

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 19-0855-RULE

Proposed Revisions to Vermont Public Utility Commission Rule 5.100

Comments of Vermont Electric Cooperative

Vermont Electric Cooperative (VEC) submits the following comments in response to the Request for Additional Information issued by the Public Utility Commission (Commission) on August 22, 2019.

- 1. Is the current net-metering compensation system causing a cost shift between customers who net-meter and those who do not? Please quantify this cost shift and provide all calculations supporting your response.**

VEC Response: Our analysis indicates that there is a significant cost shift between customers who net meter and those who do not. The estimate for 2019 is that all net metering generation costs VEC about \$2.5 million more than the value of that generation, \$314,000 of which is from systems under the current net metering compensation system. In 2020 we estimate the cost shift associated with all net metering systems will be \$2.3 million, with \$286,000 coming from systems under the current net metering compensation system. Table 1 summarizes the various components of the cost shift for 2019, 2020, and on a 20-Year levelized annual basis. It is important to note that when all of the systems currently pending (in the queue to be built, but not yet online) in VEC's service territory are included, the total cost shift would be about \$3.2 million annually with \$588,000 attributed to systems under the current compensation system.

To arrive at these estimates, VEC first calculated a value of solar, which for 2019 is \$0.08747/kWh with RECs and \$0.05272/kWh without them. For 2020, the estimated value is \$0.10043/kWh with RECs and \$0.06343/kWh without them. We then assumed a capacity factor of 12.75 percent for systems that are currently active to arrive at the total generation of the net metering systems. We estimated what percentage of the generation is used onsite versus what percentage is excess and then multiplied each share by the appropriate credit value, which depends on what time period the system applied and/or came online. We also factored in 10 years of either the solar adder or REC and siting adjusters. We compared these totals to the value of that generation. Please see Exhibits A and B for the full analyses.

Table 1. Net Metering Compensation and Cost Shifts

Table 1		All Net Metering Systems		Net Metering Systems under current Compensation System	
		Cost Shift (\$)	Impact on Rates	Cost Shift (\$)	Impact on Rates
Active Systems Only	2019 Pre-2017 Solar Adder Compensation	\$233,199	0.31%	\$0	0.00%
	2019 REC Adder Compensation	(\$73,598)	-0.10%	(\$46,113)	-0.06%
	2019 Siting Adjuster Compensation	\$62,014	0.08%	\$28,199	0.04%
	2019 Excess Generation Compensation	\$834,587	1.11%	\$72,980	0.10%
	2019 Reduced Sales Revenue (Margin)	\$1,490,227	1.99%	\$259,386	0.35%
	2019 Total Cost Shift of Net Metering	\$2,546,429	3.40%	\$314,453	0.42%
	2020 Pre-2017 Solar Adder Compensation	\$233,199	0.31%	\$0	0.00%
	2020 REC Adder Compensation	(\$92,261)	-0.12%	(\$52,237)	-0.07%
	2020 Siting Adjuster Compensation	\$62,014	0.08%	\$28,199	0.04%
	2020 Excess Generation Compensation	\$708,454	0.94%	\$69,713	0.09%
	2020 Reduced Sales Revenue (Margin)	\$1,382,252	1.84%	\$240,592	0.32%
	2020 Total Cost Shift of Net Metering	\$2,293,659	3.06%	\$286,268	0.38%
	20-Year Levelized Annual Pre-2017 Solar Adder Compensation	\$233,199	0.31%	\$0	0.00%
	20-Year Levelized Annual REC Adder Compensation	(\$63,558)	-0.08%	(\$32,659)	-0.04%
	20-Year Levelized Annual Siting Adjuster Compensation	\$25,445	0.03%	\$14,100	0.02%
	20-Year Levelized Annual Excess Generation Compensation	\$853,671	1.14%	\$84,002	0.11%
	20-Year Levelized Annual Reduced Sales Revenue (Margin)	\$1,491,054	1.99%	\$259,530	0.35%
	20-Year Levelized Annual Total Cost Shift of Net Metering	\$2,539,811	3.39%	\$324,973	0.43%
Pending Systems Included	20-Year Levelized Annual Pre-2017 Solar Adder Compensation	\$233,199	0.31%	\$0	0.00%
	20-Year Levelized Annual REC Adder Compensation	(\$211,531)	-0.28%	(\$67,707)	-0.09%
	20-Year Levelized Annual Siting Adjuster Compensation	(\$10,617)	-0.01%	\$16,314	0.02%
	20-Year Levelized Annual Excess Generation Compensation	\$1,512,088	2.02%	\$217,449	0.29%
	20-Year Levelized Annual Reduced Sales Revenue (Margin)	\$1,718,610	2.29%	\$421,456	0.56%
	20-Year Levelized Annual Total Cost Shift of Net Metering	\$3,241,750	4.32%	\$587,512	0.78%

