



# NEW HAMPSHIRE TECHNICAL REFERENCE MANUAL for Estimating Savings from Energy Efficiency Measures, 2021 Program Year

**DRAFT**

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## Introduction

This *New Hampshire Technical Reference Manual for Estimating Savings from Energy Efficiency Measures* (“TRM”) documents for regulatory agencies, customers, and other stakeholders how the New Hampshire Utilities consistently, reliably, and transparently calculate savings from the installation of efficient equipment, collectively called “measures.” This reference manual provides methods, formulas and default assumptions for estimating energy, peak demand and other resource impacts from efficiency measures.

Within this document, efficiency measures are organized by the sector for which the measure is eligible and by the primary energy source associated with the measure. The three sectors are Residential, Income Eligible, and Commercial & Industrial (“C&I”). The primary energy sources addressed in this technical reference document are electricity and natural gas, and savings from delivered fuels such as oil and propane are also addressed where appropriate.

Each measure is presented in its own section as a measure characterization. The measure characterizations provide mathematical equations for determining savings (algorithms), as well as default assumptions and sources, where applicable. In addition, any descriptions of calculation methods or baselines are provided as appropriate. The parameters for calculating savings are listed in the same order for each measure.

Algorithms are provided for estimating annual energy and peak demand impacts for primary and secondary energy sources if appropriate. In addition, algorithms or calculated results may be provided for other nonenergy impacts (such as water savings or operation and maintenance cost savings). Inputs and assumptions are based on New Hampshire-specific evaluations or data where available. Other factors being equal, New Hampshire jurisdiction-specific results will be favoured over results from other jurisdictions in order to account for differences in climate, hours of use, program design and delivery, market conditions, and evaluation frameworks. However, when relevant results exist both from New Hampshire and from other states, it may be necessary to balance the desirable attributes of state-specificity and data reliability. When considering whether to apply results from a study originating in another jurisdiction to New Hampshire programs, the EM&V Working Group (with support from independent evaluation firms as needed), will make the determination based on (1) the similarity of evaluated program/measures to those offered in NH; (2) the similarity of relevant markets and customers base; (3) the recency of the study relative to the recency of any applicable NH results; and (4) the quality of the study’s methodology and sample size. In addition to third-party evaluations, inputs may also be based on sources including manufacturer and industry data, data from government agencies such as the U.S. Department of Energy or Environmental Protection Agency, or credible and realistic factors developed using engineering judgment.

This document will be reviewed and updated annually to reflect changes in technology, baselines and evaluation results.

## Reference Tables

### PROGRAM ABBREVIATIONS

#### Commercial

Energy Rewards RFP Program	RFP
Large Business Energy Solutions	LBES
Municipal Energy Solutions	Muni
Small Business Energy Solutions	SBES

#### Residential

ENERGY STAR Homes	ES Homes
ENERGY STAR Products	ES Products
Home Energy Assistance	HEA
Home Energy Reports	HER
Home Performance with ENERGY STAR	HPwES

### CATEGORIES

Appliances  
Building Shell  
Compressed Air  
Custom  
Food Service  
Heating Ventilation and Air Conditioning (HVAC)  
Hot Water  
Lighting  
Motors and Drives  
Whole Home

## Measure Characterization Structure

This section describes the common entries or inputs that make up each measure characterization. A formatted template follows the descriptions of each section of the measure characterization. A single device or behavior is defined as a measure within each program and fuel. The source of each assumption or default parameter value will be referenced in the endnotes section of each measure chapter.

<b>Measure Code</b>	A unique way to identify a measure where the first set of characters indicates the market, the second set of characters indicates the category, and the third set is an abbreviated code for the measure name.
<b>Market</b>	This is the sector for which the measure is applicable and can be Residential, Income Eligible or C&I.
<b>Program Type</b>	The type of baseline used (i.e., retrofit, lost opportunity).
<b>Category</b>	The category of measure type, based on list above.

### Description:

This section will include a plain text description of the energy efficiency measure, including the benefit(s) of its installation.

### Baseline Efficiency:

This section will include a statement of the assumed equipment/operation efficiency in the absence of program intervention. Multiple baselines will be provided as needed, e.g., for different markets. Baselines may refer to reference tables or may be presented as a table for more complex measures.

### High Efficiency:

This section will describe the high efficiency case from which the energy and demand savings are determined. The high efficiency case may be based on specific details of the measure installation, minimum requirements for inclusion in the program, or an energy efficiency case based on historical participation. It may refer to tables within the measure characterization or in the appendices or efficiency standards set by organizations such as ENERGY STAR® and the Consortium for Energy Efficiency.

### Algorithms for Calculating Primary Energy Impact:

This section will describe the method for calculating electric savings and electric demand savings in appropriate units.

The savings algorithm will be provided in a form similar to the following:

$$\Delta kWh = \Delta kW \times Hours$$

Similarly, the method for calculating electric demand savings will be provided in a form similar to the following:

$$\Delta kW = (Watts_{BASE} - Watts_{EE}) / 1000$$

This section also describes any non-electric (gas, propane, oil) savings in appropriate units, i.e., MMBtu associated with the energy efficiency measure, including all assumptions and the method of calculation.

This section will, as appropriate, summarize electric and non-electric savings in a table that contains the following information:

**Measure Name:** <Name used in utilities’ Benefit-Cost models >

**Program:** <Defined by utilities, also referred to as Program Name>

**Savings:** <Measure savings in units of kWh, kW, MMBtu, or other as applicable; this information may be contained in multiple fields>

**Measure Life:**

This section will provide the measure life for each measure and describe the measure life basis, e.g., effective useful life (EUL) or adjusted measure life (AML). It will note any adjustments made, such as for LED market trends.

BC Measure ID	Measure Name	Program	Measure Life
[Unique ID for measures in the utilities’ Benefit-Cost model]	[Measure Name]	[Program Abbreviation from list above]	XX

**Other Resource Impacts:**

If applicable, this section describes any water or ancillary savings associated with the energy efficiency measure, including all assumptions.

**Impact Factors for Calculating Adjusted Gross Savings:**

The section includes a table of impact factor values for calculating adjusted gross savings. These include in-service rates, realization rates, and coincidence factors. Further descriptions of the impact factors and the sources on which they are based are described below.

- ISR = In-Service Rate
- CF<sub>SP</sub> = Peak Coincidence Factor (summer peak)
- CF<sub>WP</sub> = Peak Coincidence Factor (winter peak)
- RR<sub>E</sub> = Realization Rate, electric(kWh)
- RR<sub>NE</sub> = Realization Rate, non-electric (MMBtu)
- RR<sub>SP</sub> = Realization Rate for summer peak kW
- RR<sub>WP</sub> = Realization Rate for winter peak kW

Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
[Measure Name]	[Program abbreviation]	X.XX	X.XX	n/a	X.XX	X.XX	X.XX	X.XX

In-Service Rates:

Actual portion of efficient units that are installed. For example, efficient lamps may have an in-service rate less than 1.00 since some lamps are purchased as replacement units and are not immediately installed. The ISR is 1.00 for most measures.

#### Realization Rates:

Used to adjust the gross savings (as calculated by the savings algorithms) based on impact evaluation studies. The realization rate is equal to the ratio of measure savings developed from an impact evaluation to the estimated measure savings derived from the savings algorithms. The realization rate does not include the effects of any other impact factors, unless explicitly noted. Depending on the impact evaluation study, there may be separate Realization Rates for electric energy (kWh), peak demand (kW), or non-electric energy (MMBtu).

#### Coincidence Factors:

Adjusts the connected load kW savings derived from the savings algorithm. A coincidence factor represents the fraction of the connected load reduction expected to occur at the same time as a particular system peak period. The coincidence factor includes both coincidence and diversity factors combined into one number, thus there is no need for a separate diversity factor in this TRM.

#### **Energy Load Shape:**

The section includes a table or reference with the time-of-use pattern of a typical customer's electrical energy consumption for each segment and end use. Because the value of avoided energy varies throughout the year, load shapes are used to allocate energy savings into specific time periods in order to better reflect its time-dependent value. Load shapes are defined as follows based on ISO-NE definitions:

- Summer On-Peak: 7 am to 11 pm, weekdays, during the months of June through September, except ISO-NE holidays;
- Summer Off-Peak: All other hours during the months of June through September (includes weekends and holidays);
- Winter On-Peak: 7 am to 11 pm, weekdays, during the months of October through May, except ISO-NE holidays; and
- Winter Off-Peak: All other hours during the months of October through May (includes weekends and holidays).

#### **Impact Factors for Calculating Net Savings:**

The amount of savings attributable to a program or measure. Net savings differs from "Gross Savings" because it includes adjustments from impact factors, such as free-ridership or spillover. The ratio of net savings to gross savings is known as the Net-to-Gross ratio and is usually expressed as a percent.

This section would only apply to midstream and upstream offerings, which are known to have greater levels of free-ridership than other programs as an inherent part of their program design. For other programs, the utilities will prioritize designing programs and putting mechanisms in place to minimize free-riders, in line with precedent from the 1999 NH EE Working Group report, which stated that "program designs should attempt to minimize free-riders" but "the methodological challenges and associated costs of accurately assessing free-riders no longer justifies the effort required".

#### **Non-Energy Impacts:**

As discussed with the NH Benefit/Cost Working Group, and per Commission Order,<sup>1</sup> the NH Utilities are applying non-energy impacts (NEIs) in cost-effectiveness screening as follows:

The **Primary Granite State Test** reflects low-income participant NEIs, based on New Hampshire-specific primary research on the Home Energy Assistance program. Specifically, based on the HEA evaluation,<sup>2</sup> a per-project value of \$406 reflecting participant NEIs—including increased comfort, decreased noise, and health-related NEIs—will be applied annually to each weatherization project over its 15-year measure life. These NEIs are reflected in the measure chapters for insulation and air sealing.

The **Secondary Granite State Test** reflects sector-level percentage adders for participant NEIs for the residential (non-low-income) and C&I sectors, based on a review of secondary NEI research from similar jurisdictions, adjusted for New Hampshire-specific economic and other factors and matched to New Hampshire's programs and measures. The test also reflects environmental externality NEIs, based on non-embedded avoided cost values from the AESC. These NEI values are not reflected in the TRM measure chapters. For HEA, the same primary research NEI value is applied in the Secondary Granite State Test as in the Primary Granite State Test.

Both the **Primary and Secondary Granite State Tests** reflect other resource impacts for water and delivered fuels, as reflected in the TRM measure chapters.

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<sup>1</sup> Docket No. DE 17-136, Order Approving Benefit Cost Working Group Recommendations, No. 26,322, December 30, 2019; Order Approving 2020 Update Plan, No. 26,323, December 31, 2019.

<sup>2</sup>Opinion Dynamics. Home Energy Assistance Program Evaluation Report 2016-2017, Final, July 29, 2020.  
<https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200729-NHSaves-HEA-Evaluation-Report-FINAL.pdf>

## Impact Factors for Calculating Adjusted Gross and Net Savings

The New Hampshire Utilities use the algorithms in the Measure Characterization sections to calculate the gross savings for energy efficiency measures. Impact factors are then applied to make various adjustments to the gross savings estimates to account for the performance of individual measures or energy efficiency programs as a whole in achieving energy reductions as assessed through evaluation studies. Impact factors address both the technical performance of energy efficiency measures and programs, accounting for the measured energy and demand reductions realized compared to the gross estimated reductions, as well as in certain cases the programs' effect on the market for energy efficient products and services.

This section describes the types of impact factors used to make such adjustments, and how those impacts are applied to gross savings estimates.

### Types of Impact Factors

The impact factors used to adjust savings fall into one of two categories:

Impact factors used to adjust gross savings:

- In-Service Rate (“ISR”)
- Realization Rate (“RR”)
- Summer and Winter Peak Demand Coincidence Factors (“CF”)

Impact factors used to calculate net savings:

- Free-Ridership (“FR”) and Spillover (“SO”) Rates
- Net-to-Gross Ratios (“NTG”)

The **in-service rate** is the actual portion of efficient units that are installed. For example, efficient lamps may have an in-service rate less than 1.00 since some lamps are purchased as replacement units and are not immediately installed. The ISR is 1.00 for most measures.

The **realization rate** is used to adjust the gross savings (as calculated by the savings algorithms) based on impact evaluation studies. The realization rate is equal to the ratio of measure savings developed from an impact evaluation to the estimated measure savings derived from the savings algorithms. The realization rate does not include the effects of any other impact factors. Depending on the impact evaluation study, there may be separate Realization Rates for electric energy (kWh), peak demand (kW), or non-electric energy (MMBtu).

A **coincidence factor** adjusts the connected load kW savings derived from the savings algorithm. A coincidence factor represents the fraction of the connected load reduction expected to occur at the same time as a particular system peak period. The coincidence factor includes both coincidence and diversity factors combined into one number, thus there is no need for a separate diversity factor in this TRM. Coincidence Factors are provided for the on-peak period as defined by the ISO New England for the Forward Capacity Market (“FCM”), and are calculated consistently with the FCM methodology. Electric demand reduction during the ISO New England peak periods is defined as follows:

#### **On-Peak Definition (applicable definition for NH):**

- Summer On-Peak: average demand reduction from 1:00-5:00 PM on non-holiday weekdays in June, July, and August

- Winter On-Peak: average demand reduction from 5:00-7:00 PM on non-holiday weekdays in December and January

**Seasonal Peak Definition (not applied in NH):**

- Summer Seasonal Peak: demand reduction when the real-time system hourly load is equal to or greater than 90% of the most recent “50/50” system peak forecast for June-August
- Winter Seasonal Peak: demand reduction when the real-time system hourly load is equal to or greater than 90% of the most recent “50/50” system peak load forecast for December-January

The values described as Coincidence Factors in the TRM are not always consistent with the strict definition of a Coincidence Factor (CF). It would be more accurate to define the Coincidence Factor as “the value that is multiplied by the Gross kW value to calculate the average kW reduction coincident with the peak periods.” For example, a coincidence factor of 1.00 may be used because the coincidence is already included in the estimate of Gross kW; this is often the case when the “Max kW Reduction” is not calculated and instead the “Gross kW” is estimated using the annual kWh reduction estimate and a loadshape model.

The **net savings** value is the final value of savings that is attributable to a measure or program. Net savings differs from gross savings because it includes the effects of the free-ridership and/or spillover rates. Net savings currently apply to midstream and upstream offerings, which are known to have greater levels of free-ridership than other programs as an inherent part of their program design. For other programs, the utilities will prioritize designing programs and putting mechanisms in place to minimize free-riders, in line with precedent from the 1999 NH EE Working Group report, which stated that “program designs should attempt to minimize free-riders” but “the methodological challenges and associated costs of accurately assessing free-riders no longer justifies the effort required”.

A **free-rider** is a customer who participates in an energy efficiency program (and gets an incentive) but who would have installed some or all of the same measure(s) on their own, with no change in timing of the installation, if the program had not been available. The free-ridership rate is the percentage of savings attributable to participants who would have installed the measures in the absence of program intervention.

The **spillover rate** is the percentage of savings attributable to a measure or program, but additional to the gross (tracked) savings of a program. Spillover includes the effects of 1) participants in the program who install additional energy efficient measures outside of the program as a result of participating in the program, and 2) non-participants who install or influence the installation of energy efficient measures as a result of being aware of the program. These two components are the participant spillover (SOP) and nonparticipant spillover (SONP).

The **net-to-gross ratio** is the ratio of net savings to the gross savings adjusted by any impact factors (i.e., the “adjusted” gross savings). Depending on the evaluation study, the NTG ratio may be determined from the free-ridership and spillover rates, if available, or it may be a distinct value with no separate specification of FR and SO values.

# 1. Residential

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## 1.1 Active Demand Response – Residential

<b>Measure Code</b>	[Code]
<b>Market</b>	Residential
<b>Program Type</b>	Custom
<b>Category</b>	Active Demand Response

### Description:

Residential Direct Load Control is focused on reducing electrical demand during summer peak load periods by controlling equipment inside a building, such as via wi-fi connected thermostats, communicating domestic hot water heaters and pool pumps, and other controlled energy-using devices.

Residential Storage Daily Dispatch involves customers receiving incentives to decrease demand by discharging energy from storage in response to a signal or communication from the Program Administrators. Residential Storage Daily Dispatch demand response periods may occur during peak hours in summer months.

Summer peak load control periods for both Residential Direct Load Control and Residential Storage Daily Dispatch are three-hour events that may occur between 2:00 p.m. and 7:00 p.m. on non-holiday weekdays between June 1 and September 30.

### Baseline Efficiency:

The baseline case for Residential Direct Load Control is an equivalent piece of residential HVAC equipment or a residential appliance without summer peak demand response.

For thermostat controls in the Residential Direct Load Control program, vendor-supplied baselines may use one of several baseline methodologies to determine savings. The assumption in this document is that either the ISO-NE<sup>1</sup> or PJM<sup>2</sup> demand response customer baseline operation models are used by the vendor.

The baseline case for Residential Storage Daily Dispatch is an equivalent residential home with onsite energy storage, including any onsite solar PV production, but without peak demand response control.<sup>3</sup>

### High Efficiency:

The high efficiency case is a residential building with devices that are equipped to communicate with the utility to reduce demand during curtailment periods. This could include communicating thermostats, residential storage equipment, or other types of residential demand response equipment.

Note that active demand response is not intended to reduce energy use, but rather to reduce power consumption during demand response periods. As a result, little energy savings are available for Residential Direct Load Control. A small amount of energy savings per demand response event is provided in the section below.

For Residential Storage Daily Dispatch, a negative net kWh impact should be assessed to account for round-trip efficiency losses during the charging and discharging periods.

### Algorithms for Calculating Primary Energy Impact:

Thermostat control programs are the most widely implemented, and therefore have the most well-supported savings findings.

For vendors that use ISO-NE or PJM baselines to calculate demand savings for central air conditioners controlled by wi-fi connected thermostats, an adjustment to vendor-claimed demand savings based on evaluation results<sup>4</sup> is applied:

$$\begin{aligned} \Delta kW_{Pre-event} &= (\Delta kW_{Pre-event,vendor}) \times (F_{pre-event}) \\ \Delta kW_{Post-event} &= (\Delta kW_{Post-event,vendor}) \times (F_{post-event}) \\ \Delta kW_{Event} &= (\Delta kW_{vendor}) \times (F_{event}) \\ F_{event} &= -3.06 + (0.05 \times Temp_{avg}) \end{aligned}$$

Where,

- Unit = one dispatched thermostat
- $\Delta kW_{Pre-event}$  = demand adjustment for pre-cooling before event
- $\Delta kW_{post-event}$  = demand adjustment for recovery cooling after event
- $\Delta kW_{pre/post/event,vendor}$  = vendor demand savings in the period of interest (i.e. pre-event, during event, or post-event), typically calculated relative to ISO-NE or PJM baseline
- $F_{pre-event}$  = savings adjustment factor in the pre-event period = 0.72
- $F_{post-event}$  = savings adjustment factor in the post-event period = 0.68
- $F_{event}$  =  $-3.06 + (0.05 \times Temp_{avg})$
- $Temp_{avg}$  = average outdoor air temperature during the event period

For demand response events that affect central air conditioners controlled by a wi-fi connected thermostat: a deemed energy savings of 0.67 kWh<sup>4</sup> per event.

For Residential Storage Daily Dispatch, energy savings are measured directly at the device, on a site-by-site basis, as reported by the vendor:

$$\Delta kW_{Event} = \Delta kW_{vendor}$$

More detailed savings algorithms for Residential Storage Daily Dispatch and other types of residential active demand response measures, with pre-, during-, and post-event savings adjustments, may be developed as additional program evaluations are conducted.

### Measure Life:

As all residential active demand response measures are based on Program Administrators calling demand reduction events each year, the deemed measure life is 1 year.<sup>4</sup>

BC Measure ID	Measure Name	Program	Measure Life
---------------	--------------	---------	--------------

E21A5a001	Residential Direct Load Control	Residential ADR	1
E21A5a002	Residential Storage Daily Dispatch P4P (savings) Summer	Residential ADR	1
E21A5a003	Residential Storage Daily Dispatch P4P (consumption) Summer	Residential ADR	1

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A5a001	Residential Direct Load Control	Residential ADR	1.00	1.00	1.00	1.00	1.00	1.00	0.00
E21A5a002	Residential Storage Daily Dispatch P4P (savings) Summer	Residential ADR	1.00	1.00	1.00	1.00	1.00	1.00	0.00
E21A5a003	Residential Storage Daily Dispatch P4P (consumption) Summer	Residential ADR	1.00	1.00	1.00	1.00	1.00	1.00	0.00

In-Service Rates:

All installations are assumed to have 100% in-service-rates pending program evaluation. Event opt-outs and attrition during events are captured in the gross impact algorithm above.

Realization Rates:

Savings adjustment factors and deemed energy savings provided in the Algorithms section above represent an evaluation adjustment to vendor-reported reported gross savings.

Coincidence Factors:

Summer coincidence factors are assumed to be 100% reflecting the timing of demand response events. Winter coincidence factors are assumed to be 0%.

**Energy Load Shape:**

All savings for Active Demand Response take place in the summer on-peak period.

Endnotes:

1: ISO New England (2014). ISO New England Manual for Measurement and Verification of Demand Reduction Value from Demand Resources (Manual M-MVDR). Revision 6, June 1, 2014  
[https://www.iso-ne.com/static-assets/documents/2017/02/mmvd\\_r\\_measurement-and-verification-demand-reduction\\_rev6\\_20140601.pdf](https://www.iso-ne.com/static-assets/documents/2017/02/mmvd_r_measurement-and-verification-demand-reduction_rev6_20140601.pdf)

2: Day-Ahead and Real-Time Market Operations (2019). PJM Manual 11: Energy & Ancillary Services Market Operations, Revision 108. Effective Date: December 3, 2019.

<https://www.pjm.com/~media/documents/manuals/m11.ashx>

3: Navigant Consulting (2020). 2019 Residential Energy Storage Demand Response Demonstration Evaluation, Summer Season. Prepared for National Grid and Unitil. MA. [http://ma-eeac.org/wordpress/wp-content/uploads/MA19DR02-E-Storage\\_Res-Storage-Summer-Eval\\_wInfographic\\_2020-02-10-final.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA19DR02-E-Storage_Res-Storage-Summer-Eval_wInfographic_2020-02-10-final.pdf)

4: Navigant Consulting (2020). 2019 Residential Wi-Fi Thermostat Direct Load Control Offering Evaluation. Prepared for Eversource, National Grid, and Unitil. MA and CT. <http://ma-eeac.org/wordpress/wp-content/uploads/2019-Residential-Wi-Fi-Thermostat-DLC-Evaluation-Report-2020-04-01-with-Infographic.pdf>

5: The PA program evaluation plan and the measure life for behavioural measures are as published in the 2019-2021 Massachusetts Three-Year Energy Efficiency Plan. <http://ma-eeac.org/wordpress/wp-content/uploads/Exh.-1-Final-Plan-10-31-18-With-Appendices-no-bulk.pdf>

## 1.2 Appliances - Advanced Power Strip

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Appliances

### Description:

Advanced power strips can automatically eliminate standby power loads of electronic peripheral devices that are not needed (DVD player, computer printer, scanner, etc.) either automatically or when an electronic control device (typically a television or personal computer) is in standby or off mode.

### Baseline Efficiency:

The baseline efficiency case is the customers' electronic peripheral devices as they are currently operating.

### High Efficiency:

The high efficiency case is the installation of an Advanced Power Strip.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on referenced study results.<sup>1</sup>

BC Measure ID	Measure Name	Program	$\Delta kWh$	$\Delta kW$
E21A3b001	Advanced Power Strip, Tier I	ES Products	117.0	0.011
E21A3b002	Advanced Power Strip, Tier II	ES Products	174.0	0.018

### Measure Life:

The measure life is 5 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b001	Advanced Power Strip, Tier I	ES Products	0.86	0.92	n/a	0.92	0.92	0.58	0.86
E21A3b002	Advanced Power Strip, Tier II	ES Products	0.75	0.92	n/a	0.92	0.92	0.58	0.86

In-Service Rates:

In-service rates are based on consumer surveys, as found in the referenced study.<sup>1</sup>

Realization Rates:

Realization rates account for the savings lost due to improper customer set-up/use of devices, as found in the referenced study.<sup>1</sup>

Coincidence Factors:

Programs use a summer coincidence factor of 58% and a winter coincidence factor of 86%.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1 – “Primary TV and Peripherals”.<sup>2</sup>

Endnotes:

**1:** NMR Group, Inc. (2018). Advanced Power Strip Metering Study. Prepared for Massachusetts Program Administrators and EEAC.

**2:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.3 Appliances – Clothes Dryer

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Appliances

### Description:

Clothes dryers exceeding minimum qualifying efficiency standards established as ENERGY STAR® or most efficient.

### Baseline Efficiency:

For lost opportunity applications, the baseline efficiency case is a new electric resistance dryer that meets the federal standard as of January 1, 2015 which is a Combined Energy Factor (EF) of 3.73 for a vented standard dryer<sup>1</sup>. Different testing procedures were used in setting the federal standard (DOE Test Procedure Appendix D1) and the Energy Star standard (DOE Test Procedure Appendix D2). To enable comparison a baseline CEF of 3.11 is used. This was derived from ENERGY STAR Version 1.0 Estimated Baseline which multiplies the 2015 federal standard by the average change in electric dryers' assessed CEF between Appendix D1 and Appendix D2: 3.73-(3.73\*0.166).

For retrofit applications, the baseline efficiency case is the existing electric resistance dryer.

### High Efficiency:

The high efficiency case is a clothes dryer that meets the ENERGY STAR standard as of May 19, 2014. For a new standard vented or ventless electric resistance dryer the minimum CEF is 3.93<sup>2</sup>.

For Heat Pump and Hybrid technology clothes dryers, CEFs are based on an average of Northwest Energy Efficiency Alliance qualified product testing as of October 2019. For Heat Pump technology dryers, the average CEF is 6.83. For Hybrid technology clothes dryers, the average CEF is 4.30.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on EPA ENERGY STAR list and Northwest Energy Efficiency Alliance lab testing results. Demand savings are derived from the Navigant Demand Impact Model.<sup>6</sup>

$$\Delta kWh = (lbs/YEAR \div CEF_{Base}) - (lbs/YEAR \div CEF_{EFF})$$

Where:

Lbs/YEAR = Typical pounds of clothing dried per year (based on 8.45 lbs/load and 283 loads/yr)

CEFBASE = Baseline Combined Energy Factor (lbs/kWh)

CEFEFF = Efficient Combined Energy Factor (lbs/kWh)

Unit savings<sup>3,4,5</sup>

BC Measure Id	Measure Name	Program	ΔkWh	ΔkW	ΔGas MMBtu
E21B1a052	Clothes Dryer (Retrofit)	HEA	Calculated	Calculated	n/a
E21A2a055	Clothes Dryer (Retrofit)	HPwES	Calculated	Calculated	n/a
E21A1a027	Clothes Dryer (New Construction)	ES Homes	160.4	0.047	n/a
G---	Clothes Dryer (New Construction)	ES Homes			
E21A3b010	Clothes Dryer (ENERGY STAR)	ES Products	160.4	0.047	n/a
E21A3b012	Clothes Dryer (ENERGY STAR + Hybrid technology)	ES Products	213.3	0.063	n/a
E21A3b011	Clothes Dryer (ENERGY STAR + Heat Pump technology)	ES Products	421.1	0.124	n/a
G---	Clothes Dryer (Energy Star) - Gas	ES Products			

**Measure Life:**

The measure life is 16 years for electric dryers and 17 years for gas dryers.<sup>6</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a052	Clothes Dryer (Retrofit)	HEA	1.00	0.91	n/a	0.87	0.87	0.45	0.58
E21A2a055	Clothes Dryer (Retrofit)	HPwES	0.99	1.00	n/a	1.00	1.00	0.45	0.58
E21A1a027	Clothes Dryer (New Construction)	ES Homes	1.00	1.00	n/a	1.00	1.00	0.45	0.58
G---	Clothes Dryer (ENERGY STAR)	ES Products	1.00	1.00	n/a	1.00	1.00	0.45	0.58
E21A3b010	Clothes Dryer (ENERGY STAR + Hybrid technology)	ES Products	1.00	1.00	n/a	1.00	1.00	0.45	0.58
E21A3b012	Clothes Dryer (ENERGY STAR + Heat Pump technology)	ES Products	1.00	1.00	n/a	1.00	1.00	0.45	0.58

In-Service Rates:

Installations have 100% in service rate for ES Products unless an evaluation finds otherwise, 100% for HEA<sup>8</sup>, and 99% for HPwES<sup>7</sup>.

Realization Rates:

Realization rates are 100% for ES Products unless an evaluation finds otherwise, 91% for HEA<sup>8</sup>, and 100% for HPwES<sup>7</sup>.

Coincidence Factors:

Programs a summer coincidence factor of 45% and a winter coincidence factor of 58%.<sup>9</sup>

**Energy Load Shape:**

See Appendix 1 – “Clothes Dryer – Electric”.<sup>9</sup>

**Endnotes:**

- 1: DOE (accessed July 2020). Energy Conservation Program: Energy Conservation Standards for Residential Clothes Dryers. [https://www.energy.gov/sites/prod/files/2015/03/f20/Clothes%20Dryer%20Standards\\_RFI.pdf](https://www.energy.gov/sites/prod/files/2015/03/f20/Clothes%20Dryer%20Standards_RFI.pdf)
- 2: EnergyStar Energy Efficient Products (accessed July 2020): [https://www.energystar.gov/products/appliances/clothes\\_dryers/key\\_product\\_criteria](https://www.energystar.gov/products/appliances/clothes_dryers/key_product_criteria)
- 3: Northwest Energy Efficiency Alliance (2019). Dryers - QPL October 2019.
- 4: Department of Energy (2015). 10 CFR Part 431 March 27, 2015. Energy Conservation Program: Energy Conservation Standards for Residential Clothes Dryers. Table II.7.
- 5: Department of Energy (2013). 10 CFR Parts 429 and 430 August 14, 2013. Energy Conservation Program: Test Procedures for Residential Clothes Dryers; Final Rule. Table 11.1.
- 6: Guidehouse (2020). Comprehensive TRM Review, MA19R17-B-TRM.
- 7: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL
- 8: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.
- 9: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.4 Appliances – Clothes Washer

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Appliances

### Description:

Clothes washers exceeding minimum qualifying efficiency standards established as ENERGY STAR® or Most Efficient. The measure saves electric energy used by the washer itself, as well as heating energy (in the form of electricity or fossil fuel) associated with the heating of the domestic hot water (DHW) consumed during the wash cycles. DHW heating efficiency is assumed to be code-compliant.

### Baseline Efficiency:

For lost opportunity baseline, the base efficiency case is a residential clothes washer that meets the federal standard for front-loading washers effective 3/7/2015 which requires an IMEF (Integrated Modified Energy Factor) no less than 1.84 and an IWF (Integrated Water Factor) no greater than 4.7, and for top-loading washers effective 1/1/18 which requires an IMEF no less than 1.57 and an IWF no greater than 6.5. For retrofit baseline, the base efficiency case is the existing residential clothes washer.

### High Efficiency:

The high efficiency case is a residential clothes washer that meets the ENERGY STAR standard as of February 5, 2018. For a new front-loading clothes washer the minimum IMEF is 2.76 and the maximum IWF is 3.2. For a new top-loading clothes washer the minimum IMEF is 2.06 and the maximum IWF is 4.3.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are based on weighted averages by efficiency class presented in the 2018 Efficiency Vermont TRM<sup>1</sup>. Demand savings are derived from the Navigant Demand Impact Model<sup>5</sup>.

Measure ID	Measure Name	Program	$\Delta$ kWh	$\Delta$ kW	$\Delta$ Gas MMBtu	$\Delta$ Oil MMBtu	$\Delta$ Propane MMBtu
E21B1a051	Clothes Washer (Retrofit)	HEA	Calculated	Calculated	Calculated	Calculated	Calculated
E21A2a054	Clothes Washer (Retrofit)	HPwES	Calculated	Calculated	Calculated	Calculated	Calculated
E21A1a026	Clothes Washer (New Construction)	ES Homes	89.9	0.279	0.02	0.00	0.05
G21A1a009	Clothes Washer (New Construction) – Gas	ES Homes	24.1	0.075	0.29	0.00	0.29

E21A3b017	Clothes Washer (ENERGY STAR)	Products	89.9	0.0.279	0.03	0.00	0.04
G---	Clothes Washer (ENERGY STAR) – Gas	Products					
E21A3b018	Clothes Washer (ENERGY STAR Most Efficient)	Products	138.9	0.431	0.94	0.94	0.94
G---	Clothes Washer (ENERGY STAR Most Efficient) – Gas	Products					

**Measure Life:**

The measure life is 11 years.<sup>2</sup>

**Other Resource Impacts:**

Annual water savings are deemed.

