

1 Attachment A

2 Education and Professional Background

3 Elizabeth R. Nixon

4
5 My name is Elizabeth R. Nixon. I am employed as a Utility Analyst with the New
6 Hampshire Public Utilities Commission (PUC). My business address is 21 S. Fruit St., Suite 10,
7 Concord, NH 03301.

8 I earned a B.S. in Mathematics from the University of Vermont in 1985. I worked for
9 ICF, a consulting firm, where we estimated, modeled, and analyzed the energy, environmental
10 and economic impacts of various emission reduction strategies at electric utilities. At ICF and
11 AER*X, Inc., I assisted companies in implementing market-based emissions trading programs. I
12 provided comments on various air quality programs affecting the electric utilities and other
13 industries in the Northeast and other states. I also worked for the Center for Clean Air Policy
14 where we coordinated a dialogue of states and electric utilities to discuss energy efficiency and
15 other emission control strategies to reduce acid rain and greenhouse gases at electric utilities.

16 At the New Hampshire Department of Environmental Services, I wrote the air quality
17 permits for Eversource's electric generating facilities as well as other electric generating
18 facilities and manufacturing facilities in NH. I testified before the NH Air Resources Council
19 regarding the determination of the baseline mercury emissions for Eversource's coal-fired
20 electric generating facilities.

21 I joined the PUC's Sustainable Energy Division in August 2012 where I managed
22 renewable energy incentive programs, determined compliance with the renewable portfolio

1 standard (RPS) program, and conducted analysis of and provided testimony and presentations on
2 the RPS program and rebate programs.

3 In August 2016, I joined the PUC's Electric Division. I completed electric utility rate
4 training at New Mexico State University's Center for Public Utilities. I have testified in the
5 energy efficiency dockets and Liberty Utilities battery storage pilot project. I also co-drafted
6 Staff recommendation on grid modernization.

Public Service of New Hampshire d/b/a Eversource Energy
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Request No. STAFF 7-004

Page 1 of 1

Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael R. Goldman

Request:

Reference Bates pp. 30-32. Please provide a detailed narrative regarding the proposed C&I Demand Response program for each utility (Eversource and Unitil) including, but not limited to the proposed kW savings goals, the associated kWh savings, the incentive, the total cost, a detailed explanation of the devices to be used, and a benefit/cost analysis.

Response:

Eversource and Unitil are proposing to essentially continue their C&I Active Demand Response program from 2019. Please see the filing made in docket 17-136 on January 28, 2019 for the detailed narrative describing the program attached here as "Attachment A Staff 7-004". "Attachment B Staff 7-004" provides a breakdown of the budgets, projected measure quantity and projected kW savings.

For Eversource, the major change between 2019 and 2020 is designed to meet greater than expected customer interest in the program resulting in an expansion of the offering from 5 to 6.5 MW for 2020.

For its C&I Active Demand Response program, Unitil will enhance marketing efforts and expand the offering to 2.7 MW for 2020. In addition, Unitil will offer a pay for performance battery storage program that mirrors the Residential battery storage program. The targeted amount to be saved is 100 kW and the incentive will be between \$275 and \$350 per kW.

The C&I Active Demand Reduction Initiative is a demonstration initiative. As such, no benefits are planned and Eversource and Unitil have not calculated a benefit cost ratio for the offering. Similar to the utilities' education program, the costs associated with the demand demonstration are included in the 2020 Update but there are no associated benefits included. The overall portfolio of programs for 2020 is cost effective for each utility.

Eversource and Unitil are working with Synapse to develop an active demand model to calculate the benefits and costs of active demand measures and programs. That "Active Demand Model" will be used to provide informational updates regarding the 2020 demand reduction initiatives, and then will be used for actual benefit cost screening if and when demand reduction programs are proposed for future years. The NH Active Demand Model will be finalized by Synapse at the end of October, 2019. After internal testing and training, Eversource and Unitil will share the model with commission staff and stakeholders for additional discussion and review of the proposed approach. Because demand reduction is in a demonstration phase, Eversource and Unitil suggest that approval of the 2020 Update does not require finalization of the Active Demand Model, as no benefits are proposed and none will be claimed from the active demand measures offered in 2020.

Eversource and Unitil Response

2019

2019 Commercial and Industrial Demand Reduction Initiative

Jointly Submitted by
Public Service Company of New Hampshire d/b/a Eversource Energy
Unitil Energy Systems, Inc.

**NHPUC Docket DE 17-136
January 28, 2019**

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1.0 NH Commercial & Industrial (“C&I”) Active Demand Reduction Initiative Background

Eversource, Liberty, NH Electric Cooperative and Unitil (“NH Utilities”) have been actively monitoring multiple demand management demonstrations from other states, with the goal to leverage understanding of potential markets and methodologies that could be adopted in New Hampshire. The 2018-2020 Statewide Energy Efficiency Plan (the approved and amended version of that plan was submitted on January 15, 2019) includes a section on Capacity Demand Management that describes many of the demonstrations that the NH Utilities are monitoring.

