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March 17, 2016

Mrs. Judith Whitney, Clerk of the Board
Vermont Public Service Board
People's United Bank Building, 4th Floor
112 State Street
Montpelier, VT 05620-2701

RE: Docket No. 7873; Programmatic Changes to the Standard-Offer Program
Green Mountain Power Request for Extension of Time to Complete Hinesburg Area Reliability Plan

Dear Mrs. Whitney:

The purpose of this letter is to request an extension of the April 1, 2016 deadline for Green Mountain Power (GMP) to file a reliability plan for the Hinesburg area as required by the Public Service Board's (Board) order of January 22, 2016 approving the annual Vermont System Planning Committee (VSPC) geotargeting recommendations. The request is for a new deadline of October 1, 2016. This request is made with the support of the VSPC and the Public Service Department.

As described in more detail below, the extension will provide time for GMP to fully analyze the costs and benefits of battery storage, potentially combined with energy efficiency, to address the deficiency, and to compare these non-wires solutions with a substation construction option, including the potential for joint substation construction with Vermont Electric Cooperative.

Background

The Screening Framework and Guidelines for Implementation of 30 V.S.A. § 8005a(d)(2), approved by the Board in Docket No. 7873, requires that utilities file reliability plans by April 1 for any reliability issue that "screens in" under applicable screening criteria in the VSPC's geographic targeting recommendations filed by January 1. This timing was established to ensure that, if standard-offer plants provide sufficient benefit in addressing a constraint to warrant being treated as outside the standard-offer program limits on annual capacity, this potential is identified in time for the annual standard offer solicitation. As described further below, GMP's analysis has determined that additional distributed generation does not have the capability to address the specific challenges of the Hinesburg system. Therefore, an extension of the deadline for filing the Hinesburg reliability plan to October 1, 2016 will not create a conflict with the timelines of the standard offer program.

The other relevant timing issue concerns annual determination of need for geotargeted energy efficiency through the process established in EEU-2010-06 (2/16/2012) and modified in EEU-2013-11 (1/24/2015). Under the current process, the VSPC makes its energy efficiency geotargeting

recommendations to the Board in October to facilitate a Board order in November ruling on any newly geotargeted areas. This timing enables implementation to proceed in the following calendar year. The October 1 extension date requested in this letter will ensure that the VSPC is able to make a timely recommendation to the Board in October concerning the potential need for geographically targeted energy efficiency in the Hinesburg area.

The following paragraphs provide further detail on the constraint in the Hinesburg area and the status of the current analysis to better inform the Board's determination on this request for extension.

The Hinesburg Area Constraint

GMP has identified a distribution system constraint in the Hinesburg area. Specifically, the load center for this area, which is approximately 3 MW in size, is located more than eight miles from the GMP Charlotte substation source. The significant distance of the load center from the source has resulted in a number of issues, including system protection issues. While GMP has identified a potential solution to the protection issues, namely the use of distance relaying, there remain a number of unresolved issues including the potential for future load growth, voltage constraints, high solar penetration, and motor start limitations.

The traditional resolution to the Hinesburg constraint would be to construct a new GMP-owned 34.5 kV to 12.47 kV substation in Hinesburg. This substation would serve a portion of the load currently supplied by the Charlotte substation, provide feeder backup to the remaining Charlotte substation loads, increase available capacity in the area to serve new load, provide feeder backup to Vermont Electric Cooperative (VEC) area circuits, and provide additional system capacity for distributed generation.

Analysis

As noted above, GMP finds that distributed generation, as would be solicited as part of the standard offer program, does not have the capability to address the specific challenges of the Hinesburg area system. Specifically, analysis for this area indicates that additional distributed generation can result in steady state voltage fluctuations, inadvertently raising and lowering the voltage to customers outside of the allowable voltage range¹ before line and substation voltage regulators can react to adjust the voltage. This is due to an exceptionally weak area system characterized by significant line impedance, high loads, and relatively large amounts of distributed generation. To the contrary, GMP believes that strengthening the Hinesburg area distribution system with other solutions could potentially allow GMP to interconnect increasing amounts of distributed generation in the area.