Measure Name	Program	Annual Water Savings (gallons)
Clothes Washer (Retrofit)	HEA/HPwES	Calculated
Clothes Washer (New Construction)	ES Homes	2,244
Clothes Washer (ENERGY STAR)	ES Products	2,244
Clothes Washer (ENERGY STAR Most Efficient)	ES Products	3,940

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a051	Clothes Washer (Retrofit)	HEA	1.00	0.91	0.98	0.87	0.87	0.49	0.52
E21A2a054	Clothes Washer (Retrofit)	HPwES	0.99	1.00	1.00	1.00	1.00	0.49	0.52
E21A1a026	Clothes Washer (New Construction)	ES Homes	1.00	1.00	1.00	1.00	1.00	0.49	0.52
G21A1a009	Clothes Washer (New Construction) – Gas	ES Homes	1.00	1.00	1.00	1.00	1.00	1.00	0.94
E21A3b017	Clothes Washer (ENERGY STAR)	ES Products	1.00	1.00	1.00	1.00	1.00	0.49	0.52
G---	Clothes Washer (ENERGY STAR) – Gas	ES Products	1.00	1.00	1.00	1.00	1.00	1.00	0.94
E21A3b018	Clothes Washer (ENERGY STAR Most Efficient)	ES Products	1.00	1.00	1.00	1.00	1.00	0.49	0.52
G---	Clothes Washer (ENERGY STAR Most Efficient) – Gas	ES Products	1.00	1.00	1.00	1.00	1.00	1.00	0.94

In-Service Rates:

Installations have 100% in service rate for ES Products unless an evaluation finds otherwise, 100% for HEA<sup>4</sup>, and 99% for HPwES<sup>3</sup>.

Realization Rates:

Realization rates are 100% for ES Products unless an evaluation finds otherwise, 91% for HEA<sup>4</sup>, and 100% for HPwES<sup>3</sup>.

Coincidence Factors:

All electric programs use a summer coincidence factor of 49% and a winter coincidence factor of 52%.<sup>5</sup>  
 All gas programs use a summer coincidence factor of 100% and a winter coincidence factor of 94%.

**Energy Load Shape:**

See Appendix 1 – “Clothes Washer”.<sup>5</sup>

**Endnotes:**

- 1: Energy Efficiency Vermont (2018) Technical Reference User Manual. Efficient Clothes Washers.
- 2: Environmental Protection Agency (2016). Savings Calculator for ENERGY STAR Qualified Appliances. [https://www.energystar.gov/sites/default/files/asset/document/appliance\\_calculator.xlsx](https://www.energystar.gov/sites/default/files/asset/document/appliance_calculator.xlsx)
- 3: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 4: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

5: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

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## 1.5. Appliances – Dehumidifier

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Appliances

### Description:

Dehumidifiers exceeding minimum qualifying efficiency standards established as ENERGY STAR.

### Baseline Efficiency:

The lost opportunity baseline efficiency case is a dehumidifier that meets the federal standard effective June 13, 2019. Specific baseline Energy Factors (EFs) by product capacity found in the Code of Federal Regulations, 10 CFR 430.32(v)(2). The retrofit baseline efficiency case is the existing dehumidifier.

### High Efficiency:

The high efficiency case is a dehumidifier that meets the ENERGY STAR standard as of October 31, 2019<sup>1</sup>. For a new dehumidifier with a capacity less than 25 pints/day the minimum EF is 1.57 liters/kWh. For a new dehumidifier with a capacity between 25.01 and 50 pints/day the minimum EF is 1.8 liters/kWh. For a new dehumidifier with a capacity greater than or equal to 50 pints/day the minimum EF is 3.3 liters/kWh.

Capacity (pints)	Energy Factor (2019 Federal Standard)	Energy Factor (ENERGY STAR)
≤ 25	1.30	1.57
25.01-50	1.60	1.80
≥ 50	2.80	3.30

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated as below. Demand savings are derived from the Navigant Demand Impact Model.<sup>1</sup>

$$\Delta kWh = Load \times [(1 \div Eff_{BASE}) - (1 \div Eff_{ES})] \times Hours$$

Where:

Load = Typical dehumidification load, 1520 Liters/year<sup>1</sup>

Eff<sub>BASE</sub> = Average efficiency of model meeting the federal standard, in Liters/kWh

Eff<sub>ES</sub> = Efficiency of ENERGY STAR® model, in Liters/kWh

Hours = Dehumidifier annual operating hours, site-specific if available, or deemed 2,851 hour/year<sup>2</sup>

Table: Measure Energy Impact<sup>3</sup>

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW
E21B1a053	Dehumidifier (Retrofit)	HEA	407.1	0.10
E21A2a056	Dehumidifier (Retrofit)	HPwES	407.1	0.10
E21A3b019	Dehumidifier (ENERGY STAR)	Products	82.3	0.02

**Measure Life:**

The measure life is 17 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a053	Dehumidifier (Retrofit)	HEA	1.00	0.91	n/a	0.87	0.87	0.28	0.05
E21A2a056	Dehumidifier (Retrofit)	HPwES	0.99	1.00	n/a	1.00	1.00	0.28	0.05
E21A3b019	Dehumidifier (ENERGY STAR)	ES Products	1.00	1.00	n/a	1.00	1.00	0.28	0.05

In-Service Rates:

Installations have 100% in service rate for ES Products unless an evaluation finds otherwise, 100% for HEA<sup>5</sup>, and 99% for HPwES<sup>4</sup>.

Realization Rates:

Realization rates are 100% for ES Products unless an evaluation finds otherwise, 91% for HEA<sup>5</sup>, and 100% for HPwES<sup>4</sup>.

Coincidence Factors:

All programs use a summer coincidence factor of 28% and a winter coincidence factor of 5%.<sup>1</sup>

**Energy Load Shape:**

See Appendix 1 – “Dehumidifier”.<sup>1</sup>

Endnotes:

1: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-ecac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

- 2: Environmental Protection Agency (2019). Dehumidifier Key Efficiency Criteria.  
[https://www.energystar.gov/products/appliances/dehumidifiers/key\\_efficiency\\_criteria](https://www.energystar.gov/products/appliances/dehumidifiers/key_efficiency_criteria)
- 3: Guidehouse (2020). Comprehensive TRM Review MA19R17-B-TRM. Prepared for The Electric and Gas Program Administrators of Massachusetts.
- 4: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 5: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

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## 1.6. Appliances – Dishwasher

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Appliances

### Description:

The installation of a high efficiency ENERGY STAR residential dishwasher.

### Baseline Efficiency:

The baseline efficiency case is a dishwasher that meets the federal standard effective May 30, 2013. Standard size dishwashers shall not exceed 307 kwh/year and 5.0 gallons per cycle.

### High Efficiency:

The high efficiency case is a dishwasher that meets the ENERGY STAR standard as of January 29, 2016. Standard size dishwashers shall not exceed 270 kwh/year and 3.5 gallons per cycle.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated based on the EPA ENERGY STAR appliance calculator. Demand savings are derived from the Navigant Demand Impact Model.

$$\Delta kWh = kWh_{BASE} - kWh_{ES}$$

Where:

$kWh_{BASE}$  = Average usage of a baseline dishwasher

$kWh_{ES}$  = Average usage of a new dishwasher meeting ENERGY STAR® standards

Table: Measure Energy Impact<sup>1</sup>

BC Measure ID	Measure Name	Program	$\Delta kWh$	$\Delta kW$
E21A3b020	ES Dishwasher	ES Products	37.0	0.011

### Measure Life:

The measure life is 11 years.

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b020	ES Dishwasher	ES Products	1.00	1.00	n/a	1.00	1.00	0.28	0.48

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Programs use a summer coincidence factor of 28% and a winter coincidence factor of 48%.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1 – “Dishwasher”.<sup>2</sup>

Endnotes:

- 1: Environmental Protection Agency (2016). Savings Calculator for Energy Star Qualified Appliances.
- 2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.7. Appliances – Freezer

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Appliances

### Description:

Freezers exceeding minimum qualifying efficiency standards established as ENERGY STAR®.

### Baseline Efficiency:

For lost-opportunity, the baseline efficiency case is a freezer that meets the Federal standard effective September 15, 2014. Specific baseline coefficients and constants by product class found in the Code of Federal Regulations, 10 CFR 430.32(a). For retrofit, the baseline efficiency case is the existing freezer.

### High Efficiency:

The high efficiency case is a freezer that meets the ENERGY STAR standard as of September 15, 2014. For a new freezer the measured energy use must be 10% less than the minimum federal efficiency standards.

### Algorithms for Calculating Primary Energy Impact:

Retrofit unit energy and demand savings are based on evaluation study results.<sup>1</sup> Lost-opportunity unit energy and demand savings are based on calculations from the 2018 Vermont TRM<sup>2</sup>.

$$\Delta kWh = kWh_{BASE} - kWh_{ES}$$

Where:

$kWh_{BASE}$  = Average usage of a baseline freezer

$kWh_{ES}$  = Average usage of a new freezer meeting ENERGY STAR® standards

BC Measure ID	Measure Name	Program	$\Delta kWh$	$\Delta kW$
E21B1a050	Freezer (Retrofit)	HEA	769	0.09
E21A2a053	Freezer (Retrofit)	HPwES	769	0.09
E21A3b021	Freezer (ENERGY STAR®)	Products	31.2	0.004

### Measure Life:

The measure life is 12 years.

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a050	Freezer (Retrofit)	HEA	1.00	0.91	n/a	0.87	0.87	0.91	0.68
E21A2a053	Freezer (Retrofit)	HPwES	0.99	1.00	n/a	1.00	1.00	0.91	0.68
E21A3b021	Freezer (ENERGY STAR®)	ES Products	1.00	1.00	n/a	1.00	1.00	0.91	0.68

In-Service Rates:

Installations have 100% in service rate for ES Products unless an evaluation finds otherwise, 100% for HEA<sup>4</sup>, and 99% for HPwES<sup>3</sup>.

Realization Rates:

Realization rates are 100% for ES Products unless an evaluation finds otherwise, 91% for HEA<sup>4</sup>, and 100% for HPwES<sup>3</sup>.

Coincidence Factors:

Summer and winter coincidence factors are estimated using the demand allocation methodology described in the referenced study.<sup>5</sup>

**Energy Load Shape:**

See Appendix 1 – “Freezer”.<sup>5</sup>

Endnotes:

- 1: NMR Group (2019). MA19R01-E Appliance Recycling Report. Prepared for MA Program Administrators and the Energy Efficiency Advisory Council. <http://ma-eeac.org/wordpress/wp-content/uploads/MA19R01-E-ApplianceRecycleReport-Final-2019.03.26.pdf>
- 2: Vermont TRM (2018): ENERGY STAR Retail Products Platform, page 178 of 313.
- 3: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 4: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.
- 5: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.8. Appliances – Refrigerator

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Appliances

### Description:

Refrigerators exceeding minimum qualifying efficiency standards established as ENERGY STAR®.

### Baseline Efficiency:

The new product baseline efficiency case is a refrigerator that meets the Federal standard effective September 15, 2014. Specific baseline coefficients and constants by product class found in the Code of Federal Regulations, 10 CFR 430.32(a).

The retrofit baseline efficiency case is an existing refrigerator. It is assumed that income eligible customers would otherwise replace their refrigerators with a used inefficient unit.

### High Efficiency:

The high efficiency case is a refrigerator that meets the ENERGY STAR standard as of September 15, 2014. For a new refrigerator the measured energy use must be 10% less than the minimum federal efficiency standards.

### Algorithms for Calculating Primary Energy Impact:

Unit energy savings are based on consumption values from New Hampshire evaluation results.<sup>1</sup> Demand savings are derived from the Navigant Demand Impact Model<sup>2</sup>.

$$\Delta kWh = (kWh_{BASE} - kWh_{ES}) \times SLF$$

Where:

$kWh_{BASE}$  = Average baseline usage: a new refrigerator meeting federal standards, average energy consumption assumed to be 502 kWh for lost-opportunity, site-specific for retrofit

$kWh_{ES}$  = Average usage of a new refrigerator meeting ENERGY STAR® standards with an average energy consumption of 452 kWh for ENERGY STAR refrigerators, or 393 kWh for Most Efficient refrigerator

SLF = Site/Lab adjustment factor, 0.881<sup>3</sup>

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW
E21B1a049	Refrigerator (Retrofit)	HEA	Calculated	Calculated
E21A2a049	Refrigerator (Retrofit)	HPwES	Calculated	Calculated
E21A1a025	Refrigerator (New Construction)	ES Homes	44.2	0.01

E21A3b022	Refrigerator (ENERGY STAR®)	ES Products	44.2	0.01
E21A3b023	Refrigerator (Most Efficient)	ES Products	96.4	0.02

**Measure Life:**

The measure life is 12 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a049	Refrigerator (Retrofit)	HEA	1.00	0.91	n/a	0.87	0.87	1.00	0.80
E21A2a049	Refrigerator (Retrofit)	HPwES	0.99	1.00	n/a	1.00	1.00	1.00	0.80
E21A1a025	Refrigerator (New Construction)	ES Homes	1.00	1.00	n/a	1.00	1.00	1.00	0.80
E21A3b022	Refrigerator (ENERGY STAR®)	ES Products	1.00	1.00	n/a	1.00	1.00	1.00	0.80
E21A3b023	Refrigerator (Most Efficient)	ES Products	1.00	1.00	n/a	1.00	1.00	1.00	0.80

In-Service Rates:

Installations have 100% in service rate for ES Products unless an evaluation finds otherwise, 100% for HEA<sup>5</sup>, and 99% for HPwES<sup>4</sup>.

Realization Rates:

Realization rates are 100% for ES Products unless an evaluation finds otherwise, 91% for HEA<sup>5</sup>, and 100% for HPwES<sup>4</sup>.

Coincidence Factors:

A summer coincidence factor of 100% and a winter coincidence factor of 80% are based on the Vermont TRM.<sup>6</sup>

**Energy Load Shape:**

See Appendix 1 – “Primary Refrigerator”.<sup>2</sup>

**Endnotes:**

- 1:** Opinion Dynamics (2019). Home Energy Assistance Program Evaluation Report 2016-2017. Prepared for NH Utilities. ES standard energy consumption values and savings methodology extracted from supporting analysis.
- 2:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>.
- 3:** Connecticut PSD (2019).
- 4:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 5:** Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.
- 6:** Vermont TRM (2018). Refrigerator/Freezer Early Retirement.

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## 1.9. Appliances – Recycling

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	Appliances

### Description:

The retirement of old, inefficient refrigerators, freezers and room air conditioners.

### Baseline Efficiency:

The baseline efficiency case is an old, inefficient working refrigerator, freezer or room air conditioner.

### High Efficiency:

The high efficiency case assumes no replacement of the recycled unit.

### Algorithms for Calculating Primary Energy Impact:

Unit energy and demand savings are deemed based on research presented in the 2018 Vermont TRM.<sup>1</sup> study results.

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW
E21A3b027	Primary Refrigerator Recycling <sup>1</sup>	ES Products	1,027	0.180
E21A3b028	Secondary Refrigerator Recycling <sup>2</sup>	ES Products	743	0.088
E21A3b029	Secondary Freezer Recycling <sup>1</sup>	ES Products	769	0.014
E21A3b030	Room Air Conditioner Recycling <sup>3</sup>	ES Products	113	0.180

### Measure Life:

The measure life is 8 years for refrigerators and freezers and 5 years for room air conditioners.

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b027	Primary Refrigerator Recycling	ES Products	1.00	1.00	n/a	1.00	1.00	1.00	0.80
E21A3b028	Secondary Refrigerator Recycling	ES Products	1.00	1.00	n/a	1.00	1.00	1.00	0.80
E21A3b029	Secondary Freezer Recycling	ES Products	1.00	1.00	n/a	1.00	1.00	1.00	0.80
E21A3b030	Room Air Conditioner Recycling	ES Products	1.00	1.00	n/a	1.00	1.00	0.46	0.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

All programs use a summer coincidence factor of 100% and a winter coincidence factor of 80% for refrigerator and freezer recycling<sup>2</sup>, a summer coincidence factor of 46% and a winter coincidence factor of 0% for room air conditioner recycling.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1 – “Primary Refrigerator” for primary refrigerator recycling, “Secondary Refrigerator” for secondary refrigerator recycling, “Freezer” for secondary freezer recycling, “Room or Window Air Conditioner” for room air conditioner recycling.<sup>3</sup>

Endnotes:

1: NMR Group, Inc. (2019). Appliance Recycling Report. Prepared for MA Joint Utilities.

<https://etrm.anbetrack.com/#/workarea/trm/MADPU/RES-A-RFR/2019%20Report%20TRM/version/3a?measureName=Appliance%20-%20Refrigerator%2FFreezer%20Recycling>

2: Vermont TRM (2018). Refrigerator/Freezer Early Retirement.

3: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.10. Appliances – Room Air Purifier

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Appliances

### Description:

Room air purifiers exceeding minimum qualifying efficiency standards established as ENERGY STAR®.

### Baseline Efficiency:

The baseline efficiency case is a room air purifier that does not meet ENERGY STAR® efficiency requirements.

### High Efficiency:

The high efficiency case is a room air purifier that meets the ENERGY STAR® standard as of July 1, 2004. A new room air purifier must produce a minimum Clean Air Delivery Rate (CADR)<sup>1</sup> of 50, and minimum performance of 3.0 CADR per watt.

### Algorithms for Calculating Primary Energy Impact:

Unit energy savings are deemed based on latest information available at the EPA ENERGY STAR appliances website based on each CADR range, as specified in the table below.<sup>2,3</sup>

Table: Measure Energy Impacts

BC Measure ID	Measure Name	Program	CADR Range	ΔkWh
E21A3b025	Room Air Purifier	ES Products	51-100	293
			101-150	488
			151-200	683
			201-250	877
			Over 250	1,169

Demand savings are calculated using the following formula:

$$\Delta kW = \frac{\Delta kWh}{Hours}$$

Where:

*Hours* = Assumed annual operating hours, 5,840 hours per year

**Measure Life:**

The measure life is 9 years.<sup>4</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b025	Room Air Purifier	ES Products	0.97	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

In-service rate is based on evaluation results.<sup>5</sup>

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence factors are 100% for both summer and winter peaks, since the air purifiers are expected to operate continuously during peak hours.

**Energy Load Shape:**

See Appendix 1 – “24 hour operation”.<sup>6</sup>

**Endnotes:**

**1:** The Clean Air Delivery Rate is voluntary standard made available for comparing the performance of portable air filters in a room at steady-state conditions during a controlled laboratory test: ANSI/AHAM AC-1-2015 (AHAM 2015). It was developed by the Association of Home Appliance Manufacturers (AHAM), a private voluntary standard-setting trade association, and is recognized by the American National Standards Institute (ANSI).

**2:** Environmental Protection Agency ENERGY STAR website (accessed July 2020).

[https://www.energystar.gov/products/appliances/air\\_purifiers\\_cleaners](https://www.energystar.gov/products/appliances/air_purifiers_cleaners)

[https://www.energystar.gov/sites/default/files/asset/document/appliance\\_calculator.xlsx](https://www.energystar.gov/sites/default/files/asset/document/appliance_calculator.xlsx)

**3:** Guidehouse (2020), Comprehensive TRM Review, MA1917-B-TRM. The Electric and Gas Program Administrators of Massachusetts Part of the Residential Evaluation Program Area

**4:** Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division (2007). 2008 Status Report: Savings Estimates for the ENERGY STAR Voluntary Labeling Program.

**5:** NMR Group, Inc. (2018). Products Impact Evaluation of In-Service and Short Term Retention Rates Study.

**6:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>.

## 1.11. Motors- ECM Circulator Pump

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Motors and Drives

### Description:

Installation of high efficiency residential boiler circulator pumps, equipped with variable speed electronically commutated motors (ECMs).

### Baseline Efficiency:

The baseline efficiency case is the installation of a standard circulator pump.

### High Efficiency:

The high efficiency case is the installation of an ECM circulator pump.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results<sup>1</sup>.

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW
E21A3b013	ECM Motor for FWH Circulating Pump	ES Products	68.0	0.024

### Measure Life:

The measure life is 10 years.

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b013	ECM Motor for FWH Circulating Pump	ES Products	1.00	1.00	n/a	1.00	1.00	0.00	0.54

### In-Service Rates:

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Programs use a summer coincidence factor of 0% and a winter coincidence factor of 54%.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1 – “Boiler Distribution”.<sup>2</sup>

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only):**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21A3b013	ECM Motor for FWH Circulating Pump	ES Products	0.40	0.09	0.00	0.69

**Endnotes:**

- 1: West Hill Energy and Computing, 2018. CT HVAC and Water Heater Process and Impact Evaluation and CT Heat Pump Water Heater Impact Evaluation.
- 2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.13. Motors - Pool Pump

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Motors and Drives

### Description:

The installation of a variable-speed drive pool pump. Operating a pool pump for a longer period at a lower wattage can move the same amount of water, using significantly less energy.

### Baseline Efficiency:

The baseline efficiency case is a single speed 1.5 horsepower pump that pumps 71 gallons per minute (gpm) and runs 7.7 hours per day for 122 days a year. It has an Energy Factor (EF) = 2.0.

### High Efficiency:

The high efficiency case is a variable-speed pump rated at 57 gpm at high speed and 23 gpm at low speed. It has a 2.9 EF at high speed, a 10.5 EF at low speed and runs 2 hr/day at high speed for filter & cleaning and 22 hr/day for filtering alone.

### Algorithms for Calculating Primary Energy Impact<sup>1</sup>:

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW
E21A3b024	Pool Pump (Variable Speed)	ES Products	1,360	1.43

### Measure Life:

The measure life is 6 years.<sup>1</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b024	Pool Pump (Variable Speed)	ES Products	1.00	1.00	n/a	1.00	1.00	0.55	0.00

### In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Programs use a summer coincidence factor of 55% and a winter coincidence factor of 0%.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1 – “Pool Pump”.<sup>2</sup>

**Endnotes:**

1: Guidehouse, August 2020. Comprehensive TRM Review, MA19R17-B-TRM. Prepared for The Electric and Gas Program Administrators of Massachusetts Part of the Residential Evaluation Program Area.

2: Navigant, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.14. Building Shell – Air Sealing

<b>Measure Code</b>	[To Be Defined in ANB system],
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit, Single Family
<b>Category</b>	Building Shell

### Description:

The reduction of a home’s conditioned air loss (leakage) resulting from the sealing of a home’s cracks and air gaps. Home air leakage is measured in air loss in Cubic Feet per Minute (CFM), measured at 50 pascals.

### Baseline Efficiency:

The baseline efficiency case is an existing home before it is air sealed.

### High Efficiency:

The high efficiency case is an existing home after it has been air sealed.

### Algorithms for Calculating Primary Energy Impact:

The programs use vendor-calculated energy savings for air sealing measures in the Residential Home Performance with ENERGY STAR and Home Energy Assistance programs. These savings values are calculated using vendor proprietary software where the user inputs a minimum set of technical data about the house and the software calculates building heating and cooling loads and other key parameters. The software’s building model is based on thermal transfer, building gains, and a variable-based heating and cooling degree day (or hour) climate model. This provides an initial estimate of energy use that may be compared with actual billing data to adjust as needed for existing conditions. Then, specific recommendations for improvements are added and savings are calculated using measure-specific heat transfer algorithms.

Rather than using a fixed degree day approach, the building model estimates both heating degree days and cooling degree hours based on the actual characteristics and location of the house to determine the heating and cooling balance point temperatures. Infiltration savings use site-specific seasonal N-factors to convert measured leakage to seasonal energy impacts. HVAC savings are estimated based on changes in system and/or distribution efficiency improvements, using ASHRAE 152 as their basis. Interactivity between architectural and mechanical measures is always included, to avoid overestimating savings due to incorrectly “adding” individual measure results.

Should the vendor software be unavailable or unable to estimate a home’s energy savings from air sealing, the following savings algorithm should be used.

$$\Delta\text{MMBtu} = \Delta\text{CFM} * \left( \text{MMBtu}/\text{CFM}_{\text{heating}} + \text{CFM}_{\text{cooling}} \right)$$

Where:

$\Delta\text{CFM}$  = Reduced air loss, in Cubic Feet per Minute (CFM) in a treated home.

MMBtu/CFM = Deemed savings per reduced CFM of 0.012934 MMBtu per CFM. This represents a blended savings value, applicable for all heating fuel types and cooling equipment scenarios in HPwES, based on evaluation results.<sup>1</sup>

In addition to heating fuel savings, the following deemed values are applied to reflect ancillary electric savings for heating load reductions, depending on the home heating equipment. The values are based on evaluation results for weatherized homes, and are applied once per home for homes receiving air sealing and/or insulation (rather than separately applying for air sealing and insulation):<sup>5</sup>

Equipment	kWh Savings	Description of Impact
Furnace fan	86.0	Per home value reflecting reduced fan operation based on heating load reduction from weatherization measures
HW boiler circulation pump(s)	9.0	Per circulator pump value reflecting reduced pump operation based on heating load reduction from weatherization measures

### Measure Life:

The table below includes below includes the effective useful life (EUL) for air sealing which assumes retrofit installation.

BC Measure ID	Measure Name	Program	Measure Life
E21A2a001 E21A2a002 E21A2a003 E21A2a004 E21A2a005 E21A2a006 E21A2a007 G21A2a001 E21B1a001 E21B1a002 E21B1a003 E21B1a004 E21B1a005 E21B1a006 E21B1a007 G21B1a001	Air Sealing	HPwES/ HEA	15 <sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:<sup>1 3</sup>

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a001	Air Sealing	Cord Wood	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a001	Air Sealing	Cord Wood	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a002	Air Sealing	Electric	HEA	1.00	0.91	n/a	n/a	0.89	0.00	0.43
E21A2a002	Air Sealing	Electric	HPwES	0.99	1.00	n/a	n/a	1.00	0.00	0.43
E21B1a003 G21B1a001	Air Sealing	Gas	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a003 G21A2a001	Air Sealing	Gas	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a004	Air Sealing	Kerosene	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a004	Air Sealing	Kerosene	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a005	Air Sealing	Oil	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a005	Air Sealing	Oil	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a006	Air Sealing	Propane	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a006	Air Sealing	Propane	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a007	Air Sealing	Wood Pellets	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a007	Air Sealing	Wood Pellets	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a

#### In-Service Rates:

In-service rates for HPwES programs are 99% and are 100% HEA programs based on evaluation results<sup>1,3</sup>.

#### Realization Rates:

Realization rate for HPwES programs are 100% and are 91% for HEA programs based on evaluation results.<sup>1,3</sup>

#### Coincidence Factors:

A winter coincidence factor of 43% is utilized.<sup>4</sup>

#### **Energy Load Shape:**

See Appendix 1.

#### **Non-Energy Impact:**

For HEA programs, a per-project value of \$406 reflecting participant NEIs—including increased comfort, decreased noise, and health-related NEIs—will be applied annually to each weatherization project over its 15-year measure life<sup>3</sup>.

**Endnotes:**

**1:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

**2:** Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures, GDS Associates, June 2007.

[https://library.cee1.org/system/files/library/8842/CEE\\_Eval\\_MeasureLifeStudyLights%2526HVACGDS\\_1Jun2007.pdf](https://library.cee1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf)

**3:** Opinion Dynamics. Home Energy Assistance Program Evaluation Report 2016-2017, Final, July 29, 2020. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200729-NHSaves-HEA-Evaluation-Report-FINAL.pdf>

**4:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**5:** Cadmus, April 5, 2013, New Hampshire HVAC Load and Savings Research, Final Report, table 19.

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## 1.15. Building Shell – Insulation

<b>Measure Code</b>	[To Be Defined in ANB system],
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	Building Shell

### Description:

The installation of high efficiency insulation in an existing home.

### Baseline Efficiency:

The baseline efficiency case is the pre-installation average R-value for an insulation type in an existing home before installation of new insulation.

### High Efficiency:

The high efficiency case is the post-installation average R-value for an insulation type in an existing home.

### Algorithms for Calculating Primary Energy Impact:

The programs currently use vendor calculated energy savings for these measures in the Residential Home Performance with ENERGY STAR and Home Energy Assistance programs. These savings values are calculated using vendor proprietary software where the user inputs a minimum set of technical data about the house and the software calculates building heating and cooling loads and other key parameters. The proprietary building model is based on thermal transfer, building gains, and a variable-based heating/cooling degree day/hour climate model. This provides an initial estimate of energy use that may be compared with actual billing data to adjust as needed for existing conditions. Then, specific recommendations for improvements are added and savings are calculated using measure-specific heat transfer algorithms.

Rather than using a fixed degree day approach, the building model estimates both heating degree days and cooling degree hours based on the actual characteristics and location of the house to determine the heating and cooling balance point temperatures. Savings from shell measures use standard U-value, area, and degree day algorithms. HVAC savings are estimated based on changes in system and/or distribution efficiency improvements, using ASHRAE 152 as their basis. Interactivity between architectural and mechanical measures is always included, to avoid overestimating savings due to incorrectly “adding” individual measure results. Should the vendor software be unavailable or unable to estimate a home’s energy savings from insulation, the following savings algorithm should be used.<sup>1</sup>

$$\Delta\text{MMBtu} = \text{HSqFt} * (\text{MMBtuheating} + \text{MMBtucooling})$$

Where:

HSqFt = Hundred square feet of installed insulation in a treated home (represented by installed sq ft / 100 sq ft).

MMBtu $_{heating}$  = Deemed savings per square foot of installed insulation, using appropriate value for basements, walls, or attics in the tables developed by Opinion Dynamics and program implementers.<sup>1</sup>  
 MMBtu $_{cooling}$  = If cooling is present in treated home, use appropriate value for basements, walls, or attics the table developed by Opinion Dynamics and program implementers. Otherwise set to 0.<sup>1</sup>

In addition to heating fuel savings, the following deemed values are applied to reflect ancillary electric savings for heating load reductions, depending on the home heating equipment. The values are based on evaluation results for weatherized homes, and are applied once per home for homes receiving air sealing and/or insulation (rather than separately applying for air sealing and insulation):<sup>1</sup>

Equipment	kWh Savings	Description of Impact
Furnace fan	86.0	Per home value reflecting reduced fan operation based on heating load reduction from weatherization measures
HW boiler circulation pump(s)	9.0	Per circulator pump value reflecting reduced pump operation based on heating load reduction from weatherization measures

**Measure Life:**

The table below includes below includes the effective useful life (EUL) for insulation which assumes retrofit installation.

BC Measure ID	Measure Name	Program	Measure Life
E21A2a022 E21A2a023 E21A2a024 E21A2a025 E21A2a026 E21A2a027 E21A2a028 G21A2a004 E21B1a022 E21B1a023 E21B1a024 E21B1a025 E21B1a026 E21B1a027 E21B1a028 G21B1a004	Insulation	HPwES/ HEA	25 <sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>1,3</sup>**

BC Measure ID	Measure Name	Fuel	ISR	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a022	Insulation	Cord Wood	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a022	Insulation	Cord Wood	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a023	Insulation	Electric	HEA	1.00	0.91	n/a	n/a	n/a	0.00	0.43
E21A2a023	Insulation	Electric	HPwES	0.99	1.00	n/a	n/a	n/a	0.00	0.43
E21B1a024 G21B1a004	Insulation	Gas	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a024 G21A2a004	Insulation	Gas	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a025	Insulation	Kerosene	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a025	Insulation	Kerosene	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a026	Insulation	Oil	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a026	Insulation	Oil	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a027	Insulation	Propane	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a027	Insulation	Propane	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a028	Insulation	Wood Pellets	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a028	Insulation	Wood Pellets	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

In-service rates are 99% for HPwES programs and are 100% HEA programs based on evaluation results.<sup>1,3</sup>

**Realization Rates:**

Realization rate for HPwES programs are 100% and are 91% for HEA programs based on evaluation results.<sup>1,3</sup>

**Coincidence Factors:**

A winter coincidence factor of 43% is utilized.<sup>4</sup>

**Energy Load Shape:**

See Appendix 1.

**Non-Energy Impact:**

For HEA programs, a per-project value of \$406 reflecting participant NEIs—including increased comfort, decreased noise, and health-related NEIs—will be applied annually to each weatherization project over its 15-year measure life.

