Project Number and Title	Additional Information	Project Description	Project Justification
New Initiatives - Interim Period (Oct. 2017 - Dec. 2018)			
159740: 2018 Tesla	Project Type: New Initiatives In-Service Month: 3,6,9,12 In-Service Year: 2018 Primary Purpose: Innovation Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $9,670,639	The Grid Transformation/Tesla Powerwall 2.0 Pilot offers customers the option to have a Powerwall 2 installed in their home for $15/month for ten years, or for a one time, upfront $1,500 charge. The battery is available to the customer for backup power, providing increased reliability in times of grid outage. GMP utilizes the Powerwalls to reduce peak costs during our monthly transmission peak, and our annual capacity peak. This is done by using Tesla's GridLogic aggregation software platform, and allows GMP the ability to control the charging and discharging of each unit individually, and in aggregated groups. This pilot is an important part of our overall strategy to do everything we can to reduce our peak charges while improving customer resiliency.	This Pilot is necessary to increase reliability for participating customers, and to reduce overall system costs for all GMP customers. The Powerwalls represent a valuable asset on GMP's grid that allows for dynamic control of resources to help reduce our peak load while also creating a new tool that can be utilized to manage a distributed energy system – like the one we are shifting towards. GMP began the pilot deployment in the fall of 2017 with the intention of waiting to introduce these into the 2019 rate request. We must continually find new tools and resources to drive down power supply expenses and create new, 'non-traditional' revenues, that flow back to non-participating customers. This pilot provides both while giving the host customer an alternative to a fossil-fuel-fired generator for backup power. Note that the PowerWall program is closed to plant on a quarterly basis, however, this Financial Analysis summarizes the entire program costs.
143538: Residential Battery Storage	Project Type: New Initiatives In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Innovation Secondary Purpose: n/a Priority: Recommended Total Project Spending: $12,158	This project was used to purchase a Sunverge residential energy storage system to test its functionality and usefulness as a distributed energy resource on GMP's grid. This project included the procurement of the battery system and allowed us to test additional battery options in anticipation of rolling out a Bring Your Own Device Program where customers could have options to procure certain batteries directly or through other suppliers. The customer performed their own installation.	The project was necessary in order to gain an understanding of the various types of energy storage systems available in the market to determine which system(s) created enough value to be used in a broader context for GMP. Energy storage represents a significant part of GMP's future, so it was important to test and verify which systems are worth exploring deeper. It was also important to understand the functionality and reliability of the system, assuring as much as possible that these systems would perform as expected when in customers homes or businesses, and that we are able to tap into them during the peak demand times.
148976: BTM Controls	Project Type: New Initiatives In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Innovation Secondary Purpose: n/a Priority: Recommended Total Project Spending: $74,927	Behind the Meter (BTM) Controls are used for implementation and integration of various 'smart devices' into the Virtual Peaker platform. This project was also used for the procurement of various 'smart devices' to be installed and tested to determine their functionality, reliability and value to GMP. These included Aquanta water heater controls, Tado heat pump control, Sense monitoring devices, and other communication and control devices that allow integration of distributed energy resources.	This project was important for evaluating the ability to control certain remote devices, and the technology was necessary to determine which devices were able to provide the functionality and value that GMP was seeking in order to share value back to all customers and better understand the role that Distributed Energy resources can play on the distribution grid. The software integration and devices included in this project create a network of distributed energy resources that can help GMP reduce overall costs while providing us with a new toolset that can be leveraged in how we plan and operate the distribution system.
