



December 9, 2020

Via Electronic-Mail

Debra A. Howland
Executive Director and Secretary
New Hampshire Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, N.H. 03301-2429

RE: DE 20-170, Electric Vehicle Time of Use Rates
December 9, 2020 Comments of Unitil Energy Systems, Inc.

Dear Secretary Howland,

Unitil Energy Systems, Inc. (“Unitil” or the “Company”) appreciates the opportunity to provide written comments following the Commission’s November 9, 2020 prehearing conference and technical session commencing this proceeding to facilitate the development of utility-specific electric vehicle time of use (EV TOU) rates. Unitil supports the development of TOU rates for EV charging. Given the dynamic nature of the EV market and the variety of travel and parking needs, Unitil believes that no single option will be suitable to serve the needs of all customers. Therefore, the Company intends to offer a suite of electric rates tailored to different customer types and use cases, including but not limited to whole-facility TOU rates, separately-metered EV TOU rates for residential and small commercial and industrial (C&I) customers, and a separately-metered EV TOU C&I rate for “high demand” clustered Level 2 and DC fast charging (DCFC).

Unitil recognizes the evolving needs of the public that have occurred over the last several years and that are expected to continue in the future as customers transition from passive recipients to active participants in the energy market. The transition from offering traditional rate designs to tailored and more personalized options, especially for EV owners, is an important step to fulfill customers’ evolving requirements from their utility.

Much discussion during the November 9th prehearing conference occurred regarding the Company’s commitment to filing EV TOU rates in an upcoming base rate case. The Company intends to file a comprehensive base rate case in the first half of 2020. This filing will occur prior to the Commission’s April 30, 2021 deadline in the DE 20-170 procedural schedule for an EV TOU rate and feasibility assessment filing. Unitil’s rate case filing will include “low demand draw” EV TOU rates for residential and small C&I customers and a “high demand draw” rate for C&I customers that may incorporate clustered Level 2 and DCFC. Furthermore, Unitil is exploring and assessing alternative metering and demand charge management through use of smart, managed charging electric vehicle supply equipment (EVSE) and behind the meter partnerships to enable customers to easily install EV charging equipment at their premises. Unitil intends to design the TOU rates to be filed in the Company’s base rate case using guidance from Order 26,394 in IR 20-004 along with issues derived from this proceeding, DE 20-170. EV

TOU rate testimony from the Company's base rate case may also be filed to meet the expectations of this proceeding, as needed.

In an effort to avoid duplication of comments previously filed in IR 20-004, Investigation of Electric Vehicle Rate Design Standards, Electric Vehicle Time of Day Rates for Residential and Commercial Customers, Unitil provides reference to the Company's previously filed comments from this investigatory proceeding below.^{1 2}

EV TOU Rate Design Philosophy

The utilities' EV TOU rate design philosophy should focus on allowing customers to make independent consumption decisions based on proper price signals provided through the rate rather than artificially influencing customer behavior through the charging price. As a fundamental proposition, EV TOU rate design should consider EV customer segments, as well as the type of charging (e.g., Level 1, Level 2 or DCFC). However, the EV TOU rates should be based on cost of service rate design principles to ensure economic efficiency and limit cost shifting. Critical peak pricing (CPP) and demand reduction approaches are also worthy of consideration in addition to tariff-based EV TOU rates.

Marginal energy costs are typically driven by wholesale electric market (ISO New England in this case) factors and may not fluctuate for different customer segments. A utility's distribution-related costs are fixed in nature and are incurred to meet customers' non-coincident peak demands and do not necessarily exhibit time-varying cost characteristics. In most cases, demand charges for C&I customers better reflect the manner in which a utility's costs are incurred to serve such larger customers. Incremental EV loads may require new transformers, service lines and meter upgrades. Instances may also exist where the addition of EV loads would require an upstream feeder and/or substation upgrade.

