

2. Innovative Customer Programs

WE DELIVER FOR OUR CUSTOMERS

We are partnering with customers on the energy changes they want to make, while we remain focused on delivering reliable power, excellent service, and innovations that cut carbon and drive down costs.

All of our deliberations and all of our decisions consider what is best for our customers. The innovative programs described in this chapter all are designed to meet the grid modernization opportunities discussed earlier, the imperatives of climate change, and the desires of our customers. These programs help:

- Stabilize and lower customer bills—to participating customers as well as non-participating customers.
- Reduce and time-shift peak demand, helping to keep our thermal, environmentally unfriendly peakers offline and reducing high-cost energy.
- Empowering our customers to take control of their energy usage, enhance their in-home comfort, and reduce their carbon footprint.
- Engaging customers in new ways, providing more transparency and participation in their own energy consumption.
- Enabling customers to have a meaningful impact on reducing Vermont's overall carbon footprint.

We also work to reduce wholesale market costs (particularly at peak demand) to create downward pressure on rates. We open the door to allow customers to go off-grid, and make available opportunities for customers to generate their own power.

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Our Obsessive Approach to Customer Service

Beyond 2018, in continued partnership with our customers, we will work to lower costs through innovation, synergy savings, and efficient operations to attain the new energy future we all seek.

Leading this important transformation through innovation is critical to discovering and delivering ways to lower the cost of maintaining the power grid, while continuing to provide superior customer service. Our culture of innovation, paired with a lean and effective operating approach, gives us confidence during this time of challenging transition.

Partnering with the strong team of Vermont energy leaders, we will continue to navigate and accelerate the transformation to a home-, business-, and community-based energy system that creates broad socio-economic prosperity and positive climate outcomes for the customers we serve.

We are greatly concerned with climate change and the impact fossil fuel use is having on our planet. That is why our energy supply is 60% renewable and 90% carbon free. We are also offering energy transformation opportunities to help customers cut carbon at home, at work, and on the road.

OUR OBSESSIVE APPROACH TO CUSTOMER SERVICE

At Green Mountain Power, we embrace a culture of customer obsession—customers are the focus and North Star of everything we do. We are always thinking of ways to improve the customer experience, from delivering on energy transformation options to leveraging technology. Our overall goal is to be able to communicate with customers in the manner they choose, and to continually exceed their expectations during our interactions.

Our philosophy of customer obsession means we constantly assess our performance and identify ways we can improve—despite routinely exceeding service quality standards. As such, we track our performance and communicate it with our employees. Through that effort, we have maintained our focus on customers over the past several years and continue to yield extremely high satisfaction levels.

We do not pursue awards or recognitions—we simply conduct business with focus and integrity. Nonetheless, we have been recognized for excellence in customer service, innovation in partnership with customers, and leadership in this critical energy transformation.

Fast Company #1 in Energy Innovation

Earlier this year, *Fast Company* Media named Green Mountain Power #1 on its list of the Top 10 Most Innovative Companies in Energy.



Figure 2-1. Fast Company's Green Mountain Power Article

The list honors leading enterprises and rising newcomers that exemplify the best in business and innovation. As part of its rankings, Fast Company releases the “Top Ten Most Innovative Companies” in the world in 36 separate categories from artificial intelligence to wellness. This year, we ranked #1 in Energy, up from #8 last year.

While we are proud to be among the distinguished innovators recognized by Fast Company, we are prouder of the fact that our innovations come directly from our love of our

customers and our obsession with their values and their desires for a low-cost, low-carbon and highly reliable future. We are also inspired by how many companies are embracing innovation and are working to make meaningful change in the energy space.

Our mission focuses on a new way of doing business—helping people use less energy, save money, and dramatically cut carbon emissions, essentially improving lives and transforming communities. The other companies Fast Company selected—including Apple, Netflix, and Square—pursue goals similar to ours. They explore ideas and projects that excite people and enhance the way they live. That’s what drives most innovation at GMP along with a nice healthy dose of respect for the Vermonters we serve.

JD Power’s #2 in Customer Satisfaction

In J.D. Power’s 2018 electric utility residential customer satisfaction study, customers ranked us second highest for mid-sized utilities in the East Region of the country. We have achieved a high ranking three years in a row, demonstrating a strong record of continued excellence. Our results have risen every year over the past six years. In 2012, before merging with CVPS, the J.D. Power satisfaction score was 602. Our score has grown ever since: from 619 in 2013, to 626 in 2014, 656 in 2015, 681 in 2016, 707 in

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2017, and 722 in July 2018, the most recent survey date. This is an increase of 19.93% since 2012.

The J.D. Power report results come directly from customers. Companies in the midsize utility segment serve between 100,000 and 499,999 residential customers. The study measures customer satisfaction with electric utilities by examining power quality and reliability, customer service, cost, billing, corporate citizenship, and communication.

Service Quality and Reliability Performance

In 2014, together with the Department of Public Service, we developed performance standards in the Service Quality and Reliability Performance, Monitoring, and Reporting Plan (SQRP), approved by the Public Utilities Commission.

The SQRP incorporates minimum standards for key service measures linked to customer satisfaction. Our standards cover a wide variety of important performance categories, from call answering and meter reading to billing, reliability, safety, on-time performance, and customer satisfaction. Each category is tracked through specific performance measurement metrics.

We regularly report on our performance under the SQRP. Without exception, we have met every SQRP standard for each quarter since the beginning of 2015. In many cases, we exceed the SQRP standards by significant margins.

High Customer Satisfaction

We also set internal goals and standards that are higher than those included in the SQRP. Research America, an independent survey service provider, quarterly and annually surveys our customers to evaluate our overall performance and customer satisfaction. We find these are invaluable tools to help us find patterns or problems, tweak training when necessary, and address any customer concerns.

Customers continue to be extremely satisfied with our service. Research America surveys find customer satisfaction routinely over 90% quarter after quarter, and year-end satisfaction in 2017 at an astounding 95.6%. Satisfaction has remained steady and high over the past four years.