2. Please quantify the effect of net-metering compensation on your retail rates. Please provide all calculations and information supporting your response.

VEC Response: Every \$750,000 in cost has a rate impact of about one percent for VEC. Therefore, a cost shift of \$2.5 million in 2019 translates to a rate impact of 3.4 percent for all net metering systems with 0.42 percent of that impact due to systems under the current compensation system, and a cost shift of \$2.3 million in 2020 would have an impact of 3.06 percent with 0.38 percent due to systems under the current compensation system. Over a 20-year period, we estimate that the annual rate impact from only the systems currently online will be 3.39 percent with 0.43 percent due to systems under the current compensation system.

If we include the systems that are pending, the annual impact each year for 20 years increases to 4.32 percent, with 0.78 percent due to systems under the current compensation system.

For the past five years, VEC has been able to find cost savings in other areas to mitigate the effect of net metering cost shifts as well as other upward price pressures. However, VEC will be requesting a rate increase for 2020.

3. If current net-metering compensation is having a significant effect on retail rates, please describe how compensation should be changed so that the net-metering program does not have a significant effect on retail rates.

VEC Response: VEC believes that, in theory, any generation that is directly serving load (i.e. behind-the-meter generation co-located with load) should be valued at the retail rate, plus the value of the REC if that REC is transferred to the utility. Any generation that is exported to the grid should be compensated at the value of solar, which, again, depends on whether VEC receives the RECs.

Ideally, this calculation would occur on an hourly basis. For example, one of VEC's typical net metering systems generated 474 kWh in August. Of that generation 202 kWh were used on-site to directly offset load, and the other 272 kWh were exported to the grid. The house drew an additional 174 kWh from the grid when the solar was not generating power for a total consumption of 376 kWh.

VEC believes that the most accurate way to value this generation would be to credit the 202 kWh that directly offset load at the retail rate, credit the excess generation of 272 kWh at the value of solar, and charge the retail rate for the 174 kWh that were purchased from the grid.

However, accurately billing based on hourly calculations would be overly cumbersome. To simplify the process VEC proposes implementing these values based on monthly billing data. This structure would simply be an adjustment to the current net metering rate design. The siting adjustors would no longer apply, the REC value would be given on the total production as it is now, and the excess generation exported would be credited at the current value of solar rather than the statewide blended rate.

The value of solar should be updated periodically, for example every two years. When the value of solar is updated, it should change for everyone who installed their system under these rules rather than locking the values in for the lifetime of the system. We propose this for billing simplicity and because the value of that generation at any given moment is the same regardless of whether the system came online today or a year ago.

