

**THE STATE OF NEW HAMPSHIRE**  
**BEFORE THE**  
**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION**

**JOINT TESTIMONY OF**  
**DENNIS E. MOORE, BRIAN J. RICE AND MICHAEL R. GOLDMAN**

**PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE**  
**D/B/A EVERSOURCE ENERGY**

**SEPERATELY-METERED ELECTRIC VEHICLE TIME-OF-USE RATE AND LOAD**  
**MANAGEMENT PROPOSALS**

**Docket No. DE 20-170**

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1 **Q. Mr. Moore, please state your name, business address and position.**

2 A. My name is Dennis Moore, I work at 107 Selden Street in Berlin, Connecticut. I am the  
3 Director of IT Enterprise Business Solutions at Eversource Energy Service Company.

4 **Q. Have you previously testified before the Commission?**

5 A. No, I have not.

6 **Q. Please describe your educational background and professional experience.**

7 A. I have a Bachelor of Science degree in Mathematics from the University of Connecticut.  
8 I have worked at Eversource Energy for 22 years developing, implementing and

1 maintaining enterprise business solutions. Prior to that I worked as a Manager of  
2 Resource Planning and Economic Analysis at Yankee Gas Services Company.

3 **Q. Mr. Rice, please state your name, business address and position.**

4 A. My name is Brian J. Rice. My business address is 247 Station Drive, Westwood, MA  
5 02090. My position is Manger, Regulatory Projects at Eversource Energy Service  
6 Company and in that position I provide service to the operating companies of parent  
7 company Eversource Energy, including the Public Service Company of New Hampshire  
8 d/b/a Eversource Energy (“Eversource” or “the Company”).

9 **Q. Have you previously testified before the Commission?**

10 A. Yes, in Docket No. DE 19-197, the Statewide Multiuse Online Data Platform. I have  
11 also submitted testimony in several Commission dockets, including the Company’s  
12 Electric Vehicle (“EV”) make-ready infrastructure proposal filed in Docket DE 19-057. I  
13 have also testified before the Massachusetts Department of Public Utilities and  
14 Connecticut Public Utilities Regulatory Authority in several proceedings related to utility  
15 program design, revenue requirements and cost recovery.

16 **Q. Please describe your educational background and professional experience.**

17 A. I earned a Bachelor of Science degree in Industrial Economics from Union College and  
18 received a Master of Business Administration degree with a concentration in corporate  
19 finance from the Boston College Carroll Graduate School of Management. I’ve held  
20 positions in different functions at Eversource Energy since 2011. My present

1 responsibilities include managing analysis and projects in support of enterprise-wide  
2 regulatory initiatives across Eversource Energy's operating businesses. Prior to joining  
3 Eversource Energy I held consulting positions covering various segments of the energy  
4 and utility industries.

5 **Q. Mr. Goldman, please state your name, business address and position.**

6 A. My name is Michael R. Goldman. My business address is 247 Station Drive, Westwood,  
7 MA 02090. My position is Director, Energy Efficiency Regulatory, Planning, and  
8 Evaluation at Eversource Energy Service Company and in that position I provide service  
9 to the operating companies of Eversource Energy including the Company.

10 **Q. Have you previously testified before the Commission?**

11 A. Yes. I submitted testimony in DE 17-136, the Electric and Gas Utilities' 2018-2020  
12 Statewide Energy Efficiency Plan. My testimony was focused on emerging program  
13 offerings and demand response programs. I have also testified before the Massachusetts  
14 Department of Public Utilities and Connecticut Public Utilities Regulatory Authority in  
15 several proceedings related to utility program design, emerging program design, and  
16 demand response programs.

17 **Q. Please describe your educational background and professional experience.**

18 A. I earned a Bachelor of Arts degree from the University of Wisconsin-Madison and a  
19 Master of Arts degree from the Johns Hopkins University with specializations in  
20 international finance and energy policy. From 2008-2010, I was an Energy Business  
21 Analyst at the consulting firm of PowerAdvocate focusing on large capital-intensive

1 utility construction projects. From 2010-2012, I was a strategy and operations consultant  
2 within Deloitte Consulting's Energy and Resources practice area, focusing on energy  
3 issues for federal clients. I joined NSTAR in 2012, where I have served in roles of  
4 increasing responsibility, including Senior Analyst, Supervisor, Manager, and now  
5 Director. Within my roles at Eversource Energy, I have been responsible for energy  
6 efficiency planning and evaluation matters across Eversource Energy's three-state  
7 footprint. I have also been responsible for designing and setting the strategic direction for  
8 innovative programs that impact multiple parts of the Company, such as demand  
9 response initiatives. I have produced over 30 publications and have been featured as a  
10 panelist at conferences in the areas of energy efficiency, demand response, distributed  
11 energy resources and innovative energy technologies.

12 **Q. What is the purpose of this testimony?**

13 A. The purpose of our testimony is to describe how the Company would implement new  
14 time-of-use ("TOU") rates for electric vehicle ("EV") charging as well as load  
15 management options for EV customers. Eversource is filing these proposals pursuant  
16 Order No. 26,394 issued by the Commission in Docket No. IR 20-004. The design of  
17 potential EV TOU rates is presented separately in the testimony of Edward A. Davis.  
18 Eversource is pleased to have this opportunity to propose solutions to further serve  
19 customers who are expected to be increasingly driving and charging EVs in the coming  
20 years. Our testimony will explain why a near-term launch of an EV managed charging  
21 initiative is recommended over separately-metered EV TOU rates as a starting point for  
22 what is expected to be an ongoing evolution and expansion of customer options as EV

1 adoption grows and technological advances continue. Load management offers an  
2 opportunity for the Company to offer financial incentives for EV customers to optimize  
3 load which are similar to what may be sought through offering a separately-metered TOU  
4 rate. However, load management can provide incentives to the relatively small number  
5 of current EV customers without making large fixed investments to modify enterprise IT  
6 systems that support billing, data management and related functions. Load management  
7 is also a much more flexible approach to optimizing load which may better enable the  
8 Company to adapt to changing and localized system conditions that could emerge in the  
9 early stages of EV adoption across the Company's service territory.

