

# Closer, Connected & Empowered: Federal Infrastructure Funding Request for a Cleaner and Greener Vermont

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# Overview

In recent years, there has been much progress towards developing a clean electric supply for electric utility customers. This achievement is the result of steady continued work over many years by Vermont's utilities, local businesses, state elected officials, and energy transformation partners. As we look towards the future, we know that more must be done to make Vermont more resilient and more renewable.

But Vermont, and other states, cannot do it alone. To keep electrification as an affordable and clean option, federal infrastructure investments in the grid are needed in Vermont to keep electrification affordable and increasingly renewable. The federal infrastructure investments currently underway can make a large impact on Vermont's energy future. In addition to continuing to support policies that are already moving, and grant programs underway, Vermont utilities and energy transformation partners have developed a proposal that focuses on the energy infrastructure needs here in Vermont. The requests outlined below are focused on setting Vermont up to modernize and strengthen the grid in order to meet our renewable energy goals now and into the future.

## Goals

- Make Vermont more resilient, affordable, and even more green.
- Enable more Vermonters be able to afford to participate in innovative renewable energy programs that save carbon and costs.
- Strengthen and modernize the grid to launch into the 21st century and ensure Vermonters benefit from local renewables and are empowered to go electric.
- Support local jobs and boost the local economy - the local businesses, installers, energy resources, and equipment dealers for all of this work are right here in Vermont.

	Proposal	Type of Funding Request	Policy Rationale
<b>Infrastructure support for electrification – carbon and cost savings</b>	Provide upgrade funding for Vermonters through their local utility to support electrification	Grant, direct equipment incentive, or revolving loan funds	A barrier for many Vermonters from going electric is costs as well as their home infrastructure. Direct incentives will allow installed devices to be controllable <u>and</u> available to low- and moderate-income Vermonters.
	30% federal tax credit for renewable heating (heat pumps, geothermal, advanced wood heat) – and more federal dollars for efficiency work	Tax credit and federal grants	Allocate significant federal funds to support Vermonters rapid adoption of renewable heating solutions. Heating is the second largest source of carbon pollution in Vermont. Let’s enable significant and equitable new incentives for renewable heating so that we can stop installing new fossil fuel boilers.
	Provide funding for AMI for customers that lack the infrastructure	Grant, direct equipment incentive	Advanced Metering Infrastructure allows utilities to perform data analytics to optimally manage the distribution grid and allows customers to reap the full benefits of electrification.
	Funding for GIS to facilitate spatial data analysis	Federal grant	GIS mapping of the electric distribution system supports broadband deployment, more efficient distributed generation siting, and efficient distribution system operations.
	<b>More Resilient Grid with More Distributed Generation</b>	Support development of Resiliency Zones with cost subsidy/direct grants	Federal grant
Utility-scale Storage		Grant, direct equipment	Funding for Vermont Distribution Utilities to deploy up to

	incentive, or revolving loan funds	5MW/20-40MWh battery systems with associated microgrid equipment to significantly increase Vermont's grid resiliency.
Distribution and Transmission Upgrades	Federal grant	<p>Increasing capacity of an existing substation can cost \$2-4M but can increase capacity by 2 times or greater to allow for more renewable deployment.</p> <p>Similarly, targeted transmission and subtransmission upgrades carry a higher initial capital cost, \$20M - \$100M, but enable renewables integration at scale in a manner that lowers customer costs and increases grid resiliency.</p>
Long-Duration Storage	Federal matching funds to utilities	Accelerate deployment of long-duration storage in key areas of the state can provide non-wire alternatives to transmission constraints.
Enhanced cybersecurity support	Grant, direct equipment incentive, or revolving loan funds	Must significantly enhance our ability to protect against cyber intrusions along with all the new entry points to the grid.

# Specific Strategies

## 1. Support Policies Already Moving That Unlock Energy Transformation and Grants Underway

We recognize and appreciate the public support from Vermont's federal delegation for the initiatives outlined below. It is our hope that we can build on your support to see these major policy initiatives take hold and support Vermont's energy transformation.

