of the preferred site categories, data related to the plant capacity and category of systems that apply and are permitted, and data related to REC disposition. ANR further recommended that the Commission standardize the data reporting requirements for the biennial update process.

The Distribution Utilities

GMP represented that there has been extraordinary growth in distributed solar in the past few years. GMP asserted that when all commissioned and proposed net-metered and other distributed solar is considered, solar will account for about 44% of GMP's peak capacity. According to GMP, this level of solar penetration is second only to Hawaii and three times the penetration rate for New England.

GMP contended that the growth of solar penetration in Vermont in most years has been as large as the cumulative penetration rates that other states have achieved over many years. GMP provided summary data for net-metering projects that are active and proposed under the new net-metering rule. GMP represented that it has received 33.7 MW of additional net-metering interconnection applications between January 1, 2017, and March 9, 2018. GMP sorted these applications into the following categories: 1,485 for projects with a capacity of 15 kW or less, totaling 9.6 MW of capacity; 91 applications for projects with a capacity between 15 and 149 kW, totaling 7.5 MW of capacity; and 34 applications for projects with a capacity between 150 and 500 kW, totaling 16.6 MW of capacity. Therefore, it was GMP's position that "the applications for all size projects under [the 2017 net-metering rule] remain robust, and consistent

with past years the larger projects take up more than half of the total capacity while serving the smallest number of customers.”

GMP asserted that there are more cost-effective sources of in-state renewable power available through the standard-offer program, utility development, and private contracts. GMP also maintained that the value of solar has declined significantly and that adjustments to the compensation rate are necessary. Specifically, GMP argued that a long-term levelized estimate of the value of solar is about \$0.10/kWh. GMP contended that:

A single year of net-metered deployment at this pace, at a price that exceeds the estimated value of the output by about 7 cents/kWh . . . would add roughly an additional \$2.3 million/year of upward rate pressure for GMP customers. These impacts are important because they would last for at least 10 years . . . and they would also accumulate quickly over time, as additional net-metered generation is deployed each year. In total, continued deployment of net-metered generation at current payment rates would likely increase GMP’s retail rates by tens of millions of dollars for new development. When added to existing active and proposed projects, the net cost to our customers over a ten-year period will likely be in the hundreds of millions of dollars.²⁶

For these reasons, GMP recommended reducing the REC adjustor by \$0.01 in 2018 and an additional \$0.01 in 2019.

GMP also recommended decreasing the siting adjustor for Category III net-metering systems by \$0.01 in 2018 and another \$0.01 in 2019 based on the economies of scale enjoyed by larger projects. GMP argued that these larger projects are often located farther from load. GMP maintained that “these reductions for larger projects are intended to mitigate the risk of cost shifts and electric rate pressure associated with continued rapid deployment of such systems.”²⁷

GMP contended that the capital costs of large net-metering systems are more than 33% less than residential systems but the rate available to such systems is only 11% less than the rate available to residential-scale systems.

Finally, GMP recommended that the Commission also consider other policy tools to effectively manage the pace and net cost of future net-metering deployment. GMP urged the Commission to phase out the incentives over time. GMP stated that the Commission should consider setting payment rates for larger solar net-metering projects using market-based methods

²⁶Department Comments of March 1, 2018, at 7.

²⁷ *Id.* at 9.

(e.g., competitive bidding) and for only a limited amount of project capacity, instead of the current method of establishing fixed adjustors to the retail rate. According to GMP, this approach “would largely eliminate the potential for boom/bust cycles, while introducing a competitive influence on net metering pricing.”

The Vermont Public Power Supply (“VPPSA”)²⁸ disagreed with the Department’s recommendation to maintain current net-metering compensation because it “is aimed at achieving a specific rate of net metering deployment without first determining whether that pace is desirable.”²⁹ VPPSA argued that the Department’s proposal fails to conform to the statutory requirements from Act 99 because it “favor[s] the interests of new net metering customers and solar developers over the interests of ratepayers in general.” VPPSA contended that there is no legal requirement to obtain a disproportionate amount of Tier II resources from net-metering. VPPSA asserted that:

...a balance should be struck between projects of net metering size and other distributed (< 5MW) renewable resources. It is not prudent to acquire the majority of the State’s distributed renewable energy from the highest-cost category of resource when [the] same benefits can be delivered at a much lower cost to ratepayers. Moreover, solar net metering, deployed based on subsidized compensation rates, will likely cause major transmission and distribution costs long before such solar generation meets Vermont’s renewable energy targets.³⁰

VPPSA estimated that additional net-metered solar resources provide roughly \$0.08 to \$0.11/kWh of value to the host utility, inclusive of the renewable attributes. VPPSA further argued that net-metering customers in some utility territories can offset their load at a value of more than \$0.20/kWh. Thus, according to VPPSA, Vermont ratepayers are paying considerably more for net-metering generation than they are receiving in value for these resources. Therefore, VPPSA disagreed with the Department’s recommendation to maintain the current net-metering incentive levels. VPPSA maintained that a customer can now install a net-metering system and

²⁸ VPPSA’s membership includes Barton Village, Inc. Electric Department, Village of Enosburg Falls Water & Light Department, Town of Hardwick Electric Department, Village of Hyde Park Electric Department, Village of Jacksonville Electric Company, Village of Johnson Water & Light Department, Village of Ludlow Electric Light Department, Village of Lyndonville Electric Department, Village of Morrisville Water & Light Department, Northfield Electric Department, Village of Orleans Electric Department, and Swanton Village, Inc. Electric Department.

²⁹ VPPSA Comments of March 15, 2018 at 1.

³⁰ *Id.* at 3-4.

recover their investment through retail rate compensation, with a small adjustment for residential-sized systems. Accordingly, VPPSA argued that the cross-subsidy embodied in the current rates is no longer necessary to ensure the viability of net-metering, particularly for larger group net-metering systems.

WEC stated that it has analyzed the costs and benefits of net-metering and finds that costs are being shifted to other members. WEC asserted that in 2017, solar installations provided its members \$0.0867/kWh in economic value from reduced power costs. WEC argued that these savings are considerably less than the \$0.189/kWh that it is paying for net-metered power. This lost revenue is recovered from other WEC members through increasing rates.

WEC represented that there have been more net-metering installations in its service territory in 2017 than in the prior four years combined. WEC argued that the current rate structure is more generous than its legacy rate structure. WEC also recommended that the Commission consider REV's proposal to simplify the calculation of net-metering credits.

Vermont Electric Cooperative Inc. ("VEC") represented that net-metering continues at a rapid pace under the new rule. VEC stated that in 2017, the total number of applications and their total capacity exceeded the totals during the previous three years combined. Large net-metering systems were of particular concern to VEC. VEC alleged that such systems receive substantial annual subsidies at the expense of its ratepayers and at a cost well above alternative sources of solar power.³¹ VEC stated that the five 500 kW projects currently online in its service territory have only ten members subscribed to them, with 45 accounts receiving credits. VEC maintains that these five projects will cost its membership an additional \$4.31 million in subsidy over a 25-year period and, therefore, provide an unfair benefit to only ten members. VEC expects that any 500 kW projects developed in the future will similarly benefit only one or two members because it is easier to recruit one or two large businesses than to recruit dozens of small businesses or residential consumers. Therefore, VEC asserted that its membership will continue to pay a generous subsidy to benefit a few large commercial members. VEC recommended removing Category III from the net-metering program. Alternatively, VEC recommended reducing the siting adjustor for Category III systems to \$-0.03/kWh. VEC also proposed

³¹ VEC Comments of February 1, 2018 at 2.

changing the REC adjustors to +/- \$0.02/kWh to bring the REC value closer in line with the REC market.

VEC also recommended adding a caveat to the “preferred site” definition in Rule 5.100 to address transmission constraints. VEC asserted that net-metering projects can exacerbate these constraints and the resulting curtailment, thereby harming Vermont electric ratepayers. VEC argued that projects located in areas that will cause economic harm to Vermont ratepayers cannot be considered “preferred sites.”

Renewable Energy Vermont

REV recommended that the Commission: (1) make no downward adjustment to REC or siting adjustors, (2) create two new incentives for low-income and residential customer community projects, (3) reduce permitting burdens for net-metering projects, and (4) simplify the net-metering credit calculations for utilities that use inclining block rates.

REV contended that the Commission should consider all economic and environmental benefits of net-metering in this proceeding. REV asserted that up to 30 MW of annual new net-metering systems are necessary to achieve the “State’s minimal Renewable Energy Standard Tier II requirements.”³² REV maintained that the “CEP explicitly states that net-metering is *the* appropriate tool to provide a significant portion of the generation necessary to meet” this standard.³³ REV disagreed with assertions that standard-offer projects or other sources will be available to meet Tier II requirements because utilities are not required to retire RECs from those projects. REV also stated that self-supply and purchasing RECs are not reasonable options for customers to procure renewable energy.

REV asserted that the 2017 net-metering rule has slowed net-metering applications and installations. It is REV’s position that the Commission should consider the number of permits issued, permit applications, and commissioned installations and not consider interconnection requests because such requests do not reflect anticipated development. REV also represented that some portion of approved systems will not be constructed.

³² REV March 15, 2018, Comments at 3.

³³ *Id.* at 5 (emphasis in original).

REV provided a study prepared by Synapse Energy Economics Inc. (the “Synapse Report”) to support its contentions that: (1) net-metering offers significant positive overall benefits to Vermonters, (2) net-metering creates significant economic activity and tax revenues, and (3) net-metering results in a limited cost shift between net-metering customers and non-net-metering customers.

REV described several factors that will increase the cost to install net-metering systems, including: changes to the federal tax code; increased permitting expenses; tariffs on solar panels, steel, and aluminum; and the sunset of the investment tax credit in 2020. REV asserted that net-metering credits will need to increase by \$0.02 to \$0.03/kWh to maintain a consistent stream of financing relative to pretax law changes. REV further contended that past trends of decreasing installation costs will not continue in the future. For example, REV cited projections that steel tariffs will increase the price of solar racking by \$0.02 to \$0.04 per watt.

With respect to the eligibility criteria for the categories of net-metering systems, REV recommended creating two new criteria for community-based and low-income projects. REV represented that residential community solar development has come to a “virtual standstill.” Therefore, REV advocated for the Commission to create new categories of community solar projects that would be eligible to receive \$0.01 and \$0.005 adders.

REV stated that the siting adjustors have been effective at driving projects to preferred sites. For this reason, REV urged the Commission to not reduce the siting adjustors for Category II and III net-metering systems.

REV pointed out that customers of WEC receive significantly higher compensation because they can offset tiered energy rates of up to \$0.23/kWh and recommended simplifying the calculation and application of bill credits to address this issue. In general, REV urged the Commission to require more transparency, uniformity, and timeliness for data reported by the utilities in this proceeding. REV criticized the data supplied as “not reliable” because “figures for non-net-metered solar are co-mingled with net-metering” and because “data used for pace or potential cost analysis includes net metering systems that were never installed or commissioned.”

REV agreed with the Department’s comments regarding grid modernization but disagreed with the Department’s suggestion that additional solar generation in the Sheffield Highgate Export Interface (“SHEI”) would lead to displacement of renewable generation

because solar is not likely to coincide with the limited hours of congestion. REV also cited rates available through Massachusetts' SMART Solar incentive program as an example of compensation available to solar projects. Lastly, REV advocated for specific changes to the permitting process for parking-lot canopy projects.

Building a Local Economy ("BALE")

The Vermont Law School Energy Clinic (the "VLS Clinic") on behalf of BALE argued that the REC adjustor exceeds an appropriate amount in violation of 30 V.S.A. § 8010(c)(1)(H). In support of this argument, the VLS Clinic asserted that the total \$0.06 differential between the positive and negative adjustors exceeds the forecasted market price of New England RECs. The VLS Clinic contended that customers who retain and retire their RECs should receive the same compensation as customers who transfer their RECs to their utility because those customers contribute to Vermont's renewable energy goals.

The VLS Clinic contended that net-metering is intended to allow customers to generate and consume their own renewable electricity. The VLS Clinic argued that the \$0.06 REC adjustor makes this economically infeasible. According to the VLS Clinic, the REC adjustor has created additional confusion and encourages false green claims by the solar industry.