One approach that has proven successful, resulting in cost-effective demand reductions, in other states is Commercial and Industrial (“C&I”) active demand reduction. The C&I active demand reduction demonstration efforts and program offerings in Massachusetts, Connecticut, and Rhode Island typically include customers with interval meters and demand charges, with peak demand of 250 kW or higher, and with the ability to curtail 50 kW. Under an active demand reduction approach, customers agree to respond to an event call targeting conditions that typically result in ISO-NE system peak reductions through curtailment service providers (“CSPs”)—vendors who identify curtailable load, enroll customers, manage curtailment events, and calculate payments. The customer is incentivized to respond to event calls using performance-based incentives that are determined by measuring performance against a baseline that is established in alignment with ISO-NE methodology. This approach is technology agnostic and can utilize single end-use control strategies or a multitude of approaches that can reduce demand when an event is called. In the New England demonstrations, customers used lighting with both manual and automated controls, HVAC with both manual and automated controls, process loads, scheduling changes, excess Combined Heat & Power (CHP) capacity, and energy storage to reduce demand. The demonstration projects utilize a “pay for performance” program design, meaning that participants and CSPs are only paid for their verified load reductions. This ensures that utility customers are protected from non-performance, as no upfront incentives are paid.

Eversource and Unitil’s (“Utilities”) active demand reduction offering for 2019 is based on the recently evaluated C&I active demand reduction demonstration efforts from across Massachusetts, Connecticut, and Rhode Island. Based on the success of these regional demonstration efforts, the Utilities will offer incentives to reduce demand at key times to realize customer value and system benefits mainly tied to avoided peak demand as quantified in the regional Avoided Energy Supply Cost (AESC) study.

2.0 NH C&I Active Demand Reduction Initiative

The model for the New Hampshire C&I Active Demand Reduction Initiative are the MA 2016-2018 C&I Interruptible Load Curtailment demonstration projects targeting demand during summer peak (June 1 to September 30). This offering is technology agnostic and provides an incentive for verifiable shedding of load in response to a signal or communication from the Utilities coinciding with ISO-NE system peak conditions. Customers are incentivized based on their average performance during events. Typical technologies or strategies used to curtail load may include:

- energy management systems,
- building management systems,
- software and controls,
- HVAC controls,
- lighting with controls (manual, networked system or integrated),
- process offsets,
- battery storage
- any open automated demand response (OpenADR) compliant technology,
- startup sequencing, and
- other customer facility specific approaches.

Customers can use any technology or strategy at their disposal and earn an incentive based on their curtailment performance. In essence, the incentive equals the customers' opportunity cost – if it makes sense for a customer to shed load for the incentive price offered by the Utilities, then the customer will curtail. Large C&I customers that are subject to demand charges and/or direct capacity charges (determined by Installed Capacity (“ICAP”) tags) with the ability to control lighting, comfort, and/or process loads, can use this demand reduction performance offering to earn incentives by altering their operations when called upon by the Utilities. The incentive, combined with any ISO-NE capacity charge reduction and demand charge reduction, round out a compelling package for customers to adjust operations when called upon.

The Utilities anticipate that there will be between 20-40 hours' worth of calls each summer, representing approximately ten discrete calls. The program will only be offered during the summer months, because that is typically when the ISO-NE system peak occurs and the value for offsetting capacity costs is likely the highest. To maximize customer participation, it is important to minimize operational interference at a customer's facility, and dispatching for 20-40 hours, or less, is likely to result in predictable and sustainable participation levels.

3.0 Delivery Pathways

This fully-integrated initiative uses CSPs and the Utilities' existing energy efficiency implementation teams to assess curtailment opportunities at customers' facilities and deliver curtailment services to those who enroll. The utility Program Administrators will leverage the existing consultative sales approach employed for large customers to market to and recruit customers. CSPs will then identify specific curtailment opportunities, as well as demand charge and ICAP tag management opportunities, and present complete curtailment proposals to the customers. The demand charge and ICAP tag management provide opportunities for direct bill savings to customers.

This fully integrated approach relies on sales delivery teams promoting efficiency and active demand offerings to customers as they assess opportunities at customer facilities. Using the existing efficiency delivery apparatus is key to the growth of NH C&I active demand reduction. The robust relationships the Utilities have with the target customers (typically large electric customers with interval meters and demand charges) have been critical to the demonstration success in Massachusetts and the Utilities anticipate they will be the source of progress on this New Hampshire initiative.

Customers and CSPs respond to dispatch signals or criteria specified by the Utilities, generally using a system peak trigger. Events will be called the day before curtailment is needed. The core model remains focused on reducing demand during summer peak events typically targeting fewer than twenty hours per summer, although the actual number of dispatch hours may be higher. The goal of the offering is to call events at times of peak energy use. For customers participating in ISO-NE demand response markets, ISO-NE event days will be excluded from baseline calculations. The approach is structured to avoid interfering with the ISO-NE programs or penalizing customers for participating in both programs.

4.0 Anticipated Project Benefits

The NH C&I Active Demand Reduction Initiative will seek to confirm hypothesized benefits about reducing usage during ISO-NE system peak times. If this demonstration project is continued over multiple years or is developed into a program, the Utilities will be able to use ISO data to see if New Hampshire's share of overall peak capacity has been reduced over time.

