STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 22-0334-INV

In re: Biennial update of the net-metering program	

COMMENTS AND RECOMMENDATIONS OF THE DEPARTMENT OF PUBLIC SERVICE RE: BIENNIAL UPDATE OF THE NET-METERING PROGRAM

The Vermont Department of Public Service ("Department") provides the following comments to the Vermont Public Utility Commission ("Commission") regarding proposed updates to the net-metering program's (1) REC adjustors; (2) siting adjustors; (3) statewide blended residential rate; and (4) eligibility criteria applicable to categories I, II, III, and IV.[1] The Department respectfully requests the opportunity to file any responses it may have to the scheduled April 25, 2022, public comments by May 9, 2022.

The Department's recommendations in this proceeding, as discussed further herein and based on many factors, are for a modest overall downward adjustment to net-metering compensation, comprised of the following:

- An increase to the statewide blended residential rate,[2] at which excess generation is compensated for most systems. The revised rate, as calculated by the Department and discussed in Section VI of these comments, is now $0.17141/kWh, which is an increase of $0.00728/kWh.

- A decrease of $0.01/kWh to the Renewable Energy Credit ("REC") adjustor in year one but not year two, as further discussed in Section IV.[3] The Department proposes to maintain the $0.04/kWh differential between a project's election to retain or transfer RECs. The proposed REC adjustor decrease is partially offset

[1] *See generally*, Rule 5.100 *available at* https://puc.vermont.gov/sites/psbnew/files/doc_library/5100-PUC-nm-effective-07-01-2017_0.pdf.
[2] *See* Rule 5.127(A)(3).
[3] Commission Rule 5.127(B)(3).

by the increase in the statewide blended residential rates. For example, when the statewide blended residential rate and proposed REC adjustor are reconciled the total downward shift is $0.00272/kWh.

- The Department does not recommend changes to the siting adjustors, as discussed further in Section V, below.

In developing these positions, the Department balanced several factors which will be explained in greater depth later in this document. Chief among these are the statutory directives to ensure that Vermont meets its renewable energy goals in the lowest cost way possible. Net-metering has been, and remains, the most expensive pathway for Vermont to meet its renewable energy goals. In other words, renewable energy can be obtained, and built in State, in a less expensive way. At the same time, there has been enough new net-metering, alone, for Vermont to comfortably remain on track for its renewable energy goals despite there being other, cheaper, renewable energy programs.

This is important for many reasons. Among them is that higher cost renewable electricity is paid for by the consumer and is felt more dearly by Vermonters with more modest means. This cost could be lessened (and Vermont's renewable energy targets met) through greater utilization of other, less expensive renewable energy programs. Net-metering also continues to result in a cost shift from participating customers to non-participating ratepayers. Also, Vermonters can greatly reduce the State's greenhouse gas emissions by switching to electric vehicles, electric heating, and the like. However, the more expensive electricity is, the less attractive this switch will be for consumers.

These concerns also needed to be balanced with several other factors. First is that the last biennial update, Case No. 20-0097-INV, was delayed by the COVID-19 pandemic, such that actual deployment under the newer net-metering rates has occurred for a shorter period of time than usual and correspondingly impacted the data from which the Department could draw conclusions to inform its recommendations. Moreover, solar panels currently have added costs from import tariffs, the federal investment tax credit is expected to step-down, the COVID-19 pandemic has created ongoing supply chain disruptions and constraints, there have been broader inflation pressures, and workforce shortages and availability issues persist.

Table of Contents:

Summary……………………………………………………………………………………..4
The Department's Recommendations and Conclusions..……………………………..………4
Factors in the Department's Analysis……………………………………………………..……6
I. Background of Net-Metering……………………………………………………………….10
Exhibit 1: Summary of Net-Metering Programs and Adjustors…………………….....12
II. Net-Metering in the Context of Vermont's Renewable Energy Goals………………………12
Exhibit 2: Renewable Resource Cost Comparison……………………………………14
III. Contextual Policy Considerations for the Biennial Update Proceedings and Other Factors…………………………………………………………………………………………14
Market Value of Solar………………………………………………………………..…....16
Exhibit 3: Average Wholesale Price of Energy in New England through 2020..........17
Exhibit 4: Solar Impact on ISO-NE Peak Hour……………………………………...19
Exhibit 5: ISO-NE Forward Capacity Auction Clearing Prices…………………...…20
Exhibit 6: Solar Generation and Demand in Vermont……………………………..…21
Grid Penetration and Transformation……………………………………………………..24
IV. Department Recommendations Re: REC Adjustors………………………………………...25
Pace of Renewable Energy Deployment…………………………………………...……26

Total Renewable Energy Commissioned……………………………………………..28

Exhibit 7: Total Renewable Deployment…………………………………………...28

Exhibit 8: Net-Metering Deployment Summary………………………...………….29

Exhibit 9: Net-Metering Interconnection Applications Summary……………………31

Exhibit 10: Annual Solar Net-Metering Interconnections…………….……………32

Exhibit 11: Annual Solar Net-Metering CPG Applications…………………………..33

Exhibit 12: Net-Metering CPG Applications by Compensation Vintage……………..34

Exhibit 13: Installed Cost of Solar…………………………………………………35

REC Disposition………………………………………………………….………..36

Exhibit 14: Net-Metering Deployment Capacity (kW) REC Disposition……...…….36

Department REC Adjustor Recommendation……………………….………………..37

Exhibit 15: Department REC Adjustor Recommendations…………………..……..37

V. Department Recommendation Re: Siting Adjustors……………………..…………………..39

Department Siting Adjustor Recommendation……………………….……………….39

Exhibit 16: Net-Metering Deployment Capacity (kW) Category……………………..40

Exhibit 17: Net-Metering CPG Applications by Siting Category……………………41

VI. Department Recommendation Re: Statewide Blended Residential Rate……..……………42

VII. Eligibility for Categories……………………………………………………...……44

Exhibit 18: Current Siting Adjustors……………………………….………………44

VIII. Conclusion……………………………………………………………………….…..44

Attachment A – 2022 Blended Rates………………………………...……………..appended

Summary

The Department's Recommendations and Conclusions

Given various uncertainties that will be discussed further below, but also balancing the imperative to deploy distributed generation cost-effectively, the Department recommends a modest, overall downward adjustment to net-metering compensation, comprised of the following:

- An increase to the statewide blended residential rate, calculated formulaically according to Commission Rule,[4] at which excess generation is compensated for most systems. The revised rate, as calculated by the Department and discussed in Section VI of these comments, is now $0.17141/kWh, which is an increase of $0.00728/kWh;

- An offsetting decrease to of $0.01/kWh to the Renewable Energy Credit ("REC") adjustor.[5] This adjustor is currently set at negative $0.04/kWh for projects that retain the RECs, and $0.00/kWh for projects that transfer the RECs to the utility.[6] The Department proposes to maintain the $0.04/kWh differential between a project's election to retain or transfer RECs to the interconnecting utility, and also to reduce the adjustors for both REC-retaining projects and REC-transferring projects by $0.01 kWh in year one, with no change in year two. For further explanation, please refer to Section IV.

- No changes to the siting adjustor. For further explanation, please refer to Section V.

The proposed reduction to the REC adjustor is mostly offset by proposed upward revisions to the statewide blended residential rate – which is the base amount for determining the credit for excess generation for most net-metered customers – in year one. As such, the

---

[4] *See* Rule 5.127(A)(3).
[5] Commission Rule 5.127(B)(3).
[6] The $0.00/kWh REC adjustor currently available for projects that transfer the RECs to the utility is the result of a $0.01/kWh reduction in the REC adjustor as provided by the Commission during the last biennial update. *In re: biennial update of the net-metering program*, Case No. 20-0097-INV, Order of 11/12/2020 at 42.

Department's recommended reduction to the REC adjustor would modestly reduce total compensation (for instance, $0.15141/kWh in the next biennium for excess generation from a Category I project, vs. $0.15413/kWh for excess generation from a Category I project installed today).

Factors in the Department's Analysis

To provide its recommendations in this case, the Department balanced various considerations including: the pace of deployment, the relative cost of net-metered resources to alternative renewable resources, Vermont's statutory energy policy and utility procurement framework, and the overall implications for Vermont's decarbonization goals.

Vermont's net-metering program is one of a network of programs that enable the deployment of renewable energy generation in Vermont, along with the Standard Offer program, direct procurements by utilities, and avoided cost contracts under PURPA.[7] Each of these renewable energy programs impacts, the obligations of utilities within the legal context of Vermont's Renewable Energy Standard (RES),[8] which requires utilities to own attributes of increasing amounts of renewable generation over time. More specifically, Tier II of the RES requires approximately 25-30MW per year of new, smaller-scale, in-state renewable generation to be deployed to meet obligations.

Tier II of the RES sets the pace for renewable energy deployment in Vermont and each of the programs listed above can contribute to meeting it. However, in the last two-year biennial

[7] Public Utility Regulatory Policies Act of 1978, Pub.L. 95-617, 92 Stat. 3117.
[8] 30 V.S.A. §§ 8001, 8004 and 8005.

update period, net-metering deployment was sufficient to meet utilities' RES Tier II requirements alone and without relying on the other, lower-cost, programs.

At the same time, net-metering has been, and continues to be, the highest-cost program to deploy renewable energy in Vermont. Vermont's statutory energy planning framework (*See, e.g.*, 30 V.S.A. § 218c) calls for procuring electricity in a least-cost manner. Meeting all of the RES Tier II requirements with the highest-cost resource is contrary to that framework. As noted in the 2022 Vermont Comprehensive Energy Plan, "[i]n 2019, Vermonters paid $40 million more for net-metering than if this solar generation had been procured through bilateral contracts between solar developers and utilities. This amount reflects the higher compensation that was paid in prior years. While compensation rates for net-metering have more recently declined slightly, the compensation currently paid to net-metering systems continues to significantly exceed the wholesale energy price and market-based Class I REC prices combined, and therefore results in a higher cost of compliance for meeting the RES and serving Vermont customers with electricity than would alternative resources."[9]

Therefore, net-metering increases the cost to comply with the RES, which is reflected in higher-than-necessary electricity costs to customers. Higher electricity costs negatively impact the affordability of electricity – particularly when a customer's financial means are less – discouraging the economic proposition for customers to transition from fossil fuels for heating and transportation to electricity, and thereby discouraging progress toward Vermont's greenhouse gas reduction requirements.

---

[9] VERMONT DEPARTMENT OF PUBLIC SERVICE, 2022 VERMONT COMPREHENSIVE ENERGY PLAN, p. 247, *available at* https://publicservice.vermont.gov/content/2022-comprehensive-energy-plan.

