STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 17-2813-PET

Petition of Green Mountain Power for a Certificate of Public Good pursuant to 30 V.S.A. § 248(j), authorizing the installation and operation of a battery storage system on the GMPSolar Panton Project site located in Panton, Vermont, to be known as the "GMP Panton Battery Storage Project"	

Order entered: 01/22/2018

CERTIFICATE OF PUBLIC GOOD ("CPG")
ISSUED PURSUANT TO 30 V.S.A. SECTION 24

IT IS HEREBY CERTIFIED that the Vermont Public Utility Commission ("Commission") this day found and adjudged that the petition filed by Green Mountain Power Corporation ("CPG Holder"), requesting a CPG under 30 V.S.A. § 248(j) authorizing the construction and operation of a battery storage system with a capacity of 1 MW/4 MWH located on the site of the GMPSolar Panton Project in Panton, Vermont (the "Project"), in accordance with the evidence and plans submitted in this proceeding, will promote the general good of the State, subject to the following conditions:

1. Construction, operation, and maintenance of the Project shall be in accordance with the plans and evidence submitted in this proceeding. Any material deviation from these plans or a substantial change to the Project must be approved by the Commission. Failure to obtain advance approval from the Commission for a material deviation from the approved plans or a substantial change to the Project may result in the assessment of a penalty pursuant to 30 V.S.A. §§ 30 and 247.

2. Prior to commencing site preparation or construction of the Project, the CPG Holder shall obtain all other necessary permits and approvals. Construction, operation, and maintenance of the Project shall be in accordance with such permits and approvals, and with all other applicable regulations, including those of the Vermont Agency of Natural Resources ("ANR").

3. The CPG Holder shall restrict construction activities and related deliveries to the hours between 7:00 A.M. and 7:00 P.M. Monday through Friday and between 8:00 A.M. and 5:00 P.M. on Saturdays. No construction activities shall occur on Sundays or state or federal holidays except when construction activities must be performed during required outages needed to maintain system reliability.

4. Prior to proceeding with site preparation or construction of the Project, the CPG Holder shall prepare a sampling plan to evaluate the substation soils for releases of hazardous materials. The plan shall be submitted to the Vermont Department of Environmental Conservation, Sites Management Section for review and approval.

5. Following the completion of construction of the Project, the CPG Holder shall provide the ANR with the "as-built" calculation of the total sum of combined impervious surface for the GMPSolar Panton Project and the Panton Battery Project. In the event that the combined impervious surface of the two projects totals one acre or more, the CPG Holder shall promptly obtain and comply with a stormwater operational permit.

6. In order to avoid the osprey nesting season, CPG Holder shall not conduct any site preparation or construction activities for the Project between May 1 and August 1 within 1600 feet of the osprey nest located on the eastern edge of the Project site if any osprey are present or using the osprey nest.

7. Post-construction reporting: The CPG Holder shall provide ANR with the following Project "as-built" information within 60 days of the commissioning date of the Project to assist ANR with compiling and analyzing greenhouse gas impacts:

a. Manufacturer, model, and factory source of batteries;
b. Manufacturer, model, and number of inverters;
c. Manufacturer, model, and number of transformers;
d. Mass of concrete used;
e. Percent of Portland cement composition of concrete;
f. Description, quantity, and source of any recycled materials used (e.g., recycled content concrete, recycled aluminum racking, etc.);
g. Amount (length) and gauge of wiring used for project;
h. Components for connection to grid (circuit boxes, circuit breaker panels, metering equipment, etc.);

i. Distance (e.g., truck miles traveled) for transport of system components to site; and

j. Distance to grid connection.

8. By January 30 of each year, ANR may request that the CPG Holder provide an annual report for the previous calendar year of operations to ANR. The annual report shall contain the information set out below, which will assist ANR with compiling and analyzing greenhouse gas impacts. The CPG Holder will have 60 days from the date of ANR's request to supply the information. Should ANR not request the information set out below by January 30, the CPG Holder will not have any obligation to provide an annual report of the previous year of operations. The information to be provided includes the following:

a. Electric generation in kWh for the prior year, broken down by month for the GMPSolar Panton Project;

b. Operational data for the battery storage system for the prior year, specifically including:

i. MWh of charging by date and time broken down on an hourly basis;

ii. MWh of discharge by date and time broken down on an hourly basis;

iii. MWh of charging from the GMPSolar Panton Project by date and time broken down on an hourly basis; and

c. Any information about the addition or replacement of battery units, inverters, or transformers. In instances of failure and replacement of equipment (e.g., inverters, etc.), the CPG Holder shall provide descriptions of both the failed and replacement components at the same level of detail as required by the "as-built" reporting requirements of condition 8 above. This provision does not require the CPG Holder to provide information about *de minimis* replacement of system components, or information regarding regular maintenance activities, excepting activities under the capacity management agreement.

d. Should ANR not request the information set out in this paragraph 9 in any two consecutive years after Project commissioning, the CPG Holder's reporting obligations for all subsequent years shall automatically cease. ANR and the CPG Holder may, by mutual agreement, cancel the CPG Holder's reporting obligations set out in this paragraph 9 at any time.