This offering will be different than the ISO-NE demand response program and will be focused on generating different types of benefits. The ISO-NE demand response program has historically

been a program centered around reliability, which is a FERC-designated responsibility of ISO-NE. Although direct demand response calls from ISO-NE for reliability have essentially been phased out, the ISO-NE program still functions, and its main goal is to maintain system reliability. In this Initiative, the Utilities will be primarily focused on providing economic benefits for customers.

The Utilities will focus on reducing capacity and possibly transmission costs through peak demand reduction, which is not a primary goal of ISO-NE. For example, ISO-NE historically would not need to call an event during the peak hour if there were adequate supply. However, each of the Utilities may choose to call an event during the peak hour in order to lower ICAP tags and mitigate capacity costs. Customers will be able to make use of both programs if, as is anticipated, they are dispatched at different times. It is not a requirement to participate in ISO-NE’s demand response program in order to participate in the Utilities’ proposed program. In the rare instance when both the Utilities and ISO-NE dispatch at the same time, the ISO-NE dispatch will take priority and the customer’s dispatch will not factor into the performance calculation for the Utilities’ program, ensuring that the customer would not receive an additional incentive nor be penalized from the Utilities for the same dispatch.

5.0 Customer Incentive Calculation

The incentive for the interruptible load curtailment will be based on the average performance of the customer during the called hours, multiplied by the payout rate. For example, for summer curtailment, the Utilities may call for reductions during 10 hours in a given year. A customer’s hypothetical load reductions during those hours are presented below:

Table 5.1: Example load reductions

Reductions in kW										
Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Average
100	80	90	95	100	100	90	0	90	80	82.5

In this example, the average customer performance across the 10 called hours is an 82.5 kW reduction. The customer and CSP will split the performance incentive, which in this example would be calculated as 82.5 (average kW reduction) x \$35 (illustrative payout rate combined for both) = \$2,887.50. This incentive would be paid out on an annual basis and would be re-calculated each year based on that year’s performance, considering any adjustments made to the payout rate. There are no direct penalties for non-performance. However, non-performance will impact the performance calculation for a customer and thus the level of incentive. Hour 8 in the table above is an example of non-performance during a called event-hour. There is no direct penalty but the non-performance in that hour impacts the overall average reduction, which is the basis for the incentive calculation.

6.0 Baseline Calculation Methodology

A baseline will be calculated as described below for each C&I customer participating in the program. The baseline will be calculated at the retail delivery point. In order to participate in the program, the C&I customer must have an interval meter recording load or any output pushed back to the distribution system—i.e., “net supply”—for each interval. Solely for the purpose of this demand reduction effort, respondents may propose metering at a retail billing point that does not utilize a utility interval meter but is capable of recording load or net supply at appropriate intervals.

The baseline will be calculated for each non-holiday weekday interval during the summer cooling season, when the ISO-NE system peak generally occurs. The summer season for purposes of the Utilities’ program will be June 1 through September 30th. The only weekday summer holidays are Independence Day and Labor Day. If Independence Day falls on a Saturday, the holiday is observed on Friday, July 3; if the holiday falls on a Sunday, the holiday is observed on Monday, July 5. A CSP or the C&I customer is restricted from taking any action to create or maintain a baseline that exceeds the typical electricity consumption levels that would be expected in the normal course of business for the customer. The program will be designed to minimize this risk and any customer/CSP found to be engaging in this practice will be removed from the program.

If the participating C&I customer produces net supply (i.e., pushes back energy at the retail delivery point) in an interval, that net supply will be used in the baseline calculations for that interval as representative of normal operating practice.

A non-holiday weekday baseline in each interval is equal to the average of the customer's meter data for the same interval from 10 prior non-holiday weekdays, as follows:

- For a customer without a non-holiday weekday baseline, the initial non-holiday weekday baseline will be created using meter data from the first 10 consecutive non-holiday weekdays with a complete set of interval meter data. This interval meter data will either be from a period just prior to the start of the customer's enrollment in the program or for the first 10 consecutive non-holiday weekdays once enrolled in the program. The customer is not permitted to participate in any activation until a baseline can be calculated. This includes activations from ISO-NE dispatch.
- For a customer that has established a non-holiday weekday baseline, the baseline is calculated each day using meter data from:
 - the 10 most recent of the previous 30 non-holiday weekdays, excluding days during which: (1) the customer received an activation instruction or (2) the customer was on a facility scheduled shutdown (as described later);
 - if there are fewer than 10 such days, then meter data from additional days will be used (until a total of 10 days have been identified) including, first, the most recent days during which the customer received an activation instruction and, second, the most recent days during which the customer was on a facility scheduled shutdown.

A facility scheduled shutdown is a reduction in demand resulting from a scheduled plant shutdown or scheduled maintenance of energy consuming equipment that would have normally responded to a demand response event during the activation period. A scheduled plant shutdown may be no shorter than a single calendar day and the total duration of the scheduled plant shutdown per summer cooling season or winter heating season may not exceed 14 calendar days. A facility in shutdown will not have those days counted toward baseline unless the requisite 10 days cannot be met with days with normal operations. Only the first day of a scheduled plant shutdown may be counted as performance during a program dispatch. Additional days in shutdown will not count towards positive performance.

