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

Initial Comments of Unitil Energy Systems, Inc.

Unitil Energy Systems, Inc. ("Unitil" or the "Company") appreciates the opportunity to provide written comments addressing the energy storage issues identified in the Commission's October 12, 2020 Order of Notice ("Notice"). Citing the requirements of legislation establishing a new "Energy Storage" chapter to the Public Utilities statute (i.e., RSA 374-H)[1], the Commission opened this proceeding:

> *. . . to investigate how to compensate energy storage projects (ESPs) for avoided transmission and distribution costs while the ESPs also participate in wholesale energy markets. ESPs eligible for compensation will include both utility-owned and non-utility-owned ESPs, with behind-the-meter or front-of the meter storage, which are capable of storing electricity as some form of energy.*[2]

The Commission will issue a report to the New Hampshire House and Senate standing committees with jurisdiction over energy and utility matters that will include recommended statutory changes that "minimize any potential conflict with the electric restructuring principles of RSA 374-F." Unitil's comments address each issue identified in the Notice, providing relevant data and approaches from New Hampshire and other jurisdictions.

The Commission has a central role in establishing market and regulatory conditions that will optimize the contribution of energy storage services to New Hampshire's consumers. Energy storage offers the potential to substantially improve the efficiency and economics of producing, consuming, and distributing electricity. This explains why the development of energy storage use

[1] The legislation directed the Commission to submit a report within two years to the New Hampshire House and Senate standing committees with jurisdiction over energy and utility matters.

[2] "Energy Storage Project" is defined in RSA 374-H:1, V as "an individual energy storage system or an aggregation of multiple energy storage systems."

cases is currently one of the most visible issues in the electric industry.[3] Rather than generating electricity to meet instantaneous demand, energy storage enables electricity production to occur at times when it is least expensive, including from non-dispatchable sources of renewable generation, such as solar and wind. Energy storage can enhance the value of power through instantaneous dispatch, or meeting peak demand when regional electricity prices are highest. Reducing electricity supply costs provides benefits for all customers, not only those customers that have incorporated storage into their home or business energy management solutions.

When operated as part of a microgrid, energy storage enables the continuation of service during grid supply interruptions, improving grid resilience. Energy storage also may provide balancing, reactive, and stability services to support real-time operations and reliability of the grid within wholesale markets. As Unitil has explained in other dockets before the Commission, building an enabling distribution platform is a core component of the Company's grid modernization strategy, and is key to enabling the transition to clean energy resources, beneficial electrification, and innovation in energy services for our customers. Unitil has been investing in distribution platform technologies including advanced metering infrastructure ("AMI"), distribution automation, and advanced grid control technologies. This distribution platform is described in more detail below.

Given the nascent state of energy storage development (e.g., technology and business models), Unitil supports an approach to markets and regulation that encourages innovation and flexibility. This includes providing customers and projects with multiple service options, particularly as energy technologies and business models continue to evolve. Unitil can support Energy Storage Project ("ESP") development by enabling new business models and facilitating ESP access to markets. In particular, Unitil seeks to promote energy storage innovation and customer choice by:

- Ensuring the delivery of reliable, safe, and affordable electricity and related services;
- Continuing to implement grid modernization, anticipating continued evolution of energy and systems technologies, customer preferences, and business models;
- Designing and implementing efficient processes to support storage integration into planning, operations, and market functions;
- Developing a platform that will facilitate engagement of customers and DER developers with the utility and with each other; and
- Coordinating with ISO-NE to implement Federal Energy Regulatory Commission ("FERC") Order 2222, including providing access to wholesale energy markets for

[3] "50 States of Grid Modernization, Q3 2020 Quarterly Report", NC Clean Energy Technology Center, October 2020, Executive Summary, p. 8.

storage and other DER and coordinating planning of transmission and distribution ("T&D") networks.

The balance of Unitil's comments is presented in the following two sections:

- **Creating Value from Energy Storage** provides background information on ESP configurations, compensation, and integration of ESPs with the grid and markets; and
- **Comments Regarding RSA 374-H Issues** addresses issues (a), (b), (c), and (d), considering the background information provided in the prior section.

Lastly, we conclude our comments by addressing the potential conflict between policies that would support the optimal investment and use of energy storage, and the existing RSA 374 statutes, including RSA 374-G.