The last net-metering biennial update was also unusual because of COVID-19. In the last biennial review of the net-metering program, the Commission made several downward adjustments to the REC and siting adjustors, in recognition of the factors above as well as the increasing value of the statewide blended residential rate – a core part of total net-metering compensation. The net effect was a downward adjustment of compensation by about two cents, in two phases, over the biennium. However, that proceeding was delayed due to the COVID-19 pandemic, so deployment under those new rates has only occurred for the last 11 months. Therefore, this biennial update must rely upon a shorter time period from which to draw conclusions – and this was a factor in the Department's reasoning.

In addition, several other factors compound the difficulty in estimating the future pace of net-metering deployment, either under current compensation or in reaction to any future rate adjustments. These include added panel costs from import tariffs, the anticipated step-down of the federal investment tax credit, supply chain constraints attributable to the COVID- 19 pandemic, inflation pressures, and workforce shortages.

For all net-metered projects, the Department's recommendation slightly reduces compensation. For "virtual" or "group" projects – which are generally larger projects that receive compensation based on the blended retail rate – the Department's recommendation reduces overall compensation by 2-3%.[10] Projects where generation offsets load, within the month, will see about a 6% reduction in compensation[11] – but these projects will also benefit

[10] These estimates are based on estimated impacts in Green Mountain Power Corporation's service territory.
[11] These estimates are based on estimated impacts in Green Mountain Power Corporation's service territory.

from increasing retail rates, as those occur, since they primarily net on a kWh basis. This recommendation continues to encourage net-metering at the place where it can be most beneficial – small systems primarily serving on-site load. Differentially valuing excess generation – a concept the Department explores in the net-metering rulemaking[12] – could further encourage such systems.

The primary reasons for the Department recommending a reduction – albeit modest – in the total compensation rate are that the deployment of net-metering systems in 2020 and 2021 continued to exceed the requirements of the Renewable Energy Standard ("RES"),[13] at a cost greater than other Tier II alternatives, and that the statewide blended residential rate used as a basis for compensation has increased. The Department maintains that a moderate but downward adjustment is warranted, in recognition of the broader context of inflationary pressures, supply chain shortages, pandemic uncertainty, anticipated tax credit step-downs, and the short track record with NM 2.4 compensation, but also the need to continue to keep electric rates affordable to encourage adoption of beneficial electrification technologies, which would reduce greenhouse gas emissions, in service of Vermont's Climate Plan.

---

[12] *See generally*, *Proposed revisions to Vermont Public Utility Commission Rule 5.100*, Case No. 19-0855-RULE.
[13] *See*, *e.g.*, 30 V.S.A. §§ 8004 and 8005.

I. BACKGROUND OF NET-METERING

Act No. 99 of 2014[14] prompted a process during which the Commission revised Rule 5.100, which governs the net-metering program. The current version of Rule 5.100[15] became effective on July 1, 2017 ("net-metering 2.0" or "NM 2.0").[16] The net-metering statute, specifically 30 V.S.A. § 8010(c)(1), requires the Commission to promulgate rules that establish and maintain a net-metering program that:

> (A) advances the goals and total renewables targets of [30 V.S.A. Chapter 89] and the goals of 10 V.S.A. § 578 (greenhouse gas reduction) and is consistent with the criteria of subsection 248(b) of . . . [Title 30];
>
> (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 . . . [Title 30] . . . ;
>
> (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; [and]
>
> (G) accounts for changes over time in the cost of technology . . . .

[14] VT Act No. 99 (H.702), An act relating to self-generation and net metering, of 2014, *available at* https://puc.vermont.gov/sites/psbnew/files/doc_library/5100-PUC-nm-effective-07-01-2017_0.pdf

[15] Public Utility Commission Rule 5.100 *available at* https://puc.vermont.gov/sites/psbnew/files/doc_library/5100-PUC-nm-effective-07-01-2017_0.pdf.

[16] NM 2.0 refers to the revised net-metering program whose rules (and rates, as revised) are currently in place. It began as an interim rule starting on January 1, 2017, through June 30, 2017. NM 2.0 was then put in effect by an approved, final Rule 5.100 on July 1, 2017. The adjustors were the same for the interim rule and the approved final rule which is still in effect. NM 2.1, NM 2.2, NM 2.3, and NM 2.4 refer to the annual revisions made to the NM 2.0 adjustors as provided by, *In re: biennial update of the net-metering program*, Case No. 18-0086-INV, Order of 05/01/2018 and *In re: biennial update of the net metering program*, Case No. 20-0097-INV, Order of 11/12/2020.

Many of the Act 99 provisions relate to ratepayer costs and the pacing of deployment to meet Vermont's renewable energy goals. As such, the Commission has controlled the pacing of net-metering development by changing the adjustors which impact the level of compensation for the generation of electricity and the renewable energy attributes of various net-metered resources (this compensation varies depending on project size and siting). In the first biennial update of net-metering,[17] the Commission revised the "REC adjustors," the "siting adjustors," and the statewide blended residential rate (the baseline for adding or subtracting adjustors for excess generation). The eligibility criteria applicable to the various categories of net-metering system size/site type were also reviewed, but no updates were made. These components of Rule 5.100 are also subject to review during this biennial update proceeding. These factors were again updated via the Commission's order issued at the conclusion of the second biennial update of net-metering, which was postponed from spring to fall of 2020 to allow for an assessment of the long-term effects of the COVID-19 pandemic.[18]

To date, each of the net-metering programs and applicable adjustors, as promulgated by the Commission, are summarized below (with naming conventions that will be used throughout these comments).

[17] *In re: biennial update of the net-metering program,* Case No. 18-0086-INV, Order of 05/01/2018.
[18] *In re: biennial update of the net-metering program,* Case No. 20-0097-INV, Order of 11/12/2020 at 4, 42-43.

Exhibit 1: Summary of Net-Metering Programs and Adjustors

			RECs		CATEGORY				
Program	CPG Application Date	Statewide Blended Rate	Transfer to Utility	Retain Ownership	I	II	III	IV	Hydro
NM 1.0[19]	before 1/1/2017	$0.149	n/a		n/a				
NM 2.0	1/1/2017 - 6/30/2018	$0.149	$0.03	-$0.03	$0.01	$0.01	-$0.01	-$0.03	$0.00
NM 2.1	7/1/2018 - 6/30/2019	$0.154	$0.02	-$0.03	$0.01	$0.01	-$0.02	-$0.03	$0.00
NM 2.2	7/1/2019 – 2/1/2021	$0.154	$0.01	-$0.03	$0.01	$0.01	-$0.02	-$0.03	$0.00
NM 2.3	2/2/2021 – 8/31/2021	$0.164	$0.00	-$0.04	$0.00	$0.00	-$0.03	-$0.04	$0.00
NM 2.4	9/1/2021 -	$0.164	$0.00	-$0.04	-$0.01	-$0.01	-$0.04	-$0.05	$0.00

II. NET-METERING IN THE CONTEXT OF VERMONT'S RENEWABLE ENERGY GOALS

A detailed background of the net-metering program was presented in, *In re: biennial update of the net-metering program*, Case No. 18-0086-INV, order of 05/01/2018 and *In re: biennial update of the net-metering program*, Case No. 20-0097-INV, Order of 11/12/2020. In both orders, the Commission identified the REC adjustors and siting adjustors as the primary mechanism for balancing the interests of ratepayers, net-metering customers, and the businesses that install net-metering systems.

[19] After 2011, and before NM 2.0 (beginning January 1, 2017), systems received overall compensation of $0.19/kWh - $0.20/kWh and retained the RECs. Additionally, other up-front capacity-based incentives were also available.

Per 30 V.S.A. § 8010, the Commission determines the pace of net-metering deployment necessary to be consistent with the RES, the Comprehensive Energy Plan ("CEP"),[20] and any other relevant State programs, when updating the net-metering program's adjustors. Consideration should also be given to the broader role net-metering (and other programs that contribute toward the RES) plays in Vermont's renewable energy policy landscape, particularly in meeting the goals of 30 V.S.A. § 8001. Net-metering projects should continue to serve an important role in meeting the RES, because such projects allow many Vermonters to directly participate in meeting State renewable energy goals. Net-metering development also provides attendant benefits such as associated jobs and the general promotion of the deployment of renewable generation close to load. Consistent with 30 V.S.A. §§ 202(b), 218c, 8001, 8010(c)(1)(F) and Vermont's least-cost planning rubric, the Commission should place a high priority on ensuring that the State's collective renewable energy policies continue to deliver renewable energy at least cost.

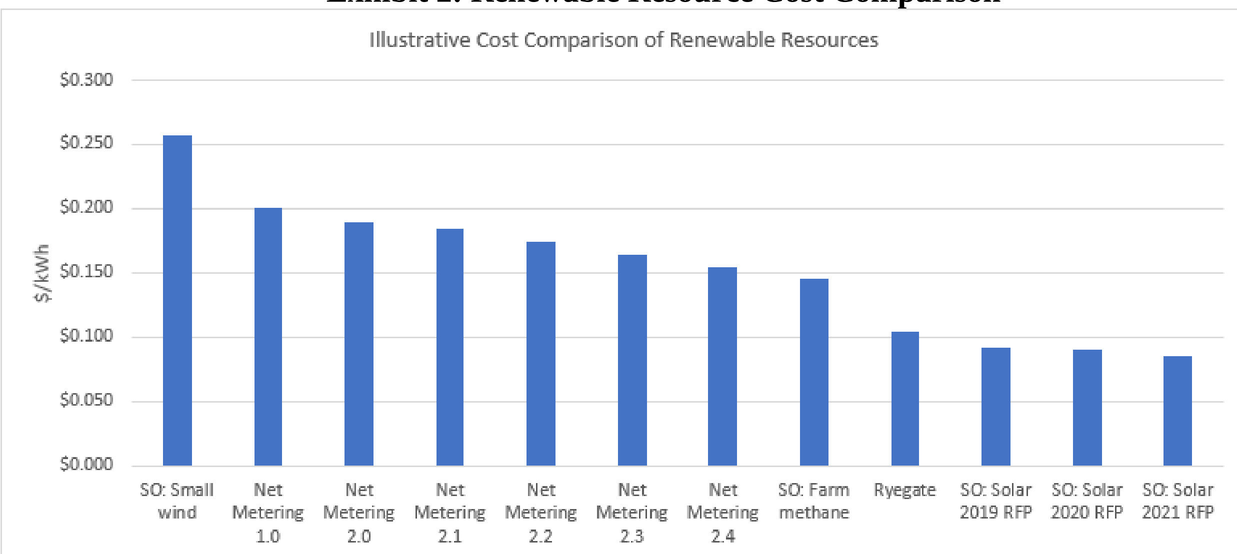
Historically, net-metering has been Vermont's highest-cost source of renewable energy generation and – despite decreases to the adjustors in the last two biennial reviews – it continues to be so. As noted in the 2022 Vermont Comprehensive Energy Plan, "[i]n 2019, Vermonters paid $40 million more for net-metering than if this solar generation had been procured through bilateral contracts between solar developers and utilities. This amount reflects the higher compensation that was paid in prior years. While compensation rates for net-metering have

---

[20] *See*, *e.g.*, 30 V.S.A. § 202b; VERMONT DEPARTMENT OF PUBLIC SERVICE, 2022 VERMONT COMPREHENSIVE ENERGY PLAN, *available at* https://publicservice.vermont.gov/content/2022-comprehensive-energy-plan

more recently declined slightly, the compensation currently paid to net-metering systems continues to significantly exceed the wholesale energy price and market-based Class I REC prices combined, and therefore results in a higher cost of compliance for meeting the RES and serving Vermont customers with electricity than would alternative resources."[21]

Exhibit 2: Renewable Resource Cost Comparison[22]



III. CONTEXTUAL POLICY CONSIDERATIONS FOR THE BIENNIAL UPDATE PROCEEDINGS AND OTHER FACTORS

While the scope of review prescribed in this biennial update proceeding relates to updates to the (1) REC adjustors; (2) siting adjustors; (3) statewide blended residential rate; (4) and eligibility criteria applicable to categories I, II, III, and IV, the context affecting the net-metering program, and the net-metering rulemaking process,[23] has evolved and is summarized here.

