Electric Vehicles Gain Momentum

2017 may have been a watershed year for electric vehicles. EVs are gaining ground as charging stations become more widely available, ranges increase, and major automakers move towards an all-electric future. Consumers are starting to warm to the idea of this emissions-free and low-maintenance option. But before getting too far into this transportation evolution, a quick history lesson about EVs is in order.

The first known electric car was developed in 1837 in Aberdeen, Scotland. Early variants were powered by galvanic cells rather than rechargeable batteries. The lead-acid battery was invented in France in 1859 with further French development leading to manufacturing of these batteries on an industrial scale in the early 1880s. This allowed a rechargeable battery to be installed on the vehicle.

Soon manufacturers were selling a wide array of EVs ranging from trams to trolleys, to cars, and even locomotives. Interest in electric cars blossomed in the late 1890s and early 1900s. As roads improved and became more extensive, demand for greater range emerged. A variety of solutions were put forth including the first battery exchanges by an electric utility in Connecticut in 1910 and the first hybrid automobile in 1911. It would not be long until America led the world in number of EVs on the roads.

But the rapid expansion of the country and the limitation of electricity to major cities and towns spelled the end of the electric car. The world wanted to be mobile, and EVs simply did not have the range required. Enter Henry Ford and the mass-produced, affordable internal combustion engine, and the EV’s fate was sealed.

Fast forward to modern times when EVs are dominating the automotive news. Thanks to the explosion of consumer technologies requires even greater innovation, both in technology and work management. Because of this, we will continue to work hard improving operational excellence and preparing for the future.

Vermont’s Comprehensive Energy Plan has a goal that 90 percent of all of Vermont’s energy will come from renewable sources by 2050. This goal creates growth opportunities for electric utilities like VEC since the shift from fossil fuels to electricity is a critical component of this transformation. We plan to do our part to ensure that this shift is economically sustainable for VEC members.

VEC participated in a multi-year study funded by the American Fuel Foundation. The Vermont Electric Co-operative (VEC) is preparing for the future. Prices are dropping and range is expanding so owners can confidently drive nearly everywhere.
The sustained 45 mph winds broke 72 poles across VEC service territory. This was on Swamp Road in Hinesburg.

The Monday, October 30, 2017 wind storm was one of the worst storms we've ever seen. The devastation from sustained 45 mile per hour winds was widespread and extensive. At the height of the damage, about 17,000 or 50 percent of VEC members were without power, 60,000 were without power in Vermont, and almost one million were in the dark in New England. For VEC, it would take seven days, 75 line workers, and almost two million dollars to get everyone back online.

On Friday, October 27, Vermont utilities got the alert that a storm could bring strong winds to Vermont late Sunday into Monday. At VEC we moved into Emergency Planning Level (EPL) yellow, which puts employees on notice that a storm may impact our system. On Sunday, it was clear the storm would hit our area, and we moved into EPL red. Employees acting as Incident Commander and Operations Chief came on-site at VEC headquarters in Johnson at 11:30pm Sunday.

The storm hit harder than expected and by 3:30 Monday morning almost half of VEC's system was down, including fourteen substations. The early morning hours were spent mustering crews and supplies while the winds died down.

Because of the scale of this storm and the massive damage to the entire region, mutual aid crews from nearby utilities were impossible to secure. VEC looked as far away as Illinois to enlist additional crews and equipment. Eighteen line workers from Corn Belt Electric Co-op, Adams Electric Co-op, Jo-Carroll Electric Co-op, and Clay Electric Co-op left on Monday for the 21-hour trip to Johnson and joined VEC crews in the field on Wednesday morning. VEC also received help from Burlington Electric Department and the towns of Orleans and Swanton, and Green Mountain Power. We also had help from 50 line clearance workers and six pole-setting workers.

Restorations were particularly complicated in this outage. First, substations needed to be restored before crews could fully assess damage in other locations and begin repairs on individual lines. Also in a typical storm, we may see a few broken poles. The October wind storm broke 72 poles on our system, and replacing a single pole takes a four-person crew over six hours and requires a bucket truck, a digger, and related equipment.

In VEC's rural service territory, many lines run through fields and forests. The debris from this wind storm was so thick and abundant that many of these rights-of-way needed to be cleaned up before a bucket truck could access the damaged area. It was a slog.

