THE STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

IR 20-166

ELECTRIC DISTRIBUTION UTILITIES

Investigation into Compensation of Energy Storage Projects for Avoided Transmission and Distribution Costs

Reply Comments of Unitil Energy Systems, Inc.

I. Introduction

Unitil Energy Systems, Inc. ("Unitil" or the "Company") appreciates the opportunity to provide written reply comments addressing the energy storage issues identified during the January 25, 2021 Technical Session and subsequent Staff report.

As indicated in Unitil's initial comments, the Company believes energy storage can provide important benefits to the transmission and distribution (T&D) system and the customers we serve. These benefits include reliability, resilience, efficiency, and the integration of clean energy resources. As Unitil considers the deployment and integration of energy storage, our focus remains on the creation of an enabling platform which provides the opportunity for T&D system benefits and value to customers. We are also interested in fostering innovation and flexibility in markets and regulation in order to achieve these outcomes, and intend to use our platform to enable the development of storage resources and contribute to an optimal level of storage. Our approach to pricing and ownership are consistent with this objective.

The following reply comments provide additional thoughts on utility ownership of energy storage, rate design, and least cost integrated resource planning (LCIRP). The reply comments

also identify outstanding issues with no resolution at this time relative to FERC Order No. 2222, wholesale/retail market participation, and state vs. federal jurisdictional authority.

II. Utility Ownership of Energy Storage

Utilities can invest in energy storage as a distributed energy resource

It is important for New Hampshire utilities to own and operate energy storage. If there is any doubt that the existing statute may preclude utilities from owning storage, subject to the Commission's oversight, the Company continues to advocate for the statute to be clarified. The New Hampshire Legislature has determined that it is in the public interest to encourage utility investment in renewable and clean distributed energy resources (DERs). RSA 374-G:1. Energy storage is one of several resources, including clean and renewable generation, energy efficiency, and demand response, that are noted in New Hampshire's definition of DERs. RSA 374-G:2.

As noted in the Company's initial comments, energy storage assets do not generate electricity and thus should not be subject to the ownership and use limitations placed upon utility-funded generation assets set forth in RSA 374-G:3 and RSA 374-G:4. Energy storage is unique among DERs in that it can behave as both a load and capacity asset, working in concert with other customer technologies, programs, and pricing options. The power rating (MW), stored energy (MWh), and service duration (time) are designed to fit many use cases. In most instances, energy storage systems are able to perform multiple functions and deliver myriad benefits (i.e., "benefit stacking"). For instance, energy storage can be used at peak load times to reduce system peak loads thus deferring system capacity investments. The same energy storage system can be used during light load periods to increase the hosting capacity of a circuit and facilitate the interconnection of an increased capacity of DERs. Use cases for energy storage continue to

develop with pilot projects and early implementations of commercial projects. The true value of energy storage will be determined over time, and the State should foster business models and ownership structures that deliver system and customer value. Flexibility and incentive to innovate is critical to realizing potential value from energy storage.

As Unitil discussed in its initial comments, energy storage projects (ESPs) typically fall into one of three main configurations: Grid Storage; Co-located Storage; and Behind-the-Meter Storage.[1] RSA 374-G:4(I) states: "a New Hampshire electric public utility may invest in or own distributed energy resources, located on or inter-connected to the local electric distribution system." This would include all three ESP configurations.

Energy storage can be a grid asset

Utilities are responsible for building and maintaining electric T&D infrastructure that is safe, reliable and economical. Energy storage can be used as a grid asset to provide similar functionality and value to customers as traditional electrical infrastructure. When used in a grid application (i.e., Grid Storage), energy storage can provide best value reliability, efficiency, and economy for electricity customers. Grid Storage projects will play an increasingly important role when integrated with an intelligent, modern grid. Where a Non-Wires Alternative (NWA) can address these circumstances more efficiently, Unitil's goal is to enable this outcome. However, there will be circumstances in which the market is not able to provide the best solution and thus utility ownership is necessary.

[1] Docket No. IR 20-166, Initial Comments of Unitil Energy Systems, Inc., January 11, 2021.

Wholesale market participation should be allowed by utility-owned energy storage

ESPs can provide wholesale products and services, and do so in the wholesale markets administered by ISO New England. Access to wholesale markets can provide revenue to ESPs even when these ESPs are used, primarily, for other purposes such as grid resilience or the integration of renewable generation. Utility-owned energy storage should be able to participate in wholesale markets[2] while providing grid benefits for utility customers. For example, Grid Storage could be intended to provide peak demand management and increase the value of the ESP over time. There is also precedent for utility participation in the wholesale markets, as the utilities bid capacity obtained from energy efficiency programs into the New England Forward Capacity Market and return the resulting revenues to customers through additional energy efficiency program funding. Utility customers should be able to receive the full spectrum of benefits from utility investments. There is no purpose served by not allowing revenues from wholesale markets.

III. Rate Design

Energy storage rate design should reflect supply costs and delivery costs. Supply costs are variable and are established in the regional wholesale market. Delivery costs are mainly fixed, paid in advance, and depend on the T&D infrastructure needed to serve expected electricity demand. As demand nears the design limits of the T&D infrastructure, a utility might

[2] Unitil's Massachusetts affiliate Fitchburg Gas and Electric Light Company (FG&E) has developed a 2 MW/4 MWh battery energy storage system connected to the primary distribution system at a substation in its Central Massachusetts service territory. This project may participate in the ISO New England Frequency Regulation market.

rely on a targeted energy efficiency or demand response program or use a pricing mechanism to reduce demand and avoid stress on the system.