---

[21] VERMONT DEPARTMENT OF PUBLIC SERVICE, 2022 VERMONT COMPREHENSIVE ENERGY PLAN, p. 247, *available at* https://publicservice.vermont.gov/content/2022-comprehensive-energy-plan.
[22] VT. DEP'T OF PUB. SERV., 2022 VERMONT COMPREHENSIVE ENERGY PLAN, p. 250 and subsequent updates, *available at* https://publicservice.vermont.gov/content/2022-comprehensive-energy-plan.
[23] *See generally*, *Proposed revisions to Vermont Public Utility Commission Rule 5.100*, Case No. 19-0855-RULE.

The environment for renewable energy development has changed enormously in the years since the inception of net-metering in the late 1990s, the Standard Offer program in 2009, and even since the passage of Act 99, in 2014, and the previous net-metering biennial reviews. From 2009 until 2022, the cumulative capacity of installed distributed solar generation in Vermont has grown from roughly 5 MW to over 434 MW, with 295 MW from net-metering.[24] To date, this makes net-metering the primary mechanism for deployment of distributed generation in Vermont.[25] Although net-metering meets many of the goals laid out in 30 V.S.A. § 8001 (including economic development and distributed generation), as noted above, it is currently the most expensive type of renewable energy commonly available to satisfy the RES. Net-metering also continues to result in a cost shift from participating customers to non-participating ratepayers.

In its comments filed in the ongoing Rule 5.100 Rulemaking, Case No. 19-0855-RULE, the Department proposed fundamental changes to the compensation structure of net-metering to minimize cost shifts between participating and non-participating customers and to better reflect the value being provided to the electric system by net-metered facilities. Specifically, the Department submitted a straw proposal under which compensation for excess generation would be based on the value of that energy to the system, rather than the residential rate. The

[24] *Joseph Roberts, associate engineer ISO-NE*, DECEMBER 2021 DISTRIBUTED GENERATION SURVEY RESULTS, presented at the Distributed Generation Forecast Working Group (Feb. 14, 2022), *available at* https://www.iso-ne.com/static-assets/documents/2022/02/dg_survey_results_dec2021.pdf, and the utility data submissions in this biennial review proceeding.

[25] Based on recent data submitted to ISO-NE regarding interconnected distributed generation, there are 64 MW of solar from Standard Offer projects, and 74 MW of solar either owned by utilities or purchased through a long-term PPA.

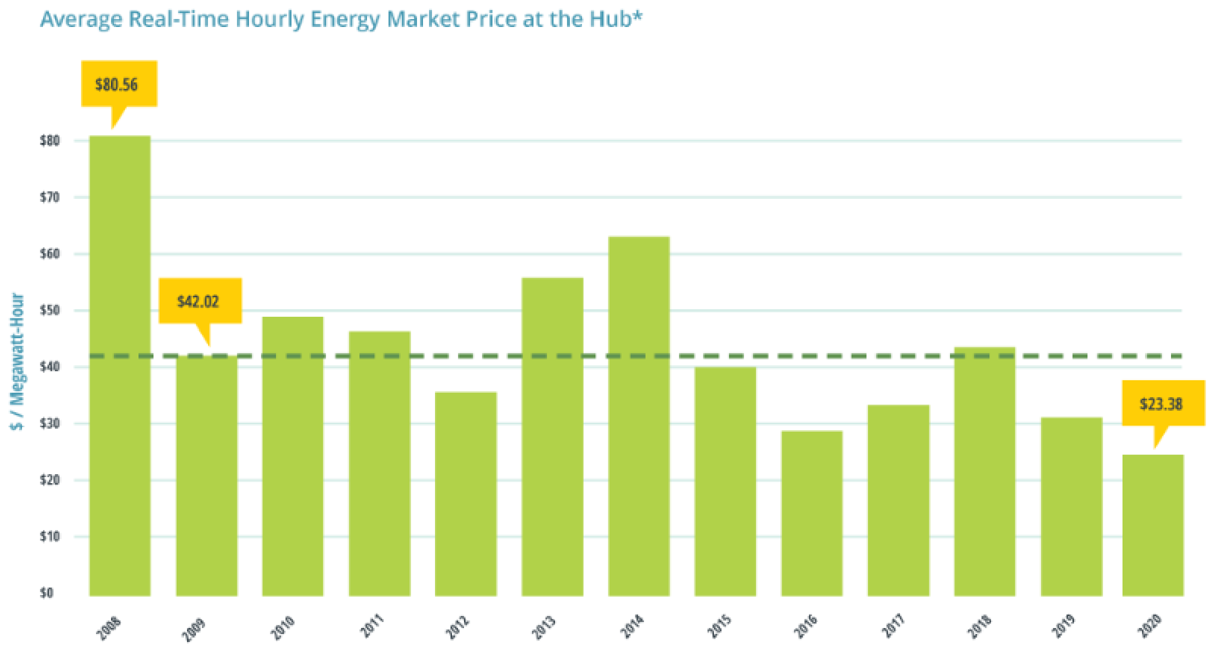
Department's straw proposal defined excess generation to mean all generation not physically consumed by a customer within the month. The Department continues to support this type of framework because it more closely aligns net-metered generation and consumption, lowers the above-market costs of the resource, and decreases the cost-shift between participating and non-participating customers. Notwithstanding that proposal, the Department's comments herein reflect the current net-metering framework.

Market value of solar

Solar projects provide value related to several market products including energy, capacity, transmission costs, and RES compliance.[26] Understanding the value of the products provided, compared to the net-metering compensation rate, is an important consideration. In New England, the wholesale price of energy has generally declined over the past decade – to an average of $23.38/MWh, or $0.02338/kWh, in 2020 – as shown in Exhibit 3 below.

[26] Net-metering resources also may reduce losses, particularly when offsetting load close to the generating resource a significant portion of the time, as may be the case with smaller rooftop systems. Virtual or group net-metered resources could either reduce or *increase* losses, depending on the characteristics of the grid and the consumption nearby; the determination is necessarily case by case. In any event, the value of avoided (or increased) losses should be factored into the value of other market products.

Exhibit 3: Average Wholesale Price of Energy in New England through 2020



Source: ISO-NE – KEY GRID AND MARKET STATS: MARKETS, https://www.iso-ne.com/about/key-stats/markets/ (last visited Apr. 1, 2022).

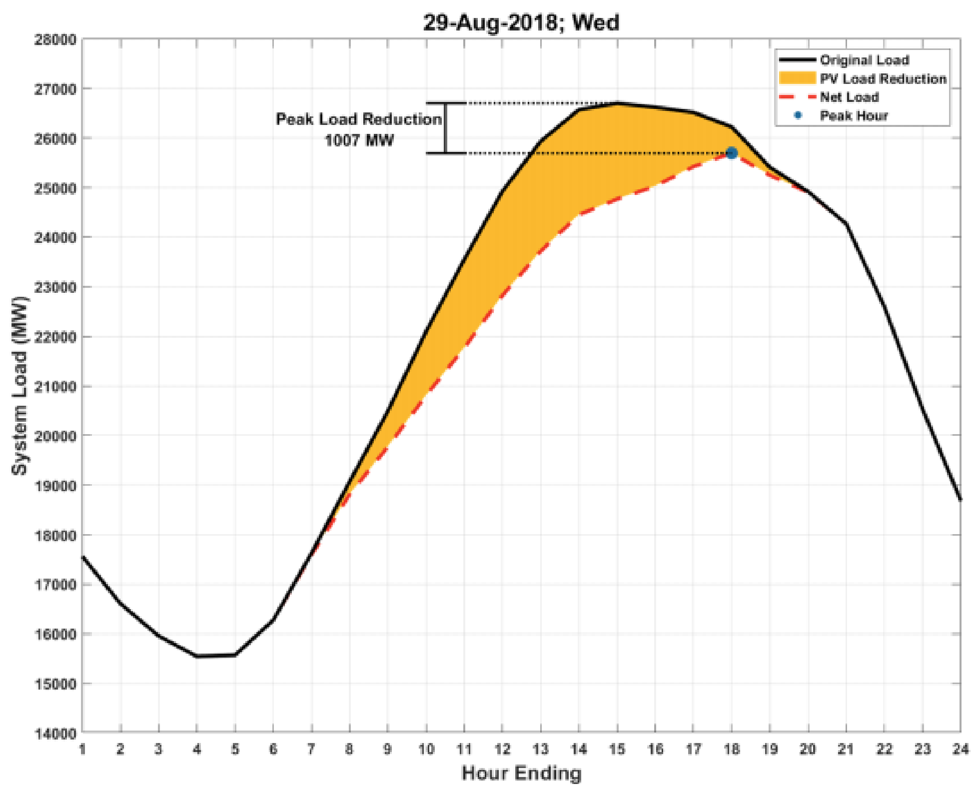
Capacity, in this context, is the amount of resources needed to meet the New England peak hour each year (this typically occurs in the summer). Each utility is required to procure its share of resources, based on its load at the time of the annual peak, in the Forward Capacity Auction. Net-metering resources act as load-reducers and decrease the amount of capacity that a utility must procure. Vermont has significantly more distributed solar as a percentage of total load than the rest of New England, hosting 9.8% of the region's distributed solar while representing less than 4% of the peak load.[27] The timing of the regional annual system peak has

[27] ISO NEW ENGLAND – DISTRIBUTED GENERATION FORECASTING WORKING GROUP, *Final 2021 PV Forecast* (Apr. 29, 2021), *available at*

not shifted as quickly as the timing of Vermont's peak load. However, ISO-NE estimates that the contribution of solar resources to the New England peak will continue to decline over time as solar penetration increases across the region and the system peak shifts to later in the day. The example, in Exhibit 4 below, of the region's load shape, with and without the impact of solar, clearly shows the peak shifting from 2-3pm to 5-6pm on this sample day. While Exhibit 4 depicts a day from 2018, the concept demonstrated remains true today. Solar net-metering resources still provide some value during the region's peak hour; however, this value is significantly reduced when compared to several years ago.

https://www.iso-ne.com/static-assets/documents/2021/04/final_2021_pv_forecast.pdf ; ISO NEW ENGLAND, *2021 CELT report:2021-2030 Forecast Report of Capacity, Energy, Loads, and Transmission* (May 1, 2021) at Tab 6.2 – Forecasts Used in Transmission Planning, *available at* https://www.iso-ne.com/static-assets/documents/2021/04/2021_celt_report.xlsx.