**Endnotes:**

**1:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL. Excel file associated with report with calculations, “2019 NHSaves HPwES Deemed Savings\_2020-02-25\_FM adjustments”.

**2:** Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures, GDS Associates, June 2007.

[https://library.cee1.org/system/files/library/8842/CEE\\_Eval\\_MeasureLifeStudyLights%2526HVACGDS\\_1Jun2007.pdf](https://library.cee1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf)

**3:** Opinion Dynamics. Home Energy Assistance Program Evaluation Report 2016-2017, Final, July 29, 2020. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200729-NHSaves-HEA-Evaluation-Report-FINAL.pdf>

**4:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**5:** Cadmus, April 5, 2013, New Hampshire HVAC Load and Savings Research, Final Report, table 19.

## 1.16. Hot Water – Faucet Aerator

<b>Measure Code</b>	
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	Hot Water

### Description:

Installation of aerators meeting the EPA WaterSense specification to replace Federal Standard or higher flow faucet aerators.

### Baseline Efficiency:

The baseline efficiency case is the existing faucet aerators with Federal Standard<sup>1</sup> flow rate of 2.2 gallons per minute (GPM) or higher.

### High Efficiency:

The high efficiency case is a low flow faucet aerator with EPA WaterSense<sup>2</sup> specified maximum flow rate of 1.5 GPM.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>3</sup>

BC Measure ID	Measure Name	Fuel Type	Program	$\Delta kWh$	$\Delta kW^4$	$\Delta MMBtu$
E21B1a009	Faucet Aerator	Electric	HEA	46.863	0.010	
E21B1a010 G21B1a002	Faucet Aerator	Gas	HEA			0.156
E21B1a011	Faucet Aerator	Kerosene	HEA			0.156
E21B1a012	Faucet Aerator	Oil	HEA			0.156
E21B1a013	Faucet Aerator	Propane	HEA			0.156
E21A2a009	Faucet Aerator	Electric	HPwES	46.863	0.010	
E21A2a010 G21A2a002	Faucet Aerator	Gas	HPwES			0.156
E21A2a011	Faucet Aerator	Kerosene	HPwES			0.156
E21A2a012	Faucet Aerator	Oil	HPwES			0.156
E21A2a013	Faucet Aerator	Propane	HPwES			0.156

**Measure Life:**

The measure life is 7 years.<sup>5</sup>

**Other Resource Impacts:**

Residential annual water savings for faucet aerators is 586 gallons per unit.<sup>3</sup>

**Impact Factors for Calculating Adjusted Gross Savings:<sup>3 6</sup>**

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a009	Faucet Aerator	Electric	HEA	1.00	0.91	n/a	n/a	n/a	0.31	0.81
E21B1a010 G21B1a002	Faucet Aerator	Gas	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21B1a011	Faucet Aerator	Kerosene	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21B1a012	Faucet Aerator	Oil	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21B1a013	Faucet Aerator	Propane	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a009	Faucet Aerator	Electric	HPwES	0.99	1.00	n/a	n/a	n/a	0.31	0.81
E21A2a010 G21A2a002	Faucet Aerator	Gas	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21A2a011	Faucet Aerator	Kerosene	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21A2a012	Faucet Aerator	Oil	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21A2a013	Faucet Aerator	Propane	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

In-service rates are 99% for HPwES programs and are 100% HEA programs based on evaluation

results.<sup>3 6</sup>Realization Rates:

All PAs use a realization rate of 100% for HPwES program and a realization rate of 91% for HEA program.<sup>3 6</sup>

Coincidence Factors:

A summer coincidence factor of 31% and a winter coincidence factor of 81% are utilized for faucet aerators with electric fuel type.<sup>4</sup>

### **Energy Load Shape:**

See Appendix 1 “Water Heater – Electric”.<sup>4</sup>

### **Endnotes:**

- 1:** In 1998, the Department of Energy adopted a maximum flow rate standard of 2.2 gpm at 60 psi for all faucets: 63 Federal Register 13307; March 18, 1998. <https://www.epa.gov/sites/production/files/2017-02/documents/ws-specification-home-final-supstatement-v1.0.pdf>
- 2:** WaterSense: Bathroom Faucets. <https://www.epa.gov/watersense/bathroom-faucets>
- 3:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 4:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>
- 5:** Faucet aerator is an add on measure. Measure life assumes 1/3 the life of the host equipment (faucet).
- 6:** Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

## 1.17. Hot Water – Heat Pump Water Heater

<b>Measure Code</b>	
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Hot Water

### Description:

Installation of a heat pump storage water heater instead of an electric resistance storage water heater.

### Baseline Efficiency:

The baseline efficiency case is a new standard efficiency electric resistance storage hot water heater.

### High Efficiency:

The high efficiency case is a high efficiency Energy Star ® certified heat pump storage water heater.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>1</sup>

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW	ΔMMBtu
E21B1a043	Heat Pump Water Heater	HEA	1,818	0.296	
E21A2a043	Heat Pump Water Heater	HPwES	1,818	0.296	
E21A3b007	Heat Pump Water Heater, 50-gallon, Energy Star, EF	ES Products	1,818 kWh for retrofit 961 kWh for lost opportunity	0.296 for retrofit 0.175 for lost opportunity	2.149 for lost opportunity
E21A3b008	Heat Pump Water Heater, 80-gallon, Energy Star, EF	ES Products	1,258 kWh for retrofit 565 kWh for lost opportunity	0.113 for retrofit 0.040 for lost opportunity	2.149 for lost opportunity

### Measure Life:

The measure life is 13 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>3 4 5</sup>**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a043	Heat Pump Water Heater (Retrofit)	HEA	1.00	0.91	n/a	n/a	n/a	0.31	0.81
E21A2a043	Heat Pump Water Heater (Retrofit)	HPwES	0.99	1.00	n/a	n/a	n/a	0.31	0.81
E21A3b007	Heat Pump Water Heater, 50-gallon, Energy Star, EF	ES Products	1.00	1.00	n/a	n/a	n/a	0.41	0.75
E21A3b008	Heat Pump Water Heater, 80-gallon, Energy Star, EF	ES Products	1.00	1.00	n/a	n/a	n/a	0.41	0.75

**In-Service Rates:**

Installations have 100% in service rate for ES Products unless an evaluation finds otherwise, 100% for HEA, and 99% for HPwES<sup>3,4</sup>.

**Realization Rates:**

All PAs use a realization rate of 100% for HPwES program and a realization rate of 91% for HEA program.<sup>3 4</sup> The ES Homes and ES Products programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A summer coincidence factor of 41% and a winter coincidence factor of 75% are utilized.<sup>5</sup>

**Energy Load Shape:**

See Appendix 1 – “Water Heater – Heat Pump”.<sup>5</sup>

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only):<sup>6</sup>**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21A3b007	Heat Pump Water Heater, 50-gallon, Energy Star, EF	ES Products	0.23	0.00	0.00	0.77
E21A3b008	Heat Pump Water Heater, 80-gallon, Energy Star, EF	ES Products	0.23	0.00	0.00	0.77

**Endnotes:**

- 1: R1614/R1613 CT HVAC and Water Heater Process and Impact Evaluation, West Hill Energy and Computing, EMI Consulting & Lexicon Energy Consulting, Jul. 19, 2018. pp. 8.6-8.8.  
<https://www.energizect.com/connecticut-energy-efficiency-board/evaluation-reports>
- 2: Navigant Consulting (2018). Water Heating, Boiler, and Furnace Cost Study (RES 19) Add-On Task 7: Residential Water Heater Analysis Memo. [http://ma-eeac.org/wordpress/wp-content/uploads/RES19\\_Assembled\\_Report\\_2018-09-27.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RES19_Assembled_Report_2018-09-27.pdf)
- 3: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 4: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.
- 5: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>
- 6: Michael's Energy, June 26, 2020. Efficiency Maine HPWH Free-ridership and Baseline Assessment Results Memo. <https://www.efficiencymaine.com/docs/Heat-Pump-Water-Heater-Free-ridership-and-Baseline-Assessment.pdf>

## 1.18. Hot Water – Pipe Insulation

<b>Measure Code</b>	
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	Hot Water

### Description:

Installation of insulation on domestic hot water pipes.

### Baseline Efficiency:

The baseline efficiency case is the existing uninsulated domestic hot water piping system located in non-conditioned spaces.

### High Efficiency:

The high efficiency case is the domestic hot water piping system in unconditioned spaces with insulation installed.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>1,2</sup>

$$\Delta kW_{total} = \text{Linear feet} \times \Delta kW$$

$$\Delta kWh_{total} = \text{Linear feet} \times \Delta kWh$$

$$\Delta MMBtu_{total} = \text{Linear feet} \times \Delta MMBtu$$

Where:

Linear feet = Total length of pipe insulation (in feet)

BC Measure ID	Measure Name	Fuel Type	Program	$\Delta kWh$	$\Delta kW$	$\Delta MMBtu$
E21B1a037	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Electric	HEA	14.100 20.500	0.010	
E21B1a038 G21B1a011	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Gas	HEA			0.078 0.113
E21B1a039	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Kerosene	HEA			0.075 0.110
E21B1a040	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Oil	HEA			0.087 0.126

E21B1a041	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Propane	HEA			0.075 0.110
E21A2a037	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Electric	HPwES	14.100 20.500	0.010	
E21A2a038 G21A2a011	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Gas	HPwES			0.078 0.113
E21A2a039	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Kerosene	HPwES			0.075 0.110
E21A2a040	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Oil	HPwES			
E21A2a041	Pipe Insulation <3/4" Pipe Pipe Insulation >3/4" Pipe	Propane	HPwES			0.075 0.110

**Measure Life:**

The measure life is 15 years.<sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>1 4</sup>**

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a037	Pipe Insulation	Electric	HEA	1.00	0.91	n/a	n/a	n/a	0.31	0.81
E21B1a038 G21B1a011	Pipe Insulation	Gas	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21B1a039	Pipe Insulation	Kerosene	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21B1a040	Pipe Insulation	Oil	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21B1a041	Pipe Insulation	Propane	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a037	Pipe Insulation	Electric	HPwES	0.99	1.00	n/a	n/a	n/a	0.31	0.81
E21A2a038 G21A2a011	Pipe Insulation	Gas	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21A2a039	Pipe Insulation	Kerosene	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21A2a040	Pipe Insulation	Oil	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21A2a041	Pipe Insulation	Propane	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

In-service rates are 99% for HPwES programs and are 100% HEA programs based on evaluation results.<sup>1,4</sup>

**Realization Rates:**

All PAs use a realization rate of 100% for HPwES program and a realization rate of 91% for HEA program.<sup>1 4</sup>

**Coincidence Factors:**

A summer coincidence factor of 31% and a winter coincidence factor of 81% are utilized for pipe insulation with electric fuel type.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1 – “Water Heater - Electric”

**Endnotes:**

1: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL

2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

3: Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures, GDS Associates, June 2007.

[https://library.cee1.org/system/files/library/8842/CEE\\_Eval\\_MeasureLifeStudyLights%2526HVACGDS\\_1Jun2007.pdf](https://library.cee1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf)

<https://energy.mo.gov/sites/energy/files/measure-life-report-2007.pdf>

4: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

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## 1.19. Hot Water – Setback

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	Hot Water

### Description:

Manual setback of the thermostat on a water heating device to reduce energy consumption.

### Baseline Efficiency:

The baseline efficiency case is a water heater with a standard water temperature of 140°F.

### High Efficiency:

The high efficiency case is a water heater with an adjusted water temperature of 125°F.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on evaluation results.<sup>1</sup>

Measure Name	Program	Fuel Type	ΔMMBtu/unit
Hot Water Setback (both dishwasher and clothes washer configuration)	HPwES	Electricity	0.174
Hot Water Setback (clothes washer only)	HPwES	Electricity	0.268
Hot Water Setback (clothes washer only)	HPwES	Propane	0.411
Hot Water Setback (clothes washer only)	HPwES	Gas	0.411
Hot Water Setback (clothes washer only)	HPwES	Oil	0.411

### Measure Life:

The table below includes the measure life for existing units and new equipment.<sup>2</sup>

BC Measure ID	Measure Name	Fuel Type	Program	Measure Life
	Hot Water Setback	All	HPwES	2

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>1</sup>**

BC Measure ID	Measure Name	Program	Fuel	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
	Hot Water Setback	HPwES	Electricity	0.99	1.00	n/a	n/a	n/a	n/a	n/a
	Hot Water Setback	HPwES	Propane	0.99	1.00	n/a	n/a	n/a	n/a	n/a
	Hot Water Setback	HPwES	Oil	0.99	1.00	n/a	n/a	n/a	n/a	n/a
	Hot Water Setback	HPwES	Gas	0.99	1.00	n/a	n/a	n/a	n/a	n/a

In-Service Rates:

All HPwES measures have a 99% in-service-rate based on evaluation results.<sup>1</sup>

Realization Rates:

All PAs use an average realization rate of 100% for HPwES program.<sup>1</sup>

Coincidence Factors:

CF results are not available.

**Energy Load Shape:**

See Appendix 1 – “Hot Water – Setback”

Endnotes:

1: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

2: Illinois TRM Version 9.0, measure 5.4.6 water heater temperature setback.

<https://www.ilsag.info/technical-reference-manual/il-trm-version-9/>

## 1.20. Hot Water – Showerhead

<b>Measure Code</b>	
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	Hot Water

### **Description:**

An existing shower head with high flow rate is replaced with a new low flow shower head.

### **Baseline Efficiency:**

The baseline efficiency case is the existing showerhead with a baseline flow rate of 2.5 gallons per minute (GPM).

### **High Efficiency:**

The high efficiency case is a low flow shower head having a maximum flow rate of 2.0 GPM or less.

### **Algorithms for Calculating Primary Energy Impact:**

Unit savings are deemed based on study results.<sup>1</sup> kW savings are calculated using the demand impact model.<sup>2</sup>

BC Measure ID	Measure Name	Hot Water Fuel Type	Program	ΔkWh	ΔkW	ΔMMBtu
E21B1a016	Handheld Showerhead	Electric	HEA	145.226	0.050	
E21B1a017 G21B1a003	Handheld Showerhead	Gas	HEA			0.633
E21B1a018	Handheld Showerhead	Kerosene	HEA			0.633
E21B1a019	Handheld Showerhead	Oil	HEA			
E21B1a020	Handheld Showerhead	Propane	HEA			0.633
E21A2a016	Handheld Showerhead	Electric	HPwES	145.226	0.050	
E21A2a017 G21A2a003	Handheld Showerhead	Gas	HPwES			0.633
E21A2a018	Handheld Showerhead	Kerosene	HPwES			0.633
E21A2a019	Handheld Showerhead	Oil	HPwES			
E21A2a020	Handheld Showerhead	Propane	HPwES			0.633
E21B1a030	Low flow Showerhead	Electric	HEA	145.226	0.050	
E21B1a031 G21B1a010	Low flow Showerhead	Gas	HEA			0.633
E21B1a032	Low flow Showerhead	Kerosene	HEA			0.633
E21B1a033	Low flow Showerhead	Oil	HEA			
E21B1a034	Low flow Showerhead	Propane	HEA			0.633
E21A2a030	Low flow Showerhead	Electric	HPwES	145.226	0.050	
E21A2a031 G21A2a010	Low flow Showerhead	Gas	HPwES			0.633
E21A2a032	Low flow Showerhead	Kerosene	HPwES			0.633
E21A2a033	Low flow Showerhead	Oil	HPwES			
E21A2a034	Low flow Showerhead	Propane	HPwES			0.633

**Measure Life:**

The measure life is 15 years.<sup>3</sup>

**Other Resource Impacts:**

Annual water savings are 1,164 gallons per unit.<sup>1</sup>

### Impact Factors for Calculating Adjusted Gross Savings:<sup>1 4</sup>

BC Measure ID	Measure Name	Hot Water Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1a016	Handheld showerhead	Electric	HEA	1.00	0.91	n/a	n/a	n/a	0.31	0.81
E21B1a017 G21B1a003 E21B1a018 E21B1a019 E21B1a020	Handheld showerhead	Gas Kerosene Oil Propane	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a016	Handheld showerhead	Electric	HPwES	0.99	1.00	n/a	n/a	n/a	0.31	0.81
E21A2a017 G21A2a003 E21A2a018 E21A2a019 E21A2a020	Handheld showerhead	Gas Kerosene Oil Propane	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a
E21B1a030	Low flow Showerhead	Electric	HEA	1.00	0.91	n/a	n/a	n/a	0.31	0.81
E21B1a031 G21B1a010 E21B1a032 E21B1a033 E21B1a034	Low flow Showerhead	Gas Kerosene Oil Propane	HEA	1.00	n/a	0.91	n/a	n/a	n/a	n/a
E21A2a030	Low flow Showerhead	Electric	HPwES	0.99	1.00	n/a	n/a	n/a	0.31	0.81
E21A2a031 G21A2a010 E21A2a032 E21A2a033 E21A2a034	Low flow Showerhead	Gas Kerosene Oil Propane	HPwES	0.99	n/a	1.00	n/a	n/a	n/a	n/a

#### In-Service Rates:

All installations have a 100% in-service-rate since programs include verification of equipment installations.

#### Realization Rates:

All PAs use a realization rate of 100% for HPwES program and a realization rate of 91% for HEA program.<sup>1 4</sup>

#### Coincidence Factors:

A summer coincidence factor of 31% and a winter coincidence factor of 81% are utilized.<sup>2</sup>

#### **Energy Load Shape:**

See Appendix 1 “Water Heater – Electric”.

**Endnotes:**

- 1: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL. kWh and annual water savings were estimated using the input values and methodology described in ‘Table C-7. Algorithms and Inputs for Efficient Showerheads’.
- 2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>
- 3: Guidehouse, inc (2020). Massachusetts Comprehensive TRM Review - MA19R17-B-TRM. Prepared for the electric and gas program administrators of Massachusetts part of the residential evaluation program area.
- 4: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

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## 1.21 Hot Water – Water Heater

Measure Code	[Code]
Market	Residential
Program Type	Retrofit/ Lost Opportunity
Category	Hot Water

### Description:

Installation of a new high-efficiency natural gas tankless and storage water heaters.

### Baseline Efficiency:

For indirect water heaters, the baseline efficiency case is the existing indirect water heater with EF of 0.6.<sup>1</sup>

For water heaters integrated with condensing boiler, the baseline efficiency case is an 82% AFUE rated boiler (79.3% AFUE actual) with a 0.6 EF water heater.<sup>1</sup> The ER baseline is an 80% AFUE rated boiler (77.4% AFUE actual) with either an indirect water heater or with a 0.55 EF water heater.

For tankless water heaters, the baseline efficiency case is a stand-alone tank water heater with a UEF of 0.63. For the early retirement portion, the baseline efficiency is an existing 0.58 UEF standalone water heater.

For standalone storage tank water heater, the baseline efficiency case is a stand-alone tank water heater with a UEF of 0.63. For the early retirement portion, the baseline efficiency is an existing 0.58 UEF standalone water heater.

### High Efficiency:

The high efficiency case for indirect water heaters is an indirect water heater attached to an ENERGY STAR® rated forced hot water boiler.

For water heaters integrated with condensing boilers, the high efficiency case is an integrated water heater/boiler unit with a 90% AFUE condensing boiler and a 0.9 EF water heater or a 95% AFUE condensing boiler and a 0.95 EF water heater.

For tankless water heaters, the high efficiency case is a tankless water heater with UEF of 0.94.

For standalone storage tank water heater, the baseline efficiency case is a stand-alone water heater with  $EF \geq 0.66$ .

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>2,3</sup> Savings have been adjusted to reflect the mix of replace and failure and early retirement based on study results. There is an electric penalty associated with the gas

on-demand tankless water heater to account for additional electrical consumption for power venting and electronic pilot ignition.

BC Measure ID	Measure Name	Fuel Type	Program	ΔkWh	ΔkW	ΔMMBtu
G21A3b012	Water Heater - Indirect (attached to ES FHW Boiler; Combined eff rating >=85% (EF=.82))	Gas	ES Products			4.000
G21A3b013	Water Heater - Integrated with Condensing Boiler >= 90% AFUE	Gas	ES Products			10.300
G21A3b014	Water Heater - Integrated with Condensing Boiler >= 95% AFUE	Gas	ES Products			12.800
G21A3b018	Water Heater - Tankless, On-Demand >=.94	Gas	ES Products	-43.000	-0.010	7.300
G21A3b016	Stand Alone Storage Tank Water Heater (EF 0.67)	Gas	ES Products	-43.000	-0.010	3.000

**Measure Life:**

The table shows the measure life for each measure.<sup>4 5 6 7</sup>

BC Measure ID	Measure Name	Program	Measure Life
G21A3b012	Water Heater - Indirect (attached to ES FHW Boiler; Combined eff rating >=85% (EF=.82) (Retrofit))	ES Products	20
G21A3b013	Water Heater - Integrated with Condensing Boiler >= 90% AFUE (Retrofit)	ES Products	19
G21A3b014	Water Heater - Integrated with Condensing Boiler >= 95% AFUE (Retrofit)	ES Products	19
G21A3b018	Water Heater - Tankless, On-Demand >=.94 (Lost Opportunity)	ES Products	19
G21A3b016	Stand Alone Storage Tank Water Heater (EF 0.67)	ES Products	10

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21A3b012	Water Heater - Indirect (attached to ES FHW Boiler; Combined eff rating $\geq 85\%$ (EF=.82) (Retrofit)	ES Products	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21A3b013	Water Heater - Integrated with Condensing Boiler $\geq 90\%$ AFUE (Retrofit)	ES Products	1.00	n/a	n/a	n/a	n/a	n/a	n/a
G21A3b014	Water Heater - Integrated with Condensing Boiler $\geq 95\%$ AFUE (Retrofit)	ES Products	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21A3b018	Water Heater - Tankless, On-Demand $\geq .94$ (New Construction)	ES Products	1.00	1.00	1.00	n/a	n/a	0.21	0.40
G21A3b016	Stand Alone Storage Tank Water Heater (EF 0.67)	ES Products	1.00	1.00	1.00	n/a	n/a	0.21	0.40

In-Service Rates:

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

A summer coincidence factor of 21% and a winter coincidence factor of 40% are claimed for tankless and stand-alone storage water heaters.<sup>8</sup>

**Energy Load Shape:**

See Appendix 1 – “Water Heater - Natural Gas/Fuel Oil”.

**Endnotes:**

- 1: The Baseline Energy Factor is based on the Federal Minimum Standard for (50-gallon) water heaters sold on or after April 16, 2015. This ruling can be found here:  
<https://www.govinfo.gov/content/pkg/CFR-2012-title10-vol3/pdf/CFR-2012-title10-vol3-sec430-32.pdf>
- 2: Massachusetts Program Administrators (2018). 2019-2021 Gas HVAC and Water Heating Calculations Workbook. Workbook can be downloaded here:  
<https://etrm.anbetrack.com/#/workarea/trm/MADPU/RES-WH-ODTWH/2020%20Report%20DRAFT%20WORKING%20TRM/version/4?measureName=Hot%20Water%20-%20On%20Demand%2FTankless%20Water%20Heater>
- 3: Navigant (2018). Home Energy Service Impact Evaluation. Prepared for program administrators in Massachusetts.  
[http://ma-eeac.org/wordpress/wp-content/uploads/RES34\\_HES-Impact-Evaluation-Report-with-ES\\_FINAL\\_29AUG2018.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RES34_HES-Impact-Evaluation-Report-with-ES_FINAL_29AUG2018.pdf)
- 4: GDS Associates, Inc. (2009). Natural Gas Energy Efficiency Potential in Massachusetts.  
[http://ma-eeac.org/wordpress/wp-content/uploads/5\\_Natural-Gas-EE-Potential-in-MA.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/5_Natural-Gas-EE-Potential-in-MA.pdf)
- 5: Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.  
[https://www.energystar.gov/sites/default/files/asset/document/Savings\\_and\\_Cost\\_Estimate\\_Summary.pdf](https://www.energystar.gov/sites/default/files/asset/document/Savings_and_Cost_Estimate_Summary.pdf)
- 6: DOE (2008). Energy Star Residential Water Heaters: [Final Criteria Analysis](#) and The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: [Net-to-Gross, Market Effects, and Equipment Replacement Timing](#).
- 7: Guidehouse, inc (2020). Massachusetts Comprehensive TRM Review - MA19R17-B-TRM. Prepared for the electric and gas program administrators of Massachusetts part of the residential evaluation program area.
- 8: Navigant Consulting (2018). Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.22 HVAC - Boiler

Measure Code	[To Be Defined in ANB system]
Market	Residential
Program Type	Retrofit/Lost Opportunity
Category	HVAC

### Description:

Installation of a new, high efficiency forced hot water boiler, replacing an existing lower efficiency boiler.

### Baseline Efficiency:

For the retirement savings over the remaining life of existing boiler, the baseline efficiency is the metered efficiency of existing system.

For the high efficiency unit savings over lifetime of the new boiler, the baseline is a 84.4% AFUE boiler.<sup>1</sup>

### High Efficiency:

For the retirement savings over the remaining life of existing boiler, the efficient case is a 84.4% AFUE boiler.

For the high efficiency savings over lifetime of the new boiler, the efficient case for gas and propane boilers is a new high efficiency boiler AFUE  $\geq$  93% adjusted by a degradation factor (0.941) to account for its metered efficiency (AFUE  $\geq$  87.5%)<sup>1</sup>. For oil, the efficient case is an 86% AFUE boiler.

### Algorithms for Calculating Primary Energy Impact:

The algorithms for calculating unit annual fossil fuel savings are:

For retrofit,  $\Delta MMBt_{URETIRE} = \text{heating load MMBTUs} * (1/AFUE_{existing} - 1/AFUE_{ee})$

For lost opportunity,  $\Delta MMBt_{UEE} = \text{heating load MMBTUs} * (1/AFUE_{base} - 1/AFUE_{ee})$

Where:

$\Delta MMBt_{URETIRE}$  = Annual MMBtu savings of code-compliant boiler compared to existing boiler

$\Delta MMBt_{UEE}$  = Annual MMBtu savings of high efficiency boiler.

*heating load MMBtus* = Annual residential heating load. 85,200,000 Btu/year for space heating and 9,630,521 Btu/year for water heating.<sup>2</sup>

*AFUE existing* = Annual fuel utilization efficiency of an existing boiler.

*AFUE base* = Annual fuel utilization efficiency of a code-compliant boiler. 0.844.

*AFUE ee* = Annual fuel utilization efficiency of the installed high efficiency boiler.

The annual unit electric savings are deemed based on evaluation results.<sup>3</sup>

BC Measure ID	Measure Name	Fuel Type	Program	ΔkWh/unit <sup>3,4</sup>	ΔMMBtu/unit
G21A3b001	Early Retirement Boiler, Forced Hot Water (EE)	Gas		9.000	Calculated
E21B1b001 E21A2b001 G21B1b001 G21A2b001 G21A3b002	Early Retirement Boiler, Forced Hot Water (Retire)	Gas		9.000	Calculated
	Early Retirement Boiler, Forced Hot Water (EE), Oil	Oil		9.000	Calculated
E21B1b003 E21A2b003	Early Retirement Boiler, Forced Hot Water (Retire), Oil	Oil		9.000	Calculated
	Early Retirement Boiler, Forced Hot Water (EE), Other	Propane/Kerosene		9.000	Calculated
E21B1b004 E21B1b002 E21A2b004 E21A2b002	Early Retirement Boiler, Forced Hot Water (Retire), Other	Propane/Kerosene		9.000	Calculated

### Measure Life:

The table below includes the measure life for existing units and new equipment. The measure life of new equipment is 23 years. For early replacement, the measure lifetime savings are calculated as the sum of retirement savings over the remaining life for the existing unit (7.67 years, assumed to be 1/3 of the measure life of a new equipment) and code/industry standard practice savings for 15.33 years.<sup>5</sup>

BC Measure ID	Measure Name	Fuel Type	Program	Measure Life EUL	RUL
	Boiler, Forced Hot Water	All	All	23	7.67

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
	Boiler, Forced Hot Water	Gas		1.00	n/a	1.00	n/a	n/a	0.00	1.00
	Boiler, Forced Hot Water	Oil		1.00	n/a	1.00	n/a	n/a	0.00	1.00
	Boiler, Forced Hot Water	Propane/ Kerosene		1.00	n/a	1.00	n/a	n/a	0.00	1.00

In-Service Rates:

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

A winter coincidence factor of 100% is claimed.<sup>6</sup>

**Energy Load Shape:**

See Appendix 1. “Boiler Distribution”

Endnotes:

- 1: Itron, June 2020. New Hampshire Residential Baseline Study. Prepared for New Hampshire Evaluation, Measurement and Verification Working Group.
- 2: CT HVAC and Water Heating Process and impact Evaluation Report, West Hill Energy and Computing, R1614/R1613 Jul. 19, 2018.
- 3: Ancillary savings applied when boiler replacement in combines with weatherization measures.
- 4: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 5: Guidehouse, inc, August 2020. Massachusetts Comprehensive TRM Review - MA19R17-B-TRM. Prepared for the electric and gas program administrators of Massachusetts part of the residential evaluation program area.
- 6: New Hampshire common assumptions.

## 1.23. HVAC – Boiler Reset Control

Measure Code	[To Be Defined in ANB system]
Market	Residential
Program Type	Retrofit
Category	HVAC

### Description:

Installation of reset controls to automatically control boiler water temperature based on outdoor temperature or return water temperature in case of condensing boilers.

### Baseline Efficiency:

The baseline efficiency case is a boiler without reset controls.

### High Efficiency:

The high efficiency case is a boiler with reset controls.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>1</sup>

BC Measure ID	Measure Name	Fuel Type	Program	ΔMMBtu/unit
G21A3b005	Boiler Reset Control	Gas	ES Appliances	5.100

### Measure Life:

The measure life of reset controls installed on a new boiler is 15 years.<sup>2</sup> The remaining useful life of reset controls installed on an existing boiler is 6.67 years (assumed to be 1/3 EUL of boiler). For reset controls installed on an existing boiler, the measure lifetime savings are calculated as the sum of retirement savings for 6.67 years and code savings for 8.33 years (calculated as 15 – 6.67).

BC Measure ID	Measure Name	Fuel	Program	EUL	RUL
	Boiler Reset Control	All	All	15	6.67

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
	Boiler Reset Control	Gas	ES Appliances	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1 “Non-Electric Measures”.

**Endnotes:**

- 1: Navigant Consulting, August 2018. Home Energy Services (HES) Impact Evaluation for Massachusetts. [http://ma-eeac.org/wordpress/wp-content/uploads/RES34\\_HES-Impact-Evaluation-Report-with-ES\\_FINAL\\_29AUG2018.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RES34_HES-Impact-Evaluation-Report-with-ES_FINAL_29AUG2018.pdf)
- 2: ACEEE, 2006. Emerging Technologies Report: Advanced Boiler Controls. Prepared for ACEEE.

## 1.24. HVAC – Condensing Boilers

Measure Code	[To Be Defined in ANB system]
Market	Residential
Program Type	Retrofit/Lost Opportunity
Category	HVAC

### Description:

Installation of a new, high efficiency combined water heating and boiler unit.

### Baseline Efficiency:

The baseline for normal replacement is a boiler with AFUE of 84.4%.<sup>1</sup> The water heating baseline is a 0.6 EF water heater.<sup>1</sup>

The early replacement baseline efficiency is the metered efficiency of the existing system.

### High Efficiency:

The efficient case is an integrated water heater/boiler unit with either an AFUE 90 boiler (AFUE = 90%, EF = 0.90) or an AFUE 95 boiler (AFUE = 95%, EF = 0.95).

### Algorithms for Calculating Primary Energy Impact:

The algorithms for calculating unit annual fossil fuel savings are:

For early replacement,  $\Delta MMBt_{URETIRE} = \text{heating load MMBTUs} \times (1/AFUE \text{ existing} - 1/AFUE \text{ ee})$

For lost opportunity,  $\Delta MMBt_{UEE} = \text{heating load MMBTUs} \times (1/AFUE \text{ base} - 1/AFUE \text{ ee})$

Where:

$\Delta MMBt_{URETIRE}$  = Annual MMBtu savings of code-compliant boiler compared to existing boiler

$\Delta MMBt_{UEE}$  = Annual MMBtu savings of high efficiency boiler

Heating load MMBtus = Annual residential hot water load. 9,630,521 Btu/year.<sup>2</sup>

$AFUE \text{ existing}$  = Annual fuel utilization efficiency of an existing boiler. Site-specific metered value.

$AFUE \text{ base}$  = Annual fuel utilization efficiency of a new boiler. 0.844 for all fuel types.<sup>1</sup>

$AFUE \text{ ee}$  = Annual fuel utilization efficiency of the installed high efficiency boiler.