And we have earned our customers' trust. Last year, when asked about their recent contact with us, 98% of customers said they were satisfied with employee courtesy and 97% felt our employees were very knowledgeable.

Measuring Customer Service Standards

Though the SQRP standards are generally measured quarterly and monthly, we seek to meet our higher internal customer care standards on a weekly, daily, and even hourly basis.

Our internal standards are high because we are committed to exceeding customer and regulator expectations and maintaining a performance level well above industry standards. To better remain vigilant and focused on improving customer experiences, every year, we set higher and higher standards—and each year, we attain them.

Every week, we measure and review these standards during a companywide conference call, as well as reviewing Research America’s quarterly results. We email these SQRP measurements, the Research America results, and our higher internal goals to every employee weekly—highlighting our customer-oriented obsession. It’s through this constant measurement, dissemination, and discussion that we are able to continue to drive progress and incredible outcomes for customers.

Customer-Centric Projects

We continue to develop and implement capital projects that improve customer access and communication. Here are three that will be implemented in the next planning period:

The Commercial and Industrial customer data access portal project will enhance our website to enable commercial and industrial customers to access their accounts and create customized reports to track their usage and costs. Currently, this is a time-consuming manual process that also involves our staff. When the project is completed, C&I customers will be better able to track their energy costs, which can help them achieve their efficiency objectives and control costs.

The customer alerts and communications project will expand text and email alerts to include bill reminders and usage alerts. This will encourage more customers to enroll in text and email alerts, and be more empowered to manage their energy use and costs.

The GMP website project will upgrade and enhance aspects of our website to improve the user interface and general functionality, adding more payment capabilities as well as outage and safety information.

We have a robust process for documenting our rationale for implementing capital projects, incorporating lessons learned, to ensure a strong, secure, resilient power grid that supports the two-way flow of energy and data. (For details on this process, see “Capital Investments Across Six Core Operating Areas” on page 7-4.)

Reliable, Innovative, Cost-Effectively Priced Service

We have delivered on our promise to provide innovative, safe, and reliable services for our customers. While some other states have seen the effects of slow utility storm recovery, our outage duration and frequency numbers are consistently among the lowest in the region.

We strive to maintain stable and affordable rates despite rapid changes and profound challenges in the energy landscape. We have assiduously invested in our state's critical energy infrastructure whenever needed through VELCO, and our electric rates are third lowest overall in New England.

Merger Commitments

We continue to meet our merger commitments.

We merged with the largest utility in the state in 2012, determined to invest in reliability and system improvements that had been deferred by them and create important savings for all of our customers. We promised higher service quality and \$144 million in customer savings over 10 years, and we are on track to deliver significantly more.

In addition, we committed to reduce outage durations by at least 10%. Since 2012, the duration of our Customer Average Interruption Duration Index (CAIDI) measuring outages has already been reduced by 6.2% excluding major storms and 13.5% including our highest impact, major storm events. We are very proud of these results.

EMPOWERING CUSTOMERS TO ACCELERATE THE NEW ENERGY FUTURE

As you read through this IRP, it is important to understand the overarching vision that we are pursuing on behalf of not just our customers, but all Vermonters and beyond. We refuse to sit idly by while the planet continues to heat up to the point of no return. Vermont may be small, but we can be a leader and example of how to transform the energy delivery system to consumers—be it transportation, home heating, or even business processes, in a way that significantly reduced carbon emissions in each area.

With this in mind, we have embarked on a vision of transforming the traditional energy delivery system to one that is highly distributed and ultimately one that relies on the choreography of millions of discrete points, instead of the original path of large

generation supply resources and thousands of miles of transmission connected to customers.

Vermont has made amazing strides toward a distributed energy model with the deployment of solar PV systems throughout the state. On a given spring day, we could actually be meeting a sizeable portion of our total customer demand from local, distributed, solar energy. As we push further into a distributed energy model, the level of intermittency—or ‘wobble’ as it is described in Chapter 8: Portfolio Evaluation—will continue to increase, which ultimately requires the need for flexible, fast-action resources that can be manipulated in a way to counter this intermittency and create an efficiently utilized and high-quality local energy system.

In addition to the intermittency management, strategic electrification of fossil fuel laden processes (such as transportation or home heating) could create new increased peak energy demands if not managed. For this reason, we have jump-started our expertise in managing a fleet of flexible demand resources in connection with various tools, such as the software platforms that are utilized to manage these resources. It has been extremely valuable for us to build up this expertise and library of resources in the early stages so that we can begin to expand and encourage the marketplace to provide these values in innovative ways. Our Bring Your Own Device program (described on 2-16) is intended to spur this opportunity by sharing the value that these flexible devices deliver with both the participating customer as well as all non-participating customers to achieve our vision of reducing carbon while also reducing cost for all customers.

To deliver on this vision, we are partnering with customers to transform their homes and businesses by participating in several energy innovation pilots that help us conserve energy, reduce costs, balance load, increase reliability, and drive down future grid costs.

In the past, the peak energy demand times would occur when air conditioning load was at its peak in the middle of the day, but increasing amounts of solar PV has shifted daily peak to later in the day. Because solar produces its greatest output in the middle of the day, it directly offsets these higher consumption times, thus reducing the daytime peak demand. Vermont now typically sees its peak energy demand occurring well after 5:00 PM, with our highest peak energy consumption occurring in the winter after dark.

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Here are the innovative programs that we currently offer, and that are highlighted on our website:

- Tesla Powerwall 2.0 Battery Pilot
- Remote Water Heater Access Innovative eWater Pilot
- Cold Climate Ductless Heat Pump Pilot
- Electric Vehicle e-Charger Pilot
- Bring Your Own Device

We also offer a number of programs that enable our customers to conserve and better manage energy, including: Nissan LEAF purchase discounts, Chevrolet Bolt purchase discounts, eControl remote heat pump control, low-income EV rebate, and heat pump and heat pump water heater financing. All of these are in addition to our smart and dynamic rate offerings, including Time of Use and Critical Peak Pricing riders, that allow customers to save money by directly managing their usage.