Exhibit 4: Solar Impact on ISO-NE Peak Hour

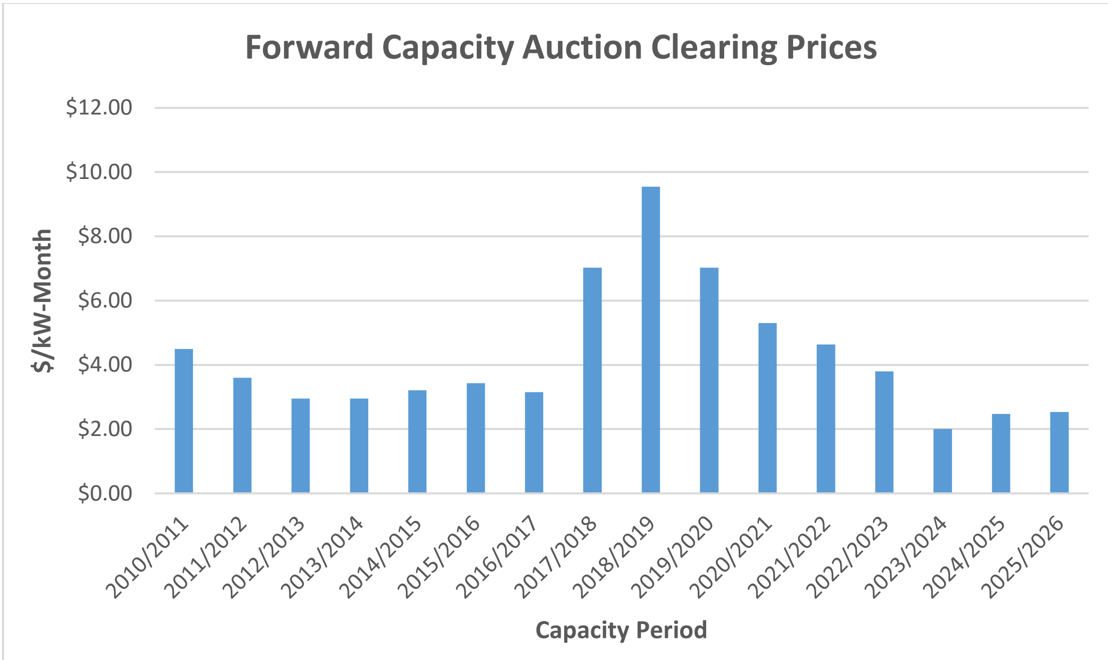


Source: ISO-NE – DISTRIBUTED GENERATION FORECAST WORKING GROUP, *Update on Estimating Summer Peak Demand Impacts of BTM PV (Mar. 2, 2020), available at*, https://www.iso-ne.com/static-assets/documents/2020/03/3_peak_load_reductions_update.pdf

In addition to the declining coincidence of solar with the annual capacity peak, capacity prices are also decreasing. Historical FCA clearing prices are shown below.[28]

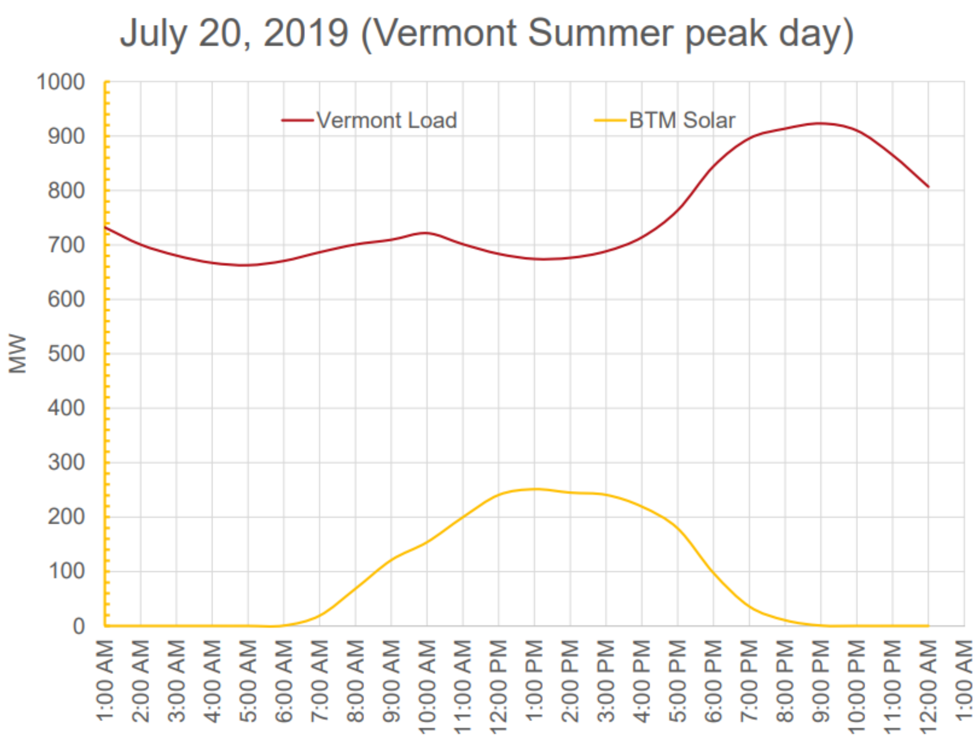
[28] Analysis based on data available from, ISO-NE – KEY GRID AND MARKET STATS: MARKETS, Table: Results of the Forward Annual Capacity Auctions (last visited Apr. 1, 2022), *available at* https://www.iso-ne.com/about/key-stats/markets/.

Exhibit 5: ISO-NE Forward Capacity Auction Clearing Prices



To the extent that solar reduces load during Vermont's monthly peak, Vermont utilities avoid Regional Network Service ("RNS") charges, which are used to fund the region's bulk transmission grid. With the increased solar deployment in Vermont, the hour of the monthly peak has shifted so that it is most often later in the day – when solar is not producing. From 2016 to 2021, Vermont's peak hour occurred before sunset only 20% of the time, and even in those instances the peak was near sunset when the sun is nearing the horizon and solar production is tailing off. Thus, incremental new distributed solar currently provides minimal benefits related to the avoidance of regional transmission costs. The figure below depicts Vermont's statewide load during the peak summer day of 2019, along with the output of solar generation during that day, illustrating the trend where Vermont's hourly load and solar production are not aligned.[29]

Exhibit 6: Solar Generation and Demand in Vermont[30]



Net-metering resources also provide value to utilities to the extent they would otherwise be required to purchase other above market alternatives. The Vermont RES requires that utilities

[29] While storage (or other load control) could help shift the timing of solar production to increase its value in reducing load obligations at the time of Vermont monthly and regional peaks, it would be inappropriate to consider those potential benefits in the context of net-metering rates because they do not (and should not) compensate or consider the value of load control itself (though such controls may ultimately prove a key tool to bring the total value of net-metering system closer to its cost to ratepayers).

[30] While Exhibit 6 shows data from 2019, this trend has continued. VELCO, HISTORICAL LOAD REVIEW (Oct. 16, 2019) at slide 12, presented at the Vermont System Planning Committee Quarterly Meeting, *available at* https://www.vermontspc.com/library/document/download/6763/Historical_load_review_Oct_2019.pdf.

retire enough RECs to meet 55% of retail sales in 2017, increasing each year to 75% in 2032.[31] Tier II of the RES requires utilities to meet one percent of retail sales with RECs from renewable distributed generation[32] in 2017, increasing to 10% in 2032.[33] Given the strict eligibility requirements, and therefore the limited pool, of Tier II resources, there is not a liquid market for Tier II RECs in Vermont. Utilities are required to retire RECs from net-metering and will also utilize RECs from qualifying Standard Offer resources and/or any owned/contracted resources, the latter two of which could be sold in REC markets outside of Vermont. Because those markets are liquid, the Department forecasts a value for Tier II RECs based on the value of Tier II resources in other state markets – an average of $0.025/kWh (with annual fluctuations).

Although the Rule 5.100 biennial update review is not explicitly tied to the value of solar, the Commission found it to be an important consideration and concluded the value of new net-metering resources is not commensurate with the current cost of obtaining such resources, because more cost-effective resources can be obtained.[34] As described above, the trends for the value of solar have continued to exacerbate this concern.

Because the value of net-metering continues to remain lower than the cost, the costs of net-metering continue to be shifted to non-participating ratepayers. The Department remains concerned that there is an inequitable distribution of the costs of net-metering. As Efficiency

---

[31] 30 V.S.A. § 8005(a)(1).
[32] Eligible Tier 2 resources must be facilities with a nameplate capacity of less than 5 MW, commissioned after June 30, 2015, and interconnected to a Vermont distribution or subtransmission line. 30 V.S.A. §§ 8002(17), 8005(a)(2).
[33] 30 V.S.A. § 8005(a)(2).
[34] *In re: biennial update of the net metering program*, Case No. 20-0097-INV, Order of 11/12/2020 at 37-40.

