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Electronic and Hand Delivery

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Mrs. Judith C. Whitney, Clerk
Vermont Public Utility Commission
112 State Street
Montpelier, VT 05620-2701

Re: Green Mountain Power – Bring Your Own Device “BYOD” Innovative Pilot

Dear Mrs. Whitney:

Please accept this as Green Mountain Power’s (“GMP”) notice of the Bring Your Own Device (“BYOD”) Pilot (the “Pilot”). Green Mountain Power plans to start offering customers the opportunity to participate in the Pilot after March 10, 2018.

Executive Summary

Green Mountain Power is focused on a new energy future, that is home-, business-, and community-based and leverages the latest innovations in grid modernization to drive down costs and provide value for all customers. Battery storage is a meaningful part of that energy future. The BYOD Pilot opens GMP’s distributed energy resource (“DER”) platform to customers who purchase and install compatible batteries in their home or business. Customers will have the opportunity to earn a GMP bill credit by allowing GMP shared access to the battery to maximize its value for all GMP customers by reducing costs at “peak” times, and exploring the ability to charge and discharge systems to achieve other forms of wholesale power market value. The BYOD pilot allows customers to find new ways to obtain backup power in a cost-competitive way, while participating in GMP’s grid transformation efforts with their own storage solution and receiving credits for doing so, while also helping to drive down costs for all GMP customers.

Current or likely to be compatible battery systems include the following¹:

1. Sonnen Battery

¹ The official list of currently approved battery systems will be located on GMP’s website.

2. Sunverge Battery
3. Solar Edge StorEdge Compatible Battery Systems
4. PowerWall 2.0

This is the current range of mainstream battery storage market offerings, and thus integrate with GMP's software. We are open to exploring the integration of other battery technologies upon request.

Customers participating in the Pilot will install a compatible battery system. Once installed, they will follow enrollment instructions to enter into the Pilot. The enrollment will include a verification process that enables their device to be utilized within the GMP energy platform². Once integration into the GMP energy platform is confirmed, the participating customer will begin receiving a credit on their electric bill in exchange for allowing GMP shared access to their device to generate value to all GMP customers. This means the battery system needs to be available to charge and discharge in accordance with GMP instructions, so that the output can be used for peak shaving and other grid services. The battery system cannot be utilized for any other controls by the customer, other than providing backup power for the customer's premises. As we look beyond this pilot, we plan to explore options that allow customers to participate on different levels and essentially 'pay for performance' when they do provide outcomes that benefit all customers and the GMP system.

To be part of this pilot and GMP's energy platform, customers will sign an agreement allowing shared access to their device to be used for grid services such as peak reduction and other ancillary services. Some of the details that will be identified in the agreement are:

- A "Peak Event" is defined as a period of time in which GMP will make adjustments to the device such as charging or discharging a battery at a specific rate.
- Peak Events are anticipated to occur an average of 5 to 8 times per month for an average of 3 to 6 hours at a time.
- Customers will be sent notification of a Peak Event, via a smart phone app or other electronic method, at least 4 hours in advance.
- GMP will ensure that batteries are available to perform backup power for the customer as quickly after the peak event as possible.
- GMP will also make adjustments when possible to avoid completely discharging a battery for the purpose of achieving grid benefits during or prior to a pending weather event that could create outages. While we cannot guarantee that the participating customer's battery system will be charged to a minimum level at all times, we will work to minimize these impacts to make sure the customer has back up power.

² The platform is a system that enables GMP to monitor and control the output of many distributed devices such as battery storage systems, for the benefit of GMP's system and customers as a whole.

- GMP will continually explore other value opportunities to generate value for all customers through mechanisms, such as ancillary market revenues, energy arbitrage, etc., and if feasible, we will amend this pilot to include a feature to share those benefits.

The participating customer's bill credit amount will be effective for the duration of the agreement with GMP. The agreement term will not exceed 10 years. Customers will have the option to opt-out of the Pilot at any time and discontinue GMP shared access to their device. The GMP bill credit will also terminate at this time. Customers are allowed to opt back into the Pilot, but will be assessed a \$15 reconnection fee on their next GMP bill and can only opt back in once annually. The 10-year term will continue from the date of the original activation.

