

Helping Vermonters Build an Energy Secure Vermont

VLiTE

2015 Annual Report



VLITE

Building An Energy Secure Vermont

VLITE is a very young nonprofit. As the Introduction to this annual report explains in more detail, we were created in 2012 as part of the Vermont Public Service Board's order approving the merger of Central Vermont Public Service into Green Mountain Power. As a result of that order, 38 percent of the stock of Vermont Electric Transmission Company (VELCO) was transferred to VLITE, a public-benefit organization representing the people of Vermont.

This portion of VELCO stock is now generating dividends of about \$1 million per year, and VLITE's charge is to use those revenues to help Vermont achieve an energy-secure future. We invest the funds into projects that show strong potential to help Vermont transition to a largely renewable-energy economy, with all the economic, environmental and health benefits that this can bring; and, where possible, to help meet the needs of low-income Vermonters, especially in reducing energy costs.

Through its Comprehensive Energy Plan, the state has set an ambitious goal — that by 2050, 90% of all Vermont's energy needs, in transportation, buildings and electric power, will be met by renewable sources, with our overall energy consumption reduced by more than one third. VLITE joins state agencies, utilities, businesses, and nonprofits in working, often in partnership, to meet those goals. Our Board of Directors includes highly qualified representatives from the public, utility, and private sectors. They set our direction and guide the work of VLITE's executive director.

Since we began issuing grants in 2013, VLITE's strategy has been to support projects that can be transformational — that can serve as models and open new pathways for renewable technologies, efficiency measures, and education and outreach programs. Knowing that more and better work gets done when we work together, we are collaborating with other key players: utilities, VELCO, the Vermont Energy Investment Corporation, state agencies, the community action agencies that deliver Weatherization Assistance Program services, and others.

This annual report spotlights several of the most promising, productive initiatives we have supported. VLITE has issued just over \$3.6 million in grants supporting projects that, in part, are reducing energy costs and improving the long-term energy efficiency of homes and buildings; are helping to promote electric vehicles and install more charging stations; and are helping utilities to protect power supplies and better deploy the energy that's being generated by the growing number of solar, wind and biomass resources around the state.

Because we seek to support "tipping point" projects that can create expanding positive impacts for the long term, we believe VLITE funding will generate more and more benefits for Vermont. A future built on a renewable economy is one in which far more energy dollars stay within Vermont, more good jobs are generated, homes and industries have lower, more stable energy costs, air and water quality is better-protected, communities are stronger, and our state grows steadily more attractive for clean economic development. We are proud that VLITE is part of this positive movement, and proud to bring you this annual report on our progress so far.

— *Richard Marron, President & Paul Craven, Executive Director*

Making Investments to Help Vermont Meet Its Energy Goals

The public-benefit nonprofit organization VLITE was created in 2012, through a Memorandum of Understanding (MOU) that was drafted by the Vermont Department of Public Service and adopted by the state's Public Service Board in its order approving the merger of Central Vermont Public Service into Green Mountain Power. The MOU stipulated that 38% of the ownership of the Vermont Electric Power Company (VELCO), Vermont's transmission utility — which had been owned entirely by the state's electric utilities since its creation in 1938 — was to be placed in the hands of VLITE, a new entity. VLITE would manage that share, and would appoint three new public members to the VELCO Board of Directors.

Under the MOU, the dividend revenues generated by those VELCO shares are deployed by VLITE to support projects and programs that have strong potential to help achieve the ambitious goals set in Vermont's Comprehensive Energy Plan (CEP), and that also, in many cases, help to meet the needs of low-income Vermonters.

First adopted in 2011, then revised and updated in 2015, the CEP presents a coordinated, multi-sector set of strategies and recommendations for meeting these targets:

1. Reduce Vermont's total energy consumption per capita by 15% by 2025, and by more than one third by 2050.
2. Meet 25% of the remaining energy need from renewable sources by 2025, 40% by 2035 — and 90% by 2050.
3. Meet these three end-use sector goals for 2025: 10% renewable transportation, 30% renewable buildings, and 67% renewable electric power.

