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Holly Anderson, Clerk
Vermont Public Utility Commission
Peoples United Bank Building, 4th Floor
112 State Street
Montpelier, VT 05620-2701

**Re: Case No. 21-3883-RULE – Proposed creation of Vermont Public Utility Commission
Rule Concerning Energy Storage
GMP Initial Comments**

Dear Ms. Anderson,

Green Mountain Power Corporation (“GMP”) appreciates the opportunity to provide the following initial comments per the schedule issued in the Commission’s October 21, 2021 order in the above-referenced rulemaking proceeding.

Topic 1. Simplified siting

- a. **Threshold.** The amended provision of § 248(u) states that “the Commission shall establish a simplified application process for energy storage facilities subject to this section with a capacity of up to 1 MW, unless it establishes a larger threshold by rule.” Should the Commission establish a threshold larger than 1 MW for projects to be eligible for simplified siting? If not, why not? If so, what should that threshold be and why?

GMP Comments

1 MW is likely an adequate threshold at this time. One recommendation, if the statute will allow it, is to consider the stored energy capacity size in addition to the power or MW capability of the storage system. 1 MW power capacity could remain as the proper threshold for simplified application up to a certain duration of energy, such as 4 hours. This would mean the battery is 4 MWH of stored energy with 1 MW of power capability. There is a possibility in the future for very long duration storage; for those systems, 1 MW could cover multiple acres and perhaps should therefore have a more thorough

review. A 1 MW/100 MWH storage system would cover a substantially larger footprint than a 1 MW/4 MWH system.

- b. **Conditional waivers.** Which, if any, Section 248 criteria and requirements for a CPG should be conditionally waived?

GMP Comments

GMP does not have an opinion on specific criteria that should be waived. We request that System Stability and Reliability remain a criterion subject to review in order to assure systems do not negatively impact customers.

- c. **Codes and standards.** Are there any codes and standards relevant to energy storage that the Commission should incorporate by reference into the rule? If so, which ones and why?

GMP Comments

The standards identified in the Rule 5.500, specifically section 5.510, apply regardless of the DC source for inverter based DER and can remain for battery storage.

- d. **Application materials.** What application materials should stand-alone storage facilities be required to file to be considered administratively complete?

GMP Comments

Application materials should include requirements in GMP's Interconnection Guidelines 5.1.2.5 (listed below) and PUC Rule 5.500.

5.1.2.5 Data Required for Energy Storage System (ESS) Applications

For applications proposing ESS, additional information will be required at the time of application for interconnection. Examples of such information include but are not limited to:

A. Method of ESS connection:

- i. ESS directly connected to Company EPS; or*
- ii. ESS DC coupled with Generator; or*
- iii. ESS AC coupled with Generator; or*
- iv. ESS connected on load side of service point and utility revenue meter with the premises load*

B. Provide the following operational characteristics:

- i. Sequence of operation and time of day for the ESS' charging and discharging capabilities and the maximum ramp rate in Watts/second if known.*

- ii. *If participating in wholesale markets, identify markets the ESS intends to participate in and how the ESS will participate in those markets. For example, the sponsor of an ESS might request GMP to study potential charge or discharge under all potential conditions of load and local generation, or to exclude operation under certain conditions (e.g., charging not allowed during conditions of maximum system load, or discharging not allowed during conditions of maximum local solar generation). GMP will study based on intended use, and the GIA will then limit use of the ESS to that which was studied. If the interconnector seeks to change the use, a new study will need to be done. Also note that if the use cases, markets etc. are unknown at the time of filing, GMP would assume worst case charge/discharge scenarios when performing the study.*
- e. **Retrofitting.** Would the list of applicable § 248 criteria or the list of materials to be filed be different for storage facilities that are being added to existing facilities (e.g., an existing solar facility with a CPG adding storage)? How should the Commission consider cumulative impacts of adding storage to existing facilities?

GMP Comments

The same information as identified in the previous question will be needed to assess the cumulative impacts. Most importantly, the use case information will be necessary for us to determine if we must study the storage output in addition to solar output or separately. If there are any unique operating conditions or constraints as a result of the paired system, we would want to make sure that was clearly identified in the interconnection applicant's information.

- f. **Comment deadline.** Noting that Act 54 requires the Commission to issue a CPG within 46 days if no major issues are raised, what is an appropriate deadline for stakeholder comments on CPG applications for energy storage facilities (e.g., 15 or 30 days after the application is filed)?

