STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

IR 22-076

ELECTRIC DISTRIBUTION UTILITIES

Investigation of Whether Current Tariffs and Programs are Sufficient to Support Demand Response and Electric Vehicle Charging Programs

Initial Comments of Unitil Energy Systems, Inc.

I. Introduction

In its November 15, 2022 Order of Notice opening the above-captioned investigation, the New Hampshire Public Utilities Commission (the "Commission") indicated its intent to "consider whether to adopt rate mechanisms or standards concerning such demand response practices and electric vehicle charging programs" pursuant to the directives of 16 U.S.C. § 2621(b), (c), and (d)(20)-(21). The Commission did not limit the investigation to compliance with 16 U.S.C. § 2621, however, and set forth a non-exclusive list of topics related to demand response and electric vehicle charging that it intends to consider. The Commission subsequently invited comments from interested stakeholders on these topics. Unitil Energy Systems, Inc. ("Unitil," "UES," or the "Company") offers the following initial comments in response to the Commission's list of topics. The Company does not directly offer comment on every topic listed in the Order of Notice, but reserves the right to comment on such topics in future rounds of comments.

II. Demand Response and Electric Vehicle Charging Standards (16 U.S.C. § 2621(d))

a. Address whether the "Demand response practices" and "Electric vehicle charging programs" standards (16 U.S.C. § 2621(d)(20), (21)) have been satisfied by prior state action.

On November 15, 2021, the Infrastructure Investment and Jobs Act ("IIJA") (codified as 16 U.S.C. § 2621) was signed into law. The IIJA amends several provisions of the Public Utilities Regulatory Policies Act of 1978 ("PURPA"), 16 U.S.C. chapter 46, including a requirement to consider new PURPA standards for (1) demand response and (2) electric vehicle ("EV") charging. 16 U.S.C. 2621(d)(20) and 2621(d)(21). Pursuant to 16 U.S.C. 2621(a), the New Hampshire Public Utilities Commission (the "Commission"), as a state regulatory authority, must consider the federal standards set forth in 16 U.S.C. 2621(d)(20) and 2621(d)(21) and determine whether or not to implement the standards for rate-regulated electric utilities under the Commission's jurisdiction. Pursuant to 16 U.S.C. 2621(b), the Commission was required to commence consideration of the standards established in 16 U.S.C. 2621(d)(20) and 2621(d)(21) by November 15, 2022, and must complete the consideration no later than November 15, 2023.

On November 15, 2022, the Commission opened the above-docketed proceeding to investigate standards for the promotion of demand response and EV charging in New Hampshire pursuant to 16 U.S.C. 2621(d)(20) and 2621(d)(21). A threshold question in this investigation is whether appropriate standards have already been implemented to:

1) Promote the use of demand-response and demand flexibility practices by commercial, residential, and industrial consumers to reduce electricity consumption during periods of unusually high demand;

2) Establish rate mechanisms allowing an electric utility subject to the Commission's ratemaking authority to timely recover the costs of promoting demand-response and demand flexibility practices; and

3) Promote greater electrification of the transportation sector, including the establishment of rates that:
    a. promote affordable and equitable electric vehicle charging options for residential, commercial, and public electric vehicle charging infrastructure;

    b. improve the customer experience associated with electric vehicle charging, including by reducing charging times for light-, medium-, and heavy-duty vehicles;

    c. accelerate third-party investment in electric vehicle charging for light-, medium-, and heavy-duty vehicles; and

    d. appropriately recover the marginal costs of delivering electricity to electric vehicles and electric vehicle charging infrastructure.