Guided by our Board of Directors, VLITE makes grants that support innovative, creative projects

— “tipping point” initiatives that can help eliminate obstacles and open new pathways for greater energy efficiency measures, new and emerging renewable technologies, and education and outreach programs that support the CEP goals and strategies. VLITE works to develop strong, collaborative partnerships with organizations that are actively engaged in meeting the CEP goals. We look for measurable results, experienced leadership with strong project management and organizational oversight, adequate staff and financial resources, and a strong commitment to bring the supported project to a successful conclusion.

In 2013, VLITE's staff and its Board members began this work by meeting with representatives of Vermont's private, cooperative, and municipal electric utilities, VELCO, the Vermont Energy Investment Corporation, the Energy Action Network, Renewable Energy Vermont, other nonprofit and for-profit energy groups and/or providers, legislators, representatives of Governor Peter Shumlin's administration, and others. All those participants were asked what they believed were Vermont's most urgent needs relating to meeting the Comprehensive Energy Plan. The discussions led to VLITE's first spending plan, which has guided the grants it began making in fiscal '13.

From fiscal year 2013 through FY 2015, VLITE has invested a total of \$3,347,134 in grants to 49 projects and programs, for an energy-secure future for Vermont and Vermonters.

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The brief articles that appear after this core narrative highlight several VLITE-supported initiatives that have been especially noteworthy in 2014 and 2015. Other highlights have included these:

- In partnership with the Weatherization Assistance Programs administered by the Vermont Office of Economic Opportunity and the state's five weatherization agencies, VLITE funding made possible the installation of 53 solar heating systems and 43 heat-pump hot water heaters in low-income households. These projects will save an estimated 1,855 gallons of heating oil, 64,500 kwh of electricity, and 138,302 lbs. of CO₂ emissions per year. "Over the past 18 years, 24,669 low-income housing units have been weatherized," a WAP fact sheet reports. "Households that are weatherized by the WAPs see an annual energy savings of \$600-\$1,900/year. ... The WAPs are a big part of achieving the state's goal of improving the energy fitness of 25% of the state's housing stock by 2020."
- Also through the Weatherization Assistance Programs, home retrofits supported by VLITE funding will enable 123 low-income households throughout the state to save 170,000 gallons of oil and kerosene and 5.6 million pounds of CO₂ emissions over the next 20 years. An additional 815 homes received fuel-assistance grants through the WARMTH program, run by the community action agencies and supported by VLITE. The program both assists families in need and helps bring attention to the energy costs and health hardships faced by Vermont low-income families.
- VLITE funding supported the 2014 study *Energy Costs and Burdens in Vermont: Burdensome for Whom?*, a report for the Vermont Low Income Trust for Electricity prepared by the Institute for Energy and the Environment at Vermont Law School. "Generally, those who spend more than 10 percent of their monthly income of energy services can be considered 'fuel poor,'" the study reports. "By this definition, we calculate that approximately 125,000 Vermonters, or one in five, live in fuel poverty." Research for the study revealed that "in 2012, average energy burdens for the bottom three deciles of Vermont households were above the fuel poverty threshold; for the bottom decile, the average energy burden was a whopping 28 percent." The study recommends that the Vermont Legislature increase funding for low-income weatherization, continue supplementing federal fuel-assistance programs, and mandate energy efficiency labeling for homes. It reports that for every dollar invested in weatherization assistance, "the program returns about \$2.51 to the household and society, including \$1.80 in reduced energy bills and \$0.71 in non-energy benefits (e.g., increased local employment and improved housing quality) and better health and safety."
- VLITE funded a number of innovative pilot programs whose impacts have the potential to be game-changing. For example: In a time when fuel-assistance funds for low-income households are shrinking, a pilot partnership between VLITE, the housing nonprofit NeighborWorks of Western Vermont, the weatherization-service provider BROCC (Bennington-Rutland Opportunity Council), GMP, and Efficiency Vermont is installing cold-climate heat pumps in 12 Rutland homes that have received weatherization energy-efficiency "shell" improvements. By monitoring system performance with sophisticated instrumentation, the program aims to demonstrate that this heat-pump technology — which uses a new, hyper-efficient refrigerant to extract warmth, even from very cold outside air — can save each home at least \$1,000 per year in fuel costs, while meeting 80% or more of heating needs from renewable sources. Wider use of heat pumps by low-income households can reduce the need for fuel-assistance funds, which primarily go to pay for fossil fuels. A VLITE grant of \$115,000 covered the bulk of the pilot program's \$128,700 budget; Green Mountain College students are helping gather data and report on outcomes.
- The new VLITE Enterprise Initiative will invite proposals for clean energy businesses and entrepreneurs that clearly map out their plans for growth in Vermont, and for the use of VLITE funds to accelerate their progress towards that growth. Through the Enterprise Initiative, VLITE has a powerful new opportunity to identify and support innovation for clean energy.