CREATING VALUE FROM ENERGY STORAGE

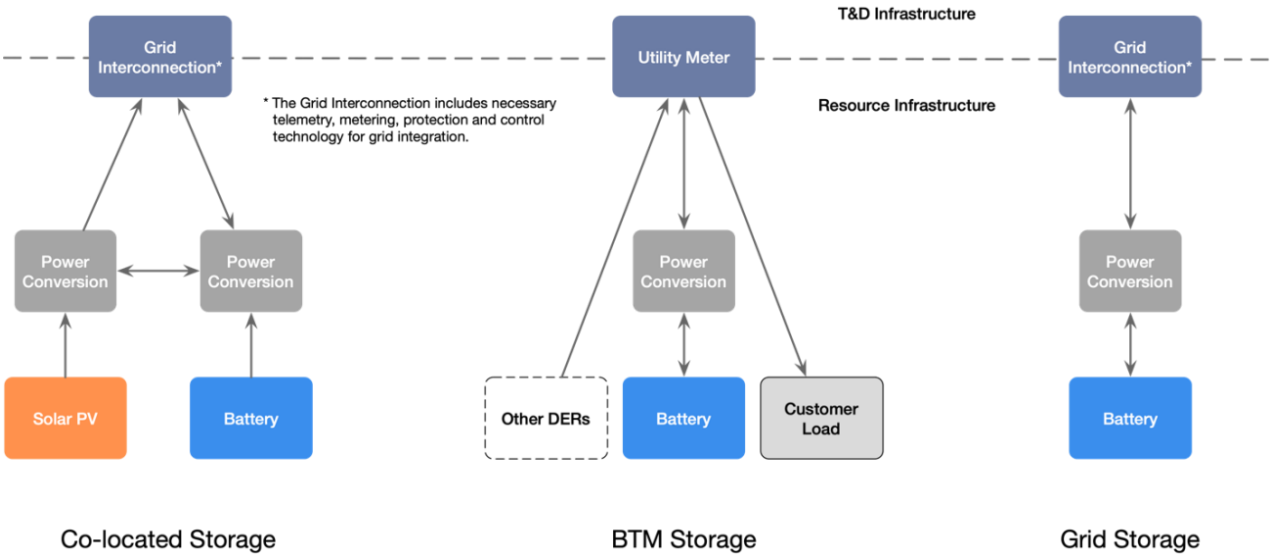
Energy storage systems may include a range of technologies, configurations, and applications. The functionality and flexibility of these systems can support multiple benefits and values for utilities, customers, and other stakeholders. The following comments describe three basic ESP configurations, and three enabling principles Unitil believes the Commission should consider to enhance the value of energy storage in New Hampshire.

Three Distinct ESP Configurations

ESPs are incorporated into integrated energy solutions in three distinct configurations (see, Figure 1):

- Co-located with large scale renewable generation ("Co-located Storage");
- Behind-the-meter ("BTM Storage"); and
- Front-of-the-meter grid storage ("Grid Storage").

Figure 1. ESP Configurations



Co-located Storage

Pairing energy storage with large-scale (i.e., larger than 1 MW) renewable energy generation can help manage generation variability, increasing the market value of the generation by firming output and reducing curtailment. At the same time, storing peak output can help avoid the need to upgrade T&D infrastructure, and the associated cost increases to customers. Numerous new Co-located Storage projects have been proposed throughout the U.S. and are under development. Florida Power and Light Company's Citrus Solar Energy Center is an example of a Co-located Storage project, including 74.5 MW of solar PV capacity and 4 MW / 16 MWh of battery energy storage. Wood Mackenzie forecasts that by 2023, over 55 percent of annual energy storage deployments in the United States will be paired with solar.[4]

BTM Storage

Energy storage may be located on a customer's premises as part of an integrated and resilient customer energy solution that may include rooftop solar and energy management technologies. BTM Storage can provide benefits to participating customers by reducing energy bills and by increasing resiliency. BTM Storage also can provide benefits to all customers by helping avoid T&D costs and lowering the cost of operating the distribution system. The market for BTM

[4] "The rise of DC architecture for solar-plus-storage," Wood Mackenzie, February 12, 2019, https://www.woodmac.com/news/editorial/rise-of-DC-architecture/.

solutions is characterized by a variety of business models. For example, larger projects generally involve a developer that will design the solution and may be compensated based in part on realized customer savings. Many retail companies offer solar + storage options for residential customers that can be tailored to an individual customer's needs. Unitil's affiliate electric distribution company, Fitchburg Gas and Electric Light Company ("FG&E"), has conducted a demonstration of BTM energy storage in its Fitchburg, MA service territory.[5] The project included the installation of 5 kW/13 kWh battery systems at four customer facilities. The systems were designed to operate remotely and in aggregate to release energy as solar PV generation lowers and the New England grid demand spikes in the early evening on the hottest summer days. The pilot program demonstrated the benefits of time-shifting renewable energy and providing backup power during outages.