Unitil believes that the TOU rate design options for any type of electric load should be designed to promote the efficient use of the utility's electric system resources and reduce costs for all utility customers. TOU rate options must provide proper price signals and influence customer behavior in a manner that creates beneficial outcomes for the customer (through lower rates and electric bills) and for the utility (through a reduction in system costs over time). To achieve these objectives, the design of the TOU rate options should only reflect system costs that are time-varying in nature, and provide customers a cost-based price signal through the rate design. The time-varying costs should drive the desired shape of the utility's system load curve and not simply represent a preconceived outcome based on non-cost or qualitative presumptions.

At the same time, it is also necessary to understand and evaluate how customers are responding to the utility's TOU rate options in order to make periodic refinements to the TOU rate design and identify how

¹ IR 20-004 Comments of Unitil Energy Systems, Inc., February 20, 2020
(https://www.puc.nh.gov/Regulatory/Docketbk/2020/20-004/LETTERS-MEMOS-TARIFFS/20-004_2020-02-20_UES_COMMENTS.PDF)

² IR 20-004 Hearing Follow-Up Comments of Unitil Energy Systems, Inc., July 24, 2020
(https://www.puc.nh.gov/Regulatory/Docketbk/2020/20-004/LETTERS-MEMOS-TARIFFS/20-004_2020-07-24_UES_COMMENTS.PDF)

the utility's load shape and resulting costs will likely change over time. For example, some customers may find certain TOU rate design options to possess overly long peak time periods, precluding those customers from responding to the TOU rate in a meaningful way.³ In addition, some jurisdictions have designed TOU rates to create a significant peak-to-off rate differential to increase the likelihood of a positive customer response without recognizing that the underlying costs of the utility are not accurately reflected by the rate design. In that case, a rate benefit is afforded to customers who can change their electric usage patterns even though the utility does not experience a corresponding reduction in cost. This may be deemed desirable for non-cost causative objectives, such as supporting technology adoption, gaining an understanding of consumer behavior, and insights into grid operations and future investment requirements by the utility. Notwithstanding the Company's earlier comments with regard to the non-time-varying cost characteristics of its distribution system today, incorporating considerations into the design of EV TOU rates that may be non-cost causative in the near term may provide an opportunity to gauge the resulting longer-term impact of EV adoption on the electric distribution system, as further discussed herein.

The Company encourages the Commission to consider the effect that EV adoption will have on the electric distribution system and subsequent system planning and investment. The EDCs must forecast EV adoption rates over the coming years and integrate these loads into planning studies and load forecasts. Possible changes to engineering and construction standards may be warranted to ensure reliability, safety, and appropriate equipment sizing. For example, a standard Level 2 electric vehicle charger will approximately double the load for a typical residential customer, possibly necessitating transformation upgrades to distribution circuits. The design of electric services may need to change as well, such as shorter distances and increased conductor size to address voltage drop concerns. Ongoing capital budgeting may need to accommodate early replacement of current infrastructure that is undersized and unable to accommodate new customer loads from EVs. Additionally, the installation of interval metering should be considered for increasingly dynamic EV loads that have the potential to export energy onto the distribution system and necessitate more granular planning analyses.

Unitil believes that any successful implementation of TOU rates for EV customers requires a strong customer communication, education and outreach plan. The main objective of that communication plan would be to raise customer awareness, educate and encourage adoption of new EV TOU rates. The Company believes that such an effort would likely include bill inserts, customer mailings, dedicated website updates, social media, and email notifications. Additionally, an easy to understand rate comparison self-service tool (e.g. shadow billing) is a critical web tool to help customers understand a comparison of charges between various rate offerings given their current and projected usage patterns. The Company is evaluating new web portals to allow for integrated and customer-friendly rate comparison tools viewed as a necessary component for customers who may consider migrating to a TOU rate offering. Such offerings include usage alerts and audio integration messages through Amazon Alexa and Google Home along with other communication channels.

³ Some customers may be unable to shift their electric usage during the rate's defined peak period to the off-peak period to take advantage of a lower rate because the shift in electric usage was not sufficient to move the usage into the off-peak period.

Residential EV Customers

Residential customers will continue to utilize Level 1 (up to 1.92 kW) and Level 2 charging (up to 19.2 kW). Rate designs may be offered for whole-facility or EV-only applications. An EV TOU rate may include a subscription fee or fixed charge to address additional demands placed on the utility's system. However, demand charges are likely not appropriate for this customer group since a customer is unlikely to create a sufficiently large demand to warrant such a charge. Smart charging (V1B) or vehicle-to-building (V2B) charging technology may be available to leverage lower market rates during off-peak times.