16 U.S.C. 2621(d)(20) and 2621(d)(21).

In its November 15, 2023 Order of Notice, the Commission noted the Electric Restructuring Policy Principle specific to Energy Efficiency, which states: "Restructuring should be designed to reduce market barriers to investments in energy efficiency and provide incentives for appropriate demand-side management and not reduce cost-effective customer conservation." Order of Notice at 2 (citing RSA 374-F:3, X). The Commission has consistently cited to this principle in the context of energy efficiency proceedings. See, e.g., Electric and Gas Utilities, DE 17-136, Order No. 26,095 at 17, 18 (January 2, 2018) (finding that the proposed Three-Year Plan will "provide incentives for appropriate demand-side management"); Electric and Gas Utilities, DE 15-137, Order No. 25,932 at 49-50 (August 2, 2016) (finding that a Settlement Agreement establishing an Energy Efficiency Resource Standard would "provide incentives for appropriate demand-side management, and not reduce cost-effective consumer conservation"). However, the Commission has not, to the Company's knowledge, expressly adopted a standard pursuant to which electric utilities "promote the use of demand-response and demand flexibility practices by commercial, residential, and industrial customers to reduce electricity consumption during periods of unusually high demand," nor has the Commission established rate mechanisms

specifically allowing New Hampshire electric utilities to timely recover the costs of promoting demand-response and demand flexibility practices. As such, the Commission's investigation into these standards, as well as the promotion and related rate recovery of demand response and demand flexibility practices, is appropriate in this docket.

Regarding standards to promote electric vehicle charging, the Commission explains in the Order opening this investigation that it established time-of use rate methodologies for EV charging pursuant to RSA 236:132-134. Order of Notice, IR 22-076 (Nov. 15, 2022) at 4 *citing* Order No. 26,604 (April 7, 2022). Therefore, the Commission asserts that no further consideration of PURPA Section 111(d)(21) is required. Order of Notice, IR 22-076 (Nov. 15, 2022) at 4. Nonetheless, the Commission further states that it is appropriate to consider whether any additional measures are needed to promote EV charging and access to charging infrastructure. As discussed herein, UES agrees with the Commission that it is appropriate to consider whether any additional measures are needed to promote EV charging and access to charging infrastructure.

The Transportation Sector accounts for the largest portion of New Hampshire's greenhouse gas emissions.[1] Therefore, reducing emissions in the transportation sector by promoting EV charging is an important and worthwhile objective. Further, electrification of the transportation sector will drive in-state economic growth by promoting travel and tourism for EV drivers.[2] In addition, electrifying the state's transportation sector presents an opportunity to provide all customers with a multitude of benefits, including public health benefits, fuel security, and downward pressure on electric rates. For these reasons, it is good public policy to explore additional measures to promote EVs and EV charging infrastructure.

III. Demand Response Practices

a. Demand Response

i. What programs or services are currently offered by the utilities that support customer demand response activities to reduce peak demand, and what are the associated rate mechanisms?

There are two "bring-your-own device" offerings in New Hampshire for Unitil customers. They are both offered under the ConnectedSolutions name.

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[1] New Hampshire Department of Environmental Services, https://www.des.nh.gov/climate-and-sustainability/transportation ("Transportation emissions from mobile sources (cars, trucks, buses, trains, off road vehicles, airplanes, etc.) are the largest source of criteria air pollutants and greenhouse gases in New Hampshire.").

[2] Final Report, Electric Vehicle Charging Stations Infrastructure Commission (Oct. 30, 2020) at 6 ("Enabling and encouraging the use of electric vehicles (EVs) in New Hampshire will support economic development in areas of the state dependent on tourism."), *available at* https://www.des.nh.gov/climate-and-ustainability/transportation/alternative-fuel-and-electric-vehicles/sb517; New Hampshire Department of Transportation ("NHDOT"), State of New Hampshire Plan for Electric Vehicle Infrastructure Deployment at 18 ("Tourism plays a vital role in New Hampshire's economy. New Hampshire saw a record number of tourists in 2021 representing a 43% increase above pre-pandemic levels. EV Infrastructure needs to account for the residents as well as visitors to the state.").