The VLS Clinic asserted that the REC adjustor results in less renewable energy for Vermont because utilities like GMP have acquired more Tier II RECs than required by law. As a result, the VLS Clinic asserted that GMP will sell excess RECs out of state, thus reducing the amount of renewable energy in Vermont. For these reasons, the Clinic recommended reducing the positive REC adjustor to \$0.02 and eliminating the negative adjustor.

The VLS Clinic also argued that the Department and the DUs are too narrowly focused on compliance with the RES. The VLS Clinic contended that the Commission is obligated to maintain a net-metering program that advances Vermont's renewable energy goals. According to the VLS Clinic, those goals go beyond the RES, including a goal of 90% renewables by 2050, and a 75% carbon reduction goal.

Vermonters for a Clean Environment (“VCE”)

VCE recommended reducing the rate of compensation for net-metering systems to the retail rate or whatever rate the Commission determines is sufficient to cover the installed cost of net-metering systems. VEC advocated for eliminating the REC adjustors so that customers may claim that their generating resource is renewable, thus creating an incentive for utilities to construct or contract with additional resources to meet their Tier II requirements. VCE also submitted a report entitled “Understanding Vermont’s Energy Policies.” The report advances the argument that net-metering is a more expensive source of energy than other Tier II resources.

VCE also suggested several changes to the net-metering program, such as crediting net-metering customers only for power generated, eliminating the banking and sharing of credits, and requiring net-metering systems to be sited next to the load served. VCE also supported incorporating storage into the net-metering program. VCE urged the Commission to encourage community solar but only where such projects “serve local load.” VCP contended that the Commission should require customer information “at the time of the request to the Select Board and Planning Commission” and “require transparency regarding how developers finance net-metered systems.” Finally, VCE requested that the Commission produce educational materials to assist net-metering customers in the management of their systems because VCE believes customers do not clean snow off their panels during winter months.

Bob Amelang

Mr. Amelang supported the removal of all solar incentives and a prohibition on large, remote net-metering projects. Mr. Amelang asserted that net-metering customers receive two subsidies: (1) a credit against utility energy rates and (2) a solar adder. It is Mr. Amelang’s contention that the cost of these two subsidies exceeds the value of net-metered power. Specifically, Mr. Amelang stated that retail utility rates include the following costs that net-metered power does not displace: distribution service, customer service, customer accounting, and administrative overhead. Mr. Amelang also contended that solar generation displaces very little production capacity and almost no transmission costs. Therefore, it is Mr. Amelang’s position that the value of net-metered power is likely less than the cost of retail-rate net-metering credits.

Mr. Amelang represented that Vermont has the highest loads in winter, after sunset. Therefore, according to Mr. Amelang, additional solar will not reduce Vermont's regional transmission costs, which are based on monthly Vermont peaks. Mr. Amelang argued that at least 60% of utility costs are due to fixed costs that are not significantly affected by installing additional solar capacity.

For these reasons, Mr. Amelang also advocated for a prohibition against large, remote net-metering projects. He stated that he has reviewed two such projects in Addison County and that these projects caused high levels of reverse power flows at the Weybridge Substation, resulting in increased thermal losses. According to Mr. Amelang, these projects displaced smaller projects that could have safely interconnected without expensive infrastructure upgrades.

Towns

The Commission received comments from the Towns of Hartford and Westford. Hartford recommended eliminating the negative \$0.03 REC adjustor for customers who elect to retain their RECs. Hartford argued that the negative adjustor is punitive and creates an unreasonable cost that prevents customers from "going solar." Hartford also recommended eliminating the 500 kW customer limit on cumulative net-metering capacity, which Hartford contends prevents it from reducing its greenhouse gas emissions.

Westford stated that it is developing a plan to comply with Act 56 and the CEP's renewable energy goals. Westford maintained that the incentives for ground-mounted solar arrays are not sufficient for the Town to pursue solar and that there are not enough rooftops in Westford to meet the Town's renewable energy objectives. Therefore, Westford requested that the Commission increase the siting adjustors for Category III net-metering systems by two cents.

Two Rivers Ottauquechee Regional Planning Commission ("TRORC")

TRORC stated that it is working on enhanced regional and municipal energy planning to support the 2016 CEP's greenhouse gas and renewable energy goals. TRORC cited a recent report that the amount of permitted solar dropped by 50% in 2017. TRORC recommended increasing the siting adjustor for Category III net-metering systems, creating a new category for

low- and moderate-income customers, and increasing compensation for community solar projects.

*The solar installation companies*³⁴

The comments of the solar installation companies shared several common themes. The primary contention of these companies was that net-metering systems are making meaningful contributions to meeting Vermont's need for in-state renewable energy generation and fighting climate change. These companies also emphasized that they offer well-paid jobs and that the clean energy sector has "bolster[ed] significant growth in the State's economy." The companies requested that the Commission either increase the rate adjustors or at least not decrease them. In support of this position, the companies asserted that the cost of net-metering projects will increase due to recent tariffs and changes to the tax code. The companies also alleged that the new net-metering rule had increased permitting costs. The companies expressed concern about the number of net-metering applications filed and projects commissioned under the new net-metering rule. They argued that the Commission should prevent further declines in the pace of solar deployment.

The solar installation companies advocated for expanding opportunities for community solar projects and projects for low- and moderate-income customers. The companies recommended increasing the value of net-metering credits to create incentives for such projects. Some companies recommended that the Commission integrate battery storage and increase incentives for solar systems that use solar-tracking technology to address peak shifting.

The companies generally disagreed with the current REC adjustor values. Some companies asserted that the current \$0.06/kWh price differential exceeded the value of New England RECs and constituted an unreasonable penalty. Other companies asked that the Commission eliminate the negative REC adjustor entirely because it prevented customers from "going solar."

³⁴ The Commission received comments from Encore Renewable Energy, Aegis Renewable Energy, Solaflect Energy, Triland Partners LP, Norwich Solar Technologies, Power Guru, Catamount Solar, Wisdom and Power LLC, Grassroots Solar Inc., Saxtons River Solar Electric LLC, and Suncommon.

Another common contention of the solar installation companies was that the regulatory environment is unduly constraining solar development. Specifically, several of the companies asked the Commission to streamline the CPG application review process, which they assert is too expensive and lengthy. Other companies called for changes to the definitions of certain preferred sites to encourage more development of such sites. Many companies contended that net-metering offers benefits to schools, towns, and other public institutions. These companies argued that the 500 kW-per-customer limit constrains these benefits and prevents these entities from achieving their renewable energy objectives.

Joint filing of Conservation Law Foundation, Vermont Conservation Voters, Vermont Natural Resources Council, Vermont Public Interest Research Group (collectively the “organizations”)

The organizations contended that the solar, aluminum, and steel import tariffs and the new net-metering rule have increased the cost to install solar, which in turn has reduced the number of permitted systems. They contended that this has resulted in fewer Vermonters having access to solar power, with a disparate impact on low- and moderate-income Vermonters.

These organizations stated that the new trade tariffs will increase the cost of solar modules by \$0.10/watt. The organizations estimated that this increase constitutes a 2.8% increase in the cost to install residential solar systems. Therefore, they recommended increasing net-metering rates by a commensurate amount, \$0.005 per kWh, to offset the effect of the solar, aluminum, and steel tariffs.

The organizations contended that the pace of deployment has declined significantly due to the revised net-metering rule. According to these organizations, the best way to compare the pace of deployment is to examine the number of applications filed during the first three quarters of calendar years 2015 through 2017. According to the organizations, an unusually high number of applications were filed during the fourth quarters of those years due to the curtailment of GMP's net-metering program in 2015 and the impending changes to the net-metering rules in 2016.

Despite these challenges, the organizations did not recommend any additional changes to the REC or siting adjustors at this time. The organizations stated that in the future, the Commission should consider:

- Increasing compensation and streamlining the permitting process for community solar systems, or systems where at least 50% of the system's offtakers are residential customers.
- Creating an adder for systems that serve low- and moderate-income customers.
- Increasing the 500kW customer cap for public institutions (municipalities, universities, schools, and hospitals) to allow them to serve their entire load with net-metering projects.

V. REC ADJUSTOR FACTORS

In this section, the Commission discusses each of the factors that the Commission must consider in determining the appropriate value of the REC adjustors. Additionally, the Commission responds to the comments of the stakeholders that were relevant to the Commission's consideration of these factors.

(1) The pace of renewable energy deployment necessary to be consistent with the Renewable Energy Standard, the Comprehensive Energy Plan, and any other relevant State program:

Background

Under this factor, the Commission must consider what pace of renewable deployment is necessary to be consistent with the Comprehensive Energy Plan ("CEP") and the Renewable Energy Standard ("RES"). In considering this question, it is important to emphasize that net-metering is only one of several ways to deploy renewable energy. What follows is a brief overview of the CEP and the RES, followed by a discussion of the pace of renewable energy deployment that will be necessary to be consistent with them. Finally, we discuss what role net-metering should play in meeting the applicable goals and requirements.

The Department is required by statute to adopt a CEP at least every six years. The CEP is a 20-year plan that must contain an analysis of "the use, cost, supply, and environmental effects of all forms of energy resources used within Vermont."³⁵ The CEP must include recommendations for how the plan can be implemented by the State and local governments and

³⁵ 30 V.S.A. § 202b(a)(1).

private actors. More fundamentally, the purpose of the CEP is to implement Vermont's general policy to "meet its energy service needs in a manner that is adequate, reliable, secure, and sustainable; that assures affordability and encourages the State's economic vitality, the efficient use of energy resources, and cost-effective demand-side management; and that is environmentally sound."³⁶ Accordingly, the CEP is meant to guide how to best "identify and evaluate . . . resources that will meet Vermont's energy service needs in accordance with the principles of least-cost integrated planning, including efficiency, conservation, and load management alternatives, wise use of renewable resources, and environmentally sound energy supply."³⁷

The most recent CEP was adopted in 2016.³⁸ The CEP establishes an ambitious goal of sourcing 90 percent of Vermont's energy from renewable resources by 2050.³⁹ It is also the CEP's goal to achieve a 40% reduction in greenhouse gas emissions below 1990 levels by 2030 and a 80% to 95% reduction by 2050.⁴⁰ The CEP examines a wide range of energy topics, including electric supply, heating, energy efficiency, and transportation. It also makes recommendations about specific steps that can be taken in each of these sectors to ultimately achieve the State's renewable energy and greenhouse gas goals.

With respect to electric supply, the CEP recognizes that the consideration of future supply should be done in the context of the RES.⁴¹ Accordingly, the CEP states that "[p]ower supply questions now revolve around the most cost-effective way to meet the RES requirements, not around how much renewable energy to acquire."⁴² The CEP recommends planning "carefully to meet all three tiers of the RES in a least-cost manner" and to "strive to lower both energy bills and electric rates."⁴³

³⁶ 30 V.S.A. § 202a(1).

³⁷ § 202a(2); § 202b(a).

³⁸ The CEP, along with documents related to its development, can be viewed online at: http://publicservice.vermont.gov/publications-resources/publications/energy_plan/2015_plan.

³⁹ CEP at 1.

⁴⁰ *Id.* Executive Summary at 4.

⁴¹ CEP at 233 ("This chapter first describes the state's future electricity supply, in the context of Act 56's new requirements for electric portfolios.").

⁴² *Id.* at 277.

⁴³ *Id.* at 10.

Accordingly, before reviewing the portions of the CEP that discuss distributed renewable energy and net-metering specifically, it is useful to discuss the RES. Under the RES, a utility “shall not sell or otherwise provide or offer to sell or provide electricity in the State of Vermont without ownership of sufficient energy produced by renewable energy plants or sufficient tradeable renewable energy credits from plants whose energy is capable of delivery in New England.”⁴⁴ The RES establishes three categories of compliance requirements, which are commonly referred to as “Tiers.” Tier I is a total renewable energy requirement.⁴⁵ Starting in 2017, each utility must obtain a quantity of RECs that equals at least 55% of the utility’s portfolio, climbing 4% every three years to 75% in 2032.⁴⁶ Tier II is a carve-out of Tier I that requires utilities to obtain a quantity of RECs from new distributed renewable generators (5 MW or less) located in Vermont equal to 1% of retail electric sales in 2017, rising 0.6% each year to 10% in 2032.⁴⁷ Net-metering systems qualify as Tier II resources, and pursuant to State law utilities must retire RECs received from net-metering systems towards compliance with the RES.⁴⁸ Finally, Tier III of the RES relates to what are known as “energy transformation projects.”