The annual unit electric savings are deemed based on evaluation results.<sup>3</sup>

BC Measure ID	Measure Name	Fuel Type	Program	$\Delta$ MMBtu/unit	$\Delta$ kWh/unit
	Condensing Boilers $\geq$ 90% AFUE, Lost Opportunity	Gas Oil Propane Kerosene	ES Products	Calculated	9.00
	Condensing Boilers $\geq$ 95% AFUE, Lost Opportunity	Gas Oil Propane Kerosene	ES Products	Calculated	9.00
	Condensing Boilers $\geq$ 90% AFUE, Early Retirement	Gas Oil Propane Kerosene	HEA/ HPwES	Calculated	9.00
	Condensing Boilers $\geq$ 95% AFUE, Early Retirement	Gas Oil Propane Kerosene	HEA/ HPwES	Calculated	9.00

### Measure Life:

The table below includes the measure life for existing units and new equipment. The measure life of new equipment is 20 years. For early replacement, the measure lifetime savings are calculated as the sum of retirement savings over the remaining life for the existing unit (6.67 years, assumed to be 1/3 of the measure life of a new equipment) and code/industry standard practice savings for 13.33 years.<sup>4</sup>

BC Measure ID	Measure Name	Program	Measure Life EUL	RUL
	Boiler, Forced Hot Water	All	20	6.67

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:<sup>3 5</sup>

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
	Condensing Boiler	Gas Oil Kerosene Propane	ES Products	1.00	n/a	1.00	n/a	n/a	0	1.00
	Condensing Boiler	Gas	HEA	1.00	n/a	0.91	n/a	n/a	0	1.00
	Condensing Boiler	Oil	HEA	1.00	n/a	0.91	n/a	n/a	0	1.00
	Condensing Boiler	Propane /Kerosene	HEA	1.00	n/a	0.91	n/a	n/a	0	1.00
	Condensing Boiler	Gas	HPwES	0.99	n/a	1.00	n/a	n/a	0	1.00
	Condensing Boiler	Oil	HPwES	0.99	n/a	1.00	n/a	n/a	0	1.00
	Condensing Boiler	Propane /Kerosene	HPwES	0.99	n/a	1.00	n/a	n/a	0	1.00

#### In-Service Rates:

All installations have a 100% in-service-rates unless an evaluation finds otherwise.

#### Realization Rates:

The HPwES program uses a realization rate of 100% and the HEA program uses a realization rate of 91%. The ES Products program uses a 100% realization rate unless an evaluation finds otherwise.

#### Coincidence Factors:

A winter coincidence factor of 100% is claimed.<sup>6</sup>

#### **Energy Load Shape:**

See Appendix 1 “Non-Electric Measures”.

#### Endnotes:

- 1: Itron, June 2020. New Hampshire Residential Baseline Study. Prepared for New Hampshire Evaluation, Measurement and Verification Working Group.
- 2: CT HVAC and Water Heating Process and impact Evaluation Report, West Hill Energy and Computing, R1614/R1613 Jul. 19, 2018.
- 3: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 4: Environmental Protection Agency, 2009. Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.

5: Opinion Dynamics, July 29, 2020, New Hampshire Utilities, Home Energy Assistance Program  
Evaluation Report, 2016-2017 – FINAL.

6: New Hampshire common assumptions.

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## 1.25. HVAC – ENERGY STAR Central Air Conditioning

Measure Code	[To Be Defined in ANB system]
Market	Residential
Program Type	Retrofit/Lost Opportunity
Category	HVAC

### Description:

The installation of a high efficiency ENERGY STAR central air conditioning (AC) system.

### Baseline Efficiency:

For lost opportunity and replace on failure retrofit, the baseline efficiency case is a Seasonal Energy Efficiency Ratio (SEER) 12.4 central air-conditioning unit.<sup>1</sup> For early retirement, if values are known, then baseline is the existing air-conditioning unit SEER over its remaining life, and a SEER 12.4 central air-conditioning unit for the remaining life of the new unit. If baseline values are unknown, the baseline case over its remaining life should be the average efficiency levels of units replaced in the previous calendar year.

### High Efficiency:

The high efficiency case is a program qualified ENERGY STAR central air-conditioning unit, based on the reported capacity and efficiency levels of units rebated in the previous calendar year. The minimum ENERGY STAR Seasonal Energy Efficiency Ratio (SEER) requirement for the program is 15.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \text{Tons} \times 12 \text{ kBtu/hr} / \text{Ton} \times (1/\text{SEER}_{\text{BASE}} - 1/\text{SEER}_{\text{EE}}) \times \text{Hours}$$

$$\Delta kW = \Delta kWh \times \text{Annual Maximum Demand Factor}$$

Where:

**Tons** = Cooling capacity of the central AC equipment in tons. Use actual rebated tons or if unknown assume previous year average program rebated tonnage (for 2019, was 2.85 tons).<sup>2</sup>

**SEER<sub>BASE</sub>** = Seasonal Energy Efficiency Ratio (SEER).

- For lost opportunity and replace on failure retrofit installation, baseline AC equipment should be SEER 12.4 equipment.
- For early replacement retrofit, baseline AC equipment is divided into two components:
  - o For the remaining useful life of the replaced AC equipment:
    - if known, use the replaced (old) AC SEER value.
    - if unknown, assume previous calendar year average of the replaced (old) AC SEER value (for 2019 was SEER 10).
  - o For the remaining useful life of the new AC equipment: baseline AC equipment should be 12.4 SEER

**SEER<sub>EE</sub>** = Seasonal Energy Efficiency Ratio (SEER) of new efficient AC equipment. Use actual rebated SEER, or if unknown, assume previous calendar year average (for 2019 was 17.1 SEER).<sup>3</sup>

**Hours** = Equivalent Full Load Hours (EFLH). Assume 385 for New Hampshire based on the ENERGY STAR calculator.<sup>3</sup>

**Savings Assumptions for Calculating Residential Central Air Conditioners:**

BC Measure ID	Measure Name	Program	Tons	SEER <sub>BASE</sub>	SEER <sub>EE</sub>	Hours	Annual Max Demand Factor <sup>6</sup>
E21A3b015	ENERGY STAR Central AC	ENERGY STAR Products	Use actual, if unknown use 2.85	12.4	Use actual, if unknown use 17.1	385	0.001594
	ENERGY STAR Central AC, Early Retirement	HPwES/HEA	Use actual, if unknown use 2.85	Use actual, if unknown use 10 for remaining useful life of replaced AC, 12.4 for remaining useful life of new AC	Use actual, if unknown use 17.1	385	0.001594

**Measure Life:<sup>5 6</sup>**

The table below includes the effective useful life (EUL) for central air-conditioning units which assumes a lost opportunity installation<sup>4</sup>. Retrofit installations that meet early retirement criteria should receive a remaining useful life of 6 years for a total of 18-year life<sup>5</sup>. To calculate lifetime savings for lost opportunity and replace on failure retrofit installations, use the full EUL of 18 years with the first row of savings assumptions (ENERGY STAR Central AC) above. For retrofit installations that meet early retirement criteria, lifetime savings are based on the sum of two components: 6 years with savings from the second row of savings assumptions above (ENERGY STAR Central AC, Early Retirement) and the remaining 12 years using the lost opportunity savings assumptions (ENERGY STAR Central AC).

BC Measure ID	Measure Name	Program	Measure Life (EUL)	Measure Life (RUL)
E21A3b015	ENERGY STAR Central AC	ES Products	18	n/a
	ENERGY STAR Central AC, Early Retirement	HPwES/HEA	18	6

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b015	ENERGY STAR Central AC	ES Products	1.00	1.00	n/a	1.00	1.00	0.50	0.00
	ENERGY STAR Central AC, Early Retirement	HEA	1.00	0.91	n/a	1.00	1.00	0.50	0.00
	ENERGY STAR Central AC, Early Retirement	HPwES	0.99	1.00	n/a	1.00	1.00	0.50	0.00

In-Service Rates:

In-service rates are 100% for ES Products unless an evaluation finds otherwise, 100% for HEA<sup>8</sup>, and 99% for HPwES<sup>7</sup>.

Realization Rates:

Realization rates are 100% for ES Products until further evaluation, 91% for HEA<sup>8</sup>, and 100% for HPwES<sup>7</sup>.

Coincidence Factors:

Summer coincidence factors are estimated using the RES1 Demand Impact Model Update.<sup>9</sup> The winter coincidence factor is assumed to be zero.

**Energy Load Shape:**

See Appendix 1 – “Central Air Conditioner/Heat Pump (Cooling)”.

Endnotes:

- 1: Itron 2020. New Hampshire Residential Baseline Study. Prepared for New Hampshire Evaluation, Measurement and Verification Working Group.
- 2: Average tonnage for Eversource 2019 rebated ENERGY STAR central AC according to tracking database summary report. Pulled February 10, 2020.
- 3: Average SEER for Eversource 2019 rebated ENERGY STAR central AC according to tracking database summary report. Pulled February 10, 2020.
- 4: ENERGY STAR Central AC calculator. Assumptions worksheet. Usage: Full Load Cooling Hours. Concord NH location. Based on 2002 EPA study.  
[https://www.energystar.gov/sites/default/uploads/buildings/old/files/CentralAC\\_Calculator.xls](https://www.energystar.gov/sites/default/uploads/buildings/old/files/CentralAC_Calculator.xls)  
 EFLH Calculator tab in the EVT\_CCHP MOP and Retrofit\_2018\_.xlsx.). Previous VT TRM was 375. Cadmus study showed much lower for heat pumps:  
<https://publicservice.vermont.gov/sites/dps/files/documents/2017%20Evaluation%20of%20Cold%20Climate%20Heat%20Pumps%20in%20Vermont.pdf>
- 5: Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures, GDS Associates, June 2007.  
[https://library.cce1.org/system/files/library/8842/CEE\\_Eval\\_MeasureLifeStudyLights%2526HVACGDS\\_1Jun2007.pdf](https://library.cce1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf)
- 6: RUL is based on the 2019 MA TRM, Illinois TRM version 9.0, and NEEP TRM version 9.0, which all assume an RUL of one-third the EUL, or six years.

7: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

8: Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

9: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

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## 1.26. HVAC – ENERGY STAR Room Air Conditioning

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity/Retrofit
<b>Category</b>	HVAC

### Description:

The installation of high efficiency room air conditioning (AC) unit.

### Baseline Efficiency:

The baseline efficiency case is a room AC unit meeting current federal standard.

### High Efficiency:

The high efficiency case is a program-qualified ENERGY STAR room AC unit.

### Algorithms for Calculating Primary Energy Impact:

Electric energy savings for a program-qualified ENERGY STAR room air-conditioning unit are deemed at 33 kWh per unit. Unit savings are based on the Massachusetts eTRM value (36 kWh) adjusted to account for the cooling load differential between Massachusetts and New Hampshire.

Savings Assumptions for Calculating Residential ENERGY STAR Room Air Conditioners:

BC Measure ID	Measure Name	Program	$\Delta$ kWh	$\Delta$ kW <sup>3</sup>
E21A3b016	ENERGY STAR Room AC	ES Products	33	0.06
E21B1a054	ENERGY STAR Room AC	HEA	113	0.18
E21A2a057	ENERGY STAR Room AC	HPwES	113	0.18

### Measure Life:

The table below includes the effective useful life (EUL) for room air-conditioning units which assumes lost opportunity installation.

BC Measure ID	Measure Name	Program	Measure Life <sup>3</sup>
E21A3b016	ENERGY STAR Room AC	ES Products	12
E21B1a054	ENERGY STAR Room AC	HEA	12
E21A2a057	ENERGY STAR Room AC	HPwES	12

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b016	ENERGY STAR Room AC	ES Products	0.97	1.00	n/a	1.00	1.00	0.33	0.00
E21B1a054	ENERGY STAR Room AC	HEA	1.00	0.91	n/a	1.00	1.00	0.33	0.00
E21A2a057	ENERGY STAR Room AC	HPwES	0.99	1.00	n/a	1.00	1.00	0.33	0.00

#### In-Service Rates:

In-service rates are 0.97% for ES Products<sup>4</sup>, 100% for HEA<sup>6</sup>, and 99% for HPwES<sup>5</sup>

#### Realization Rates:

Realization rates are 100% for ES Product program until the measure is evaluated. Realization rates for all HEA programs are 91%<sup>6</sup> and for all HPwES programs are 100%<sup>5</sup> per evaluation results.

#### Coincidence Factors:

Summer coincidence factors is estimated using the RES1 Demand Impact Model Update.<sup>3</sup> The winter coincidence factor is assumed to be zero.

#### **Energy Load Shape:**

See Appendix 1 – “Room or Window Air Conditioner”.

#### Endnotes:

**1:** Connecticut’s 2019 Program Savings Document, March 1, 2019.

<https://www.energizect.com/sites/default/files/2019%20PSD%20%283-1-19%29.pdf>

Common cooling savings algorithms used in the Connecticut PSD show a directly proportional relationship between savings and cooling operational hours. We assume a similar directly proportional relationship between cooling operational hours (EFLH), cooling savings, and cooling degree days. The New Hampshire CDD of 518 is based on the HPwES evaluation and the MA CDD is assumed to be the average of New Hampshire and Connecticut (603).

**2:** Opinion Dynamics, New Hampshire Utilities Home Performance with Energy Star Program Evaluation Report 2016-2017 – DRAFT, December 24, 2019.

**3:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>.

**4:** NMR Group, INC. (2018). RLPNC 17-4 and 17-5: Product Impact Evaluation of In-Service and Short-Term Retention Rates Study. Prepared for MA Electric Program Administrators and EEAC.

**5:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

**6:** Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

## 1.27. HVAC – Furnace

<b>Measure Code</b>	
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	HVAC

### Description:

Installation of a new high efficiency space heating furnace with an electronically commutated motor (ECM) for the fan.

### Baseline Efficiency:

The baseline efficiency case is an 83.2% AFUE furnace.<sup>1</sup>

For the retirement savings over the remaining life of existing boiler, the baseline efficiency is the metered efficiency of existing system.

### High Efficiency:

The high efficiency case is a new furnace with AFUE ≥ 95%.

### Algorithms for Calculating Primary Energy Impact:

The algorithm for calculating lost opportunity annual fossil fuel savings is:

$$\Delta MMBtu = 77.5 \times \left( \frac{1}{AFUE_b} - \frac{1}{AFUE_l} \right)$$

Where,

77.5 = Average heating factor based on home's heat load.<sup>2</sup>

AFUE<sub>b</sub> = Annual fuel utilization efficiency of the baseline furnace. 0.832

AFUE<sub>l</sub> = Annual fuel utilization efficiency of the installed furnace

The algorithm for calculating retrofit annual fossil fuel savings is:

$$\Delta MMBtu = 77.5 \times \left( \frac{1}{AFUE_e} - \frac{1}{AFUE_b} \right)$$

Where,

AFUE<sub>e</sub> = Annual fuel utilization efficiency of the existing furnace.

AFUE<sub>b</sub> = Annual fuel utilization efficiency of the baseline furnace. 0.832

Unit savings for Furnace ancillary savings measure are based on the 2020 HPwES study results.<sup>3</sup>  
 Ancillary electric savings for furnace replacement measure are based on the 2018 ES Products evaluation study.<sup>4</sup>

BC Measure ID	Measure Name	Fuel	Program	ΔkWh	ΔkW	ΔMMBtu
E---	Furnace Ancillary Savings	Electric	HPwES			0.0293
E21B1b005 G21B1b002  E21A2b005 G21A2b002	Furnace Replacement	Gas	HEA HPwES	130.600 168	0.064	Calculated
E21B1b006 E21A2b006	Furnace Replacement	Kerosene	HEA HPwES	87.600 168	0.064	Calculated
E21B1b008 E21A2b008	Furnace Replacement	Propane	HEA HPwES	130.600 168	0.064	Calculated
	Furnace Replacement	Oil	HEA HPwES	6.700 168	0.064	Calculated

**Measure Life:**

Measure life is summarized in the table below.<sup>5</sup>

BC Measure ID	Measure Name	Fuel Type	Program	Years
	Furnace Ancillary Savings	Electric	HPwES	17
E21B1b005 G21B1b002  E21A2b005 G21A2b002	Furnace Replacement	Gas	HEA HPwES	17
E21B1b006 E21A2b006	Furnace Replacement	Kerosene	HEA HPwES	17
E21B1b008 E21A2b008	Furnace Replacement	Propane	HEA HPwES	17
	Furnace Replacement	Oil	HEA HPwES	17

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>3 6</sup>**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E---	Ancillary Savings	Electric	HPwES	0.99	1.00	n/a	n/a	n/a	0.00	0.45
E21B1b005 G21B1b002	Furnace Replacement	Gas	HEA	1.00	n/a	0.91	n/a	n/a	0.00	0.45
E21A2b005 G21A2b002	Furnace Replacement	Gas	HPwES	0.99	n/a	1.00	n/a	n/a	0.00	0.45
E21B1b006	Furnace Replacement	Kerosene	HEA	1.00	n/a	0.91	n/a	n/a	0.00	0.45
E21A2b006	Furnace Replacement	Kerosene	HPwES	0.99	n/a	1.00	n/a	n/a	0.00	0.45
E21B1b008	Furnace Replacement	Propane	HEA	1.00	n/a	0.91	n/a	n/a	0.00	0.45
E21A2b008	Furnace Replacement	Propane	HPwES	0.99	n/a	1.00	n/a	n/a	0.00	0.45

**In-Service Rates:**

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

**Realization Rates:**

All PAs use a realization rate of 100% for HPwES program and a realization rate of 91% for HEA program.<sup>3 6</sup>

**Coincidence Factors:**

The summer coincidence factor for ancillary electric savings is 0.00 and winter coincidence factor is 0.45.<sup>7</sup>

**Energy Load Shape:**

See Appendix 1 “Furnace Fan”.

**Endnotes:**

- 1: Itron 2020. New Hampshire Residential Baseline Study. Prepared for New Hampshire Evaluation, Measurement and Verification Working Group.
- 2: CT HVAC and Water Heating Process and impact Evaluation Report, West Hill Energy and Computing, R161/ R 1613 Jul. 19, 2018.
- 3: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 4: New Hampshire ENERGY STAR® Products Program 2016 Evaluation Report (2018).

5: Guidehouse, inc (2020). Massachusetts Comprehensive TRM Review - MA19R17-B-TRM. Prepared for the electric and gas program administrators of Massachusetts part of the residential evaluation program area.

6:Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

7: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

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## 1.28 HVAC – Air-source Heat Pump

<b>Measure Code</b>	[Code]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	HVAC

### Description:

This measure includes the installation of a high-efficiency, air-source heat pump unit (ASHP) to serve the heating and cooling loads of a residential unit. The electric savings for this measure are realized through the increased nameplate efficiency between the baseline and installed equipment. If a fossil-fuel based heating system is being partially or completely displaced by the new heat pump unit, fossil fuel savings and increase electric consumption will be realized.

The measure covers four baseline scenarios, described below, and two load configurations:

1. Partial heating displacement
2. Full heating displacement (heat pump meets over 90% of annual space heat load)

### Baseline Efficiency:

The baseline efficiency varies as a function of replacement scenario.

Scenario	Baseline System Type	
	Cooling	Heating
1. Lost opportunity	Code minimum heat pump	Code minimum heat pump
2. Retrofit, replacing a heat pump	Market average heat pump	Market average heat pump
3. Retrofit, replacing central cooling and electric resistance heat	Market average central air conditioner	Electric resistance
4. Retrofit, replacing central cooling and fossil fuel heating* *Fossil fuel displacement scenario is proposed for a limited pilot offering, starting 2021.	Market average central air conditioner	Market average fossil fuel furnace

### High Efficiency:

The high efficiency (or energy efficient) case is the site-specific air-source heat pump unit. For full displacement, the heat pump must meet cold-climate heat pump standards, such as those listed by NEEP or other sources for a cold climate air-source heat pump (ccASHP).

### Algorithms for Calculating Primary Energy Impact:

The savings for this measure are attributable to the increase in nameplate efficiency between the baseline and installed units. Based on the end use of the installed heat pump unit, the savings will be:

1. Cooling only, if the energy efficient heat pump will serve only the cooling load of the house

2. Heating only, if the energy efficient heat pump will serve only the heating load of the house (either partial or complete displacement)
3. Combined, if the energy efficient heat pump will serve both the cooling and heating loads of the house.

The algorithm for calculating electric demand savings is:

$$\Delta kW = \max(\Delta kW_{cool} \text{ or } \Delta kW_{heat})$$

$$\Delta kW_{cool} = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

If cooling is absent in the preexisting case, the term  $(1/EER_{BASE}) = 0$

$$\Delta kW_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right)$$

$Cap_{heat} = Cap_{cool} \times 1.0$  if unit is a cold climate air-source heat pump

$Cap_{heat} = Cap_{cool} \times 0.9$  for all other air-source heat pump

Where:

$\Delta kW_{cool}$  = Gross annual cooling demand savings for air-source heat pump unit

$\Delta kW_{heat}$  = Gross annual heating demand savings for air-source heat pump unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient air-source heat pump unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient air-source pump unit, from equipment specifications. Use equation to convert from cooling capacity value if standard equipment literature does not provide this value.

$EER_{BASE}$  = Energy Efficiency Ratio of the baseline cooling equipment

$EER_{EE}$  = Energy Efficiency Ratio of the energy efficient air-source heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient air-source heat pump unit, from equipment specifications

The algorithm for calculating annual electric energy savings is:

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{SEER_{BASE}} - \frac{1}{SEER_{EE}} \right) \times EFLH_{cool}$$

If cooling is absent in the preexisting case, the term  $(1/EER_{BASE}) = 0$

$$\Delta kWh_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right) \times EFLH_{heat}$$

If fossil fuel heating baseline, the term  $(1/HSPF_{BASE}) = 0$  and the fossil fuel savings are:

$$\Delta MMBtu_{heat} = \frac{Cap_{heat}}{AFUE} \times EFLH_{heat} \times 10^{-3}$$

$$Cap_{heat} = Cap_{cool} \times 1.0 \text{ if unit is a cold climate air-source heat pump}$$

$$Cap_{heat} = Cap_{cool} \times 0.9 \text{ for all other air-source heat pump}$$

Where:

$\Delta kWh_{cool}$  = Gross annual cooling savings for air-source heat pump unit

$\Delta kWh_{heat}$  = Gross annual heating savings for air-source heat pump unit

$\Delta MMBtu_{hea}$  = Gross annual heating savings resulting from the decrease in fuel consumption due to the partial or complete displacement of the heating load by the energy efficient air-source heat pump unit.

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient air-source heat pump unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient air-source pump unit, from equipment specifications. Use equation to convert from cooling capacity value if standard equipment literature does not provide this value.

$SEER_{BASE}$  = Seasonal Energy Efficiency Ratio of baseline cooling equipment

$SEER_{EE}$  = Seasonal Energy Efficiency Ratio of energy efficient air-source heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient air-source heat pump unit, from equipment specifications

$EFLH_{cool}$  = Equivalent Full Load Hours for cooling

$EFLH_{heat}$  = Equivalent Full Load Hours for heating

$AFUE$  = Annual fuel utilization efficiency of replaced fossil fuel heating system

0.9 = Conversion factor<sup>1</sup> to convert cooling capacity to heating capacity for non-cold climate, air-source heat pump units not meeting standards similar to NEEP's cold climate air source heat pump (ccASHP) product list. The conversion factor for ccASHP meeting standards similar to NEEP's is 1.0.

$10^{-3}$  = Conversion factor from kBtu to MMBtu

Heat Pump Type	Cooling Capacity Range	Parameter	Value				Units
			1. Lost Opportunity	2. Retrofit - HP	3. Retrofit - Resistance	4. Retrofit – Fossil Fuel	
Air-source Heat Pump	All sizes	EER <sub>BASE</sub>	12.72 <sup>2</sup>	10.90 <sup>2</sup>	-	-	Btu/W-h
		SEER <sub>BASE</sub>	14.00 <sup>3</sup>	12.00 <sup>5</sup>	-	-	Btu/W-h
		HSPF <sub>BASE</sub>	8.20 <sup>3</sup>	7.40 <sup>5</sup>	3.412 <sup>4</sup>	-	Btu/W-h
		AFUE	N/A	N/A	N/A	75% <sup>6</sup>	
		EFLH <sub>cool</sub>	280 <sup>7</sup>				Hours
		EFLH <sub>heat</sub>	1020 <sup>8</sup>				Hours

### Measure Life<sup>9</sup>:

The measure life of a new heat pump unit is 18 years.

BC Measure ID	Measure Name	Program	Measure Life
E21A3b003	Air-source Heat Pump – Lost Opportunity (Cooling)	ES Products	18
E21A3b004	Air-source Heat Pump – Lost Opportunity (Heating)	ES Products	18
E21A3b033	Air-source Heat Pump – Retrofit HP	ES Products	18
E21A3b034	Air-source Heat Pump – Retrofit Resistance	ES Products	18

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b003	Air-source Heat Pump – Lost Opportunity (Cooling)	ES Products	1.00	1.00	1.00	1.00	1.00	0.346	0.00
E21A3b004	Air-source Heat Pump – Lost Opportunity (Heating)	ES Products	1.00	1.00	1.00	1.00	1.00	0.00	0.595
E21A3b033	Air-source Heat Pump – Retrofit HP	ES Products	1.00	1.00	1.00	1.00	1.00	0.346	0.595
E21A3b034	Air-source Heat Pump – Retrofit Resistance	ES Products	1.00	1.00	1.00	1.00	1.00	0.346	0.595

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors<sup>10</sup>:

A coincidence factor of 34.60% during cooling season and a coincidence factor of 59.5% for the heating season should be applied.

**Energy Load Shape:**

See Appendix 1 – “Air-source Heat Pump”

**Endnotes:**

- 1: Conversion factor is based on internal ERS analysis of Mass Save and NEEP ccASHP product data.
- 2: Since IECC does not provide EER requirements for air-cooled heat pumps < 65 kBtu/h, assume the following conversion from SEER to EER:  $EER \approx SEER/1.1$ .
- 3: International Energy Conservation Code 2015, table C403.2.3(2) Minimum Efficiency Requirements: Electrically Operated Unitary and Applied Heat Pumps
- 4: Electric heating system has COP = 1, which converts to an HSPF value of 3.412 Btu/w-h
- 5: ASHRAE 90.1 2004 table 6.8.1B Electrically Operated Unitary and Applied Heat Pumps - Minimum Efficiency Requirements.
- 6: MA TRM DMSHP measure. This value in the MA TRM has been agreed upon by EEAC consultants. We believe that this value accurately represents actual fossil fuel heating equipment efficiencies which include efficiency degradation over the age of the equipment. [MA TRM DMSHP](#).
- 7: Cooling hours from NY TRM v7 Appendix G for Single family homes. We believe the average of cooling hour values for the cities of Albany and Massena are representative of NH, because their lie roughly along the same latitudes as endpoints of NH.
- 8: Heating hours from NY TRM v7 Appendix G for Single family homes. We believe the average of heating hour values for the cities of Albany and Massena are representative of NH, because their lie roughly along the same latitudes as the endpoints of NH.
- 9: [GDS Associates, Inc. \(2007\)](#). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group; Page 1-3, Table 1.
- 10: Values reflect a blend of replace on failure and early replacement. Coincidence Factors obtained from Navigant Consulting (2018), Demand Impact Model Update (for Central Air Conditioner/Heat Pump (Cooling) and Ductless Mini Split Heat Pumps (Heating)). The calculation of Coincidence Factors can be found in MA PAs' 2019-2021 Plan Electric Heating and Cooling Savings Workbook (2018)

## 1.29 HVAC – Heat Pump, Ductless

<b>Measure Code</b>	[Code]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	HVAC

### Description:

This measure includes the installation of a high-efficiency, ductless, mini-split heat pump unit (DMSHP) to serve the heating and cooling loads of a residential unit. The savings for this measure are realized through the increased nameplate efficiency between the baseline and installed equipment. If a fossil-fuel based heating system is being partially or completely displaced by the new heat pump unit, fossil fuel savings and electric consumption increases will be realized.

The measure covers four baseline scenarios, described below, and two load configurations:

0. Partial heating displacement
1. Full heating displacement (heat pump meets over 90% of annual space heat load)

### Baseline Efficiency:

The baseline efficiency varies as a function of replacement scenario.

Scenario	Baseline System Type	
	Cooling	Heating
5. Lost opportunity	Code minimum heat pump	Code minimum heat pump
6. Retrofit, replacing a heat pump	Market average heat pump	Market average heat pump
7. Retrofit, replacing central cooling and electric resistance heat	Market average central air conditioner	Electric resistance
8. Retrofit, replacing central cooling and fossil fuel heating *Fossil fuel displacement scenario is proposed for a limited pilot offering, starting 2021.	Market average central air conditioner	Market average fossil fuel furnace

### High Efficiency:

The high efficiency (or energy efficient) case is the site-specific ductless, mini-split heat pump unit. For full displacement, the heat pump must meet cold-climate heat pump standards, such as those listed by NEEP or other sources for a cold climate ductless, mini-split heat pump (ccDMSHP).

### Algorithms for Calculating Primary Energy Impact:

The savings for this measure are attributable to the increase in nameplate efficiency between the baseline and installed units. Based on the end use of the installed heat pump unit, the savings will be:

4. Cooling only, if the energy efficient heat pump will serve only the cooling load of the house
5. Heating only, if the energy efficient heat pump will serve only the heating load of the house (either partial or complete displacement)
6. Combined, if the energy efficient heat pump will serve both the cooling and heating loads of the house.

The algorithm for calculating electric demand savings is:

$$\Delta kW = \max(\Delta kW_{cool} \text{ or } \Delta kW_{heat})$$

$$\Delta kW_{cool} = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

If cooling is absent in the preexisting case, the term  $(1/EER_{BASE}) = 0$

$$\Delta kW_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right)$$

$$Cap_{heat} = Cap_{cool} \times 1.0 \text{ if unit is a cold climate ductless mini split heat pump}$$

$$Cap_{heat} = Cap_{cool} \times 0.9 \text{ for all other ductless mini split heat pump}$$

Where:

$\Delta kW_{cool}$  = Gross annual cooling demand savings for ductless, mini-split heat pump unit

$\Delta kW_{heat}$  = Gross annual heating demand savings for ductless, mini-split heat pump unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient ductless, mini-split heat pump unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient ductless, mini-split pump unit, from equipment specifications. Use equation to convert from cooling capacity value if standard equipment literature does not provide this value.

$EER_{BASE}$  = Energy Efficiency Ratio of the baseline cooling equipment

$EER_{EE}$  = Energy Efficiency Ratio of the energy efficient ductless, mini-split heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient ductless, mini-split heat pump unit, from equipment specifications

The algorithms for calculating annual cooling and heating electric energy savings are as follows:

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{SEER_{BASE}} - \frac{1}{SEER_{EE}} \right) \times EFLH_{cool}$$

If cooling is absent in the preexisting case, the term  $(1/EER_{BASE}) = 0$

$$\Delta kWh_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right) \times EFLH_{heat}$$

If fossil fuel heating baseline, the factor  $(1/HSPF_{BASE}) = 0$  and the fossil fuel savings are:

$$\Delta MMBtu_{heat} = \frac{Cap_{heat}}{AFUE} \times EFLH_{heat} \times 10^{-3}$$

$$Cap_{heat} = Cap_{cool} \times 1.0 \text{ if unit is a cold climate ductless mini split heat pump}$$

$$Cap_{heat} = Cap_{cool} \times 0.9 \text{ for all other ductless mini split heat pump}$$

Where:

$\Delta kWh_{cool}$  = Gross annual cooling savings for ductless, mini-split heat pump unit

$\Delta kWh_{heat}$  = Gross annual heating savings for ductless, mini-split heat pump unit

$\Delta MMBtu_{heat}$  = Gross annual heating savings resulting from the decrease in fuel consumption due to the partial or complete displacement of the heating load by the energy efficient ductless, mini-split heat pump unit.

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient ductless, mini-split heat pump unit, from equipment specifications

$Cap_{hea}$  = Heating capacity (in kBtu/h) of the energy efficient ductless, mini-split pump unit, from equipment specifications. Use equation to convert from cooling capacity value if standard equipment literature does not provide this value.