9. The CPG Holder shall prepare an annual report, submitted to the Department of Public Service and filed with the Commission, by December 15 of each year for a period of three years following Project commissioning. The annual report shall, at a minimum, contain the following items for the applicable reporting period:
    a. Introduction
    b. Costs
        i. The project's as-built capital and operations and maintenance costs, as well as any activity under the Capacity Maintenance Agreement.
    c. Benefits
        i. Peak Reductions
            1. Methods and success rate for predicting and discharging for the duration of the regional annual peak, and the capacity at which the system was discharging during that peak.
            2. Reduction in forward capacity auction ("FCA") obligation (annual and cumulative estimated value to customers).
            3. Methods and success rate for predicting and discharging for the duration of monthly peaks, and the capacity at which the system was discharging during those peaks.
            4. Regional Network Service ("RNS") bill savings (annual and cumulative estimated value to customers).
        ii. Other Market Revenues
            1. Regulation revenues (annual and cumulative estimated value to customers).
            2. Energy arbitrage revenues (annual and cumulative estimated value to customers).
        iii. Renewable Energy Integration
            1. Power Quality
                a. Description of power quality benefits to be explored:
                    i. Voltage and Reactive Power Compensation
                    ii. Conservation Voltage Reduction
                b. Baseline power quality metrics on the circuit, or the specific section or area of the power quality study plan. The study plan will leverage existing available data from SCADA,

battery storage system (data points as required to operate the system), AMI metering, and regulator and switch capacitor controls that were installed on the system. Additional power quality equipment may be required to measure and monitor the voltage and reactive power on the "points of interests" on the system. Baseline assumptions are established on the following scenarios using the data points and sources:

i. Prior to the installation of the battery storage system,
ii. After commissioning of the battery storage system, and,
iii. If possible, baseline assumptions prior to Panton Solar installation

c. Performance and results of the power quality tests. The study plan will describe the following on each of the scenarios described above.
    i. description of how the system has been deployed to manage or improve power quality (i.e. settings, controls, or additional equipment deployed, etc.);
    ii. results of those efforts or tests conducted (e.g. comparison of each scenarios and various power quality measures tested);
    iii. and lessons learned that can be applied to other projects.
d. Solar Saturation
    i. Description of and results from testing the system to allow for greater penetration of renewable energy on the circuit.

2. Resilience
    a. A separate project plan or statement of work ("SOW") describing the strategy on implementing distribution islanding and other necessary microgrid controls for the Project, including timeline, costs, and any necessary permitting.

b. Steps taken and results of any testing undertaken to island the distribution circuit.

3. Tradeoffs

a. A description and quantification of any instances of conflicting use and value (e.g., times when the battery is being used for one purpose, such as power quality, that precludes it from being used for a different purpose, such as peak reduction).

b. Lessons learned from exploring system tradeoffs and how GMP is managing charging and discharging regimes and ordering deployment to maximize value to ratepayers.

d. Insights

i. Lessons learned and applied from the use of the system and peak prediction tools (GridLogic, Utopus, inside expertise), and how GMP is using these or other tools differently or more effectively over time.

ii. New or emerging market opportunities for the project, such as reserves or black start, along with potential costs and benefits of deploying the system to capture these opportunities.

iii. A summary of any major changes to the way the battery is being used, including costs incurred and benefits realized.

iv. A summary of insights or learning that occurred regarding battery operations, market participation, or microgrid development.

10. This CPG shall not be transferred without prior approval of the Commission.

Dated at Montpelier, Vermont this 22nd day of January, 2018.

Anthony Z. Roisman) PUBLIC UTILITY
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Margaret Cheney) COMMISSION
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)
Sarah Hofmann) OF VERMONT

OFFICE OF THE CLERK

Filed: January 22, 2018

Attest: Clerk of the Commission

Notice to Readers: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) or any apparent errors, in order that any necessary corrections may be made. (E-mail address: puc.clerk@vermont.gov).

PUC Case No. 17-2813-PET - SERVICE LIST

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