With this context in mind, we return to the CEP, which discusses distributed generation and net-metering extensively. The CEP states that the RES “sets an explicit structure for distributed generation resources to support the grid. . .”⁴⁹ The CEP estimates that more than 20 MW of new distributed generation will be needed annually to comply with Tier II. The CEP states that net-metering provides “an appropriate tool to develop a significant portion of this generation” but also states that “it is critical that the state implement a [net-metering] program that is financially sustainable over the long term and avoids boom-and-bust cycles.”⁵⁰ The CEP recognizes “the question of appropriate and fair monetary compensation for net metered

⁴⁴ 30 V.S.A. §§ 8004(a).

⁴⁵ CEP at 234.

⁴⁶ 30 V.S.A. §§ 8005(a)(1)(a).

⁴⁷ 30 V.S.A. §§ 8005(a)(2)(B)(ii).

⁴⁸ 30 V.S.A. §§ 8005(a)(2)(B)(ii) and 8010(c)(1)(H)(ii). *See also*, Commission Rule 5.127(B)(requiring retirement of RECs).

⁴⁹ CEP at 195.

⁵⁰ *Id.* at 257.

generation has risen in prominence” as the program has expanded.⁵¹ For these reasons, the CEP recommends that the Commission create a “financially sustainable” net-metering program.⁵²

Discussion

The Commission has been tasked with finding the balance between moving toward a carbon-free energy future, as outlined in the CEP and the RES, and doing so at a reasonable cost to ratepayers. In 1999, net-metering was the first in-state program to be made available for small, new renewable resources, and it now accounts for the largest portion of solar power in Vermont. However, other renewable resource programs, such as the 2009 standard-offer program, now provide renewable resources at a lower cost than net-metering, as do utility-built systems and merchant generators that enter into power purchase agreements. Thus, the question presented in this proceeding is not what economic incentives the Commission should set to promote the maximum amount of net-metering, but rather what incentives are necessary to meet the CEP and RES goals while protecting the interests of ratepayers. The Department estimated that, assuming most Tier II resources are solar plants, approximately 25-30 MW of new resources will be needed annually to comply with Tier II.⁵³ The Department contended that net-metering projects should continue to play an important role in meeting the RES but did not quantify the amount of new net-metering systems that should be installed over the next two years. However, the Department also stated that it prioritizes delivering renewable energy at least cost, and net-metering has historically been Vermont’s highest-cost source of renewable generation.

In contrast, the DUs argued that the current pace of development is unsustainable. For example, VPPSA contended that the Department has failed to explain why 15 to 25 MW of new annual net-metering deployment (the amount estimated in the Department’s business-as-usual model) is desirable or sustainable. VPPSA contended that this amount of annual net-metering deployment represents approximately 1.5% to 2.5% of Vermont’s system peak and is unsustainable given the current cost of net-metered power.

⁵¹ CEP at 255.

⁵² *Id.* at 257.

⁵³ Department Comments of March 1, 2018, at 5. This assumption is based on the economic advantages enjoyed by solar as a technology in comparison to other renewable energy technologies.

REV, on the other hand, argued that the RES targets are “minimums,” not maximum ceilings for renewable energy development. Therefore, REV asserted that more than 30 MW of annual net-metering capacity is necessary to meet the minimal requirements of Tier II. REV also contended that other types of Tier II resources, such as standard-offer projects, may not be relied upon for Tier II compliance because utilities may sell RECs generated by those plants. Similarly, the VLS Clinic contended that the Commission should consider the broader renewable energy and greenhouse gas reduction goals expressed in the CEP and state statute.

Based upon our review of the relevant portions of the CEP, the Commission concludes that the RES is the best standard for determining the amount of renewable energy necessary to meet State policy goals. The total energy requirement expressed in Tier I of the RES, which requires utilities to be 75% renewable by 2032, is consistent with the long-range goal of 90% renewable energy by 2050. The CEP states that Tier II creates an “explicit structure” by which distributed generation will participate in Vermont’s power supply.⁵⁴ The Commission agrees with the Department that developing up to 30 MW of new distributed generation resources annually is necessary to meet the RES and, therefore, is also consistent with the CEP.

Thus, it is important to consider the appropriate portion of Tier II resources that should come from the net-metering program. Based on the CEP’s emphasis on least-cost planning, the Commission concludes that the appropriate amount depends on whether net-metering is the least-cost option, considering price and the other characteristics of net-metering. For example, if net-metering were the least-cost option for meeting Tier II, then an optimal portfolio would include substantial amounts of net-metering. This is consistent with the CEP’s guidance that “utilities should strive to deliver maximum ratepayer value, combining load shape (and related capacity value), location, and price to an optimal mix” when selecting resources to meet their Tier II obligations.⁵⁵ Similarly, according to the CEP, the Commission should design the net-metering program in a manner that maximizes ratepayer value and reduces upward pressure on electric rates.⁵⁶

⁵⁴ CEP at 195.

⁵⁵ *Id.* at 236.

⁵⁶ CEP Executive Summary at 10. (Recommending strategies to “Plan carefully to meet all three tiers of the RES in a least-cost manner. Strive to lower both energy bills and electric rates.”).

The CEP does not require a specific amount of net-metered power to be included in the supply portfolios of Vermont's distribution utilities. Therefore, the Commission does not accept REV's contention that at least 30 MW of new annual net-metering capacity is necessary to meet the requirements of Tier II. Instead, the CEP states that net-metering has the "potential" to meet a significant portion of Tier II.⁵⁷ The CEP also recognizes that the net-metering program must be "financially sustainable" for it to do so.⁵⁸ As discussed in more detail below, the Commission finds persuasive the Department's and the DUs' contention that the current rate structure is not financially sustainable. For example, net-metered power costs significantly more than other Tier II resources.⁵⁹ The information presented in this proceeding suggests that the costs and benefits of net-metered power are not well balanced.⁶⁰ As a result, the net-metering program continues to create upward rate pressure for utilities.⁶¹

The Commission also rejects REV's contention that standard-offer projects or other sources will not be available to meet Tier II requirements because utilities are not required to retire RECs from those projects. To the contrary, if utilities sell RECs from standard-offer projects, it is because they have acquired more distributed renewable generation than required by the RES.

For similar reasons, we reject the VLS Clinic's contention that we should encourage net-metering customers to retain RECs, thereby forcing the utilities to procure additional resources to meet their Tier II obligations. The Commission does not believe it is appropriate to force the utilities to obtain significantly more Tier II resources than the targets set by the RES when such resources are not least-cost. As noted in the CEP, the RES provides a mechanism for distributed generation to participate in Vermont's electric portfolio. The Commission does not oppose the utilities choosing to obtain more renewable energy than required by law, but they must do so in a way that minimizes the cost to residential and business ratepayers.

⁵⁷ CEP at 257.

⁵⁸ *Id.*

⁵⁹ Note 66, below. Department Comments of March 1, 2018 at 8; GMP Comments of March 15, 2018 at 7-8.

⁶⁰ The basis of this conclusion is discussed in detail on pages 40 through 45, below.

⁶¹ GMP Comments of March 15, 2018 at 6-7; WEC Comments of February 1, 2018 at 3.

We also see no basis to compensate net-metering customers who retain RECs in the same manner as those who transfer RECs. When a customer transfers RECs to the utility, that customer is making a contribution toward meeting the utility's RES requirements.⁶² This is a public benefit. Therefore, it is appropriate to pay for the value supplied to the system by such customers. In contrast, the VLS Clinic's proposal would require ratepayers to bear the cost of net-metering customers obtaining a private benefit - namely, the ability to claim their power consumption as green. Normally, customers who elect to consume only renewable energy must pay the increased cost of obtaining such power. For example, customers participating in GMP's green-pricing program must pay a premium so that the utility can retire RECs on the customer's behalf.⁶³ The Commission thinks that the net-metering program should similarly reflect the value of RECs.

In summary, the Commission concludes that in order to balance the costs and benefits of net-metering, it is appropriate to reduce the difference between the cost of net-metered power and other Tier II resources. This may have the effect of reducing the amount of net-metering systems while utilities pursue less costly sources of renewable generation (such as bilateral contracts or utility-sponsored projects). This would create an incentive for utilities to develop or buy those other resources, including solar, thus allowing the market, not incentives, to determine the cost of those non-net-metered renewable resources. Such an outcome is consistent with the CEP's instruction that utilities must design their Tier II portfolios in a cost-effective manner.

In reaching this conclusion, the Commission has also considered the CEP's instruction to implement the net-metering program in a manner that avoids boom and bust cycles. Accordingly, the Commission will phase in the adjustments in this biennial review to avoid an abrupt reduction in net-metering compensation and to allow time to gauge the effect on the pace of net-metering. The Commission will continue to compare the cost of net-metering to the cost of alternative Tier II resources and to the value derived by distributed generation. If necessary, the Commission will make future adjustments to the net-metering incentives to make net-metering a more cost-effective option for meeting Tier II.

⁶² By law, utilities are required to retire RECs generated by net-metering systems. 30 V.S.A. § 8010(c)(1)(H)(ii).

⁶³ See GMP's Voluntary Renewable Service Rider *available at* <https://greenmountainpower.com/wp-content/uploads/2016/09/Voluntary-Renewable-Service-Rider-4.1.16-1.pdf>

(2) *The total amount of renewable energy capacity commissioned in Vermont in the most recent two years:*

The amount of renewable energy capacity commissioned⁶⁴ in Vermont is summarized in the following table.

Table 2. Amount of renewable energy capacity commissioned in 2016 and 2017 (MW)⁶⁵

	2016	2017
Net-Metering	43.8	42.2
Standard Offer	7.4	4.4
Utility Owned and PPAs	29.7	11.2
Total	80.9	57.8

These figures show the amount of renewable energy resources commissioned in Vermont in the past two years. It is worth noting that the amount of net-metering capacity commissioned in the past two years exceeded the capacity and pace of all other sources. The past pace of net-metering development has also exceeded the pace necessary to meet the utilities' Tier II obligations (25-30 MW). This portfolio mix is not optimal given the fact that net-metering is the most expensive of the resources shown above.⁶⁶ As GMP stated, if this pace of development continues, "then net metered solar PV will effectively displace some amount of much lower-cost solar alternatives (e.g., power purchase agreements, utility-sponsored projects, [and] Standard Offer program)."⁶⁷

⁶⁴ Pursuant to 30 V.S.A. § 8002, "commissioned" means "the first time a plant is put into operation following initial construction or modernization if the costs of modernization are at least 50 percent of the costs that would be required to build a new plant including all buildings and structures technically required for the new plant's operation."

⁶⁵ Department Comments of March 1, 2018, at 15.

⁶⁶ For example, recent utility-sponsored distributed generation resources were estimated to cost \$0.123/kWh. *Petition of GMP solar-Williamstown, LLC.*, Docket 8682, Order of 8/24/16 at 9. More recently, the winners of the 2017 standard-offer RFP accepted contracts for energy, capacity, and RECs as low as \$0.09/kWh. *Investigation into Programmatic Adjustments to the Standard-Offer Program*, Docket 8817 Order of 10/20/2017 at 2-3.

⁶⁷ GMP Comments of March 15, 2018 at 8.

In addition to the amount of renewable energy capacity commissioned, there are several other potentially relevant data sources for evaluating the net-metering program. These include the number and capacity of net-metering CPG applications filed and approved, as shown in Table 3, below.⁶⁸ Additionally, the utilities represented that they have received interconnection requests⁶⁹ for a significant number of larger, Category III net-metering systems.⁷⁰

In considering this data, it is important to recognize that it was not practicable to use the Commission's pre-ePUC records to distinguish between new, small net-metering systems and amendments of existing small systems. Therefore, it is likely that the number and capacity of registrations shown in Table 3 are somewhat overstated because requests to alter existing or previously approved systems are counted as applications.⁷¹ The Commission can distinguish between registrations for new systems and amended systems for all cases filed after July 1, 2017, but those cases were not removed from Table 3, below, so that the figures for 2016 and 2017 are comparable.

⁶⁸ These records are available online at <https://epuc.vermont.gov/?q=node/95>. Please note that ePUC can only return up to 2,000 results in a single query. Therefore, multiple queries may be necessary to retrieve an entire year's worth of data.

⁶⁹ For larger net-metering systems, a developer must file an interconnection request with the utility prior to filing a CPG application. The Commission recognizes that some projects that file interconnection requests are never commissioned because they encounter interconnection constraints or other issues. However, the Commission believes this data is relevant as a gauge of interest in the program.