10 **Q. How is your testimony organized?**

11 A. Our testimony begins with a summary of the relevant guidance issued by the Commission  
12 in Docket No. IR 20-004 which informed the Company's development of TOU rate and  
13 load management options. We then discuss the technical requirements, anticipated costs  
14 and business considerations of offering EV TOU rates to customers in the near term. We  
15 explain how a recommended load management program would provide similar benefits  
16 to EV customers at lower overall cost and risk, and finally conclude with discussion on  
17 the recovery of costs for offering the EV customer options addressed in this testimony.

18 **I. RATE DESIGN STANDARDS FOR EV CHARGING**

19 **Q. Please summarize the Commission's guidance which informed the Company's**  
20 **development of TOU rate and load management options.**

21 A. The Commission made several determinations in Order No. 26,394 which guided the  
22 Company's development of EV proposals. The Commission ordered that the current

1 docket be opened for it to consider utility-specific EV TOU rate proposals for separately-  
2 metered residential and small commercial customers as well as high-demand draw  
3 commercial applications. Separately-metered residential EV rates were directed, among  
4 other criteria, to incorporate time-varying energy supply, transmission, and distribution  
5 components; have three periods (e.g., off peak, mid-peak, and peak); and be seasonally  
6 differentiated. The Commission's guidelines were generally consistent with the rate  
7 designed and approved for the purposes of Liberty's Battery storage pilot, and later  
8 adopted for Liberty's separately-metered EV TOU Rate<sup>1</sup>. The Commission also found  
9 that load management offerings may provide near-term ratepayer benefits without  
10 installation of metering infrastructure and other associated upgrades. (Order No. 26,394  
11 at 8). For that reason, it found that load management techniques may be an appropriate  
12 strategy for EV rate design.

13 **Q. Are there other criteria which guided the Company's development of EV customer**  
14 **options?**

15 A. Yes. The Company was also guided by the goals enumerated in SB 575 which originally  
16 directed the Commission to determine the appropriateness of rate design standards for EV  
17 charging. SB 575 advised that the determination of EV rate designs include  
18 consideration of whether such rates would encourage energy conservation, optimal and  
19 efficient use of facilities and resources by an electric company, and equitable rates for  
20 electric consumers. The Company expects that load management approaches  
21 recommended for near-term implementation will advance these legislative goals.

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<sup>1</sup> Liberty Utilities (Granite State Electric) Corp., Order No. 26,376 at 9 (June 30, 2020).

1 **II. EV TOU RATE IMPLEMENTATION**

2 **Q. Please summarize the EV TOU rate structure identified by the Company to be**  
3 **consistent with Commission guidance.**

4 A. The EV TOU rate structure is described in more detail in the accompanying testimony of  
5 Edward A. Davis. Consistent with the guidance issued by the Commission in Docket No.  
6 IR 20-004 the Company has developed, and evaluated the implementation of, an EV  
7 TOU rate that has three periods (e.g. off-peak, mid-peak and peak) for energy supply,  
8 transmission and distribution components. This rate is for residential and small business  
9 customers; the high-demand draw rate developed by Eversource was filed to and being  
10 evaluated separately in Docket No. DE 21-078.

11 **Q. Does the Company currently bill rates similar to what is contemplated for EV**  
12 **charging?**

13 A. No. Eversource has offered distribution and transmission time-of-day rates to residential  
14 New Hampshire customers for many years, but they include only two usage periods (peak  
15 and off-peak). The Company also does not presently bill TOU periods for varying  
16 Energy Service rates.

17 **Q. What metering equipment would be required to collect necessary billing data?**

18 A. Enrollment in a separately-metered EV TOU rate would require installation of a separate  
19 utility service and meter at a customer's premises. The EV-only meter would require  
20 interval data capabilities to produce the necessary billing determinants for the proposed  
21 rate and cellular communication capabilities to transmit data. The Company estimates  
22 the installed cost of the necessary utility meter to be approximately \$500. A customer

1 would also likely incur additional costs for a licensed electrician to install wiring and a  
2 meter socket for the new service. These customer costs would vary, but could be several  
3 hundred to over a thousand dollars.

4 **Q. Did the Company consider if it were feasible to use alternative sources of EV**  
5 **charging data instead of requiring an additional meter?**

6 A. Yes. Eversource presented an outline of criteria to Commission Staff and participants at  
7 a technical session in this docket that the Company would need to assess to determine if it  
8 were readily feasible to use alternative sources of EV charging data. Eversource noted  
9 that ITRON MV90xi is the Company's system of record for receiving and managing  
10 interval data. Efficient implementation of a separately-metered EV TOU rate would  
11 require alternative data sources, such as customer-owned electric vehicle supply  
12 equipment ("EVSE") have a Translation Interface Module ("TIM") to tell MV90xi how  
13 to read the meter type correctly. The TIM would also need to be installed in MV90xi and  
14 tested with the data source. Eversource directly confirmed with ITRON that such  
15 capabilities to enable interval data communication from current EVSE to MV90xi are not  
16 presently available.