Tesla Powerwall 2.0 Battery Pilot

Tesla's Powerwall 2.0, a 13.5 kWh lithium-ion battery with an integrated inverter, is the industry's premier small energy storage system. Our Tesla Powerwall Grid

Transformation Innovative Pilot—a first-of-its kind program—benefits participating customers by increasing their personal energy reliability as well as non-participating customers through lower reduced system-wide energy costs.

In this Pilot (which started mid-summer 2017), we offer 2,000 Powerwall 2.0 batteries to any residential customer, 100 of which are available to eligible low-income customers at no cost through a grant. While customers who own Powerwall batteries experience direct benefits, all of our customers (those participating and those not) benefit from the program's many realized advantages. This program is now fully subscribed.

Tesla Powerwall 2.0 batteries provide eight to twelve hours of backup power like a standard generator, turn on seamlessly, are cleaner than fossil fuel driven generators, produce zero on-site emissions, are quiet, and require no maintenance whatsoever.

They can be charged from power off the grid, or with a customer's own home solar array.



Figure 2-2. Satisfied Powerwall Battery Owners

Customers participate in the Pilot for \$15 a month for ten years or a \$1,500 one-time fee. They then receive backup power to their home for at least the next decade, which eliminates the need for traditional, fossil-fuel-fired backup generators. These monthly and one-time fees are only a limited fraction of the all-in cost of purchasing and operating the Powerwall 2.0 batteries. We are able to offer these prices to participating customers because, under the terms of the program, the Powerwall batteries can be dispatched to reduce wholesale costs (particularly peak-driven costs). Those estimated savings are shared between participating customers (through a monthly price) and all of our other customers (through lower power and transmission expenses).

Customers who install the Powerwall 2.0 batteries can store their own energy to power their homes during an outage. Those customers with solar installations can create their own energy island, and power their homes even longer during an outage. In addition to this Powerwall Pilot, customers could, under one of our multiple time-of-use plans, purchase a battery directly and use stored energy during higher priced times and use grid-supplied energy during off-peak times.

A \$150,000 grant from the Vermont Low Income Trust for Electricity (VLITE) pays for the cutting-edge technology and its installation in the homes of low-income customers with significant need for backup power reliability because of health and mobility issues. We offer this opportunity to 100 qualifying customers.

This Pilot is unique in the industry. Using Tesla's software platform, we can aggregate the 2,000 Powerwall 2.0 batteries to reduce system-wide peak load by 10 MW—the equivalent of removing about 7,500 homes from the grid. This directly lowers costs for all customers. We use the aggregated Powerwall 2.0 batteries to:

- Store energy when it is abundant and dispatch it at peak times when it is most expensive. This results in significant transmission (regional network service) and capacity (capacity supply obligation) savings and other ancillary market revenues that will be split between participating and non-participating customers (like any classic demand response resource). Even this relatively small capacity of peak control has the potential to save customers over \$2 million over the life of the program.
- Deliver dynamic capacity (energy reserves that can be dispatched when they are needed most) to provide additional grid stability for all customers, especially in areas with significant distributed generation penetration.
- Potentially avoid or reduce the scope of future transmission and distribution-related upgrades and mitigate impacts of high-penetration intermittent resources.
- Increase resiliency, and create strategic storm response plans that will account for the distribution of these resources, potentially decreasing storm restoration costs.

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- Reduce the carbon content of the regional grid during the most carbon-intensive peak events.
- Provide a dynamic reactive power resource that can manage voltage or reduce the flow of reactive power across the delivery system.
- Gain operational experience building, operating, and maintaining a control platform that enables aggregated dispatch of thousands of distributed energy resources, preparing us for third-party involvement in energy platforms.

The software enables us to operate the battery units individually, as an entire fleet, or in specific groupings as needed for a local benefit. In addition, services offered through the software platform can generate new revenue streams through participation in ISO-New England's energy market, operating reserve market, and frequency regulation market.

This Pilot is a core part of our proactive approach to respond to the cost pressures of declining sales, increasing regional transmission and capacity costs, and increasing net metering cost pressures that are impacting the entire New England region. Our strategy is to directly confront these external pressures that are out of our direct control. We are working to reduce our share of transmission and capacity costs via radical peak management that includes, among other things, shared access to devices like the Powerwall batteries. Dispatching them during peak times in a way that is imperceptible to participants helps lower costs for all customers.

In addition, we use Tesla's software platform to better manage distribution system voltages and power quality. We must continually develop new solutions to better manage a power grid that continues to transition to highly distributed, variable energy sources. To achieve this, we must rely more and more on DERs that can provide very fast response to fluctuations on the distribution system. This requires a control platform that can choreograph all the resources and provide the optimal value depending on the location. As the amount of DERs continues to grow, the challenge becomes one of scaling up and automating the management of these energy resources to assure the highest and most efficient use at any given time. This Pilot, with the support of the team at Tesla, includes the development of algorithms to automatically operate the energy resources to the maximum benefit for customers to drive down costs.

In total, the Powerwall batteries in this Pilot become both grid and customer assets. They decrease regional transmission and capacity costs, generate other revenues through participation in ancillary services markets, bring in new revenue for non-participating customers, and increase reliability.

In the future, (and as repeated through this plan), we envision battery energy storage and flexible demand resources as a key tool for managing the future distributed energy

system. We provide more detail on our forward-looking storage strategy in Chapter 8: Portfolio Evaluation, however, some of the highlights are that we will continue to offer storage directly to customers while also creating a market-based platform through the Bring Your Own Device approach, where third parties or aggregators can plug storage, or other flexible demand devices, into our platform creating value for the host customer as well as all customers on our system. Chapter 8 provides further detail on the specific use cases that we see for battery storage, and the relative scale and pace of deployment that we believe makes sense for our customers.

Remote Water Heater Access Innovative eWater Pilot

This Pilot enables shared access to a customer's electric resistance water heater.