The Residential Wi-Fi Thermostat Direct Load Control offering enrolls electric customers who own a qualified, wirelessly communicating thermostat that controls a central A/C system (including but not limited to heat pump technology). Participants receive an incentive in exchange for allowing their utility to make brief (three-hour), limited adjustments to their Wi-Fi thermostats during periods of peak electric demand (referred to as "events"). These adjustments can be overridden by the customer at their discretion. Utilities will call up to 15 events per summer season (June-September), which occur mainly in July and August. During the summer season of 2023, events will be called between 2 PM and 8 PM. The ultimate goal is to predict and call an event for the highest demand hour (peak) of the summer season (technically the year); however, all events called provide benefits to the grid.

The C&I Load Curtailment offering provides electric customers an incentive for verifiable shifting and shedding of load in response to communication from the utility or a curtailment service providers ("CSP"). The strategy taken by the customer to shift or shed load is technology neutral, which means that customers are able to use any technology or strategy to earn an incentive based on their summer seasonal average curtailment performance. Shifting refers to moving load away from the event time period, flattening the load curve. In this case, there is no energy (kWhs) saved during the event, prior to the event in preparation for the event, and/or recovery from the event. Shedding refers to load reduction in that energy is saved during the event, prior to the event, and/or after the event. The goal of the offering is the same as the residential offering. The New Hampshire Utilities' program allows for calling up to eight events per summer season. Normally, there is one to four events per summer season called. There is a balance of creating the most benefits by calling eight events vs. calling a low number of events to avoid customer fatigue. For ConnectedSolutions, most of the demand savings fall under the C&I offering.

Unitil also offers whole-house and EV charging Time of Use ("TOU") Rates. See Section IV.d below. Such rates support demand reduction by incentivizing customers to shift usage away from on-peak periods.

ii. How can demand response reduce electricity consumption during periods of unusually high demand?

Please see section III.a.i above.

iii. What new programs or opportunities could be implemented to further promote demand response practices and reduce consumption during unusually high demand periods?

Utilities can use rate designs, bill credits, or other incentives to control demand on the electric grid during periods when the demand for electricity is at its highest and/or threatens to outpace the electricity supply. By working with customers to actively reduce loads during these peak hours through Active Demand Reduction ("ADR") strategies, utilities in New Hampshire can positively influence the price of capacity in the ISO-NE forward capacity market and provide immediate benefits to all customers in the form of suppressing wholesale power prices during

times of high demand. This is accomplished by reducing the system's reliance on the most economically and environmentally expensive forms of generation. ISO-NE is forecasting significant increases in electric load due to large-scale electrification in the transportation and building sectors.[3] As the demand for electricity grows ADR programs can help avoid negative and costly grid impacts resulting in avoided capacity, transmission, and distribution costs that are incorporated into electric rates on a long-term basis. As a result, all customers benefit from the lower costs of a smaller generation, transmission, and distribution system.

Through their existing ADR Pilot Programs and experience operating programs at scale in other jurisdictions, the New Hampshire utilities have developed the framework and expertise to scale their New Hampshire ADR programs to meet the challenge to the electric system that will arise from additional electrification loads. The future opportunities to deploy comprehensive load management strategies and offerings are evolving as technology evolves and customers are educated and engaged. The development of comprehensive and varied load management options that support a range of operational needs and use cases to incentivize customers to manage their energy usage and reduce additions to peak load is essential to avoid unnecessary and costly transportation and building electrification grid impacts and associated rate pressure.

With the continuing growth of EV charging in New Hampshire, there is additional opportunity to employ demand response to shift load away from peak periods. Approximately eighty percent of charging will take place at customers' homes.

iv. What technologies are available today or could be available within a utility's planning horizon to enable support of demand response and transactive energy?

There are many technologies available today that enable and support ADR and peak load management. Distributed energy resources ("DER") and connected devices are available and can enable demand response and reduce peak demand. This potential is magnified if these resources are coupled with advanced metering infrastructure ("AMI") and digital management systems that allow the aggregation and remote control of numerous small resources.

