

STATE OF NEW HAMPSHIRE  
PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 20-170

IN THE MATTER OF:       ELECTRIC DISTRIBUTION UTILITIES  
                                  ELECTRIC VEHICLE TIME OF USE RATES

SUPPLEMENTAL TESTIMONY

OF

SANEM I. SERGICI

February 4, 2022

1 **Q. Dr. Sergici, please restate in substance the supplemental testimony you provided during**  
2 **the hearing in this proceeding held on January 25, 2022.**

3 A. Certainly. In my direct testimony, I recommended that all three utilities in New Hampshire  
4 adopt an electric vehicle (EV) time of use (TOU) rate alternative to current demand charge-  
5 based rates for high-demand draw commercial EV charging applications. My  
6 recommendation included a 100% reduction in demand charges and the recovery of  
7 generation, transmission, and distribution revenue requirements (net of customer charges)  
8 through TOU rates. I designed illustrative TOU rates that are consistent with marginal cost  
9 principles, minimize cost shifts, and have the potential to avoid future capacity costs by  
10 encouraging customers to shift load from peak to off-peak periods.

11  
12 When developing the illustrative rates described in my direct testimony, I had to make  
13 several assumptions due to the limited number of separately-metered commercial class  
14 charging stations currently deployed, and the lack of information relating to usage patterns  
15 for those charging stations. One of those assumptions is the “charging station utilization  
16 rate,” which is defined as the actual usage, divided by the maximum possible usage based on  
17 the installed capacity. I assumed a 15% utilization rate to develop TOU rates that would lead  
18 to the same amount of revenue collection as the analogous non-EV commercial customer  
19 class based on a dataset provided by Eversource.<sup>1,2</sup> However, after further inquiry during a  
20 subsequent technical session, I discovered that the previous utilization rate we relied upon  
21 was based on *billed demand*, instead of the installed capacity of the chargers at the station.

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<sup>1</sup> Exhibit 13 at Bates 7-10.

<sup>2</sup> I used data from analogous commercial customer rate classes: G1 and G2 for Unitil and Liberty, and Rate GV for Eversource.

1 This distinction was identified and corrected in a follow-up data request, which is available at  
2 Exhibit 13, Bates 34, with actual usage information detailed at Bates 36-39. Those sheets  
3 contain two percentage columns showing the billed demand utilization and installed capacity  
4 utilization and show that separately-metered EV charging customers generally had an  
5 installed capacity utilization of between 1% and 5%.

6  
7 This new information had two implications: (1) the illustrative rates in my testimony were  
8 only recovering similar revenues to those that would be recovered through the analogous  
9 class rates, under the 15% utilization rate assumption; and (2) the illustrative rates would  
10 *under-recover* costs for stations with a lower utilization rate, such as those with utilization  
11 rates less than 5%.

12  
13 With this new information, I performed bill impact analyses for all three utilities, using  
14 different utilization rates. My analysis showed that this under-recovery situation could be  
15 remedied by leaving all other assumptions in my modeling the same, and leaving the  
16 resulting volumetric rates the same, but also maintaining a demand charge at half of the  
17 demand charge rate of the comparable commercial customer class. This is in fact the rate  
18 design adopted for separately-metered, commercial class EV charging stations under the  
19 settlement agreement.

20  
21 Table 1 below presents the monthly bills for three hypothetical EV charging facilities with  
22 5%, 10%, and 19% utilization rates under the original rates (G1 for Unitil and Liberty), TOU  
23 rate only, and TOU rate plus half of the demand charge of the comparable commercial

1 customer class. This analysis assumes an annual consumption allocation of 50% during the  
2 peak period, 30% during the mid-peak period, and 20% during the off-peak period, before  
3 any load-shifting.

4

5 **Table 1: Monthly Bills for Representative EV Charging Facilities**

Monthly Bill	Unit	Facility 1	Facility 2	Facility 3
Utilization rate		5%	10%	19%
<b>Unitil G1</b>				
Original G1	\$/month	\$1,223	\$1,396	\$2,767
DOE Rate - Original TOU	\$/month	\$722	\$1,260	\$3,644
DOE Rate - Original TOU and 1/2Demand Charge	\$/month	\$1,178	\$1,716	\$4,404
<b>Liberty G1</b>				
Original G1	\$/month	\$2,043	\$2,523	\$5,381
DOE Rate - Original TOU	\$/month	\$1,459	\$2,406	\$6,609
DOE Rate - Original TOU and 1/2Demand Charge	\$/month	\$2,005	\$2,952	\$7,519

6

7

8 Before any load shifting behavior takes place, the TOU rate plus half of the demand charge  
9 option ensures recovery of approximately the same amount of revenue that would have been  
10 recovered under the original rate on a monthly basis. For example, for Facility 1 with a  
11 utilization rate of 5%, the original Unitil G1 rate leads to a monthly bill of \$1,223. The TOU  
12 rate-only option leads to a monthly bill of \$772, which under-recovers the required revenue.  
13 TOU rate plus half of the demand charge option leads to a monthly bill of \$1,117, which  
14 approaches the original revenue. A similar pattern is observed for the Liberty G1 rates  
15 shown.

16

1 In conclusion, for the design of the separately-metered high-demand draw charging station  
2 EV TOU rates, I recommend that half of the demand charges of the analogous commercial  
3 customer rate class be maintained and that the rest of the revenue requirement be collected  
4 through the TOU rates, based on the methods described in my direct testimony. That rate  
5 structure will send efficient price signals to encourage EV charging during the times of the  
6 day when it costs less and will mitigate future capacity needs, thereby resulting in cost  
7 savings for all ratepayers. It will also ensure revenue recovery from low-utilization charging  
8 stations and reduce the extent of potential cost shifts.

9 **Q. Does that conclude your supplemental testimony?**

10 A. Yes, it does.