To participate in this Pilot, customers receive a small, easy-to-install retrofit kit manufactured by Aquanta. That kit enables us to share access to their water heaters. Through this access, we can turn customer water heaters on and off (with opt out capability), or adjust the temperature up or down, in response to system needs. This Pilot enhances our previous water heater access program (which is less flexible, only enabling load reductions) in which 16,000 customers are enrolled.



Figure 2-3. Remote Water Heater Access eWater Pilot

The device itself is an electrical component that installs directly onto an electric resistance water heater, and communicates with both the customer and us via the customer's Wi-Fi internet connection. The device ensures customers remain comfortable by establishing high and low temperature settings; if the water heater's temperature falls below the low setting, it automatically turns back on. Customers can also turn their water heaters down when leaving for vacation, then turn the water heater's

temperature back up remotely before they arrive home. Participating customers also receive a Nest smart thermostat as a way to increase their energy savings. As part of this Pilot, Nest offers voluntary enrollment in their Seasonal Savings program. This program adjusts the thermostat's temperature within a pre-defined limit of degrees, further reducing energy costs. Customers can also control the thermostat remotely.

We expect to enroll 400 customers in this Pilot by the end of 2018. There is no cost for participating customers. As an incentive for participation, customers can choose to receive a Nest smart thermostat, six smart LED light bulbs, or a donation in their name of equal value into the state's Warmth program.

The Pilot enables us to better manage a power grid that is inexorably transitioning to variable renewable generation and DERs. Through the Pilot, we can turn off or turn down water heaters during peak demand, thus reducing the cost of energy to all our customers. We also anticipate that this two-directional capability will enable additional cost savings by increasing water heating during periods when energy market prices are unusually low, and decreasing water heating when energy market prices are temporarily very high, essentially using the water heater as a thermal battery. The Pilot also provides the means to store solar energy in the form of hot water from peak solar generation times to be dispatched later, essentially utilizing a water heater like a large thermal battery.

Smart thermostats reduce carbon emissions by making heating (and in some cases, cooling systems) more efficient to operate. This benefit not only helps meet Vermont's goal of reduced greenhouse gas emissions, but also provides another resource for meeting RES Tier III requirements.

Electric water heaters are an excellent form of energy storage that already exist in tens of thousands of homes in our territory. We plan to transition this pilot into a tariff offering, for customers, terms which will be based on the results of the data collected and analyzed from the pilot period. As with all of our offerings, we believe that customers should have a choice in how to procure their equipment; therefore, we will offer water heater controls both directly and through the BYOD platform where customers can procure their own systems through a third-party provider and integrate it with us.

Through our traditional water heater control program, we know that 16,000 controlled water heaters yield roughly 3 MWs of peak reducing value. With this number in mind, we believe that there is an additional opportunity of about 3 MWs of controllable water heater value in the residential and small commercial installations. As with any customer-side flexible resource, we must balance the value that the resource provides against the share of that value provided to the participating customer. The higher the incentive, the higher the uptake—but the lower the benefit to non-participating customers. The pilots allow us to find that sweet spot and get the greatest amount of resource possible.

Because this new water heater control platform allows for greater flexibility than the traditional on-off only water heater control, for customers that are currently on our Rate 03, we will look to explore the opportunity to transition those existing Rate 03 customers to this new platform over the next year.

Cold Climate Air Source Heat Pump and Heat Pump Water Heater Pilot

A cold climate heat pump is much cleaner and more efficient compared to oil or propane systems, and doubles as a cooling system in the summer. Ductless models excel

in cold climates like Vermont's. Heat pump water heaters reduce your energy costs as well when replacing a fossil fuel or electrical resistance water heater.



Figure 2-4. A Customer with Their Ductless Heat Pump

Our Cold Climate Air Source Heat Pump Pilot and Heat Pump Water Heater are also a resource toward meeting our carbon reductions for RES Tier III. We partnered with VSECU to offer customers attractive financing options for purchasing heat pumps and heat pump water heaters. Customers can finance their heat pump and heat pump water heaters along with installation through VSECU's affordable VGreen loan program, which offers flexible down payment, monthly payment, and loan term options. Customers also have the option of purchasing the equipment outright through a private company. Either way,

customers receive a Sensibo Sky control device free of charge with their heat pump. This device gives the customer the ability to remotely control their heat pump over their smart phone as well as provides us the ability to access the heat pump.



Figure 2-5. Sensibo Heat Pump Control Device

After installing the Sensibo app onto a smartphone, a customer can program their heat pump to pre-cool or pre-heat their home based on the time of day. Customers can also put their heat pump on a schedule, which has the potential to save even more money.

This eControl program is another way we partner with our customers to reduce peak energy demand—such as on hot summer days when energy is expensive. By enrolling, customers agree to allow us to adjust their heat pump (or air conditioner) up or down a few degrees when demand is high and energy the most expensive. We make this adjustment for, at most, one to three hours, six to eight times a

month. During these times, we alert customers via their smartphone that we need to adjust their heat pump or air conditioner. Customers can opt out if they wish. Changing the temperature of all devices enrolled in the eControl program, even by a few degrees,

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helps reduce peak energy demand, which creates savings for all customers and lessens the impact to the grid.

We work closely with customers to ensure they receive the most benefit from participating in the Pilot. Through an onsite visit with a qualified assessor, we help customers determine how best to participate in the program, educate customers about heat pumps, help decide where best to install the unit, walk them through the financing process, and then schedule an installation with one of our trusted installers.

Once installed, we consult with customers on how to use the control device to gain maximum benefit. Then, annually for the first seven years, we service their heat pump to ensure the unit is operating at maximum efficiency.

Along the way, we will be assessing this Pilot to determine how the new financing affected participation levels; how annual servicing affected a heat pump's operation; how working with third-party partners could be employed in other pilots; how effective were heat pumps as distributed energy resources; and how controlling these grid assets through our DERM platform lowered energy costs and reduced peak demand periods.

