

November 3, 2017

Commissioner June Tierney
Department of Public Service
112 State St.
Montpelier VT 05620

Re: Recommendation for Battery Storage Study

Dear Commissioner Tierney,

GMP commends the Department of Public Service for its analyses of the current state of energy storage technology. Leveraging innovation is key in the transformation of the energy sector. GMP is fully committed and is partnering with customers to create an energy system that is home, business and community based and drives down costs for all customers. To achieve this, it will take a new set of resources, including energy storage and in particular battery storage.

The need to move rapidly to a distributed environment has never been more pressing. The electrical system approach of the late 1800's is not economically sustainable and with the voracity of climatic events due to global warming it has become more pressing than ever to provide customers and communities with options that are cost-effective and incredibly reliable. Based on a report from the U.S Department of Energy, the economic annual impact of major storms has been as much as \$75 billion and with the continued increased intensity of storms this is expected to continue to rise.

GMP/Vermont are leaders in the U.S. on energy storage by deploying the technology, both large and small scale, to find innovative ways to improve reliability, enhance resiliency and integrate more distributed generation while lowering costs for all GMP customers. This is a critical value of battery storage – to share access and lower costs for all to combat the uncontrollable rate pressures facing customers.

Here are a few examples of the work happening now in Vermont. GMP has deployed a combined solar/storage project at the Stafford Hill landfill site in Rutland. The project is one of the nation's first micro-grids powered solely by solar and battery back-up, and is the first in the region to use battery storage to reduce peak power usage, benefiting customers by saving \$200,000 in one hour.

GMP also worked with Tesla to offer a first-of-its-kind program that is an affordable home storage system to customers for \$15 a month. By sharing access, the Powerwall batteries will deliver savings to all customers by hitting peak demand times.

GMP is developing a "bring your own device" storage offering that will encourage customer-owned storage devices to participate in GMP programs that enable these customers to share in the value their batteries offer to the grid and lowering costs for all GMP customers.

GMP expects many opportunities for storage deployment will continue to address unique local circumstances, as well as customer energy transformation. In Vermont, examples of such local uses could include management of distribution system voltage on a circuit that features high penetration of intermittent generation, interconnection of a major transmission or generation project in the state, or management of a constraint on the transmission system. We are presently evaluating the cost-effectiveness of using energy storage to address such needs, and anticipate continuing to do so.

There is also an unrestricted market for the adoption of storage that will continue to feed the acceleration and adoption of this technology. GMP's residential and commercial customers with battery storage can take advantage of time-of-use and demand rates, using the electricity stored in their battery to power their homes and businesses when electric prices are high and recharging it when prices are low. Alternatively, under GMP's pilot Powerwall 2.0 offering, participating customers may allow GMP to dispatch their battery storage systems to achieve wholesale market revenue or savings (e.g., through peak shaving and energy arbitrage).

Based on the importance of the advancement of battery storage technology, and the need to ensure an appropriate and cost-effective pace of deployment, GMP makes the following recommendations:

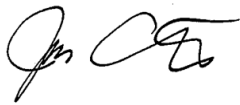
- The State should recognize that Vermont and its electric utilities are leaders in storage deployment and encourage them to continue with pilot programs for the purpose of continuing to demonstrate the use of battery technology for grid stability (including the ability to manage a growing amount of distributed renewable energy), reliability, and lowering electric costs for all customers.
- That Vermont electric utilities be encouraged to work with battery retailers to facilitate the deployment of systems, and compensate them accordingly, where they provide the greatest grid value in terms of grid stability and lowering costs, and provide peak shaving benefits to benefit customers.
- The State should recognize that it would not be appropriate to promote battery storage technology with financial incentives without first assessing if such incentives are necessary or prudent, especially given the rapid pace of advancements in battery industry scale and technology. And that all programs should focus on bringing down the overall cost of the grid and bring value to all customers being served by it.
- If action to speed the adoption of battery storage technology is contemplated, the primary objective should be to lower the total cost of constructing and operating the grid so that all electric utility customers (not only those who participate in battery storage projects) save money.
- Before any directive from the state is issued, electric utility companies should be given time to deploy battery technology to assess the ability to effectively access and control the technology to achieve the potential "stacked" benefits that battery systems can offer. The experience and associated lessons learned will help GMP and other electric distribution utilities determine the level of benefit such access will yield in lowering costs

for all their customers, and put in place systems to facilitate the achievement of such savings.

- In considering the economics of storage and whether goals for storage deployment are appropriate, it will be important to recognize that some of the key benefit streams that storage can provide will tend to have limits in scale, or diminishing returns. For example, local peak reductions that are achievable through storage or other methods will tend to feature diminishing returns (i.e., to achieve deeper peak reductions, more hours of deployment and more deployment events will be required), and the ISO-NE market for frequency regulation service is quite small (with hourly requirements well under 100 MW for the entire New England region). Similarly, the amount of storage that can be cost-effectively deployed in a given area to address local grid needs is likely to be discrete and case-specific. This context should be taken into account.
- Industry expectations are that battery storage costs will continue to decline over time, and that system performance/capabilities will continue to improve. As Vermont leads in this regard, we stand to garner benefits that other states will not achieve as we shift more regional costs to the other participants of the grid. It makes sense to deploy storage today, as discussed above, in part to lay the groundwork and gain the experience to support potential larger investments later when the technology will ideally be even more mature and potentially even lower-cost.

We thank you for the opportunity to comment on this thoughtful report and to work together to provide an energy system for our customers that is more resilient, reliable and cost effective. Battery storage is one of the most important ways electric utilities have to find ways to bend the rising cost curve, and deliver value back to customers. At Green Mountain Power, we are excited about this work with customers, and about continuing to collaborate with many others in the private industry to grow innovation as we lead the way to a new energy future.

All the best,

A handwritten signature in black ink, appearing to read 'Josh Castonguay', with a stylized flourish at the end.

Josh Castonguay
VP Innovation