



Vermont Electric Cooperative, Inc.

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About VEC

VEC was established in 1938 to bring electricity to rural Vermonters. We are part of the Rural Utility Services (RUS) that was established by executive order in 1936. In the 1930's it became apparent that rural America would not get electricity from the Investor Owned Utilities because it was not profitable. Today the economics are the same; without Rural Electric Cooperatives, many rural areas would not have electricity. Rural electric cooperatives serve 75% of the nation's land mass.

Vermont Electric Cooperative is a democratic nonprofit organization that is owned by its 38,000 members. We serve member-owners in 74 towns and eight counties and are Vermont's second largest utility. Like you, our constituents can have diverse perspectives and opinions and our 12 member Board works hard to find consensus on difficult policy issues. VEC is recognized nationally for its technology leadership. We employ over 100 of the best and brightest Vermonters. We are headquartered in Johnson and have service centers in Grand Isle, Newport and Richford. VEC continues to focus on our core functions which include providing cost effective, safe and reliable electric service to our member owners.

About Net Metering

Please see the attached detailed net metering comments that VEC has recently submitted to the VT Public Service Board (January 13, 2016 and February 4, 2016). Our primary concern about the current net metering system is the excessive price we are required to pay for net metering electricity, and the associated cost shifts. These concerns are exacerbated by the large size of many of the projects, as allowed under the current statute, and we believe the maximum net metering project size should be reduced.

- Under the current net metering program, every 1% of the net metering cap costs the Co-op approximately \$125,000 more each year than the value it provides.
- At 12.6% penetration, as expected in 2016, this totals to about \$1.6 million in excess cost to the Co-op annually.

VEC also has significant concerns that we are paying premium rates for power that does not include the Renewable Energy Certificates (RECs). We believe all the RECs associated with net-metering should transfer to the utility to help us meet our Renewable Energy Standard obligations. As a nonprofit cooperative, any increase in cost is borne directly by our members. Our members include some of the lowest income

populations in the state. (VEC territory includes three of the top five VT counties for people living in poverty). Our members cannot afford to pay more than needed for renewable energy.

Siting of Renewable Energy Projects in VEC Territory

The benefit or cost to the co-op of renewable energy projects (not taking into account the cost shift discussed above due to current mandated net metering rates), depends primarily upon the location of the project. The first question our Engineering and Operations Departments ask when presented with a new project is, “where and how big?” The benefits or potential adverse grid impacts vary significantly depending on location and size.

The size considerations are mostly divided between projects less than or greater than 150kW. The smaller size projects serve as a load reducer and have no concerning impact on the grid. The larger projects begin to raise concerns as they are no longer just a load reducer, but perform more like a merchant generator. VEC treats projects 150 kW and greater almost identically to projects up to 5MW. In fact, in many locations a 150kW project can have a bigger impact on the local grid than a 5MW project depending on the local grid characteristics.

The location considerations are the same for all types of renewable generation whether it is net metering or standard offer/feed in tariff. The considerations include:

- **Transmission Grid:** Is the project located within the Block Load area in the Northeast Kingdom which is not connected to ISO-NE? Is it within the constrained area of northern Vermont (Highgate –Jay- Irasburg –St. Johnsbury)? Is it in a more densely populated area with higher loads such as Grand Isle or Chittenden Counties?
- **Distribution Grid:** Is it in close proximity to three phase power? Are the substation and circuit loads high enough to absorb the generation and a general alignment of generation and load profiles? (In other words does the generation help mitigate peak loads).
- **Communication Infrastructure:** Is it in a location where adequate communication infrastructure exists? Is the project close to an accessible fiber network? Within reach of our Jay Peak SCADA radio? Is Fairpoint ELan close by or is there a secure cellular network available?
- Lastly, what are the ongoing direct costs of managing the generator output?

Other Transmission Considerations

Block Load: VEC’s system is unique because of its location to the border. We have direct HQ connections with long term contracts in place that are affected when generation is built in those areas. We refer to this area as the “Block” in reference to the Block Load contracts. When generation projects are connected to this grid, VEC does not realize any transmission benefits from VELCO or ISO-NE as the other utilities do, and additionally prevents VEC from taking reasonably priced power under our HQ block load contract. At some point we expect we will have to deny projects because of reverse flows into the HQ system which would not be allowed either by our Presidential permit or by HQ.

Constrained Transmission Grids (Northern VT): About 1/4 of VEC's territory is served by a very constrained transmission grid because of high levels of existing generation (Highgate Converter, Kingdom Community Wind, Sheffield Wind, Swanton Hydro, Missisquoi Hydro and Swanton Peaker) and a very sparse population with light electrical loads. At times the installed generation is curtailed due to interface limits and which has a significant negative financial impact on the utilities with financial investments in these generators.

Load Profile/Generation Profiles: An ideal generator produces energy at a steady level at all hours of the day, or at least during times of the day when loads are peaking. VEC has several farm methane and hydro projects in our system that do exactly this while adding strength to the grid due to the rotating mass/inertia. Intermittent renewables are challenging due to the fact that they often do not generate when the energy is needed. In most areas in our system our loads peak during hours 7-9 PM during the cold winter months, solar does not help during these times. This is when generation is most helpful to the grid. The current net metering rules allow for solar generation in excess of a member's peak load which means they are overproducing their use sometimes by a factor of 3X often at times it is not needed. VEC must manage this excess generation and still buy energy to fill the peak needs.

Communications Infrastructure: To support our renewable goals of providing a reliable and stable grid for all generators without discrimination, VEC has been a leader in requiring SCADA (remote) control and monitoring generators of all types sized larger than 150kW. This requires secure telecommunications infrastructure and has become the single most challenging part of our interconnection protocols because a traditional internet connection is not adequate to connect the generator controls directly into our SCADA system. We have recently begun developing a private secure wireless LTE network solution but currently have one generator which is not being monitored due to the unavailability of communications. Who should pay for this service is under review.

Ongoing Operation and Management Responsibilities and Cost: Our grid is becoming more and more complex with every generator that is connected. For the protection of our workers, we require that all non-synchronous (solar) generators equal to or larger than 150kW and any synchronous generator (spinning) must be disconnected from the grid before our crews can work on the lines. We have some circuits that have 2 or more generators that meet these criteria. The switching times can easily add 2-3 hours to the duration of the outage. There is a quantifiable impact to the outage duration and cost of operating the system.

In sum, VEC is very supportive of increased renewable energy generation provided it is sited responsibly and is priced sustainability. We appreciate your interest in helping us to achieve these goals.