Water heaters consume a lot of energy; traditional electric resistance usually cost about \$400 annually to operate. A heat pump water heater operates more efficiently, costing about half as much to operate, saving more than \$1,400 over the unit's lifetime. Heat pump water heaters operate at 550 watts, while standard water heaters operate at 4,500 watts. Besides saving money every month on an energy bill, they also reduce carbon emissions.



Figure 2-6. Heat Pump Water Heater and Dehumidifier

Heat pump water heaters absorb naturally occurring heat from the surrounding air and transfer that captured heat to the water. Through this water heating process, they also remove moisture in the air—essentially acting as a dehumidifier—that helps your basement stay nice and dry. This results in lower electricity use and energy cost savings.

Our customers can obtain affordable financing through our partnership with VSECU. This financing features low fixed-rate interest and flexible payment options, and covers the cost of the unit and its

installation. In addition, customers can receive a rebate of up to \$500 off the purchase price through Efficiency Vermont.

We will continue to directly offer cold climate air source heat pumps and heat pump water heaters to customers through a variety of offerings. This includes a proposed tariff currently being reviewed by the DPS to offer the Heat Pump and Heat Pump Water heater directly to customers, as well as a continuation of the VSECU program.

Electric Vehicle e-Charger Pilot

This Pilot offers up to 300 customers a free Level 2 electric vehicle charger as an incentive to purchase a new all-electric or plug-in hybrid electric vehicle. Customers who already own a qualifying EV can also participate in the Pilot for a low monthly fee.

Customers are responsible for installing and commissioning their EV charger.



Figure 2-7. Level 2 Electric Vehicle e-Charger

Customers participating in this Pilot as well as all other customers who already own an EV charger can enroll in our EV Unlimited plan. This plan encourages unlimited off-peak charging for up to two EVs for a flat monthly price for each EV. We notify customers between 8 and 24 hours before a peak demand event. Customers who elect to opt out and charge during a peak demand event are billed a higher per-kWh fee.

In exchange for participating in this Pilot, customers agree to allow us access to their EV charger so that we can manage and reduce demand during peak energy usage, saving money for all our customers. In addition, we project that 90% of all Pilot participants will purchase a new EV, thus contributing toward our annual RES Tier III goal.

This pilot not only provides valuable data on how EV charging functions on the delivery system, but also sets us up very early on to manage what could be a substantial additional peak demand if left unmanaged. By providing smart charging equipment and integrating into the energy management platform, we are able to not only mitigate the demand impacts, but also potentially extract further value through energy arbitrage or other similar benefits for customers. In Chapter 4: Declining Electricity Demand, we provide greater detail on sensitivities that we reviewed about the deployment pace of EVs.

The e-Charger Pilot will come to an end at the beginning of 2019. We are planning to transition to an EV Tariff that will allow customers who prefer it to pay a flat fee rate for 100% renewable energy charging. We will also continue our Tier III charger program and look for ways to enable greater electrification through altering demand charges or time-of-use rates to encourage deployment of EV infrastructure. The range of potential outcomes in the EV space is quite wide which is why we ran a low, base, and high case sensitivity analyses for EV deployment trajectories and how each will impact energy and demand on the system. All signs point to the importance of a strong control and shared access management program.

Bring Your Own Device

A goal in all of our piloting has been to learn fast and expand in a way that helps the marketplace provide solutions to customers, together with us. This led us to develop the Bring Your Own Device program.

This program allows customers to connect their energy storage devices to the grid and receive credits on their energy bill in exchange for allowing us to dispatch their system. By enrolling in the Bring Your Own Device program, customers allow us to use their connected device to reduce the amount of energy that their home or business is consuming at that moment, or shift the time that the energy is used. Both help us better manage the grid transformation toward distributed renewable generation and minimize energy peaks, reducing the highest-costing energy, which reduces costs for all customers.

GMP's Bring Your Own Device Program

Our Bring Your Own Device program allows Green Mountain Power customers to connect their energy storage devices to the GMP grid and receive credits on their energy bill.



The program allows our customers to independently purchase their own battery energy storage solution from one of Vermont's energy solution providers. Currently, the eligible energy storage devices are the Tesla Powerwall 2.0 battery, SolarEdge StorEdge compatible storage systems, Sonnen battery

Figure 2-8. Bring Your Own Device Energy Storage Program

storage system, and Sunverge battery energy storage system. We will evaluate the commercial options available to customers throughout the Pilot period.

Monthly bill credits depend on the amount of stored energy we use to moderate peak demand. The amount of energy we apply ranges from 2 kW to 5.9 kW, to which customers receive a monthly credit ranging from \$14.50 to \$36.00.

We plan to expand our Bring Your Own Device platform beyond just batteries and wrap in other flexible demand devices that we have proven add value through our other pilots. This will include flexible resources such as water heater controls, level 2 EV chargers, and thermostats. Opening the platform to these devices increases a customer's option for obtaining compatible devices, while helping us take advantage of additional distributed resources that are increasingly important to dynamically managing the grid and reducing costs for all customers. And most importantly, it provides a very simple way for the customer or provider to integrate the device with our system.

In addition to the standard value sharing provided for peak reduction, we will be piloting an expanded Bring Your Own Device platform that includes additional value based on the locational needs on the distribution system (such as in a heavily solar-saturated area). While it is not yet clear how upgrades to solar-saturated distribution circuits should be handled, we do believe it is worthwhile to pilot the Bring Your Own Device program with an added incentive when a system is sited in one of these areas and can be used to absorb excess solar generation during the middle of the day, to determine the overall effect on this problem.

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Enabling Customer Energy Conservation and Management

We currently offer several programs that enable customer to conserve and better manage energy: Nissan LEAF purchase discount, Chevrolet Bolt purchase discount, low-income EV rebate, eControl remote heat pump control, and heat pump water heater financing.

Here are descriptions of our current offerings. We plan to evaluate and add similar programs throughout the next planning period.