Unitil has implemented, or plans to implement, numerous technologies on its system that can facilitate demand response initiatives. With the continuing integration of distributed, variable, and renewable resources on the distribution system, increased visibility into and control of the distribution system is essential. The Company's vision of Grid Intelligence includes centralized information systems and field devices supporting, among other systems, an advanced Distribution Management System ("ADMS"), a Distributed Energy Management System ("DERMS"), and the further integration of AMI. Grid Intelligence will empower customer choice and demand side flexibility through demand response resources, as well as other technologies such as photovoltaic solar, energy storage, and electric vehicles. Grid Intelligence supports an operator's ability to monitor and control power flows to optimize the system resources.

[3] Source: ISO NE 2050 Transmission Study

The Company has implemented an ADMS, which provides enhanced monitoring and control of the distribution system and will enable demand response programs and practices, among numerous other functions including control for DERs, real-time load flow and circuit analysis, direct load control, and volt var management capabilities. The ADMS is also being expanded to include a DERMS, which uses real-time information communicated across the FAN to monitor, control, and manage distribution assets on the distribution system, including but not limited to demand response assets. The DERMS will have the capability to control individual grid-connected devices by changing voltage and power flow settings.

AMI investments support customer-facing technologies such as energy management systems, in-home displays, and programmable thermostats, as well as market-facing functions such as time-based rates and demand response programs. Interval metering supports demand response programs and other energy management activities that rely on automation to reduce their electricity consumption at peak times. Unitil has also implemented a meter data management system (MDMS) that enables the Company to deliver demand response programs such as time-based rates and various load control solutions. MDMS enables customers to learn about their energy use, improves customer communications, and increases operational efficiency while improving customer satisfaction.

To support these systems, Unitil has begun implementing a field area network ("FAN"), which provides two-way communications to all field devices. A FAN provides the Company with the communications backbone to support demand response initiatives and many other systems and programs that are possible with a modern grid.

As explained above, the Company launched a C&I load curtailment pilot in April 2019 with support from a third-party CSP. The CSP works with the Company to identify curtailable load, enroll customers, manage curtailment events and calculate performance and payments. The targeted dispatch load curtailment is operated on a technology neutral pay-for-performance model in which participating customers are notified the day before the demand response event by 1:00 PM, giving them a chance to prepare to curtail operations.

In addition to what is available today there are innovative technologies, solutions, approaches, use and business cases that are still in the nascent stage of development. Electric vehicle-to-grid (V2G) charging, which allows vehicles to input electricity into the grid, smart appliances that are interoperable with demand response systems, using smart meters and energy management systems, and virtual power plants (VPPs), that digitally link, aggregate and control DERs to optimize their use. Although these technology advances and use cases are promising, it may take years for some of these advances to reach a fully commercial stage and may require national data and communications standards before fully becoming a coordinated DER.

Unitil recognizes that customer education and engagement is key to enabling demand response. Today's utility customers seek to reduce their usage, bill amount, and reduce their carbon footprint. Customers seek to accomplish these by using a comprehensive and personalized digital self-service platform. Unitil's customer experience roadmap involves solutions with an analytics component that act as a layer between Unitil's current web applications and our disparate data sources. We aim to offer solutions that provide customers

with an intuitive "one-stop" self-service portal offering personalized customer experiences and opportunities that calibrate potential energy related recommendations for customers. Some examples of customer facing tools that we will deploying within the next three years to support demand response and transactive energy for our customers are:

- Access to current energy marketplace offerings
- Energy efficiency initiatives
- Energy/Usage Alert Notifications
- Promotions or assistance offerings
- Available dynamic rate options and integrated rate comparison tools
- Demand response
- Behind-the-meter products or services
- Recommended contractors or installers
- Educational opportunities focused on improving customer energy behaviors.

b. Transactive Energy

Transactive Energy (TE) is an evolving topic. There is a general expectation that the transactive energy market will evolve as electrification and DER technologies advance and are adopted. The overall vision for Transactive Energy is not clearly defined within the scope of this docket (or even nationally) which will likely lead to much speculation as to what and when enabling technologies should be deployed and who should own, operate, or control aspects of this market.

