S. 267: ENERGY RESILIENCE & DIVERSITY ACT – 100% RENEWABLE ENERGY STANDARD

Resolves these problems:

- Electricity costs are increasing due to regional transmission & ISO-NE charges.
- Current RES implementation limits efficient, local distributed renewable energy to just 10% of Vermont's needs, stifling self-sufficiency, local economic opportunity, & climate resilience.
- Vermont is experiencing more frequent and intense storms due to climate change which reduces electricity reliability and increase costs for everyone.
- Existing grid is just 43% efficient.
- Vermont imports 60% of its electricity, consuming almost four times as much energy as it produces overall, sending hundreds of millions out of the state every year.

Questions & Answers

Why is this good for ratepayers?

A U.S. Department of Energy funded study by VEIC and supported by the Department of Public Service found that **getting 20% of Vermont's electricity from local solar creates $8 billion in net benefits.** See https://www.veic.org/vermont-solar-pathways.

Creating a more resilient and local renewable electricity system reduces long term energy costs, helps prepare Vermont for current and future climate change impacts, and improves grid reliability and public safety. Adding storage to existing local renewable generation maximizes its full financial and grid value, which benefits all ratepayers. (Examples include storing solar for use during peak evening times when sun is not shining, and eliminating curtailment of existing utility wind generation.).

Increasing energy transformation Tier III (from 12 to 24%) could result in a net **reduction in rate pressure of a few percent by 2030**, if this load is managed properly by utilities to be off peak.

Why double Tier II (increase from 10% by 2032 to 20% by 2030)?

Tier II resources (local distributed renewables less than 5MW) provide concrete benefits to the grid in Vermont, as well as to Vermont's economy. Tier II was intended to be a floor for distributed generation deployment in the state. In practice, it is being treated as a target or ceiling, and holding back in-state deployment of smaller renewable generation.

Tier II directs money that would otherwise be spent perpetually on out-of-state energy supplies toward local resources and economic development. The cost to deploy distributed renewable generation continues to fall. Vermont's largest utility, Green Mountain Power, supports doubling Tier II to 20% by 2030 as a necessary and pragmatic step to increase grid efficiency and climate resilience, and lower transmission costs.

Can Vermont's grid actually handle 20% local distributed renewables outside of Tier IIb (without storage)?

Yes. The 2018 VELCO Long Range Transmission Plan identified that 1058 MW of solar PV could be interconnected if it were distributed around the grid in an optimal way.

Why do we need legislation? Won't the market or utilities take care of this on their own?

When it comes to energy, the policy legislated is what creates and catalyzes the market. Without a statewide directive, inequity in participation and access to resilient renewable solutions will continue to grow.

Without a statewide law, many Vermonters are left behind (particularly those in rural areas with highest energy burdens and electricity costs) in realizing the benefits of 100% renewable electricity and resilient local generation. While GMP has pioneered utility and residential energy storage – the scale of those efforts are largely limited to pilots and relatively small compared to the need and potential benefit due to the lack of state policy framework. No other utility in Vermont offers residential, commercial, or institutional customers the opportunity to participate and benefit in energy storage. Similarly, BED and WEC pioneered 100% renewable electricity and have shown the benefits and customer support / demand for such standards.

Without legislative instruction regarding a shared vision across the state (for all utilities, regulators, and other stakeholders) utilities have little incentive to taking on the real risk that the PUC will rule that they should have pursued a different vision (e.g. one based on imports). For example, in 2018 and 2019 cases before the PUC, the Scott Administration's DPS argued to disallow cost saving battery storage. Expanding the RES with Tier IIb, especially if coupled with requirements to plan for a modern grid enabled by Tier IIb, would send a clear policy signal, reduce risk and costs. Clear statutory direction and language reduces uncertainty and risk, which reduces the cost of successful local climate solutions deployment (legal, finance & capital, regulatory compliance, etc.).

There are multiple ways that Vermont could meet 100 percent of its electricity needs with renewable energy. It could, for example, simply buy RECs from generators around the region, or import more power over reinforced and expanded transmission networks. However, these pathways decrease the resilience of Vermont's electric system and increase electricity costs over time.

How does Vermont's RES compare to other states?

Vermont Tier I energy sources do not qualify as renewable in neighboring New England state RPS laws. . In Vermont, Tier I are primarily HydroQuebec and older hydro generators in New York, New Hampshire, and Maine. These RECs are available at low cost because there are no other states that aim to buy them as qualifying resources.

Why is the resilient renewable energy Tier IIb necessary? How will Tier IIb increase reliability and resilience while lowering costs?

Community-level microgrids and island-able operation will allow interconnecting utilities to maintain reliable service, increase resilience, and reduce storm recovery costs. If a community can keep itself going for a day or more while being disconnected from the regional grid, then utility storm crews can work at a more reasonable pace, increasing their safety, and reducing reliance on contracted crews and overtime, which drive up storm costs.

Vermont can cut its regional transmission and capacity costs by dispatching the storage resources enabled by Tier IIb to reduce load during the critical peak hours. GMP and VEC have proven cost savings from dispatch of distributed and centralized battery systems.