Vermont noted in its 2019 Vermont Energy Burden Report: "[t]he most widespread adoption of clean energy technologies and efficiency appears to be in communities with the lowest energy burden. In other words, energy transformation is primarily in the purview of those who can afford the upfront cost."[35] A town-level comparison of household income and the locations of residential-scale, solar net-metering shows a moderate correlation between high-earning towns and higher solar adoption rates. That is, a household in a high household income earning town is more likely to have a solar system than a household in a low-income earning town. This holds true in all regions of the State, and in 13 of 14 counties.[36] This inequitable distribution of the benefits of net-metering makes the cost shift to non-participating customers more problematic. Expansion of net metering opportunities to low-income electric customers is best accomplished by targeted programs.[37]

While providing above-market compensation can be a helpful mechanism to move forward a specific technology, distributed solar is also being built through other means and for

[35] Justine Sears and Kelly Lucci – EFFICIENCY VERMONT, 2019 VERMONT ENERGY BURDEN REPORT at 23 (Oct. 2019), *available at*: https://www.efficiencyvermont.com/Media/Default/docs/white-papers/2019%20Vermont%20Energy%20Burden%20Report.pdf.

[36] Median household income for cities and towns is based on American Community Survey five-year estimates (2013-2017) issued by the US Census Bureau. Households are individual housing units, including apartments, but exclude group quarters (such as dormitories) and their residents. The American Community Survey interviews a sample of Vermonters each year (8,100 households in 2018). The Census Bureau calculates more accurate estimates of town-level median household income by combining information reported over five years of interviewing.

Solar net-metering system count, and capacity, is drawn from project data reported by the distribution utilities to Energy Action Network and compiled by the Department. To limit the database to customer-sited systems, projects with AC capacity of 15 kW above are excluded. Non-residential systems are excluded for all utilities except VPPSA, for which all customer types are included because VPPSA did not specify customer type.

[37] For example, Green Mountain Power Corporation sought approval of a Solar Energy Affordability Program in, *Petition of Green Mountain Power Corporation for approval of Solar Energy Affordability Program pursuant to 30 V.S.A. § 218(e)*, Case Number 19-0091-PET.

substantially lower cost than the net-metering compensation, and therefore with substantially less cross-subsidy.

Grid Penetration and Transformation

In the past, distributed generation had the potential to be beneficial to Vermont's grid by avoiding or deferring transmission and distribution upgrades that would otherwise be necessary to manage load constraints. However, these potential benefits have continued to decline in the past two years despite efforts to identify such benefits by the Vermont System Planning Committee and others. Overall load in Vermont has been flat and is forecasted have only modest growth in the next 5-10 years.[38] Modeling done for the Climate Action Plan and the Comprehensive Energy Plan shows increases in annual and peak load over the next 10-20 years, but like the Long-Range Transmission Plan, it assumes some limited load management (only for electric vehicles). Moreover, much of the heat pump and electric vehicle load adoption that drives overall load growth occurs in the winter when the system peaks after dark. For at least the last six years, the Geotargeting Subcommittee of the Vermont System Planning Committee has not identified any constrained areas that could be addressed by targeted energy efficiency, or by extension, targeted distributed generation.[39]

---

[38] VELCO, 2021 VERMONT LONG RANGE TRANSMISSION PLAN (Jul. 1, 2021) at 5, 31, *available at* https://www.velco.com/assets/documents/2021%20VLRTP%20to%20PUC_FINAL.pdf; VELCO, 2021 VERMONT LONG RANGE TRANSMISSION PLAN – LOAD FORECAST UPDATE, presentation to the Vermont System Planning Committee (July 15, 2020), *available at* https://www.vermontspc.com/library/document/download/7061/VSPC_LRP_Forecast_updateJul2020.pdf. However, a significant breakthrough in electric vehicle costs, capabilities, and availability would likely result in a higher rate of load growth in the medium term.

[39] *See e.g.*, Letter from Shana Louiselle, VSPC Secretary, to Judith Whitney, Clerk of the Commission, dated November 8, 2021, *available at*

One result of the rapid development of distributed generation, particularly in areas with high penetration of solar capacity, is that constraints on the Vermont grid are now often the result of *excess generation* rather than load growth. This results in "saturated" distribution circuits at risk of backward power flow through substations, during certain times of the day, and potentially costly upgrades to interconnect for some generators. At a macro level, export constraints on areas of the transmission system during certain times of the year (such as the Sheffield-Highgate Export Interface located in the northern portion of the State),[40] are exacerbated by each incremental addition of renewable generation which effectively displaces other renewable generation on the system by requiring curtailments of that generation.

IV. DEPARTMENT RECOMMENDATIONS RE: REC ADJUSTORS

Pursuant to Rule 5.128(B), in updating the adjustors for either transferring or otherwise retaining RECs, the Commission must consider:

(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.

---

https://www.vermontspc.com/library/document/download/7410/2021%20VSPC%20Geographic%20Targeting%20Recommendations.pdf.

[40] *See generally Application of Derby GLC Solar, LLC for a certificate of pub. good, pursuant to 30 V.S.A. §§ 248 and 8010, for a 500 kW grp. net-metered solar elec. power sys. in Derby, Vt.*, PUC Case No. 17-1247-NMP, Final Order of 01/24/2019; aff'd, *In re Application of Derby GLC Solar, LLC*, 2019 VT 77, 221 A.3d 777.

Pace of Renewable Energy Deployment

The Department estimates that 25-30 MW per year of distributed generation will need to be deployed each year to meet the RES and the CEP, and potentially more depending on the magnitude and timing of additions to load from beneficial electrification. At the historical pace of adoption, the necessary Tier II resources are likely to come from net-metering, Standard Offer, and resources owned by, or under contract to, utilities.

Of the 25-30 MW necessary to meet Tier II, the Standard Offer program will comprise an increasingly larger portion at least until the annual solicitations for new projects cease.[41] Please also note that Standard Offer contracts last for up to 25 years, meaning the production from Standard Offer projects that can contribute to Tier II of the RES will increase until the full 127.5 MW of capacity comes online, but will start to decrease as contracts expire. To date, 122 MW of capacity has been awarded contracts through the Standard Offer program. Of the total contracted capacity, 46 MW was commissioned prior to 6/30/2015 and does not qualify for Tier II, 27 MW is online and Tier II eligible, and 48 MW has been contracted but not yet commissioned. An additional 10 MW of available capacity is to be solicited in a Request for Proposals ("RFP") in 2022.[42]

[41] This considers the Standard Offer capacity to be solicited by the Commission, which differs from the pace at which Standard Offer projects are permitted and/or interconnected. Projects receiving Standard Offer contracts in 2021 might not come online until 2023 or later.

[42] *See* 30 V.S.A. § 8005a. *See also*, *Investigation to review the 2022 implementation of the Standard-Offer program*, Case No. 21-4085-INV, Order – 2022 Standard Offer Program of 02/15/2022 at 7-10 (detailing process for Standard Offer solicitations after 2022, the last year where a programmatic availability of additional capacity is provided for).

To evaluate the pace of net-metering participation over the next several years, the Department analyzed historical application and deployment trends in comparison to compensation rates and installation costs. In the inaugural biennial review, the Department undertook a complex rate-of-return analysis based on historical data going back to 2009.[43] However, the expected deployment rates resulting from that model did not accurately capture the impacts of a reduced REC adjustor and underestimated the amount of installed net-metering. For this annual review, with more than five years of history under Rule 5.100, the Department relies on actual recent application and installation trends, as reported by utilities in this case, to inform its recommendations.[44]

The Department notes that installation costs continue to decrease, though at more modest rates than previously experienced. From 2009-2014, solar installed costs saw significant annual declines; while price declines have continued since 2014, they have done so at a much slower rate. Over time, the decreasing compensation rates from the REC and siting adjustors have been more than offset by the decreasing installation costs and higher retail rates, making net-metering increasingly profitable for both participating customers and developers over the years. Looking forward, solar installation costs are expected to continue to level off (see more in-depth discussion below).

[43] *See generally, In re: biennial update of the net-metering program*, Case No. 18-0086-INV, order of 05/01/2018.
[44] The Department did not check for inconsistencies between the data provided by utilities in this case and what is available on ePUC.

Total Renewable Energy Commissioned

Exhibit 7 (below) shows the total amount of Tier II-eligible renewable capacity commissioned in Vermont in the last two years:

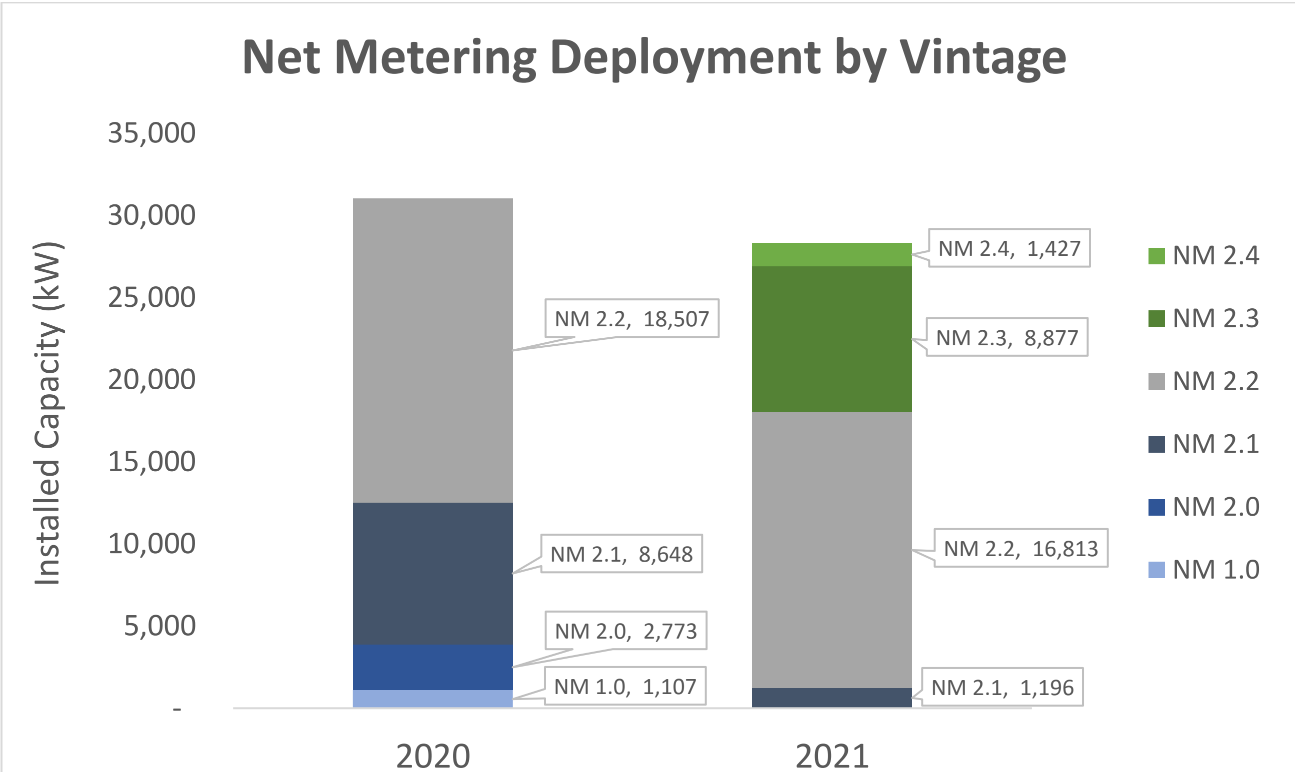
Exhibit 7: Total Renewable Deployment[45]

	2020	**2021**
Net-metering	31.0 MW	28.3 MW
Standard Offer	0 MW	6.5 MW
Utility-owned projects or PPAs	0 MW	3.7 MW
Total	**31.0 MW**	**38.5 MW**

The installed capacity of net-metering systems was similar in 2020 and 2021, but the composition of the projects installed (i.e., NM 1.0 vs. NM 2.0 vs. NM 2.2 vs. NM 2.3 vs. NM 2.4), and therefore the compensation rates, of the various systems were different. Much of the capacity installed during 2020 and 2021 came from NM 2.1 and NM 2.2, rather than from facilities with the more recently approved rates associated with NM 2.3 and NM 2.4. This is largely because NM 2.3 only became active in February of 2021 and NM 2.4 became active in September of 2021, leaving just a few months of opportunity for new deployment under the current rate structure in this biennium. Exhibit 8 shows the Department's summary of utility data regarding the projects that went into service in the last two years.