Small C&I EV Customers (Level 2)

An EV TOU rate is appropriate to send proper price signals to small C&I customers. However, the design may result in higher rates to serve these vehicle loads as this end-use is anticipated to require day-time charging. A flat or fixed charge may be desirable for C&I charging service to such vehicle owners. Demand rates may be appropriate for these applications depending on the resulting overall system demand. EVSE may offer power optimization to prevent demand spikes on the utility's system and control costs. Demand charges may also stimulate adoption of new technology such as energy storage to further optimize loads and peak demand. Unitol believes that having interval data for C&I EV loads separate from other facility loads will be important to better understand system impacts and the associated cost to serve.

(3) Large C&I EV Customers for Public and Clustered/Corridor EV Charging (Level 2 and DCFC)

These customers typically utilize Level 2 or DCFC charging. An EV TOU rate is appropriate to send proper price signals to large C&I customers. However, the design may result in higher rates to serve these vehicle loads as this end-use is anticipated to require day-time charging. A flat or fixed energy charge may be desirable for C&I charging service to such vehicle owners. Demand rates may be appropriate for Level 2 or DCFC charging for these applications depending on the resulting overall system demand. EVSE may offer power optimization to prevent demand spikes on the utility's system and control costs. Demand charges may also stimulate adoption of new technology such as energy storage to further optimize loads and peak demand. Unitol believes that having interval data for C&I EV loads separate from other facility loads will be important to better understand system impacts and the associated cost to serve.

A variety of technology factors should also be considered by the Commission when determining the appropriate service offerings for EV customers. Many of these considerations are summarized below:

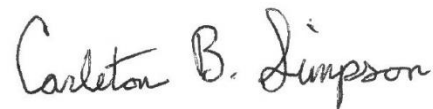
- Unitol's existing Advanced Metering Infrastructure (AMI), Customer Information System (CIS), Meter Data Management System (MDMS), and other internal systems are capable of offering a suite of TOU rates today.
- Utility facilitated make-ready programs, charging incentives, and behind the meter partnerships with third parties should be considered as solutions to overcoming EV charging barriers that

may currently exist for customers. EVSE capability to manage demand, provide measurement functionality, and inform customer behaviors is worthy of additional study.

- Customers may not be familiar with the high load demands of charging equipment or behavioral changes required to benefit from TOU rates. The electric distribution utilities could provide customers with rate estimation tools based on usage data in a manner that offers immediate feedback regarding usage behavior and resulting charges. Data sharing tools and standards (i.e. Green Button) should be a consideration and are supported by Unitil.
- Home energy management systems have become widely available, with lower costs over time. Utilities should consider partnering with vendors like Google and Amazon to provide behind-the-meter services as a means to share data and enable customers to better understand and control their energy usage, including EV charging load patterns. Unitil is working on such plans to offer usage alerts via Google Home and Amazon Alexa to participating customers.
- Unitil hopes to begin capturing TOU data, provided system limitations do not exist, before a rate is approved. Such efforts would provide customers with their historical usage patterns regardless of any rate adoption. Customers could estimate savings once TOU rate offerings are approved using an integrated rate comparison tool.
- Third party behind the meter vendors may be able to offer additional services to customers if they have access to utility TOU data. Data sharing standards and platforms should be considered that benefit the customer, the utility, society at large, and third party vendors.
- Future EV pricing models may include demand reduction and energy from EVs via bidirectional vehicle-to-grid (V2G) functionality. Metering technologies and systems that accommodate these future models should be considered.

Unitil appreciates the opportunity to provide these comments regarding EV TOU charging rates and infrastructure development efforts. Please do not hesitate to contact me if you have any additional questions concerning this matter.

Sincerely,

A handwritten signature in black ink that reads "Carleton B. Simpson". The signature is written in a cursive, slightly slanted style.

Carleton B. Simpson
Attorney for Unitil Service Corp.