Protecting Power Supplies in an Age of Renewables and Severe Weather

At a time when extreme weather events are striking more often and growing more severe, a research collaboration between VELCO (Vermont Electric Power Company) and IBM Research is using new prediction models and analytics to better protect power supplies, prevent outages, reduce the costs of severe storms, and make the best use for Vermonters of power generated with renewable resources. A \$200,000 VLITE grant has made it possible for the Vermont Institute of Applied Meteorology, at Lyndon State College, to contribute expertise and resources, plus faculty and student time, to a piece of the project that is developing a long-term perspective on solar energy as a resource for Vermont as climate change unfolds.

The Vermont Weather Analytics Project is, in essence, producing a sophisticated informational tool that adapts IBM's Deep Thunder weather-prediction model to Vermont's landscape, conditions, and energy needs, helping decision makers to better protect power supplies and respond to storms. The project is also developing a better long-term understanding of how the renewable generation resources now spreading across the map — mainly in the form of solar, wind, and hydro projects — can most effectively help to meet Vermonters' energy needs in the coming years of climate impacts. Along with looking at solar's long-term prospects, Lyndon State students and faculty are also contributing to the research on better predicting the impacts of weather events on power outages.



A Washington Electric Cooperative line crew works to restore power after the December 2014 ice storm.

Helping Electric Vehicles Spread Across Vermont

The 2011 Comprehensive Energy Plan set the goal that by 2030, one quarter of all vehicles registered in Vermont will be powered by renewable sources — and Drive Electric Vermont (DEV) program is a public-private partnership that promotes electric vehicle use. A VLITE grant has supported its outreach and training programs for car dealers, the incentives it offers dealers and consumers, and its outreach and advertising programs aimed at building Vermonters' awareness of electric vehicles and interest in buying them.

Transportation is the single largest source of greenhouse-gas emissions in Vermont, accounting for 45% of the state's emissions — and wider use of plug-in electric vehicles can dramatically reduce those emissions while improving the energy efficiency of the state's transportation sector. The DEV program is coordinated by VEIC (the Vermont

Energy Investment Corporation), which received VLITE grants totaling \$420,000 in 2014-15. These VLITE funds enabled the program to offer \$200 incentives to dealers for each EV they stock, plus a \$500 reduction in the purchase or lease cost of a plug-in vehicle for consumers.

Also, VLITE grants of \$147,000 and just over \$162,000 went to the Washington Electric Coop (WEC) and Stowe Electric, respectively, to support their EV charging-station programs as a pilot initiative aimed at understanding how destination resorts and rural communities could both benefit from vehicle electrification. The Stowe project is developing partnerships between the municipal utility and local businesses to install eight public charging stations; the WEC grant helped the coop install charging stations at workplaces and downtown locations in its rural service area.



Clearing the 'Vermiculite Barrier' to Home Energy-Saving Retrofits

For many Vermont low-income households, the presence of vermiculite insulation that contains asbestos has been a barrier to receiving energy-saving retrofits through the Vermont Weatherization Assistance Programs. A VLITE-funded pilot program is opening a path toward solving that problem.

Vermiculite insulation is widespread in Vermont, and very costly to remove. Almost all vermiculite insulation used in buildings between 1919 and 1990 contained asbestos, which can cause significant health risks if it becomes airborne. Whenever vermiculite is found in a building, that home has been deferred from receiving weatherization services. But starting in 2014, and working through the five community action agencies that provide

Weatherization Program services, the state Office of Economic Opportunity has used a VLITE grant to fund vermiculite removal in 18 homes through the pilot project.