Nissan LEAF Purchase Discount

The 2019 Nissan LEAF's driving range is about 150 miles on a single charge, making it an attractive option for local driving as well as a way to reduce automobile emissions.



Figure 2-9. Nissan LEAF All-Electric Vehicle

Through a partnership with Freedom Nissan (South Burlington) and Nissan of Keene, New Hampshire, our customers and employees can choose from two incentives to purchase a 2019 Nissan LEAF electric vehicle: receive \$5,000 off the manufacturer's suggested retail price or 0% annual percentage rate financing for up to 72 months. To sweeten the deal, federal

tax incentives of up to \$7,500 could result in an overall saving of up to \$12,000.

Customers or employees who choose the \$5,000 price reduction are also eligible to apply for a Green Vehicle Loan from VSECU (a statewide credit union). This loan offers lower fixed interest rates, flexible terms, and online and mobile payment options.

Chevrolet Bolt Purchase Discount

With a 238 mile driving range on a single charge, the Chevrolet Bolt makes an option for people wanting to save money on gas while having a positive effect on our environment.



Figure 2-10. Chevrolet Bolt All-Electric Vehicle

Through our partnership with Alderman's Chevrolet in Rutland, our customers and employees can receive General Motors employee discount pricing on the all-electric Bolt and the plug-in electric hybrid Volt. Customers and employees can also take advantage of other Alderman incentives, as well as federal tax incentives of up to \$7,500.

As with the LEAF, customers or employees are also eligible for a Green Vehicle Loan from VSECU.

Low-Income EV Rebate

This program is yet another way we are creating incentives for customers to reduce their carbon footprint. Qualifying low-to-moderate income customers can receive a \$600 rebate when purchasing any new electric vehicle with a price tag of less than \$50,000. Customers simply complete a rebate form and send it to us. If they qualify, we send them a \$600 check.

Innovation During the Planning Period

To reiterate, the overarching purpose of these pilots has been to build up a library of resources that will be critical in allowing us to transition the energy delivery system to one that is heavily distributed, significantly less carbon intensive, highly reliable, and lower cost. As Tier III of the RES statute lays out, strategic electrification will be a major contributor toward achieving our carbon targets. At the same time, we will need to employ the appropriate level of technology to mitigate any adverse impacts such as exacerbating peak demand in the winter. Our pilots have built up the toolset to allow this, whether through direct control of the resource or by offsetting the impact of peak through other resources like batteries.

Over the IRP planning period, we will be offering battery storage directly to customers either bundled with other goods and services or standalone. We will also offer control

devices for various resources along with the smart EV charging equipment. Equally as important will be the expansion of the Bring Your Own Device program where any third party can integrate certain flexible assets into our platform and tap into the various market values that are available through us, while providing a value to all customers. We plan to further expand Bring Your Own Device by testing out locational incremental value in areas such as high solar PV penetration locations on the distribution system. While it is not yet clear what ability we have to manage the increase of solar saturation through solar hosting capacity, we do believe it is an appropriate test of the Bring Your Own Device pilot to see what types of solutions come forward and what their ultimate costs are. Success in these programs would look like the addition of 10 MWs of flexible demand resources over the next three years with at least 3 MWs able to provide multiple benefits such as adding locational value.

COMMUNICATING WITH OUR CUSTOMERS

Part of partnering with our customers and delivering the best service means we have an ongoing conversation with them to share as much information as we can about what we are doing and why we are doing it. From safety tips and weather information leading up to storms, to outage restoration work updates, to exploring new innovations to help customers cut carbon and costs, we regularly use multiple media platforms to reach all of those we serve.

As a reliable energy partner, we communicate with our customer in myriad ways, which allows them to connect with us in the way they like best. Customers can choose to access our integrated voice response phone system (which employs interactive voice response (IVR) technology to automate most transactions) or to speak directly with a customer care representative. We operate walk-in service centers at our Colchester headquarters, at our Rutland operations headquarters, and at dozens of retail locations across the state.

We offer self-service functions on multiple platforms, including text, our mobile app, and our website. In addition, we routinely communicate with customers, including individually, through email and social media, including Facebook and Twitter. Before storms hit, we communicate through text alerts, social media, press releases, and website updates to ensure customers are well informed. During major storm events, we make outbound calls and employ door-to-door outreach in many cases. Almost 37,000 customers have enrolled in text alerts; that number grows by about 200 per week.

Our new web-based self-service functions allow customers to change billing addresses, set up payment arrangements, stop service at their convenience 24 hours a day, as well as many other tasks. Over 45,000 accounts are enrolled in automatic recurring payments (increasing by 50 to 75 weekly), and over 50,000 have downloaded our mobile app (increasing by about 300 weekly).

We continue to encourage the use of paperless billing, online accounts, and automated recurring payments, for ease of use to customers and to cut back on costs. We currently have approximately 54,000 accounts enrolled in electronic billing; this amount grows by 100 per week. Mailing paper bills costs about 51.5¢ per month per mailing; thus each account receiving an electronic bill saves \$6.18 annually, for a cumulative total of well over \$309,000 a year.

Any enrolled customer can view detailed information online about their own energy usage and load profiles, to help educate themselves about their costs and ways to manage it.

These technological investments enable us to better interact and communicate with our customers, improve efficiency, and play a critical role in our success with customer satisfaction. We are constantly looking for new ways to reach our customers and facilitate improved communications.

Social Media and Local Area Electronic Information Boards

Social media plays a critical role in reaching customers, especially during severe weather. We can broadcast key info, which customers share, plus we can answer customer questions in real time.

Facebook

We have about 22,000 followers on Facebook. They are an active community, making it a great way for us to share news about storms and answer questions as the situation

2. Innovative Customer Programs

Communicating with Our Customers

develops. For example, Figure 2-11 shows our Facebook post about a storm update; Figure 2-12 shows the ensuing dialog of our Facebook community.