In the alternative to either a traditional solution or a generation solution, in 2015, GMP engaged RES Americas to analyze an alternative reliability solution for the Hinesburg area that would include battery storage. GMP believes that for the Hinesburg area, a battery storage solution has the potential to address area steady-state voltage issues. When coupled with a reactive compensation system, the hybrid solution could also address voltage flicker concerns associated with motor starts and with the increasing amount of photovoltaic generation in the area.

¹ For steady state voltage, GMP adheres to the American National Standards Institute (ANSI) standard C84.1.

The Need for an Extension of Time

GMP has recently learned that VEC intends to replace its VEC Hinesburg substation with a new substation. The replacement of the VEC Hinesburg substation is driven by advanced substation age and deteriorating asset condition and cannot be avoided or deferred with non-transmission alternatives. As a result, GMP and VEC have begun discussions on the possibility of constructing a jointly-owned substation. GMP notes that, in recent years, GMP and VEC have successfully collaborated on three joint substation ventures including the Richmond, Jay, and Tafts Corner distribution substations. GMP also notes that such collaboration is required by the Department of Public Service (Department) *Vermont Electric Plan*.²

Construction of a jointly-owned substation has the potential to significantly reduce the cost of a traditional solution to GMP's Hinesburg area constraints. This in turn affects whether a traditional or alternative solution would be least cost. An extension of time for GMP to develop its Hinesburg area reliability plan would help ensure that GMP develops a least-cost solution. Given an extension of time, GMP would analyze and report on the following:

- Jointly-Owned Substation: GMP would continue to work collaboratively with VEC to determine the feasibility, cost, location, electrical configuration, and permitting challenges of a new, jointly-owned substation.
- Comparison of Benefits: Once the cost and configuration of a jointly-owned substation is known, GMP will be able to compare the costs and benefits of all potential solutions. This would include an examination of the alternatives' relative merits with regard to cost, system reliability, the ability to perform equipment maintenance and feeder backup, the ability of each alternative to enable the interconnection of new distributed resources, and relative asset lifetimes. Of particular interest is whether deferral of a traditional solution on the part of GMP could result, in the long term, in the cost and impacts of two substations for the Hinesburg area rather than one.
- Participation in the ISO New England Markets: The analysis to date by RES Americas on a battery solution reveals that a significant portion of the benefits from this alternative result from the ability to enter the battery into various ISO New England (ISO-NE) markets. The most notable value appears to accrue from participation in the frequency regulation market. To date, GMP has not participated in the frequency regulation market in this manner. Before doing so, GMP would analyze the capital requirements, relative risks, and feasibility of using a battery in this manner. Of particular interest is the extent to which revenues from the ISO-NE markets (e.g., capacity, regulation service) could offset the cost of battery storage, and whether using the battery for local area support would adversely impact the battery's ability to effectively participate in these markets.

² The 2016 *Comprehensive Energy Plan* (2016 CEP) incorporates the *Electric Plan*. The 2016 CEP, Appendix B, at page 20 states: "Decisions regarding some facilities may affect more than one utility. In such instances, utilities should work together so that their evaluations reflect not only their individual interests, but also the interests of ratepayers generally."

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- Energy Efficiency: GMP has contracted with Vermont Energy Investment Corporation (VEIC) to determine whether energy efficiency, either alone or in combination with other alternatives, could result in deferral of a traditional solution for the Hinesburg area. As discussed above, the feasibility and costs of a jointly-owned substation must be known before a meaningful comparison can be made with the relative costs and benefits of an energy efficiency solution.

Once the full stream of costs and benefits are known, for all alternatives, GMP would prepare an economic analysis and through its reliability plan propose a least-cost solution for the Hinesburg area constraints.

Thank you for your attention to this matter. Please feel free to contact me if you have any questions regarding this request.

Sincerely,

A handwritten signature in black ink, appearing to read "Kim L. Jones", written in a cursive style.

Kim L. Jones
Manager of T&D Planning and Distribution Engineering
cc: Electronic Service List