17 Manual processes would be required for data collection and billing separately-metered  
18 EV TOU rates with data that cannot be received by MV90xi. There are also additional  
19 factors that would likely prevent the Company from replicating the quality, accuracy and  
20 security of billing data from utility-owned metering with alternative third-party devices.  
21 Prior to relying on alternative data sources, the Company would seek to confirm, at a  
22 minimum, that it had unrestricted access to equipment to ensure its integrity through



1 periodic testing and verification according to established protocols; have copies of all  
2 software and firmware that could have an effect on accuracy; and confirm equipment has  
3 suitable tampering protections.

4 Eversource has determined that it is not readily feasible for alternative data sources to be  
5 used in place of utility metering for billing purposes at this time, but remains committed  
6 to exploring all opportunities to effectively utilize third-party device capabilities to serve  
7 customers. The Company's load management proposal discussed later in this testimony  
8 is consistent with this goal and the Company will continue to explore other opportunities  
9 that may emerge with advances in technology and systems.

10 **Q. Would the Company need to modify existing billing and other IT systems in order**  
11 **to bill a three-period rate for EV charging?**

12 A. Yes. Making the separately-metered EV TOU rate available to all customers would  
13 impact a number of the Company's enterprise systems and processes. Modifications  
14 would be required to MV90xi, the meter tracking system, the process for billing  
15 determinant files sent to the billing system, the C2 billing system, bill print and  
16 EDI. MV90xi, the meter tracking system and associated billing determinant process will  
17 require system changes for a new meter type and additional billing determinants. This  
18 new and more complex TOU rate would need to be built in the C2 billing system and the  
19 ability to differentiate and bill the supply cost for both internal and external supply would  
20 have to be developed. The EDI files sent to suppliers would require enhancements as  
21 would the bill format and print process. Extensive testing to all impacted systems and  
22 areas including metering, billing, print and load service would be needed.

1 **Q. What is the estimated cost and lead time for necessary system modifications?**

2 A. Eversource estimates it would need to invest approximately \$9 million in modifications  
3 to existing enterprise systems to make the proposed EV TOU rate available to customers.  
4 Completion of anticipated work could also require a lead time of up to 30 months  
5 following the Commission's approval of a separately-metered EV TOU rate. These  
6 estimates are the result of an internal review of the proposed rates and consultation with  
7 Eversource's IT subject matter experts on the scope of changes required to implement the  
8 program.

9 **Q. Are there additional business considerations associated with implementation of an**  
10 **EV TOU rate?**

11 A. Yes, there are several. First, the estimated costs for system modifications represent fixed  
12 costs that would be entirely incurred by the Company prior to making EV TOU rate  
13 options available to customers. If few customers ultimately chose to enroll in the new  
14 TOU rate the expenditures in system modifications could end up as a sunk cost that  
15 provides little customer benefit. Eversource expects the level and volume of customer  
16 interest in various EV rate options will grow with EV adoption, but notes that the EV  
17 market is still in very early stages and EV customers that might be interested in a  
18 separately metered EV TOU rate at this time represent a very small portion of the  
19 Company's customer base. The Company has also not determined that the level of  
20 savings that an individual residential EV customer could achieve through a separately-  
21 metered rate would be sufficient to encourage large numbers of customers to enroll. As  
22 indicated in the testimony of Mr. Davis, a typical residential customer that charges one

1 EV at home entirely during off-peak periods would likely realize very minimal savings  
2 by enrolling in a potential EV-only TOU rate. Given that customers would need to incur  
3 additional cost for wiring a separately-metered service to achieve savings through the  
4 TOU rate it's possible that enrollment in that rate could be modest.

5 Second, implementation of a three-period TOU rate would require the Company to make  
6 expenditures to modify billing and data management systems that may have limited  
7 future useful lives. While the Company does not yet have a specific timeline for retiring  
8 current systems, Eversource Energy is engaged in several activities across multiple  
9 jurisdictions that could lead to replacement of enterprise systems. As part of the  
10 Settlement Agreement on Permanent Distribution Rates approved by the Commission in  
11 Docket No. 19-057 the Company has agreed to assess the feasibility of deploying  
12 advanced metering functionality in New Hampshire. This assessment is expected to  
13 build upon work performed by Eversource Energy to prepare an Advanced Metering  
14 Infrastructure Business Case and Implementation Plan filed with the Connecticut Public  
15 Utilities Regulatory Authority in Docket No. 17-12-03RE02. The Massachusetts  
16 Department of Public Utilities has also directed Eversource Energy to prepare a strategic  
17 proposal to achieve advanced metering functionality through a full-scale deployment of  
18 AMI and required that such a plan address associated back-office support systems<sup>2</sup>. The  
19 current progress toward evaluating and developing new metering, billing and data  
20 management solutions across all of Eversource Energy's operating companies suggest it  
21 is likely not reasonable to assume that investment in current enterprise systems would

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<sup>2</sup> D.P.U. 20-69-A, May 21, 2021 pgs. 33-34.

1 provide benefits to customers over an extended time period. However, the eventual  
2 deployment of new enterprise systems would also likely position the Company to more  
3 efficiently support more rate options for EV customers in the future; creating  
4 opportunities to build upon effective near-term approaches.