Figure 2-11. Storm Update on Facebook



Figure 2-12. Facebook Community Storm Comment Stream

We also engage with customers about our innovative programs, using static posts and Facebook live. For example, Figure 2-13 shows our Facebook post to promote the federal tax credit on the purchase of a 2018 Chevy Bolt 100% electric vehicle. We have also used Facebook to promote our other innovation programs, such as the free in-home Level 2 charger.

Figure 2-14 depicts our Facebook post promoting a 30-minute “Ask An Expert” segment on electric vehicles with questions from followers and answers from the experts, which can be viewed through this link:

<https://www.facebook.com/GreenMountainPower/videos/316496345780742/>

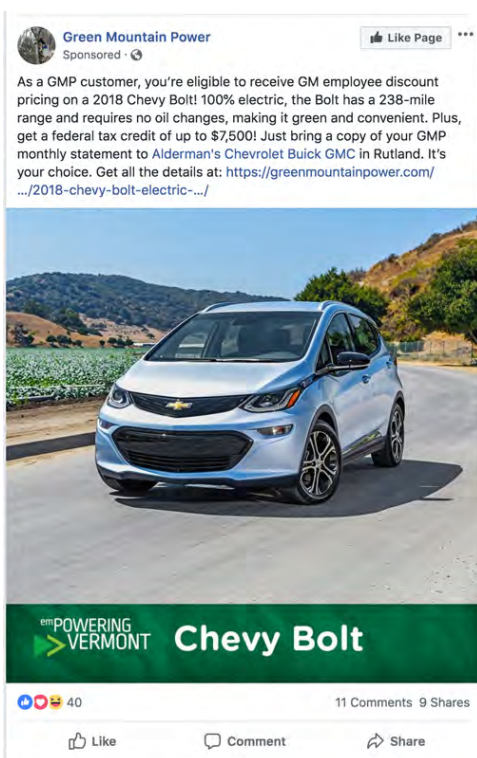


Figure 2-13. Chevy Volt Facebook Promotion



Figure 2-14. Facebook Post Promoting an “Ask An Expert” Segment

Twitter

We amplify our Facebook messages by posting the same or slightly abbreviated information on

Twitter. Our Twitter following is smaller than Facebook, however we reach a different group of customers.

Front Porch Forum

We post monthly on Front Porch Forum in communities around the state—an extremely localized bulletin board. The information we share usually has tips to save money, cut carbon emissions, or increase safety or convenience. We also provide updates about impending or ongoing major storm events. Figure 2-15 depicts a post

about helping customers save money by enrolling in our program to reduce peak demand.

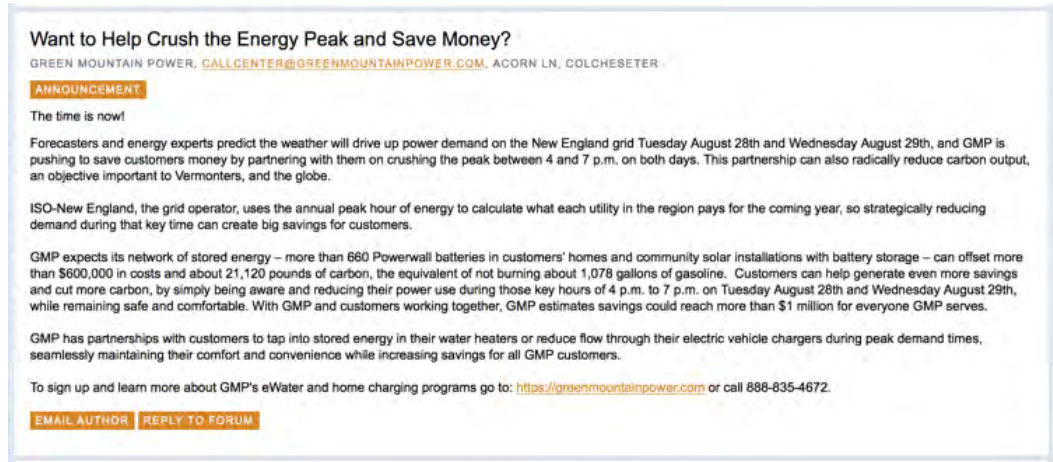


Figure 2-15. Front Porch Forum Post on Helping Customers Save Money

Communication Platforms

We have multiple platforms of our own that we use to communicate with customers—our website, a mobile app, even messages on monthly bills help us to explain customers' energy usage, offer tips and discounts, and share critical information during storms.

Text Alerts

Over 36,000 customers have enrolled to receive our text alerts. We send information about impending storms so customers can prepare. Once a storm hits, we text updates and estimated power restoration times for their location.

GMP Electric Smartphone App

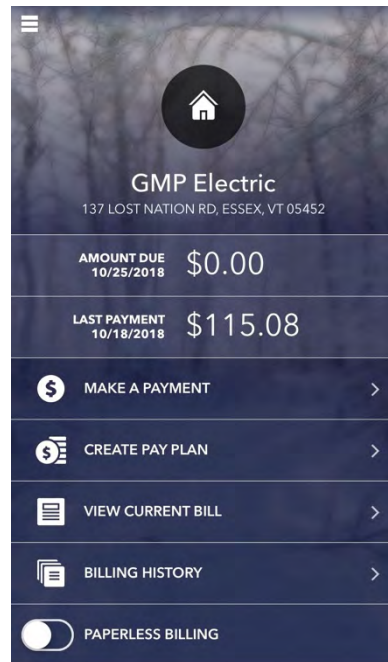


Figure 2-16. GMP Electric App Interface

Nearly 48,000 customers have downloaded the GMP Electric smartphone app. After registering, customers can perform a myriad of tasks to help them manage their account: make a payment, create a pay plan, view their current bill, and review their billing history. In addition, they can view a graph of their energy consumption, report and check on outages, review payment locations, and contact us directly.

The GMP Electric app is a great way to keep connected with our customers, especially if there is a power outage.