Grid Storage

Energy storage, when directly connected to the grid or integrated with more traditional T&D assets and smart grid technologies, enables a utility to accommodate intermittent electricity supplies and large numbers of distributed energy resources while maintaining safe, reliable service along distribution circuits. In addition to enabling interconnection of DER, Grid Storage can lower distribution costs and benefits all distribution customers. Grid Storage may be developed and owned by the utility as an infrastructure investment, or developed and owned by a third party, perhaps as part of a non-wires alternative ("NWA") solution. Utility operational control is necessary to ensure that T&D benefits are provided to customers. Unitil's Massachusetts affiliate 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. The system will be monitored by the Unitil companies' electric dispatch center, where our operators control the output of the system to manage charging and discharging in response to system conditions. This example of Grid Storage will allow FG&E to defer a substation upgrade necessary to accommodate residential load growth and increase local hosting capacity.

Lastly, in addition to owning Grid Storage, utilities may also play a future role in developing and owning Community Solar and/or Community Solar + Storage projects to ensure all customers benefit from renewable energy.

<u>Enabling Value from ESPs</u>

The performance characteristics of energy storage provide important functionality that can unlock significant value for generators, utilities, and customers. Fast ramping, high

[5] "Unitil Partners with Revision Energy, Eguana on Energy Storage Pilot," Unitil, October 7, 2019, https://unitil.com/media-center/local-news-releases/unitil-partners-revision-energy-eguana-energy-storage-pilot.

controllability, and the ability to use stored energy when and where it is most needed make energy storage an important tool in the Company's strategy for grid modernization. However, energy storage does not create value on its own. It is always part of an integrated energy solution that includes services enabled by the grid. Moreover, initial energy storage projects are a test bed for evolving technology, customer preferences, and business models. Unitil believes the following principles will support a market and regulatory environment that provides financial support and encourages market innovation.

As explained below, there are three key factors to unlocking the potential value from ESPs.

Establish Accurate Rate Designs and ESP Compensation

Realizing and optimizing the value from each configuration depends on accurate price signals that will drive project design and operations. These price signals include compensation to the utility for distribution services (rate design) and compensation to DER and renewable energy projects for any value that they provide, including value attributable to avoided T&D costs that benefits all utility customers. The unique value of energy storage is maximized when rate design and DER compensation reflect real-time pricing principles, enabled by metering and measurement capabilities. Location also is a key compensation attribute, because it reflects the way the distribution system is planned and operated.

Integrate ESPs with an Intelligent Distribution System Platform

The utility grid is the foundation upon which a more advanced energy ecosystem will be built. Connection to a modern distribution system that delivers electricity and information is critical to unlocking the value from ESPs, and other energy products and services. ESPs and other distributed energy resources can contribute more value for more stakeholders when connected to, and integrated with, an intelligent distribution system platform. This infrastructure enables energy delivery and other distribution services and unlocks the value from projects that rely on the grid for access to wholesale markets for revenues or for back-up generation.[6]

Building the distribution platform is a core component of Unitil's grid modernization strategy. Unitil believes the platform is key to enabling the transition to clean energy resources, beneficial electrification, and innovation in energy services for our customers. In addition to the platform technologies mentioned above, the Company will continue to develop capabilities for monitoring, metering, and data sharing among ESP developers/owners/operators, consumers, and utilities that benefit from, and pay for, the value created by the ESP. Such stakeholders could

[6] Testimony of Thomas P. Meissner Jr., Exhibit TPM-1, NHPUC Docket No. DE 16-576, September 14, 2016.

include a retail customer (e.g., BTM Storage), a wholesale market participant (e.g., Co-located Storage), or the utility that owns and operates the platform within which the ESP is integrated (e.g., Grid Storage). Integration with the distribution platform helps ESPs provide a taller "stack" of energy storage benefits and incremental revenues for owner-operators (generally a customer or third-party).