⁷⁰ GMP Comments of March 15, 2018 at 4-5.

⁷¹ Amendment cases for systems with capacities greater than 15 kW are not displayed in Table 3.

Table 3. Annual Number and Capacity of Net-Metering CPG Applications Filed in 2016 and 2017

	2016 Number	2016 Capacity (kW)	2017 Number	2017 Capacity (kW)
0-15 kW	2,994	20,369	2,425	16,357
>15 - 150 kW	119	11,222	108	7,006
>150 - 500 kW	72	34,445	23	10,273
Cumulative⁷²	3,185	66,036	2,556	33,636

REV and other solar advocates have expressed concern that the changes to the net-metering rule in 2017 have slowed net-metering applications and installations. REV contended that there has been a dramatic reduction in the number of applications for systems with capacities between 150 and 500 kW. The data paint a more nuanced picture. For example, the number and capacity of residential systems (up to 15 kW) applied for in 2017 remained historically strong. Approximately 2,424 small net-metering systems, or nearly 16.5 MW, were registered in 2017. Additionally, some utilities, such as WEC and VEC, reported interconnecting more net-metering systems in 2017 than any previous year.⁷³

With respect to systems with capacities between 150 and 500 kW, there were fewer applications received in 2017. In 2016, the Commission received 72 such applications, compared to 23 in 2017. This apparent reduction is consistent with the Commission's intent to moderate the pace of development of large net-metering systems and to encourage the development of net-metering systems on previously developed sites.⁷⁴ However, this comparison is skewed because of the unprecedented number of applications filed in 2016, which was likely due to the expiration of the pre-2017 net-metering incentives. In addition, it is not clear whether the difference between the number of applications for large net-metering systems

⁷² The Commission approved more than 8 MW of applications for net-metering plants on landfills pursuant to Section 219a(m). These plants were not included in this table because they had capacities of up to 5 MW and net-metering plants of this size are no longer authorized by law.

⁷³ VEC Comments of March 15, 2018 at 1-2; WEC Comments of March 1, 2018 at 2.

⁷⁴ Act 99 Report at 40. "Given the new requirement that large net-metering systems be located in preferred sites, the [Commission] anticipates that the pace of development will be more controlled than it has been in the past few years."

filed in 2016 and 2017 is the result of reduced compensation, changes in the permitting process, or some other reason. It is possible that fewer applications for large net-metering systems were filed in 2017 because of the lead time needed to develop projects on preferred sites. When compared to years prior to 2016, the number of large net-metering applications received in 2017 is still relatively strong.

Ultimately, it is difficult to use this table to predict precisely how much net-metering capacity will be commissioned in the future because the data reflect interest in different programs. If all the projects applied for in 2017 were commissioned, their combined capacity would exceed the total amount of Tier II resources needed to comply with the RES, through net-metering alone. More recent data suggest that the pace of development is accelerating again. For example, in the first four months of 2018, the Commission has received applications for over 675 new net-metering systems, totaling over 16 MW of new capacity.⁷⁵ The Commission also has received notices from developers intending to submit CPG applications for at least 30 large ground-mounted net-metering systems in the next 180 days or sooner.⁷⁶

The Department states that it expects that the Commission will receive between 15 and 25 MW of new annual net-metering applications in a “business as usual” scenario. The Department further projects that each penny reduction of the net-metering incentives will decrease annual development by 3 to 4 MW. The Department’s “business as usual scenario” seems overly conservative given the significantly greater number of applications received in 2017 (34 MW) and 2018 than assumed by the Department (15 to 25 MW). Even if the Department’s projection proves accurate, net-metering would still constitute a substantial portion of the capacity needed to meet the requirements of Tier II, though not as great a proportion as in the past. This level of deployment is consistent with the goals of the CEP because net-metering is not the least-cost option available to meet Tier II.

⁷⁵ This figure excludes amendment cases which may include cases where additional capacity is being added to existing systems.

⁷⁶ See, e.g., *45-day advance notice of ER Jericho Gravel Solar, LLC, for a Certificate of Public Good for a 500 kW net-metered solar array on land located off Ethan Allen Road in Jericho, VT*, 18-0246-AN filed January 30, 2018. A complete list of pending advance notices may be viewed online at <https://epuc.vermont.gov/?q=node/92>.

In closing, the incentive system for net-metering is not failing if net-metering applications, CPGs, or total capacity commissioned do not increase as rapidly in the next year as it did in previous years. One purpose of the incentives is to find the proper balance between the pace of net-metering and cost to ratepayers. Renewable energy is flourishing in Vermont⁷⁷ and has reached a level of maturity where it can continue to be deployed with lower incentives.

(3) The disposition of RECs generated by net-metering systems commissioned in the past two years:

The disposition of RECs generated by net-metering systems commissioned in the past two years is summarized in Table 4. The data for 2017 have been broken out between projects that are subject to the prior net-metering rule (“NM 1.0”) and the new rule (NM 2.0”).

Table 4. Summary of REC Dispositions in 2016 and 2017.⁷⁸

	2016	2017 - NM 1.0	2017 - NM 2.0
Customers Retaining RECs	2108	797	39
Customers Transferring RECs	61	27	1,254

This table suggests that the current REC adjustor has been effective at causing net-metering customers to transfer their RECs to their utility to be retired, in furtherance of State renewable energy goals.

The VLS Clinic argued that the negative REC adjustor applicable to customers who retain their RECs is “punitive” and therefore should be eliminated entirely and that customers who retain and retire their RECs should be compensated in the same manner as customers who transfer RECs to their utility.⁷⁹ These arguments ignore the fact that RECs have economic value.

⁷⁷ For example, the Commission has received several CPG applications for non-net-metered solar plants, including several 5 MW facilities. *See e.g., Petition of GMP MicroGrid -Milton LLC*, Case no. 17-5003-PET.

⁷⁸ Department Comments of March 1, 2018 at 21.

⁷⁹ BALE Comments of March 15, 2018 at 1-2.

Furthermore, State law requires the Commission to reduce the value of net-metering credits by an “appropriate amount” where a customer elects to retain ownership of RECs.⁸⁰ Net-metering compensation should reflect the value of the products supplied to the system. However, customers who retain their RECs are retaining a benefit for themselves and are supplying non-renewable energy to the system. Furthermore, considering the renewable energy requirements of the RES, the Commission does not find a valid basis for requiring utilities to purchase non-renewable energy at significantly above wholesale cost.

For these reasons, the Commission does not accept the VLS Clinic’s position that customers who elect to retain RECs should be compensated for excess generation at the retail rate or higher. RECs can be sold out of state for a profit. Customers who want to do so (or who want to keep their RECs for themselves so they can claim their electricity consumption is renewable) should pay for that option. Vermont’s goal is that by 2050, 90% of the electricity sold to customers in Vermont will be renewable. The net-metering program should be a mechanism by which all customers can contribute to Vermont achieving this goal. Therefore, there is no persuasive basis for the VLS Clinic’s contention that customers who retain RECs should receive the same compensation as customers who supply valuable RECs to their utility.

(4) Any other information deemed appropriate by the Commission:

The Commission received substantial comments from stakeholders raising issues relevant to the Commission’s determination of the appropriate REC adjustor, including: (1) the “value of solar,” (2) the market value of RECs, and (3) “headwinds” facing the solar industry. We address each of these issues in turn.

⁸⁰ 30 V.S.A. § 8010(c)(1)(H)(i). The VLS Clinic’s contention that the current REC adjustor value is not an “appropriate amount” because it exceeds the market value of New England RECs is addressed in our discussion of factor (4), below.

The Value of Solar

In their comments, the Department and the DUs asserted that the “value of solar,” meaning the avoided costs realized by a utility due to net-metered solar power, is substantially less than the price paid by ratepayers for such power.⁸¹ The Department contended that in the past, distributed solar provided a number of benefits for Vermont’s grid, including avoided wholesale energy purchases and potential transmission and distribution upgrades. However, according to the Department, these benefits have declined significantly because of declining wholesale-energy costs and fundamental changes to the Vermont system. The Department represented that “[p]eak load in Vermont now occurs after sunset in all months of the year.”⁸² Therefore, the Department argued that new distributed solar will provide minimal transmission and distribution benefits. The Department stated that new distributed generation will continue to provide capacity benefits, but the ability of such resources to avoid future Regional Network Service (“RNS”) costs will likely decline.

Similarly, the DUs presented estimates of the value of solar that ranged from \$0.08 to \$0.11/kWh, which is substantially less than the \$0.189/kWh paid to residential net-metering customers.⁸³ The Department and the DUs contended that the value of additional solar has decreased because system peaks have been pushed into evening hours. GMP stated that past installations of solar power provided “several cents/kWh of value” due to avoided RNS charges and the potential deferral of peak-driven transmission and distribution capital projects. However, GMP maintained that additional solar will not provide these benefits because GMP and VELCO system peaks occur consistently during evening hours.

In contrast, REV asserted that the cost of net-metering is justified by its substantial benefits. In support of this contention, REV filed a report analyzing the costs and benefits of net-metering authored by Synapse Economics (the “Synapse Report”). The Synapse Report relies on estimates of the avoided costs for demand-side resources, as established by the Commission in Docket EEU-2015-04, and discusses additional benefits of net-metering such as

⁸¹ A summary of the total amount of compensation currently available to net-metering customers is contained in Table 1, above.

⁸² Department Comments of March 1, 2018 at 9.

⁸³ *See, e.g.*, GMP Comments of March 15, 2018 at 7 (“[A] reasonable estimate of the value of output from a new net-metering solar project is roughly 10 cents/kWh.”).

pollution reduction benefits and economic benefits from jobs and taxes. Based on these estimates, the Synapse Report concludes that there is a minimal cost shift between net-metering customers and customers who do not net-meter.

The Commission has reviewed the Synapse Report and does not accept its conclusions for several reasons. On December 22, 2015, the Commission approved calculations of avoided energy supply costs (“AESC”), externality adjustments, and other screening components for use by the energy efficiency utilities when they evaluate the cost-effectiveness of energy efficiency measures.⁸⁴ The AESC approved by the Commission were based on a 2015 study titled *Avoided Energy Supply Costs in New England* (the “2015 AESC Report”). This study was subsequently updated in 2016 (the “2016 AESC Memorandum”) and the Commission approved those figures, subject to certain adjustments, for use in the EEU screening process.⁸⁵ The 2015 AESC Report states:

The Base Case avoided costs should not be interpreted as projections of, or proxies for, the market prices of natural gas, electricity, or other fuels in New England at any future point in time, for the following two reasons. First, the projections are for a hypothetical future without new energy efficiency measures and thus do not reflect the actual market conditions and prices likely to prevail in New England in an actual future with significant amounts of new efficiency measures. Second, the Study is providing projections of the avoided costs of energy in the long term. The actual market prices of energy at any future point in time will vary above and below their long-run avoided costs due to the various factors that affect short-term market prices.⁸⁶

In other words, the analysis used for screening energy efficiency assumes a future scenario that is different from what is expected to occur. For this reason, the Commission finds that Synapse has not adequately explained why the AESC figures are an appropriate foundation for any avoided-cost analysis involving net-metering. Therefore, the Commission does not find the Synapse Report reliable because its foundational inputs come from a report that was not intended to be used as an estimate of the avoided cost of solar energy.

⁸⁴ *Order Re: EEU Avoided Costs for the 2016-2017 Time Period*, EEU-2015-04, Order of 12/22/15.

⁸⁵ *Order Re: EEU Avoided Costs for the 2017-2018 Time Period*, EEU-2015-04, Order of 10/20/17.

⁸⁶ 2015 AESC Report at 1-1 (March 27, 2015) available at <http://www.ct.gov/deep/lib/deep/energy/aescinnewengland2015.pdf>.

Another issue is that the AESC figures relied on by Synapse attribute substantial value to net-metering due to avoided transmission and distribution costs.⁸⁷ The reason these benefits were assumed in the AESC report is that energy efficiency measures perform differently than solar plants. For example, energy efficiency measures are not dependent on daylight to be effective and, therefore, can potentially reduce evening peaks. The Commission finds persuasive the Department's and DUs' contention that future transmission and distribution benefits from new net-metering plants are likely to be minimal due to changes in Vermont's peak. Therefore, the Commission finds that there is no adequate basis to include significant avoided transmission and distribution costs in an analysis of net-metering systems. As a result, the Synapse Report likely overstates the transmission and distribution benefits of additional net-metering resources.