7.0 Costs and Savings

Eversource anticipates spending \$250,000 in 2019 to generate 5 MW of summer demand savings. Unitil anticipates spending \$90,000 in 2019 to generate 1.8 MW of savings (included in the Large Business Energy Solutions budget). This equates to \$50/kW. That budgetary figure is inclusive of incentives, vendor costs, software costs, and utility program delivery costs. As mentioned earlier, this is a “pay for performance” program design, meaning that none of the incentive or vendor costs will be paid unless there are verifiable and measurable load reductions.

Costs for the Demand Reduction Initiative are included in the benefit cost model and detail attachments provided in the DE 17-136 Update Plan Compliance Filing made on January 15, 2019. Because this is a pilot initiative, the savings are not included in the benefit cost model for 2019.

8.0 Next Steps

The Utilities will utilize CSPs under existing contracts through their respective Massachusetts demand response programs and will begin recruiting New Hampshire customers for participation immediately following approval to prepare for the summer 2019 season. The Utilities will provide updates on the NH C&I Active Demand Reduction Initiative as appropriate at DE 17-136 Quarterly Meetings. All of the NH Electric Utilities will review this initiative for potential inclusion in the 2020 Update and the 2021-2023 Statewide Energy Efficiency Plan.

The NH Electric Utilities will also continue to review the results of other demonstrations approved by the Massachusetts Department of Public Utilities (“MA DPU”) in D.P.U. 16-178, and programs under consideration in D.P.U. 18-117 (Fitchburg Gas and Electric, dba Unitil) and D.P.U. 18-119 (Eversource in MA) as well as other related demonstrations in Connecticut and Rhode Island. In 2018 and 2019, Eversource (MA) is deploying demand reduction

demonstration offerings for battery storage, thermal storage, software and controls, and active demand response, some including upfront incentives for equipment installations. Eversource has also proposed testing the ability to manage electric vehicle charging in Massachusetts. These demonstrations are designed to test the ability of the projects to deliver cost-effective benefits to customers at scale. After the evaluation of the demonstrations, Eversource in Massachusetts will submit a report to the MA DPU with an analysis of the actual costs and benefits of each demonstration project. The NH Utilities will utilize this review and as well as demonstration results from other states and utilities to inform future potential offerings in New Hampshire.

	Qty	Total Summer kW	Total cost	Total incentive
Eversource				
Interruptible Load	20	6,500	\$ 380,187	\$ 325,000
Total	20	6,500	\$ 380,187	\$ 325,000
Unitil				
Interruptible Load	8	2,700		\$ 140,400
Storage Targeted Dispatch	1	100		\$ 34,600
Total	9	2,800	\$ 227,343	\$ 175,000

*For Unitil only incentive costs are allocated at the measure level

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Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael R. Goldman

Request:

Please provide detailed results of the C&I demand response initiative conducted in the Summer of 2019 including a benefit/cost analysis using actual data. If the hourly benefit model is not available, please provide a benefit/cost analysis without it.

Response:

Eversource's target for the C&I demand response initiative was to reduce demand by 5,000 kW in 2019. In order to achieve 5,000 kW of performance Eversource successfully recruited 36 sites with a total enrollment of 5,905 kW. Over enrollment is required when managing a portfolio to account for the variances in curtailment performance of C&I customers. This over enrollment must also be balanced with expected expenditures in order to avoid budget overages when calculating pay-for-performance incentives.

Three program events were called during the summer of 2019, each of which was 3 hours in duration. Based upon preliminary vendor supplied data, the average performance of the NH C&I portfolio over these 9 hours was 5,190 kW. This preliminary data is still currently under review within Eversource as well as by third party evaluation with results expected in the first quarter of 2020. This curtailment represents 103% of the anticipated target. Within the portfolio individual customer performance varied between 0% - 433% of enrolled amount.

Eversource notes that by the end of the 2019 cooling season, there was a waiting list for program participation. This indicates strong customer interest in this demonstration project and led the Company to propose an expanded offering for 2020.

Unitil's target for the C&I demand response initiative in 2019 was to reduce demand by 1,800 kW. Unitil successfully recruited 7 sites with a total enrollment of 1,600 kW.

One program event was called during summer 2019, which was 3 hours in duration. Based upon preliminary vendor supplied data, the average performance of the NH C&I portfolio over these 3 hours was 1,300 kW. This preliminary data is still currently under review within Unitil as well as third party evaluation with results expected in the first quarter of 2020. This represents 81% of the curtailment target. Within the portfolio individual customer performance varied between 0% - 275% of enrolled amount.

Eversource and Unitil are working with Synapse to develop an active demand model to calculate the benefits and costs of active demand measures and programs. That "Active Demand Model" will be used to provide informational updates regarding the 2019 and the 2020 demand reduction initiatives, and then will be used for actual benefit cost screening if and when demand reduction programs are proposed for future years. The NH Active Demand Model will be finalized by Synapse at the end of October, 2019. After internal testing and training, Eversource and Unitil will share the model with Commission staff and stakeholders for additional discussion and review of the proposed approach. Because demand reduction is in a demonstration phase, Eversource and Unitil suggest that approval of the 2020 Update does not require finalization of the Active Demand Model, as no benefits will be claimed from the active demand measures offered in 2019 or in 2020.