Integrate ESP with Wholesale and Retail Markets

Today, ESPs can offer value (and earn revenues) by participating in wholesale markets. New England wholesale markets administered by ISO New England ("ISO-NE") include energy, capacity, reserve, and regulation (voltage and frequency), and are open to ESPs that meet participation requirements. In recent years, FERC has expanded wholesale market participation opportunities for energy storage and other DERs. FERC Order 841 directed wholesale market operators to establish participation models for energy storage resources that recognize the physical and operational characteristics of the resource. Most recently, FERC Order No. 2222 will enable small-scale ESPs (specifically, BTM Storage) to participate in wholesale markets more easily, and less expensively, through aggregation.[7]

The concept of an intrastate, retail electricity market has yet to be fully realized within New Hampshire. Unitil anticipates that ESPs will sell services to the distribution utility and other distribution-level buyers in the future as retail market formation evolves. In the U.S. and internationally, policy makers, utilities, and DER providers are in the early stages of exploring retail/intrastate/distribution-level energy markets. A retail electricity market will leverage the monitoring and data sharing of the distribution platform to create a place where retail producers and consumers can exchange energy products and services at the local level. This will provide greater market access for ESPs, and allow utilities and their customers to more efficiently procure the grid services that ESPs can provide. Over time, utilities could leverage retail markets to provide open access distribution service similar to how open access transmission service is provided today. It will be important to ensure that wholesale and retail markets are coordinated and governed to allow access to whole-system value without compromising distribution system reliability.

COMMENTS REGARDING RSA 374-H ISSUES

We address the first four of six issues in this subsection, incorporating the sixth issue (any other topic relevant to this inquiry) within these comments. The first two issues, (a) and (b) focus directly on price signals and DER compensation; the third issue (c) explores how best to

[7] ISO-NE must prepare a compliance filing to implement FERC Order No. 2222 by July 21, 2021.

encourage both utility and non-utility storage; and the fourth issue (d) considers the costs and benefits of a "bring your own device" ("BYOD") program. The fifth issue (e) addresses potential statutory changes for consideration by the general court, and is covered in the last subsection of these comments. Where appropriate, we will refer specifically to the Co-located Storage, BTM Storage or Grid Storage ESP configurations.

Issue (a): How public policy can best help establish accurate and efficient price signals for energy storage projects that value their ability to avoid transmission and distribution costs while simultaneously reducing wholesale electricity market prices.

Public policy has a critical role in establishing accurate and efficient price signals, and enabling outcomes that reduce wholesale market prices. Today, the development and subsequent operation of ESPs that are owned and operated by a third party will respond directly to two price signals: utility rate designs for distribution service that customers who pay for access to and use of grid services; and compensation for capacity, energy, and ancillary services in wholesale and distribution-level markets. Efficient price signals will motivate optimal investment and use of energy storage (load and supply) as part of integrated energy solutions.

Establish Efficient Price Signals: Utility Rate Designs

In establishing efficient utility rate designs, the Commission should apply long-standing and well-established ratemaking principles that recognize the importance of cost causation among homogenous rate classes when setting rates. As Unitil stated in Docket DE 16-576:

> *The Company strongly believes the overarching objective of rate design should be the development of pricing for grid services that adhere to the principles of fairness, transparency and economic efficiency. Prices for regulated utility services should reflect the true cost of providing those services; bills should reflect each customer's demand for or use of those services. Only through transparent and efficient rate designs will a viable and sustainable long-term model be developed that provides sufficient revenue to support the significant investments needed to modernize the grid, while also incenting the appropriate behaviors and assuring fairness and equity among customers.*[8]

These fundamental principles have been acknowledged by Commission Staff:

> *Rates designed under the cost of service standard should, to the maximum extent possible, reflect the cost of providing service to a particular customer*

[8] Direct Testimony of Thomas P. Meissner Jr., Docket No. DE 16-576, p. 11.

class. The cost of service standard has been a foundational component of rate design in New Hampshire for decades.[9]

Unitil further recommends that in the near-term, the Commission approve a three-part rate design including customer, demand, and usage charges, with one or more time-varying price options. This approach is necessary to optimize the value from energy storage at the time of development and when the ESP is operating as part of an integrated solution. Unitil has invested in smart metering and customer billing capabilities anticipating the implementation of a three-part rate design with time-varying options, and intends to propose multiple service tariffs, allowing retail customers to select the option that maximizes the value from their preferred BTM energy solution.