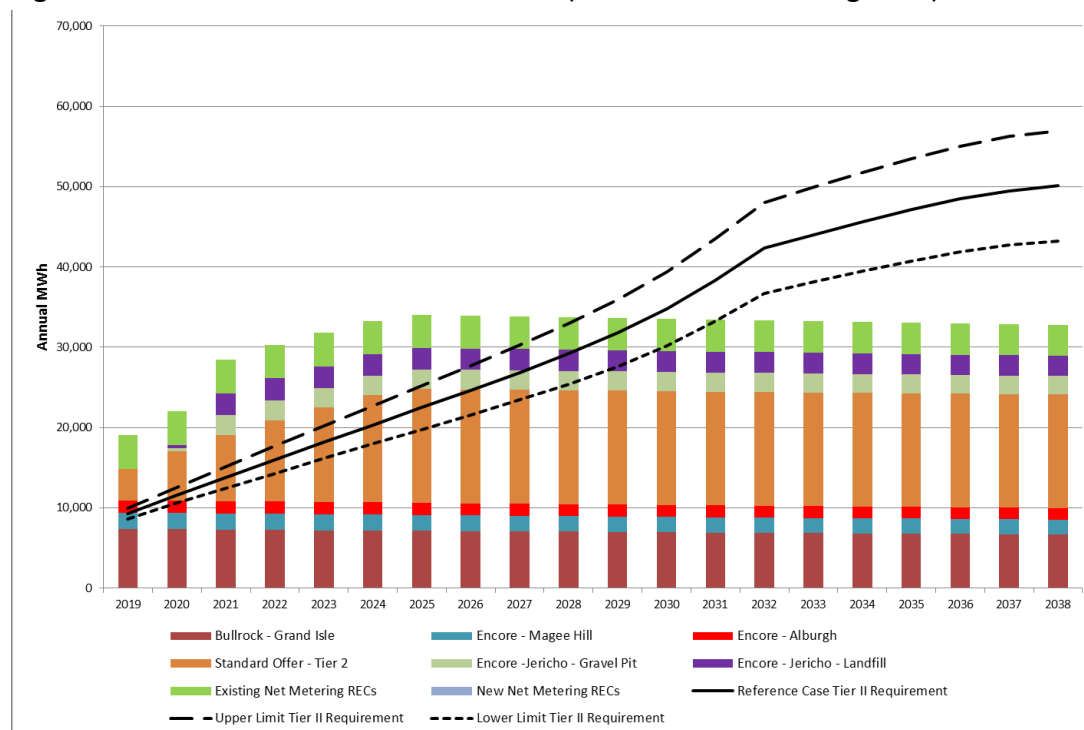
Basing the net metering rate on the value of solar is appropriate because that is what VEC would use as the key reference point if it were negotiating to purchase the output of a non-net metering solar resource that is not needed to meet a renewable standard (which is currently true for new net metering resources). In such voluntary negotiations the value of solar would be the maximum amount VEC would be willing to pay, and any eventual contract price would have to compare favorably to that number, or it would not be worth doing at the time.

If the Commission were to adopt value of solar pricing, we believe that the cost shift would no longer be an issue for new systems. However, if the pricing structure remains largely unchanged, the Commission should consider eliminating Category III projects and reducing the maximum system size to 150 kW. This change would help transition net metering capacity from merchant-generator projects to community-sponsored and true net metering (i.e. behind the load) projects.

4. Please state the amount of new net-metering capacity the utility will need to meet Vermont's Renewable Energy Standard in total and on average per year.

VEC Response: Figure 1 compares VEC's projected annual Tier II RES requirements under three load scenarios to the projected RECs from Tier II resources as of October 1, 2019.