$SEER_{BASE}$  = Seasonal Energy Efficiency Ratio of baseline cooling equipment

$SEER_{EE}$  = Seasonal Energy Efficiency Ratio of energy efficient ductless, mini-split heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient ductless, mini-split heat pump unit, from equipment specifications

$EFLH_{cool}$  = Equivalent Full Load Hours for cooling

$EFLH_{hea}$  = Equivalent Full Load Hours for heating

$AFUE$  = Annual fuel utilization efficiency of replaced fossil fuel heating system

0.9 = Conversion factor<sup>1</sup> to convert cooling capacity to heating capacity for non-cold climate, ductless heat pump units not meeting standards similar to NEEP's cold climate air source heat pump (ccASHP) product list. The conversion factor for ccASHP meeting standards similar to NEEP's is 1.0.

$10^{-3}$  = Conversion factor from kBtu to MMBtu

Heat Pump Type	Cooling Capacity Range	Parameter	Value				Units
			1. Lost Opportunity	2. Retrofit - HP	3. Retrofit - Resistance	4. Retrofit – Fossil Fuel	
Ductless Mini Split	All sizes	EER <sub>BASE</sub>	12.72 <sup>2</sup>	10.90 <sup>2</sup>	-	-	Btu/W-h
		SEER <sub>BASE</sub>	14.00 <sup>3</sup>	12.00 <sup>5</sup>	-	-	Btu/W-h
		HSPF <sub>BASE</sub>	8.20 <sup>3</sup>	7.40 <sup>5</sup>	3.412 <sup>4</sup>	-	Btu/W-h
		AFUE	N/A	N/A	N/A	75% <sup>6</sup>	
		EFLH <sub>cool</sub>	218 <sup>7</sup>				Hours
		EFLH <sub>heat, partial</sub>	535 <sup>8</sup>				Hours
		EFLH <sub>heat, full</sub>	1,117 <sup>8</sup>				Hours

**Measure Life<sup>9</sup>:**

The table below the measure life of the ductless mini-split heat pump equipment.

BC Measure ID	Measure Name	Program	Measure Life
E21A3b005	Ductless Mini-split Heat Pump (cooling) - Lost Opportunity	ES HVAC	18
E21A3b006	Ductless Mini-split Heat Pump (heating) - Lost Opportunity	ES HVAC	18
E21A3b032	Ductless Mini-split Heat Pump - Retrofit HP	ES HVAC	18
E21A3b031	Ductless Mini-split Heat Pump - Retrofit Resistance	ES HVAC	18

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b005	Ductless Mini-split Heat Pump (cooling) - Lost Opportunity	ES HVAC	1.00	1.00	1.00	1.00	1.00	0.29	0.00
E21A3b006	Ductless Mini-split Heat Pump (heating) - Lost Opportunity	ES HVAC	1.00	1.00	1.00	1.00	1.00	0.00	0.62
E21A3b032	Ductless Mini-split Heat Pump - Retrofit HP	ES HVAC	1.00	1.00	1.00	1.00	1.00	0.29	0.62
E21A3b031	Ductless Mini-split Heat Pump - Retrofit Resistance	ES HVAC	1.00	1.00	1.00	1.00	1.00	0.29	0.62

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors<sup>10</sup>:

Coincidence factor of 29% during cooling season and a coincidence factor of 62% for the heating season should be applied.

### **Energy Load Shape:**

For cooling, see Appendix 1 – Mini-Split Air Conditioner/Heat Pump (Cooling)

For heating, see Appendix 1 – Mini-Split Heat Pump (Heating)

### **Endnotes:**

- 1: Conversion factor is based on internal ERS analysis of Mass Save and NEEP ccASHP product data.
- 2: Since IECC does not provide EER requirements for air-cooled heat pumps < 65 kBtu/h, assume the following conversion from SEER to EER:  $EER \approx SEER/1.1$ .
- 3: International Energy Conservation Code 2015, table C403.2.3(2) Minimum Efficiency Requirements: Electrically Operated Unitary and Applied Heat Pumps
- 4: Electric heating system has COP = 1, which converts to an HSPF value of 3.412 Btu/w-h
- 5: ASHRAE 90.1 2004 table 6.8.1B Electrically Operated Unitary and Applied Heat Pumps - Minimum Efficiency Requirements.
- 6: MA TRM DMSHP measure. This value in the MA TRM has been agreed upon by EEAC consultants. We believe that this value accurately represents actual fossil fuel heating equipment efficiencies which include efficiency degradation over the age of the equipment. [MA TRM DMSHP](#).
- 7: Cooling hours from Cadmus Group (2016), Ductless Mini-Split Heat Pump Impact Evaluation, December 30, 2016. [Cadmus 2016 DMSHP Impact Evaluation](#)
- 8: Heating hours from Navigant Consulting (2018), Quick Hit Study: Ductless Mini-Split Heat Pump Survey (RES 29), March 30, 2018. Assumes higher heating hours for displacement of electric heat based on top 25% EFLH (heating) reported in Cadmus Group (2016), Ductless Mini-Split Heat Pump Impact Evaluation, December 30, 2016. [Navigant 2018 DMSHP Survey](#).
- 9: [GDS Associates, Inc. \(2007\)](#). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group; Page 1-3, Table 1.
- 10: Coincidence factors come from the Navigant Demand Impact model analysis spreadsheet – MA, Aug 2018.

### 1.30. HVAC – Heat Recovery Ventilator

Measure Code	[To Be Defined in ANB system]
Market	Residential
Program Type	Lost Opportunity
Category	HVAC

**Description:**

Heat recovery ventilators (HRVs) and energy recovery ventilators (ERVs) can help make mechanical ventilation more cost effective by reclaiming energy from exhaust airflows.

**Baseline Efficiency:**

The baseline efficiency case is an ASHRAE 62.2-compliant exhaust fan system with no heat recovery.

**High Efficiency:**

The high efficiency case is an exhaust fan system with heat recovery.

**Algorithms for Calculating Primary Energy Impact:**

Unit savings are deemed based on study results<sup>1</sup>

BC Measure ID	Measure Name	Program	Δmmbtu
G21A3b010	Heat Recovery Ventilator	ES Products	8.6
	Energy Recovery Ventilator	ES Products	8.8

**Measure Life:**

The measure life is 20 years<sup>1</sup>.

**Other Resource Impacts:**

An electric penalty results due to the electricity consumed by the system fans<sup>1</sup>.

BC Measure ID	Measure Name	Fuel Type	Program	ΔkWh/Unit	ΔkW/Unit
G21A3b010	Heat Recovery Ventilator	Electric	ES Products	-171	-0.020
	Energy Recovery Ventilator	Electric	ES Products	-127	-0.014

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21A3b010	Heat Recovery Ventilator	ES Products	1.00	1.00	1.00	1.00	1.00	0.00	1.00
	Energy Recovery Ventilator	ES Products	1.00	1.00	1.00	1.00	1.00	0.00	1.00

In-Service Rates:

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Summer and winter coincidence factors are estimated using demand allocation methodology described by the Cadmus Demand Impact Model (2012) prepared for MA Program Administrators.

**Energy Load Shape:**

See Appendix 1.

Endnotes:

**1:** Guidehouse, August 2020. Comprehensive TRM Review MA19R17-B-TRM. Prepared for The Electric and Gas Program Administrators of Massachusetts.

## 1.31. HVAC- Swimming Pool Heater

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Custom

### Description:

The installation of a high efficiency heat pump or gas swimming pool heater.

### Baseline Efficiency:

The base case is a new, standard efficiency electric resistance hot water heater.

### High Efficiency:

The high efficiency case is a heat pump or gas-fired water heater.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>1</sup>

Measure ID	Measure Name	Program	$\Delta kWh$	$\Delta kW$
E21A3b009	Heat Pump Swimming Pool Heater, <55 gallon, Energy Star	ES Products	1592	0.100
E21A3b009	Heat Pump Swimming Pool Heater, >55 gallon, UEF 2.70	ES Products	197	0.018
G21A3b016	Gas Swimming Pool Heater	ES Products	2550	0.160

### Measure Life:

The measure life is 13 years<sup>1</sup>.

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3b009	Heat Pump Swimming Pool Heater	ES Products	1.00	1.00	n/a	1.00	0.00	0.31	0.00
G21A3b016	Gas Swimming Pool Heater	ES Products	1.00	1.00	n/a	1.00	0.00	0.31	0.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Programs use a summer coincidence factor of 31% and a winter coincidence factor of 0% since pool pumps do not operate during winter.

**Energy Load Shape:**

See Appendix 1.

Endnotes:

1: Navigant Consulting, 2018. Water Heating, Boiler, and Furnace Cost Study (RES 19) Add-On Task 7: Residential Water Heater Analysis Memo. 2018\_Navigant\_Water\_Heater\_Analysis\_Memo

## 1.32. Lighting - Fixture

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Lighting

### Description:

The installation of Light-Emitting Diode (LED) fixtures, which offer comparable luminosity to incandescent and halogen fixtures at significantly less wattage and significantly longer lifetimes.

### Baseline Efficiency:

The baseline efficiency case for a lost opportunity LED fixture is a combination of an incandescent fixture, halogen fixture, and a compact fluorescent fixture. The baseline efficiency case for a retrofit LED fixture is a combination of an incandescent fixture and halogen fixture.

### High Efficiency:

The high efficiency case is an ENERGY STAR ® rated LED fixture.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are based on the algorithm below. Demand savings are derived from the Navigant Demand Impact Model.

Vendor calculated unit savings are calculated using the following algorithms and assumptions:

$$\Delta kWh = ((Watts\_Ineff - Watts\_EE) \times HOU)) / 1000 \times Qty\_Bulbs \times 365$$

$$\Delta kW = \Delta kWh \times kW/kWh$$

Watts\_Ineff = Rated watts of inefficient bulbs (either removed, through retrofit, or assumed to have been installed, through lost opportunity)

Watts\_EE = Rated watts of efficient bulbs installed

Qty\_Bulbs = Number of bulbs per fixture

365 = Days per year

HOU = Daily hours of use. The hours of use are largely based on recent NH evaluation studies for the ENERGY STAR Products Program and the Home Performance with ENERGY STAR Program, as well as increased hours of operation for ENERGY STAR Products to account for cross-sector sales at retailers (i.e., businesses purchasing program incented fixtures). The direct installation delivery strategies (HPwES) are based on residential hours only but reflect higher hours of use since the programs direct

contractors to only replace fixtures that are used for at least three hours per day. The following summarizes the key assumptions for daily hours of use:<sup>1</sup>

- Lost opportunity LEDs installed in residential applications: 1.75 hours/day
- Lost opportunity LEDs installed in commercial applications (7% of all lost opportunity fixtures): 7 hours/day
- Retrofit HPwES LEDs (all installed in residential applications): 3.0 hours/day
- Retrofit HEA LEDs: (all installed in residential applications): 3.0 hours/day

Delta watts (WattsINEFF – WattsEE) are broken out by delivery strategy, and reflect a mix of program fixture wattages (for the efficient wattage), removed fixtures (for retrofit inefficient fixtures), and a blended mix of incandescents, halogens, and CFLs that would have been purchased in absence of the program measure.<sup>2</sup>

BC Measure ID	Measure Name	Program	Delta Watts per Fixture	Daily HOU	Number of Bulbs	ΔkWh	ΔkW	
E21A3a009	LED Fixture	ES Products	34.2	2.1	1	26.4	0.03	
E21A2a048	LED Fixture	HPwES	34.2	3	1	37.4	0.02	
E21B1a048	LED Fixture	HEA	Vendor Calculated					
E21A3a010	LED Fixture (Hard to Reach)	ES Products	34.2	2.1	1	26.4	0.02	
E21A1a024	LED Fixture	ES Homes	8.55	1.75	1	5.5	0.01	

### Measure Life:

The table below summarizes the measure lives for each of the measures listed above. Note these measure lives have been adjusted to account for the differential in measure life between the inefficient fixtures and LED fixtures (as well as the remaining useful life in the retrofit cases), and the potential for future lighting standards to lead the same sockets reached through the program to have been occupied by an LED in a period shorter than the technical life of the LED.<sup>3</sup>

BC Measure ID	Measure Name	Program	Adjusted Measure Life
E21A3a009	LED Fixture	ES Products	3
E21A2a048 E21B1a048	LED Fixture	HPwES/HEA	2
E21A3a010	LED Fixture (Hard to Reach)	ES Products	3
E21A1a024	LED Fixture	ES Homes	3

### Other Resource Impacts:

Based on the 2018 NH Energy Star Products Program Evaluation report, fossil fuel interactive penalties for residential lighting programs are -2,272 Btu/kWh saved.<sup>8</sup>

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3a009	LED Fixture	ES Products	100%	100%	100%	100%	100%	0.55	0.85
E21A2a048	LED Fixture	HPwES	99%	100%	100%	100%	100%	0.55	0.85
E21B1a048	LED Fixture	HEA	100%	91%	100%	100%	100%	0.55	0.85
E21A3a010	LED Fixture (Hard to Reach)	ES Products	100%	100%	100%	100%	100%	0.55	0.85
E21A1a024	LED Fixture	ES Homes	100%	100%	100%	100%	100%	0.55	0.85

In-Service Rates:

All HEA installations use an in-service rate of 100% because HEA realization rates account for uninstalled measures. All HPwES installations use in-service rate of 99% based on evaluation results.<sup>59</sup> All other installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

Based on evaluation results, all HEA installations use a realization rate of 91% and all HPwES installations use a realization rate of 100% because gross savings assumptions are adjusted to reflect evaluated results.<sup>59</sup> All other installations have a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence factors are based on prescriptive loadshapes from the updated Navigant Massachusetts Demand Impact Model.<sup>6</sup>

**Energy Load Shape:**

See Appendix 1 – “Lighting”.<sup>6</sup>

**Impact Factors for Calculating Net Savings:<sup>7</sup>**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21A3a009	LED Fixture	ES Products	67%	n/a	n/a	33%
E21A3a010	LED Fixture (Hard to Reach)	ES Products	47%	n/a	n/a	53%

Endnotes:

**1:** Hours of use (residential) for the ES Products and HTR channel are based off of “New Hampshire ENERGY STAR® Products Program”, prepared by Cadmus for the New Hampshire ENERGY STAR

Products New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018. The values reflect the daily weighted average LED hours of use. Cross-sector sales are based upon MA RLPNC Cross-Sector Sale HOU Update”, Prepared by the NMR Group for the Massachusetts Program Administrators (PAs), August 2, 2018. The 2.1 hours per day for ES Products and HTR are calculated as the weighted combination of residential and commercial hours of use: (residential HOU\*residential %)+(commercial HOU\*commercial %) = (1.75\*0.93)+(7.0\*0.07). HOU for ES Homes reflects the residential HOU only. Hours of use for the HPwES and HEA are based on program requirements for contractors to only replace fixtures that are used for at least three hours per day.

**2:** The delta watts are based off of the “MA PAs (2018). 2019-2021 Lighting Worksheet”

(<https://etrm.anbetrack.com/etrm/api/v1/etrm/documents/5bd06d1d6c50367b3deba017/view?authToken=fe238b4571e888c7558f844a02040d1941948e021564ac20156f12ece790e6a86c8a6c488b1d838694b8d9>). Note the delta watts for ES Homes is reduced by 75% to reflect the requirement that 75% of lamps be high-efficacy lamps for new construction

([https://www.energycodes.gov/sites/default/files/becu/2015\\_IECC\\_residential\\_requirements.pdf](https://www.energycodes.gov/sites/default/files/becu/2015_IECC_residential_requirements.pdf)).

**3:** The direct installation measure life values come from RLPNC 18-5 Home Energy Assessment LED Net-to-Gross Consensus, Prepared by NMR Group, Inc. for the 2019—21 Planning Assumptions: Lighting Hours-of-Use and In-Service Rate, Prepared by NMR Group, Inc. for the Massachusetts Program Administrators (PAs) and Energy Efficiency Advisory Council (EEAC) Consultants, July 23, 2018 ([http://ma-eeac.org/wordpress/wp-content/uploads/RLPNC\\_185\\_HEALEDTG\\_REPORT\\_23July2018\\_Final.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RLPNC_185_HEALEDTG_REPORT_23July2018_Final.pdf)). These values reflect early replacement baselines, and assume that the replaced bulb, when it burnt out, would have been replaced by an LED at that time. Lighting measures with lost opportunity baselines (e.g., ES Products) add a year to measure life to reflect the different baseline as well as significantly lower hours of use.

**4:** In-service rates for ES Products and HTR channel, as well as ES Homes, are based on MA assumptions of 100% ISR for fixtures. In-service rates for HPwES and HEA are based on the NH study “Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL,” Prepared by Opinion Dynamics Corporation, June 11, 2020.

<https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/NHSaves-HPwES-Evaluation-Report-Final-20200611.pdf>

**5:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

**6:** Navigant, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**7:** “R1615 Light Emitting Diode (LED) Net-to- Gross Evaluation,” Prepared by the NMR Group, Inc. for the Connecticut EEB, August 7, 2017. The 2020 Connecticut net-to-gross values are applied to New Hampshire for 2021 to account for the relatively slower pace of market transformation, due in part to fewer program bulbs per home in New Hampshire (2.5 bulbs per home in 2019) compared to Connecticut (4 bulbs per home in 2019).

**8:** Table 22. PY2016 Residential Lighting Energy Savings by Utility. Shows evaluated annual net electric energy savings, and evaluated penalties for gas, oil, and propane. Using the values for Eversource, a total calculated heating energy penalty of 341,757,000,000 Btu was assessed on the 150,403,000 kWh of electrical energy savings. “New Hampshire ENERGY STAR® Products Program 2016 Evaluation Report”, prepared by Cadmus for the New Hampshire ENERGY STAR Products New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018.

**9:** Opinion Dynamics, July 29 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

### 1.33. Lighting – LED Lamp

Measure Code	[To Be Defined in ANB system]
Market	Residential
Program Type	Retrofit/Lost Opportunity
Category	Lighting

#### Description:

The installation of Light-Emitting Diode (LED) screw-in lamps and linear LEDs. LEDs offer comparable luminosity to incandescent and halogen lamps at significantly less wattage and significantly longer lamp lifetimes.

#### Baseline Efficiency:

The baseline efficiency case lost opportunity is a combination of an incandescent lamp, halogen lamp, and a compact fluorescent lamp. The baseline efficiency case for retrofit LED lamps is a combination of an incandescent lamp and halogen lamp.

#### High Efficiency:

The high efficiency case is an ENERGY STAR ® rated LED lamp.

#### Algorithms for Calculating Primary Energy Impact:

Unit savings are based on the algorithm below. Demand savings are derived from the Navigant Demand Impact Model.

Vendor calculated unit savings are calculated using the following algorithms and assumptions:<sup>1</sup>

$$\Delta kWh = ((Watts\_Ineff - Watts\_EE) \times HOU) / 1000 \times 365$$

$$\Delta kW = \Delta kWh \times kW/kWh$$

Watts\_Ineff = Rated watts of inefficient lamps (either removed, through retrofit, or assumed to have been installed in lieu of the program lamps, through lost opportunity)

Watts\_EE = Rated watts of efficient lamps installed

365 = Days per year

HOU = Daily hours of use. The hours of use are largely based on recent NH evaluation studies for the ENERGY STAR Products Program and the Home Performance with ENERGY STAR Program, as well as increased hours of operation for ENERGY STAR Products to account for cross-sector sales at retailers (i.e., businesses purchasing program incented lamps). The direct installation delivery strategies (HPwES, HEA) are based on residential hours only but reflect higher hours of use since the programs direct

contractors to only replace lamps that are used for at least three hours per day. The following summarizes the key assumptions for daily hours of use:<sup>2</sup>

- Lost opportunity LEDs installed in residential applications: 1.75 hours/day
- Lost opportunity LEDs installed in commercial applications (7% of all lost opportunity lamps): 7 hours/day
- Retrofit HPwES LEDs (all installed in residential applications): 3.0 hours/day
- Retrofit HEA LEDs: (all installed in residential applications): 3.0 hours/day

Delta watts (Watts\_Ineff – Watts\_EE) are broken out by lamp style and delivery strategy, and reflect a mix of program lamp wattages (for the efficient wattage), removed lamps (for retrofit inefficient lamps), and a blended mix of incandescents, halogens, and CFLs that would have been purchased in absence of the program measure (for lost opportunity inefficient lamps).<sup>3, 11</sup>

Note that the ENERGY STAR Homes values represent a weighted average (based on the distribution of LEDs in NH homes as identified as part of a recent saturation study) of general service lamps, reflectors, and other specialty values.<sup>4</sup> The linear lamp values are based off of a separate research project in MA that specifically examined the characteristics (e.g., incented technologies, rooms with linear lamps) of linear LEDs.<sup>5</sup>

BC Measure ID	Measure Name	Program	Delta Watts	Daily HOU	ΔkWh	ΔkW
E21A3a001	General Service Lamps	ES Products	40	2.1	30.7	0.04
E21A3a004	Reflector	ES Products	43	2.1	33.0	0.04
E21A3a003	Other Specialty	ES Products	35	2.1	26.8	0.04
E21A3a002	Linear	ES Products	17.9	1.6	10.5	0.02
E21A2a044	General Service Lamps	HPwES	32.2	3.0	35.3	0.03
E21A2a047	Reflector	HPwES	46.2	3.0	50.6	0.05
E21A2a046	Other Specialty	HPwES	46.2	3.0	50.6	0.05
E21A2a045	Linear	HPwES	17.9	3.0	19.6	0.02
E21B1a044	General Service Lamps	HEA	Vendor Calculated			
E21B1a047	Reflector	HEA	Vendor Calculated			
E21B1a046	Other Specialty	HEA	Vendor Calculated			
E21B1a045	Linear	HEA	Vendor Calculated			
E21A3a005	General Service Lamps (Hard to Reach)	ES Products	40	2.1	30.7	0.04
E21A3a008	Reflector (Hard to Reach)	ES Products	43	2.1	33.0	0.04
E21A3a007	Other Specialty (Hard to Reach)	ES Products	35	2.1	26.8	0.04
E21A3a006	Linear (Hard to Reach)	ES Products	17.9	1.6	10.5	0.02
E21A1a023	ES Homes Lighting	ES Homes	10.2	1.75	6.5	0.01
	General Service Lamps	Drop Ship	40	1.75	25.6	0.04

	Reflector	Drop Ship	43	1.75	27.5	0.04
	Other Specialty	Drop Ship	35	1.75	22.4	0.04

### Measure Life:

The table below summarizes the measure lives for each of the measures listed above. Note these measure lives have been adjusted to account for the differential in measure life between the inefficient lamps and LEDs (as well as the remaining useful life in the retrofit cases), and the potential for future lighting standards to lead the same sockets reached through the program to have been occupied by an LED in a period shorter than the technical life of the LED.<sup>6</sup>

BC Measure ID	Measure Name	Program	Adjusted Measure Life
E21A3a001	General Service Lamps	ES Products/Drop Ship	3
E21A3a004	Reflector	ES Products/Drop Ship	2
E21A3a003	Other Specialty	ES Products/Drop Ship	3
E21A3a002	Linear	ES Products	10
E21A2a044 E21B1a044	General Service Lamps	HPwES/HEA	2
E21A2a047 E21B1a047	Reflector	HPwES/HEA	2
E21A2a046 E21B1a046	Other Specialty	HPwES/HEA	2
E21A2a045 E21B1a045	Linear	HPwES/HEA	10
E21A3a005	General Service Lamps (Hard to Reach)	ES Products	3
E21A3a008	Reflector (Hard to Reach)	ES Products	2
E21A3a007	Other Specialty (Hard to Reach)	ES Products	3
E21A3a006	Linear (Hard to Reach)	ES Products	10
E21A1a023	ES Homes Lighting	ES Homes	3

### Other Resource Impacts:

Based on the 2018 NH Energy Star Products Program Evaluation report, fossil fuel interactive penalties for residential lighting programs are -2,272 Btu/kWh saved.<sup>10</sup>

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3a001	General Service Lamps	ES Products	0.86	1.00	100%	100%	100%	0.547	0.848
E21A3a004	Reflector	ES Products	0.89	1.00	100%	100%	100%	0.547	0.848
E21A3a003	Other Specialty	ES Products	0.89	1.00	100%	100%	100%	0.547	0.848
E21A3a002	Linear	ES Products	0.89	1.00	100%	100%	100%	0.547	0.848
E21A2a044 E21B1a044	General Service Lamps	HPwES/HEA	0.99 1.00	1.00 0.91	100%	100%	100%	0.547	0.848
E21A2a047 E21B1a047	Reflector	HPwES/HEA	0.99 1.00	1.00 0.91	100%	100%	100%	0.547	0.848
E21A2a046 E21B1a046	Other Specialty	HPwES/HEA	0.99 1.00	1.00 0.91	100%	100%	100%	0.547	0.848
E21A2a045 E21B1a045	Linear	HPwES/HEA	0.99 1.00	1.00 0.91	100%	100%	100%	0.547	0.848

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A3a005	General Service Lamps (Hard to Reach)	ES Products	0.86	1.00	100%	100%	100%	0.547	0.848
E21A3a008	Reflector (Hard to Reach)	ES Products	0.89	1.00	100%	100%	100%	0.547	0.848
E21A3a007	Other Specialty (Hard to Reach)	ES Products	0.89	1.00	100%	100%	100%	0.547	0.848
E21A3a006	Linear (Hard to Reach)	ES Products	0.89	1.00	100%	100%	100%	0.547	0.848
E21A1a023	ES Homes Lighting	ES Homes	1.00	1.00	100%	100%	100%	0.547	0.848
	General Service Lamps	Drop Ship	50%	100%	100%	100%	100%	0.547	0.848
	Reflector	Drop Ship	50%	100%	100%	100%	100%	0.547	0.848
	Other Specialty	Drop Ship	50%	100%	100%	100%	100%	0.547	0.848

**In-Service Rates:**

All HEA installations use an in-service rate of 100% because HEA realization rates account for uninstalled measures<sup>12</sup>. All HPwES installations use an in-service rate of 99%.<sup>4</sup> In-service for all other installations are based on MA evaluations.<sup>7</sup>

**Realization Rates:**

Based on evaluation results, all HEA installations use a realization rate of 91%.<sup>12</sup> All HPwES installations use a realization rate of 100% because gross savings assumptions are adjusted to reflect evaluated results.<sup>4</sup> All other installations have a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

Coincidence factors are based on prescriptive loadshapes from the updated Navigant Massachusetts Demand Impact Model.<sup>8</sup>

**Energy Load Shape:**

See Appendix 1 – “Lighting”.<sup>8</sup>

### Impact Factors for Calculating Net Savings:<sup>9</sup>

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21A3a001	General Service Lamps	ES Products	67%	n/a	n/a	33%
E21A3a004	Reflector	ES Products	67%	n/a	n/a	33%
E21A3a003	Other Specialty	ES Products	67%	n/a	n/a	33%
E21A3a002	Linear	ES Products	67%	n/a	n/a	33%
E21A3a005	General Service Lamps (Hard to Reach)	ES Products	47%	n/a	n/a	53%
E21A3a008	Reflector (Hard to Reach)	ES Products	47%	n/a	n/a	53%
E21A3a007	Other Specialty (Hard to Reach)	ES Products	47%	n/a	n/a	53%
E21A3a006	Linear (Hard to Reach)	ES Products	47%	n/a	n/a	53%

#### **Endnotes:**

- 1:** Note that interactive effects require modeling HVAC end-use consumption based on home characteristics and equipment (e.g., cooling, heating fuel) saturation assumptions. The data and models were not available for New Hampshire, so are not included in the TRM.
- 2:** Hours of use (residential) for the ES Products and HTR channel are based off of “New Hampshire ENERGY STAR® Products Program”, prepared by Cadmus for the New Hampshire ENERGY STAR Products New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018. The values reflect the daily weighted average LED hours of use. Cross-sector sales are based upon MA RLPNC Cross-Sector Sale HOU Update”, Prepared by the NMR Group for the Massachusetts Program Administrators (PAs), August 2, 2018. The 2.1 hours per day for ES Products and HTR channel are calculated as the weighted combination of residential and commercial hours of use: (residential HOU\*residential %)+(commercial HOU\*commercial %) = (1.75\*0.93)+(7.0\*0.07). HOU for ES Homes reflects the residential HOU only. Hours of use for the HPwES and HEA are based on program requirements for contractors to only replace fixtures that are used for at least three hours per day.
- 3:** NMR, 2020. Delta Watt Update (MA19R09-E). Delta watts for ES Products and HTR are based on both historical lamps sales in Massachusetts and the most recently available market adoption model (for PY2021). Note that Massachusetts data were used because the New Hampshire ENERGY STAR Product evaluation had not stratified the program data or forecasted baseline wattage by style at the time of this TRM. The delta watts for ES Homes is reduced by 75% to reflect the requirement that 75% of lamps be high-efficacy lamps for new construction ([https://www.energycodes.gov/sites/default/files/becu/2015\\_IECC\\_residential\\_requirements.pdf](https://www.energycodes.gov/sites/default/files/becu/2015_IECC_residential_requirements.pdf)).
- 4:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.
- 5:** RLPNC 18-7: TLED Product Impact Factor Estimation, Memo from NMR Group, Inc. to the Massachusetts Program Administrators, August 3, 2018.
- 6:** The direct installation measure life values come from RLPNC 18-5 Home Energy Assessment LED Net-to-Gross Consensus, Prepared by NMR Group, Inc. for the 2019—21 Planning Assumptions: Lighting Hours-of-Use and In-Service Rate, Prepared by NMR Group, Inc. for the Massachusetts Program Administrators (PAs) and Energy Efficiency Advisory Council (EEAC) Consultants, July 23,

2018 ([http://ma-eeac.org/wordpress/wp-content/uploads/RLPNC\\_185\\_HEALEDNTG\\_REPORT\\_23July2018\\_Final.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RLPNC_185_HEALEDNTG_REPORT_23July2018_Final.pdf)). These values reflect early replacement baselines, and assume that the replaced bulb, when it burnt out, would have been replaced by an LED at that time. Lighting measures with lost opportunity baselines (e.g., ES Products) add a year to measure life to reflect the different baseline as well as significantly lower hours of use.

**7:** In-service rates for ES Products and HTR channel are based on the MA study “RLPNC 179: 2019—21 Planning Assumptions: Lighting Hours-of-Use and In-Service Rate,” Prepared by the NMR Group, Inc. for the Massachusetts Program Administrators, July 13, 2018. Note the ISR is adjusted downward for lamps that are assumed to never be installed but does account (through discounted values) for lamps that are not immediately installed but are likely to be installed in the future. The ISR for Drop Ship is estimated based on program experience with lighting kits and will be evaluated.

**8:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**9:** “R1615 Light Emitting Diode (LED) Net-to- Gross Evaluation,” Prepared by the NMR Group, Inc. for the Connecticut EEB, August 7, 2017. The 2020 Connecticut net-to-gross values are applied to New Hampshire for 2021 to account for the relatively slower pace of market transformation, due in part to fewer program bulbs per home in New Hampshire (2.5 bulbs per home in 2019) compared to Connecticut (4 bulbs per home in 2019).

**10:** Table 22. PY2016 Residential Lighting Energy Savings by Utility. Shows evaluated annual net electric energy savings, and evaluated penalties for gas, oil, and propane. Using the values for Eversource, a total calculated heating energy penalty of 341,757,000,000 Btu was assessed on the 150,403,000 kWh of electrical energy savings. “New Hampshire ENERGY STAR® Products Program 2016 Evaluation Report”, prepared by Cadmus for the New Hampshire ENERGY STAR Products New Hampshire Evaluation Measurement & Verification Working Group, October 17, 2018.

**11:** Delta watts for HPwES are based on NH study “Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL,” Prepared by Opinion Dynamics Corporation, June 11, 2020. <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/NHSaves-HPwES-Evaluation-Report-Final-20200611.pdf>

**12:** Opinion Dynamics, July 29, 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.

## 1.34. Thermostat – Wi-Fi Communicating

<b>Measure Code</b>	TBD
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

A communicating Wi-Fi enabled thermostat which allows remote set point adjustment and control via remote application. System requires an outdoor air temperature algorithm in the control logic to operate heating and cooling systems. This measure includes thermostats only with communication features and does not extend to Energy Star rated smart thermostats.

### Baseline Efficiency:

The baseline efficiency case is an HVAC system with either a manual or a programmable thermostat.

### High Efficiency:

The high efficiency case is an HVAC system that has a Wi-Fi thermostat installed.

### Algorithms for Calculating Primary Energy Impact: <sup>4</sup>

Unit savings are deemed based primarily on impact evaluation results.<sup>4</sup> For fuels that were not included in the impact evaluation (i.e. kerosene and wood pellets), unit savings are instead based on secondary research recommendations.<sup>1</sup>

Direct install thermostats that control both heating and cooling systems should claim savings using the Cooling measure in the last line of the table below in addition to the relevant heating savings measure line.