VEC is proud of the work of our 100+ employees every day, but especially in an emergency situation when employees drop everything to get power back on as quickly as possible for members. We are also very appreciative of our members whose patience, kindness, and understanding helps keep us going during long, hard days. Thank you to all who shared a kind word, food, drinks, and other support.
**October Wind Outage by the Numbers**

Total members affected: **17,000**  
Total calls answered: **7,500**  
Broken poles: **72**  
Estimated cost: **$1.8 million**

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**Hidden Heroes**

**NRCC Responds to Oil Leaks During Outages**

Unknown to most people, the National Response Center (NRCC) is a critical part of the clean-up process after a major event like the October Wind Storm. NRCC worked around the clock to respond to oil spills caused by damaged equipment. Most of these are the result of broken pole-mounted transformers. Thank you NRCC for the critical work of protecting the environment during an event like this.

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**GENERATOR SAFETY TIPS**

*Never connect a standby generator into your home’s electrical system. There are only two safe ways to connect a standby generator to your equipment.*

**Stationary Generator:**  
An approved generator transfer switch, which keeps your house circuits separate from the electric co-op, should be installed by a professional.

**Portable Generator:**  
Plug appliances directly into the outlet provided on the generator.

Set up and run your generator in a well-ventilated area outside the home. Make sure it’s out and away from your garage, doors, windows and vents. The carbon monoxide generated is **deadly**.

Use a heavy-duty extension cord to connect electric appliances to the outlet on the generator.  
Start the generator first **before** connecting appliances.

*Source: SafeElectricity.org*
Vermont Electric Cooperative – 31 Points of Pride

Vermont Electric Cooperative was proud to join 30,000 cooperatives nationwide to celebrate National Co-op Month in October, recognizing the many ways cooperatives are committed to strengthening the local communities they serve. Vermont Electric Cooperative is also proud to be member-owned, not-for-profit, and committed to the best interests of our members and their communities. In honor of National Co-op Month, and to demonstrate our pride in what we do and who we do it for, we presented “VEC 31 Points of Pride” on Facebook and Twitter. Here’s a look back at VEC’s 31 Points of Pride:

1. VEC was established in 1938 by farmers in Eden, Vermont, with the goal of bringing electricity to rural Vermonters.

2. VEC is the largest locally-owned electric distribution utility in VT.

3. VEC is nationally recognized for innovative and advanced use of technology.

4. As a member-owned cooperative, VEC is a democratic organization controlled by its members.

5. VEC was founded to serve “unprofitable” parts of rural Lamoille County by-passed by other utilities.

6. VEC is a great employer supporting innovation, creativity, and collaboration.

7. VEC Co-op Community Solar is an easy and efficient way for all members to get great value while supporting clean electricity.

8. VEC serves 32,000 members in 75 communities within 8 counties.

9. VEC is a recognized technology leader—we were one of the first utilities in the U.S. to implement smart grid in 2005.

10. VEC’s Energy Transformation Program helps members transition from using fossil fuels to cleaner electricity.

11. VEC services 2,882 miles of line and 2,056 square miles territory.

12. VEC Co-op Community Solar is perfect for folks renting their home and for houses with a shady site or unsuitable roof.

13. The VEC Community Fund helps member communities by supporting organizations promoting community & economic development.

14. VEC offers financial incentives for the purchase of new or used Electric and Plug-in Hybrid vehicles.

15. VEC offers financial incentives for members who install cold-climate heat pumps. Energy Transformation!

16. VEC provides “patronage capital”—members share of money remaining at year end, after paying operating expenses.

17. By August 2015, Supervisory Control and Data Acquisition (SCADA) was installed at all (36) VEC substations.

18. VEC employees are generous and caring. Lunches to support charities are organized by our employees every couple weeks.

19. VEC members can save time & money by paying their electric bill online with SmartHub.

20. Rate stability is a VEC priority. Our average annual rate increase has been less than 1% over the past 8 years, way below average annual inflation.

21. VEC Bond rating is A+ for past 2 years with a stable outlook.

22. VEC members can sign up for Beat the Peak alerts so they can conserve electricity during peak energy times and help control Co-op energy costs.

23. VEC members save money and save trees by signing up for paperless billing. 6,474 paperless members = more than $45,000 in annual savings.

24. VEC meets or exceeds all Service Quality and Reliability Goals (SQGR) set by the State.

25. VEC power supply portfolio is increasingly clean and green, and we are an industry leader in cost effectively integrating renewables into our power supply portfolio.

26. VEC has three Co-op Community Solar projects: Alburgh, Grand Isle, and Hinesburg.

27. VEC offers members with off-grid or underserved homes and businesses ways to replace fossil fuels with cleaner electricity.