Figure 1. Tier II Minimum MWh Resources (No New Net Metering RECs) Post-Tier III

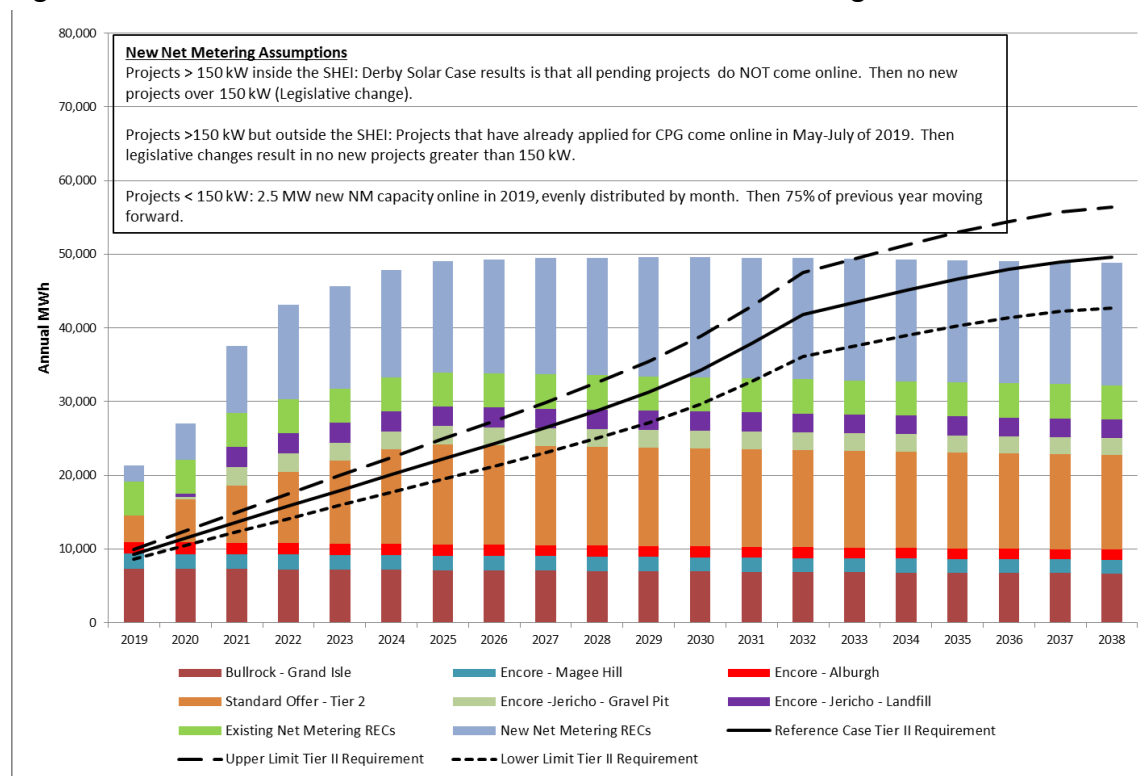


The three load scenarios used to develop the Tier II requirement projections are from VEC's Integrated Resource Plan (IRP) submitted to the PUC in July of 2019 and are based on the pre-Tier III, pre-new net metering load forecasts developed by Daymark Energy Advisors, adjusted for load growth attributed to VEC's Tier III programs under the Vermont RES and for net metering impacts through August 2019.

The chart shows that no new Tier II projects are needed until 2030 for VEC to meet its projected Tier II RES requirement in the Reference Case load projections and through 2029 in the Upper Limit load projection. Note that this assumes no banking of Tier II RECs. If VEC were to bank RECs, these time frames could be pushed out several years in each scenario.

Figure 2 shows VEC's Low Net Metering case from its 2019 IRP. The net metering assumptions are shown in the text box on the chart.

Figure 2. Tier II Minimum MWh vs. Resources – Low Net Metering Case Post Tier III



The chart shows that VEC has excess Tier II RECs through 2037 in the Reference case and through 2032 in the Upper Limit load projection.

5. Please identify all the benefits that net-metering provides (for example, energy capacity, reduced regional network service charges, etc.).

VEC Response: Table 2 lists the specific benefits VEC believes net metering provides as well as information regarding who receives the benefit (ratepayers, the utility, net-metering customer, society in general, etc.)