Establish Efficient Price Signals: Compensation for T&D Value[10]

The Commission considers the potential for avoided T&D costs attributable to a specific project as one element of DER compensation. T&D infrastructure is planned and engineered to meet peak electricity demand from consumers and deliver electricity products from generators while maintaining high reliability and safety requirements. Ensuring sufficient delivery capacity and high reliability are critical drivers of T&D capital investments. All three ESP configurations have the potential to defer or avoid the need for T&D infrastructure investments, defer or avoid T&D costs, or enable increased penetration of distribution connected generation and full integration of renewable generation. Compensation for avoided T&D costs (and other T&D value) by the utility should reflect the strength of commitment and actual performance of the resource. ESPs that commit to availability and response, and deliver on those commitments, should be compensated accordingly.

Energy storage can be configured to provide a wide range of functionality and T&D benefits for generators, electricity customers, and utilities. Table 1 presents a high-level qualitative assessment of the relative value of five benefit categories as they apply to the three ESP configurations.

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[9] Staff Memorandum in IR 20-004, January 10, 2020 (citing Order 20,504 at 285 (June 8, 1992)).

[10] The Commission is exploring DER compensation models in the current phase of Docket DE 16-576, by engaging consultants to conduct two related studies: (1) a Locational Value of Distributed Generation study completed on July 31, 2020 by Guidehouse, and (2) a Value of DER study that is underway. These studies will inform compensation for avoided T&D costs and other values. Unitil supports DER compensation approach that reflects the locational value of DER and efficient access to value that solutions incorporating energy storage can derive from participation in wholesale markets.

Table 1. Comparison of T&D values by ESP configuration.

Value/Benefit	Co-located Storage	BTM Storage	Grid Storage
T&D deferral	Moderate	Less	Greater
Distribution resilience	Less	Less	Greater
Renewables integration	Greater	Moderate	Moderate
Transmission Network Service cost	Moderate	Moderate	Greater
T&D efficiency	Moderate	Moderate	Greater
Overall T&D cost savings	Moderate	Less	Greater

Of the three ESP configurations, Grid Storage provides the highest proportion of overall T&D cost savings. Grid Storage solutions are designed to deliver the functionalities and benefits most associated with a traditional T&D investment. By comparison, BTM Storage may provide a lower proportion of T&D cost savings, but can provide significant benefits including reliability, resiliency and cost savings for customers choosing to install storage.

Compensation mechanisms for avoided T&D costs should be tailored to the ESP configuration. Unitil suggests a simple credit on customer bills in the near-term, a standard rate adjustment, or a time-of-use ("TOU") rate to account for the benefit BTM storage provides. The Company anticipates Co-located Storage and Grid Storage projects will be evaluated as part of utility system planning processes and interconnection applications. Depending on size and location, such projects may require T&D upgrades that would be paid by the developer. T&D cost savings benefits could be applied to the project as a credit to interconnection costs. Payment to the ESP developer or owner could include an upfront payment plus a series of payments over time (e.g., five years) as the ESP demonstrates benefits and T&D cost savings.

Establish Efficient Price Signals: Access to Wholesale Market Value

Access to wholesale market value has the potential to benefit all customers. Wholesale electricity market prices are established by ISO-NE at over one thousand pricing nodes throughout New England, subject to regulation by FERC. As a general matter, reductions in demand or increases in supply during peak hours will lower wholesale electricity market prices during peak hours. The aggregate of BTM configurations that include energy storage and Co-located Storage may

be specifically designed to achieve these outcomes.[11] As a result, all end-use customers in New Hampshire benefit from lower wholesale market prices over time whether they purchase their electricity supply from a retail supplier or rely on default service from a utility.

Co-Location and Grid Storage ESPs that are owned by third parties benefit directly from access to wholesale markets as these projects are designed to deliver supply into the market when prices are highest. Access to wholesale markets and the ability to execute Power Purchase Agreements ("PPAs") for their output are the primary drivers of investment and operations for these projects.

Wholesale market reforms pursuant to FERC Order 2222 should enable access for DERs that incorporate energy storage and participate in an aggregation. This means that BTM Projects may be able to receive compensation through both retail and wholesale mechanisms. Care must be taken to avoid double-compensation of benefits. ISO-NE's compliance filing addressing the requirements of the order is due on July 21, 2021. New Hampshire end-users that meet metering and numerous other requirements will be eligible to participate in the ISO-NE markets after this compliance filing is approved.