5 Lastly, the Company expects that the core objectives for EV rate design enumerated in  
6 SB 575 can be effectively advanced at this time through alternative and currently  
7 available approaches at much lower cost. We discuss the opportunities for optimizing  
8 load through load management further in this testimony, but also note that Eversource's  
9 existing rate R-OTOD, Residential Time-of-Day Service is an available option for  
10 customers who may seek a time-differentiated rate for predominantly off-peak EV  
11 charging. The Company is separately filing proposed amendments to this rate pursuant  
12 the Docket No. DE 19-057 settlement agreement that may further enhance its suitability  
13 for EV customers and alignment with SB 575.

### 14 **III. LOAD MANAGEMENT PROPOSAL**

#### 15 **Q. Please summarize the Company's Load Management Proposal**

16 A. A detailed proposal for an EV managed charging initiative is included as Attachment  
17 MRG-1 to this testimony. Eversource's proposal leverages existing demand management  
18 capabilities and builds upon successful demand response programs that have been  
19 implemented in Massachusetts and Connecticut. The proposed program would provide  
20 annual cash incentives of up to \$150 to customers that agree to allow the Company and  
21 its EV charging partners to directly control EV charging activity through networked  
22 EVSE. Through direct load control, the burden to avoid charging during peak periods

1 would be taken off customers and they would receive a financial benefit similar to, but  
2 likely greater than, what may be sought through a separately-metered TOU rate.

3 **Q. What are the estimated costs of the EV managed charging initiative**

4 A. In addition to the incentives provided to customers, which the Company estimates could  
5 total \$450,000 over five years, the Company anticipates it could incur approximately  
6 \$500,000-\$900,000 in additional costs to administer the program over five years. The  
7 Company believes that an additional \$200,000 for evaluation, measurement and  
8 verification (“EM&V”) activities may be appropriate but is not included in any budgetary  
9 estimates at this time.

10 **Q. Please summarize the administrative costs the Company anticipates would be**  
11 **incurred to run the program**

12 A. The Company would expect to incur administrative costs for customer acquisition,  
13 program enrollment, marketing, vendor management, platform management, OEM  
14 partner management, reporting, performance calculation, and customer settlement. A  
15 more detailed description of costs are included in Attachment MRG-1. Eversource  
16 Energy has typically recommended that EM&V costs be included in budgets for similar  
17 load management programs conducted as part of energy efficiency programs in  
18 Massachusetts and Connecticut. However, the Company would also find it reasonable to  
19 defer EM&V activity at this time to the extent the program is largely deployed as an  
20 alternative to separately-metered EV TOU rates.

1 **Q. Does the proposed EV managed charging initiative have potential advantages over**  
2 **separately-metered EV TOU rates?**

3 A. Yes. The Company believes a managed charging initiative could have a number of near-  
4 term advantages with respect to customer experience, flexibility and cost. EV customers  
5 with existing networked EVSE would likely be able to enroll in the program without the  
6 need to install any additional equipment. As discussed previously, the Company has  
7 confirmed that existing data management systems would not support opportunities for  
8 customers to enroll in EV-only TOU rates without the installation of additional utility-  
9 owned metering. Load management approaches are much more suited to utilizing third-  
10 party device capabilities to serve customers. Proposed incentives will be paid based on  
11 whether the Company is retaining the ability to curtail charging during certain time  
12 periods. It is a binary condition: the vehicle is either charging or it is not. The program  
13 and development of incentives is not reliant on measuring actual energy consumption.  
14 Relying on the charger to tell the Company if the vehicle is charging is exponentially  
15 simpler than relying on equipment to measure energy consumption accurately enough to  
16 be used for billing purposes. This program would pay off-bill incentives as a non-tariff  
17 program, in line with how energy efficiency programs are currently offered.

18 Load management also provides much greater flexibility for the Company to optimize  
19 charging activity based on changing distribution system conditions and localized system  
20 conditions. A TOU rate would uniformly encourage EV customers to all charge during  
21 the same period across the entire distribution system. Revising TOU periods within a  
22 commission-approved rate structure can also be an administratively-burdensome and

1 time-consuming process. Such an inflexible solution is not well suited to addressing  
2 some of the anticipated challenges that may emerge as EV adoption grows. As discussed  
3 in Attachment MRG-1, utilities face several risks as the demand for EVs grow, including  
4 substation and transformer impacts, peak load increases, and timer peaks. There are  
5 strategies the Company can deploy to mitigate these risks as part of a demand  
6 management program, such as throttling and scheduling, that would be difficult to  
7 replicate through a rate solution.

8 Lastly, the near-term cost of offering effective load management incentives to customers  
9 is both lower and entails less risk. Implementing a load management program would not  
10 require the Company to make significant fixed investments to enhance system  
11 capabilities that could be sunk if customers did not enroll. Eversource would largely be  
12 using existing enterprise system capabilities and resources that are already in place, or  
13 will be in place, to support successful demand management programs across all of  
14 Eversource Energy's operating companies. A substantial portion of the estimated  
15 administrative expenses represent the cost of these resources that would be appropriately  
16 allocated to New Hampshire program budgets based on Eversource Energy's existing  
17 cost allocation policies. In the event that enrollment in a New Hampshire EV load  
18 management did not materialize or was outpaced by the scale of demand management  
19 activities of other operating companies then allocated costs would be adjusted  
20 accordingly. New Hampshire customers would not be responsible for supporting the  
21 ongoing costs of Eversource Energy's demand management capabilities if comparatively  
22 few New Hampshire EV customers participated in the proposed program. Other

1 administrative costs which are more directly associated with New Hampshire activities  
2 are also largely variable based on the number of customers that enroll. Because of these  
3 factors, the proposed managed charging initiative would be launched with a much lower  
4 fixed cost commitment than would be required to implement a separately-metered EV  
5 TOU rate.