Our Outage Center and Map

This is another way we continue the ongoing partnership with our customers and increase transparency. They can report outages in our online outage center, and they can use the interactive map to see, in real time, where outages are, zoom in on a location, get details about the cause of an outage (a tree on line, a vehicle crash, or other reasons), and see estimated restoration times. Our IT team developed this map so it can load easily on mobile phones—because that’s mainly what customers use when the power is out.

GreenMountainPower.com

Our website is robust and shares a lot of information with customers. Residential and commercial customers can manage their accounts, learn about where their power comes

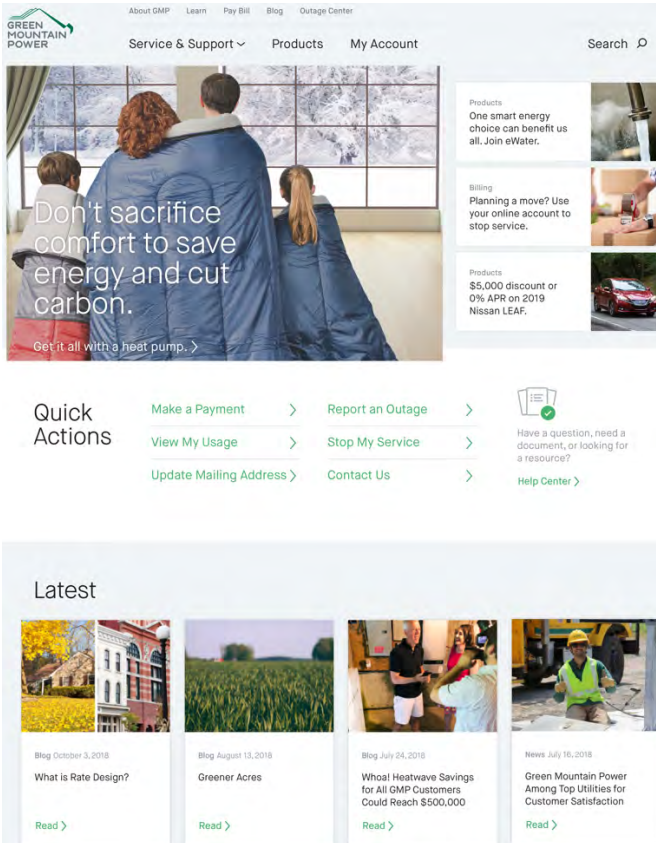


Figure 2-17. GreenMountainPower.com Home Page

from, look at regulatory and legal filings, or browse products we offer to help them cut carbon, cut costs, and increase comfort. We have blog posts on new initiatives and other big announcements, and an archive of news releases, too.

In early December, we will have information about this 2018 IRP on the web site. Customers will be able to read about our IRP and how it impacts them, as well as download the Executive Summary and the entire report.

Our Call Center

We have 15 service centers scattered throughout the state. Our customer service representatives are right here in Vermont and take about 340,000 routine customer service calls every year. Every day they work with customers to answer billing or service questions, set up new accounts,

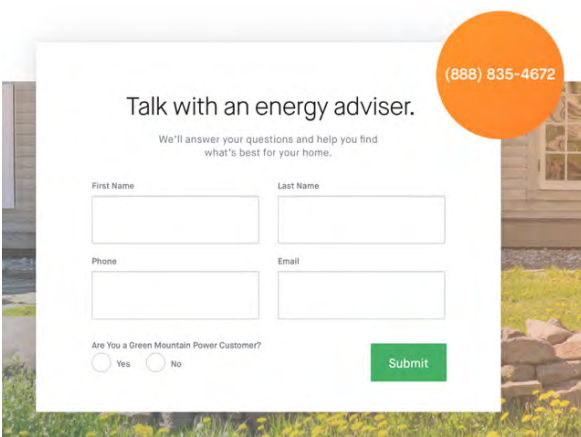
or even help them get help paying their bills.

During storms, our customer service representatives are a key piece of the company-wide effort to get the power back on. They are trained to handle the flood of calls that severe weather can create, providing critical information to customers when they need it most.

Energy Statement

Customers receive bills from us once a month. In that mailing, we include helpful messages about safety, or ways to save energy and increase convenience along with billing information. When appropriate, we also include news about regulatory filings and public hearings, such as when this IRP has been filed and how to access it through our website. The bill's actual layout was redesigned recently to help customers clearly navigate the information they're receiving about their accounts.

Talk Directly with an Energy Advisor



Talk with an energy adviser.
We'll answer your questions and help you find what's best for your home.

First Name Last Name

Phone Email

Are You a Green Mountain Power Customer?
 Yes No

Submit

(888) 835-4672

Figure 2-18. Energy Advisor Online Request Form

Our Energy Advisors work with customers on the phone and do home visits to help customers learn about the products and services we offer. From heat pump installations to Level 2 electric vehicle car chargers to smart thermostats for water heaters, Energy Advisors work with customers so they know how the product or service will impact the energy they use, the carbon they cut, and ultimately what it means for their energy bill so customers can make smart choices.

Customers can schedule a conversation simply by completing the online request form.

COMMUNICATION INNOVATIONS DURING THE PLANNING PERIOD

We are considering ways to deepen customer engagement even further. Feedback from both the DPS and the Commission has us seeking more opportunities to explain our work and the way the regulatory process supports and oversees it.

We are developing plans to conduct biannual open houses for customers and the broader public. One would be in the southern part of the state and the other farther north, rotating around all our district offices over time. We would bring company leaders and field team members to these meetings. The meetings would provide us the opportunity to review our rate-related filings and Multi-Year Regulation Plan, along with operations, safety, reliability, and customer programs.

The meetings would be scheduled for at least an hour, but go as long as the public attending warrant it should go, with plenty of time for questions and answers. We would also live-stream the meetings through our Facebook pages to broaden opportunities for customers and the public to participate or watch live, posting videos for later viewing. We would publicize these events in many ways, including local newspapers, bill messages, and on our website and Facebook page.

We are also planning to seek engagement in a new way with local public access channels across the state to further educate customers and the public about energy innovation and GMP in new and different ways.