What is inevitable is the growing need to better optimize a power system that will be greatly affected by transient, dynamic, and controllable generation and loads. A Transactive Energy market has the potential to provide value through contributing to an optimized power system. Further discussion amongst stakeholders is necessary to define a vision of a transactive energy market and determine a roadmap to achieve this vision. The Department of Energy's GridWise® Architecture Council has outlined a reasonable framework for developing a vision of TE that helps to organize the development of models, designs, and implementations of TE systems.[4] This framework may serve as a reasonable guide to ensure the stakeholders have a common set of references for TE definitions, principles, potential markets, and power system considerations.

Of particular interest to enable and support a TE market is the ability to share load data, remotely control DER, and provide economic information in a real-time multi-directional manner (i.e. between market participants). This future means of sharing and interaction will also require a robust consideration of cyber and physical security since the TE market will expose power systems operation to a broader range of endpoints and new and diverse attack vectors. The integration of information technology and telecommunications with the traditional electric delivery infrastructure can introduce new vulnerabilities that must be addressed. The standards for this level of data sharing and security have not been fully developed, vetted or adopted by the

[4] Transactive Energy: An Overview | NIST. See "Transactive Energy Framework" and Additional Resources referenced for a robust discussion on TE.

potential DER that may participate in a future TE market and we will likely have to consider security enhancements to both the electrical networks and communications networks in addition to the software systems utilized. The chart below details DER cyber-attack vectors and potential threats that will need to be carefully considered and addressed to support a robust TE market.

Attack Vector	Description	Compromise
Lack of interoperability	DER architectural diversity and implementation specifications (e.g., security requirements) can result in inter-system insecure communications.	DER denial of legitimate messages and control commands
Data integrity violations	Stored, transmitted or received data is modified without validation, causing DER malfunction or allowing unauthorized access to control/log information.	Malicious modification of control parameters
Implementation errors	Security flaws within systems and/or communication modules enabling the remote control of DER assets and exfiltration of historical generation data.	Command and control of load/demand-side devices
Supply-chain compromises	Installment of malicious hardware-based eavesdropping programs, worms, oversights during manufacturing of components, devices, or systems.	Sensitive information disclosure
Insecure firmware	Digital signatures of firmware updates are not verified, granting malware (viruses, worms, trojans, etc.) access to otherwise secure systems.	DER systems privilege escalation

It should be noted that standards do exist to share data, protect systems (both power systems, communications and software related), and secure endpoints, but they have not yet been designed to work together in a TE market. For example, there are many different standards for sharing data between utilities and customers, between EVs and customers, and between control systems and endpoints, but they do not all work together in a seamless and secure manner. The area of TE standards is still evolving, as there are potentially competing standards without an established leader.

What is clear is that there are a number of foundational technologies/capabilities that are needed to facilitate the development and adoption of a transactive energy market. Two-way, real time data transfer will be needed but there is not a single standard of focus at this time. The Electronic Data Interchange ("EDI") as used by the electric utilities is a basic and somewhat antiquated standard that provides data in a batched mode (i.e. at defined intervals). It has not been designed for the exchange of real-time data. If EDI was to serve as the platform for TE, it would have to be extensively upgraded.

Although still in its nascent state, discussions and foundational efforts are underway in New Hampshire, with a broad range of stakeholders, towards the development of a programmatically accessible statewide data sharing platform. The initial focus of our efforts is on a minimally viable product that enables a set of standardized application programming interfaces and a common data model representing customer usage data. However, the architecture of this

platform has taken into consideration additional use cases such as those necessary to support TE. There are many additional details to be worked through as this effort in New Hampshire progresses, but it will likely be beneficial for us to continue to consider this as a potential delivery mechanism for TE transactions as the project continues to mature.

In order to adopt an optimized set of data sharing and communications standards to facilitate the development of a TE market and future integrated operations of such, a common vision of TE needs to be developed (and accepted), and clear objectives outlined first.