BC Measure ID	Measure Name	Energy Type	Program	$\Delta kWh$	$\Delta kW$	$\Delta MMbtu$
E21B1b015 E21A2b015	Wi-Fi Thermostat, Electric Heating	Electricity	HEA HPwES	419.0	0	n/a
E21B1b016 G21B1b004 E21A2b016 G21A2b004	Wi-Fi Thermostat, Gas	NG - Res Heating	HEA HPwES	n/a	n/a	5.80
E21B1b017 E21A2b017	Wi-Fi Thermostat, Kerosene	Kerosene	HEA HPwES	n/a	n/a	3.10
E21B1b018 E21A2b018	Wi-Fi Thermostat, Oil	Fuel Oil - Residential Distillate	HEA HPwES	n/a	n/a	5.90

E21B1b019 E21A2b019	Wi-Fi Thermostat, Propane	Propane	HEA HPwES	n/a	n/a	5.80
E21B1b020 E21A2b020	Wi-Fi Thermostat, Wood Pellets	Pellet Wood	HEA HPwES	n/a	n/a	3.10
E21A3b026	Wi-Fi Thermostat (Heating & Cooling)	Fuel Blind	ES Products	66.7	0.1	4.92
G21A3b020	Wi-Fi Thermostat (Heating & Cooling)	NG - Res Heating	ES Products	n/a	n/a	4.92
G21A3b019	WiFi Thermostat (Heating Only)	NG - Res Heating	ES Products	n/a	n/a	4.92
	Wi-Fi Thermostat (Cooling Only)	Electricity	ES Products	46.0	0.1	n/a

**Measure Life:**

The measure life is 15 years.<sup>2</sup>

**Other Resource Impacts:**

No other impacts are reported.

**Impact Factors for Calculating Adjusted Gross Savings:** <sup>1,3,4</sup>

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1b015 E21A2b015	Wi-Fi Thermostat, Electric	Electricity	HEA HPwES	1.00 0.99	0.91 1.00	n/a	n/a	n/a	0.00	1.00

E21B1b016 E21A2b016	Wi-Fi Thermostat, Gas	NG - Res Heating	HEA HPwES	1.00 0.99	n/a	0.91 1.00	n/a	n/a	n/a	n/a
E21B1b017 E21A2b017	Wi-Fi Thermostat, Kerosene	Kerosene	HEA HPwES	1.00 0.99	n/a	0.91 1.00	n/a	n/a	n/a	n/a
E21B1b018 E21A2b018	Wi-Fi Thermostat, Oil	Fuel Oil - Residential Distillate	HEA HPwES	1.00 0.99	n/a	0.91 1.00	n/a	n/a	n/a	n/a
E21B1b019 E21A2b019	Wi-Fi Thermostat, Propane	Propane	HEA HPwES	1.00 0.99	n/a	0.91 1.00	n/a	n/a	n/a	n/a
E21B1b020 E21A2b020	Wi-Fi Thermostat, Wood Pellets	Pellet Wood	HEA HPwES	1.00 0.99	n/a	0.91 1.00	n/a	n/a	n/a	n/a
E21A3b026	Wi-Fi Thermostat (Heating & Cooling)	NG- Res Heating	ES Products	1.00	1.00	1.00	n/a	n/a	0.35	0.00
G21A3b020	Wi-Fi Thermostat (Heating & Cooling)	NG - Res Heating	ES Products	1.00	1.00	1.00	n/a	n/a	0.35	0.00
G21A3b019	WiFi Thermostat (Heating Only)	NG - Res Heating	ES Products	1.00	1.00	1.00	n/a	n/a	0.35	0.00

**In-Service Rates:**

All HEA installations have a 100% in-service-rate and all HPwES installations have a 99% in-service rate based on evaluation results.<sup>5,6</sup> All ES Products installations use a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All HEA installations have a 91% realization rate and all HPwES installations have a 100% realization rate based on evaluation results.<sup>5,6</sup> All ES Products installations use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

Summer and winter coincidence factors are estimated using demand allocation methodology described in the Navigant Demand Impact Model prepared for MA Program Administrators.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1 “Weighted HVAC- All Homes”

**Endnotes:**

- 1:** Navigant Consulting, September 2018. Wi-Fi Thermostat Impact Evaluation--Secondary Research Study Memo. [http://ma-eeac.org/wordpress/wp-content/uploads/Wi-Fi-Thermostat-Impact-Evaluation-Secondary-Literature-Study\\_FINAL.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/Wi-Fi-Thermostat-Impact-Evaluation-Secondary-Literature-Study_FINAL.pdf)
- 2:** Environmental Protection Agency, 2010. Life Cycle Cost Estimate for ENERGY STAR Programmable Thermostat. Assumed to have the same lifetime as a regular programmable thermostat
- 3:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>
- 4:** Navigant Consulting, August 2018. Home Energy Services (HES) Impact Evaluation. [http://ma-eeac.org/wordpress/wp-content/uploads/RES34\\_HES-Impact-Evaluation-Report-with-ES\\_FINAL\\_29AUG2018.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RES34_HES-Impact-Evaluation-Report-with-ES_FINAL_29AUG2018.pdf)
- 5:** Opinion Dynamics, July 29, 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.
- 6:** Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

## 1.35. Thermostat – Programmable

<b>Measure Code</b>	
<b>Market</b>	Residential
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

Installation of a programmable thermostat, which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.

### Baseline Efficiency:

The baseline efficiency case is an HVAC system without a programmable thermostat: either a manual thermostat or no thermostat.

### High Efficiency:

The high efficiency case is an HVAC system that has a programmable thermostat installed.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on evaluation results.<sup>1</sup>

BC Measure ID	Measure Name	Energy Type	Program	ΔkWh	ΔkW	ΔMMbtu
E21B1b009	Programmable Thermostat, Electric Heat	Electricity	B1b - HEA (HVAC Systems)	278.0	0	n/a
E21B1b010	Programmable Thermostat, Gas	NG - Res Heating	B1b - HEA (HVAC Systems)	n/a	n/a	3.50
E21B1b011	Programmable Thermostat, Kerosene	Kerosene	B1b - HEA (HVAC Systems)	n/a	n/a	3.50
E21B1b012	Programmable Thermostat, Oil	Fuel Oil - Residential Distillate	B1b - HEA (HVAC Systems)	n/a	n/a	3.50
E21B1b013	Programmable Thermostat, Propane	Propane	B1b - HEA (HVAC Systems)	n/a	n/a	3.50

E21B1b014	Programmable Thermostat, Wood Pellets	Pellet Wood	B1b - HEA (HVAC Systems)	n/a	n/a	3.50
E21A2b009	Programmable Thermostat, Electric	Electricity	A2b - HPwES (HVAC Systems)	251.0	0	n/a
E21A2b010	Programmable Thermostat, Gas	NG - Res Heating	A2b - HPwES (HVAC Systems)	n/a	n/a	3.50
E21A2b011	Programmable Thermostat, Kerosene	Kerosene	A2b - HPwES (HVAC Systems)	n/a	n/a	3.50
E21A2b012	Programmable Thermostat, Oil	Fuel Oil - Residential Distillate	A2b - HPwES (HVAC Systems)	n/a	n/a	3.50
E21A2b013	Programmable Thermostat, Propane	Propane	A2b - HPwES (HVAC Systems)	n/a	n/a	3.50
E21A2b014	Programmable Thermostat, Wood Pellets	Pellet Wood	A2b - HPwES (HVAC Systems)	n/a	n/a	3.50
TBD	Programmable Thermostat, AC only	Electricity	TBD	27.0	0	n/a

Thermostats that control both heating and central cooling may claim savings for both cooling (27.0 kWh/yr) and heating impacts (by fuel).

**Measure Life:**

The measure life is 15 years.<sup>2</sup>

**Other Resource Impacts:**

No other resource impacts are included.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21B1b009	Programmable Thermostat, Electric	Electricity	B1b - HEA (HVAC Systems)	1.00	0.91	0.00	n/a	1.00	0.00	1.00
E21B1b010	Programmable Thermostat, Gas	NG - Res Heating	B1b - HEA (HVAC Systems)	1.00	n/a	0.91	n/a	1.00	n/a	n/a
E21B1b011	Programmable Thermostat, Kerosene	Kerosene	B1b - HEA (HVAC Systems)	1.00	n/a	0.91	n/a	1.00	n/a	n/a
E21B1b012	Programmable Thermostat, Oil	Fuel Oil - Residential Distillate	B1b - HEA (HVAC Systems)	1.00	n/a	0.91	n/a	1.00	n/a	n/a
E21B1b013	Programmable Thermostat, Propane	Propane	B1b - HEA (HVAC Systems)	1.00	n/a	0.91	n/a	1.00	n/a	n/a
E21B1b014	Programmable Thermostat, Wood Pellets	Pellet Wood	B1b - HEA (HVAC Systems)	1.00	n/a	0.91	n/a	1.00	n/a	n/a
E21A2b009	Programmable Thermostat, Electric	Electricity	A2b - HPwES (HVAC Systems)	0.99	1.00	n/a	n/a	1.00	0.00	1.00
E21A2b010	Programmable Thermostat, Gas	NG - Res Heating	A2b - HPwES (HVAC Systems)	0.99	n/a	1.00	n/a	1.00	n/a	n/a
E21A2b011	Programmable Thermostat, Kerosene	Kerosene	A2b - HPwES (HVAC Systems)	0.99	n/a	1.00	n/a	1.00	n/a	n/a
E21A2b012	Programmable Thermostat, Oil	Fuel Oil - Residential Distillate	A2b - HPwES (HVAC Systems)	0.99	n/a	1.00	n/a	1.00	n/a	n/a
E21A2b013	Programmable Thermostat, Propane	Propane	A2b - HPwES (HVAC Systems)	0.99	n/a	1.00	n/a	1.00	n/a	n/a
E21A2b014	Programmable Thermostat, Wood Pellets	Pellet Wood	A2b - HPwES (HVAC Systems)	0.99	n/a	1.00	n/a	1.00	n/a	n/a
TBD	Programmable Thermostat, AC only	Electricity	TBD	1.00	1.00	0.00	n/a	0.00	1.00	0.00

Programmable thermostats that control both cooling and heating equipment should claim both the 27 kWh of electric energy savings associated with the cooling equipment at the impact factors listed above and any heating savings.

In-Service Rates:

All HEA installations have a 100% in-service rate and all HPwES installations have a 99% in-service rate based on evaluation results.<sup>4,5</sup>

Realization Rates:

All HEA installations have a 91% realization rate and all HPwES installations have a 100% realization rate based on evaluation results.<sup>4,5</sup>

Coincidence Factors:

Summer and winter coincidence factors are estimated using demand allocation methodology described the Navigant Demand Impact Model prepared for MA Program Administrators.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1 “Weighted HVAC- All Homes”

Endnotes:

- 1: Navigant Consulting, August 2018. Home Energy Services (HES) Impact Evaluation. [http://ma-eeac.org/wordpress/wp-content/uploads/RES34\\_HES-Impact-Evaluation-Report-with-ES\\_FINAL\\_29AUG2018.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/RES34_HES-Impact-Evaluation-Report-with-ES_FINAL_29AUG2018.pdf)
- 2: Environmental Protection Agency, 2010. Life Cycle Cost Estimate for ENERGY STAR Programmable Thermostat.
- 3: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>
- 4: Opinion Dynamics, July 29, 2020, New Hampshire Utilities, Home Energy Assistance Program Evaluation Report, 2016-2017 – FINAL.
- 5: Opinion Dynamics, June 11, 2020, Home Performance with Energy Star Program Evaluation Report 2016-2017 – FINAL.

## 1.36. Whole Home – New Construction

<b>Measure Code</b>	RES-WH-NEW
<b>Market</b>	Residential
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Whole Home

### Description:

The Program Administrators currently use vendor calculated energy savings using a RESNET accredited Rating Software Tool (REM/Rate) where a user inputs a detailed set of technical data about a project, comparing as-built projected energy consumption to that of a Baseline Home. This process is used to calculate electric and fossil fuel energy savings due to heating, cooling, and water heating for all homes.<sup>1</sup>

### Baseline Efficiency:

The Baseline Home is based on a User Defined Reference Home (UDRH), which was updated in 2019 to reflect the IECC 2015 code, with amendments as adopted by the state of NH.<sup>2, 3</sup> UDRH heating system efficiencies and air infiltration rates remain more stringent than code to reflect the results of the 2017 NH Energy Star Homes evaluation.<sup>4</sup>

### High Efficiency:

The high-efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are custom calculated for each home for heating, cooling, and water heating end uses. Demand savings are derived from the Navigant Demand Impact Model. As noted below, because the values are custom generated on a site-by-site basis, they are not shown in the table below.

<b>BC Measure ID</b>	<b>Measure Name</b>	<b>Program</b>
E21A1a001 E21A1a012	Cooling, Electric	ENERGY STAR Homes
E21A1a002 E21A1a013	Heating, Electric	ENERGY STAR Homes
E21A1a003 E21A1a014	Heating, Gas	ENERGY STAR Homes
E21A1a004 E21A1a015	Heating, Oil	ENERGY STAR Homes

E21A1a005 E21A1a016	Heating, Propane	ENERGY STAR Homes
E21A1a006 E21A1a017	Heating, Wood Pellets	ENERGY STAR Homes
E21A1a007 E21A1a018	Hot Water, Electric	ENERGY STAR Homes
E21A1a008 E21A1a019	Hot Water, Gas	ENERGY STAR Homes
E21A1a009 E21A1a020	Hot Water, Oil	ENERGY STAR Homes
E21A1a010 E21A1a021	Hot Water, Propane	ENERGY STAR Homes
E21A1a011 E21A1a022	Hot Water, Wood Pellets	ENERGY STAR Homes

**Measure Life:**

The measure life is shown below and varies by end use.<sup>5</sup>

BC Measure ID	Measure Name	Program	EUL
E21A1a002 E21A1a013 E21A1a003 E21A1a014 E21A1a004 E21A1a015 E21A1a005 E21A1a016 E21A1a006 E21A1a017	Heating	ENERGY STAR Homes	25
E21A1a001 E21A1a012	Cooling	ENERGY STAR Homes	25
E21A1a007 E21A1a018 E21A1a008 E21A1a019 E21A1a009 E21A1a020 E21A1a010 E21A1a021 E21A1a011 E21A1a022	Water Heating	ENERGY STAR Homes	15

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A1a001 E21A1a012	Cooling, Electric	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	0.35	0.00
E21A1a002 E21A1a013	Heating, Electric	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	0.00	0.43
E21A1a003 E21A1a014	Heating, Gas	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a004 E21A1a015	Heating, Oil	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a005 E21A1a016	Heating, Propane	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a006 E21A1a017	Heating, Wood Pellets	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a007 E21A1a018	Hot Water, Electric	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	0.31	0.81
E21A1a008 E21A1a019	Hot Water, Gas	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a009 E21A1a020	Hot Water, Oil	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a010 E21A1a021	Hot Water, Propane	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E21A1a011 E21A1a022	Hot Water, Wood Pellets	ENERGY STAR Homes	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**In-Service Rates:**

All installations have 100% in service rate unless an evaluation finds otherwise.

**Realization Rates:**

All energy realization rates are 100% because energy and demand savings are custom calculated based on project specific details.

**Coincidence Factors:**

Coincidence factors for electric end uses are based on prescriptive load shapes from the updated Navigant Demand Impact Model for Massachusetts.<sup>6</sup>

Coincidence factors for non-electric end uses are set to 100% as no electrical energy impacts are expected.

## **Energy Load Shape**

See Appendix 1.

### **Endnotes:**

- 1:** Note that there are also prescriptive rebates for appliances, including clothes washers, clothes dryers, and refrigerators, as well as lighting, which are covered in other sections of the TRM.
- 2:** See “ESHOME UDRH update 02-23-2018, Revised 5-17-2019.docx”
- 3:** Note the UDRH represents both single family and multifamily homes, and all measures (cooling heating, and hot water) are present in both single family and multifamily homes.
- 4:** Energy and Resource Solutions, December 7, 2018. New Hampshire ENERGY STAR Homes Program Impact Evaluation. Prepared for the NH Program Administrators.  
[https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/NH\\_ESHomes\\_Report\\_Final\\_v4-2017.pdf](https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/NH_ESHomes_Report_Final_v4-2017.pdf)
- 5:** MA Technical Reference Manual 2019 Plan-Year Report Version, Page 244, “Chapter 1.60: Whole Home New Construction” section, accessed on February 14, 2020, and GDS Associates Inc. Measure Life Report, Residential and Commercial Industrial Lighting and HVAC Measures, Jun. 2007.
- 6:** Navigant Consulting, 2018. RES 1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 1.37. Whole Home – Energy Report

<b>Measure Code</b>	[Code]
<b>Market</b>	Residential
<b>Program Type</b>	Custom
<b>Category</b>	Behavioral

### Description:

Residential home energy report programs are a behavioral feedback program that involves sending energy use reports to participating electric and natural gas customers in order to change customers' energy use behavior. Vendor results are based on statistical analysis of the differences in energy usage for the treatment group when compared to the energy usage of a control group.

### Baseline Efficiency:

The baseline efficiency case is a customer who does not receive a whole home energy report. Vendor savings calculations may use randomly sampled controls who do not receive the whole home energy report treatment to calculate savings.

### High Efficiency:

The high efficiency case is a customer who receives a home energy report.

### Algorithms for Calculating Primary Energy Impact:

Unit savings for Home Energy Reports are based on calculations from vendor results.

$$\Delta kWh = (kWh_{baseline}) \times (\%Savings_{elec})$$

$$\Delta MMBtu = (MMBtu_{baseline}) \times (\%Savings_{gas})$$

Where:

- Unit = One participant household
- $kWh_{baseline}$  = Baseline energy consumption in kWh/year
- $MMBtu_{baseline}$  = Baseline energy consumption in MMBtu/year
- $\%Savings_{elec}$  = Energy savings percent per program participant, electric
- $\%Savings_{gas}$  = Energy savings percent per program participant, gas

Savings are determined each year by the vendor. However, at times when vendor savings values are not available (e.g. during program planning or for estimating savings for new populations receiving whole home energy reports), default program savings values, based on NH evaluations, may be used.

Default program savings values are as follows:

Variable	Value
$\%Savings_{elec}$	1.32% <sup>1</sup>

<i>%Savings<sub>gas</sub></i>	1.28% <sup>2</sup>
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**Measure Life:**

The measure life for Home Energy Reports is 1 year<sup>1</sup>. As a behavioral measure, the intervention of regularly receiving a Home Energy Report is required to claim savings.

BC Measure ID	Measure Name	Program	Measure Life
	Residential Whole Home Energy Report	[Abbr]	1

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21A4a001	Residential Whole Home Energy Report	Residential Behavior	1.00	0.88	0.98	1.00	1.00	0.73	1.00

In-Service Rates:

All installations have 100% in-service-rates since reports are sent out regularly to participants.<sup>1</sup>

Realization Rates:

The electric realization rate is based on Navigant’s 2016 evaluation of Eversource New Hampshire Home Energy Report pilot program.<sup>1</sup> The evaluation did not directly report a realization rate; however, the electric realization rate is calculated based on the reported and evaluated savings in that document.

The non-electric realization rate is based on Navigant’s 2015 evaluation of the MA gas utility savings for their Home Energy Report program.<sup>2</sup>

Coincidence Factors:

Summer and winter coincidence factors are estimated using the demand allocation methodology described in the Demand Impact Model, based on ISO-NE peak loading periods.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

- 1: Navigant Consulting (2016). Home Energy Report Pilot Program Evaluation Final Report, Feb 2014-Feb 2015. Prepared for Eversource New Hampshire.
- 2: Navigant Consulting and Illume Advising (2015). Behavior Program Evaluation Opower Results. Navigant\_Illume\_2014\_Behavior\_Program\_Impact\_Evaluation.  
Natural gas savings estimates for this evaluation is based on the average savings of the 12 gas Home Energy Report programs listed in the document.
- 3: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>  
2018\_Navigant\_Baseline\_Loadshape\_Comprehensive\_Report

## 2. Commercial

## 2.1. C&I Active Demand Response

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Custom
<b>Category</b>	Active Demand Response

### Description:

Active Demand Reduction includes C&I Load Curtailment and Storage Performance. The Load Curtailment offering is technology agnostic and provides an incentive for verifiable shedding of load in response to a signal or communication from the Program Administrators coinciding with system peak conditions. Large C&I customers that are subject to demand charges and/or direct capacity charges (determined by ICAP tags) with the ability to control lighting, HVAC, and/or process loads, can use this demand reduction performance offering to generate revenue by altering their operations a few times per year. The offering focuses on reducing demand during summer peak events typically targeting fewer than twenty hours per summer.

The C&I Storage Performance offering provides performance incentives for C&I storage performance. Since storage does not impact customer comfort or operations, storage resources are expected to be available for daily dispatch to maximize their value.

### Baseline Efficiency:

Baseline conditions will be determined based on technology.

For storage, both daily dispatch and targeted dispatch (summer and winter), demand reduction is calculated based on battery load. A baseline value is not directly calculated for storage, instead, the counterfactual is the actual facility load without the battery, which is derived based on the facility load with the battery and the battery load.

For load curtailment, baseline conditions are based on an adjustment settlement baseline with symmetric, additive adjustment. The symmetrically adjusted settlement baseline is developed based on a pool of the most recent 10 non-holiday weekdays. The baseline shape consists of average load per interval across the eligible days. The baseline is adjusted based on the difference between baseline and facility load in the second hour prior to the event (the baseline adjustment period), and the adjustment can be either to increase or decrease the estimated load reduction (i.e., symmetric adjustment). This adjustment accounts for weather-related and other differences of load magnitude.<sup>1</sup>

Custom projects will have a custom baseline.

### High Efficiency:

Active Demand Reduction does not directly increase efficiency. Load curtailment does reduce power consumption by curtailing use, but does not inherently reduce energy consumption. Storage increases energy consumption due to round trip efficiency losses. Battery round trip efficiency losses are calculated on a per-project basis. For reference, evaluation results for daily dispatch storage reflect an impact of 240 kWh per year per kW of nameplate battery discharge capacity.<sup>2</sup>

**Algorithms for Calculating Primary Energy Impact:**

The Active Demand Reduction measure generates site-specific vendor-reported demand savings, which are validated by evaluation. Savings estimates for these projects are calculated using engineering analysis with project-specific details.

**Measure Life:**

As all C&I active demand response measures are based on Program Administrators calling demand reduction events each year, the deemed measure life is one year.

BC Measure ID	Measure Name	Program	Measure Life
E21C5a001	Load Curtailment Targeted Dispatch P4P Summer	C&I Active Demand Response	1
E21C5a002	Storage Daily Dispatch P4P (savings) Summer	C&I Active Demand Response	1
E21C5a003	Storage Daily Dispatch P4P (consumption) Summer	C&I Active Demand Response	1
E21C5a004	Storage Targeted Dispatch P4P (savings) Summer	C&I Active Demand Response	1
E21C5a005	Storage Targeted Dispatch P4P (consumption) Summer	C&I Active Demand Response	1

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C5a001	Load Curtailment Targeted Dispatch P4P Summer	C&I Active Demand Response	1.00	0.981	1.00	0.981	1.00	1.00	0.00
E21C5a002	Storage Daily Dispatch P4P (savings) Summer	C&I Active Demand Response	1.00	1.04	1.00	1.04	1.00	1.00	0.00

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C5a003	Storage Daily Dispatch P4P (consumption) Summer	C&I Active Demand Response	1.00	1.04	1.00	1.04	1.00	1.00	0.00
E21C5a004	Storage Targeted Dispatch P4P (savings) Summer	C&I Active Demand Response	1.00	1.01	1.00	1.01	1.00	1.00	0.00
E21C5a005	Storage Targeted Dispatch P4P (consumption) Summer	C&I Active Demand Response	1.00	1.01	1.00	1.01	1.00	1.00	0.00

**In-Service Rates:**

In-service rates for commercial and industrial active demand response are assumed to be 100% by default, as measured performance in the ADR program is required to claim savings.

**Realization Rates:**

Electrical energy realization rates for this measure are assumed to be equal to summer peak demand realization rates.

Summer peak realization rates for interruptible load are based on a program evaluation of the 2019 summer demand reduction period for New Hampshire.<sup>1</sup> These realization rates are based on the overall program savings, rather than individual measure savings, and represent the retrospective realization rate (i.e. the evaluated symmetric savings estimate divided by the reported asymmetric savings estimate).

For daily and targeted storage dispatch programs, summer peak realization rates are based on an evaluation of Eversource battery storage demonstration projects.<sup>2</sup>

**Coincidence Factors:**

Coincidence factors for this measure are assumed to be 100%, as all summer savings take place during summer peak periods according to program rules; the programs are not claiming winter peak impacts due to the fact that the ISO-NE system is summer peaking.

**Energy Load Shape:**

As commercial active demand response events are called on the day preceding the event, the most appropriate load shape to use is a symmetric load based on the 10 baseline day load shape at the same facility.<sup>1</sup>

**Endnotes:**

1: ERS (2020). Cross-State C&I Active Demand Reduction Initiative Summer 2019 Evaluation Report. Prepared for Eversource, National Grid, and Unitil (MA, CT, and NH).

[https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/Cross-State-CI-DR-S19-Evaluation-Report\\_04-15-2020.pdf](https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/Cross-State-CI-DR-S19-Evaluation-Report_04-15-2020.pdf)

2: ERS (2020). Daily Dispatch Battery Project Evaluation Report. Prepared for Eversource. <https://api-plus.anbetrack.com/etrm-gateway/etrm/api/v1/etrm/documents/5ee488776996f264267df7b6/view?authToken=8a34f8598773992325038987ea62e83319d208f835e892092c491823f78722e7a92604e473dc75021eb90f821f219b8cbc0ddafa207ed1924f97faecb70d5eaf3e5372d04fb6>

## 2.2. Building Envelope – Air Sealing and Insulation

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Building Shell

### Description:

**Air Sealing:** Air sealing will decrease the infiltration of outside air through cracks and leaks in the building.

**Insulation:** The installation of high efficiency insulation in an existing structure.

### Baseline Efficiency:

**Air Sealing:** The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing air changes per hour (ACHPRE) for multi-family facilities, which is measured prior to the implementation of the air sealing measure. This will typically be a default value of a baseline/pre-retrofit ACH =0.5.

**Insulation:** The baseline efficiency case is characterized by the total R-value of the existing attic, basement, or sidewall (Rexisit). This is calculated as the R-value of the existing insulation, estimated by the program contractor, plus the R-value of the ceiling, floor, or wall (for all projects: RCEILING = 3.36; RFLOOR = 6.16; RWALL = 6.65).

### High Efficiency:

**Air Sealing:** The baseline efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented. This will typically be a default value of a baseline/pre-retrofit ACH =0.4.

**Insulation:** The high efficiency case is characterized by the total R-value of the attic after the installation of additional attic, basement, or sidewall insulation. This is calculated as the sum of the existing R-value (Rexisit) plus the R-value of the added insulation.

### Algorithms for Calculating Primary Energy Impact:

**Air Sealing:**

Unit savings are calculated using the following algorithms and assumptions:

$$\text{kWh} = (\text{Vol} \times \text{ACH} \times 0.018 \times \text{HDD} \times 24 / \eta_{\text{heating}}) / 3,413$$

$$\text{MMBtu} = (\text{Vol} \times \text{ACH} \times 0.018 \times \text{HDD} \times 24 / \eta_{\text{heating}}) / 1,000,000$$

$$kW = kWh \times kW/kWh$$

Where:

Vol = [ft<sup>3</sup>] This is the air volume of the treated space, calculated from the dimensions of the space, which could include the number of floors, the floor area per floor, and the floor-to-ceiling height, or the dwelling floor area and number of dwellings. The treated space can be the entire building including the common areas, or just the individual dwelling units. (Auditor Input)

Δ ACH = [°F-day] Infiltration reduction in Air Changes per Hour, natural infiltration basis. This will typically be a default value, but the source of the assumption should be transparent and traceable, or it could come from a blower door test. (Stipulated Value or Blower Door Test)

HDD60 = Heating degree-days with temperature base of 60 degrees. <sup>1</sup>

η<sub>heating</sub> = [AFUE, COP, thermal efficiency (%)] Efficiency of the heating system, as determined on site (Auditor Input)

24 = Conversion factor: 24 hours per day

0.018 = [Btu / ft<sup>3</sup>- °F] Air heat capacity: The specific heat of air (0.24 Btu / °F.lb) times the density of air (0.075 lb / ft<sup>3</sup>)

1,000,000 = Conversion factor: 1,000,000 Btu per MMBtu

3,413 = Conversion factor: 3,413 Btu / kWh

kW / kWh = Average kW reduction per kWh reduction: 0.00073 kW / kWh <sup>2</sup>

Insulation:

Unit savings are calculated using the following algorithms and assumptions:

$$MMBtu_{annual} = ((1/R_{exist} - 1/R_{new}) * HDD * 24 * Area) / 1000000 * \eta_{heat}$$

$$kWh_{annual} = MMBtu_{annual} * 293.1$$

$$kW = kWh_{annual} * kW/kWh_{heating}$$

Where,

R<sub>exist</sub> = Existing effective R-value (R-ExistingInsulation + R-Assembly), ft<sup>2</sup>-°F/Btuh

R<sub>new</sub> = New total effective R-value (R-ProposedMeasure + R-ExistingInsulation+ R-Assembly), ft<sup>2</sup>-°F/Btuh

Area = Square footage of insulated area

η<sub>heat</sub> = Efficiency of the heating system (AFUE or COP) 293.1 = Conversion constant (1MMBtu = 293.1 kWh)

24 = Conversion for hours per day

HDD = Heating Degree Days; dependent on location

1,000,000 = Conversion from Btu to MMBtu kW/kWh heating = Average annual kW reduction per kWh reduction <sup>2</sup>

Measure	kW/kWh Factor
Insulation (Electric)	0.00073
Insulation (Gas, Oil, Other FF)	0.00076
Insulation, Central AC in Electrically Heated Unit	0.00059

**Measure Life:**

The measure life is shown in the table below.<sup>3</sup>

BC Measure ID	Measure Name	Program	Measure Life
E21C3a015 E21C3a016 E21C3a017 E21C3a018 E21C3d017 E21C3d018 E21C3d019 E21C3d020	Air Sealing	Municipal Retrofit Municipal Direct Install	15
E21C3a051 E21C3a052 E21C3a053 E21C3a054 E21C3d051 E21C3d052 E21C3d053 E21C3d054	Insulation	Municipal Retrofit Municipal Direct Install	25

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>2</sup>**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C3a015 E21C3d017	Air Sealing	Electric	Muni Retro Muni DI	1.00	1.00	n/a	n/a	n/a	0.00	0.43
E21C3a016 E21C3d018	Air Sealing	Gas	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a017 E21C3d019	Air Sealing	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a018 E21C3d020	Air Sealing	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a051 E21C3d051	Insulation	Electric	Muni Retro Muni DI	1.00	1.00	n/a	n/a	n/a	0.00	0.43
E21C3a052 E21C3d052	Insulation	Gas	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C3a053 E21C3d053	Insulation	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a054 E21C3d054	Insulation	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A winter coincidence factor of 43% is utilized.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** The HDD should be calculated based on the TMY3 weather data of the nearest weather station.

<https://www7.ncdc.noaa.gov/CDO/cdoselect.cmd?datasetabbv=GSOD&countryabbv=&georegionabbv>

**2:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**3:** Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures, GDS Associates, June 2007.

[https://library.cee1.org/system/files/library/8842/CEE\\_Eval\\_MeasureLifeStudyLights%2526HVACGDS\\_1Jun2007.pdf](https://library.cee1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf)

## 2.3. Compressed Air – Air Compressor

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Compressed Air

### Description:

Covers the installation of oil flooded, rotary screw compressors with Variable Speed Drive or Variable Displacement capacity control with properly sized air receiver. Efficient air compressors use various control schemes to improve compression efficiencies at partial loads.

### Baseline Efficiency:

The baseline efficiency case is a typical load/unload compressor.