148978: ePark	Project Type: New Initiatives In-Service Month: 5 In-Service Year: 2018 Primary Purpose: Innovation Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $154,780	GMP is providing a reliability solution for a distribution line feeding Emerald Lake State Park in Dorset, VT. The line that feeds the B and C loop is aged and in need of replacement (estimated at $120,000- Attachment – 148978 GMP Estimate.pdf). Over the past two years, the line experienced 23 reliability events, resulting in restoration costs. Rather than continue to maintain this challenging line or replace it in a location and manner that will inevitably lead to the same issues, GMP is taking a transformational approach by providing Emerald Lake State Park with power using a solar array and batteries to take the park off-grid. With these improvements, GMP will retire the troubled line saving costs for all GMP customers and vastly improving reliability for the park. The park uses minimal energy at a couple of locations including a few bathroom facilities and ranger house. Furthermore, the park closes during the winter months, however, GMP must continue to maintain that line throughout the winter to assure we don't have any public safety hazards. This solution eliminates the need for that, as well as ongoing maintenance of the line such as tree trimming. For technical specifications, we will be constructing a 10.24 kW Solar Electric System 32 Photovoltaic Modules, UL listed manufacturer, Solarworld SunModule XL SW320 mono, or equivalent. 25 year manufacturer's warranty. Solar module installation on DPW Top of the Pole mounting system. Schneider-Electric Conext XW+ Inverter Chargers with XW MPPT Charge Controllers and 24 SimpliPhi 3.4kWh lithium ion batteries. We will also build an enclosure near the entrance to a mechanical room on Restroom C. Underground cable is used in conduit, connecting the solar array to Camping Area C Restroom and then to Building B and "Little B" in Camping Area B. All NEC-code compliant wiring components is required for complete installation.	As noted above, the existing distribution line is in need of replacement, and has had a significant number of outages that require regular repair. The ePark project will increase reliability and customer satisfaction due to its efficient, no-maintenance nature, and will help reduce operating costs for GMP and the rest of our customers by eliminating maintenance of an entire line. An outage at this location requires 2 crews for a minimum of 4 hours at a cost of approximately $236/hour per crew. Averaging 11.5 outages per year, this is a total avoided maintenance cost of $22,000. This specific distribution line runs off road through dense woods and a swampy area which makes access very challenging and adds to the cost and duration of restoration. GMP will be removing the line in 2018 after a trial run of the off grid to assure that everything functions appropriately.

Project Number and Title	Additional Information	Project Description	Project Justification
153462: 2018 Heat Pumps	Project Type: New Initiatives In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Innovation Secondary Purpose: n/a Priority: Recommended Total Project Spending: $1,172,515	Under Green Mountain Power's Heat Pump Pilot, GMP sells heat pumps to customers in its service territory over a 15-year term. In July 2018 the heat pump program model will change to offer customers three options: 1) finance through Vermont State Employees Credit Union (VSECU), 2) cash or 3) heat pump as a service. The existing heat pump program offers a convenient no upfront payment and includes the cost of installation by qualified contractors and maintenance. A GMP representative maintains contact with the customer throughout the process. The benefit to participating customers is that the heat pump efficiently heats and cools their homes, increases their comfort, may reduce their costs and reduces their greenhouse gas emissions. Increased intelligent electrical usage provides a direct benefit to non-participating customers by spreading fixed costs while reducing greenhouse gases. The monthly cost for a participating customer varies based on the size of the unit being installed and the complexity of the installation. The size of the unit is determined by the footprint of the property in which the unit is to be utilized. The footprint consists of the square footage and the openness of the floor plan. The heat pump installed consists of a condenser located on the outside of the house and a single or multi-unit (when applicable) interior wall unit or floor model. Deployment of the technology continues to grow with increasing awareness of the program through word of mouth by neighbors, friends and family and marketing by a host of organizations in the public and private sector. As a result of this, we expect our program to continue to grow in popularity. As shown in Exhibit 2, most of the spend for this project is for heat pumps already installed under the existing pilot. From July through September 2018, we anticipate fewer units sold under this project as the VSECU-financing model ramps up. The revenue generated from the heat pump lease program and increased retail energy sales is currently benefitting all customers by reducing GMP's cost-of-service. Participating customers are charged for the heat pump as a line item on the customer's GMP energy statement.	The State of Vermont, our Customers, and Green Mountain Power understand the need to transform the way that we use energy. In fact, Act 56 requires utilities to find ways to reduce carbon emissions in the electric, thermal and transportation sectors. It encourages innovation that not only reduces carbon emissions but also reduces costs. GMP's Heat Pump program helps to achieve these goals by reducing costs not only for the customers participating in this program but for all of our customers. The revenue generated from the heat pump program covers the costs of the program and contributes to lowering rates for all customers. The heat pump program also helps to satisfy Tier 3 of the Renewable Energy Standard ("RES"), which requires Vermont Distribution Utilities to deliver customer-facing transformative energy projects that decrease fossil fuel consumption and greenhouse gas emissions. The targets set forth by the RES Statute for GMP require us to deliver transformative energy projects representing 2% of our retail sales in 2017 and increase to 12% by 2032. They also require that a mix or resources and measures be utilized to achieve these goals as cost effectively as possible. This program represents an option that provides a net benefit to non-participating customers.