IV. EV Charging

a. What are the current policies around customer-funded versus ratepayer-funded interconnections of EV charging infrastructure?

One of the biggest barriers to EV adoption is the lack of charging infrastructure.[5] Make-ready investments in the electric distribution system are necessary to overcome this barrier. Accordingly, legislation at both the state and federal level has focused on promoting make ready investments to address this barrier and enable EV market development.

At the federal level, the IIJA established the National Electric Vehicle Infrastructure Formula Program ("NEVI Program") to provide funding to states to strategically deploy EV charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability. The estimated NEVI funding apportioned to New Hampshire is approximately $17.3 million.[6] The NHDOT intends to administer the NEVI funds to develop direct current fast charging ("DCFC") stations along the state's Alternative Fuel Corridors beginning with interstate routes I-93, I-95, and I-89. NHDOT intends to follow this development by focusing on NH-9, NH-12, NH 101, NH 9/US 202 from I-89 to Keene, NH 11, US 4/NH 9, NH 16, US 302, and US 2.[7]

The New Hampshire Legislature has also enacted laws which further promote the development of EV charging infrastructure: Senate Bill 517 ("SB 517") and Senate Bill ("SB 131").

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[5] Final Report, Electric Vehicle Charging Stations Infrastructure Commission (Oct. 30, 2020) at 6 ("The Commission finds that electric utility investment in grid infrastructure to support the installation of EVSE lowers the barriers to such installation."), *available at* https://www.des.nh.gov/climate-and-sustainability/transportation/alternative-fuel-and-electric-vehicles/sb517; New Hampshire Department of Transportation ("NHDOT"), State of New Hampshire Plan for Electric Vehicle Infrastructure Deployment at 8 (Aug. 1, 2022). ("Addressing electrification barriers is essential for mitigating risks for successful EV charging infrastructure deployment or usage early during plan development."); Edison Electric Institute, Electric Vehicle Sales and the Charging Infrastructure Required Through 2030, at 1 (June 2022) ("The lack of charging infrastructure often is cited as a primary barrier to increased adoption of EVs…"), *available at* https://www.eei.org/-/media/Project/EEI/Documents/Issues-and-Policy/Electric-Transportation/EV-Forecast--Infrastructure-Report.pdf.

[6] New Hampshire Department of Transportation ("NHDOT"), State of New Hampshire Plan for Electric Vehicle Infrastructure Deployment at 3, 29, 34 (Aug. 1, 2022).

[7] *Id*. at 3.

On May 30, 2018, SB 517 was signed into law and it established the EV Charging Stations Infrastructure Commission (the "EV Commission") to make recommendations on various policies, programs, and initiatives to encourage EV infrastructure development and the use of zero emission vehicles in New Hampshire.

The EV Commission met regularly between August 2018 and October 2020[8] and developed two annual reports, which were submitted to the Speaker of the House of Representatives, the President of the Senate, the Governor, and the State Library. The reports describe the activities and findings of the Commission and its recommendations.

Among other things, the EV Commission found that "[e]nabling and encouraging the use of [EVs] in New Hampshire will support economic development in areas of the state dependent on tourism, lower lifetime costs of owning a vehicle for many drivers, and result in lower emissions of criteria pollutants and greenhouse gas emissions that contribute to climate change."[9] In addition, the EV Commission found that electric utility investment in "make ready" grid infrastructure lowers barriers EVSE installation. [10]

The Legislature expressed similar support for the role utilities should play in EV development in SB 131, which signed into law on August 10, 2021. Specifically, in SB 131 the Legislature found the availability of EVSE is critical to facilitating the development of the EV market and electric utility investments in grid infrastructure lowers the barriers to EVSE installation.

Consistent with the intent of the legislation described above, UES proposed an EV infrastructure development program to support the installation of EVSE in New Hampshire, which is described in detail below.

b. Can the development of EV charging infrastructure be structured to cost-effectively reduce electricity consumption during periods of unusually high demand?