### High Efficiency:

The high efficiency case is an oil-flooded, rotary screw compressor with Variable Speed Drive or Variable Displacement capacity control with a properly sized air receiver. Air receivers are designed to provide a supply buffer to meet short-term demand spikes which can exceed the compressor capacity. Installing a larger receiver tank to meet occasional peak demands can allow for the use of a smaller compressor.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta \text{ kWh} = (\text{HP COMPRESSOR}) \times (\text{Save}) \times (\text{Hours})$$

$$\Delta \text{ kW} = (\text{HP COMPRESSOR}) \times (\text{Save})$$

Where:

HP COMPRESSOR = Nominal rated horsepower of high efficiency air compressor

Save = Air compressor kW reduction per HP: 0.189<sup>1</sup>

Hours = Annual operating hours of the air compressor

### Measure Life:

The measure life is 15 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b016 E21C2b016 E21C3b016	Air Compressor	LBES New SBES New Muni New	1.00	1.00	1.00	1.00	1.00	1.17	0.98

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

CFs from the prospective results of the 2015 study of prescriptive compressed air.<sup>1</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** DNV GL, October 2015. Impact Evaluation of Prescriptive Chiller and Compressed Air Installations. Prepared for the MA PAs and EEAC. Result for VSD 25-75 HP used since “All” result includes savings from load/unload compressors, which are now baseline. [http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report\\_FINAL\\_151026.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report_FINAL_151026.pdf)

**2:** ERS, November 2005. Measure Life Study. Prepared for MA Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

## 2.4. Compressed Air – Air Nozzle

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity/ Retrofit
Category	Compressed Air

### Description:

Covers the installation of engineered air nozzles which provide effective air nozzle action while reducing compressed air system air flow.

### Baseline Efficiency:

The baseline efficiency case is a a standard nozzle on a compressed air system.

### High Efficiency:

The high efficiency case is an engineered nozzle on the same compressed air system.

### Algorithms for Calculating Primary Energy Impact:

Savings are calculated in a spreadsheet tool per the following:

$$\Delta kW = (FLOW_{BASE} - FLOW_{EE}) \times \frac{kW}{cfm}$$

$$\Delta kWh = \Delta kW \times hr$$

Where:

$FLOW_{BASE}$  = base case nozzle flow in cfm, at site specific pressure if available, or else at 100 psig

$FLOW_{EE}$  = energy efficient nozzle flow in cfm, at site specific pressure if available, or else at 100 psig

$\frac{kW}{cfm}$  = site specific compressor efficiency, default value of 0.29 if unavailable

### Measure Life:

The measure life is 13 years.

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b017 E21C2b017 E21C3b017	Air Nozzle	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.80	0.54

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

CFs from the prospective results of the 2015 study of prescriptive compressed air.<sup>1</sup>

**Energy Load Shape:**

See Appendix 1.

Endnotes:

**1:** DNV GL, October 2015. Impact Evaluation of Prescriptive Chiller and Compressed Air Installations. Prepared for Massachusetts Program Administrators and Massachusetts Energy Efficiency Advisory Council. [http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report\\_FINAL\\_151026.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report_FINAL_151026.pdf)

## 2.5. Compressed Air – Adding Compressor Capacity and/or Storage

Measure Code	[Code]
Market	Commercial
Program Type	Retrofit
Category	Compressed Air

### Description:

Adding storage capacity to compressed air systems with previously insufficient storage results in less system pressure fluctuations and allows lower average system pressures, leading to air compressor energy savings when operated at lower system pressures. It also reduces cycling losses in compressor systems that use a compressor with load-unload controls for part-load modulation.

### Baseline Efficiency:

The baseline is the site-specific air compressor energy consumption operating at the higher average system pressure with insufficient compressed air storage.

### High Efficiency:

The high efficiency case is the site-specific air compressor energy consumption operating at the lower average system pressure after the added compressed air storage, and with reduced cycling losses for load/unload compressors.

### Algorithms for Calculating Primary Energy Impact:

The energy savings are based on air compressor energy efficiency improvements resulting from two components: the lower average pressure after air storage capacity is added, and reduced cycling losses. The measure may realize one or both savings components, depending on baseline conditions.

The algorithm for calculating electric demand savings from the system pressure reduction is:

$$\Delta kW_{PR} = kW_{BASE} \times (psi_{BASE} - psi_{EE}) \times 0.4\%$$

Where:

$\Delta kW_{PR}$  = Average kW savings from the system pressure reduction

$kW_{BASE}$  = Baseline air compressor system average input kW

$psi_{BASE}$  = Baseline average system pressure, in psi

$psi_{EE}$  = Energy efficient average system pressure with added storage, in psi

0.4%/psi = Compressor kW reduction factor<sup>1</sup>

The algorithm for calculating annual electric energy savings from the system pressure reduction is:

$$\Delta kWh_{PR} = \Delta kW_{PR} \times \frac{hr}{yr}$$

Where:

$\Delta kWh_{PR}$  = Gross annual kWh savings from system pressure reduction  
 $\Delta kW_{PR}$  = Average kW savings from the system pressure reduction  
 $\frac{hr}{yr}$  = Annual compressed air system pressurization hours

The algorithm for calculating savings from the reduction in cycling losses is:

$$\Delta kW_{CL} = kW_{BASE,MOD} \times (\%kW_{BASE} - \%kW_{EE})$$

Where:

$\Delta kW_{CL}$  = Average kW savings from the reduction in cycling losses for load/unload compressors  
 $kW_{BASE,MOD}$  = Baseline air compressor input kW for the load-unload compressor that is the modulating or topping compressor  
 $\%kW_{BASE}$  = Percentage kW input in the base case (refer to %kW table, interpolate as needed)  
 $\%kW_{EE}$  = Percentage kW input in the energy efficient case after added storage (refer to % kW table, interpolate as needed)

Average Percent Capacity	Tank Plus Distribution System Storage per Compressor Capacity <i>(use the modulating compressor capacity only)</i>	% kW <sup>2</sup>
25%	1 gal/cfm	70%
	3 gal/cfm	55%
	5 gal/cfm	50%
	10 gal/cfm	48%
50%	1 gal/cfm	88%
	3 gal/cfm	76%
	5 gal/cfm	71%
	10 gal/cfm	68%
75%	1 gal/cfm	96%
	3 gal/cfm	92%
	5 gal/cfm	89%
	10 gal/cfm	86%

The algorithm for calculating annual electric energy savings from the cycling losses is:

$$\Delta kWh_{CL} = \Delta kW_{CL} \times \frac{hr}{yr}$$

Where:

$\Delta kWh_{CL}$  = Gross annual kWh savings from the reduction in cycling losses for load/unload compressors  
 $\Delta kW_{CL}$  = Average kW savings from the reduction in cycling losses for load/unload compressors  
 $\frac{hr}{yr}$  = Annual operating hours of the load/unload topping compressor

**Measure Life:**

The measure life is 25 years for non-mechanical infrastructure, similar to that of insulation.<sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b020	Compressed air – compressor storage	LBES	1.00	1.00	n/a	1.00	1.00	1.17	0.98
E21C2b020	Compressed air – compressor storage	SBES	1.00	1.00	n/a	1.00	1.00	1.17	0.98
E21C3b032	Compressed air – compressor storage	Muni	1.00	1.00	n/a	1.00	1.00	1.17	0.98

In-Service Rates:

All installations have 100% a in-service-rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

A summer coincidence factor of 117% and a winter coincidence factor of 98% is utilized.<sup>4</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

1: Estimate based on ERS data of CAGI Compressor Data Sheets of 40 operating points of 10 compressors from 4 manufacturers, downloaded 5/21/20.

2: [Department of Energy Compressed Air Challenge. Improving Compressed Air System Performance A Sourcebook for Industry, Third Edition, DOE/EE-1340, \(approx. 2015\) p. 40.](#)

3: [Energy & Resource Solutions \(2005\). Measure Life Study. Prepared for The Massachusetts Joint Utilities..](#)

4: [DNV GL \(2015\). Impact Evaluation of Prescriptive Chiller and Compressed Air Installations. Prepared for The Massachusetts Joint Utilities.](#)

## 2.6. Compressed Air – Low Pressure Drop Filter

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit/Lost Opportunity
Category	Compressed Air

### Description:

Filters remove solids and aerosols from compressed air systems. Low pressure drop filters have longer lives and lower pressure drops than traditional coalescing filters, resulting in low air compressor energy use.

### Baseline Efficiency:

The baseline efficiency case is a standard coalescing filter with initial drop of between 1 and 2 pounds per sq inch (psi) with an end of life drop of 10 psi.

### High Efficiency:

The high efficiency case is a low pressure drop filter with initial drop not exceeding 1 psi over life and 3 psi at element change. Filters must be deep-bed, “mist eliminator” style and installed on a single operating compressor rated 15 - 75 HP.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kW = kW_{BASE} \times (psi_{BASE} - psi_{EE}) \times 0.4\%$$

$$\Delta kWh = \Delta kW \times \frac{hr}{yr}$$

Where:

$\Delta kW$  = Average kW savings

$\Delta kWh$  = Gross annual kWh savings

$kW_{BASE}$  = Air compressor system average input kW, site specific

$psi_{BASE}$  = Baseline standard filter pressure drop, in psi

$psi_{EE}$  = Energy efficient filter pressure drop, in psi

0.4%/psi = Compressor kW reduction factor<sup>1</sup>

$\frac{hr}{yr}$  = Annual compressed air system pressurization hours

### Measure Life:

The measure life is 5 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a032	Low Pressure Drop Filter	LBES Retro	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C1b043	Low Pressure Drop Filter	LBES New	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C1d032	Low Pressure Drop Filter	LBES DI	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C2a032	Low Pressure Drop Filter	SBES Retro	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C2b043	Low Pressure Drop Filter	SBES New	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C2d032	Low Pressure Drop Filter	SBES DI	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C3a055	Low Pressure Drop Filter	Muni Retro	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C3b065	Low Pressure Drop Filter	Muni New	1.00	1.00	n/a	1.00	1.00	0.80	0.54
E21C3d055	Low Pressure Drop Filter	Muni DI	1.00	1.00	n/a	1.00	1.00	0.80	0.54

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

Realization rates are based on impact evaluation of PY 2004 compressed air installations.<sup>3</sup>

Realization rates are based on impact evaluation of NSTAR 2006 compressed air installations.<sup>4</sup>

**Coincidence Factors:**

Summer and winter coincidence factors are CFs based on impact evaluation of PY 2004 compressed air installations.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes :**

1: Estimate based on ERS data of CAGI Compressor Data Sheets of 40 operating points of 10 compressors from 4 manufacturers, downloaded 5/21/20.

2: ERS, November 2005. Measure Life Study. Prepared for MA Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

3: DMI, 2006. Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Results analyzed in RLW Analytics, 2006. Sample Design and Impact Evaluation Analysis for Prescriptive Compressed Air Measures in Energy Initiative and Design 2000 Programs.

4: LW Analytics, 2008. Business & Construction Solutions (BS/BC) Programs Measurement & Verification - 2006 Final Report.

## 2.7. Compressed Air – Refrigerated Air Dryer

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Compressed Air

### Description:

The installation of cycling or variable frequency drive (VFD)-equipped refrigerated compressed air dryers. Refrigerated air dryers remove the moisture from a compressed air system to enhance overall system performance. An efficient refrigerated dryer cycles on and off or uses a variable speed drive as required by the demand for compressed air instead of running continuously. Only properly sized refrigerated air dryers used in a single-compressor system are eligible.

### Baseline Efficiency:

The baseline efficiency case is a non-cycling refrigerated air dryer.

### High Efficiency:

The high efficiency case is a cycling refrigerated dryer or a refrigerated dryer equipped with a VFD.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta \text{ kWh} = (\text{CFM DRYER}) \times (\text{Save}) \times (\text{HRS})$$

$$\Delta \text{ kW} = (\text{CFM DRYER}) \times (\text{Save})$$

Where:

CFM DRYER = Full flow rated capacity of the refrigerated air dryer in cubic feet per minute (CFM) obtained from equipment's Compressed Air Gas Institute Datasheet.

Save = Refrigerated air dryer kW reduction per dryer full flow rated CFM: 0.00554<sup>1</sup>

HRS = Annual operating hours of the refrigerated air dryer

### Measure Life:

The measure life is 15 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b047	Refrigerated Air Dryer	LBES New	1.00	1.56	n/a	1.00	1.00	1.17	0.98

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C2b047	Refrigerated Air Dryer	SBES New	1.00	1.56	n/a	1.00	1.00	1.17	0.98
E21C3b078	Refrigerated Air Dryer	Muni New	1.00	1.56	n/a	1.00	1.00	1.17	0.98

**In-Service Rates:**

All installations have a 100% in-service rates unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

Summer and winter coincidence factors are from the prospective results of the 2015 study of prescriptive compressed air. <sup>1</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

- 1** DNV GL, October 2015. Impact Evaluation of Prescriptive Chiller and Compressed Air Installations. Prepared for MA Joint Utilities and MA EEAC. [http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report\\_FINAL\\_151026.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report_FINAL_151026.pdf)
- 2:** ERS, November 2005. Measure Life Study. Prepared for MA Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

## 2.8. Compressed Air – Zero Loss Condensate Drain

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Compressed Air

### Description:

Drains remove water from a compressed air system. Zero loss condensate drains remove water from a compressed air system without venting any air, resulting in less air demand and consequently less air compressor energy use.

### Baseline Efficiency:

The baseline efficiency case a standard condensate drain on a compressor system.

### High Efficiency:

The high efficiency case is installation of a zero loss condensate drain on a single operating compressor rated  $\leq 75$  HP.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = (CFM_{pipe}) \times (CFM_{save}) \times (Save) \times (Hours)$$

$$\Delta kW = (CFM_{pipe}) \times (CFM_{save}) \times (Save)$$

Where:

$$\Delta kWh = \text{Energy Savings}$$

$$\Delta kW = \text{Demand savings}$$

$CFM_{pipe}$  = CFM capacity of piping that is served by the condensate drain, site specific

$CFM_{saved}$  = Average CFM saved per CFM of piping capacity: 0.049

Save = Average savings per CFM, site specific if available, default value of 0.29 kW/CFM

Hours = Annual operating hours of the zero loss condensate drain.

### Measure Life:

The measure life is 5 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a046	Zero Loss Condensate Drains	LBES Retro	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C1b051	Zero Loss Condensate Drains	LBES New	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C1d046	Zero Loss Condensate Drains	LBES DI	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C2a046	Zero Loss Condensate Drains	SBES Retro	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C2b051	Zero Loss Condensate Drains	SBES New	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C2d046	Zero Loss Condensate Drains	SBES DI	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C3a090	Zero Loss Condensate Drains	Muni Retro	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C3b082	Zero Loss Condensate Drains	Muni New	1.00	1.00	1.00	1.00	1.00	0.80	0.54
E21C3d090	Zero Loss Condensate Drains	Muni DI	1.00	1.00	1.00	1.00	1.00	0.80	0.54

In-Service Rates:

All installations have a 100% in-service rate since unless an evaluation finds otherwise.

Realization Rates:

All program use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Summer and winter coincidence factors are based on Massachusetts TRM values. Latest 2015 evaluation study did not yield a statistically significant sample size for updating CF values.

**Energy Load Shape:**

See Appendix 1.

Endnotes:

**1a:** DMI, 2006. Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid; results analysed in RLW Analytics, 2006. Sample Design and Impact Evaluation Analysis for Prescriptive Compressed Air Measures in the Energy Initiative and Design 2000 Programs. Prepared for National Grid

**1b:** RLW Analytics, 2008. Business & Construction Solutions (BS/CS) Programs Measurement & Verification - 2006 Final Report. Prepared for NSTAR Electric and Gas; Table 17

**2:** Energy & Resource Solutions, November 2005. Measure Life Study. Prepared for Massachusetts Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

## 2.9. Custom Measures – Large C&I

<b>Measure Code</b>	[Code]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Custom

### Description:

The Custom project track is offered for electric energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and benefits.

### Baseline Efficiency:

Retrofit projects will use the existing system or performance as the baseline for all single baseline projects. For dual baseline projects, retrofit projects will use the existing system or performance as the baseline for the first period and use the code or Industry Standard Practice (ISP) as the baseline for the second period (remaining useful life). Lost opportunity projects will generally refer to code, if applicable, or Industry Standard Practice (ISP), although there may be exceptions. If code does not apply and an ISP is not available, engineering judgement should be used to determine a project baseline.

### High Efficiency:

The high efficiency scenario is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective to qualify for energy efficiency incentives.

### Algorithms for Calculating Primary Energy Impact:

Gross energy and demand savings estimates for custom projects are calculated using engineering analysis with project-specific details. Custom analyses typically include a weather dependent load bin analysis, whole building energy model simulation, end-use metering or other engineering analysis and include estimates of savings, costs, and an evaluation of the projects' cost-effectiveness.

### Measure Life:

For both lost-opportunity and retrofit custom applications, the measure life is determined on a case-by-case basis.<sup>2</sup> Dual baseline effects should be considered for retrofit projects.<sup>3</sup>

**Other Resource Impacts:**

Other resource impacts should be determined on a case by case basis for custom projects.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>1</sup>**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b001	Custom Large Compressed Air New	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1a001	Custom Large Compressed Air Retro	LBES	1.00	0.976	0.917	n/a	n/a	1.17	0.98
E21C1b002	Custom Large Hot Water New	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1a002	Custom Large Hot Water Retro	LBES	1.00	0.99	0.917	n/a	n/a	0.00	0.00
E21C1b003	Custom Large HVAC New	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1a003	Custom Large HVAC Retro	LBES	1.00	0.99	0.917	n/a	n/a	0.00	0.00
E21C1b004	Custom Large Lighting New – Interior	LBES	1.00	1.036	0.909	n/a	n/a	0.000	0.00
E21C1b054	Custom Large Lighting New – Exterior	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1b055	Custom Large Lighting New – Controls	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1a004	Custom Large Lighting Retro – Interior	LBES	1.00	0.976	0.917	n/a	n/a	0.00	0.00
E21C1a047	Custom Large Lighting Retro – Exterior	LBES	1.00	0.976	0.917	n/a	n/a	0.00	0.00
E21C1a048	Custom Large Lighting Retro – Controls	LBES	1.00	0.976	0.917	n/a	n/a	0.00	0.00
E21C1b005	Custom Large Motors New	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1a005	Custom Large Motors Retro	LBES	1.00	0.976	0.917	n/a	n/a	1.00	1.00
E21C1b008	Custom Large Other New	LBES	1.00	1.036	0.909	n/a	n/a	0.00	0.00
E21C1a008	Custom Large Other Retro	LBES	1.00	0.976	0.917	n/a	n/a	0.00	0.00

E21C1b006	Custom Large Process New	LBES	1.00	1.036	0.909	n/a	n/a	0.49	0.06
E21C1a006	Custom Large Process Retro	LBES	1.00	0.976	0.917	n/a	n/a	0.49	0.06
E21C1b007	Custom Large Refrigeration New	LBES	1.00	1.036	0.917	n/a	n/a	0.00	0.00
E21C1a007	Custom Large Refrigeration Retro	LBES	1.00	0.976	0.909	n/a	n/a	0.00	0.00
E21C3b001	Custom Muni Compressed Air New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a001	Custom Muni Compressed Air Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b002	Custom Muni Hot Water New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a002	Custom Muni Hot Water Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b003	Custom Muni HVAC New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a003	Custom Muni HVAC Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.45	0.00
E21C3b004	Custom Muni Lighting New – Interior	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b085	Custom Muni Lighting New – Exterior	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b086	Custom Muni Lighting New – Controls	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a004	Custom Muni Lighting Retro – Interior	Muni	1.00	1.00	1.00	n/a	n/a	0.80	0.61
E21C3a091	Custom Muni Lighting Retro – Exterior	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a092	Custom Muni Lighting Retro – Controls	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b005	Custom Muni Motors New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a005	Custom Muni Motors Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b008	Custom Muni Other New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00

E21C3a008	Custom Muni Other Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.346	0.00
E21C3b006	Custom Muni Process New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a006	Custom Muni Process Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3b007	Custom Muni Refrigeration New	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C3a007	Custom Muni Refrigeration Retro	Muni	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C4a001	Custom RFP Program Compressed Air	RFP	1.00	1.024	0.914	n/a	n/a	0.00	0.00
E21C4a002	Custom RFP Program Hot Water	RFP	1.00	1.024	0.914	n/a	n/a	0.00	0.00
E21C4a003	Custom RFP Program HVAC	RFP	1.00	1.024	0.914	n/a	n/a	0.70	0.85
E21C4a004	Custom RFP Program Lighting - Interior	RFP	1.00	1.024	0.914	n/a	n/a	0.80	0.61
E21C4a015	Custom RFP Program Lighting - Exterior	RFP	1.00	1.024	0.914	n/a	n/a	0.00	1.00
E21C4a016	Custom RFP Program Lighting - Controls	RFP	1.00	1.024	0.914	n/a	n/a	0.15	0.13
E21C4a005	Custom RFP Program Motors	RFP	1.00	1.024	0.914	n/a	n/a	0.00	0.00
E21C4a008	Custom RFP Program Other	RFP	1.00	1.024	0.914	n/a	n/a	0.00	0.00
E21C4a006	Custom RFP Program Process	RFP	1.00	1.024	0.914	n/a	n/a	0.95	0.90
E21C4a007	Custom RFP Program Refrigeration	RFP	1.00	1.024	0.914	n/a	n/a	0.00	0.00
E21C2b001	Custom Small Compressed Air New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a001	Custom Small Compressed Air Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b002	Custom Small Hot Water New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a002	Custom Small Hot Water Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00

E21C2b003	Custom Small HVAC New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a003	Custom Small HVAC Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b004	Custom Small Lighting New - Interior	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b054	Custom Small Lighting New - Exterior	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b055	Custom Small Lighting New - Controls	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a004	Custom Small Lighting Retro - Interior	SBES	1.00	1.066	1.00	n/a	n/a	0.00	0.00
E21C2a047	Custom Small Lighting Retro- Exterior	SBES	1.00	1.027	1.00	n/a	n/a	0.00	1.00
E21C2a048	Custom Small Lighting Retro - Controls	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b005	Custom Small Motors New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a005	Custom Small Motors Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b008	Custom Small Other New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a008	Custom Small Other Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.67	0.88
E21C2b006	Custom Small Process New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a006	Custom Small Process Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2b007	Custom Small Refrigeration New	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00
E21C2a007	Custom Small Refrigeration Retro	SBES	1.00	1.00	1.00	n/a	n/a	0.00	0.00

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

1: DNV GL, September 2015. New Hampshire Utilities Large Commercial and Industrial (C&I) Retrofit And New Equipment & Construction Program Impact Evaluation.

<https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf>

**2:** Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities; Table 1-2. [ERS 2005 Measure Life Study](#)

**3:** Baseline Categories and preliminary Out Year Factors are described at a high level in DNV GL, ERS (2018). Portfolio Model Companion Sheet. Additional background on the baseline categorization given in DNV GL, ERS (2018). Portfolio Model Methods and Assumptions – Electric and Natural Gas Memo. [2018 DNVGL ERS Portfolio Model Companion Sheet](#)

## 2.10. Food Service – Dishwasher

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Dishwasher High Temperature: Installation of a qualified ENERGY STAR® high temperature commercial dishwasher in a building with gas domestic hot water. High temperature dishwashers use a booster heater to raise the rinse water temperature to 180 F – hot enough to sterilize dishes and assist in drying. Electric savings are achieved through savings to the electric booster.

Dishwasher Low Temperature: Installation of a qualified ENERGY STAR® low temperature commercial dishwasher in a facility with electric hot water heating. Low temperature dishwashers use the hot water supplied by the kitchen’s existing water heater and use a chemical sanitizing agent in the final rinse cycle and sometimes a drying agent.

### Baseline Efficiency:

Dishwasher High Temp: The baseline efficiency case is a commercial dishwasher with idle energy rates and water consumption as follows<sup>2</sup>:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
High Temp Under Counter Dishwasher	0.76	1.09
High Temp Door Type Dishwasher	0.87	1.29
High Temp Single Tank Conveyer Dishwasher	1.93	0.87
High Temp Multi Tank Conveyer Dishwasher	2.59	0.97
High Temp Pots & Pans Dishwasher	1.20	0.70

Dishwasher Low Temp: The baseline efficiency case is a commercial dishwasher with idle energy rates and water consumption as follows<sup>2</sup>:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
Low Temp Under Counter Dishwasher	0.50	1.73
Low Temp Door Type Dishwasher	0.60	2.10
Low Temp Single Tank Conveyer Dishwasher	1.60	1.31

Low Temp Multi Tank Conveyor Dishwasher	2.00	1.04
Low Temp Pots & Pans Dishwasher	1.00	0.70

**High Efficiency:**

Dishwasher High Temp: The high efficiency case is a commercial dishwasher with idle energy rates and water consumption following ENERGY STAR® Efficiency Requirements<sup>1</sup> as follows:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
High Temp Under Counter Dishwasher	0.50	0.86
High Temp Door Type Dishwasher	0.70	0.89
High Temp Single Tank Conveyer Dishwasher	1.50	0.70
High Temp Multi Tank Conveyer Dishwasher	2.25	0.54
High Temp Pots & Pans Dishwasher	1.20	0.58

Dishwasher Low Temp: The high efficiency case is a commercial dishwasher with idle energy rates and water consumption following ENERGY STAR® Efficiency Requirements<sup>1</sup> as follows:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
Low Temp Under Counter Dishwasher	0.50	1.19
Low Temp Door Type Dishwasher	0.60	1.18
Low Temp Single Tank Conveyor Dishwasher	1.60	0.79
Low Temp Multi Tank Conveyor Dishwasher	2.00	0.54
Low Temp Pots & Pans Dishwasher	1.00	0.58

**Algorithms for Calculating Primary Energy Impact:**

Dishwasher High Temp: Unit savings are deemed based on the Energy Star Commercial Kitchen Equipment Savings Calculator<sup>2</sup>:

$kWh = kWh$   
 $kW = kWh / \text{hours}$   
 $MMBtu = MMBtu$

Where:

- kWh = gross annual kWh savings from the measure. See table below.
- kW = gross average kW savings from the measure. See table below.
- MMBtu = gross average natural gas MMBtu savings from the measure. See table below.

Hours = Average annual equipment operating hours, see Hours section below.

BC Measure ID	Measure	Program	ΔkW	ΔkWh	ΔMMBtu
E21C1b026 E21C2b026 E21C3b040	High Temp Under Counter Dishwasher	LBES New SBES New Muni New	0.32	1,791	n/a
E21C1b022 E21C2b022 E21C3b036	High Temp Door Type Dishwasher	LBES New SBES New Muni New	0.74	4,151	n/a
E21C1b025 E21C2b025 E21C3b039	High Temp Single Tank Conveyer Dishwasher	LBES New SBES New Muni New	0.75	4,243	n/a
E21C1b023 E21C2b023 E21C3b037	High Temp Multi Tank Conveyer Dishwasher	LBES New SBES New Muni New	1.71	9,630	n/a
E21C1b024 E21C2b024 E21C3b038	High Temp Pots & Pans Dishwasher	LBES New SBES New Muni New	0.18	1,032	n/a
E21C1b030 E21C2b030 E21C3b044	Low Temp Under Counter Dishwasher	LBES New SBES New Muni New	0.39	2,178	n/a
E21C1b027 E21C2b027 E21C3b041	Low Temp Door Type Dishwasher	LBES New SBES New Muni New	2.46	13,851	n/a
E21C1b029 E21C2b029 E21C3b043	Low Temp Single Tank Conveyer Dishwasher	LBES New SBES New Muni New	2.07	11,685	n/a
E21C1b028 E21C2b028 E21C3b042	Low Temp Multi Tank Conveyer Dishwasher	LBES New SBES New Muni New	2.86	16,131	n/a
TBD	Low Temp Pots & Pans Dishwasher	tbd			

**Measure Life:**

The measure life for a new high temperature dishwasher is given by type below <sup>3</sup>:

<b>BC Measure ID</b>	<b>Measure Name</b>	<b>Program</b>	<b>Measure Life</b>
E21C1b026 E21C2b026 E21C3b040	High Temp Under Counter Dishwasher	LBES New SBES New Muni New	10
E21C1b022 E21C2b022 E21C3b036	High Temp Door Type Dishwasher	LBES New SBES New Muni New	15
E21C1b025 E21C2b025 E21C3b039	High Temp Single Tank Conveyer Dishwasher	LBES New SBES New Muni New	20
E21C1b023 E21C2b023 E21C3b037	High Temp Multi Tank Conveyer Dishwasher	LBES New SBES New Muni New	20
E21C1b024 E21C2b024 E21C3b038	High Temp Pots & Pans Dishwasher	LBES New SBES New Muni New	10
E21C1b030 E21C2b030 E21C3b044	Low Temp Under Counter Dishwasher	LBES New SBES New Muni New	10
E21C1b027 E21C2b027 E21C3b041	Low Temp Door Type Dishwasher	LBES New SBES New Muni New	15
E21C1b029 E21C2b029 E21C3b043	Low Temp Single Tank Conveyer Dishwasher	LBES New SBES New Muni New	20
E21C1b028 E21C2b028 E21C3b042	Low Temp Multi Tank Conveyer Dishwasher	LBES New SBES New Muni New	20

**Other Resource Impacts:**

Dishwasher high temp: There are water savings associated with this measure. <sup>2</sup>

<b>Dishwasher Type</b>	<b>Annual water savings (gal/unit)</b>
High Temp Under Counter Dishwasher	5,399
High Temp Door Type Dishwasher	35,056
High Temp Single Tank Conveyer Dishwasher	21,284
High Temp Multi Tank Conveyer Dishwasher	80,754

High Temp Pots & Pans Dishwasher	10,517
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Dishwasher low temp: There are water savings associated with this measure.<sup>2</sup>

Dishwasher Type	Annual water savings (gal/unit)
Low Temp Under Counter Dishwasher	12,677
Low Temp Door Type Dishwasher	80,629
Low Temp Single Tank Conveyor Dishwasher	65,104
Low Temp Multi Tank Conveyor Dishwasher	93,900
Low Temp Pots & Pans Dishwasher	TBD

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b026 E21C2b026 E21C3b040	High Temp Under Counter Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b022 E21C2b022 E21C3b036	High Temp Door Type Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b025 E21C2b025 E21C3b039	High Temp Single Tank Conveyor Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b023 E21C2b023 E21C3b037	High Temp Multi Tank Conveyor Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b024 E21C2b024 E21C3b038	High Temp Pots & Pans Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b030 E21C2b030 E21C3b044	Low Temp Under Counter Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b027 E21C2b027 E21C3b041	Low Temp Door Type Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b029 E21C2b029 E21C3b043	Low Temp Single Tank Conveyor Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b028 E21C2b028 E21C3b042	Low Temp Multi Tank Conveyor Dishwasher	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90

In-Service Rates:

In-service rates are assumed to be 100% until an evaluation finds otherwise.

Realization Rates:

Realization rates are assumed to be 100% until an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1.

Endnotes:

1. ENERGY STAR Commercial Dishwashers Key Product Criteria, version 2.0. Effective Feb 1, 2013.  
**Note:** ENERGY STAR Commercial Dishwashers product specification version 3.0 is in its final draft form as of June 15, 2020 but does not yet have a set adoption date.
2. ENERGY STAR Commercial Kitchen Equipment Calculator. Updated October 2016.  
**Note:** High temperature units are assumed to have natural gas hot water and electric temperature boosters. Low temperature units are assumed to have electric hot water. ENERGY STAR notes that a new version of the calculator will be available in fall 2020.
3. FSTC Life Cycle Savings Calculators <https://fishnick.com/saveenergy/tools/calculators/>

## 2.11. Food Service – Fryer

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Food Service

### Description:

Electric Fryer: Installation of a qualified ENERGY STAR standard or large vat commercial fryer. ENERGY STAR commercial fryers save energy during cooking and idle times due to improved cooking efficiency and idle energy rates.

Gas Fryer: The installation of a natural-gas fired fryer that is either ENERGY STAR rated or has a heavy-load cooking efficiency of at least 50%. Qualified fryers use advanced burner and heat exchanger designs to use fuel more efficiently, as well as increased insulation to reduce standby heat loss.

### Baseline Efficiency:

Electric Fryer: The baseline efficiency case for both, standard sized fryers and large capacity fryers is an electric deep-fat fryer of the same size with a cooking energy efficiency, shortening capacity, and idle energy rate as defined by any relevant U.S. federal requirements.

Gas Fryer: The baseline efficiency case is a gas deep-fat fryer of the same size with a cooking energy efficiency, shortening capacity, and idle energy rate as defined by any relevant U.S. federal requirements.

### High Efficiency:

Electric Fryer: The high efficiency case for both, standard sized fryer and large capacity fryers is an electric deep-fat fryer with a cooking energy efficiency, shortening capacity, and idle energy rate in line with ENERGY STAR requirements.