Pairing of storage and load control with local renewable generation, when installed with the right controls, will allow for islanded operation, whether at the building, feeder, or even larger level. Tier IIb provides an opportunity to develop storage associated with variable generation, enable further in-state generation without paired storage, and maximize the grid and resilience benefits of DG. Given that Vermont will need storage and load flexibility to meet its energy objectives, Tier IIb would also encourage pairing of storage with generation in ways that are likely to reduce costs, such as shared inverters and tax credit eligibility.

Today, portions of Vermont's grid are experiencing challenges with DG interconnection (in the SHEI area, and GMP has slowed down DG interconnection in some places). These constraints inhibit Vermonters ability to generate their own renewable electricity and needlessly curtail local economic opportunity. Tier IIb offers the opportunity to cost effectively address these issues.

What kinds of resilient dispatchable renewable resources could count for Tier IIb?

Dispatchable storage and load-control resources include: electric energy storage (batteries, compressed air, pumped hydro); thermal storage (ice-based air conditioning); and controllable loads (controlled water heaters or EV chargers). Pairing storage with local renewable generation means that the storage or controlled load would need to be on the same feeder for smaller, distribution-interconnected generators, or in the same VELCO load zone for transmission-interconnected generators. Any non-dispatchable renewable resource would generate eligible RECs provided that it is paired with storage or load control that supports the Vermont grid. For example, a 10 kW system requires at least a 5kW battery, and would get full credit if that battery can store 20 kWh. But if the battery can only store 10 kWh, then it gets half credit as a dispatchable resource, and the other half of its RECs count only for other Tiers.

How will this proposal impact utilities that are already 100% renewable (BED, WEC, Swanton)? What about space/ geographic constraints for smaller utilities?

Utilities with 100% renewable portfolios are exempt from RES Tier II requirements and as such are not required to add new renewable resources outside of net metering. So this proposal would not impact them, outside of increased Tier III requirements.

In terms of geographic concerns, Tier II compliance is not service-territory specific. A utility can buy power and RECs from any solar/wind/hydro project on the VT grid so long as the project does not exceed 5 MW. Utilities are not constrained by their geographic service territory.

How much local solar and other renewable generation would it take to achieve 20% Tier II?

Assuming flat utility sales (approx. 6,000 GWh/yr), 20% Tier II equates to at least 750 MW of new solar by 2030 OR additional digesters, low impact hydro, or wind.

How much storage and renewable generation would be needed to meet the resilient dispatchable renewables Tier IIb (30% by 2030)?

Tier IIb would drive the installation of 500-600 MW of storage capacity, with the ability to store 2-2.4 GWh. Tier IIb does not dictate the storage or renewable generation technology type, the mix of which would be influenced by the market (lowest price), utilities, and siting processes (regional & local energy plans, community support, CPG permit process, etc.). To generate 30% of Vermont's electricity by 2030 would take something akin to one of these breakdowns:

- 650 WM of solar PV and 325 MW of wind; OR
- 1000 MW of solar and 160 MW of wind
  - This could be 1000 MW of solar PV and adding storage to Kingdom Community Wind, Sheffield Wind, Georgia Wind, and Deerfield Wind - so no new notable wind generation.

Who would own the storage resources? Who would control them?

Storage resources could be owned by utilities, customers, or independent third parties. In order to support the grid's integration of renewable resources and optimize grid costs, the resources would be dispatched by or in response to direction from the interconnecting utility (for distribution-connection resources) or by VELCO (for transmission-interconnected resources), consistent with the interconnection agreement (required by PUC Rule 5.500) and applicable CPG (PUC permit) or utility tariff.

What is the purpose of Tier I ?

Vermont's RES Tier 1 (current = 65% by 2032) was designed / enacted to:

1) Increase the renewable portion of Vermonters' electric consumption, including maintaining utility renewable electricity purchases already "on the books" from HyroQuebec; and

2) Ensure that electrification under Tier III (Energy Transformation) results in fossil fuel use and climate pollution reduction, as new electric end uses create more demand for electricity.

What are the existing state laws & rules to ensure grid optimization and control electricity costs as the Renewable Energy Standard is implemented?

- PUC Rule 5.500 Interconnection Rule: Any new generation project is required to file an interconnection application with the utility under PUC Rule 5.500. The project applicant pays for the utility studies of grid impacts at the distribution level (i.e., GMP, VEC, etc.) and transmission level (i.e., VELCO); identifies necessary upgrades, if any; and estimates associated costs. The project installer must pay the upgrade costs identified in each study. Ratepayers do not pay these costs.
- Utility Planning, Current Law – 30 V.S.A. Section 218c: requires every utility to create a "least-cost integrated plan".
- CPG Process, Current Law – 30 V.S.A Section 248(b)(3) & Section 248(b)(10): does not allow the PUC to approve a project if it will result in an undue adverse impact to the electric grid. Section 248(b)(10) requires that any new project "be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers."
- State Energy Policy, Current Law – 30 V.S.A Section 8001: General Assembly findings & directive to the PUC & DPS state "(a) … in the interest of the people of the State to promote the State energy policy…. by: (1) Balancing the benefits, lifetime costs, and rates of the State's overall energy portfolio to ensure that to the greatest extent possible the economic benefits of renewable energy in State flow to the Vermont economy in general, and to the rate-paying citizens of the State in particular…(7) Providing support and incentives to locate renewable energy plants of small and moderate size in a manner that is distributed across the State's electric grid, including locating such plants in areas that will provide benefit to the operation and management of that grid through such means as reducing line losses and addressing transmission and distribution constraints."

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