- a. **Standalone tax credit for energy storage.** Supporting a standalone, refundable tax credit for energy storage will allow the storage installed by homeowners and businesses to provide maximum support to customers and the grid, through utility dispatch and re-charging of those batteries from the grid.
- b. **Refundable option for solar and storage tax credits.** Creating a grant in lieu of tax credits for solar and storage will make solar and energy storage installations available to homeowners and businesses who might not otherwise have the needed tax liability. This will allow for more equitable access to the benefits solar and storage can provide.
- c. **Rural Broadband.** Continued investment in deploying broadband to all Vermonters. The energy transformation can only happen for all if there is broadband access for all Vermonters, including those in our most rural communities.
- d. **Electric Vehicles:** Transportation is the top source of carbon pollution in Vermont. Continue, expand, and make refundable the federal tax credits for new and used EVs, federal support for EV charging infrastructure as proposed, and electrification of fleets such as school buses and delivery vehicles. With additional federal support, we could move quickly to assist in getting more school districts to convert their buses to an all-electric option (see work being done with the Essex Westford School District).
- e. **DOE Grant for Statewide Electrification Platform - a software management system for widespread, rapid electrification to support decarbonization for all Vermonters.** All utilities and all Vermonters would benefit from the ability to deploy load management for storage, renewable generation, EV charging, heat pump, and other electrification systems, giving Vermont the ability to use these tools to soak up solar during the day and allow for more solar and other renewable distributed generation to be deployed on the grid. The need to choreograph the grid of the future will be critical to the success of a major decarbonization effort through electrification. Having a common statewide platform would provide equitable access for all Vermonters to benefit from this work and to move the entire state forward, using the same tools to achieve our goals. A joint VELCO/utility effort to secure a DOE grant is underway.

## 2. Electrification for Carbon and Cost Savings

Help Vermonters get ready to go electric. A barrier for many Vermonters is their home infrastructure – even with good rebate programs for heat pumps, EVs, etc., they have undersized panels and lack of wiring to where they need it, which can drive up the cost of switching to cleaner technology. As programs are designed to allow Vermonters to transition to cleaner, greener technologies, it must be done in a way that is accessible for all. A key component driver of making these programs accessible is affordability, and ensuring cost is not a barrier.

Data consistently shows that the lowest-income Vermonters purchase much less energy than upper-income Vermonters, but the energy spending takes up a much greater share of their household budget.<sup>1</sup> Policies such as those outlined below will help.

- f. **Infrastructure for Electrification.** Provide upgrade funding for Vermonters, through their local utility, to upgrade their home and business panels and electric service to enable solar, batteries, EVs, metering solutions, and all the benefits of electrification in their homes and businesses, and for utilities to upgrade small customer transformers to serve expanded demand and distributed generation. Provide funding for installation of Advanced Metering Infrastructure in the remaining Vermont premises to allow equitable access to the full benefits of energy transformation.
- g. **Dramatically Lower Carbon Emissions and Costs By Supporting Vermonters to Adopt Renewable Heating.** Allocate significant federal funds to support Vermonters rapid adoption of renewable heating - including cold climate heat pumps, geothermal, and advanced wood heating. Heating is the second largest source of carbon pollution in Vermont. Let's enable significant new incentives for reliable renewable heating solutions so that we can stop installing new fossil fuel boilers. It is absolute madness to be installing a fossil boiler with a 20+ year lifespan in the year 2021. As others have said, more heat pumps = more electric load (lowers costs for all customers) = more need for local, in-state renewables. Create a refundable 30% federal tax credit for renewable heating, and assign more federal dollars for building energy efficiency for low- and moderate-income residents and small businesses.
- h. **Expand and increase funding for federal LIHEAP and Weatherization Assistance Programs** to enable low income household access to more efficient renewable heating (cold climate heat pumps, advanced wood heat, geothermal, etc.) and transportation solutions (shared mobility, electric vehicles, e-bikes, etc.).
- i. **Increase funding for and expand the USDA REAP Program** to help farms and rural businesses lower their energy burdens and climate impact by accessing renewable heating, electric transportation and farm equipment, and resilient energy storage. This would enable and encourage Vermont farms to switch from harmful and inefficient fossil fuel heating for hoopouses, greenhouses, barns and farm stores; gas and diesel delivery trucks, tractors, and landscape maintenance equipment; and dangerous and polluting gas generators to heat their and price stable renewable solutions. Current funding levels enable less than 50% of Vermont local businesses applying to proceed with local renewable electricity, heating, and efficiency projects.

**b. Create a More Resilient and Modern Grid with More Distributed Generation**

Enhanced rural climate resilience by directing FEMA and U.S. DOE funding opportunity to local energy resilience and reliability projects, such as microgrids, battery storage, and enhanced distribution grid strength.

