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***Via ePUC***

Holly Anderson, Clerk  
Vermont Public Utility Commission  
112 State Street  
Montpelier, VT 05620-2701

**Re: Case No. 24-3351-INV – Investigation into the potential need for transmission system improvements identified in the 2024 Vermont Long-Range Transmission Plan**

**Case No. 26A-1277 – Green Mountain Power Corporation reliability plan for the northern and northwest reliability areas**

Dear Ms. Anderson,

Green Mountain Power (GMP) appreciates the opportunity to provide answers to the Commission's *Order Requesting Comments on Reliability Plan and Responses to Information Requests*, in the above-referenced proceedings regarding the final reliability plan for the northern and northwest area, dated June 26, 2026 and filed in Case No. 26A-1277 (Reliability Plan). The Reliability Plan is the result of the non-transmission alternative (NTA) working group analysis.

**PUC Info Request**

***The reliability plan states that the updated forecast shows a significantly lower projection of electric vehicle (“EV”) adoption across the state pending the removal of federal incentives. Please describe in more detail the uncertainty associated with the updated EV load forecast, including: differences between the updated EV load forecast to the 2024 Plan’s EV load forecast; the assumptions about the number of registered EVs in the state in 2026 and 2033, separated by all-electric vehicles and plug-in-hybrid electric vehicles; the basis or dataset used for forecasting the number of EVs; and the assumptions about coincident peak EV load reductions.***

**GMP Response:**

Consistent with State requirements at the time, the 2024 Long-Range Transmission Plan (LRTP or Plan) was based on the premise that Vermont would meet its mandate of 100% new passenger

vehicles being zero-emission by 2035, resulting in higher EV adoption rates than currently forecasted. In addition to the loss of federal and state incentives, requirements under Advanced Clean Cars II were paused via State Executive Order in May 2025<sup>1</sup> after the 2024 Plan's forecast had already been finalized.

During the NTA process, the Energy Information Administration (EIA) completed an updated projection of EV adoptions to reflect how these policy changes would affect EV adoption rates. The updated 2026 forecast projects approximately 198,000 registered EVs in Vermont by 2035, compared to 370,000 in the 2023 forecast. In terms of annual energy, this translates to 655,402 MWh instead of 1,327,572 MWh.

In the Reliability Plan's updated 2026 EV forecast, the total number of EVs in Vermont is expected to reach 222,000 by 2036 and 316,000 by 2046, which is up from approximately 19,300 registered EVs in Vermont in July 2025 (11,791 full electric EVs, 7,554 PHEVs). Itron first forecasted EV registrations in Vermont, incorporating assumptions about the numbers of BEV/PHEV, annual miles traveled, kWh/mile, then distributed EVs across the counties based on household income and other factors.

The 2024 LRTP identified reliability challenges because the 2023 EV forecast modeled all EV charging in Vermont as uncontrolled. This was a change from the 2021 LRTP and does not reflect the programs DUs have been developing and deploying to manage EV charging loads in partnership with customers. GMP's charging programs have a high enrollment percentage and are therefore an important and effective way at managing current peak charging loads. For this reason and through the analysis that we led in the NTA Working Group, the Load Forecast Subcommittee came to the agreement that all TOU EV programs should be included within the forecast at their current adoption rates today and at their forecasted enrollment rates going forward.

The Reliability Plan and the work completed through the NTA Working Group helped to inform and improve the 2026 EV forecast to reflect the successful customer programs already in place. Specifically, the NTA Working Group developed EV curves that include Rate 74 and Rate 72 charging at current and future enrollment rates. Itron used a variety of GMP's EV charging data to inform the load shapes that were developed as part of the 2026 EV forecast. For customers enrolled in Rate 74, Itron used average Rate 74 average curves to model the load shapes and coincident contributions of these vehicles. Vehicles in Rate 72 were modeled as uncontrolled and

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<sup>1</sup> State of Vermont EO No. 04-25, <https://governor.vermont.gov/document/executive-order-no-04-25>

are left as a resource that we can dispatch during the LRTP analysis if reliability needs are found. Vehicles not enrolled in either program are modeled using an average curve from GMP's Rate 72 program on days when events are not called. It should be noted that Itron extrapolated GMP's programs statewide, including into the territories of other DUs.

### **Info Request**

*Please describe the load forecast assumptions addressing hourly EV charging, including the assumptions for: customers enrolled in EV charging management program; new EV drivers enroll in charging management program; opt-out rates of management events for customers enrolled in a charging management program; plug-in-hybrid electric vehicle participation in charging management programs; amount of home charging versus public charging; customers not on any EV rate; allocation of EV loads across each affected distribution utilities; the amount of charging under an EV management rate program that is moved off the peak; charging patterns for EVs in charging programs versus EVs not enrolled in programs.*

### **GMP Response:**

The 2023 load forecast is presented in terms of regional load (MW and MWh). This level of detail, as described in the Reliability Plan, was estimated through the work completed for the NTA analysis. First, the NTA Working Group proportionally allocated the zonal load in such a way that we could distribute it down to individual substation buses which then allowed us to allocate load among each DU. Once EV load was allocated among each DU, we then used our EV charging program data to further characterize the forecasted load within GMP service territory. Other DUs who participated in the NTA Working Group provided similar information based on their capabilities and available data.

### **Current Enrollment Rates:**

We looked at the current number of fully electric EVs that are registered within GMP's service territory and compared that to the number of accounts enrolled in a charging management program. This shows that approximately 72% of our customers with fully electric vehicles are enrolled in a charging management program in 2026.