[45] The Department's presentation of data in this section was derived from the utilities' filings in this case, as well as Standard Offer and ISO-NE information, with respect to renewable energy deployment of systems ≤ 5 MW in Vermont (i.e. systems eligible for Tier II of the RES) during 2020 and 2021. The Department has found some minor errors in the data provided and is working with the utilities to correct them. However, the errors are not of a size that significantly impacts the Department's summary or recommendations. Exhibit 7 does not include 19.8 MW worth of solar generation that was commissioned in 2018 but does not qualify for Tier II of the RES.

Exhibit 8: Net-Metering Deployment Summary



Using the utility filed data, we can also see that there is about 10.2 MW of NM 2.2, 10.3 MW of NM 2.3, and 5.6 MW of NM 2.4 that has applied for interconnection but has yet to be installed. There are also 6.9 MW of larger Category II and III systems that have submitted interconnection applications in GMP's service territory where NM vintage is yet to be determined.

The pace of applications — both interconnection and Certificate of Public Good ("CPG") — is an important consideration.[46] More than half of the total capacity (kW) and number of

[46] The Department's analysis and observations are based on utility filings in this case. In cases where a project has been interconnected, but no interconnection application date was provided, the interconnection application date is assumed to be the same as the CPG application date.

systems installed in 2020 and 2021 were applied for under NM 2.2, which generally makes sense given that NM 2.2 spanned 13 of the 24 months in this biennium. The period under which NM 2.3 and 2.4 were active was just 7 and 4 months, respectively, all of which fell in the 2021 calendar year. Within those combined 11 months, over 23 MW of net-metering interconnection applications were filed, with another 5.5 MW having applied for interconnection but not having filed a CPG application. That said, given the delayed 2020 biennial update and the limited time new net-metering compensation structures were available to the market, it is difficult to draw substantive conclusions from these trends. All of this occurred with the backdrop of the COVID-19 pandemic, with increasing global supply chain disruptions further complicating the picture.

Exhibit 9 summarizes the interconnection applications received in the last two years.

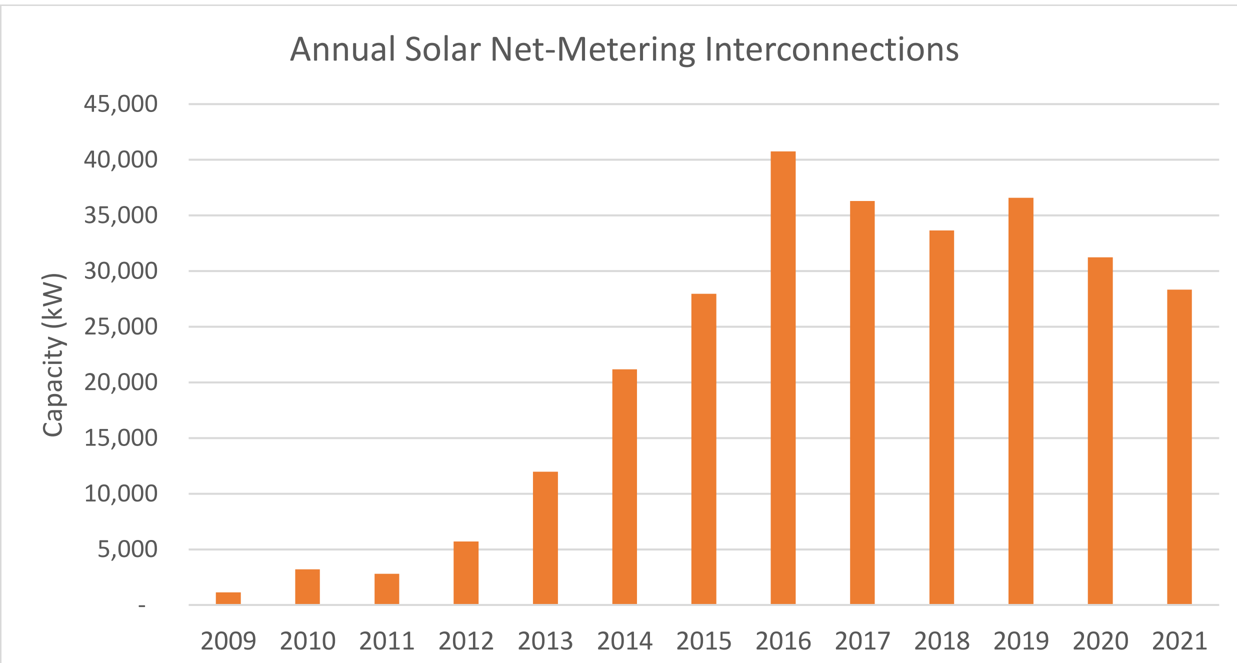
Exhibit 9: Net-Metering Interconnection Applications Summary

Net-metering rate regime		2020	2021	Total
NM 1.0	kW	127	5	132
	Count	19	1	20
NM 2.0	kW	0	0	0
	Count	0	0	0
NM 2.1	kW	500		500
	Count	1		1
NM 2.2	kW	34,308	6,206	40,514
	Count	1,614	409	2,023
NM 2.3	kW	2,800	16,226	19,026
	Count	7	1,262	1,269
NM 2.4	kW		7,237	7,237
	Count		432	432
TBD[47]	kW	1,500	5,485	6,985
	Count	3	14	17
Total	kW	**39,236**	**35,159**	**74,395**
	Count	**1,644**	**2,118**	**3,762**

[47] There are 17 larger GMP Category II and III projects that applied for interconnection in 2020 and 2021 but have not applied for CPGs.

Looking at the trend over time, we see continued robust deployment of net-metering over the 2020-2021 biennial period, at a pace roughly in line with previous years, and still exceeding the deployment necessary to meet RES Tier II requirements. Exhibit 10 shows interconnections of net-metering capacity from 2009 through 2021.

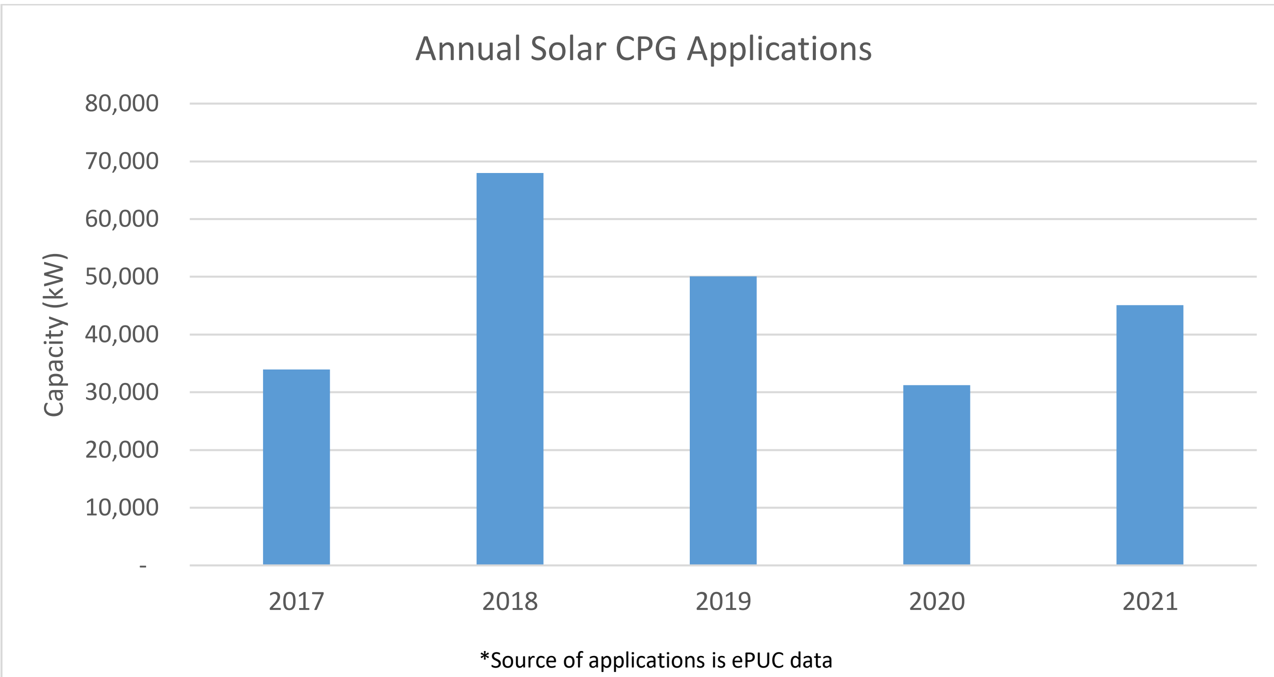
Exhibit 10. Annual Solar Net-Metering Interconnections



Another way to look at pacing is by considering applications for CPGs. Based on ePUC CPG applications and actual interconnections in 2020 and 2021, there are over 20 MW of projects that have applied for CPGs but have not yet been built. There are at least 7.2 MW of larger Category III systems and 3.1 MW of Category II systems that have applied for CPGs but have not yet been built. Additionally, larger projects often apply for interconnection before applying for a CPG, to ensure the utility can accommodate their system at the selected location at a reasonable cost.