Lastly, utility-owned Grid Storage can be designed to generate incremental revenues from wholesale markets. The benefit to wholesale market prices from a marginal increase in supply from these resources should be modest compared to the other two categories, but will generate revenues that reduce utility distribution costs.

Establish Efficient Price Signals: Continued Applicability of Net Energy Metering

Unitil has recognized Net Energy Metering ("NEM") as a service and interim pricing mechanism that provides an incentive for customers to install renewable distributed generation. Although easy to implement, NEM is an imperfect mechanism that does not reflect real-time price signals that can and should be provided by rate design and DER compensation. Grid pricing and DER compensation can reflect the fact that cost and value vary by time-of-use and operating conditions. Unitil has invested in AMI along with other smart grid capabilities and is now able to reflect time-of-use in both pricing and DER compensation, including the ability to incorporate value derived from wholesale markets that establish prices that vary by time period.

Of particular relevance to energy storage, Unitil has submitted comments in Docket DE 16-576 (regarding Value of DER) that explain how NEM serves as a deterrent to investments in energy

[11] Grid Storage may increase wholesale market supplies during peak hours to realize an incremental source of revenues that improve project economics, but it is not yet clear whether this supply will have a meaningful impact on wholesale market prices.

storage.[12] In short, NEM effectively competes with ESPs by enabling free use of the distribution grid as an energy storage device. It is now time to transition to a pricing model that provides accurate signals to developers and customers, creating long-term economic efficiencies.

Issue (b): How to compensate energy storage projects that participate in wholesale electricity markets for avoided transmission and distribution costs in a manner that provides net savings to consumers.

Compensation for larger third-party ESPs

Co-located Storage and Grid Storage owned by third-parties tend to be large ESPs (larger than one MW) designed primarily to sell power under PPAs and/or participate in wholesale markets. These ESPs connect directly to the grid.

Unitil proposes to establish cost-based rates that would apply to Co-located and Grid Storage ESPs owned by third parties for access to and use of the grid. Because the impacts on the T&D system cost basis for these larger ESPs is likely to be project-specific (reflecting the location and size of the project), it may be challenging to derive a single tariff-based rate class that can be fairly be applied to all projects. Until recommends that the Commission conduct an inquiry to develop a methodology that fairly calculates the rates to be paid by these ESPs.

Co-located Storage and Grid Storage generally require project-specific interconnection studies that determine whether distribution and/or transmission infrastructure investments are required in order to integrate the project without having an adverse impact on the reliability or quality of service to other customers. These studies consider the anticipated load profile of the projects (distribution service and generation) to assess the need for utility investment. For utilities that offer a "flexible interconnection" service, there may be an opportunity for the project to reduce the cost of interconnection by committing to change its operating profile (e.g., by reducing its reliance on the distribution system during peak hours).

The interconnection study also may reveal the potential for the project to provide other ancillary distribution services (such as voltage or reactive support) when the project commences operation. The utility will communicate how these ancillary services will be compensated, i.e., whether pursuant to a Commission-approved compensation method, an existing or planned distribution services market, or whether a contract is required. The resulting interconnection agreement and compensation mechanism will be subject to Commission regulation and oversight.

[12] Testimony of Thomas P. Meissner Jr., Exhibit TPM-1, NHPUC Docket No. DE 16-576 (September 14, 2016). Rebuttal Testimony of Thomas P. Meissner Jr., UES Exhibit 5, NHPUC Docket No. DE 16-576 (December 21, 2016).

Compensation for ESPs owned or controlled by a utility

Grid storage projects that are owned or controlled by the utility (e.g., a non-wires solution that incorporates energy storage) may be designed to participate in wholesale energy markets, and receive revenue offsetting the cost of the project. This revenue contribution lowers costs that are borne by all customers. These projects are subject to regulatory oversight. Grid Storage projects that are owned by the utility are compensated by the return of and on their investment. Utility system planners will consider energy storage as part of grid solutions that address capacity, reliability, resiliency, and power quality issues. These energy storage installations will be owned by the utility in the same manner as poles, wires, and other facilities.

Ownership of Grid Storage is necessary when a third-party NWA is not a viable alternative, and as a "price-to-beat" option when a third-party NWA is a viable solution. NWAs are secured through competitive processes with a contract as the outcome. This contract will define the compensation to the NWA and the commitments the NWA is making to meet the performance requirements of utility infrastructure, including reliability and availability. Utility control is essential for ensuring that T&D value is delivered.