The Synapse Report also ignores adjustments made to the AESC to reflect RES compliance costs. In analyzing whether net-metering causes a cost shift from net-metering customers to non-net-metering customers, the Synapse Report excluded the cost of REC adjusters from its consideration of net-metering compensation rates.⁸⁸ The basis for this methodological choice was that the 2016 AESC Memorandum did not include avoided RES compliance costs and therefore it would be inappropriate to include the cost of "RECs on [only] one side of the ledger."⁸⁹ However, the Commission's order cited by Synapse states that the AESC figures were adjusted to account for RES compliance.⁹⁰ Therefore, Synapse's cost-shift analysis appears to be imbalanced because it accounts for some RES compliance benefits on one side of the ledger but excludes the costs of obtaining RECs from the other side of the ledger. For this reason, and because the AESC figures improperly account for transmission and distribution benefits that are not likely to occur, the Synapse Report likely understates the existence of a cost shift.

The Synapse Report also describes other potential benefits of net-metering that do not directly accrue to ratepayers, such as benefits from increased employment, taxes, and avoided air pollution. For example, Synapse estimates that net-metering systems installed in 2017 will pay \$200,000 in taxes and generate \$6,365,000 in wages. Synapse extrapolates that these net-

⁸⁷ Synapse Report at 10, Table 1.

⁸⁸ *Id.* at 19.

⁸⁹ *Id.*

⁹⁰ *Order Re: EEU Avoided Costs for the 2017-2018 Time Period*, EEU-2015-04, Order of 10/20/17 at 4-5.

metering systems will have a total economic impact of over \$22 million and an additional \$1 million in annual environmental benefits. The Commission does not find this analysis persuasive. As an initial matter, the analysis is based on numerous assumptions that have not been tested. The report concedes that a complete economic analysis of net-metering has not been performed but extrapolates the results of an economic analysis performed for a large-scale solar development in Vermont.⁹¹ Ironically, this comparison reinforces the Commission's impression that developing more cost-effective sources of renewable energy would also result in tax revenue, employment, and environmental benefits in Vermont, but at a much lower cost to residential and business ratepayers than net-metering. Vermont has ambitious renewable energy goals and achieving those goals with resources that are not least cost has the potential to cause far more economic harm than good.⁹² The Commission recognizes that net-metering businesses make meaningful contributions to the Vermont economy. However, these benefits must be balanced against the high cost that ratepayers, including other Vermont businesses, pay for net-metered power. These additional costs could reduce Vermont's competitiveness in attracting new businesses and adversely affect the Vermont economy.

In summary, the Commission does not adopt the conclusions and recommendations contained in the Synapse Report because of the issues described above. The Commission finds a sufficient basis to conclude that the value of new net-metering resources is not proportional to the current cost of obtaining such resources. Our conclusion is based on the following circumstances, which do not appear to be disputed: (1) the substantial amount of distributed generation that has been installed in Vermont in recent years has had a profound effect on the operation of the grid and on the shape of Vermont's load, and (2) system peaks now frequently occur in the evening, when net-metered solar is not available. These circumstances have significant implications with respect to what benefits additional net-metering systems will

⁹¹ Synapse Report at 16.

⁹² For example, GMP's comments described how the selection of high-cost resources can lead to significant annual costs for ratepayers over time. GMP Comments of March 15, 2018 at 7.

provide to the grid. Consequently, new net-metering projects are not likely to provide a benefit in the next two years through avoided transmission and distribution costs.⁹³

Previous estimates of the value of net-metering in Vermont⁹⁴ and the Synapse Report assumed net-metering would reduce transmission and distribution costs based on Vermont's prior experience with load-induced constraints and mid-day peaks. However, these circumstances are no longer common. When distribution and transmission benefits are removed from such analyses, the costs and benefits of net-metering no longer appear to be proportional. Therefore, the Commission should take steps in this proceeding to gradually lower the cost of net-metering. This will benefit ratepayers while also providing net-metering businesses an opportunity to plan for these changes.

In conclusion, the Commission agrees with the Department's recommendation that we should "solicit comments on additional changes that may be useful in giving shape to the biennial review process in the future, particularly in relation to data needs and considerations." In addition to developing standardized forms for the submission of data, the Commission believes it will be beneficial to develop a common understanding among stakeholders about how the benefits and costs of distributed generation should be measured and what role those estimates should play in the biennial review process. The Commission is currently evaluating similar issues in case number 17-5257-INV, which concerns an investigation of the standard-offer program. If the information submitted in that case proves relevant to the net-metering biennial update process, the Commission will make appropriate adjustments to that process, after opportunity for input from stakeholders.

The Value of RECs

Many stakeholders asserted that the current \$0.06 difference between the positive and negative REC adjustors exceeded the expected value of RECs in New England. The stakeholders disagreed about how this fact should be reflected in the amount of REC adjustors.

⁹³ It is possible that future developments in battery storage will enable additional solar generation to effectively address peaks. To the extent this occurs, the value of solar would likely change, but no information presented in this proceeding suggests that this will occur in the next two years.

⁹⁴ Vermont Department of Public Service, *Evaluation of Net Metering in Vermont Conducted Pursuant to Act 99 of 2014*, (November 7, 2014).

For example, the Department recommended that the Commission reduce the amount of the positive REC adjustor by \$0.005 because of the discrepancy between the assumed near-term price of RECs in New England. The DUs recommended more significant changes; most recommended a \$0.02 reduction in the positive adjustor. In contrast, the VLS Clinic recommended eliminating the negative adjustor entirely and reducing the positive adjustor by \$.005. According to the VLS Clinic, the positive REC adjustor would then reflect the forward price of New England Class I RECs (\$0.02 to \$.03/kWh).

In response to these arguments, the Commission notes that the REC adjustor is not intended to perfectly reflect the market value of New England RECs. Such regional REC prices reflect the cost of complying with other states' portfolio standards, not the cost of complying with Tier II of the RES. Tier II facilities must be in Vermont and must have a capacity of 5 MW or less. The prices of other states' RECs do not necessarily reflect the cost of plants having these characteristics. Therefore, statements about the market value of such RECs are not dispositive of the appropriate value of Tier II RECs or the appropriate amount of the REC adjustors. The Commission is not aware of a liquid market for Tier II RECs that could provide a clear market-based price for such RECs.

In addition, the REC adjustor contributes generally to the overall compensation of net-metering customers. Therefore, while the value of RECs is relevant to the Commission's consideration of the appropriate REC adjustor amount, the Commission's rules state that the Commission must also consider information about the pace of development and the State's renewable energy policy.⁹⁵ Consideration of such information is necessary for the REC adjustor to achieve its intended purpose of allowing the Commission to balance the costs and benefits of net-metering and to ensure that the pace of development is not excessive.⁹⁶

Notwithstanding these issues, the Commission agrees that the cost of complying with Tier II is not likely \$0.06/kWh and finds that the current REC adjustor values are higher than necessary to encourage customers to transfer RECs to their utility. The Commission also concludes that the current \$0.03 positive REC adjustor is contributing to the overall cost of net-

⁹⁵ See Commission Rule 5.128(B)(1)(4).

⁹⁶ Act 99 Report at 40 ("The [Commission] will initiate a proceeding if the pace of development is excessive.")

metering being higher than the cost of other Tier II resources. In other proceedings, the Department has estimated that the cost of Tier II compliance is between \$0.05 and \$0.03/kWh.⁹⁷ We find this estimate appropriate, and it supports our decision to reduce the amount of the positive REC adjustor by \$0.02 cents over the next two years. As a result, the difference between the positive and negative REC adjustors will be \$0.04/kWh, which falls within the estimated value of Tier II RECs. Furthermore, this change will reduce the cost of net-metering and thus better align the costs and benefits of net-metering.

We have considered the VLS Clinic's recommendation that we eliminate the negative REC adjustor and reduce the positive adjustor to \$0.025/kWh, but we do not agree that this amount is appropriate. Under the VLS Clinic's recommendation, residential net-metering customers who transfer RECs would receive as much as \$0.189/kWh in total compensation. As discussed above, this value is excessive when considering the cost of other Tier II resources. Furthermore, customers who retain RECs would receive more than the retail rate for electricity (assuming a positive siting adjustor). This is an inappropriate amount of compensation for non-renewable power.⁹⁸ The Commission has instead chosen a value for the REC adjustors that reduces the differences between the previous adjustor values and the market value of RECs but does so in a manner that better balances the costs and benefits of net-metering. For these reasons, we do not agree with the VLS Clinic's arguments about the appropriate amount of the REC adjustor.

Solar Industry Headwinds

Next, we turn to the issue of potential increases in the cost of installing solar. Many stakeholders described "headwinds" faced by the solar industry, including proposed tariffs on solar panels, steel, and aluminum. Solar advocates also cited recent changes in the federal tax law, such as a reduction in the value of accelerated depreciation and decreases in the corporate tax rate, as reasons for concern. REV stated that the federal investment tax credit will be reduced in 2020 and that this development will reduce the number of new solar projects. REV

⁹⁷ *Order Re: EEU Avoided Costs for the 2017-2018 Time Period*, EEU-2015-04, Order of 10/20/17.

⁹⁸ Act 99 Report at 36 ("Accordingly, the [Commission] does not believe it is appropriate to require utilities to account for such non-renewable power at the blended retail rate, which is significantly above the wholesale cost of power.").

recommended that the Commission maximize private local investment in energy infrastructure to the greatest extent possible in 2018 and 2019 because the trend of decreasing costs to install solar is ending and the cost of installation may rise in the future. In sum, REV asserted that “with all of the headwinds at the federal level now is not the time to hit the brakes or slow solar adoption in Vermont, rather we should be looking to take a more bold leadership position.”⁹⁹

Some stakeholders challenged the magnitude of the headwinds facing the solar industry. For example, GMP stated that “the tax law changes and solar module tariffs do (all else equal) stand to increase the net cost to develop and operate new net metered solar projects, but not by large fractions.”¹⁰⁰ According to GMP, the solar industry has been a declining-cost industry for many years due to technology improvements and increasing scale. GMP asserted that these trends could offset other upward price pressures. GMP claimed that industry literature reviewed by GMP supports the Department’s view that capital for net-metered projects will remain approximately constant in the near term, despite upward pressure from the tax and tariff developments.

The Department contended that it does not expect the cost to install solar to continue to decline. Instead, the Department “expects that solar installation costs in Vermont over the next several years will resemble those experienced in 2017, which were probably slightly higher than in 2016 (due to the pricing in of impending module tariffs and the added costs of developing preferred sites).”¹⁰¹

The Commission has considered the potential headwinds facing the solar industry and concludes that these issues do not provide a persuasive basis to maintain the current incentives for net-metering. Consider the experience of residential customers with small net-metering systems. Starting in 2011, residential solar customers were eligible to receive \$0.20/kWh.¹⁰² The current compensation for new residential systems installed in GMP’s service territory is approximately \$0.189/kWh,¹⁰³ which represents a 5.5% decrease. REV’s comments indicate that during the same period, the cost to install solar decreased substantially.¹⁰⁴ In this context,

⁹⁹ REV Comments of March 15, 2018 at 1.

¹⁰⁰ GMP Comments of March 15, 2018 at 8.

¹⁰¹ Department Comments of March 15, 2018 at 14.

¹⁰² 30 V.S.A. § 219a(h)(1)(K) (repealed January 1, 2017).

¹⁰³ See Table 1, above (describing current net-metering incentives).

¹⁰⁴ REV Comments of March 15, 2018 at 10.

the Commission believes that the economics of solar remain strong, even if moderate cost increases do occur.

Turning to the specific headwinds cited by REV, the impact of these on the cost of solar installations is not clear. For example, the effect of the tariff on solar panels may already be reflected in current module prices. The Solar Energy Industries Association (“SEIA”) report cited by REV indicates that the industry may already have experienced the effects of this tariff in the 4th quarter of 2017 because of increased demand as buyers sought to increase inventories in advance of the tariff.¹⁰⁵ Therefore, REV’s arguments concerning the effect of the tariff do not provide a sufficient basis for the Commission to conclude that the cost of future solar installations will be significantly greater than in the past. Based on the strong number of residential applications filed in 2017 and the pace of applications in the first four months of 2018,¹⁰⁶ the Commission is not convinced that the Vermont solar industry is as challenged as REV asserts.

