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August 17, 2021
Via Electronic Mail

Dianne Martin
Chairwoman
New Hampshire Public Utilities Commission
21 South Fruit St., Suite 10
Concord, NH 03301-2429

Dear Chairwoman Martin:

Re: DE 17-189; Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty
Petition to Approve Battery Storage Pilot Program

Enclosed for filing in the above-referenced docket please find Liberty's Q2 report as required under the Settlement Agreement in Docket No. DE 17-189.

Thank you for your attention to this matter. Please do not hesitate to call if you have any questions.

Sincerely,

Heather M. Tebbetts

Attachments

Cc: Service List

Battery Storage Pilot Program

Quarterly Evaluation Report: Q2 2021

Prepared for:

Liberty Utilities

Submitted by:

Guidehouse Inc.
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Burlington, MA 01803
Telephone (781) 270-8300
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Reference No.: 208249
August 12, 2021

Background

Guidehouse prepared this report as part of its evaluation of Liberty Utilities' (Liberty's) Battery Storage Pilot Program (pilot) and the report reflects data and progress from April 1, 2021 through June 30, 2021 (Q2 2021). Throughout the duration of the pilot, Guidehouse is providing quarterly updates regarding key metrics and insights with a primary focus on peak demand reduction performance.

The pilot is being executed in two phases. In Phase 1, Liberty is deploying two Tesla Powerwall 2 batteries at each of the 100 participating residential customers' homes. Liberty will own and install the batteries and customers can participate by paying either an upfront fee or a monthly payment for 10 years. Phase 1 began in November 2020 and will proceed through August 2022. Phase 2 is planned to begin in September 2022 and proceed through November 2023 (36 months from the beginning of Phase 1). Phase 2 will introduce additional Tesla Powerwall 2 batteries (up to 500 total) and may also include a Bring Your Own Device program with up to 2,500 kW of additional capacity.

Liberty is dispatching batteries to take full advantage of coincident peak demand reduction during forecasted coincident peak demand conditions.[1] At all other times, participant batteries will be dispatched automatically to deliver additional participant value through time-of-use (TOU) bill savings.[2] To enable a minimum amount of available energy for backup power in case of an outage, 20% of the battery energy is held in reserve. The remaining energy is available for peak demand reduction and TOU bill savings.

The following sections provide updates regarding deployment progress, peak reduction performance, and customer surveys through the end of the second quarter of 2021.

Deployment Progress

Figure 1 summarizes deployment progress through June 30, 2021. As of this date, Liberty has made the following progress deploying batteries to pilot participants:

- Installed new meters for all 100 participants.
- Installed batteries for 81 participants (3 added in Q2).[3]
- Commissioned batteries (given authority to connect) for 79 participants (3 added in Q2).[4]
- Activated TOU rates for 78 participants (2 added in Q2).

For most participants, TOU rates were activated for the first billing cycle after the battery was installed (approximately 2 weeks after installation, on average). However, for nine participants with solar PV systems, TOU rates were activated prior to battery installation (approximately 16

[1] Batteries are dispatched to offset coincident peak demand charges from ISO-NE associated with Regional Network System demand, Local Network System demand, and Forward Capacity Market demand.