- a. **Resiliency Zones.** Provide cost subsidy/grants for Resiliency Zones: batteries installed at schools, libraries, affordable housing developments, municipal buildings, and other key community facilities, paired with solar and with a microgrid where possible, to allow them to serve as emergency community hubs during and after natural disasters, in partnership with utilities that can offer load

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<sup>1</sup> Efficiency Vermont, "Vermont Energy Burdge Report," 2016 & 2019. Energy Action Network, "Energy Inequity and Burden in Vermont," 2020.

control, on-bill payment/credits and expertise in design and management so that it is easy for them to implement and reduce costs for all customers.

- i. For context: \$5M could fund a large battery project in each county in Vermont (total of \$70M for 14 counties). Microgrid engineering like being deployed in Panton would require additional funding to gain added resiliency.
- b. **Utility-Scale Storage.** Funding for Vermont Distribution Utilities to deploy up to 5MW/20-40MWh battery systems to significantly increase Vermont's grid resiliency. This could be by permitting utilities to access a direct grant in lieu of tax credit for storage. Storage systems reduce costs for customers - peak reduction benefits, flexibility, enabling distributed generation (DG) deployment, are all proven benefits to deploying additional storage.
- c. **Distribution and Transmission Upgrades to Future-Proof the Electric Distribution System and Address Constrained Transmission Areas.** Upgrade substation and transmission capacity across the Vermont grid to be prepared for both increased DG and electrification. Increasing the capacity of an existing substation can cost approximately \$2-\$4M but can increase the capacity 2 times or greater. This would include both the transformers as well as the remaining components in a substation to allow for greater capacity, and more local renewable DG to be built.
  - i. GMPis seeing an increase in the number of substations that will be unable to host more distributed generation without costly upgrades. Right now approximately 42 substations have only 50% of their capacity remaining to host additional distributed generation due to the deployment that has occurred to date.
  - ii. Vermont Electric Coop (VEC) also currently has 3 substations that are at or over 50% of their remaining capacity to host additional distributed generation.
  - iii. Washington Electric Coop (WEC) members have access to limited high speed internet service and in fact 75% of the service territory is under or unserved. WEC members in its 41 towns need funding to support deployment of fiber and new infrastructure to provide high speed and reliable internet service and reach those in our rural landscapes.

And with the utilities and VELCO, we could also deploy transmission and distribution corridor upgrades and other projects to unlock the ability to deploy more local renewable generation to serve Vermonters in areas where the current system has reached capacity. Let's break the mindset that we cannot make these upgrades until capacity is already exceeded - let's future-proof the Vermont grid so that capacity is not a barrier to renewable deployment and electrification.

- d. **Long-Duration Storage.** To help address transmission constraints like we have seen in the NEK, while also providing non-wires alternatives to transmission, deploy cutting-edge Long-Duration Storage. Provide utilities with matching funds to help bridge the cost gaps and accelerate the deployment of these new and innovative long duration storage systems, such as aqueous or compressed air, liquid aid, gravity including pumped hydro, flow batteries, green hydrogen, and other technologies, which can provide clean peaking capacity, backup power, firming of intermittent renewable energy and ancillary services and system support. By allocating meaningful funds that not only focus on small-scale long-duration energy storage pilots, but also focus on ways to offset costs to spur full demonstration at scale, it will encourage participation and the pursuit of projects at larger scales. As long-duration storage is deployed in other parts of the country, there is a general agreement that increased learning is needed for large scale developments, including permitting, interconnection, construction, operations, insurance, and financing. Some technologies

are inherently larger in scale and more difficult to demonstrate at very small scales.

- e. **Enhanced Cybersecurity funding to protect a more distributed grid:** As we continue to expand distributed energy resources in customer homes and businesses and connect more local renewables and storage to the grid, we must significantly enhance our ability to protect against cyber intrusions along all these new entry points. VELCO maintains and operates a statewide Vermont utility fiber network and associated systems dedicated to secure utility operations. For the past decade, it has proven to serve as a robust defense function against all manner of cyber attack, as well as enabled innovative, customer-focused program delivery. Considered revolutionary at the time, the rest of New England's utilities are now adopting this strategy. To further bolster grid operations at a time of massive expansion of grid connections, Vermont should build a complementary, secure wireless network to better ensure such new and necessary grid participant connections are able to deliver value without needlessly raising the risk of cyber attack.
  
- f. Resurrect the **Energy Efficiency and Conservation Block Grant** program for states that can be used to immediately launch job-intensive renewable energy projects and energy efficiency programs for municipalities. Previous clean energy-related block grant programs created about 63,000 jobs and saved electricity users \$5.2 billion nationally.