Likewise, the effect of the new federal tax law is not clear at this time. While some of the recent changes may negatively affect the financing of solar projects, solar companies may experience offsetting benefits from the reduction of the corporate income tax rate. Absent a thorough analysis of the impacts of the tax changes, the Commission does not find REV’s arguments on this point persuasive. With respect to future changes to the investment tax credit, these changes will not take effect until after 2020. The Commission will conduct another biennial review before then, and we can consider the potential effect of such changes at that time. Based on the Commission’s experience with the expiration of the old net-metering rule, the possible impending expiration of the federal investment tax credit is likely to drive more rapid development in the near term than would have otherwise occurred. Therefore, it is important to control the costs of such development.

¹⁰⁵ Solar Market Insight Report 2017 Q4, SEIA (“[C]urrent module price trends are largely a result of supply-demand tightness, with prices increasing to an average of \$0.45/W for standard multi modules as buyers seek inventory ahead of the uncertainties regarding the outcome [of the tariff request].) *Available at* <https://www.seia.org/research-resources/solar-market-insight-report-2017-q4>.

¹⁰⁶ The Commission has received over 675 CPG applications for new net-metering systems, totaling approximately 16 MW so far in 2018. The Commission expects that there may be an increase in the pace of applications during the period between when this order issues and when the new incentives take effect on July 1, followed by a relative lull in applications. This experience would be similar to what happened at the end of 2016 when the previous incentives changed.

Finally, we respond to REV's contention that "now is not the time to hit the brakes or slow solar adoption in Vermont, rather we should be looking to take a more bold leadership position." This argument conflates net-metering with solar development generally. As the Department and the DUs pointed out, there are more cost-effective ways for Vermont to develop solar resources than continuing the current net-metering incentives. As stated in the CEP, "[p]ower supply questions now revolve around the most cost-effective way to meet the RES requirements, not around how much renewable energy to acquire."¹⁰⁷ The Commission believes that Vermont has taken a bold leadership position on renewable energy by adopting the RES. Our determination in this case is consistent with the CEP's and RES's focus on obtaining significant amounts of renewable energy, including solar, in a cost-effective manner.

Conclusion

Based on the discussion above, the Commission determines that it is appropriate to gradually reduce the positive REC adjustor for customers who transfer their RECs to their utility. This reduction will be phased in with a \$0.01/kWh reduction over each of the next two years. The Commission makes no changes to the negative REC adjustor applicable to customers who retain ownership of their RECs. These adjustments will reduce, though not eliminate, the extent by which the cost of net-metered power exceeds the cost of comparable alternative sources of renewable energy. Additionally, these changes better reflect recent estimates of the value of Tier II RECs. To avoid an abrupt decline in the total compensation available to new net-metering customers, the Commission will phase in this change over the course of 2018 and 2019, with a \$0.01/kWh reduction effective July 1st of each year.

VI. SITING ADJUSTOR FACTORS

(1) The number and capacity of net-metering systems receiving CPGs in the most recent two years:

The following tables summarize the Commission's records with respect to the number and capacity of net-metering systems issued a CPG in 2016 and 2017.

¹⁰⁷ CEP at 277.

Table 5. Annual Number and Capacity of Systems Receiving CPGs in 2016 and 2017¹⁰⁸¹⁰⁹

	2016 CPGs	2016 Capacity (kW)	2017 CPGs	2017 Capacity (kW)
0-15 kW	3,086	20,919	2,798	19,407
>15 - 150 kW	99	9,862	129	8,818
>150 – 500 kW	68	26,043	37	14,372
Cumulative	3,253	58,704	2,964	42,597

As was the case with the Commission’s records of CPG applications, it was not practicable to sort the Commission’s pre-ePUC records to distinguish between CPGs issued to new systems and amendments of existing small systems. Therefore, it is likely that the number and capacity of registrations shown in Table 5 are somewhat overstated because requests to alter existing or previously approved systems are counted as new CPG applications.¹¹⁰ The Commission can readily distinguish between registrations for new systems and amended systems for all cases filed after July 1, 2017, but those cases were not removed from Table 5, above, so that the figures for 2016 and 2017 are comparable.

When considering these data, it is also important to acknowledge that there is a lag between when an application is filed and when it is approved. For example, a significant number of CPG applications filed in December of 2016 were not approved until January of 2017. Therefore, a portion of the CPGs issued in 2017 reflect development under the prior net-metering rule. As discussed on pages 34 through 36 above, it is useful to consider several data sources when considering the rate of net-metering deployment, such as the number of CPG applications received, the number of systems installed, and the number of interconnection requests submitted to each utility. When taken together, these figures suggest that interest in net-metering remains strong, particularly with respect to residential systems but also with respect to larger net-metering systems.

¹⁰⁸ All data concerning net-metering CPGs were retrieved from ePUC.

¹⁰⁹ The Commission also issued several CPGs for large, landfill net-metering systems. There is no longer statutory authority for net-metering systems larger than 500 kW and, therefore, these systems were excluded from this table.

¹¹⁰ Amendment cases for systems with capacities greater than 15 kW are not displayed in Table 5.

(2) The extent to which the current siting adjustors are affecting siting decisions:

REV stated that the current siting adjustors have been effective at driving development on “preferred sites” but that few to no projects have been permitted on parking lot canopies or brownfields. Therefore, REV contended that the Commission should consider reducing the permitting burden and process for projects on sites that are previously developed or “impaired” because the construction of solar on such properties will not create new negative environmental impacts. REV stated that there are many proposed Category II and III projects, but some are likely to be withdrawn because they are not economically viable under the revised net-metering rule.

Based on our review of the Commission’s records for CPG applications filed in 2017 and 2018, it appears that the siting adjustors are encouraging a significant number of residential-sized and large roof-mounted net-metering systems. For example, the Commission has received a substantial number of registrations for roof-mounted Category II and Category III systems in 2017 and 2018. In contrast, the Commission has received very few applications for systems not located on preferred sites. Accordingly, the Commission agrees with REV’s comment that the siting adjustors appear to be driving more environmentally beneficial siting decisions. REV’s issues related to the CPG application process are addressed under Section VIII, below.

(3) Whether changes to the qualifying criteria of the categories are necessary:

Pursuant to Commission Rule 5.128(A), the Commission may make changes to the eligibility criteria for Category I, II, III, and IV net-metering systems. For example, Category I systems must have a capacity of 15 kW or less. The Department and the DUs did not recommend any such changes. ANR recommended changes to the definitions of certain “preferred sites” contained in Commission Rule 5.103.

Several participants suggested changes to the qualifying criteria. Specifically, ANR and several solar development companies recommended changes to the definitions of the “preferred sites” set forth in Commission Rule 5.103. The Commission considered these comments but has determined that it is not appropriate to make any changes to the definitions of “preferred sites” in this proceeding. First, the changes proposed would alter the definitions that are contained in the

adopted rule; therefore, the Commission determines that these issues are more appropriately considered in a rulemaking than in the biennial update process. The Commission is currently conducting a proceeding in case number 17-5202-PET to facilitate a discussion about what information is necessary to demonstrate that resource extraction sites qualify as “preferred sites.” The Commission believes additional stakeholder input will lead to more clarity concerning preferred sites generally. Accordingly, the Commission directs the hearing officer in that case to expand the scope of the proceeding to include the consideration of whether improvements to any of the definitions of “preferred sites” is appropriate.

REV recommended creating new eligibility criteria for low- and moderate-income projects and “community solar.” The Commission has considered these arguments but declines to create additional incentives for such projects on the basis that these changes would increase the cost of the net-metering program. Low- and moderate-income customers spend a greater percentage of their income on energy and it is harder for such customers to absorb increases in electric rates. The most cost-effective way for such low-income customers to use renewable energy is for the utility to increase the amount of renewable energy in its supply portfolio at the lowest possible cost. Offering incentives to allow low- and moderate-income customers to participate in net-metering may provide a financial benefit to those participating customers but would increase costs for other low- and moderate-income customers who do not net-meter. This is contrary to the Legislature’s instruction that the Commission design the net-metering program in a manner that avoids such cost shifting to the extent practicable.¹¹¹

The Commission also does not accept the factual premises of REV’s recommendations. REV contended that “since implementation of the most recent 2017 net metering rule, residential community solar participation and development in Vermont has come to a virtual standstill.” The data reviewed by the Commission show that many medium (over 15 to 150 kW) and large (up to 500 kW) group net-metering systems have been approved in 2017 and 2018. Thus, there appear to be sufficient opportunities for community solar. We therefore infer that REV’s argument must be that some residential customers need additional financial incentives to participate in net-metering. The Commission has not seen any persuasive analysis justifying

¹¹¹ Section 8010(c)(1)(C).

additional incentives for these projects. As discussed above, the cost of net-metered power currently exceeds the cost of other comparable renewable resources and likely exceeds the value of its benefits. It is not consistent with the CEP or State energy policy to favor resources that are not least-cost. Accordingly, absent an adequate justification for the increased price of the programs proposed by REV and other stakeholders, the Commission does not support initiatives that would further increase the cost of net-metered power relative to the cost of comparable renewable energy resources.

Next, we turn to VEC's request that the Commission identify the SHEI as a transmission-constrained area. VEC contended that constructing additional net-metering in this area will increase the curtailment of existing renewable resources and result in economic harm to Vermont ratepayers. Therefore, VEC stated that projects located in transmission-constrained areas cannot be considered "preferred sites" and should be disqualified from receiving this designation.

The Commission has considered the issue raised by VEC and declines to make any changes to the eligibility criteria. Transmission constraints are a dynamic issue. There is insufficient information in this proceeding for the Commission to develop a general rule about the SHEI. Instead, the Commission determines it is more appropriate to consider such issues in the context of a contested case, where current information can be used to evaluate the effect of a proposed generator on the operation of the system.

(4) The overall pace of net-metering deployment:

The data discussed above, including the number of CPG applications filed in 2017 and 2018 suggests that the pace of net-metering continues to be robust. The Commission acknowledges that some amount of this approved capacity will not be commissioned, but that does not alleviate the Commission's concern about the cost to ratepayers of net-metering relative to the cost of other available Tier II resources, such as standard-offer, bilateral contracts, and utility projects. In fact, the Commission expects that a substantial amount of this approved capacity will be commissioned, and that upward rate pressure will continue unless steps are taken to make the net-metering program more financially sustainable.

(5) *Any other information deemed appropriate by the Commission:*

Several of the DUs contended that the Commission should decrease the siting adjustor for Category III net-metering systems. The DUs contended that these systems enjoy better economies of scale than residential-sized systems and that as a result their compensation is too high in comparison.¹¹² Other DUs contended that a decrease in compensation is necessary to make the price of these projects align more favorably with the cost of other Tier II resources. GMP contended that larger net-metering systems tend to be located farther from load than smaller systems. The Commission finds these arguments to be persuasive and, therefore, will reduce the siting adjustor applicable to Category III net-metering systems. This will help make these systems more cost-competitive with other Tier II resources.

Conclusion

Having considered the factors discussed above, the Commission determines that it is appropriate to reduce the siting adjustor applicable to Category III net-metering systems by one penny to negative \$0.02. The Commission finds persuasive the DUs' contention that the cost of these systems should be closer to that of other commercial generators. Given the similarities between these resources, the Commission agrees that a reduction in the compensation for Category III facilities is warranted.

VII. DETERMINATION OF THE STATEWIDE BLENDED RESIDENTIAL RATE

The Department recommended that the statewide blended residential rate be recalculated because of rate increases by several utilities in the intervening year. Specifically, the Department recommended an increase of \$0.00495/kWh, for a new statewide blended residential rate of \$0.15417/kWh. No party has objected to the Department's recommendation. Therefore, it is adopted. This change will offset some of the changes made to the REC and siting adjustors.

Table 6, below, illustrates the cumulative effect of the changes described in this Order. The figures in this table illustrate the experience of a net-metering customer located in the service territory of a distribution utility that applies the blended residential rate. Actual

¹¹² See e.g., GMP Comments of March 15, 2018 at 9.

experiences may vary if the retail rates offered by a customer’s utility are less than the blended residential rate. The figures are also based on the customer choosing to transfer RECs to the utility. These revised adjustor values will apply to customers who apply for a net-metering CPG on or after July 1, 2018 and 2019. Applicants who file complete applications that contain all the information required by the Commission’s rules prior to July 1, 2018, will receive the initial adjustor values stated in Commission Rule 5.127.