6 **Q. Will the proposed EV managed charging initiative inform development of future EV**  
7 **customer options?**

8 A. Yes. Eversource expects it would gather information and gain insights in the course of  
9 running the proposed EV managed charging program that could contribute to the success  
10 of future EV customer offerings. Customer enrollment data would help the Company  
11 better understand which of its customers are acquiring EVs, where they are located in the  
12 Company's service territory and what equipment they are using for EV charging. Event  
13 participation and charging session data collected in the course of running the program  
14 would also allow the Company to better understand when customers are charging, the  
15 potential impacts that charging may have on the electric power system and the  
16 opportunities for charging activity to be shifted to reduce system impacts.

17 **IV. COST RECOVERY**

18 **Q. How does the Company propose to recover the anticipated costs of providing new**  
19 **rate options to EV customers?**

20 A. Eversource appreciates the opportunity that the Commission has created with this docket  
21 to provide EV customers with financial incentives to optimize load. Eversource Energy



1 has already implemented or proposed EV programs to further serve customers in  
2 Massachusetts and Connecticut and would like to make similar options available to New  
3 Hampshire EV customers as well. However, making these programs available to  
4 customers in the near-term would require the Company to incur incremental costs that are  
5 outside the normal course of the Company's current business or, in the case of separately-  
6 metered TOU rates, require significant new investment to implement.

7 All of the anticipated costs for the recommended managed charging initiative would  
8 likely be considered customer assistance expenses and included within operations and  
9 maintenance ("O&M") costs for the Company. The anticipated costs to provide load  
10 management incentives to customers have traditionally been included in energy  
11 efficiency program budgets in other jurisdictions and recovered through separate rate  
12 mechanisms for funding energy efficiency activities. The System Benefits Charge  
13 ("SBC") is the mechanism for recovery of energy efficiency program costs in New  
14 Hampshire, but the Company does not propose to recover costs for near-term  
15 implementation of the managed charging initiative through the SBC at this time. Given  
16 that the managed charging initiative can be offered at lower cost than other alternatives,  
17 the Company requests only that it be allowed to defer incremental costs for the program  
18 to a regulatory asset to be amortized following its next base rate proceeding. Eversource  
19 would likely eliminate EM&V activities for the managed charging initiative in order to  
20 contain costs under the proposed recovery framework, however, as discussed previously.  
21 The Company does not recommend near-term implementation of a separately-metered  
22 EV-only TOU rate with existing systems, as the costs it would incur to do so would be

1 significantly greater than what is expected to launch the proposed managed charging  
2 initiative. If the Commission were to order the Company to implement the proposed  
3 separately-metered EV TOU rate or a similar rate, the Company would respectfully  
4 request it also provide the opportunity for associated incremental costs to be recovered  
5 through the Company's Regulatory Reconciliation Adjustment or a comparable  
6 reconciling mechanism.

7 **Q. Would the Company seek to recover costs of offering EV TOU rates to customers in**  
8 **the future through the same mechanism?**

9 A. Not necessarily. Eversource expects that there will be more opportunities to offer  
10 different rate options to EV customers in the future as part of more comprehensive  
11 updates to the Company's enterprise billing and data management systems. While no  
12 such updates are presently planned for near-term implementation, the Company has  
13 identified a number of parallel activities in multiple jurisdictions earlier in this testimony  
14 that are likely to lead to updates of enterprise systems. Such updates would be more  
15 likely to be undertaken in the normal course of the Company's enterprise operations, or  
16 through a more broad-based investment initiative, and appropriately recovered through a  
17 different rate mechanism.

18 **IV. CONCLUSION**

19 **Q. Please summarize the Company's recommended approach for serving EV**  
20 **customers in the near-term.**

21 A. Eversource applauds the Commission for thoughtfully considering EV rate design  
22 standards in Docket No. IR 20-004 and subsequently directing New Hampshire utilities

1 to file EV rate proposals. The Company looks forward to effectively serving customers  
2 that will be charging EVs in increasing numbers. Rate design standards that promote  
3 optimal and efficient use of facilities and resources by an electric company, and equitable  
4 rates for electric consumers, will be critical as the transportation sector of New  
5 Hampshire and the surrounding region becomes increasingly electrified. Based on a  
6 thorough assessment of the Company's current enterprise systems, Eversource proposes  
7 that the near-term launch of an EV managed charging initiative is the most cost-effective  
8 starting point for what is expected to be an ongoing evolution and expansion of EV  
9 customer options as adoption grows and technological advances continue. Eversource  
10 expects that future comprehensive updates to the Company's billing, data management  
11 and other enterprise systems will likely expand the rate options it can provide to all  
12 customers, including those with EVs. However, the modification of current enterprise  
13 systems for the narrow purpose of offering EV TOU rates is not recommended. The  
14 estimated costs of such modifications are significant and there is a meaningful risk that  
15 commensurate customer benefits would not be realized.

16 **Q. Does this conclude your testimony?**

17 **A.** Yes. It does.