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Public Service of New Hampshire d/b/a Eversource Energy
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Page 1 of 1

Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael R. Goldman

Request:

Reference Bates pp. 30-32. Please provide a detailed narrative regarding the proposed Residential Demand Response program for each utility (Eversource and Unitil) including, but not limited to the proposed kW savings goals, the associated kWh savings, the incentive, the total cost, a detailed explanation of the devices to be used, and a benefit/cost analysis.

Response:

Please see Attachment A STAFF 7-002 for a more detailed narrative regarding the proposed Residential Demand Response initiative. Attachment B Staff 7-002 provides a breakdown of the budgets, projected measure quantity and projected kW savings. In light of new information, Unitil is proposing minor changes to the measure incentives in the residential program, the number of customers who will be served, and how the overall active demand program budget for residential customers will be allocated by cost category.

For customers interested in participating in the wi-fi thermostat demand response demonstration, a one time sign up incentive of \$25 to \$35 will be offered and an ongoing incentive of \$20 to \$35 per season will be paid. Eversource and Unitil are assuming an average of a 0.5 kW peak reduction per thermostat for customers with central air conditioning. For customers interested in participating in the battery storage demand response demonstration, a pay for performance incentive of \$225 to \$350 per annual kW achieved will be offered. Eversource and Unitil are assuming an average of 5.0 kW peak reduction per household.

The Residential Demand Reduction Initiative is a demonstration initiative. As such, no benefits are planned and Eversource and Unitil have not calculated a benefit cost ratio for the offering. Similar to the utilities' education program, the costs associated with the demand demonstration are included in the 2020 Update but there are no associated benefits included. The overall portfolio of programs for 2020 is cost effective for each utility.

Eversource and Unitil are working with Synapse to develop an active demand model to calculate the benefits and costs of active demand measures and programs. That "Active Demand Model" will be used to provide informational updates regarding the 2020 demand reduction initiatives, and then will be used for actual benefit cost screening if and when demand reduction programs are proposed for future years. The NH Active Demand Model will be finalized by Synapse at the end of October, 2019. After internal testing and training, Eversource and Unitil will share the model with commission staff and stakeholders for additional discussion and review of the proposed approach. Because demand reduction is in a demonstration phase, Eversource and Unitil suggest that approval of the 2020 Update does not require finalization of the Active Demand Model, as no benefits are proposed and none will be claimed from the active demand measures offered in 2020.

Overview

Residential active demand offerings present unique challenges for recruitment and implementation. Unlike large C&I customers, residential customers currently do not generally pay demand charges or time varying rates, and therefore have no inherent, direct incentive to decrease usage during specific peak demand periods. Peak demand reductions through active demand management can have a system benefit that reduces overall capacity and temporal-energy costs for all customers, therefore, Eversource and Unitil have designed a model for residential active demand offerings that provides incentives for peak demand reductions to capture these system benefits.

The core model for the residential direct load control offering remains focused on reducing demand during summer peak load. The design is a bring-your-own-device (BYOD) model, starting first with communicating thermostats controlling central air conditioning units and behind the meter customer owned battery storage systems. At some time in the future, additional eligible connected devices may include water heaters, pool pumps, window AC, electric vehicle chargers and other devices. Incorporation of additional devices will depend on device saturation, manufacturer concentration, and the costs associated with integrating and enabling load control on each type of device.

Eligible customers' devices will be connected to a demand response management platform through an application programming interface ("API"), a mechanism that allows two different electronic systems to exchange core data and interact in a common language. Eversource, through its contracted demand response management platform, will send a signal to the device manufacturer cloud during an event that causes the controller to reduce the demand of the connected device. Events will be called in advance, primarily in the months of June, July, August, and September. Customers can opt-out of events; however, they will be removed from the program if they regularly do not participate.

Delivery Pathways for Residential Direct Load Control Offerings

Customers with eligible technology (controllable communicating device) will be offered the opportunity to enroll in the active demand offering and incentivized to participate in demand reduction during summer peak events. Eversource and Unitil will seek to enroll both customers with devices already installed and customers installing devices through the energy efficiency delivery. By targeting customers with devices already installed, Eversource and Unitil can seek to ramp up enrollment by recruiting adopters of technology already incentivized by efficiency efforts or other means, while also seeking to expand the pool of eligible devices through energy efficiency efforts, where applicable.

Smart Thermostats

The Smart Thermostat program is proposed for customers that own a qualified thermostat controlling a central air conditioning system. Participants agree to allow for brief, limited adjustments of their thermostats during periods of peak electric demand between June 1 and September 30. There will be at least one adjustment, and a maximum of 15 adjustments per summer. Peak demand periods typically occur on especially hot days. Participation is voluntary, and customers always retain ultimate control of their thermostat.