GMP Comments

GMP believes the 30-day comment period in Rule 5.100 is appropriate for comments or additional time to review. However, it should be recognized that if additional study is required, a CPG could not issue in the 45 days identified. GMP would expect to follow a similar process for the study work and notification of the affected parties as laid out in Rule 5.500.

- g. **Notice.** Should the Commission modify the notice requirements of Title 30 for energy storage projects in the simplified process?¹

GMP Comments

At this time, GMP believes that the notice requirements in Title 30 should apply.

- h. **Interconnection.** What is the optimal process to manage interconnection for facilities in the simplified siting review? Should the Commission require that applicants file a copy of an executed interconnection agreement with the application? Are there size thresholds that should trigger a requirement for an interconnection agreement? If so, what are the appropriate size thresholds?

GMP Comments

GMP feels that all interconnections, including storage, should be incorporated and handled through PUC Rule 5.500, understanding that this rule is going through its own update and should include varying size thresholds that allow for different processes for interconnection review. It would only be possible for the storage developer to provide an executed interconnection agreement with their CPG application if they were to file the interconnection request and move through that process prior to filing for the CPG.

Currently, for generation resources, an Interconnection Agreement is required for any generation resource over 150 kW in size. For storage, we could use a similar size threshold, noting that an Interconnection Agreement could be required for a smaller resource if the resource wants to interconnect with certain operating restrictions imposed to avoid studying worst case scenarios, for example.

- i. **Other issues.** What other issues should the Commission consider in establishing a simplified siting process for storage systems?

GMP Comments

One additional area that should be further discussed is when a storage system is paired with a net-metered project, to make sure that the appropriate metering is required and in place to allow for proper measurement and separation of solar power and grid power sources so that the net-metering value is not attributed to discharging battery storage if that energy did not originate from the solar. Today, we can handle this through traditional metering; we continue to explore the ability to use inverter based metering and telemetry to provide this value in the future.

¹ See 30 V.S.A. § 8011(d)(2). This section authorizes the PUC to waive the notice and hearing requirements for energy storage projects.

Topic 2. Aggregations and interplay between owners, operators, and utilities

- a. Visibility to utilities.** Are there specific requirements related to two-way communications with distribution utilities that the Commission should impose on aggregators as a condition of receiving a § 231 CPG?

GMP Comments

Yes. The Commission should require that real time or near real time visibility of the entire aggregation is capable, and if necessary, the ability to view a single resource in the aggregation exists. Furthermore, the aggregation should be able to receive dispatch instructions either directly from the utility, or from the aggregator, who in turn can receive dispatch instructions from the utility. In the event of a system emergency, the DU shall have the ability to override any market participation to assure the stability, security, and safety of the energy system for customers. It is also important to note that there is an ongoing proceeding at ISO-NE to develop guidelines and rules for aggregations of resources that are providing wholesale market values, and we will need to assure that this rule is in synch, or updated, as a result of the ISO requirements for those resources looking to participate.

- b. Override.** Are there circumstances under which local distribution utilities may need to override operator control to charge or discharge aggregated systems to maintain system stability and reliability? If so, is that currently technically feasible?

GMP Comments

Yes, these circumstances could arise. And yes, this is technically feasible. This would be an overriding set of dispatch instructions that would be issued by the DUs either to the aggregator or directly to the resources, depending on the specific situation and arrangement with the DU. This arrangement could be a direct software connection that the DU has with the aggregator or the direct resources, or through a pre-determined communication to the aggregator in the event this need arises. An example could be an email or phone call to the aggregator dispatch operations to make an adjustment.

- c. Notice of changes to an aggregation.** Aggregations are likely to change over time. For example, small resources may leave or join aggregations rather frequently. What requirements for notice should be included in § 231 CPGs when changes occur to aggregations?

GMP Comments

A process needs to be established so that the DU is made aware of a change in aggregation—this could be an increase in size, decrease in size, or can be a swapping of resources, even if overall size stays the same but the location of resources changes on the distribution system. GMP recommends a 30-day notice period, and within that period we would determine if further study is required. It could be possible to establish criteria

where notice is not required, for example if within a certain time frame the change in aggregation size does not increase or decrease by more than some specific amount of kW.