# Eversource Proposal for Electric Vehicle Managed Charging Initiative

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Docket No. DE 20-170, Electric Vehicle Time of Use Rates



Submitted to the State of New Hampshire Public Utilities Commission

June 15, 2021

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## 1. Overview

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This proposal, filed by Eversource Energy (hereinafter “Company” or “Eversource”) in Docket No. DE 20-170, pursuant to the New Hampshire Public Utilities Commission’s (“Commission”) Order in Docket No. IR 20-004, *Investigation into Rate Design Standards for Electric Vehicle Charging Stations and Electric Vehicle Time-of-Day Rates*. In its Order, the Commission directed New Hampshire electric distribution companies (EDCs) to propose separately-metered Electric Vehicle (“EV”) time-of-use (“TOU”) rates. The Commission also recognized that load management offerings could provide near-term ratepayer benefits without installation of metering infrastructure and other associated upgrades and, for that reason, found that load management techniques may be an appropriate strategy for electric vehicle rate design. Consistent with the Commission’s Order, the Company proposes implementing an Electric Vehicle (“EV”) Managed Charging initiative as a near-term alternative to TOU rates. The Company believes that managed charging may be able to functionally achieve the same objectives as a TOU rate but at a significantly lower upfront cost and with lower risk.

Since 2011, consumer demand for EVs has increased significantly with over 1.5 million vehicles currently on the nation’s roads and the Edison Electric Institute (“EEI”) forecasts EV sales will surpass 3.5 million by 2030.<sup>1</sup> This increase has direct impacts on the electric power system as EVs require vehicle chargers that draw power during both peak and off-peak times. As the adoption and use of EVs increase across the United States and in New Hampshire, utilities must consider how best to manage this additional load to benefit the electric power system and customers.

The Company supports exploring opportunities to encourage the efficient use of the electric power system by the growing number of customers who seek to charge EVs at homes, businesses, and public charging facilities. In addition, the Company supports long-held standards that rates should be based on principles of cost causation and provide proper price signals. However, the near-term implementation of more advanced TOU rate structures is likely to introduce costs and complexities to metering and billing process. Advanced rate structures based on the marginal cost of service of EV customers must be presently developed in the absence of significant data. The current number of EV customers is small and data on actual EV load profiles and customer behavior is limited. There is a risk that inappropriate rate design may inadvertently encourage inefficient use of facilities and resources, particularly on localized portions of the electric power system.

<sup>1</sup> EEI, Issues & Policy: Electric Transportation, available at: <https://www.eei.org/issuesandpolicy/electrictransportation/Pages/default.aspx>.

Eversource encourages the Commission to review this proposal for an EV Managed Charging initiative and to consider a more gradual approach to serving a growing EV customer segment in New Hampshire. An EV Managed Charging initiative could be implemented in a shorter time frame, at a lower cost, and still encourage the efficient use of the electric power system.

Managed charging strategies allow electric utilities to remotely control EV charging by turning chargers on/off or limiting the draw of power corresponding to different thresholds such as the level of demand on the electric power system or local distribution issues. EV managed charging strategies have the potential to reduce peak loads, provide system benefits, reduce the need for new energy generation, and better utilize utilities' facilities and resources. The Company is well suited to develop an EV Managed Charging initiative that can achieve these objectives through its deep understanding of system conditions and experience in running energy efficiency, demand management programs, and similar EV managed charging demonstrations in its other service territories. The Company has significant experience in providing performance-based incentives to customers through programs based on the utilization of third-party technologies such as thermostats, including utility control of such devices.

Demand-side management initiatives provide the added benefit of being flexible to reduce load when and where it is necessary, regardless of the time of day. As the timing of peaks fluctuate and change over time, an EV Managed Charging initiative would provide flexibility to quickly evolve so that the Company is continually geared toward meeting the initiative's and Commission's objectives in this Docket.

## 2. Initiative Objectives

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In order to meet the objectives addressed so far in this docket, as well as in Docket No. IR 20-004 and included in SB 575, the Company has designed an initiative that directly integrates EVs and vehicle chargers into the Company's non-model based distributed energy resource management system ("DERMS") to provide a potentially lower cost alternative to the development of a full TOU rate. Once an integration between the EV charger and/or manufacturer with Eversource's DERMS is complete, the Company will have the ability to gather all the information it needs to control customer's charging behaviors and issue incentives. No further metering or billing system integrations are required.

An additional benefit of integrating EVs and vehicle chargers into the Company's DERMS is that these loads can be incorporated into a more holistic energy management strategy where EVs and chargers can be controlled in conjunction with other customer devices to achieve beneficial system outcomes. In this construct, EVs can be

part of a larger portfolio of flexible load that can be deployed to help alleviate issues at the Independent System Operator-New England (“ISO-NE”), transmission, and distribution levels.

The success of TOU rates depend on customers making rational economic decisions and require customers to take affirmative actions to take advantage of the price differentials embedded in TOU rates. One advantage of demand management is that it does not require customers to take any action outside of opting into the initiative. Once a customer opts in, the Company along with its EV charging partners have the ability to directly control EV charging activities, taking that burden off of the customer. Within a demand management initiative, the Company can ramp down charging levels during times of acute system need or push a schedule to the EV or charger to tell it when to start charging. In either scenario, a customer can come home, plug in their vehicle, and not worry about taking any other actions. The initiative will optimize the charging behavior to achieve the effort’s objectives.