Below is the current list of qualifying thermostats. Eversource, Unitil and their partners endeavor to continuously add new devices as they become available

Provider	Approved Thermostats
Alarm.com	Radio Thermostat CT30, CT80, CT100; Trane ComfortLink Control; RCS Z-Wave Communicating Thermostat; GoControl Z-wave Thermostat; Alarm.com Smart Thermostat
Building36	Building 36 Intelligent Thermostat
ecobee	ecobee3, ecobee3 Lite, ecobee4, ecobee Smart Si, ecobee Smart, ecobee SmartThermostat with voice control
Emerson	Sensi™ Wi-Fi Programmable Thermostat, Sensi Touch Wi-Fi Thermostat
Honeywell Home	Wi-Fi Smart Color Thermostat, Wi-Fi 7-Day Programmable Thermostat, Wi-Fi 9000 7-Day Programmable Thermostat, 9000 Smart Thermostat, 7-Day Programmable Smart Thermostat, VisionPro 8000 Smart Thermostat, Round Smart Thermostat, T5+ Smart Thermostat, T6 Pro Smart Thermostat, T9 Smart Thermostat, T10 Smart Thermostat
Lux	LUX/GEO, LUX KONO
Nest	Nest Learning Thermostat, Nest Thermostat E
Radio Thermostat	Filtrete 3M-50, CT30, CT50, CT80
Vivint	Radio Thermostat CT100 with Vivint Go!Control Panel

Marketing & Enrollment

The utilities will work with OEMs, their own internal marketing departments, and third-party business partners to recruit and enroll customers to participate in these bring your own device demonstration projects. Eversource and Unitil successfully worked with device manufacturers in their other service territories to send targeted emails and in-app enrollment notifications to customers with existing equipment to spur enrollment. Eversource and Unitil can also implement internal marketing approaches (direct mail, utility websites, etc.).

Example of co-marketing emails:

Honeywell Home **EVERSOURCE**

With Eversource, you can get rewarded for using a Honeywell Home thermostat

Eversource's **ConnectedSolutions** will adjust your thermostat during times of high energy use. As a thank you for helping save energy, you'll get \$25 when you enroll and \$20 at the end of each summer for participating.

Enroll now

Automatic savings for your thermostat

Connect with Eversource

Use your Honeywell Home and utility account information to connect each thermostat.

Start saving automatically

Eversource will help you manage the energy you use during peak times of the year.

Sign up

Honeywell Home

Facebook, Twitter, Instagram, Pinterest icons

sensi **EVERSOURCE**

Get \$45 by enrolling your Sensi thermostat in Eversource's **ConnectedSolutions**!

Reward yourself

Get \$45 by enrolling your Sensi Thermostat in Eversource's **ConnectedSolutions**. By allowing your thermostat to make small, automatic adjustments during times of peak electric demand, you'll get \$25 for each eligible Sensi thermostat plus \$20 per thermostat at the end of each summer you remain enrolled. Sign up today!

Cut cost - not comfort

Your participation is risk-free. Reduce energy demand but not your well-being by participating in limited events with minor thermostat adjustments. You can opt out of the adjustments at any time from your mobile device, web browser or thermostat. When you do participate, you can earn \$20 for each thermostat at the end of each summer season you remain enrolled. Sign up today!

Who it helps

Customers like you are enrolling in **ConnectedSolutions** and working together to reduce energy use during peak demand times.

Enroll today

Not all applicants will be accepted to participate. See the **Terms and Conditions** for full program terms.

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Adjustment Details

At the start of a peak energy event, the thermostat will be automatically adjusted no more than 4 degrees above the current temperature. The adjustment will typically last 3 hours, and will occur between 2 p.m. and 7 p.m. Once the temperature adjustment is over, the thermostat will return to its normal set point and/or schedule.

In some cases, the thermostat might be adjusted down 3 degrees prior to an adjustment event to pre-cool. The pre-cool helps customers to maintain comfort throughout the duration of the event.

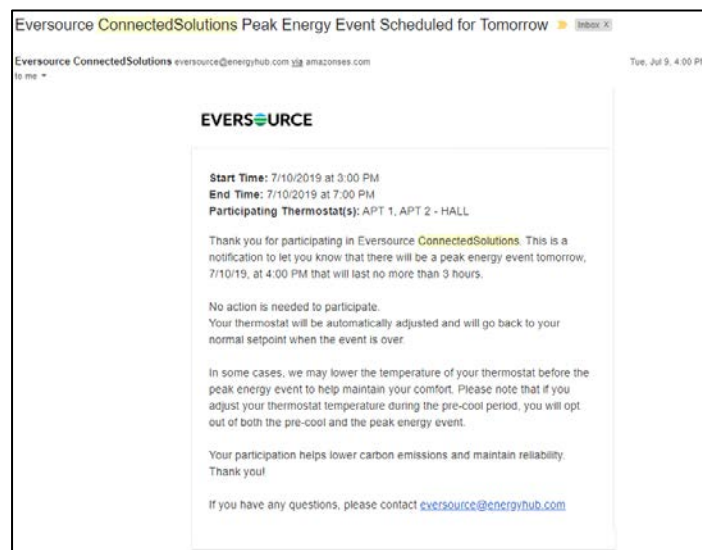
Customers can opt out of an event at any time from a mobile device, web browser, or thermostat.

Incentive Information

Participants will receive one \$25 to \$35 e-gift card per device after being accepted into the program and another \$20 to \$35 e-gift card per device at the end of each summer season for participating.