### **Enrollment Rates for New Vehicles:**

In the Reliability Plan and consistent with our 2024 Integrated Resource Plan (IRP), our projected enrollment rate for full electric vehicles is 65% in the next 10 years. This allows for lower enrollment rates for new vehicles.

### **Opt-Out Rates for Charging Management Events:**

Our data shows that customers overwhelmingly participate in management events and the opt-out rate stays at or below 2% for any given event.

**PHEV Participation and Home Charging vs. Public Charging:**

As modeled in our 2024 IRP, our residential EV charging management plans are focused on managing full-EV load at home. In our analysis we assumed that PHEVs and public charging would be unmanaged, and accounted for that by reducing our total capability by a factor of ~5%

See Question 1 for an explanation of the number of PHEVs that are registered in Vermont in the forecast.

**Customers not on any EV Rate:**

Similarly, we forecasted 65% of fully electric vehicles in our territory being enrolled in a managed charging program, with the remaining 35% modeled with an uncontrolled load curve taken from an average of Rate 72 non-event days. This is the best approximation of a true, non-controlled EV demand curve.

**Allocation of EV loads across different DUs:**

Iron provides the load forecast used in the LRTP at the load zone level, which is a way of breaking the state into different electrical zones and does not correspond directly to town or county lines. As explained above, GMP and the NTA Working Group allocated the zonal EV loads down to individual substation/DU levels.

**Amount of charging in a program that is shifted off peak:**

As noted, there is an opt-out rate for charging events that is below 2%. For Rate 74, that means almost all charging for vehicles enrolled in this program is shifted outside of the eight-hour on-peak period using scheduled charging through the OEM charging software, and for Rate 72, it means that when GMP calls a day-ahead event, almost all charging is shifted outside of the period the event is called for.

In the Reliability Plan we used this near 100% capability to illustrate how existing programs and enrollment rates could potentially be modified to shift charging away from peak hours and spread remaining charging across a wider range of hours, keeping overall system peak loads low over a longer time period than is needed today. We are already successfully doing this to reduce Forward Capacity Market and Regional Network Service costs and will continue to do so as long as it keeps reducing costs for our customers.

**Charging Patterns for EVs in Programs vs. Those not in Programs:**

To account for unmanaged EVs we developed a demand curve from an average of Rate 72 non-event days for each month. These non-controlled days are the best current approximation of an uncontrolled charging profile.

**PUC Info Request**

*Please describe how EV forecast assumption values were determined, including how data from existing charging programs informed assumptions, the use of any data sets, online tools, and*

*studies, and any realization rates for EV charging programs that measure the ratio of evaluated or actual grid/energy impacts compared to original ex-ante engineering estimates.*

**GMP Response:**

The assumptions that Itron and VELCO used to develop the most recent 2026 EV forecast were informed heavily by the work that we performed with the NTA Working Group for the Reliability Plan, also described in Response 2, and through the VSPC Load Forecasting Subcommittee. We outlined the most relevant assumption changes between the 2023 EV Forecast and the 2026 EV Forecast in Response 1 above.

Through the NTA Working Group, GMP led analysis to quantify managed EV enrollment rates in different regions of the state, event opt-out rates, and the overall shape of managed and unmanaged EV charging shapes. The review of the multiple years of consistent performance allowed for the explicit inclusion of Rate 74 curves at current-day enrollment rates and the ability to include Rate 72 event days as part of the LRTP process to make sure that the impact and value of our existing programs is fully accounted for.

Our EV charging management programs are an effective tool to manage peaks and lower costs for our customers, and our work is focused on how to maximize the benefits of these programs to further drive costs down for the region. Subsequently we have not performed any analysis to compare the forecasted grid impacts of individual EVs compared to their actual grid impacts since the forecast data is provided at the zonal level. We also maintain a dataset of seasonal average EV curves for Rate 74 weekday/weekend and Rate 72 event/non-event days, which we have shared with Itron, the DPS, and ISO-NE forecasting groups to help improve the modeling of EV charging across various stakeholder groups in Vermont and the larger New England region.

**PUC Info Request**

*Page 15 of the reliability plan describes potential changes to time-of-use programs to allow “multiple staggered time-of-use (“TOU”) windows (with on peak hours of 3pm-12am, 4pm-1am, 5pm-2am, for example) to more evenly distribute the impact of many EVs coming online during the off-peak hours. Please explain whether any utility has demonstrated the effectiveness of such an approach. Please explain the intermediate steps that would need to be taken to develop and implement “multiple staggered TOU windows” that would be sufficiently robust to defer a transmission need.*

**GMP Response:**

As discussed throughout the NTA process, the current Rate 74 TOU demonstrates how effective the current program is at managing load—in large part because it is simple for participating customers to navigate. We are not aware of any DUs implementing multiple TOU windows. This was contemplated in the Reliability Plan as a potential option for further managing peaks if EV charging load reached the forecasted levels, though the revised load forecast reinforced that EV coincident peak loads are low enough that they do not impact the reliability of the system as a whole.

GMP is continually evaluating system peak and system minimum timing so that all the flexible resources across the state can be better dispatched and managed to reduce costs for all our customers. We recently submitted a change in Case No. 26-1302-TF for the Rate 74 TOU EV charging program to allow for a more flexible program (following customer notification) to adjust the on-peak hours, ensuring we continue to push the load later into the night and further from the peaks. Because Rate 74 customers can schedule charging automatically, these proposed updates retain the simple and effective structure of this TOU rate, with updated peak schedules sent to OEMs for automatic update.

Thank you for the opportunity to provide this information. Please reach out with any questions.

Sincerely,



Kamran Hassan  
Director of Substation Operations

cc: Service List (*via ePUC*)