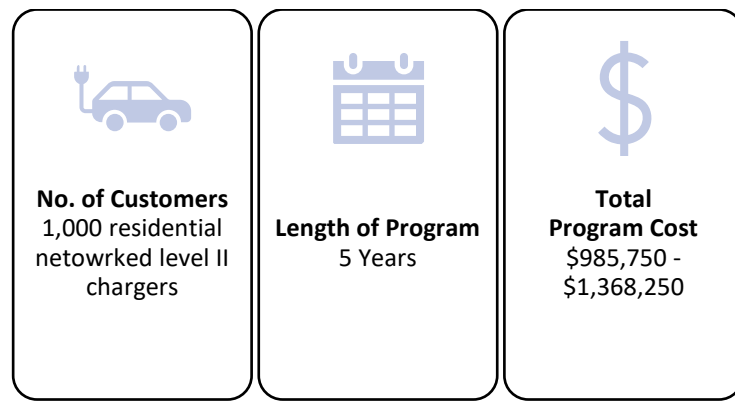
**Figure 1: TOU Rates vs. Managed Charging**

TOU vs. Managed Charging		
Managed charging may be able to functionally achieve everything that a TOU rate is meant to do while also providing some additional benefits like flexibility		
Benefits	EV TOU Rate	Managed Charging
Provide an economic signal to customers	✓	✓
Push charging out of peak time periods	✓	✓
Easily change definition of peak periods	✗	✓
Stagger charging restarts	✗	✓
Geotarget specific areas	✗	✓
Requires internal backend system upgrades	✓	✗
Ongoing software/volumetric fees	✗	✓

The primary objective of the EV Managed Charging initiative is to utilize managed charging strategies to incentivize customers to charge during off-peak times. Over a five-year timeline, the primary goal will be to enroll 1,000 residential networked level II chargers (single-family homes) during the initial phase of the initiative. During a potential second phase, the Company would investigate the feasibility of enrolling additional chargers at Commercial and Industrial (“C&I”) locations, Multi-Unit Dwellings (“MUDs”), non-networked chargers, and vehicle fleets.



**Figure 2: Proposal Summary**



### 3. Initiative Design & Dispatch Considerations

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As noted previously, Eversource has the experience and resources needed to effectively develop and implement the proposed initiative. The Company is committed to providing its customers the tools and programs to efficiently charge EVs, and has designed and will deploy the initiative in a thoughtful and balanced manner.

As a governance structure for the program, the Company will alert control room operators and call center supervisors as to when a dispatch will be called and which Eversource's system operations can override, if necessary. Dispatch is the period of time when electric utility or grid operators can call upon participants to reduce electricity consumption. For this initiative, customers will be dispatched daily every summer weekday (i.e., non-holiday weekend). All dispatch periods would have a maximum time period of eight hours. Customers can opt out of 20 percent of events (per season) and still receive the incentive at the end of the season.

As the demand for EVs increases, utilities face several risks including substation and transformer impacts, peak load increases, and timer peaks. Timer peaks are periods of the day, typically early morning or late evening, where customers have scheduled their EVs to begin charging at the moment off-peak rates begin (in locations where TOU rates are in effect) resulting in sharp load ramps. To avoid these timer peaks, the Company will experiment with staggering the start and end times for customers by creating groups that are on different charging schedules.

#### 3.1 Managed Charging Strategies

Eversource's proposed initiative would use demand-side managed charging strategies to incentivize customers to charge their EVs during off-peak times. The Company's proposed EV managed charging strategies, throttling

and scheduling, are discussed below. The Company will work with their managed charging program partners to develop the optimal strategy.

- **Throttling.** This managed charging strategy will allow Eversource to send a signal to a networked level II charger to limit the instantaneous draw of power of the charger for a predefined period of time. A typical residential level II charger has a normal power draw of 7 kilowatts (“kW”). During a throttling demand management event, the Company could throttle down (decrease) the rate of charging from 7 kW to 0 or 1 kW for a period of time, and
- **Scheduling.** This strategy is where a schedule is pushed to the EV charger, informing the device when it should start charging. Eversource could set a schedule that only allows for off-peak charging but also allows customers to opt out of the schedule if they have an emergency. The Company proposes that by sending a throttling signal every day at the same time of day, Eversource could essentially replicate a scheduling strategy.

### 3.2 Customer Incentives

To establish the proper customer incentive for the EV Managed Charging initiative, the Company evaluated potential customer savings realized when EV TOU rates are in effect. To establish average customer savings for EV owners on TOU rates, the Company reviewed a 2016 International Council on Clean Transportation whitepaper that used customer savings data from the top six cities for plug-in vehicle sales: San Francisco, Atlanta, Los Angeles, San Diego, Portland, and Seattle (*in order from highest to lowest number of EV sales*).<sup>2</sup> The review calculated the costs of charging exclusively during peak and off-peak hours under the rate plans to determine the value of off-peak TOU charging to the average household. Among the top five cities with TOU rates, customer savings varied from \$116 per year to \$237 per year depending upon the utility. After reviewing this literature and its own internal analysis, the Company proposes to offer participants \$150 per year.

For other demand management and energy efficiency programs, customer incentives are processed by a third-party vendor who mails checks directly to customers. These incentives provided to participating customers are not dispersed through the utility bill. Instead, customers are incented to participate in these programs through cash rebates, checks, or gift cards. The Company is researching alternative offerings to incentivize customer

<sup>2</sup> FleetCarma, “How Much Can You Save with Off-Peak Charging?”, Jul. 21, 2016, available online at: <https://www.fleetcarma.com/electric-vehicle-off-peak-charging-cost/>. Please note that Seattle was the only city that did not offer an EV TOU rate.

participation in the EV Managed Charging initiative, including offering an annual utility bill credit, prepaid gift cards (i.e., Mastercard or Visa), and charging credits for EV charging stations.<sup>3</sup>

#### 4. Administrative Activities

As the Administrator, the Company has determined that the following activities (detailed in Figure 3) will need to be undertaken to run the EV Managed Charging initiative at the proposed scale across its three-state service territory:<sup>4</sup>

**Figure 3: Administrative Activities<sup>5</sup>**



#### 5. Integration with Distributed Energy Resources System Architecture

If approved, the Company would need to integrate the EV Managed Charging initiative with its existing DERMS architecture. The Company has already integrated many of the largest residential EV charger OEMs into its DERMS platform and would be able to begin operating this program almost immediately after Commission approval. Going forward, the Company would continuously evaluate opportunities to incorporate additional residential EV charger OEMs into the DERMS platform. Key considerations for future OEM integration would include: (1) the charger must be Wi-Fi enabled or have the ability to communicate, and (2) the charger OEM must integrate into the Company’s DERMS platform or have an integration plan in place.