Value of Energy Storage Systems

Energy Storage

The agreement between GMP and the customer will yield a monthly bill credit³ based on assumed value for each kW of storage capacity contractually available to GMP for a minimum duration of 3 hours at the full capacity rating. The minimum offer amount must be 2kW or greater with the maximum aggregate offer being 10kW behind an individual meter. If batteries are paired to get a full 10kW/30kWh the bill credit would be two times the 5kW bill credit rate.

Duration (Hours)	Power (kW) Available to GMP	Energy (kWh) Available to GMP	Monthly Bill Credit*
3	2-2.9	6-8.7	\$14.50
	3-3.9	9-11.7	\$22.00
	4-4.9	12-14.7	\$29.00
	5-5.9	15-17.7	\$36.00

* Bill credit based on an assumption that GMP will be able to use participating battery systems to reduce 8 out of 12 monthly Vermont peaks per year for RNS transmission savings, and assumes that the systems will be 75% effective at reducing the annual ISO-NE peak that determines GMP's Forward Capacity Market obligations.

- GMP reserves the right to omit or reduce the participating customer's monthly bill credit if the contracted energy storage is not available due to:
 1. Lack of capacity to deliver a 3-hour discharge at full output; or
 2. Lack of communication with the device during a peak event.
- The monthly bill credit amount is locked in for a period of 10 years or until the customer opts out or the contract is terminated.
- The monthly bill credit can be used to offset all chargers on the bill, including those not covered by solar, i.e. 'non-bypassable'.
- An integration and communication fee of \$2.50 per month will be added to each bill to cover the costs of the ongoing communications and software platform fee.

³ Participating customers receive 70% of the estimated value that the battery system will provide to GMP, with remaining 30% of value flowing to non-participating customers through reduced retail rates.

Customer Obligation

1. The customer is required to maintain the internet connection with the battery storage system at all times. In the event GMP loses connectivity with the battery system, the customer will be notified and will have 30 days to remedy. If not resolved in this time frame, the customer will be removed from the Pilot and no longer receive the bill credit. If the issue is resolved at a future date, the customer may opt back in with a \$15 reconnection fee. The monthly bill credit will be resumed in the amount specified at the initial activation.
2. If a customer is a net-metered customer, the credits generated from the battery storage system will be tracked separately from any solar credits generated. All rules and expiration requirements for solar credits will still apply.
3. Monthly bill credits will be allowed to accrue, and are able to be used to pay all charges on the GMP bill. At any time, but no more frequent than once annually, if a customer has excess bill credits, they are able to request an Energy Transformation Rebate in the amount of the excess bill credit with proof of purchase any product that meets the requirements of the Renewable Energy Standard under Tier 3, such as:
 - i. Smart Thermostat
 - ii. Heat Pump
 - iii. Heat Pump Water Heater
 - iv. Qualified Electric Vehicle
4. GMP will measure performance of the system during the peak events. If the battery system fails to perform within 10% of the contracted capacity, the customer will have 30 days to resolve the issue. Upon resolution, the customer will request GMP to test and verify performance has been restored. If not resolved within 30 days, the customer may be removed from the Pilot with the agreement voided and the bill credit ceased, or the monthly bill credit amount may be lowered to reflect the new available power and capacity.
5. GMP may remove a customer from the Pilot for any reason, including, but not limited to repeat issues with connectivity or performance of the system as that is how value is delivered to all customers.

Measurement & Verification

Measurement and verification is a key component of this Pilot to test the assumptions made regarding benefits to the grid and savings to all GMP customers – both those participating in the Pilot and those not participating. To that end, GMP's Energy Platform will report the available capacity for grid services, monitor which resources are sent dispatch signals, and most importantly, provide the total capacity and energy of the DERs for each peak event that is called. The energy platform will provide us with the performance information for each system, which will determine the systems are remaining in compliance with their requirements. GMP will be using data provided by Virtual Peaker to determine the overall effectiveness of the Pilot to reducing GMP peak demands.