Exhibit 11 shows all CPG applications of solar PV systems up to 500 kW.[48]

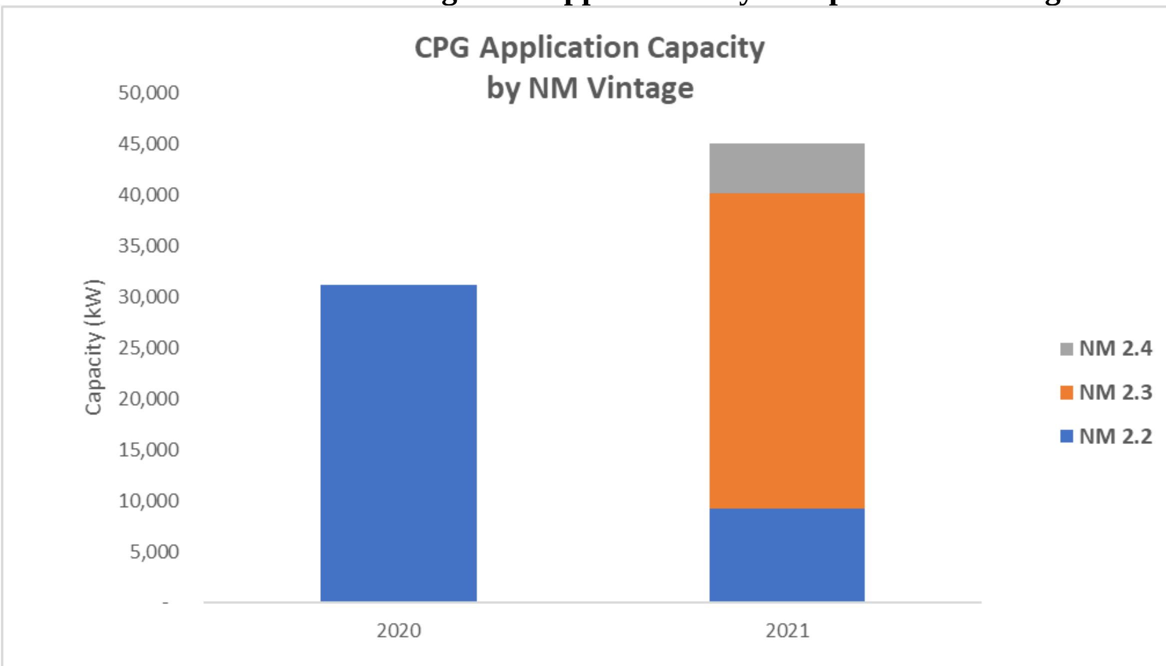
Exhibit 11: Annual Solar Net-Metering CPG Applications



The Department further analyzed CPG application data to gain a better understanding of the relative contribution from projects applying to the Commission under different compensation vintages. These are summarized below in Exhibit 12:

[48] 500 kW is generally the size limit for net-metering projects, though at various points in history, larger systems have been allowed under certain circumstances. Additionally, a handful of systems ≤ 500 kW are not net-metered.

Exhibit 12: Net-Metering CPG Applications by Compensation Vintage



The Department draws the following conclusions from the interconnection and application data that is summarized above:

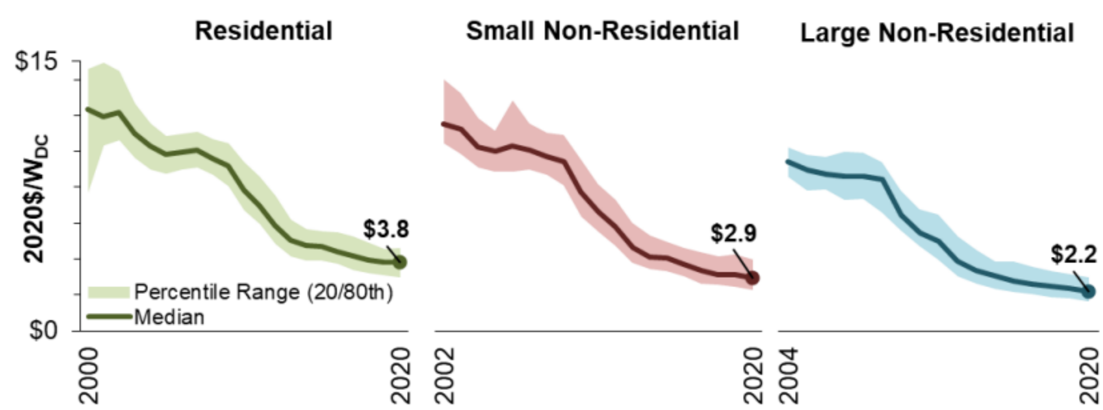
(1) The number of large projects (> 150 kW to ≤ 500 kW) proposed for interconnection decreased from 18.7 MW in 2020 to 14.3 MW in 2021. It is difficult to clearly identify the cause of this reduction – but factors could include the decreased siting adjustor, and possibly the dwindling availability of easier-to-develop preferred sites, or the impacts of the pandemic. There are also 20.7 MW of large Category III projects that have been proposed but not yet installed. Many larger systems that were installed in 2020 and 2021 were proposed several years prior, indicating a longer development cycle for these projects.

(2) The capacity of installed net-metering over the past two years has been slightly lower than the prior biennial period, with between 31 MW and 28.3 MW commissioned each year. However, these installation rates continue to meet or exceed the incremental annual Tier II RES requirements, even prior to accounting for non-net metered projects.

(3) With just 11 months of history under Net-Metering 2.3 and 2.4, it is challenging to identify trends and make recommendations for REC adjustor levels.

When considering future deployment levels, it is important to also consider the costs associated with solar generator development. As noted above, steep declines in the installed cost of solar (since around 2008) are beginning to flatten out. While the solar import tariff and declining Investment Tax Credit ("ITC") have put upward cost pressure on module or project costs, based on publicly available data, overall costs have continued to decrease. The rate of decrease in module costs has leveled off in recent years and some soft costs, particularly for smaller residential systems, have seen modest increases over prior years. However, long-term trends still show a substantial annual decrease in price per watt. Exhibit 13 depicts the declining costs of solar over the past several years.[49] The compensation paid to net-metering resources has not seen a corresponding reduction in magnitude over time.

Exhibit 13: Installed Cost of Solar



Source: Lawrence Berkley National Laboratory. Tracking the Sun, September 2021

[49] Because net-metering installers are typically private commercial enterprises that accordingly have not shared cost information with the Commission or the Department, the actual installed costs are not generally available for Vermont projects.

REC Disposition

Exhibit 14 shows the disposition of net-metering RECs in the past two years, derived from the utility filings in this case:

Exhibit 14: Net-Metering Deployment Capacity (kW) REC Disposition

	REC disposition	NM 1.0	NM 2.0	NM 2.1	NM 2.2	NM 2.3	NM 2.4	TOTAL
2020	Retain	1,000		14	329			1,343
	Transfer	107	2,773	8,634	18,178			29,691
2021	Retain	2			171	62	17	252
	Transfer	12	13	1,196	16,642	8,815	1,409	28,088
TOTAL	Retain	1,002	0	14	500	62	17	1,595
	Transfer	119	2,786	9,330	34,820	9,315	1,409	57,779

Net-metering 1.0 did not differentiate compensation based on REC disposition. As a result, most NM 1.0 projects retained the ownership of RECs. NM 2.0-2.2 have a -\$0.03/kWh adjustor for projects that elect to retain the RECs, with a respective \$0.03/kWh, \$0.02/kWh, or \$0.01/kWh REC adjustors for NM 2.0, NM 2.1, and NM 2.2 projects that elect to transfer the RECs to the utility. The compensation differential between a system owner retaining the RECs (and potentially selling them in the regional REC market) versus transferring them to the utility was \$0.06/kWh for NM 2.0 and shrank to \$0.05/kWh for NM 2.1 and to \$0.04/kWh for NM 2.2. This differential was maintained in NM 2.3 and 2.4 with no adjustor (\$0.00/kWh) for projects that elect to transfer RECs to the utility and a -\$0.04/kWh adjustor for projects that elect to retain the RECs. The current \$0.04/kWh differential has continued to encourage REC transfers. This value remains greater than the projected value of Tier II RECs.

Department REC Adjustor Recommendation

Relying on the REC adjustor as the primary pacing mechanism for net-metering deployment, and given the importance of providing an incentive for customers to transfer their RECs to the utility, the Department proposes maintaining a $0.04/kWh price differential between projects that retain RECs and those that transfer RECs. The current pace of deployment and applications, both interconnection and CPG, exceeds the requirements of RES Tier II, and leaves utilities over-procured when also including new Standard Offer projects coming online. Additionally, the difference between the value of the solar energy and the rate at which it is compensated continues to create a cost shift that should be minimized.[50] Therefore, the Department recommends that the REC adjustors for projects that both retain and transfer their RECs be reduced by $0.01/kWh to begin the next biennium – possibly starting September 1, 2022, which would be a year since the inception of NM 2.4 compensation – and maintained for its duration.

Exhibit 15: Department REC Adjustor Recommendations

Program	Transfer RECs	Retain RECs
NM 2.3/NM 2.4	$0.00/ kWh	-$0.04/ kWh
NM 2.5	-$0.01/ kWh	-$0.05/ kWh

This gradual step-down in compensation is consistent with the Commission's previous decisions to incrementally decrease the REC adjustor for projects that transfer their RECs, or

[50] *E.g.*, 30 V.S.A. § 8010 (c)(1)(C).

siting adjustors for specific categories.[51] These adjustments will be partially offset by the increase in the statewide blended residential retail rate (discussed below in section VI), resulting in little practical change to compensation between NM 2.4 projects and NM 2.5 projects.

Given the current compensation structure, as the statewide blended rate increases, the compensation paid to all net-metered resources automatically increases as well. The retail rate is not connected to the value of the net-metering resource but instead reflects the ability of the utility to recover prudently incurred necessary costs. These costs are rising due to several factors, including increased storms and administrative costs. The retail rate does not reflect the power supply costs of the utility, which is the more appropriate metric for the value of a net-metering resource. The only adjustments available to the compensation paid to net-metering resources are the siting adjustor and the REC adjustor.

The costs of net-metering exceed the benefits to non-participating customers, including the costs of Tier 2 RES compliance. So long as the utilities are overcompensating net-metering customers, the REC adjustor should not be considered the price paid by the utilities to procure RECs from net-metering project owners. Instead, the REC adjustor acts as a means of distinguishing between customers who keep their RECs and those who provide the RECs to the utility. Because customers who keep their RECs can resell them without benefit to the utilities or ratepayers generally, it is appropriate to compensate such customers at a reduced rate. A more aggressive reduction to the REC adjustor might be warranted from the perspective of allowing

[51] *In re: biennial update of the net-metering program*, Case No. 18-0086-INV, Order of 05/01/2018 at 50 and *In re: biennial update of the net-metering program*, Case No. 20-0097-INV, Order of 11/12/2020 at 42.

utilities to meet some of their Tier II obligation with more cost-effective resources; however, as discussed earlier in these comments, exogenous pressures on the cost of net-metering system components, as well as component availability, combined with multiple recent adjustments whose consequences are not fully known, led the Department to conclude that a modest reduction that occurs in 2022 and lasts through 2023 is justified.