153463: 2018 Heat Pump Water Heaters	Project Type: New Initiatives In-Service Month: 9 In-Service Year: 2018 Primary Purpose: Innovation Secondary Purpose: n/a Priority: Recommended Total Project Spending: $278,350	The Heat Pump Water Heater Innovative Pilot is a program offering high efficient heat pump water heaters to heat our customers' hot water. Through this program, GMP is helping customers overcome large upfront costs in order to take advantage of this energy-saving technology. Customers pay a monthly payment for a term of 15 years. The units are provided with a warranty for the full term, removing any risk to the customer. GMP has installed over 400 heat pump water heaters in customers' homes since starting this program. We anticipate an increase in demand for this product as more and more of our customers are interested in efficiencies in their home and as aging water heaters continue to need to be retired. GMP believes that the continued success of this Pilot will demonstrate that deployment of this energy-efficient technology on a large scale is possible in Vermont, where many customers have less efficient traditional water heaters. GMP has utilized contractor relationships and infrastructure built for the traditional water heater program to provide a smooth transition to the heat pump water heater program. GMP also expects more traditional water heater customers to convert to heat pump water heaters given that the traditional tanks continue to age and operate less efficiently. Federal mandates have dictated that any new water heaters over 55 gallons be equipped with a heat pump, and any under 55 gallons must meet an energy factor target. Additionally, GMP believes that because heat pump water heaters operate up to 67% more efficiently than resistance water heaters, customer interest in this technology will continue to grow.	GMP's heat pump water heater program offers our customers what they tell us they want – services and technology that will help them reduce cost, reduce carbon, and make them more comfortable. The innovative offerings are also necessary to satisfy Tier 3 of the recently enacted Renewable Energy Standard ("RES"), which requires Vermont Distribution Utilities to deliver customer-facing transformative energy projects that decrease fossil fuel consumption and greenhouse gas emissions. The targets set forth under Tier 3 of the RES statute require us to deliver transformative energy projects representing 2% of our retail sales in 2017 and increase to 12% by 2032. This offering also advances the renewable energy and greenhouse gas reduction goals contemplated in Vermont's Comprehensive Energy Plan.

Project Number and Title	Additional Information	Project Description	Project Justification
New Initiatives - Rate Period (Jan. - Sept. 2019)			
159741: 2019 Heat Pumps	Project Type: New Initiatives In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Innovation Secondary Purpose: n/a Priority: Recommended Total Project Spending: $189,111	Under Green Mountain Power's Heat Pump Pilot, GMP sells heat pumps to customers in its service territory over a 15-year term. In July 2018, the heat pump program model will change to offer customers three options: 1) finance through Vermont State Employees Credit Union (VSECU), 2) cash, or 3) heat pump as a service. The existing heat pump program offers a convenient no upfront payment and includes the cost of installation by qualified contractors and maintenance. A GMP representative maintains contact with the customer throughout the process. The benefit to participating customers is that the heat pump efficiency heats and cools their homes, increases their comfort, may reduce their costs and reduces their greenhouse gas emissions. Increased intelligent electrical usage provides a direct benefit to non-participating customers by creating a larger pool to spread fixed costs. The monthly cost for a participating customer varies based on size of the unit being installed and the complexity of the installation. The size of the unit is determined by the footprint of the property in which the unit is to be utilized. The footprint consists of the square footage and the openness of the floor plan. The heat pump installed consists of a condenser located on the outside of the house and a single or multi-unit (when applicable) interior wall unit or floor model. Deployment of the technology continues to grow. The technology itself is gaining increasing acceptance by Vermonters through word of mouth by neighbors, their friends and family. The awareness of the product increases via marketing by a host of organizations in the public and private sector. As a result of this, we expect our program to continue to grow in popularity. The spend for this project is for heat pumps as a service. The revenue generated from the heat pump lease program and increased retail energy sales is currently benefitting all customers by reducing GMP's cost-of-service. Participating customers are charged for the heat pump as a line item on the customer's GMP energy statement.	The State of Vermont, our Customers, and Green Mountain Power understand the need to transform the way that we use energy. In fact, Act 56 requires utilities to find ways to reduce carbon emissions in the electric, thermal and transportation sectors. It encourages innovation that not only reduces carbon emissions but also reduces costs. GMP's Heat Pump program helps to achieve these goals by reducing costs not only for the customers participating in this program, but for all of our customers. The revenue generated from the heat pump program covers the costs of the program and contributes to lowering rates for all customers. The heat pump program also helps to satisfy Tier 3 of the Renewable Energy Standard ("RES"), which requires Vermont Distribution Utilities to deliver customer-facing transformative energy projects that decrease fossil fuel consumption and greenhouse gas emissions. The targets set forth by the RES Statute for GMP require us to deliver transformative energy projects representing 2% of our retail sales in 2017 and increase to 12% by 2032. They also require that a mix or resources and measures be utilized to achieve these goals as cost effectively as possible. This program represents an option that actually provides a net benefit to non-participating customers.