Event Notification

Customers may be notified of events via mobile device in-app, email message, or directly on device. Below are examples of in-app & email notifications:



Performance Calculation

As stated above, the customer incentive is solely based upon successful enrollment and participation in the program. Calculation of performance (kW) is calculated by the Demand Response Management System platform for each event. This methodology will be verified by 3rd party evaluations. The calculation is based on AC run time data provided by each individual thermostat and nominal AC size. This is compared to a 10-of-10 ISO-NE baseline.

Residential Storage

Eversource and Unitil are proposing a residential storage offering that is specifically tailored to build on the lessons learned from successful pay for performance active demand demonstrations in other states. This program would encourage the performance of energy storage by providing incentives higher than other Direct Load Control offerings. This higher incentive assumes that storage performance does not impact customer comfort, will be more robust, more available, less likely to be overridden and thus more reliable as a resource overall.

By using a pay for performance approach, Eversource and Unitil will be able to utilize incentive funds in a manner that maximizes the benefits of peak demand reduction, while providing a predictable revenue stream to customers. The incentive levels under this program are designed to encourage performance of storage, which comparatively has a high upfront cost but also provides opportunities for demand reduction without significant interference with customer comfort and operations. Under this offering, customers will be incentivized to decrease demand through the discharge of energy from storage in response to a signal or communication from the Utilities' intermediary partner(s). Lowering daily summer peak demand will have an impact on overall capacity requirements. Storage provides an opportunity to secure predictable demand reductions without the potentially significant and adverse impacts on customers of shedding demand on a frequent basis through other means.

Delivery Pathways for Residential Storage Offerings

The Residential Storage Performance offering recognizes that residential customers do not have the same value proposition for storage as a Large C&I customer with demand charges, direct capacity costs, and time of use rates. Eversource and Unitil anticipate that many energy storage installations by residential customers will be paired with solar PV systems. The overall offering balances giving customers flexibility in using energy storage systems for multiple purposes such as backup power during outages and ensuring that ratepayer funds are used in a manner that provides substantial peak demand reductions.

Eversource and Unitil will reach customers by partnering with storage device manufacturers and local project developers. The utilities also plan significant marketing and educational sessions directed towards customers to educate them on these advanced energy topics.

Dispatch

Eversource and Unitil will be responsible for scheduling the dispatch of storage devices. It will be the Utilities' responsibility to decide when the dispatch should occur. From a technical perspective, it is not envisioned that Eversource or Unitil will have direct access to the storage units themselves. Rather, an intermediary, either the storage original equipment manufacturer (OEM) or a project developer, will have the direct software access to the storage unit that physically controls the dispatch. Eversource will use dispatch software platforms to send a signal to the battery system controllers' cloud to carry out the desired dispatch instructions to the discreet device. Customers or the operator of the device always

retains the right to opt out of any event dispatch at any time but will receive a zero towards its annual average for that event.

Program Details

Residential Storage Program Details	
Incentive per average kW used	\$225 to \$350
Season Dates	June 1- September 30
Number of Events	30-60
Event Duration	3 hours
Timing	2:00 pm - 7:00 pm
Notifications	Before every event

Storage Incentive

The storage incentive is intended to motivate customers to deliver peak demand reductions from storage assets to mitigate the costs of peak demand for all customers. The incentive is not specifically intended to offset financial losses associated with cycling, charging, or other uses. Those losses are a cost, among others, that customers must consider when planning their investments, much like increased fuel use with the installation of a combined heat and power system. The incentive is meant to provide a guaranteed revenue stream, tied to performance at system peak, for customers and developers that will encourage storage units to be developed and installed while protecting all customers from the risk that storage assets will not produce system benefits.

The incentive for the Storage dispatch will be based on the average performance of the customer during the called hours multiplied by the payout rate. The output performance of the battery storage system is measured directly at the storage devices themselves. As stated above, Eversource and Unital plan to partner with the battery OEMs and developers who have access to this device data. The Utilities will receive this data from the devices' onboard telemetry without the need for added metering costs.

For this example, for summer Storage Daily Dispatch, the Program Administrators have called 10 events over the summer season (actual program range is 30 to 60 events). The events were a duration of 3 hours each. And the incentive was \$225 per average annual seasonal kW reduction. Thus, there were 30 total event hours during this example season. This customer's hypothetical load reductions come from an 8 kW (nominal nameplate rating) system. The performance during those event hours are presented below:

	kW Performance by Hour During Event		
	Hour 1	Hour 2	Hour 3
Event 1	6	7	8
Event 2	8	7	6
Event 3	5	5	6
Event 4	6	7	8
Event 5	0	0	0
Event 6	5	8	6
Event 7	5	7	7
Event 8	6	8	8
Event 9	5	7	8
Event 10	6	8	7

Even though the nominal rating of the storage system is 8kw, it is expected that the output may not be 8kW at all times. This customer has also elected to Opt Out of Event #5 as reflected in the data. The average customer performance across those 30 hours was a 6 kW reduction. The customer would be paid 6 (average kW reduction) x \$225 (payout rate for summer daily storage dispatch) = \$1,350. This incentive would be paid after each summer season to the customer or their designee. As these programs carry on, this customer would be eligible to participate in any subsequent season with a fresh start.