Table 2. Benefits of Net Metering

Benefit	Market Value Category	Value Accrues to:
Energy	Energy	Ratepayer/utility ³
Capacity ¹	Capacity	Ratepayer/utility ³
Regulation	Regulation	Ratepayer/utility ³
Reserves	Reserves	Ratepayer/utility ³
NEPOOL OATT Schedule 1 ¹	Transmission	Ratepayer/utility ³
NEPOOL OATT Schedule 2 ¹	Transmission	Ratepayer/utility ³
NEPOOL OATT Schedule 9 ¹	Transmission	Ratepayer/utility ³
NEPOOL OATT Schedule 16 – Black Start	Transmission	Ratepayer/utility ³
ISO Tariff Schedule 1 ¹	Transmission	Ratepayer/utility ³
ISO Tariff Schedule 2 ¹	Transmission	Ratepayer/utility ³
ISO Tariff Schedule 3 ¹	Transmission	Ratepayer/utility ³
ISO Tariff Schedule 5 ¹	Transmission	Ratepayer/utility ³
Auction Revenue Rights ¹	Transmission	Ratepayer/utility ³
Renewable Energy Certificates	RECs	Ratepayer/utility ³
Job retention/creation ²		A subset of Society in General
Environmental Benefits not captured in REC value.		Society in General
Reduced electric bill ⁴		NM customer
Profit ⁴		Developer
Rates higher than they otherwise would be ⁴		Non-NM Customers

See Exhibit C for more detailed explanations of these benefits.

Notes:

1. Whether there is a value or not, and/or when that value is realized, depends upon how big the society we are looking at is. For example, regarding Capacity charges, each utility is charged its percentage share of the total ISO-NE capacity charges in the month based on the utility's percentage share of the load in the one hour of the annual New England peak in the previous calendar year. If a utility reduces its load in that hour, the total capacity charges in New England do not change immediately. However, the utility realizes a savings in the next year and all other load serving entities in New England

realize an increase in capacity charges. As time goes on, ISO-NE will use the reduced load in New England and determine a lower capacity requirement for the entire region, but that savings will not be realized for several years. A similar situation occurs for other relative costs based on load, such as NEPOOL OATT and ISO Tariff expenses. In these cases VEC has calculated the value to Vermont ratepayers only.

- 2. VEC does not have expertise in this area. However, the net metering program is explicitly a renewable energy program. Economic development benefits are ancillary and should not be a primary driver of net metering policy. Net metering policy could also suppress job creation by increasing electric rates across all sectors.*
 - 3. VEC is a not-for-profit cooperative owned by the customers it serves (which we refer to as members). Therefore, in VEC's case "ratepayer" and "utility" are the same.*
 - 4. Reduced electric bills benefit net metering customers. The developer also profits. Non-net metering customers pay for the combination of these two through higher rates. Therefore, depending on what are considered the boundaries of "Society in General" there is either a benefit or no benefit at all.*
- 6. For each benefit identified, please state whether the value of the benefits accrues to the net-metering customer, ratepayers, the utility, or society in general.**

VEC Response: Please see the response to Question 5 above.

- 7. For each benefit, please describe how the Commission should estimate the value of that benefit. Please identify what data sources the Commission should use to make such estimates. If you have an estimate of the value of a particular benefit, please provide the estimate, along with supporting document showing how the estimate was derived.**

VEC Response: VEC projects the 20-year levelized market value of solar to be \$0.1056/kWh if RECs are transferred to the utility and \$0.0704/kWh if RECs are not transferred to the utility.

Table 3 provides VEC's 20-year projections of market value for each category of benefits on a \$/kWh basis that make up the levelized rates:

Table 3. Value of Solar Over 20 Years

	Energy \$/kWh	Regulation \$/kwh	Fwd Reserve \$/Kwh	Capacity \$/kwh	Trans \$/kwh	REC \$/kWh	Total \$/kwh with RECs	Total \$/kWh without RECs
2020	\$0.0341	\$0.0002	\$0.0004	\$0.0256	\$0.0031	\$0.0370	\$0.1004	\$0.0634
2021	\$0.0345	\$0.0002	\$0.0004	\$0.0210	\$0.0033	\$0.0330	\$0.0924	\$0.0594
2022	\$0.0350	\$0.0002	\$0.0004	\$0.0178	\$0.0034	\$0.0313	\$0.0881	\$0.0569
2023	\$0.0361	\$0.0002	\$0.0005	\$0.0167	\$0.0036	\$0.0290	\$0.0860	\$0.0570
2024	\$0.0370	\$0.0002	\$0.0005	\$0.0172	\$0.0042	\$0.0150	\$0.0741	\$0.0591
2025	\$0.0383	\$0.0002	\$0.0005	\$0.0177	\$0.0047	\$0.0150	\$0.0765	\$0.0615
2026	\$0.0398	\$0.0002	\$0.0005	\$0.0182	\$0.0050	\$0.0150	\$0.0788	\$0.0638
2027	\$0.0413	\$0.0002	\$0.0005	\$0.0185	\$0.0052	\$0.0150	\$0.0808	\$0.0658
2028	\$0.0428	\$0.0002	\$0.0005	\$0.0186	\$0.0055	\$0.0150	\$0.0827	\$0.0677
2029	\$0.0444	\$0.0003	\$0.0006	\$0.0187	\$0.0058	\$0.0150	\$0.0847	\$0.0697
2030	\$0.0461	\$0.0003	\$0.0006	\$0.0188	\$0.0061	\$0.0150	\$0.0869	\$0.0719
2031	\$0.0477	\$0.0003	\$0.0006	\$0.0189	\$0.0064	\$0.0150	\$0.0889	\$0.0739
2032	\$0.0494	\$0.0003	\$0.0006	\$0.0190	\$0.0067	\$0.0150	\$0.0910	\$0.0760
2033	\$0.0511	\$0.0003	\$0.0007	\$0.0191	\$0.0071	\$0.0150	\$0.0932	\$0.0782
2034	\$0.0528	\$0.0003	\$0.0007	\$0.0192	\$0.0075	\$0.0150	\$0.0954	\$0.0804
2035	\$0.0546	\$0.0003	\$0.0007	\$0.0193	\$0.0079	\$0.0150	\$0.0978	\$0.0828
2036	\$0.0565	\$0.0003	\$0.0007	\$0.0194	\$0.0083	\$0.0150	\$0.1002	\$0.0852
2037	\$0.0584	\$0.0003	\$0.0007	\$0.0195	\$0.0088	\$0.0150	\$0.1027	\$0.0877
2038	\$0.0604	\$0.0003	\$0.0008	\$0.0196	\$0.0093	\$0.0150	\$0.1054	\$0.0904
2039	\$0.0625	\$0.0004	\$0.0008	\$0.0197	\$0.0098	\$0.0150	\$0.1081	\$0.0931
20-Year Levelized	\$0.0433	\$0.0003	\$0.0006	\$0.0192	\$0.0054	\$0.0204	\$0.0891	\$0.0687

Exhibit B provides the full analysis of how VEC projected the value of each of these benefits.

For benefits associated with cost reduction in the electricity and transmission markets administered by ISO New England, VEC believes the methodology and assumptions it used in estimating the value of solar for this analysis are a good starting point. Although VEC has done its best to include and approximate these values, we recognize that others may have different methodologies and assumptions that could improve upon ours.

8. When estimating the value of the benefits of net metering, what time horizon should the Commission consider? Why?

VEC Response: VEC believes a 20-year time horizon is appropriate when estimating the value of solar. It is our understanding that 20 years is a typical term in net metering agreements

between solar developers and the hosts of the net metering projects. Twenty years is also consistent with many utility planning analyses, including IRPs.

9. Please identify all costs of net-metering. Please describe how the Commission should account for these costs so that they can be compared to the benefits of net metering.

VEC Response: VEC's approach to this question is to estimate the amount of net metering credit that must be paid on an annual basis and over the life of the system versus the value of that solar generation. Exhibits A and B contain these analyses.

In addition to the cost of the net metering credit, the net metering program has a significant administrative cost that is only partially recovered through fees to participants. We estimate that the cost of administering custom billing, providing additional member service, and custom programming through our billing vendor is \$100,000 annually. About \$8,000 of this cost is recovered in a one-time net metering set up fee for program participants.