159740: 2019 Tesla	Project Type: New Initiatives In-Service Month: 3,6 In-Service Year: 2019 Primary Purpose: Innovation Secondary Purpose: Reliability Priority: Recommended Total Project Spending: $5,558,220	The Grid Transformation/Tesla Powerwall 2.0 Pilot offers customers the option to have a Powerwall 2 installed in their home for $15/month for ten years, or for a one time, upfront $1,500 charge. The battery is available to the customer for backup power, providing increased reliability in times of grid outage. GMP utilizes the Powerwalls to reduce peak costs during our monthly transmission peak, and our annual capacity peak. This is done by using Tesla's GridLogic aggregation software platform, and allows GMP the ability to control the charging and discharging of each unit individually, and in aggregated groups. This pilot is an important part of our overall strategy to do everything we can to reduce our peak charges while improving customer resiliency.	This Pilot is necessary to increase reliability for participating customers, and to reduce overall system costs for all GMP customers. The Powerwalls represent a valuable asset on GMP's grid that allows for dynamic control of resources to help reduce our peak load while also creating a new tool that can be utilized to manage a distributed energy system – like the one we are shifting towards. GMP began the pilot deployment in the fall of 2017 with the intention of waiting to introduce these into the 2019 rate request. We must continually find new tools and resources to drive down power supply expenses and create new, 'non-traditional' revenues, that flow back to non-participating customers. This pilot provides both while giving the host customer an alternative to a fossil-fuel-fired generator for backup power. Note that the PowerWall program is closed to plant on a quarterly basis, however, this Financial Analysis summarizes the entire program costs.
159742: 2019 Heat Pump Water Heater	Project Type: New Initiatives In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Innovation Secondary Purpose: n/a Priority: Recommended Total Project Spending: $255,656	The Heat Pump Water Heater Innovative Pilot is a program offering high efficient heat pump water heaters to heat our customers' hot water. Through this program, GMP is helping customers overcome large upfront costs in order to take advantage of this energy-saving technology. Customers pay a monthly payment for a term of 15 years. The units are provided with a warranty for the full term, removing any risk to the customer. GMP has installed over 400 heat pump water heaters in customers' homes since starting this program. We anticipate an increase in demand for this product as more and more of our customers are interested in efficiencies in their home and as aging water heaters continue to need to be retired. GMP believes that the continued success of this Pilot will demonstrate that deployment of this energy-efficient technology on a large scale is possible in Vermont, where many customers have less efficient traditional water heaters. GMP has utilized contractor relationships and infrastructure built for the traditional water heater program to provide a smooth transition to the heat pump water heater program. GMP also expects more traditional water heater customers to convert to heat pump water heaters given that the traditional tanks continue to age and operate less efficiently. Federal mandates have dictated that any new water heaters over 55 gallons be equipped with a heat pump, and any under 55 gallons must meet an energy factor target. Additionally, GMP believes that because heat pump water heaters operate up to 67% more efficiently than resistance water heaters, customer interest in this technology will continue to grow.	GMP's heat pump water heater program offers our customers what they tell us they want – services and technology that will help them reduce cost, reduce carbon, and make them more comfortable. The innovative offerings are also necessary to satisfy Tier 3 of the recently enacted Renewable Energy Standard ("RES"), which requires Vermont Distribution Utilities to deliver customer-facing transformative energy projects that decrease fossil fuel consumption and greenhouse gas emissions. The targets set forth under Tier 3 of the RES statute require us to deliver transformative energy projects representing 2% of our retail sales in 2017 and increase to 12% by 2032. This offering also advances the renewable energy and greenhouse gas reduction goals contemplated in Vermont's Comprehensive Energy Plan.
159761: 2019 Residential EV Chargers	Project Type: New Initiatives In-Service Month: 9 In-Service Year: 2019 Primary Purpose: Innovation Secondary Purpose: Operational Efficiency Priority: Recommended Total Project Spending: $84,193	Through the EV Charging program, GMP plans to offer smart residential L2 electric vehicle chargers to customers as a monthly charging service. GMP will own the chargers and provide them to customers for a monthly service fee. Participating customers will be responsible for installation costs of the equipment.	Electric vehicles are a quickly emerging market. L2 charging provides customers incentive to purchase electric vehicles without the need to worry about the availability of their car being charged and ready for use. As GMP experiences declining retail sales, electric vehicles provide an opportunity to increase sales, and in turn, keep rates as low as possible for our customers. EV's also represent a Tier 3 resource under Vermont's Renewable Energy Standard. Additionally, EVs present the potential for increased peak costs when customers charge during peak hours. Through GMP's EV charging pilot, GMP has the ability to control the charger with customer consent and effectively manage these resources to avoid increasing peak costs. As with all programs, GMP continually looks at how to leverage each product as a broader grid resource.