Unitil recommends that NWAs include an opportunity for the utility to earn an appropriate return on services provided by the third party. This compensation should be based on the incremental benefits provided by the third-party NWA relative to the traditional utility solution. New York has addressed the compensation issue by allowing the utility to share in the benefits of an NWA.[13]

Issue (c): How best to encourage both utility and non-utility investments in energy storage projects.

Establish Efficient Price Signals

Unitil proposes stating this important objective as "how best to encourage optimal utility and non-utility investments in energy storage projects." This subtle but important change reflects our perspective that market forces should determine the amount, technology configuration, and timing of energy storage that is developed in New Hampshire. This will occur if the Commission establishes: (1) the appropriate prices for access to and use of the grid by energy storage projects, whether they be integrated into a whole customer solution (BTM and Co-located Storage) or connect directly to the distribution grid (Grid Storage owned by a third party); (2) a DER compensation model that accurately reflects the value of each service provided to the distribution

[13] Con Edison, for example, has been allowed to retain 30% of the net benefits from an NWA and depreciate investments associated with an NWA project over ten years.

grid (including deferred or avoided T&D investments); and (3) efficient access to wholesale markets, including as a participant in an aggregation of DER.[14] Time-of-use energy prices and location-specific DER compensation are essential aspects of establishing efficient price signals.

It may be argued that energy storage should be supported by mandated targets requiring the utility (as the one regulated entity) to enable the development of storage or by establishing DER compensation levels that exceed the value being provided. Unitil believes this approach would only be appropriate for a jurisdiction that views its role as a sponsor of energy storage to "jumpstart" the market. Unitil does not believe this approach is either necessary or appropriate for New Hampshire, and that the "get the prices right" strategy will yield optimal development over the long term, with late adopters benefiting from better technology at lower costs.

Implement Enabling Policies

The Commission and other New Hampshire policy makers have a critical role in realizing the potential of energy storage to substantially improve the economics of producing, consuming, and distributing electricity. Implementing enabling policies that encourage utility and non-utility investment in ESPs is essential to furthering this objective. Such policies include:

Rate Design and Ratemaking

- Approve TOU tariff(s), including options;
- Eliminate NEM for new resources;
- Establish rate design methodology for large scale Co-located and Grid Storage owned by third parties;
- Establish a compensation methodology for BTM Storage; and
- Develop a utility earnings mechanism that would apply to a third-party NWA solutions.

Grid Modernization

- Provide oversight to grid modernization activities, including enhancements to grid planning, operations, and markets along with enabling technologies and investments; and
- Support ongoing utility investments to develop the distribution platform.

Retail Market Development

- Develop a retail market for DER and ESP participation.

[14] A TOU rate could encourage a large group of customers with BTM storage to operate their systems in such a way as to reduce peak demand on a distribution feeder. Adding some degree of utility coordination and control to the storage devices could help ensure that collective battery output is managed to deliver great impact and value.

Encourage Investment and ESP Financing

Energy storage remains an emerging technology. The Company's comments begin with the assumption that the key to achieving an optimal level of storage will be establishing a market and regulatory environment that support innovation and investment by storage developers and utilities. This includes recognition that all energy project investments, including those that incorporate energy storage, must be financeable at reasonable terms. Co-located renewable + storage projects and Grid Storage owned by third parties derive the bulk of their revenues by selling their output under PPAs and/or participating in regional wholesale energy markets. A large-scale "community" solar + storage project sells its output to qualified subscribers. BTM projects are financed by a combination of cost savings that accrue over time to the customer, equipment supplier leases, and compensation for energy products delivered to the grid or to wholesale markets by signing up with an aggregator. Utility-owned Grid Storage projects are financed through rate base.

Issue (d): The costs and benefits of a potential bring your own device program; how such a program might be implemented; and whether such a program should include all distributed energy resources or be limited to distributed energy storage projects.

A BYOD program allows customers to participate in a utility energy program using technology that they obtain themselves. Customers can choose to purchase and install their own equipment, or work with a third-party service provider. BYOD programs are often faster to reach the market, see higher participation rates, and achieve higher customer satisfaction than competing approaches. Utilities have used BYOD programs for Wi-Fi thermostats for years as part of demand-side management portfolios. More recently, the BYOD concept has expanded into solar PV, electric vehicle chargers, and energy storage as these technologies have become more affordable, commercially available, and desirable to customers.