Large-scale transportation electrification has the potential to add a significant but flexible electric load to the power system that could result in considerable system costs if not properly managed. Load management and managed charging technologies and programs are essential to ensuring that transportation electrification does not lead to unnecessary and costly power system impacts and rate pressure.

c. Can electric metering and EV metering standards be changed to cost-effectively and fairly increase EV and expand EV charging infrastructure in New Hampshire?

The Company 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

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[8] The EV Commission's term expired on November 1, 2020.

[9] Final Report, Electric Vehicle Charging Stations Infrastructure Commission (Oct. 30, 2020) at 6, *available at* https://www.des.nh.gov/climate-and-sustainability/transportation/alternative-fuel-and-electric-vehicles/sb517

[10] *Id*. at 2.

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.

Electric utilities are required to meet certain metering accuracy and data security standards. These accuracy standards limit the electric company's ability to accept metering data that does not meet these standards. As the accuracy of integrated metering within EV chargers improves and common standards for securely sharing data are adopted, Unitil is open to considering using EV charger data as opposed to requiring a separate meter.

d. What programs or services are currently offered by the utilities that support EV charging by customers at non-peak demand periods, and what are the associated rate mechanisms?

In addition to legislation promoting EV infrastructure development, the General Court has encouraged the development of rate designs to further support the EV market. Specifically, New Hampshire Senate Bill 575 ("SB 575") (codified as RSA 236:132-134) required the Commission to determine whether certain rate designs should be implemented for electric vehicle charging stations, specifically requiring the Commission to determine whether to implement electric vehicle time of use rates for residential and commercial customers.

On January 16, 2020, the Commission opened an investigation (IR 20-004) pursuant to SB 575, which was later continued as DE 20-170. At the conclusion of DE 20-170, the Commission approved, pursuant to the terms of a Settlement Agreement, Unitil's residential EV TOU Rate (TOU-EV-D) and two commercial EV TOU Rates (TOU-EV-G1 and TOU-EV-G2). Order No. 26,604 (April 7, 2022) at 24-26. The Commission also approved TOU rates for Liberty and directed Eversource to adopt a two-period time varying rate for residential customers and a manually billed three-period TOU rate for commercial customers. *Id*. at 26. Further, the Commission directed Unitil, Liberty, and Eversource to update rate and class revenue requirements in their next rate cases pursuant to the terms of the Settlement Agreement. *Id*.

In UES's most recent base distribution rate case (DE 21-030), the Company proposed a suite of TOU rates including: (1) a domestic "whole house" TOU (TOU-D); (2) a domestic EV TOU (TOU-EV-D); (3) a small general service EV TOU (TOU-EV-G2); and (4) a large general service EV TOU (TOU-EV-G1). The development of these rates was informed by the Commission's findings in Order 26,394 that resulted from IR 20-004, and the EV TOU proceeding (DE 20-170) described above. The Settlement Agreement in DE 21-030 provided that UES's EV TOU Rate Proposals would be implemented consistent with the Commission's final order in the DE 20-170 proceeding and the Whole House TOU rate would be the same as the TOU-EV-D rate, except that the customer charge would be the same as that for regular residential service. Order No. 26,623 (May 3, 2022) at 10, 27. The Commission incorporated its approval of the Company's EV TOU rates in DE 20-170 by reference and ordered UES to implement its TOU rate features pursuant to the terms of Order No. 26,604. *Id*. at 27.

The Company believes that the 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. 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 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 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.

e. What new programs or opportunities could be implemented to cost-effectively reduce EV charging consumption during periods of unusually high demand?

Residential customers represent an important class given the disproportionate ratio of charging at home versus other locations and the need to optimize EV loads to mitigate peak demand and new infrastructure costs. Level 2, residential home EV charging is estimated to represent approximately eighty percent of the EV charging market.[11] Industry analysts believe that electric system upgrades will be needed to handle the increased load from EVs and impacts will depend on charging locations on the distribution system along with the time of day when vehicles are charged. Managing these impacts through smart charging can improve asset utilization and may mitigate needed system investments.