Table 6. Summary of Changes to Net-Metering Incentives

Category	2017	2018	2019
Category I (up to 15 kW)	\$0.189	\$0.184	\$0.174
Category II (>15 to 150 kW on preferred site)	\$0.189	\$0.184	\$0.174
Category III (>150 to 500 kW on preferred site)	\$0.169	\$0.154	\$0.144
Category IV (>15 to 150 kW on non-preferred site)	\$0.149	\$0.144	\$0.134

VIII. OTHER ISSUES

Data Issues

Both ANR and REV raised concerns about the consistency and transparency of the various data that were offered in this proceeding. REV contended that “current data is not reliable when figures for non-net metered solar are co-mingled with net metering, and when data used for pace or potential cost analysis includes net metering systems that were never installed.” According to REV, there should be readily available data concerning: (1) the number of applications filed with the Commission, (2) number of applications withdrawn before a final order, (3) number of CPGs issued, (4) number CPG applications denied, and (5) total capacity of net-metering systems commissioned. REV also stated that it would be useful to sort this data by technology, category, and site type.

The Commission agrees with REV and ANR that data quality is important. Accordingly, the Commission will develop a standardized reporting form for the next biennial update proceeding. The Commission will provide stakeholders an opportunity to comment on this reporting form when it is developed. Additionally, stakeholders should contact the Clerk of the Commission if they have questions about how to retrieve net-metering data from ePUC. This biennial update was challenging due to the fact that much of the relevant information was developed prior to when ePUC began accepting net-metering applications. The Commission expects that data for future proceedings will be easier to access.

With respect to the quality of data in this proceeding, REV's comments do not identify which data it found unreliable. Therefore, it is difficult to respond to REV's issue. The Commission acknowledges REV's contention that not all proposed net-metering systems are ultimately approved or will achieve commissioning, and we have considered this fact when reviewing the number of applications filed and approved.

Turning to REV's recommended data sets, we note that items (1) through (4) are available through ePUC. With respect to item (5), the utilities were required to provide this information to the Commission pursuant to Commission Rule 5.128(D), and their filings containing that information were publicly available on ePUC. Again, REV hasn't specifically identified which data submitted in this proceeding were unreliable, so the Commission was not able to evaluate this criticism.

Permitting Issues

Several stakeholders recommended that the Commission address the cost and complexity of filing net-metering CPG applications that do not qualify to use the registration process. These stakeholders contended that these issues are slowing the pace of development. In response to these comments, the Commission notes that the new net-metering rule made it easier for large roof-mounted net-metering systems up to 500 kW to receive a CPG through a simple registration process. The Commission received more applications in 2017 for such systems than in the past and believes this is an example of the success of the revised net-metering rule.

However, the Commission agrees that its processes can be improved and believes it is in the public interest to ensure that the CPG application process for net-metering systems is

appropriately simplified. Therefore, in response to the comments raised in this proceeding, the Commission directs its staff to take the following actions to improve the CPG application process:

1. Develop an application checklist for applicants so they can ensure that their applications are complete when submitted. The Commission has observed that applications are frequently incomplete the first time they are filed. We believe that a checklist for applicants will help reduce the number of rejected filings and thus decrease the resultant burden and delay.

2. Develop substantive guidance for applicants concerning the Section 248 criteria. While it is impossible for the Commission to advise applicants whether a proposed project will meet the applicable criteria of Section 248, we believe that past decisions can be summarized in a manner that will help applicants better assess whether a project will experience problems during the review process.

3. Commission staff will soon conduct a workshop with the Department, ANR, and the Natural Resources Board concerning the definition of “preferred sites” under Commission Rule 5.103.¹¹³ The Commission directs staff to expand the scope of that proceeding to include an opportunity for stakeholders to recommend changes to the application process set forth in the net-metering rule. Staff should conduct such workshop and other process as necessary and deliver a summary of all proposed rule changes to the Commission. The Commission will review those proposals and initiate a rulemaking if appropriate.

Net-Metering Credits for WEC Customers

Both WEC and REV recommended changes to the way customer credits are calculated for WEC’s members. It is the Commission’s understanding that this issue arises because WEC uses an inclining-block rate structure, which means that net-metering customers with otherwise high consumption are avoiding kWh charges at rates well above the blended residential rate. Unfortunately, the methodology for measuring net energy and calculating bill credits is set forth in Commission Rule 5.126. Therefore, the Commission cannot change the method of calculating bill credits in this update proceeding.

¹¹³ Case Number 17-5202-PET.

In this proceeding, the Commission has reduced the incentives for net-metering customers in a manner that is generally consistent with WEC's recommendations. However, to the extent that WEC's issue has not been satisfactorily addressed, the Commission will consider a petition to revise Rule 5.126 pursuant to 3 V.S.A. § 806. WEC should discuss this issue with the Department and other stakeholders prior to filing such a petition. If such a petition is filed, WEC is encouraged to include a specific proposal for changes to the rule.

500 kW per Customer Limit

Finally, many commenters called for an end to the 500-kW limit on cumulative net-metering capacity that an individual customer may have. They asserted that this requirement hindered the development of solar projects and prevented large customers, including schools, towns, and businesses, from "going 100% solar." Issues like this cannot be addressed in the biennial update proceeding. As discussed above, the biennial update provides a process for adjusting the initial REC and siting adjustor values and the criteria for Category I, II, III, and IV net-metering systems.¹¹⁴ The 500 kW-per-customer limit is a rule-based requirement that the Commission can only change in a rulemaking. However, the Commission observes that it considered and rejected similar arguments against the 500 kW-per-customer limit when it adopted Rule 5.100. The Commission believes that the limit continues to serve the valid purpose of ensuring that large customers do not avoid significant electricity charges at the expense of other customers.

IX. ORDER

IT IS HEREBY ORDERED, ADJUDGED, AND DECREED by the Vermont Public Utility Commission ("Commission") that:

1. The revised REC and siting adjustor values announced in this Order shall apply to all systems for which a complete application for a certificate of public good ("CPG") is filed on or after the effective dates stated in order paragraphs 2 and 3, below.

¹¹⁴ Rule 5.128(A).

2. The positive renewable energy credit (“REC”) adjustor applicable to customers who elect to transfer RECs to their utility shall be \$0.02 kWh for the period beginning July 1, 2018, through June 30, 2019, and \$0.01/kWh for the period beginning July 1, 2019.

3. The siting adjustor for Category III net-metering systems shall be negative \$0.02/kWh for the period beginning July 1, 2018.

4. The Commission makes no changes to the negative REC adjustor applicable to customers who elect to retain ownership of RECs.

5. The Commission makes no changes to the other siting adjustors.

6. The Commission makes no changes to the eligibility criteria for Category I, II, III, and IV net-metering systems.

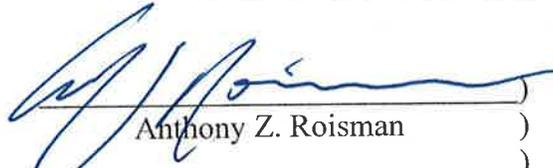
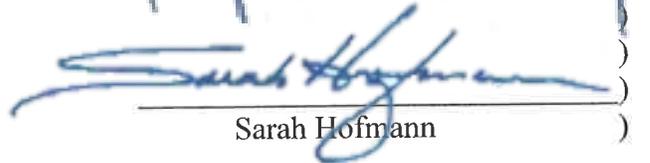
7. The Commission directs staff to develop an application checklist so that applicants can ensure that their applications are complete when they are submitted.

8. The Commission directs staff to develop a guidance document concerning the application process for net-metering CPGs.

9. The Commission directs the hearing officer in case number 17-5202-PET to conduct such process as necessary to develop recommendations for proposed changes to the net-metering rule concerning preferred sites and further simplification of the CPG application process.

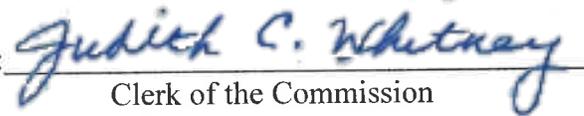
10. The Commission directs staff to develop standardized data reporting forms for purposes of future biennial update proceedings.

Dated at Montpelier, Vermont, this 1st day of May, 2018.

)	
Anthony Z. Roisman)	PUBLIC UTILITY
)	
)	
Margaret Cheney)	COMMISSION
)	
)	
Sarah Hofmann)	OF VERMONT

OFFICE OF THE CLERK

Filed: May 1, 2018

Attest: 
Clerk of the Commission

Notice to Readers: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Commission (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: puc.clerk@vermont.gov)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Commission within 30 days. Appeal will not stay the effect of this Order, absent further order by this Commission or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Commission within 28 days of the date of this decision and Order.