28. Members report an overall customer service rating of 4.8 (out of 5) after service calls.

29. VEC provides reliable electric service! Our outage index is consistently better than state regulatory requirements.

30. VEC is committed to safety and wellness! We have received the Governor’s Award for Excellence in Worksite Wellness for the past four consecutive years.

31. VEC’s mission as a member-owned electric distribution utility is to provide safe, affordable, and reliable energy services to our members. We are proud to serve you!

At the start of 2017, VEC’s financial projections showed that we almost certainly would need to request a rate increase for January 2018. Over the course of the year, staff found unexpected savings in power supply and transmission costs as well as savings in other areas. As a result, we’re happy to report that rates will not increase at the start of 2018.

Like in most areas of life, costs impacting electric rates continue to rise. Cost pressures include Vermont’s net metering program, which requires utilities to compensate producers at rates above retail prices, heavy storm activities, increases in transmission costs, and replacement of natural gas contracts with higher cost renewable contracts.

We don’t expect any of these cost pressures to go away, but we will continue to look for every opportunity to keep electric rates stable. VEC’s rates have increased an average of 0.77 percent each year for the past nine years, which is well under the annual rate of inflation.
VEC Employee Years of Service Awards

VEC is lucky to have dedicated employees who spend years and, in many cases, decades contributing their work and talent to the Co-op and our members. In October, VEC recognized 22 employees for their years of service at an all-employee meeting. VEC employees are recognized at five year milestones. Seven of the employees recently recognized have worked at VEC for 30 years or more. We are thankful to have such talented and committed people to help us fulfill our mission in accordance with the cooperative principles.

A hearty thank you and congratulations to the following VEC employees, who together have contributed 390 years of service to the Co-op!

5 YEARS
- Amanda Fisher
- Gayle Tatro
- Cody Hopkins
- Michael Beaulieu
- Melanie Messier
- Vic Carter
- Justin LaPointe
- Justin Johnson

10 YEARS
- Fred Jewett
- William Johnson
- Jeremy Tinker

15 YEARS
- Nate Perham

20 YEARS
- Avis Marsh
- Orson Hitchcock

25 YEARS
- Dave Lahar

30 YEARS
- Dave Daggett
- Gary Young
- Steve Johnson
- Laurie Wells

35 YEARS
- Rick Langdell

40 YEARS
- Danny McMullen

45 YEARS
- Mary Sylvester

Utility Arborist Jeremy Tinker (left) receives an award from Manager of Forestry Sara Packer and CEO Christine Hallquist.

A costumed Debbie Machia (right), VEC’s Assistant Controller, presented an award (and a lei) to Accounts Payable/Receivable Clerk Avis Marsh (left).

CEO Update

by the Department of Energy, called “Solar Pathways” to identify the best way to meet the goals of the Comprehensive Energy Plan. This resulted in a comprehensive report that was released earlier this year by the Vermont Energy Investment Corporation. The VEC Board of Directors was given a presentation on the findings of the report at their September board meeting. This report gave some excellent technical insights into what will be necessary to meet those goals.

A few important conclusions from the report demonstrate the challenges that VEC and the other Vermont electric utilities face as we develop our long range resource and technology plans. The report assumes that:

• Our transportation and heating/cooling infrastructure will all run on electricity. Presently the electric grid has been sized to manage the peak so it is used only half the time. As long as we do not increase peaks, this creates an opportunity for greater grid efficiency, which would lower cost to VEC members.
• 2,200 megawatts of solar generation will be needed; there are about 200 megawatts today.
• 2,000 megawatts of wind will be needed; there are 119 megawatts today.

Assuming things get built according to plan, over 4,000 megawatts of renewable generation would be available. If we meet the need using only new solar, it would require over 5,000 megawatts of generation due to the lower production factors of solar. Presently, Vermont’s electric grid is designed to carry just over 1,000 megawatts.

The traditional answer to this challenge would be to simply increase capacity by building more poles and wires. However, that is the most expensive solution. We believe the best answer is a combination of solutions:
• Beyond the meter controls (smart appliances)
• Innovative rate structures
• Battery storage
• Strategic grid upgrades

VEC is presently working on all of these solutions. Beyond the meter controls, combined with innovative rate structures, mean we will need to communicate in real time with appliances to incentivize using electricity during times when the grid has availability. This has to be done in a way that does not inconvenience members.

The good news is that the Smart Meter platform that we deployed in 2005 is still an excellent technology for helping to meet this goal.