GMP will also send out a brief survey to each customer 6 months into their agreement to gain feedback from Pilot participants. GMP will look to learn if customers are satisfied with their involvement in the Pilot, the notification process, and value of the monthly bill credit.

Timing & Scope

Beginning in March the BYOD Pilot will be available to all residential customers and small commercial customers not currently on a Time-Of-Use retail electric rate. The initial Pilot will last for 18 months and will be available to a maximum of up to 2MW/6MWh of battery storage systems.

To reach 2MW/6MWh, GMP is expecting a mix of system sizes will be installed by participating customers. Currently, the most commonly sized system is around 9kWh, and other common sizes range from 6kWh to 15kWh. With this in mind, GMP anticipates the breakdown of 2MW/6MWh will be close to the following:

Battery kW Size	Quantity Installed
2	50
3	550
4	45
5	15

The Pilot Advances State Energy Goals

The BYOD offering will help advance state energy goals. First, the promotion and use of energy storage provides a clean alternative backup power solution for customers that would otherwise rely on a fossil-fuel generator, or not have a backup power source. Second, energy storage can be a tool to manage the grid with the development of distributed energy resources called for under Act 56, the Vermont Renewable Energy Standard (“RES”) enacted in 2015. Specifically, dispatch control of energy storage can be used to help smooth grid impacts caused by a high penetration of distributed solar energy, potentially avoiding more expensive, traditional grid upgrades⁴. Additionally, these resources are anticipated to provide a small amount of value towards the Tier 3 targets under the RES. Finally, these DERs represent innovative, dispatchable resources that can be used during peak periods to help reduce GMP’s power supply costs, lowering costs for customers.

Summary of Projected Costs & Revenues

There is an ongoing software cost to enable this Pilot that is partially offset by the monthly communication fee. This Pilot will provide value to non-participating customers through power supply cost reductions. Based on GMP Power Supply projections, GMP assumes

⁴ The BYOD Pilot will begin by primarily focusing on peak shaving, however GMP will continue to work and build the framework to utilize batteries for this purpose.

a levelized per kW value of approximately \$10.30 per month. Participating customers will receive 70% of this value, while the remaining 30% will benefit all GMP customers. GMP expects a mix of battery sizes to be deployed by participating customers. Table 1 shows the expected benefits to all GMP customers based on an anticipated mix of battery size deployments.

	Year	1	2	3	4	5	6	7	8	9	10
Revenue											
Communication & Integration Fees		\$19,800	\$19,800	\$19,800	\$19,800	\$19,800	\$19,800	\$19,800	\$19,800	\$19,800	\$19,800
Power Supply Benefit		\$150,521	\$251,251	\$316,532	\$325,119	\$334,653	\$350,465	\$372,873	\$397,496	\$423,057	\$449,713
Total Revenue		\$170,321	\$271,051	\$336,332	\$344,919	\$354,453	\$370,265	\$392,673	\$417,296	\$442,857	\$469,513
Costs											
GMP Grid Platform		(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)
Battery Bill Credit		(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)	(\$176,040)
Total Costs		(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)	(\$206,040)
Net Benefit to GMP Customers		(\$36,080)	\$65,667	\$131,608	\$140,282	\$149,912	\$165,884	\$188,518	\$213,390	\$239,209	\$266,134

Table 1

Efficiency Vermont Non-Conflict and Collaboration Certification

By this filing, GMP certifies that the BYOD Pilot does not conflict with work being performed by Efficiency Vermont. GMP has discussed the scope and objectives of this pilot with Efficiency Vermont and Efficiency Vermont is supportive of this pilot.

Status Updates

GMP proposes to provide status updates to the Commission regarding the BYOD Pilot's progress on a six-month basis until the Pilot expires in 18 months. In the event GMP decides to terminate the Pilot prior to the passage of 18 months, we will provide prompt notice to the Commission and the Department.

If you should have any questions, please contact me at 802-747-6818.

Sincerely,



Craig Ferreira

cc: Stephanie Hoffman, Vermont Department of Public Service
Karen Glitman, Efficiency Vermont
Barry Murphy, Vermont Department of Public Service