BYOD programs are designed around the premise that customers prefer choice and participation is higher with device options. By developing the distribution platform, Unitil seeks to enable device interoperability, data sharing, and innovation, and allow customers and third party service providers to choose use case and supporting technologies that provide the best value.

Opportunities and goals of a "BYOD" storage program

A BYOD energy storage program should support a clear beneficial outcome for customers. Examples include reducing peak demand, increasing hosting capacity, and increasing the resilience of the distribution system. In addition, a BYOD program should help introduce New Hampshire customers to storage as an energy solution, accelerate adoption, and ensure benefits realization. The goal of BYOD program design should be to simplify customer enrollment, increase engagement, and demonstrate the beneficial outcomes for customers.

Specifically, a BYOD energy storage program should:

- Expand access of battery storage solutions to more customers, offering more devices at a range of price points, helping connect customers to technology and service providers, and lowering the cost of entry where possible, particularly for underserved communities.
- Reduce the cost and risk to rate base by encouraging cost sharing between utilities and program participants through a combination of rate design and incentives.
- Include a participation cap and enrollment time frames to establish clear boundaries for program scope and cost.
- Include targets that encourage participation by customers that can most readily contribute to T&D cost savings by utilizing energy storage.
- Establish technology guidelines that encourage standards (e.g., communications, operations, security), interoperability, and data sharing, as well as ensuring that the functionality and benefits of different systems can be consistently valued. This could include a qualification process and maintenance of a list of "approved" devices.

A BYOD Collaborative to explore key questions

A BYOD program offers the potential to extend the benefits of energy storage to mass market customers. Unitil recommends that the Commission convene a collaborative to focus on making BYOD a reality. Among the questions that could be addressed are:

- What standards should be used or developed to ensure data and equipment compatibility?
- Should New Hampshire "pre-qualify" a set of technologies?
- How could New Hampshire coordinate BYOD for energy storage with similar programs for solar or EV charging?
- Should New Hampshire address markets that may be underserved by third-party providers? What might this program look like?
- Are specific revenue mechanisms needed for compensating customers if value is provided?

RECOMMENDED STATUTORY CHANGES

Unitil has reviewed New Hampshire statutory authority relevant to energy storage, focusing on the potential need for clarification of the statutes to align with, accommodate, and/or support the implementation of policies that will produce an optimal investment and use of ESPs. This review is timely as certain sections of the current statute were enacted at the time of electric utility restructuring, and before the promise of energy storage technology was understood. Even RSA 374-H, which became effective on September 12, 2020, merits a review to ensure it provides the Commission with the authority it may require to establish policies that support optimal energy storage investment and use.

There are several aspects of the existing statutes that merit review:

1) **NH RSA 374-G:2, Definition of "Distributed energy resources":** the statute should be amended, if necessary, to clarify that energy storage is not "generation". Energy storage assets do not generate electricity but may enhance the value of distributed generation for customers. Energy storage may reduce system costs when paired with large renewable projects or in a Grid Storage configuration. This statutory language clarification could be accomplished as follows:

   374-G:2 Definitions; Exclusions. –
   I. The following definitions shall apply in this chapter except as otherwise provided:
   (a) "Commission" means the public utilities commission.
   (b) "Distributed energy resources" means electric generation equipment~~,~~ (including clean and renewable generation), energy storage, energy efficiency, demand response, load reduction or control programs, ~~and~~ or technologies or devices located on or interconnected to the local electric distribution system for purposes including but not limited to reducing line losses, supporting voltage regulation, or peak load shaving, as part of a strategy for minimizing transmission and distribution costs as provided in RSA 374-F:3, III.

2) **Utility Ownership of Energy Storage:** the statutes should be amended, if necessary, to clarify that a utility can own Grid Storage in accordance with regulations to be established by the Commission. Further, the statutes should be amended to preclude a blanket prohibition of utility ownership of energy storage more broadly. It is premature at this early stage of development to take the utility ownership option off the table without evidence that energy storage is achieving its desired potential. This could include utility ownership of large co-located renewable + storage projects and BTM Storage projects if policymakers determine that utility ownership is necessary to provide deliver the benefits of these projects to unserved or underserved market segments and/or achieve New Hampshire renewable energy goals. Such storage would continue to be subject to the jurisdiction of the Commission.

3) **Other suggestion RSA 374 Revisions:** the statutes should be amended to consistently reference "distributed energy resources" and "electric generation equipment". These terms are inconsistently utilized throughout the statute and could lead to ambiguity in interpretation.