In the area of storage, VEC is applying the lessons we learned from the deployment and evolution of solar. Utility-scale storage, just like utility-scale solar, is about half the cost of residential storage because of the economy of scale. VEC is working on utility-scale storage projects, planning the first project to be online by the summer of 2018. VEC also has a pilot storage project with a commercial account to test both the grid and member benefits. Since storage costs have come down significantly, VEC plans to aggressively pursue storage options to improve grid efficiency.

In the area of residential storage, there are options available today. However, VEC first must ensure that proper incentives and controls are in place for members. Massive adoption of residential battery storage could create grid problems that increase costs for members if those batteries were charging during a system peak. Peaks are very expensive. VEC is helping to develop the technologies needed through two grants from the Department of Energy. This, combined with our planned technology upgrades, will enable VEC to effectively integrate residential storage in 2020. Meanwhile, for those members who are early adopters or want to take advantage of the batteries for back-up power, they are commercially available today.

The electric grid is one of human kind’s greatest accomplishments. The electric cooperative, the business model that serves 75 percent of America’s land mass, is one of the greatest accomplishments of American ingenuity. Transforming our transportation, heating, and cooling from fossil fuels to electricity, while simultaneously moving to a decentralized electric grid, will be a major challenge of the twenty-first century. The good news is that we are learning every day, and we are well prepared to take on this challenge.

Electric Vehicles

with a little bit of planning. On top of this, the cars are just plain cool. If you’ve never driven an electric vehicle, you are in for a treat. While an internal combustion engine must rev up to speed, an EV has full power at its disposal instantly. Of course, there are limits on this 0-60 mph capability to prevent inexperienced and over-eager drivers from launching themselves into accidents and speeding tickets. EVs are quiet, have well-appointed interiors, and allow you to forever bypass the gas station lines—unless you are in need of some snacks and a slushy. One final word: if you do purchase an EV, be sure to take advantage of VEC’s bill credit incentive. Currently, we’re offering $250 for the purchase of a new or used EV or plug-in hybrid. For leased vehicles, we’re offering $50 per year of the lease. The incentives for EVs are likely to expand in 2018.

Someday, we’ll all be gliding silently – and cleanly – on our travels.
According to the U.S. Energy Information Administration’s Winter Fuels Outlook, we’re in for a winter that is 17% colder than last year and heating fuel prices that are more than 20% higher than last year. And while these are just estimates, Vermonters should be prepared for a long heating season and a possible bump in energy costs. To help keep homes warm and energy bills down, Efficiency Vermont offers these 10 tips for the cold weather months ahead.

1. Keep your heating system in shape

Oil-fired systems need annual maintenance. Gas systems and heat pumps typically need a checkup every two years. And a new filter will go a long way to ward maintaining the efficiency of your furnace and decreasing your heat bills.

2. Take control of the thermostat

Lower the heat as everybody leaves for the day and before going to bed. It costs less to heat up a house as needed than to keep it constantly warm. Programmable and learning thermostats can turn the heat down for you and have the house warm for you according to your schedule.

3. Let the heat reach you

Dust or vacuum radiators, baseboard heaters, air return vents, and heat duct openings regularly and make sure that furniture, carpets, and drapes aren’t between you and the flow of heat.

4. Drafty windows?

Before you consider buying new, energy-efficient windows, it makes financial sense to see that you’re getting the most out of the windows you already have. Replace cracked panes and any cracked or missing glazing, run a bead of caulk around window frames, lock windows firmly in place, and use Low-E storm windows that are easy to install yourself. For drafty doors, use weather stripping and door sweeps.

5. Shut dampers when you’re not using the fireplace

An open fireplace damper pulls warm air from the house, even when there is no fire. Shut dampers after ashes have gone cold.

6. Keep cold out and warmth in

An insulated, air-sealed house stays warmer and costs less to heat. A Home Performance with ENERGY STAR® contractor can do a whole-house assessment and make improvements, now or over time, within your budget. Rebates and financing are available, learn more.

7. Stop paying for escaping heat:

Seal the seams and joints of your furnace ducts to stop costly heat leaks. Insulate ducts that go through unheated spaces like attics or garages. A Home Performance with ENERGY STAR contractor can get this work done.

8. Light up those dark winter nights for less

Replace your incandescent light bulbs with ENERGY STAR LEDs (light-emitting diodes) and use up to 90% less energy for lighting.

9. Look for the blue ENERGY STAR label

If you’re planning to buy a new heating system, appliances, home electronics, or light bulbs, look for the ENERGY STAR label to find the most energy-efficient, top-quality models on the market.

10. Participate in Button Up Vermont activities

Thousands of Vermonters will participate in Button Up events and activities across the state to take energy saving actions to get ready for winter. Visit www.buttonupvermont.org for informational videos, a customizable energy-saving action checklist, and a full list of events and activities.