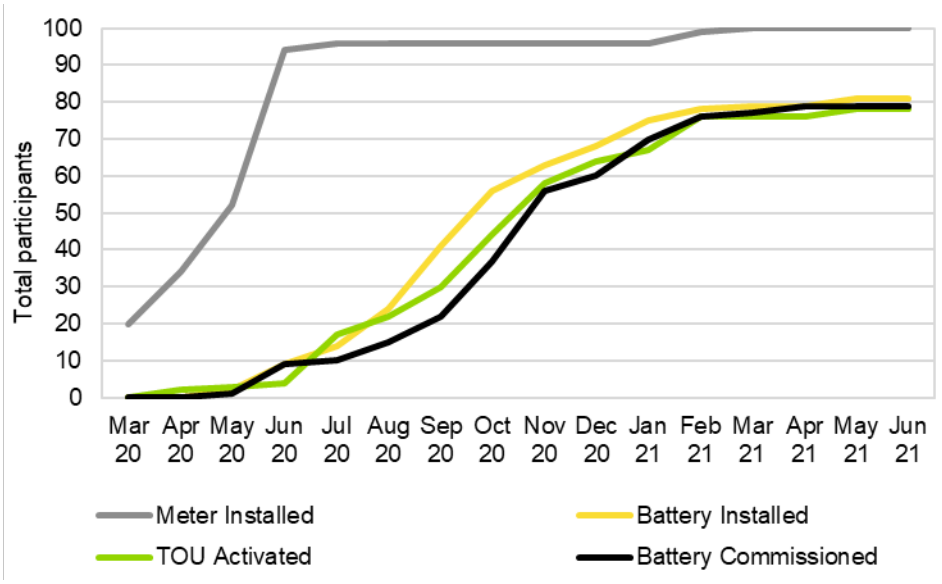
[2] All participants in Phase 1 are subject to seasonal TOU rates. Batteries will be discharged for TOU bill savings only during Critical Peak hours.

[3] One of the additional batteries for Q2 was actually installed during Q1, but it was not included in the Q1 data.

[4] One of the additional batteries for Q2 was actually commissioned during Q1, but it was not included in the Q1 data.

weeks before battery installation, on average) as moving those customers to the TOU provided greater bill savings during those months versus continuing service on Residential Rate D. On average, batteries were commissioned in less than 4 weeks after installation.

Figure 1. Cumulative Battery Deployment Progress through Q2 2021

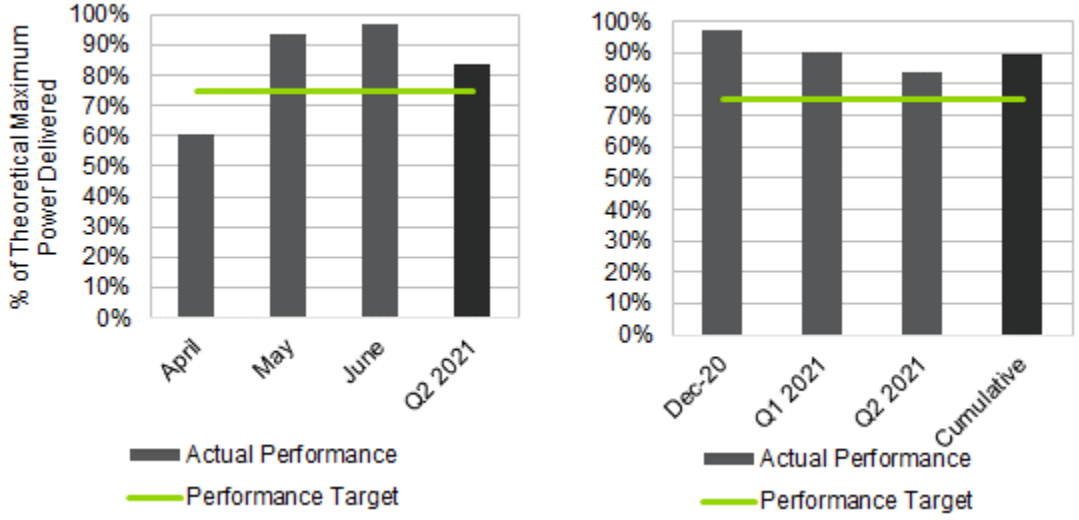


Source: Guidehouse Analysis

Peak Demand Reduction

Figure 2 summarizes the peak reduction performance during the coincident peak hour of each month of the second quarter of 2021. Peak reduction performance is defined as the actual peak reduction (average kW dispatched during coincident peak hour) relative to the maximum power rating of the batteries (5 kW per battery, 10 kW per customer). As set forth in the filing, the performance target is 75%. Liberty exceeded this target in two of the three coincident peak hours during Q2 2021. The performance for the second quarter of 2021 as a whole was approximately 84%, which exceeds the performance target. Figure 2 also shows the cumulative performance of the batteries during Phase I, starting with December 2020 (the first coincident peak after the start of Phase I). Cumulative performance through the end of Q2 2021 is 90%, which exceeds the performance target.