	Qty	Total Summer kW	Total cost	Total incentive
Eversource				
WiFi Control	1,000	500	\$99,717	\$85,000
Storage	20	100	\$28,742	\$24,500
Total	1,020	600	\$128,459	\$109,500
Unitil				
WiFi Control	500	250		\$ 32,500
Storage	10	50		\$ 17,500
Total	510	300	\$ 122,100	\$ 50,000

*For Unitil only incentive costs are allocated at the measure level

Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 17-136

Date Request Received: 10/15/2019

Date of Response: 10/29/2019

Request No. STAFF 7-011

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Request from: New Hampshire Public Utilities Commission Staff

Witness: Katherine W. Peters

Request:

Reference Bates p. 23 and the Settlement Agreements in DE 17-136. a) Please provide a detailed explanation of each of the elements of the customer engagement platform and the purpose of the element and how it relates to the energy efficiency program. b) Please provide a month by month total of the number of new users to the customer engagement platform by residential and commercial sector for 2017, 2018, and 2019. If available, please provide the total users by platform used. Please provide the live spreadsheet with formulae intact of this information. c) Per the Settlement Agreement for the 2019 plan update, please provide the number of new users that have “moved forward to participate in energy efficiency program offerings.” If this information is not available, please explain why this information is not available and when it will be available. d) Please explain in a narrative description if the CEP is the only platform for a customer to obtain usage information. If not, please explain.

Response:

A. The customer engagement platform includes four components: 1) the Energy Savings Plan for Residential and Commercial Customers; 2) the Energy Analysis Tool for Enterprise Customers; 3) the Ex Machina machine learning/analysis tool; and 4) the Marketo, digital marketing product.

The Energy Savings Plan is an online self-assessment tool which provides customers with an analysis of their energy usage and costs, the ability to answer profile questions to receive optimized energy efficiency recommendations to save energy and costs, and the ability to set goals and create a customized energy savings plan and track their performance against their plan. This platform is targeting both residential and commercial customers. Through this tool, customers are provided with ways to save on their energy usage and costs which includes energy efficiency program information, rebates, website links, etc.

The Energy Analysis Tool for Enterprise customers is an online portal which targets larger multi-facility commercial and municipal customers. The tool provides customers the capability of analyzing usage and spending at both aggregated location and individual account levels, benchmarking different facilities to identify the energy efficiency opportunities, and tracking the status energy efficiency projects. Additionally, the interval data is available for accounts which have interval meters.

Ex Machina is a machine learning tool which allows the energy efficiency team to perform detailed data analysis and build predictive data models. Through this tool, the team can track customers’ activity within Energy Savings Plan and identify the most appropriate measures to recommend to those customers. Eversource can also query the tool to find commonalities of customers

and the energy efficiency programs that they participate in so that appropriate recommendations and offers can be made to similar customers using predictive analytics.

Marketo is a digital marketing / email automation tool which Eversource is utilizing for energy efficiency marketing campaigns. This method is more economical than traditional direct marketing mailings and can incorporate customer lists that are developed from the Ex Machina product. Additionally, the Marketo product has the ability to track email open rates, click through rates, etc.

B. Please see Attachment B STAFF 7-011

C. Please see Attachment C STAFF 7-011

D. In addition to CEP, customers can also access usage information through Eversource.com My Account page. Within the view usage page under My Account, customers can review the usage history data or graphs for up 36 months. The data can be downloaded in cvs and xlm format. Customers can also call Eversource and customer service representatives can email their energy usage to them.
Eversource Response

Residential	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2017 New Users	N/A	540	272	334	187	190	256	173	110	158	1,309	1,117
2017 Total Users	N/A	569	319	373	218	208	289	204	132	169	1,331	1,147
2018 New Users	853	573	525	484	822	426	536	657	509	1,490	1,187	1,025
2018 Total Users	905	619	571	526	879	453	568	703	537	1,549	1,254	1,092
2019 New Users	1,297	1,032	1,022	695	1,102	646	873	941	955			
2019 Total Users	1,394	1,113	1,089	747	1,155	700	915	997	999			

Commercial	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2017 New Users	N/A	25	12	16	7	7	6	7	2	5	15	14
2017 Total Users	N/A	25	13	17	8	10	9	10	3	6	16	14
2018 New Users	10	12	12	7	18	6	9	9	3	20	10	11
2018 Total Users	10	13	12	7	19	6	9	10	3	20	11	11
2019 New Users	16	12	14	6	19	11	11	16	11			
2019 Total Users	16	14	15	6	21	12	12	17	13			

*Note, Total Users depicted in the charts are the total number of users for that month, including both new and repeat users who logged in during the month. The total number of individual users who have used the CEP since it launched in New Hampshire are 26,487 Residential and 1,293 Commercial

2019												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number of Customers	81	70	48	99	93	100	144	139	79			

This chart depicts the number of customers who have previously used CEP and in 2019 participated in an energy efficiency program offering. Program offerings included in the analysis include ENERGY STAR Products (except upstream lighting), Home Performance with ENERGY STAR ENERGY STAR Homes and Home Energy Assistance