Have questions? Contact Efficiency Vermont’s Customer Support team with any questions about your energy use and to get practical tips to help you take control of your energy bills. Call 888-921-5990 toll-free, or send an email to info@efficiencyvermont.com.
Two More Co-op Community Solar Projects Coming Online in 2017

VEC's first Co-op Community Solar project in Alburgh came online last December, and now two new projects in Grand Isle and Hinesburg are expected to be up and running by the end of the year. The three projects combined will total over six megawatts.

The Alburgh project has generated about 1.3 million kilowatt-hours in the past 10 months, which is about as much as 225 typical homes use in a year. Once the other two projects are completed, the generation will be about six times that.

Members can sponsor panels in the array for either 10 or 20 years and receive a guaranteed credit back on their monthly electric bills. Almost 100 VEC members have signed up to sponsor 2,343 of the total 3,996 panels in Alburgh. Co-op Community Solar is a great program for members who rent, don’t have a suitable site for solar, or simply prefer an off-site option to support solar.

About 70 percent of the Alburgh project is currently sponsored by VEC members. Whether or not panels are sponsored, all co-op members benefit from the Co-op Community Solar projects because these projects are the most cost-effective way to add solar to our power supply.

Contact us to learn how you can sign up to support solar generation!

www.vermontelectric.coop/community-solar
support@vermontelectric.coop
1-800-832-2667

The 1.3 megawatt solar array in Hinesburg, part of VEC’s Co-op Community Solar program. Photo credit: Encore Renewable Energy

Construction over the summer on the 4.8 megawatt solar project in Grand Isle. Photo credit: Bullrock Corporation

Ready for winter? We’ve got your checklist.

Stay warm and save money this season with these energy-saving solutions. Find resources and videos to help you get the work done at ButtonUpVermont.org.

Each action you take qualifies you for a chance to win Button Up prizes, like a smart thermostat or $500 toward a Home Performance with ENERGY STAR® weatherization project. Enter your actions to win at vtenergydashboard.org/ButtonUpVermont and see what your neighbors are doing to button up.

Weatherization

Talk with a Home Energy Expert
Get a walk-through assessment or energy audit of your home
Undertake comprehensive energy improvements on your home

Do-It-Yourself
Turn down your thermostat or install a programmable thermostat
Close your windows and other gaps along the window frame
Change the filter on your furnace every 6-12 months
Install gasket and switch-plate foam gaskets and outlet safety plugs
Weatherstrip your doors
Make sure cold air returns for forced-air systems are free from blockages
Make sure window casement locks are working and latched
Seal up the fireplace chimney
Add insulation and unribbed radon pipes
Add storm windows and doors

Weatherization

Do-it-Yourself (Advanced)
Air seal and insulate your attic
Insulate and weatherize your basement door
Insulate the box sill and rim joint
Seal up and insulate your attic hatch

Equipment Upgrades
Get a tune-up on your boiler or furnace
Install a cold climate heat pump to displace some of your heating needs
Replace your furnace/boiler with an energy efficient, ENERGY STAR® qualifying model

Hot Water Efficiency
Turn your hot water down to 120 degrees
Install showerheads that use 3.5 gallons/minute or less
Install a heat pump hot water heater
Insulate pipes from the hot water heater

VEC Returned $1 Million in Patronage Capital to Members

In September 2017, VEC returned one million dollars in patronage capital funds to member-owners. This will be the fifth consecutive year that VEC members have received a patronage capital distribution with a total distribution of $3,350,000 in patronage capital dollars to active and former members over those five years.

Patronage capital was distributed to active members as a credit on their September electric bill. Former members with a refund of at least $10 were sent a refund check. Both active and former members have the option of donating their patronage capital dollars to VEC’s Community Fund that works to support local organizations.

Patronage capital is a distinct advantage of cooperative membership. It is a member-owner’s share of the remaining funds after the co-op pays its operating expenses. The VEC Board of Directors determines annually whether the Co-op is in a strong enough financial position to return portions of patronage capital to members.

“We are so proud that the co-op is in a strong financial position and that the Board of Directors has been able to distribute patronage capital for the past 5 years,” said Christine Hallquist, VEC CEO. “Our employees continue to find ways to deliver outstanding service and innovative solutions to our members in a cost effective way,” she said. “We will continue to work hard to continue to do that in the years to come.”

For more information about VEC Patronage capital, visit VEC’s website at www.vermontelectric.coop/patronage-capital or call, 1-800-832-2667.