- d. Dispute resolution.** Should the Commission create a special or unique dispute resolution process for parties involved in energy storage? If so, what is an appropriate process for dispute resolution when disputes arise between storage facility owners, operators, and the interconnecting providers? Are disputes likely on matters other than system stability and reliability? Are there limits on the Commission's jurisdiction to resolve disputes among these entities?

GMP Comments

It would depend on the dispute needing to be resolved. For example, if it were a dispute related to CPG criteria, such as from a neighbor of a project, this should remain with the PUC, or there could be a dispute related to interconnection and operations which could start with the Interconnection Agreement. The existing interconnection rules also provide that during the 5.500 process either the Interconnecting Utility or the Interconnection Requestor may seek resolution of disputes by written petition to the Commission.² If the dispute related to wholesale market participation, it likely would need to be handled by ISO-NE or the FERC.

- e. Other issues.** What issues outside system stability and reliability should the Commission consider when issuing a CPG for energy storage aggregators?

GMP Comments

We recommend that the Commission make sure appropriate protections are in place to avoid any double-counting such as participating in various wholesale markets while also acting as a load reducer in Vermont, or if the resource is interconnected with a net-metered resource as mentioned above. Also, as mentioned above, the interplay with the ongoing work at ISO-NE to implement FERC Order 2222 will be important to follow and harmonize with this rule as it is developed; it appears to be on a longer timeline.

Topic 3. Role of energy storage.

- a. System optimization.** How can the Commission encourage or require energy storage systems paired with existing resources to allow for system optimization, including: injecting power during times tied to regional power supply expense drivers, alleviating local grid congestion, and shifting renewable production to cover peak times? What tools, inverter settings, and control protocols are needed to ensure that storage paired with systems in State programs is benefitting the grid as much as possible?

² See 5.508(D).

GMP Comments

Ultimately, this will be a function of use case and what the storage developer/owner intends to do with the system. The Commission can ensure that we have a very robust interconnection process so that if a storage system will be performing activities that are not optimized for the local system, they appropriately cover the costs for upgrades necessary caused by this impact. For storage this can be both for charging and discharging of the battery storage. Through the workshop, it would be helpful to explore how to ensure a storage developer/owner operates the batteries in a way that is beneficial to the greater grid and customers, reducing the possibility of upgrades that might ultimately be paid for by all customers. A DU can also explore ways to address this through the interconnection process or have the appropriate mechanisms for cost or incentives in place to create greater value to optimize the battery system locally.

- b. Carbon impact.** Storage systems programmed to optimize deployment for revenue only can have a significant carbon impact because they can charge on carbon-intensive, overnight energy. If storage systems are paired with resources in State renewable programs, should the Commission impose charge and discharge requirements related to carbon intensity? If so, how might this be done?

GMP Comments

We do not think charge and discharge specifics should be something imposed by the Commission on a prescriptive basis. The DUs are in the best position to determine the optimal charge/discharge strategy for the storage systems which include a balance of cost reduction, carbon reduction, and reliability improvements.

- c. Equity and access.** Historically disadvantaged and low-income communities have comparatively little access to clean energy technologies, including storage. How can the benefits of energy storage be shared in an equitable fashion? How can the Commission improve equity and access for energy storage?

GMP Comments

Storage is a critical way to help lower costs for all customers, both participating and non-participating. When a battery is used to provide local value directly to the DU and priced so benefits exceed the costs, all customers will see the benefits from this system—at this time that is a very important and perhaps primary way we should ensure that the benefits of storage are shared with all customers, even if not all customers have onsite storage. As we look to continue to expand the role of batteries in our energy system in the face of climate change to strengthen the greater grid, in the future onsite batteries could also be a utility service similar to metering and provisioning of power. To encourage more deployment of batteries, programs could be developed that would provide storage, paired with solar where possible on a combined cost basis (not under the existing net-metering paradigm), to provide onsite resiliency for the customer served while avoiding cost impacts to other customers. Finally, considering storage solutions in multi-family settings and mobile home communities could be an important strategy. For a Resiliency Zone in

Brattleboro, for example, we are looking at potential storage solutions for a mobile home community.

- d. Other issues.** What other issues should the Commission consider when determining how to integrate storage with existing resources?

GMP Comments

GMP looks forward to addressing this and other topics during the workshop.

GMP thanks the Commission for the opportunity to comment. Please do not hesitate to reach out with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Carolyn Browne Anderson'.

Carolyn Browne Anderson
Associate General Counsel

cc: Service list (via ePUC)