Figure 2. Coincident Peak Reduction for Q2 2021 (left), Phase I Cumulative (right)



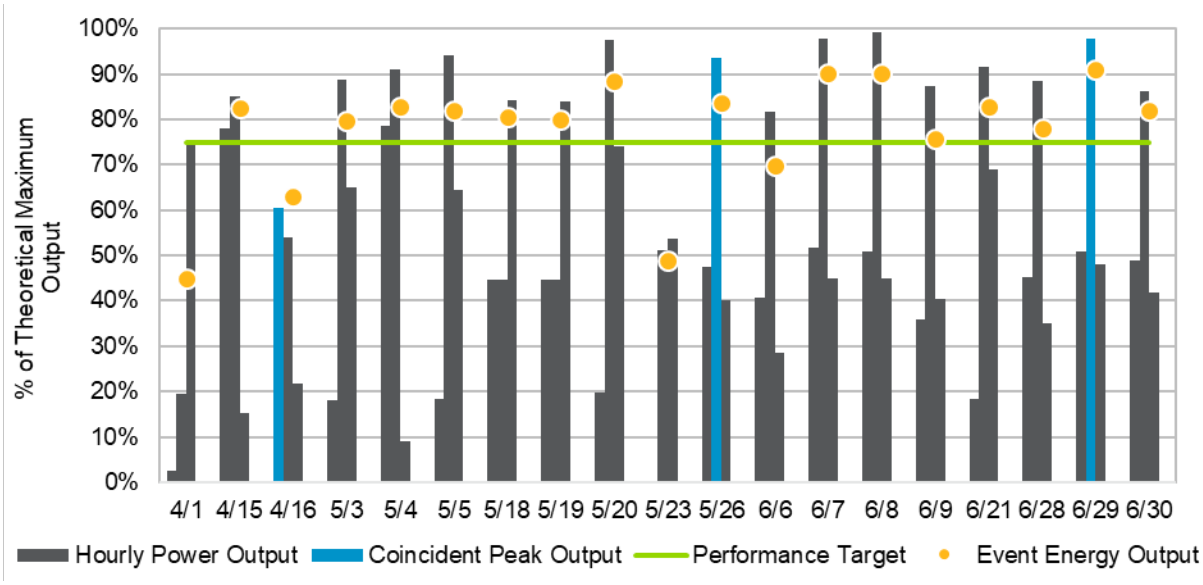
Source: Guidehouse Analysis

To achieve the targeted coincident peak reduction, Liberty called 19 peak reduction events between April 1, 2021 and June 30, 2021. The events were each 3 hours in duration, yielding 57 total event hours during this period. Figure 3 shows the hourly power output (relative to total rated power output) during each of the peak reduction events of the second quarter of 2021. Additionally, Figure 3 shows the relative energy output during each individual event (relative to the maximum available energy during the course of the event).[5]

For most events, power output exceeded the performance target during at least one hour of the event. Notably, battery power output cannot exceed the target during an entire three-hour event due to limited available energy in the battery (nominal duration at maximum power is 2.2 hours). For three of the events, power output did not exceed the target during any event hours. On these days, the total energy output was relatively low, which was primarily due to limited advance warning for those events, which resulted in the fleet having a relative low state of charge preceding the events. For one event (April 16 coincident peak), a National Weather Service storm warning triggered the batteries to start charging. Liberty was able to override this command, but the temporary charging from the storm warning lowered performance.

[5] The maximum available energy is based upon the minimum of (a) the rated power multiplied by the duration of the event and (b) the total usable energy in the batteries (10.8 kWh per battery, which is based upon 13.5 kWh rated energy capacity less 20% energy held in reserve).

Figure 3. Demand Reduction Events, Q2 2021



Source: Guidehouse Analysis

Customer Surveys

Through the end of June 2021, the team has received 59 responses to the pilot customer enrollment survey, equaling a 76% response rate. The survey captures customer's motivations for enrolling, satisfaction with installation process, and overall comprehension of the pilot. Guidehouse plans to field the survey until the completion of Phase 1. During Q2 2021, two additional participants received survey requests, but no additional survey responses were received. Consequently, there is no change in results relative to the prior quarter.

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