<sup>3</sup> Eversource notes that to provide an annual bill credit to customers there would be an associated Information Technology (“IT”) cost. In addition, JuiceBox EV charging stations are manufactured by Enel X which offers its own incentive reward system (JuicePoints) to customers for charging during off-peak times. The Company would have to work with the manufacturer to issue charging credits for JuiceBox residential and C&I applications (if offered as an alternative to the traditional customer incentive).

<sup>4</sup> If 17-12-03RE04 in Connecticut and Managed Charging in Massachusetts are approved, 2 Full-Time Equivalents (“FTEs”) will be necessary across all three states served by Eversource (CT, MA, and NH).

<sup>5</sup> OEM stands for Original Equipment Manufacturer.

## 6. Budget & Enrolled Customers

The Company looks to acquire 200 customers annually over the five-year period of the initiative, ending with a cumulative 1,000 customers enrolled. As the number of customers enrolled increases, so will the costs of the EV Managed Charging initiative due to more customer incentives being disbursed, internal Company administrative costs, and upgrades to software and third-party vendor networks/platforms. For the purposes of establishing the initiative’s budget, a description of the cost categories are detailed in Table 1 below:

- **Customer Incentive.** Funds paid directly to customers for their participation in the initiative,
- **Administrative Costs.** This includes labor and administrative overhead, and
- **Software & Vendor Costs.** This includes the EV platform fee, start-up costs, integrations and OEM fees, device fees, incentive processing fees, and fixed and variable DERMS fees.

**Table 1: Budget and Enrolled Customers**

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<b>No. of Customers*</b>	200	400	600	800	1,000	
<b>Customer Incentive</b>	\$30,000	\$60,000	\$90,000	\$120,000	\$150,000	\$450,000
<b>Administrative Costs**</b>	\$35,000 - \$95,000	\$35,000 - \$95,000	\$35,000 - \$95,000	\$35,000 - \$95,000	\$35,000 - \$95,000	\$175,000 - \$475,000
<b>Software/Vendor Costs**</b>	\$45,550 - \$68,050	\$51,350 - \$66,350	\$69,650 - \$84,650	\$87,950 - \$102,950	\$106,250 - \$121,250	\$360,750 - \$443,250
<b>Total</b>	<b>\$110,550 - \$193,050</b>	<b>\$146,350 - \$221,350</b>	<b>\$194,650 - \$269,650</b>	<b>\$242,950 - \$317,950</b>	<b>\$291,250 - \$355,250</b>	<b>\$985,750- \$1,368,250</b>

\*These are residential networked level II chargers (single-family homes).

\*\*Assuming that the Company can split costs across its three-state service territory and initiatives/programs. Does not include EM&V costs. Cost ranges are based on New Hampshire proportional costs based on allocation of devices and Megawatts under control under different scenarios depending on program approvals in other Eversource jurisdictions.

## 7. Data Collecting

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Eversource plans to use data collected to refine peak and off-peak periods for the initiative allowing the Company to avoid running dispatch events when customers are not charging their EVs anyway. The data will be collected at a minimum of 15-minute intervals and provide the Company insights into charging start time, charging end time, energy consumption in kilowatt-hours (“kWh”), average power (in kW), peak power (in kW), cumulative energy consumption, and locational/geographic distribution information

## 8. Optional Components for Initiative

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The Company will continue to make improvements and enhancements to the initiative as data is collected, EM&V results are reviewed, and customer and vendor feedback is received. Some optional components that may be integrated into the initiative in future years may include an off-peak rebate pathway, a pathway for non-networked chargers, and the use of EV’s onboard telematics. In addition, as referenced in Section 2, the Company will look to enroll additional chargers at C&I locations, MUDs, and for vehicle fleets in a secondary phase of the EV Managed Charging initiative.

## 9. Conclusion

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The Company appreciates this opportunity to provide further comment on how electric utilities may effectively serve their customers as more New Hampshire residents and businesses seek to purchase and drive EVs. Eversource believes that its proposed EV Managed Charging initiative will advance “energy conservation, optimal and efficient use of facilities and resources by [utilities], and equitable rates for electric customers.”<sup>6</sup> The Company remains committed to providing its customers the tools to efficiently charge EVs and expects that this will be best accomplished through a range of demand-side management approaches that it designs and deploys on a thoughtful and balanced basis. The Company looks forward to the continued engagement of the Commission and stakeholders as it seeks to accomplish these goals in this Docket.

<sup>6</sup> New Hampshire Public Utilities Commission, Memorandum with Recommendations and Order of Notice, Docket No. IR 20-004, *Investigation into Rate Design Standards for Electric Vehicle Charging Stations and Electric Vehicle Time-of-Day Rates*, Jan. 10, 2021.