In Massachusetts, FG&E recently received approval for an EV infrastructure development program ("FG&E EV Program"). The Massachusetts Department of Public Utilities approved a five-year program that provides "Make Ready" incentives for residential customers to offset some of the cost of installing networked, smart Electric Vehicle Supply Equipment (EVSE) that will enable residential customers to easily control their charging behavior to maximize the impact of residential EV TOU rates and participate in managed charging programs. In addition, the MADPU approved a marketing and outreach program designed to meaningfully increase consumer awareness regarding the benefits of EV TOU-specific rates, and increase customer understanding of EV charging at home, work, and public locations, and the implications for the customer and the electric system of unmanaged charging

Some jurisdictions have designed TOU rates to create a significant peak to off-peak 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-

[11] "Charging at Home." *U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy*, https://www.energy.gov/eere/electricvehicles/charging-home.

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.

f. What are the current funding sources and utility practices concerning make-ready costs for EV charging infrastructure?

In New Hampshire, Unitil currently responds to electric service requests from EV charging station applicants in the same manner it responds to other service requests from customers within the same rate class. The installation of required infrastructure is consistent with the Company's normal business practices. Absent an approved make-ready program, Unitil will treat each EV charger as a new customer. The Company will run an internal rate-of-return ("IRR") model to determine the necessary customer contribution.

As part of its most recent base distribution rate case (DE 21-030), UES proposed an EV infrastructure development program ("UES EV Program") comprised of two initiatives: (1) a behind-the-meter partnership program to incentivize residential customers to procure and install smart Level 2 electric vehicle supply equipment for charging at their homes, and (2) a public "make-ready" EV infrastructure program to expand the availability of charging stations in New Hampshire. As part of a Settlement Agreement filed for the Commission's consideration in DE 21-030, the Settling Parties agreed that the Company could offer rebates of up to $600 for the procurement and installation of Level 2 chargers and invest up to $300,000 in a Marketing, Communications, and Education Plan to increase customer awareness of electric vehicles ("EVs") and engage with customers about the Company's proposed TOU rates and UES EV Program offerings. The Settlement Agreement also provided that the Company would invest up to $2,362,000 in infrastructure to enable EV charging:

- Provide make-ready infrastructure, with a cap on investment of $572,000, to support up to four third-party owned and operated Direct Current Fast Charging (DCFC) stations in the UES service territory with approximately six DCFC plugs/ports at each respective station site.
- Provide make-ready infrastructure, with a cap on investment of $1,540,000, to support up to twenty third-party owned and operated Level 2 public charging sites with approximately ten third-party owned and operated Level 2 plugs/ports at each respective site.
- Provide make-ready infrastructure, with a cap on investment of $250,000, to support third-party owned and operated Level 2 pole-mounted EV chargers, with a non-binding construction target of up to 20 chargers.

The Commission issued a final Order in DE 21-030 on May 3, 2022 approving most, but not all, of the features of the Settlement Agreement. However, the Commission did not approve the UES EV Program as set forth in Settlement Agreement.

As noted above, UES's Massachusetts affiliate, FG&E, recently received approval for its FG&E EV Program. The MADPU approved a five-year program with a $1 million budget consisting of: (1) a public infrastructure offering ($0.5 million); (2) Electric Vehicle Supply Equipment (EVSE) incentives for residential customers ($0.3 million); and (3) a marketing and

outreach program ($0.2 million). As part of that approval, the Department found that FG&E's investment in make-ready infrastructure will lower the financial barriers to EVSE ownership and will support, rather than hinder, the competitive EV charging market. Fitchburg Gas and Electric Light Company d/b/a Unitil, D.P.U. 21-92 at 95, 96 (Dec. 30, 2022).

V. Conclusion

Unitil appreciates the opportunity to provide initial comments addressing the topics set forth in the Order of Notice. The Company looks forward to further discussion with the Commission and other stakeholders on these important issues.