PUBLIC COMMENTS -- ATTACHMENT A

18-0086-INV NET-METERING PROGRAM BIENNIAL UPDATE

LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME	LAST NAME	FIRST NAME
Adams	Penelope	Christian	Bill	Foster	Matthew	Jones	Victoria	Marx	Roland J.	Parent	Charles D.	Stark	Holly				
Allen	Dana	Clay	Jack	Franko	Clary	Jordon	Brooks	Mathers	Jennifer Jill	Parish	Phil	Steele	Brian				
Allen	Timothy	Cleveland	Tom and Terry	Fraser	Dan	Kahoe	Deborah A.	Mayo	Josephine	Parish	Ralph	Stephenson	Kate				
Altup	Keld	Colhan	Abby	Fredericks	James	Kaschner	Richard L.	McCarthy	Mike	Parraut	Michael	Stewart	Scott				
Alvard	Jared	Comes	Roger	Fresman	Gregg	Kiefer	Joseph	McComrack	Patrick	Perry	John	Stone	Steven				
Amelung	Robert	Condon	Mieghan	Friedrichs	Annie	Knafl	Andrew	McCoy	Mary	Pierson	Dianne	Sridsberg	David				
Anderson	Steve	Conn	William	Friert	William	Knight	Jane	McCullough	Allen	Pixley	Ingrid	Sturgeon	Linda				
Anthes	Ed and MaryRose	Connellee	Karen and James	Gallott	Karen and James	Kuebler	Carolyn	McEnaney	Scott	Piasee	Sean	Sullivan	Richard J.				
Aralujo	Patricia	Corcoran	Patricia	Gardner	Patricia	Kyle	Dorothy	McHugo	Gregory	Polya	Lance	Taylor	Cynthia				
Arden	Gary	Cowles	Frank	Giabobbi	Frank	Laberge	Bill	McKay	Barbara	Post	Don	Terrill	Weldon Davis				
Astarita	Alice	Crocco	Michael	Gilhooley	Michael	Lambert	Susan	McKinsey	Anne	Post	Melissa	Thomson	Michael				
Atkinson	Dana	Crown	Lucy	Gluck	Lucy	Lander	Erin	McManary	Emily	Post	Phil	Thyme	Jessica A.				
El	Chris	Cystal	Ben	Gordley	Ben	Jordan	Brooks	Meerburg	Merina	Pratt	Caroace J.	Tommelli	Zachary				
Bacon	Alan	Daigle	Francis	Gore	Francis	Kahoe	Deborah A.	Mallen	Brent	Pritchard	Nathaniel	Trennani	Zachary				
Barbour	Suzette Josephine	Davis	Dan	Gottlieb	Dan	Kaschner	Richard L.	Melville	Andra	Prochorchik	Roy	Tremback	Brian				
Batzel	Diana	Davis	Robin	Gresham	Robin	Kiefer	Joseph	Meyer	Katherine	Quessel	Linda	Treize	Arthur D.				
Beadle	Margret	Davis	Marilyn	Grossman	Marilyn	Knafl	Andrew	Meyers	Dominique	Ratico	Silas	Turnosa	Nina				
Behn	Sonia	Dees	Jennifer	Hallatt	Jennifer	Knight	Jane	Michalka	Michael	Rebhun	Scott	Twitchell	Maggie				
Benjamin	John	DeFont	John	Hameslough	John	Kuebler	Carolyn	Miller	Candace	Reid	Luc	Vaillancourt	Alan and Susan				
Benoit	Alan	Densmore	Phyllis A.	Harmon	Phyllis A.	Kyle	Dorothy	Miller	Kurt	Rhodes	Joel	Vansant	Ted				
Benson	Anna Rose	Deppe	Andy	Harris	Andy	Laberge	Bill	Moland	Liesl	Richel	Peggy	Ventura	Ely				
Berry	Tom	Dewees	Eric	Harman	Eric	Lambert	Susan	Monahan	Donna	Riggen	Susan	Veta	Lynn				
Berthiaume	Leon	DeWind	George	Harvey	George	Lander	Erin	Morley	Nancy	Roberts	Jean	Vorstefeld	Hans				
Bickerstaff	Mieghan	Dinan	James	Harvey	James	Langhus	John	Morris	Sue	Rome	Alan and Gale	Wales	Melissa				
Blandhard	Cassey	Doran	Alec	Hastings	Alec	Larrabee	Jake	Moulton	Colleen L.	Rooney	Michael	Walker	Bevan				
Bliss	Robert	Drown	Israel	Heiland	Israel	Lau	Sam	Moulton	Elizabeth	Rosenblum	John	Walker	Paul				
Bloom	Darryl	Dubois	Paige	Hevety	Paige	Lee	English	Moulton	Melinda	Rosenmiller	Diane	Wanzar	Charles				
Borducci	Lisa	Dunning	Edward	Heys	Edward	Lemal	Aik	Mulroy	Bob	Ross	Donald	Ward	David				
Bourassa	Nicole	Dykstra	Jack	Highland	Jack	Lessard	Amber	Munro	Khanti	Roy	William	Weiss	Thomas				
Bower	Anne	Dzubak	Fred	Hodgdon	Fred	Lewis	Ron	Murphy	Barbara	Ryder	Beverly	Weiss	Garret				
Brody	Oliver	Eagan	Dairde	Holmes	Dairde	Lewis, Sr.	Everett	Murphy	Thomas	Sabick	Jessica	Wheeler	Bruce C.				
Brown	Alex	Eagerly-Walsh	James	Hobbs chuh	James	Lill	CR	Murray-Clesen	Madeline	Salazar	Karla	Whitchurch	Barbara				
Bull	Leonard Seth	Edling	Timothy	Hoopes	Timothy	Lippold	Ero	Nardozzi	Charles	Scheef	Demis	Whitcomb	Hallie				
Burde	James	Elliott	Annie	Horstmeyer	Annie	Litwinsky	Marie	Naumann	Terence	Schults	William	White	William				
Bushnell	Marcia	Eustis	Jennifer	Hout	Jennifer	Litwinsky	Tom	Nelson	Donna	Shapiro	Andrew	White	Becca				
Cady	Luke	Farrow	Roger	Howland	Roger	Lopez	Tamaron	Newton	Garland	Shaw	Sarah	Wible	Andrew				
Can	Erin	Fenton	Zachary	Hunter	Zachary	Lopez	Kate	Nielsen	Erin S.	Shenholm	Eric	Willcock	Brian				
Canty	Edward	Feurzig	Wendy	Ireland	Wendy	Lowther	Catherine	Noe	Carl	Simon	Laura	Williams	Esha				
Carlson	Sam	Fiacco	Rex	James	Rex	Macejko	Wayne	Nokes	Gary	Simonds	Michael	Wilson	Katharine				
Caspersen	Dana	Fifield	Dana	Jeffery	Dana	Meier	Brian	Norris	Michael	Skolnick	Nora	Wirkkala	Erik				
Casettano	Albert G.	Fischer	Ethan	Jenne	Gregory	Melley	Richard	O'Connell	Coleen	Sleeper	David	Wood	Michael				
Cavanagh	Janet	Fischer	Ethan	Jensen	Traci	Manganello	Paul	Olesky	Chris	Smith	R. Paul	Wood	Noa				
Charabois	Steven	Fisk	Rhannon	Johnson	Rhannon	Manning	Brian	O'Neill	Michael	Snyder	Steve	Yalodi	Carl				
Chese	Jill	Fitch	Wendy	Johnson	Wendy	Marr	Tim	Owen	John J.	Soquet	Julie	Yoder	Robert				
Childers	Laurie	Flanigan	Wesley	Johnson	Wesley	Martin	David	Owen	John R.	Sparado	Chris	Young, Jr.	John T.				
Chipman	Stephen	Ranigan	David C.	Jones	David C.	Martone	Walter	Palmer	James	Star	Laura	Young, Jr.	John T.				

BUSINESSES / TOWNS / ORGANIZATIONS

Aegis Renewable Energy, Inc. | Behn, Nils
Barton Village Inc. Electric Department
Catamount Solar LLC | McCollister, Kevin
City of Burlington Electric Department
Conservation Law Foundation and VCV, VNRC, VPIRG | Wolfe, Sarah
Encore Renewable Energy
Energy Clinic at Vermont Law School | Jones, Kevin
Green Mountain Power Corporation
Renewable Energy Vermont | Campbell Andersen, Olivia
Solaflect Energy | Bender, Bill
Swanton Village, Inc. Electric Department
Town of Hardwick Electric Department
Town of Hartford | Martin, Geoff
Town of Hartford Selectboard | Dennis, Simon
Town of Northfield Electric Department
Town of Stowe Electric Department
Town of Westford | Melissa Manka

Triland Partners LP | Garden, Thomas T.
Two Rivers-Ottawa-Quebec Regional Commission
Vermont Agency of Natural Resources
Vermont Department of Public Service
Vermont Electric Cooperative Inc.
Vermont Public Power Supply Authority
Vermont Public Power Supply Authority
Vermonters for a Clean Environment, Inc. | Smith, Annette
Village of Enosburg Falls Water & Light Department Inc
Village of Hyde Park Electric Department
Village of Jacksonville Electric Company
Village of Johnson Water & Light Department
Village of Ludlow Electric Light Department
Village of Lyndonville Electric Department
Village of Morrisville Water & Light Department
Village of Orleans Electric Department
Washington Electric Cooperative Inc.

PUC Case No. 18-0086-INV - SERVICE LIST

Parties:

Carolyn Browne Anderson, Esq. (for Green Mountain Power Corporation)
Green Mountain Power Corporation
2152 Post Road
Rutland, VT 05702
carolyn.anderson@greenmountainpower.com

Reginald Beliveau, Jr. (for Swanton Village, Inc. Electric
Swanton Village, Inc. Electric Department Department)
P.O. Box 279
120 First Street
Swanton, VT 05488
rbeliveau@swanton.net

Meredith Birkett (for Village of Johnson Water & Light
Village of Johnson Water & Light Department Department)
P.O. Box 603
Johnson, VT 05656
vojmanager@townofjohnson.com

Victoria J. Brown, Esq. (for Vermont Electric Cooperative Inc.)
Vermont Electric Cooperative, Inc.
42 Wescom Road
Johnson, VT 05656
vbrown@vermontelectric.coop

Ellen Burt (for Stowe Electric Department)
Stowe Electric Department
P.O.Box 190
Stowe, VT 05672
eburt@stoweelectric.com

William Coster (for Vermont Agency of Natural Resources)
1 National Life Drive
Davis 2
Montpelier, VT 05620
billy.coster@vermont.gov

William F. Ellis
McNeil, Leddy & Sheahan
271 South Union Street
Burlington, VT 05401
wellis@mcneilvt.com

(for City of Burlington Electric Department)

Jonathan Elwell
Village of Enosburg Falls Water & Light
42 Village Drive
Enosburg Falls, VT 05450
jelwell@enosburg.net

(for Village of Enosburg Falls Water & Light
Department Inc.)

Steve Farman
VPPSA
sfarman@vppsa.com

(for Vermont Public Power Supply Authority)

James Gibbons
City of Burlington Electric Department
585 Pine Street
Burlington, VT 05401
jgibbons@burlingtonelectric.com

(for City of Burlington Electric Department)

Christine Hallquist
Vermont Electric Cooperative, Inc.
42 Wescom Road
Johnson, VT 05656
challquist@vermontelectric.coop

(for Vermont Electric Cooperative Inc.)

Stephanie Hoffman, Esq.
Vermont Department of Public Service
112 State Street
Montpelier, VT 05620
steph.hoffman@vermont.gov

(for Vermont Department of Public Service)

Stephanie Hoffman, Esq.
Vermont Department of Public Service
112 State Street
Montpelier, VT 05620
steph.hoffman@vermont.gov

(for Vermont Department of Public Service)

Bill Humphrey
Village of Lyndonville Electric Department
P.O. Box 167
20 Park Avenue
Lyndonville, VT 05851
bhumphrey@lyndonvilleelectric.com

(for Village of Lyndonville Electric
Department)

Neale Lunderville
City of Burlington Electric Department
585 Pine Street
Burlington, VT 05401
nlunderville@burlingtonelectric.com

(for City of Burlington Electric Department)

Pamela Moore
Village of Jacksonville Electric Company
P.O. Box 169
Jacksonville, VT 05342
jackelec@myfairpoint.net

(for Village of Jacksonville Electric Company)

John Morley
Village of Orleans Electric Department
Municipal Building
One Memorial Square
Orleans, VT 05860
orloffice@villageoforleansvt.org

(for Village of Orleans Electric Department)

Craig Myotte
Village of Morrisville Water & Light
Department
857 Elmore Street
Morrisville, VT 05661
cmyotte@mwlvt.com

(for Village of Morrisville Water & Light
Department)

Ken Nolan
Vermont Public Power Supply Authority
P.O. Box 126
Waterbury Center, VT 05677
knolan@vppsa.com

(for Vermont Public Power Supply Authority)

James V. Pallotta
Village of Ludlow Electric Light Department
9 Pond Street
Ludlow, VT 05149
jpleld@tds.net

(for Village of Ludlow Electric Light
Department)

Jessica Patterson
Town of Hardwick Electric Department
PO Box 516
Hardwick, VT 05843
jess@hardwickelectric.com

(for Town of Hardwick Electric Department)

Patricia Richards
Washington Electric Cooperative, Inc.
P.O. Box 8
East Montpelier, VT 05651
patty.richards@wec.coop

(for Washington Electric Cooperative Inc.)

Evan Riordan
Barton Village, Inc. Electric Department
P.O. Box 519
Barton, VT 05822
electricmanager@bartonvt.com

(for Barton Village Inc. Electric Department)

Carol Robertson
Village of Hyde Park Electric Department
P.O. Box 400
Hyde Park, VT 05655
carol.robertson@hydeparkvt.com

(for Village of Hyde Park Electric Department)

Matt Rutherford
Town of Stowe Electric Department
P.O. Box 190
56 Old Farm Road
Stowe, VT 05672
mrutherford@stoweelectric.com

(for Stowe Electric Department)

Jeffrey Schulz
Town of Northfield Electric Department
51 South Main Street
Northfield, VT 05663
jschulz@northfield.vt.us

(for Town of Northfield Electric Department)

Melissa Stevens
Green Mountain Power Corporation
2152 Post Road
Rutland, VT 05701
melissa.stevens@greenmountainpower.com

(for Green Mountain Power Corporation)

Michael Sullivan
Town of Hardwick Electric Department
P.O. Box 516
Hardwick, VT 05843
msullivan@hardwickelectric.com

(for Town of Hardwick Electric Department)

Non-Party Recipients:

Carolyn M.X. Alderman, Esq.
VEPP Inc.
P.O. Box 1938
Manchester Center, VT 05255
carolyn@veppi.org

Beren Argetsinger
Keyes & Fox LLP
bargetsinger@kfwlaw.com

Olivia Campbell Andersen
Renewable Energy Vermont
33 Court St.
Montpelier, VT 05602
olivia@revermont.org

David G Carpenter
Facey Goss & McPhee PC
PO Box 578
RutlandRutland, VT 05702
dcarpenter@fgmvt.com

John Chaimanis
Kendall Sustainable Infrastructure, LLC
6 University Road
Cambridge, MA 02138
jchaimanis@kendallinvestments.com

Anne Margolis
Vermont Department of Public Service
Department of Public Service
112 State St
Montpelier, VT 05620-2601
anne.margolis@vermont.gov

Nathan Phelps
Vote Solar
745 Atlantic Ave.
7th Floor
Boston, MA 02111
nathan@votesolar.org

Chris Rauscher
595 Market Street, Floor 29
San Francisco, CA 94015
chris.rauscher@sunrun.com

John Spencer
jrspencervt@gmail.com

Sarah Wolfe
Vermont Public Interest Research Group
swolfe@vpirg.org