V. DEPARTMENT RECOMMENDATION RE: SITING ADJUSTORS

According to Rule 5.128(C), in updating the adjustors for siting (based on system size as well as preferred siting), the Commission must consider:

(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.

Department Siting Adjustor Recommendation

The Department does not recommend altering the siting adjustors. The Department has not undertaken a detailed analysis of the extent to which siting adjustors are affecting siting decisions, nor does it have the data required for such an analysis. Based on the filings provided by the utilities, the Department provides the following summary of information that is relevant to factors (1) and (4), above.

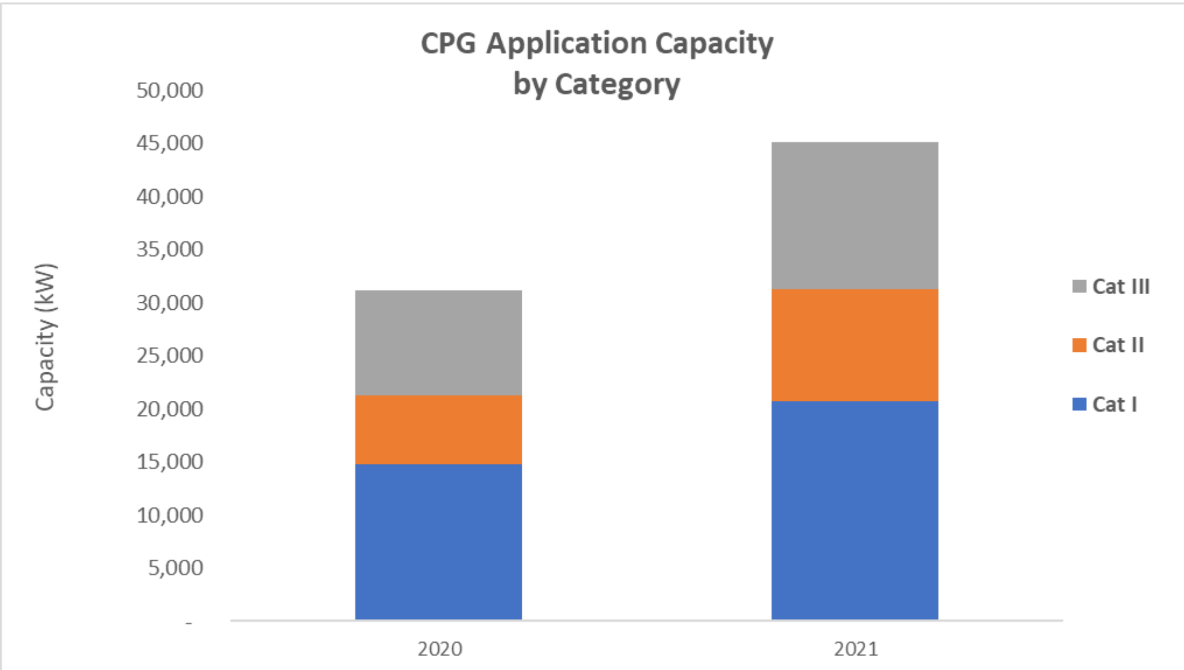
**Exhibit 16: Net-Metering Deployment Capacity (kW)
Category**

Year		NM 2.0	NM 2.1	NM 2.2	NM 2.3	NM 2.4	TOTAL
2020	Category I	23	614	10,568	0	0	11,204
	Category II	150	1,385	3,939	0	0	5,474
	Category III	2,600	6,650	4,000	0	0	13,250
	Category IV	0	0	0	0	0	**0**
2021	Category I	13	92	5,423	7,141	1,321	13,990
	Category II	0	338	4,090	836	106	5,370
	Category III	0	767	7,300	900	0	8,967
	Category IV	0	0	0	0	0	**0**

A large portion of the new capacity installed in 2020 and 2021 (22.2 MW) was from large Category III systems that applied under prior net-metering program compensation regimes. Of the 48 Category III systems installed in 2020 and 2021, 45 of these were from NM 2.2 or earlier. There are roughly 20 MW of additional Category III systems that have applied for interconnection but are not yet in-service, 13.5 MW of which would fall under NM 2.3 or later. Deployment of Category I and II system capacity in 2020 and 2021 was relatively similar to deployments in 2018 and 2019. Overall capacity installed under NM 2.3 and 2.4, of any Rule 5.100 Category, was limited to the last 11 months of this biennial period.

The Department also analyzed the relative share of projects under various siting categories through CPG applications to the Commission:

Exhibit 17: Net-Metering CPG Applications by Siting Category



Generally, because siting adjustors contribute to overall system compensation, the Department does not recommend increasing the siting adjustors (commensurate with the rationales for REC adjustors above). Modifications could be made to the siting adjustors to modulate the pace of net-metering if the Commission desired more, or less, deployment in certain categories, instead of using the REC adjustor for this purpose. Based on recent experience, it appears that interconnection applications for Category III projects have been greatly reduced. This could be the result of a combination of factors, including the -$0.04/kWh siting adjustor or perhaps the limited availability of preferred sites. It is possible that due to nuances in design, permitting, and construction costs, as well as in system production, it would be necessary to provide differential adjustor or regulatory treatment to projects on different types of preferred sites. However, careful consideration to any ratepayer impacts of any such adjustor design would be needed. The complete absence of any Category IV projects (per Rule 5.103, non-hydroelectric systems > 15 kW to ≤ 150 kW that are not on preferred sites) is a possible indication that the higher negative adjustor has been successful at discouraging development of this scale of project on these less suitable sites.

Lastly, the Department encourages siting adjustors to be implemented based on a project's impacts on the grid (for instance, a project located on a "saturated" distribution circuit, or export-constrained area of the transmission system, would receive a lower adjustor unless paired with storage or otherwise able to time-shift production to hours of higher load and lower generation on that circuit). Should the Commission consider this topic germane to the biennial adjustor review,[52] the Department would be able to provide additional comments.

VI. DEPARTMENT RECOMMENDATION RE: STATEWIDE BLENDED RESIDENTIAL RATE

The net-metering rules describe how the blended residential rate, which is used to determine the value of net-metering credits ("statewide blended residential rate"), is determined.[53] The Department has determined that the statewide blended residential rate has risen, since the previous rate was set in 2020, as a result of rate increases at several utilities in the intervening years. The Department calculated a statewide blended residential rate to $0.17141, which is an increase of $0.00728, based on the utility data and Rule 5.127. This rate will replace

[52] Or perhaps the net-metering rulemaking in Case No. 19-0855-RULE.
[53] It is the weighted statewide average of all electric company blended residential retail rates. Rule 5.127(A)(3).

the existing blended residential rate for *all* – both existing and new – net-metering customers, increasing the overall cost of the net-metering program.[54]

The Department's determination of the statewide blended residential rate was calculated using the attached spreadsheet ("Attachment A") "2022 blended rates." Retail sales data for 2021 will not be available until later this year, so the utilities' share of load is calculated using 2020 retail sales. Rates for each utility were updated to their most current Commission-ordered tariffs.[55] The rate is weighted by each utility's share of retail sales.[56]

Although this attachment calculates the blended rate for each utility with an inclining block rate, the method employed here – also used by the Department in the 2020 biennial review – is slightly different than the one prescribed by the Commission for the purposes of setting net-metering rates under 5.127(A)(2).[57] Utilities that include inclining block rates in their general residential service tariffs are required to recalculate their blended residential retail rates by May 15 of each even-numbered year, including in 2022.[58] If the recalculation shows that the rate has changed, the utility is required to file a revised net-metered tariff with the Commission. The

---

[54] *See* Revised Rule 5.124, 5.125, 5.126 (effective January 1, 2017) *available at*, https://puc.vermont.gov/sites/psbnew/files/doc_library/5100-PUC-attachment-a-on-reconsideration_0.pdf; Rule 5.125, 5.126, 5.127 (effective July 1, 2017) *available at*, https://puc.vermont.gov/sites/psbnew/files/doc_library/5100-PUC-nm-effective-07-01-2017_0.pdf.

[55] Currently, Hyde Park, Vermont Electric Cooperative, and Washington Electric Cooperative have pending rate increase requests.

[56] In accordance with Rule 5.127(A)(3).

[57] The Department employed a slightly different method because it does not have access to the granular level of data required for the Commission's method. Specifically, the Department does not have revenue data for collections under the *volumetric* portion of the block rates. The Department used a proxy for this measure by inferring sales under each block and multiplying by the rate for that block. Although results for individual utilities may vary from what is shown in our attachment, the Department believes the effect on the statewide blended rate of these differences would be minimal.

[58] 5.127(A)(2). Given the extension of the schedule in this proceeding, from that provided in Rule 5.128, an extension to the tariff revision date may also be warranted.

Department recommends that utilities conduct this exercise for themselves regardless of our calculations here.

VII. ELIGIBIILTY FOR CATEGORIES

The Department does not recommend significant changes to the eligibility criteria for the net-metering categories[59] at present, commensurate with our comments above on siting adjustors.

Exhibit 18: Current Siting Adjustors

Category	Size/site type	Adjustor
I	≤ 15 kW, not hydro	-0.01/kWh
II	> 15 to ≤ 150 kW, not hydro, on a preferred site	-0.01/kWh
III	> 150 to ≤ 500 kW, not hydro, on a preferred site	-0.04/kWh
IV	> 15 to ≤ 150 kW, not hydro, NOT on a preferred site	-0.05/kWh
Hydro	Up to 500 kW	0.00/kWh

The Commission may wish to consider this question in Case No. 19-0855-Rule as well.

VIII. CONCLUSION

The Department looks forward to working with the Commission and other stakeholders to assess the impacts of net-metering adjustors on deployment and the role of net-metering within the context of Vermont's renewable energy goals. To that end, the Department recommends that the Commission 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.

[59] Rule 5.103 "Category" at page 6.

Dated in Montpelier, Vermont on this 8th day of April 2022.

VERMONT DEPARTMENT OF PUBLIC SERVICE

By: /s/ Alex Wing
Alexander Wing, Special Counsel
Department of Public Service
112 State Street
Montpelier, VT 05620-2601
alexander.wing@vermont.gov
(802) 828-4011

cc: ePUC Service List

Attachments list:
Attachment A – 2022 Blended Rates