Two pricing mechanisms are common for encouraging electricity customers to change their usage patterns: time-of-use (TOU) rates and demand charges. Unitil believes that both mechanisms could be effective for ESPs if properly designed. In addition, other mechanisms such as access charges or subscription rates may be well suited to the performance characteristics and business models of ESPs.

TOU Rates

Due to the unique characteristics of energy storage, ESPs can be designed and operated to deliver different energy, capacity, and delivery benefits. These benefits can be targeted separately to specific applications, and at different times throughout the day. To best compensate ESPs, TOU rates may be designed to include prices for energy, transmission and distribution that match the periods of time when costs and benefits occur.

Unitil has piloted and is further developing TOU rates using advanced metering infrastructure (AMI) that supports TOU metering and billing. In New Hampshire, TOU rate design has incorporated separate prices for different hours of the day and different days of the week. TOU periods are typically defined as off-peak, mid-peak, and peak, with off-peak prices being lowest, and peak prices being highest.

Current TOU rates include supply and delivery costs and are applied volumetrically through a kWh rate. As Unitil stated in its initial comments, grid pricing and DER compensation

can reflect the fact that cost and value vary by time-of-use and operating conditions.[3] As New Hampshire transitions to new pricing models for DERs (including energy storage), Unitil intends to offer rates, including TOU rates, which reflect and appropriately value the time-varying characteristics of DERs.

Demand Charges

Demand charges can help allocate delivery costs to those customers whose electricity usage may result in the need to upgrade T&D capacity. Similar to higher prices charged through a TOU peak rate, a demand charge can create an incentive for a customer to change electricity usage and reduce stress on the system. Demand charges should align with times when customer consumption (or production) might cause the utility to incur higher T&D costs that would be borne by other customers.

Today, demand charges in New Hampshire do not include a time component like that found in a TOU rate. As a result, the demand charge applied to an ESP may not reflect the cost the ESP places on the T&D system or the value the ESP provides to the T&D system. To ensure that customers receive the full benefits from ESPs, a demand determination should be made during a coincident on-peak period suited to the characteristics of ESPs. The ESP on-peak period could be the same as the TOU on-peak period or could be narrower depending on the effect the utility is trying to achieve to reduce stress on the T&D system.[4]

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[3] Docket No. IR 20-166, Initial Comments of Unitil Energy Systems, Inc., January 11, 2021.

[4] FG&E utilizes a similar approach in its Large General Delivery Service (GD-3) rate, where "demands shall be measured as the highest 15-minute integrated kilovolt-ampere (kVA) load determined during the On-Peak period of the month." Fitchburg Gas and Electric Light Company, General Delivery Service Schedule GD, M.D.P.U. No. 355, Sheet 4 (eff. November 1, 2020).

Impact of Utility-owned Energy Storage on Demand

The operation of utility-owned energy storage systems would be coordinated with other grid infrastructure and operations to maintain reliability and avoid overloads on other T&D infrastructure. Simultaneously, utilities would operate with the objective to minimize costs to ratepayers while maximizing the benefit to the system.

Other Fixed Charges

Utilities could offer ESPs a fixed charge or subscription rate to cover a portion of fixed delivery costs. This could be set as an access charge or flat rate applied to a contracted capacity. Energy storage devices could be programmed to operate within predetermined limits, including charging and ramp rates.

IV. Least Cost Integrated Resource Planning

As stated in the Company's initial comments, Unitil's vision of a modern grid includes the integration of energy storage and other DERs with traditional grid infrastructure. This approach received support from other commenters. The Company anticipates utilizing energy storage to accommodate intermittent electricity supplies and large numbers of distributed energy resources while maintaining safe and reliable service. Unitil foresees Grid Storage being developed and owned by utilities as grid infrastructure investments, or as part of a third-party non-wires alternative (NWA) solution. Regardless of ownership, NWAs must support the reliability, availability, and control that we need, in order to provide electricity service to our customers in the long term.

Along with other New Hampshire utilities, Unitil has been learning about using energy storage in the T&D system with pilot projects for Grid Storage and Behind-the-Meter Storage. That experience is helping us understand how to incorporate energy storage into our planning. The Company will be working with PUC Staff to evaluate NWA solutions as part of its LCIRP process as agreed in recent settlement discussions.[5]

V. FERC Order No. 2222

Unitil and other New England distribution utilities are participating in ISO New England's process to develop a FERC Order No. 2222 compliance plan. The expansion of wholesale market access to DERs and DER Aggregators (DERAs) will introduce new requirements and responsibilities for distribution utilities. It is important that New Hampshire utilities and the State actively coordinate with ISO New England to address key issues. These include, but are not limited to:

a. Jurisdictional questions related to allocation of costs for compliance with ISO rules (e.g., asset registration, assessment of resource eligibility, and metering/telemetry);
b. State roles and responsibilities for revising tariffs to comply with ISO rules;
c. Modification and enhancement of interconnection applications, agreements, and rules;
d. Establishment and modification of data sharing rules, and dispute resolution between DERAs and distribution utilities over issues such as access to individual DER data;
e. Overseeing distribution utility review of DER participation in aggregations;
f. Establishing rules for multi-use applications; and
g. Modification of State rules to ensure that retail participation models do not enable "double counting" of benefits at wholesale and retail.

Resolving these issues will require significant time and effort by the State, ISO New England, and the distribution utilities. However, Unitil does not believe that the outcome of the work related to FERC Order No. 2222 compliance will have a material impact on the

[5] Docket No. DE 20-002, Unitil Energy Systems, Inc., 2020 Least Cost Integrated Resource Plan.

Commission's work in Docket No. IR 20-166. Therefore, Unitil does not believe an extension of the July 12, 2021 deadline for a Staff Recommendation in this investigation is necessary.