10. For each cost, please identify who pays the cost (ratepayers, the utility, society).

VEC Response: In VEC's case, the utility and the ratepayer are the same. Any cost that we incur must be recovered in rates. The full cost of the net metering program is borne by the ratepayer.

11. Please compare the benefits of net-metering to the cost of net-metering under the current net-metering rule.

VEC Response: See previous responses.

12. If the current net-metering compensation system does not balance the costs and benefits of net-metering, please describe how the compensation system could be changed to better balance the costs and benefits.

VEC Response: See response to 3 above.

13. Would using time-of-use retail rates to set net-metering compensation better align the costs and benefits of net metering? Should the Commission require net metering customers to be on time-of-use rates?

VEC Response: In theory, time-of-use (TOU) rates could provide a more accurate way of pricing the value of solar throughout the day. In VEC's billing system, net metering and TOU are

currently not compatible because we have to put the account on either a net metering rate or a TOU rate. If the entire structure of net metering compensation were changed to simply credit at whatever retail rate is currently in effect, then it's possible that we would be able to implement a TOU crediting structure. However, we believe that the value of solar method of calculating net metering credit would be simple to implement, easy for participants to understand, and reflective of the value the generation.

14. Should the Commission allow utilities that provide their customers 100% renewable energy to propose alternative net metering tariffs?

VEC Response: VEC believes that the Commission should set net metering rates that serve the interest of all Vermont ratepayers, whether or not their utility purchases sufficient RECs to claim 100 percent renewability. When the RECs are transferred, net metering systems reduce the amount of RECs that need to be purchased to achieve whatever degree of renewability a utility claims. This is just as true at a claim of 55 percent renewability as it is at 100 percent.

This question highlights the inherent tension between net metering, for which utilities are required to pay rates that are set by the Commission's net metering rule, and other comparable renewable resources, for which utilities can negotiate a price based on the value of the resource. For commercial-scale projects specifically, net metering can artificially inflate the rates of other solar projects or cause utilities to enter into power purchase agreements that they otherwise would not have pursued simply because the cost of a net metering project at the same location would be higher. Allowing commercially developed projects to participate in the net metering program ensures that utilities will be required to pay more for solar resources than would otherwise be necessary.

Hypothetically, all utilities could purchase sufficient RECs to claim 100 percent renewability, and each utility could request an alternative net metering tariff. This scenario would lead to significant customer and industry confusion.

15. Should the Commission adopt a limit on the amount of new net-metering resources? If so, how should the Commission determine the amount?

VEC Response: VEC does not favor reinstating a cap on net metering because of the difficulties of administration. A cap requires close utility tracking, can lead to a run on the program, and is hard to administer transparently. With the appropriate rates, no cap is needed on the amount of net metering.

It is especially important for the Commission to set rates for Category III projects that match market rates for commercially-operated projects. Of the six 500-kW net metering projects currently active in VEC service territory, only one offsets electrical use for the same or adjacent properties. The other projects send credits to accounts in other parts of VEC's service territory. From an electrical perspective, these projects function no differently from solar projects developed through a power purchase agreement or Standard Offer. However, VEC must pay a considerably higher rate for the power net metering projects produce. VEC must also administer the distribution of net metering credits to the accounts that are signed up to receive credits from these commercial projects.

VEC believes that the method we proposed in Question 3 of this filing would address the rate impact without requiring a cap on the net metering program.

Preferred Sites

VEC does not object to the Commission's proposal to remove joint letter of support from the list of qualifying preferred site criteria. VEC would also add that a site that might be "preferred" from a land use perspective could be detrimental from a grid perspective. For example, projects located in areas that will cause economic harm to Vermont ratepayers should not be considered "preferred sites." Specifically, projects located in transmission-constrained areas should be disqualified from receiving this designation.

Thank you for the opportunity to comment. We look forward to continued engagement on this topic.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa Morris".

Lisa Morris
Energy Services Planner
Vermont Electric Cooperative