Resolving a vermiculite problem opens the door for low-income homeowners to receive Weatherization Program services that typically average \$7,500-\$9,000 in value per house. The \$125,000 invested by VLITE in the program made it possible for the 18 homes involved to receive a total of \$153,000 in additional efficiency retrofits — and those measures will save an estimated \$25,484 in total annual fuel costs, while preventing the emissions of 149,049 lbs. of carbon dioxide each year.



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Saving Energy in Apartment Buildings

A VLITE grant of \$200,000 to the statewide “3E Thermal” program of Capstone Community Action is making it more feasible and affordable for owners of Vermont apartment buildings to make energy-efficiency improvements — such as sealing leaks and adding insulation — that can save an estimated 37%-60% in annual energy costs.

Formerly known at the Vermont Fuel Efficiency Partnership, 3E Thermal provides a team of building-science professionals and green-building experts who can analyze a building’s performance, diagnose problems and design solutions, help building owners review specifications and contractor bids, and coordinate related services, such as those provided by Efficiency Vermont and the Vermont

Weatherization Assistance Programs. For owners of apartment buildings that are considered low-income housing, and have relatively high energy use, the program’s services are free — and 3E Thermal offers cash incentives that make energy efficiency retrofits and repair projects more affordable. Owners of buildings that don’t qualify for free services can contract with the program on a fee basis.

VLITE funding in 2015 enabled the program to complete 49 unit retrofits in seven buildings — and it helped keep the six-year-old program working, after earlier funding from the American Recovery and Reinvestment Act of 2009 expired. The program is also supported by funding from the Regional Greenhouse Gas Initiative, through Efficiency Vermont.



3E Thermal employee adds a layer of cellulose insulation on top of spray foam insulation in the attic of a Middlebury apartment building.

VLITE-Funded Programs 2013-2015

Comprehensive Energy Plan (Low-Income Efficiency)

Program	Category	Amount \$	Status
Vermiculite pilot – OEO/ WAPs	<i>New Technology/Efficiency</i>	\$75,000	complete
Solar furnace pilot – OEO/ WAPs	<i>New Technology/Efficiency</i>	\$125,000	complete
Efficiency training trailer	<i>Outreach/Efficiency</i>	\$20,000	complete
Heat pump pilot – OEO/ WAPs	<i>New Technology/Efficiency</i>	\$90,000	complete
WARMTH – OEO/ WAPs	<i>Outreach/Efficiency</i>	\$100,000	complete
VFEP	<i>Efficiency</i>	\$165,000	complete
ReSOURCE	<i>Efficiency/Training</i>	\$190,000	complete
VT Law School	<i>Education/Outreach</i>	\$42,000	complete
Vermiculite pilot – OEO/ WAPs	<i>New Technology/Efficiency</i>	\$125,000	complete
WARMTH – OEO/ WAPs	<i>Outreach/Efficiency</i>	\$100,000	complete
VFEP	<i>Efficiency</i>	\$200,000	
NeighborWorks	<i>New Technology/Efficiency</i>	\$115,000	
ReSOURCE	<i>Efficiency/ Training</i>	\$120,000	
OEO Vermiculite	<i>New Technology/Efficiency</i>	\$125,000	
OEO/ WAPs	<i>Efficiency</i>	\$90,000	
VT Law School	<i>Efficiency Solar Study</i>	\$42,000	
VHCB	<i>Efficiency/New Technology</i>	\$150,000	

Comprehensive Energy Plan (Tipping Point Projects)

Program	Category	Amount \$	Status
VEIC	<i>New Technology</i>	\$130,000	complete
EAN “Dashboard”	<i>Outreach/New Technology</i>	\$100,000	
Thermal initiative	<i>Efficiency</i>	\$150,000	complete
Lyndon State	<i>New Technology</i>	\$200,000	
Farm digester pilot	<i>New Technology/Efficiency</i>	\$62,000	
Thermal initiative	<i>Efficiency</i>	\$100,000	
Stowe Electric	<i>New Technology</i>	\$162,134	
WEC	<i>New Technology</i>	\$147,000	
REV	<i>Education/Outreach</i>	\$4,000	
Housing VT	<i>New Technology/Efficiency</i>	\$200,000	
VEIC	<i>New Technology/Outreach</i>	\$290,000	
Northern Forest	<i>New Technology</i>	\$120,000	
PSD Thermal	<i>Efficiency</i>	\$100,000	

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