Gas Fryer: The high efficiency case is an fryers is a deep-fat gas fryer with a cooking energy efficiency, shortening capacity, and idle energy rate in line with ENERGY STAR requirements.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \Delta kWh$$

$$\Delta kW = \Delta kWh / \text{Hours}$$

Where:

$\Delta kWh$  = gross annual kWh savings from the measure per table below

$\Delta kW$  = gross average kW savings from the measure per table below

Hours = Annual hours of operation

$$\Delta MMBtu = \Delta MMBtu$$

Where:

$\Delta MMBtu$  = gross annual MMBtu gas savings from the measure per table below

**Energy Savings for Commercial Fryer:**

BC Measure ID	Measure Name	Program	$\Delta kW$	$\Delta kWh$	$\Delta MMBtu$
E21C1b033 E21C2b033 E21C3b050	Electric Fryer, Standard Vat	LBES New SBES New  Muni	0.50	2,976	n/a
E21C1b032 E21C2b032 E21C3b049	Electric Fryer, Large Vat	LBES New SBES New  Muni	0.50	2,841	n/a
G21C1b024 G21C2b024	Gas Fryer	LBES New SBES New	n/a	n/a	78.3

**Measure Life:**

The measure life for a new commercial fryer is 12 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b033 E21C2b033 E21C3b050	Electric Fryer, Standard Vat	LBES New SBES New Muni	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b032 E21C2b032 E21C3b049	Electric Fryer, Large Vat	LBES New SBES New Muni	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1b024 G21C2b024	Gas Fryer	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1

**Endnotes:**

**1:** SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>

## 2.12. Food Service – Griddle

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Food Service

### Description:

Electric Griddle: Installation of a qualified ENERGY STAR electric griddle.

Gas Griddle: Installation of a qualified ENERGY STAR gas griddle.

ENERGY STAR griddles save energy cooking and idle times due to improved cooking efficiency and idle energy rates.

### Baseline Efficiency:

Electric Griddle: The baseline efficiency case is a typically sized, (6 sq. ft.) electric, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate as defined by any applicable U.S. federal requirements.

Gas Griddle: The baseline efficiency case is a typically sized, (6 sq. ft.) gas, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate as defined by any applicable U.S. federal requirements.

### High Efficiency:

Electric Griddle: The high efficiency case is a typically sized (6 sq. ft.), electric, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate meeting the minimum ENERGY STAR requirements.

Gas Griddle: The high efficiency case is a typically sized (6 sq. ft.), gas, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate meeting the minimum ENERGY STAR requirements.

### Algorithms for Calculating Primary Energy Impact:

BC Measure ID	Measure Name	Program	$\Delta kW$	$\Delta kWh$	$\Delta MMBtu$
E21C1b034 E21C2b034 E21C3b055	Commercial Electric Griddle	LBES New SBES New Muni	0.90	3,965	n/a
G21C1b025 G21C2b025	Commercial Gas Griddle	LBES New SBES New	n/a	n/a	37.9

For electric Griddle:  
 $\Delta kWh = \Delta kWh$   
 $\Delta kW = \Delta kWh / \text{Hours}$

Where:  
 $\Delta kWh$  = gross annual kWh savings from the measure per table above  
 $\Delta kW$  = gross average kW savings from the measure per table above  
 Hours = annual operating hours

For Gas Griddle:  
 $\Delta MMBtu = MMBtu$

Where:  
 $\Delta MMBtu$  = gross annual MMBtu gas savings from the measure per table above.

**Measure Life:**

The measure life for a new commercial griddle is 12 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b034 E21C2b034 E21C3b055	Electric Griddle	LBES New SBES New  Muni	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1b025 G21C2b025	Gas Griddle	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1

**Endnotes:**

**1:** SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>

## 2.13. Food Service – Holding Cabinet

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Food Service

### Description:

Installation of a qualified ENERGY STAR hot food holding cabinet (HFHC). ENERGY STAR hot food holding cabinets are 70 percent more energy efficient than standard models. Models that meet this requirement incorporate better insulation, reducing heat loss, and may also offer additional energy saving devices such as magnetic door gaskets, auto-door closures, or Dutch doors. The insulation of the cabinet also offers better temperature uniformity within the cabinet from top to bottom. Offering full size, 3/4 size, and 1/2 size HFHC.

### Baseline Efficiency:

The baseline efficiency idle energy rate for a HFHC is a unit meeting any applicable federal energy efficiency standards.

### High Efficiency:

The high efficiency idle energy rate for HFHC is based on the product interior volume in cubic feet (V) as shown below.<sup>1</sup>

Size Category	Product Interior Volume, V (ft <sup>3</sup> )	Product Idle Energy Consumption Rate (W)
Half size	$0 < V < 13$	$\leq 21.5 V$
3/4 size	$13 \leq V < 28$	$\leq 2.0 V + 254.0$
Full size	$28 \leq V$	$\leq 3.8 V + 203.5$

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed:

$$\text{kWh} = \text{kWh}$$

$$\text{kW} = \text{kWh} / \text{Hours}$$

Where:

kWh = gross annual kWh savings from the measure: See table below.

kW = gross average kW savings from the measure: See table below.

Hours = annual operating hours

### Energy Savings for Commercial Hot Food Holding Cabinets

BC Measure ID	Measure Name	Program	ΔkW	ΔkWh
E21C1b037 E21C2b037 E21C3b058	Full Size	LBES New SBES New Muni	0.50	2,737
E21C1b036 E21C2b036 E21C3b057	3/4 Size	LBES New SBES New Muni	0.20	1,095
E21C1b038 E21C2b038 E21C3b059	1/2 Size	LBES New SBES New Muni	0.20	1,095

**Measure Life:**

The measure life for a new commercial HFHC is 12 years. <sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b037 E21C2b037 E21C3b058	Hot Food Holding Cabinet Full Size	LBES New SBES New Muni	1.00	1.00	1.00	1.00	1.00	0.90	0.90
E21C1b036 E21C2b036 E21C3b057	Hot Food Holding Cabinet 3/4 Size	LBES New SBES New Muni	1.00	1.00	1.00	1.00	1.00	0.90	0.90
E21C1b038 E21C2b038 E21C3b059	Hot Food Holding Cabinet Half Size	LBES New SBES New Muni	1.00	1.00	1.00	1.00	1.00	0.90	0.90

In-Service Rates:

All installations have a 100% in-service rate since programs include verification of equipment installations.

Realization Rates:

100% Realization Rates are assumed because savings are based on researched assumptions by ENERGY STAR.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** ENERGY STAR Program Requirements Product Specification for Commercial Hot Food Holding Cabinets, Version 2.0. Effective October 1, 2011.

[https://www.energystar.gov/ia/partners/prod\\_development/revisions/downloads/hfhc/Final\\_V2.0\\_HFHC\\_Program\\_Requirements.pdf?b187-e770](https://www.energystar.gov/ia/partners/prod_development/revisions/downloads/hfhc/Final_V2.0_HFHC_Program_Requirements.pdf?b187-e770)

**2:** FSTC Life Cycle Savings Calculators <https://fishnick.com/saveenergy/tools/calculators/>

## 2.14. Food Service – Ice Machine

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Food Service

### Description:

Installation of a qualified ENERGY STAR commercial ice machine. Commercial ice machines meeting the ENERGY STAR specifications are on average 15 percent more energy efficient and 10 percent more water-efficient than standard models. ENERGY STAR qualified equipment includes ice-making head (IMH), self-contained (SCU), and remote condensing units (RCU).

### Baseline Efficiency:

The baseline efficiency case is a non-ENERGY STAR commercial ice machine, which must be compliant with the applicable federal standard.<sup>1</sup>

### High Efficiency:

The high efficiency case is a commercial ice machine meeting the ENERGY STAR V3.0 Efficiency Requirements for commercial ice machines.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated on a per-unit basis, based on the equipment type and daily ice harvest rate.

$$\text{kWh} = \text{kWh}_{\text{baseline}} - \text{kWh}_{\text{ee}}$$

$$\text{kW} = \text{kWh} / \text{hours}$$

Where:

kWh = gross annual kWh savings from the measure.

kWh<sub>baseline</sub> = annual kWh usage for the base case, based on ice harvest rate H. See table below.

kWh<sub>ee</sub> = annual kWh usage for the efficient case, based on ice harvest rate H. See table below.

kW = gross average kW savings from the measure.

Hours = Average annual equipment operating hours, see Hours section below.

Energy Savings Inputs for Commercial Ice Machine <sup>2</sup>

BC Measure ID	Measure Name	Program	Daily Ice Harvest Rate, H (lb ice/24 hr)	Baseline Daily Energy Use (kWh/100 lb ice) <sup>1</sup>	Efficient Daily Energy Use (kWh/100 lb ice) <sup>3</sup>
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E21C1b039 E21C2b039 E21C3b060	Ice Making Head	LBES New SBES New Muni New	$H < 300$	$10 - 0.01233 \times H$	$9.20 - 0.01134 \times H$
			$300 \leq H < 800$	$7.05 - 0.0025 \times H$	$6.49 - 0.0023 \times H$
			$800 \leq H < 1500$	$5.55 - 0.00063 \times H$	$5.11 - 0.00058 \times H$
			$1500 \leq H < 4000$	4.61	4.24
E21C1b040 E21C2b040 E21C3b061	Self Contained Unit	LBES New SBES New Muni New	$50 \leq H < 1000$	$7.97 - 0.00342 \times H$	$7.17 - 0.00308 \times H$
			$1000 \leq H < 4000$	4.55	4.13
			$H < 110$	$14.79 - 0.0469 \times H$	$12.57 - 0.0399 \times H$
E21C1b041 E21C2b041 E21C3b062	Remote Condensing Unit (Batch)	LBES New SBES New Muni New	$110 \leq H < 200$	$12.42 - 0.02533 \times H$	$10.56 - 0.0215 \times H$
			$200 \leq H < 4000$	7.35	6.25
E21C1b042 E21C2b042 E21C3b063	Remote Condensing Unit (Continuous)	LBES New SBES New Muni New	$H < 800$	$9.7 - 0.0058 \times H$	$7.76 - 0.00464 \times H$
			$800 \leq H < 4000$	5.06	4.05

### Measure Life:

The measure life for a new ice making machine is 8 years. <sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b039 E21C2b039 E21C3b060	Ice Machine - Ice Making Head	LBES New SBES New Muni New	1.00	1.00	1.00	1.00	1.00	0.9	0.9
E21C1b040 E21C2b040 E21C3b061	Ice Machine - Remote Cond./Split Unit - Batch	LBES New SBES New Muni New	1.00	1.00	1.00	1.00	1.00	0.9	0.9

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b041 E21C2b041 E21C3b062	Ice Machine - Remote Cond./Split Unit - Continuous	LBES New SBES New Muni New	1.00	1.00	1.00	1.00	1.00	0.9	0.9
E21C1b042 E21C2b042 E21C3b063	Ice Machine - Self Contained	LBES New SBES New Muni New	1.00	1.00	1.00	1.00	1.00	0.9	0.9

**In-Service Rates:**

All installations have 100% in service rate since programs include verification of equipment installations.

**Realization Rates:**

100% realization rates are assumed because savings are based on researched assumptions.

**Coincidence Factors:**

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

- 1: 10 CFR 431.136. Effective January 28, 2018
- 2: FOOD SERVICE COMMERCIAL ICE MACHINE. SWFS006-01. (CA) December 2018.
- 3: ENERGY STAR Program Requirements For Automatic Commercial Ice Makers. V3.0.

## 2.15. Food Service – Oven

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Combination Oven, Electric Convection Oven, Electric	Installation of a qualified ENERGY STAR commercial convection oven or commercial combination oven. ENERGY STAR commercial ovens save energy during preheat, cooking and idle times due to improved cooking efficiency, and preheat and idle energy rates. Combination ovens can be used either as convection ovens or as steamers.
Combination Oven, Gas Convection Oven, Gas Conveyor Oven, Gas Rack Oven, Gas	Installation of High Efficiency Gas Ovens

### Baseline Efficiency:

The baseline efficiency case is a convection, combination, conveyor, or rack oven that meets applicable minimum federal efficiency standards and uses the same fuel as the proposed high efficiency equipment.

### High Efficiency:

The high efficiency case is a commercial oven that meets the ENERGY STAR program requirements for its type and fuel, as shown below.<sup>1</sup> Note that combination ovens are rated based on their capacity in number of pans (P), and that no ENERGY STAR program requirements for conveyor ovens have yet been approved.

Oven Fuel	Measure Name	Efficiency Requirement	Idle rate
Electric	Convection Oven	$\geq 71\%$	$\leq 1.60 \text{ kW}$
Electric	Combination Oven	$\geq 55\%$ steam mode $\geq 76\%$ convection mode	$\leq 0.133P + 0.6400 \text{ kW}$ steam mode $\leq 0.080P + 0.4989 \text{ kW}$ convection mode
Gas	Convection Oven	$\geq 46\%$	$\leq 12,000 \text{ Btu/hr}$
Gas	Combination Oven	$\geq 41\%$ steam mode $\geq 56\%$ convection mode	$\leq 200P + 6,511 \text{ Btu/hr}$ steam mode $\leq 150P + 5,425 \text{ Btu/hr}$ convection mode

Gas	Conveyer Oven		
Gas	Rack Oven	≥ 48%	≤ 25,000 Btu/hr

Ovens must be rated based on ASTM F1496 (Convection Oven), ASTM F2861 (Combination Oven), and ASTM 2093 (Conveyer Oven and Rack Oven).

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed.

$$\Delta kWh = kWh$$

$$\Delta kW = kWh / \text{hours}$$

$$\Delta MMBtu = MMBtu$$

Where:

$\Delta kWh$  = gross annual kWh savings from the measure. See table below.

$\Delta kW$  = gross average kW savings from the measure. See table below.

$\Delta MMBtu$  = gross average natural gas savings from the measure. See table below.

Hours = Annual hours of operation = 4,390 hr/yr at 12 hr/day

### Energy Savings for Commercial Ovens

BC Measure ID	Measure Name	Program	$\Delta kW$	$\Delta kWh$	$\Delta MMBtu$
E21C1b021 E21C2b021 E21C3b035	Electric Full Size Convection Oven	LBES New SBES New Muni New	0.70	2,787	n/a
E21C1b019 E21C2b019 E21C3b031	Electric Combination Oven	LBES New SBES New Muni New	3.50	15,095	n/a
G21C1b022 G21C2b022	Gas Convection Oven	LBES New SBES New	n/a	n/a	35.7
G21C1b021 G21C2b021	Gas Combination Oven	LBES New SBES New	n/a	n/a	110.3
G21C1b023 G21C2b023	Gas Conveyer Oven	LBES New SBES New	n/a	n/a	88.4
G21C1b026 G21C2b026	Gas Rack Oven	LBES New <b>SBES New</b>	n/a	n/a	211.3

### Measure Life:

The measure life for a new commercial oven is 12 years. <sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b021 E21C2b021 E21C3b035	Electric Convection Oven	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1b019 E21C2b019 E21C3b031	Electric Combination Oven	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1b022 G21C2b022	Gas Convection Oven	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b021 G21C2b021	Gas Combination Oven	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b023 G21C2b023	Gas Conveyer Oven	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b026 G21C2b026	Gas Rack Oven	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have 100% in service rate since programs include verification of equipment installations

Realization Rates:

Installations have a 100% realization rate because programs use researched values for savings estimates.

Coincidence Factors:

Coincidence Factors for electric ovens are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1.

Endnotes:

- 1: ENERGY STAR Program Requirements for Commercial Ovens. Version 2.2.  
<https://www.energystar.gov/sites/default/files/Commercial%20Ovens%20Final%20Version%202.2%20Specification.pdf>
- 2: FSTC Life Cycle Savings Calculators <https://fishnick.com/saveenergy/tools/calculators/>

## 2.16. Food Service – Steam Cooker

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Food Service

### Description:

Electric Steam Cooker: Installation of a qualified ENERGY STAR commercial steam cooker. ENERGY STAR steam cookers save energy during cooling and idle times due to improved cooking efficiency and idle energy rates.

Gas Steam Cooker: The installation of an ENERGY STAR rated natural-gas fired steamer, either connectionless or steam-generator design. Qualified steamers reduce heat loss due to better insulation, improved heat exchange, and more efficient steam delivery systems.

### Baseline Efficiency:

Electric Steam Cooker: The Baseline Efficiency case is an electric steam cooker with a cooking efficiency, pan production capacity, preheat energy, and idle energy rate as defined by any relevant U.S. federal requirements.

Gas Steam Cooker: The baseline efficiency case is a gas steam cooker with a cooking efficiency, pan production capacity, preheat energy, and idle energy rate as defined by any relevant U.S. federal requirements.

### High Efficiency:

Electric Steam Cooker: The High Efficiency case is an electric steam cooker with a cooking energy efficiency, pan production capacity, preheat energy, and an idle energy rate meeting the minimum ENERGY STAR requirements.

Gas Steam Cooker: The high efficiency case is a gas steam cooker with a cooking energy efficiency, pan production capacity, preheat energy, and an idle energy rate meeting the minimum ENERGY STAR requirements.

### Algorithms for Calculating Primary Energy Impact:

BC Measure ID	Measure Name	Program	$\Delta kWh$	$\Delta kW$	$\Delta MMBtu$
E21C1b048 E21C2b048 E21C3b079	Electric Steam Cooker	LBES New SBES New Muni New	30,156	6.89	n/a
G21C1b027	Gas Steam Cooker	LBES New	n/a	n/a	370.7

G21C2b027		SBES New			
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Quantity = Number of pans

Hours = Average annual equipment operating hours. See Hours section below.

**Measure Life:**

The measure life for a new steamer is 12 years.<sup>1</sup>

**Other Resource Impacts:**

Electric Steam Cooker: Deemed annual water savings.

Gas Steam Cooker: Deemed annual water savings.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b048 E21C2b048 E21C3b079	Electric Steam Cooker	LBES New SBES New Muni New	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1b027 G21C2b027	Gas Steam Cooker	LBES New SBES New	1.00	n/a	1.00	1.00	1.00	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1

**Endnotes:**

1: SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>

## 2.17. Hot Water – Faucet Aerators

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Food Service

### Description:

Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting.

### Baseline Efficiency:

The baseline efficiency case is an existing faucet aerator with Federal Standard flow rate of 2.2 GPM.<sup>1</sup>

### High Efficiency:

The high efficiency case is a low flow faucet aerator with EPA WaterSense<sup>2</sup> specified maximum flow rate of 1.5 GPM.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated using the Federal Energy Management Program (“FEMP”) Energy Cost Calculator.<sup>3</sup> kW savings are calculated using the demand impact model.<sup>4</sup>

BC Measure ID	Measure Name	Fuel Type	Program	ΔkWh	ΔkW	ΔMMBtu
E21C1a028 E21C1b031 E21C1d030 E21C2a028 E21C2b031 E21C2d030 E21C3a044 E21C3b045 E21C3d046	Faucet Aerator	Electric	LBES Retro LBES New LBES DI SBES Retro SBES New SBES DI Muni Retro Muni New Muni DI	309	0.01	n/a
E21C3a045 E21C3b046 E21C3d047 G21C1a005 G21C1b017 G21C2a005 G21C2b017	Faucet Aerator	Gas	LBES Retro LBES New LBES DI SBES Retro SBES New SBES DI Muni Retro	n/a	n/a	1.7

			Muni New Muni DI			
E21C3a046 E21C3b047 E21C3d048	Faucet Aerator	Oil	LBES Retro LBES New LBES DI SBES Retro SBES New SBES DI Muni Retro Muni New Muni DI	n/a	n/a	1.7
E21C3a047 E21C3b048 E21C3d049	Faucet Aerator	Propane	<b>LBES Retro</b> <b>SBES Retro</b> <b>Muni Retro</b>	n/a	n/a	1.7

**Measure Life:**

The measure life for a faucet aerator is 10 years.<sup>5</sup>

**Other Resource Impacts:**

There are deemed water savings of 5,460 gallons/unit.<sup>3</sup>

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a028 E21C1b031 E21C1d030 E21C2a028 E21C2b031 E21C2d030 E21C3a044 E21C3b045 E21C3d046	Faucet Aerator	<b>Electric</b>	LBES Retro LBES New LBES DI SBES Retro SBES New SBES DI Muni Retro Muni New Muni DI	1.00	1.00	1.00	1.00	1.00	0.52	1.00
E21C3a045 E21C3b046 E21C3d047 G21C1a005 G21C1b017 G21C2a005 G21C2b017	Faucet Aerator	Gas	Muni Retro Muni New Muni DI LBES Retro LBES New SBES Retro SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a046 E21C3b047	Faucet Aerator	Oil	LBES Retro	1.00	n/a	1.00	n/a	n/a	n/a	n/a

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C3d048			SBES Retro Muni Retro							
E21C3a047 E21C3b048 E21C3d049	Faucet Aerator	Propane	LBES Retro SBES Retro Muni Retro	1.00	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A summer coincidence factor of 52% and a winter coincidence factor of 100% is utilized.<sup>4</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** In 1998, the Department of Energy adopted a maximum flow rate standard of 2.2 gpm at 60 psi for all faucets: 63 Federal Register 13307; March 18, 1998. <https://www.epa.gov/sites/production/files/2017-02/documents/ws-specification-home-final-supstatement-v1.0.pdf>

**2:** WaterSense: Bathroom Faucets. <https://www.epa.gov/watersense/bathroom-faucets>

**3:** Federal Energy Management Program (“FEMP”) Energy Cost Calculator for Faucets and Showerheads. Available at: <https://www.energy.gov/eere/femp/energy-cost-calculator-faucets-andshowerheads-0>. On average, faucets are assumed to run 30 minutes per day, 260 days per year. Actual usage values should be used, when known, in lieu of default savings values.

**4:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**5:** Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks, GDS Associates, April 2009. [http://ma-eeac.org/wordpress/wp-content/uploads/5\\_Natural-Gas-EE-Potential-in-MA.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/5_Natural-Gas-EE-Potential-in-MA.pdf)

## 2.19. Hot Water – Showerheads

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	Hot Water

### Description:

Low-Flow Showerhead with Thermostatic Valve: Installation of a stand-alone thermostatic shut-off valve on stand flow showerhead.

Low-Flow Showerhead, Electric: Installation of a low-flow showerhead with thermostatic shut-off valve.

Low-Flow Showerhead, Gas: Installation of a low flow showerhead with a flow rate of 1.5 GPM or less in a commercial setting with service water heated by natural gas.

### Baseline Efficiency:

Low-Flow Showerhead with Thermostatic Valve: The baseline efficiency is an existing standard-flow showerhead (2.5 GPM) with no thermostatic shut-off valve.

Low-Flow Showerhead, Electric: The baseline efficiency is an existing standard-flow showerhead (2.5 GPM) with no thermostatic shut-off valve.

Low-Flow Showerhead, Gas: The baseline efficiency case is a 2.5 GPM showerhead.

### High Efficiency:

Low-Flow Showerhead with Thermostatic Valve: The high efficiency case is a standard flow showerhead (2.5 GPM) with the addition of a stand-alone thermostatic shut-off valve.

Low-Flow Showerhead, Electric: The high efficiency case is a low-flow showerhead (1.75 GPM) with the addition of a thermostatic shut-off valve.

Low-Flow Showerhead, Gas: The high efficiency case is a 1.5 GPM showerhead.

### Algorithms for Calculating Primary Energy Impact:

Low-Flow Showerhead with Thermostatic Valve: Unit savings are deemed.<sup>1</sup> kW savings are calculated using the demand impact model.<sup>2</sup>

Low-Flow Showerhead, Electric and Low-Flow Showerhead, Gas: Unit savings are deemed.<sup>3</sup>

BC Measure ID	Measure Name	Fuel Type	$\Delta$ kWh	$\Delta$ kW	$\Delta$ MMBtu
E21C1a033 E21C1b044 E21C1d033 E21C2a033 E21C2b044 E21C2d033 E21C3a056 E21C3b066	Low-Flow Showerhead with Thermostatic Valve		69	0.01	n/a

E21C3d056 G21C1a006 G21C1b018 G21C2a006 G21C2b018					
E21C3a057 E21C3b067 E21C3d057	Low-Flow Showerhead	Electric	507	0.09	
E21C3a058 E21C3b068 E21C3d058	Low-Flow Showerhead	Gas	n/a	n/a	2.8
E21C3a059 E21C3b069 <b>E21C3d059</b>	Low-Flow Showerhead	Oil	n/a	n/a	2.8
E21C1a034 E21C1b045 E21C1d034 E21C2a034 E21C2b045 E21C2d034 E21C3a060 E21C3b070 E21C3d060 G21C1a007 G21C1b019 G21C2a007 G21C2b019	Low-Flow Showerhead	Propane	n/a	n/a	2.8

**Measure Life:**

The measure life for all Showerheads is 10 years.<sup>4</sup>

**Other Resource Impacts:**

Low-Flow Showerhead With Thermostatic Valve: Annual water savings of 558 gallons per unit.<sup>1</sup>

Low-Flow Showerhead, Electric and Low-Flow Showerhead, Gas: Annual water savings of 7,300 gallons per unit.<sup>3</sup>

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a033 E21C1b044 E21C1d033 E21C2a033	Low-Flow Showerhead with	LBES Retro LBES New LBES DI SBES Retro	1.00	1.00	n/a	1.00	1.00	0.52	1.00

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C2b044 E21C2d033 E21C3a056 E21C3b066 E21C3d056 G21C1a006 G21C1b018 G21C2a006 G21C2b018	Thermostatic Valve, Electric	SBES New SBES DI Muni Retro Muni New Muni DI LBES Retro LBES New SBES Retro SBES New							
E21C3a057 E21C3b067 E21C3d057	Low-Flow Showerhead with Thermostatic Valve, Gas	Muni Retro Muni New Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a058 E21C3b068 E21C3d058	Low-Flow Showerhead with Thermostatic Valve, Oil	Muni Retro Muni New Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a059 E21C3b069 E21C3d059	Low-Flow Showerhead with Thermostatic Valve, Propane	Muni Retro Muni New Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C1a034 E21C1b045 E21C1d034 E21C2a034 E21C2b045 E21C2d034 E21C3a060 E21C3b070 E21C3d060 G21C1a007 G21C1b019 G21C2a007 G21C2b019	Low-Flow Showerhead, Electric	LBES Retro LBES New LBES DI SBES Retro SBES New SBES DI Muni Retro Muni New Muni DI LBES Retro LBES New SBES Retro SBES New	1.00	1.00	n/a	1.00	1.00	0.52	1.00
E21C3a061 E21C3b071 E21C3d061	Low-Flow Showerhead, Gas	Muni Retro Muni New Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a062 E21C3b072 E21C3d062	Low-Flow Showerhead, Oil	Muni Retro Muni New Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a063 E21C3b073 E21C3d063	Low-Flow Showerhead, Propane	Muni Retro Muni New Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

All programs have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A summer coincidence factor of 52% and a winter coincidence factor of 100% is utilized.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

1: National Grid, 2014. Review of ShowerStart evolve. Calculation document provided in the MA TRM.

2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

3: Federal Energy Management Program (“FEMP”) Energy Cost Calculator for Faucets and Showerheads. Available at: <https://www.energy.gov/eere/femp/energy-cost-calculator-faucets-andshowerheads-0>. On average, showerheads are assumed to run 20 minutes per day, 365 days per year. Actual usage values should be used, when known, in lieu of default savings values.

4: Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks, GDS Associates, April 2009. [http://ma-eeac.org/wordpress/wp-content/uploads/5\\_Natural-Gas-EE-Potential-in-MA.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/5_Natural-Gas-EE-Potential-in-MA.pdf)

## 2.20. HVAC – Boiler Reset Controls

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

Boiler Reset Controls: Boiler Reset Controls are devices that automatically control boiler water temperature based on outdoor or return water temperature using a software program.

### Baseline Efficiency:

The baseline efficiency case is a boiler without reset controls.

### High Efficiency:

The high efficiency case is a boiler without reset controls.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated as:

$$\Delta \text{MMBtu/unit} = \text{CAP}_{\text{input}} \times \text{EFLH} \times \frac{\text{SF}}{1000}$$

Where,

$\text{CAP}_{\text{input}}$  = Boiler input capacity (MBH = MBtu/h)

EFLH = Equivalent full load heating hours

SF = Savings factor: 8%<sup>1</sup> or custom.

BC Measure ID	Measure Name	Fuel Type	Program	$\Delta$ MMBtu/unit
E21C3a019 E21C3d021 G21C1a010 G21C2a010	Boiler Reset Controls	Gas	Muni Retro Muni DI LBES Retro SBES Retro	Calculated
E21C3a020 E21C3d022	Boiler Reset Control	Oil	Muni Retro Muni DI	Calculated
E21C3a021 E21C3d023	Boiler Reset Control	Propane	Muni Retro Muni DI	Calculated

**Measure Life:**

The measure life is 15 years.<sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C3a019 E21C3d021 G21C1a010 G21C2a010	Boiler Reset Controls	Gas	Muni Retro Muni DI LBES Retro SBES Retro	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a020 E21C3d022	Boiler Reset Control	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a021 E21C3d023	Boiler Reset Control	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1.

Endnotes:

**1:** Savings factor is the estimate of annual gas consumption that is saved due to adding boiler reset controls. The CLEAResult uses a boiler tune up savings value derived from Xcel Energy "DSM Biennial Plan-Technical Assumptions," Colorado. Focus on Energy uses 8%, citing "Michigan Energy Measures Database". Vermont Energy Investment Corporation's boiler reset savings estimates for custom projects further indicate 8% savings estimate is better reflection of actual expected savings.

**2:** ACEEE, 2006. Emerging Technologies Report: Advanced Boiler Controls.

## 2.21. HVAC – Circulator Pump

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

Circulator Pump: Single-phase circulator pumps up used in C&I buildings used for hydronic heating and system hot water.

### Baseline Efficiency:

The baseline system is a pump without an EC motor. The baseline system may have no control, a timer, aquastat, or be on demand. The baseline system is assumed to run a weighted average of these four control types.

### High Efficiency:

The high efficiency case is a circulator pump with an ECM.

### Algorithms for Calculating Primary Energy Impact:

Savings depend on application and pump size as described in table below.<sup>1</sup>

Size	Type	kW	kWh
<= 1 HP	Hydronic Heating	$\Delta kW = 0.245 * HP_{rated} + 0.02$	$\Delta kWh = 1,325 * HP_{rated} + 111$
<= 1 HP	Service Hot Water	$\Delta kW = 0.245 * HP_{rated} + 0.02$	$\Delta kWh = 2,780 * HP_{rated} + 233$
> 1 HP	Hydronic Heating	$\Delta kW = 0.265$	$\Delta kWh = 1,436$
> 1 HP	Service Hot Water	$\Delta kW = 0.265$	$\Delta kWh = 3,013$

### Measure Life:

The measure life is 15 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:<sup>3</sup>

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b018 E21C2b018 E21C3b030	Circulator Pump	LBES New SBES New Muni New	1.00	1.00	n/a	n/a	n/a	0.00	0.53

#### In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

#### Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

#### Coincidence Factors:

A summer coincidence factor of 82% and a winter coincidence factor of 5% are utilized.<sup>3</sup>

#### **Energy Load Shape:**

See Appendix 1.

#### **Endnotes:**

**1:** The Cadmus Group, 2017. Circulator Pump Technical Memo. Prepared for National Grid and Eversource engineers.

**2:** Energy & Resource Solutions, November 2005. Measure Life Study. Prepared for The Massachusetts Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

**3:** Navigant Consulting (2018). RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 2.22. HVAC – Cooler Night Cover

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

Installation of retractable aluminium woven fabric covers for open type refrigerated display cases, where the covers are deployed during the facility unoccupied hours in order to reduce refrigeration energy consumption.

### Baseline Efficiency:

The baseline efficiency case is the annual operation of open-display cooler cases.

### High Efficiency:

The high efficiency case is the use of night covers to protect the exposed area of display cooler cases during unoccupied hours.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta \text{kWh} = (\text{Width}) \times (\text{Save}) \times (\text{Hours})$$

$$\Delta \text{kW} = (\text{Width}) \times (\text{Save})$$

Where:

$\Delta \text{kWh}$  = Energy Savings

$\Delta \text{kW}$  = Connected load reduction

Width = Width of the opening that the night covers protect (ft)

Save = Savings factor based on the temperature of the case (kW/ft). See table below <sup>1</sup>

Hours = Annual hours that the night covers are in use

Cooler Case Temperature	Savings Factor
Low Temperature (-35 F to -5 F)	0.03 kW/ft
Medium Temperature (0 F to 30 F)	0.02 kW/ft
High Temperature (35 F to 55 F)	0.01 kW/ft

### Measure Life:

The measure life for refrigeration add-on measures are 10 years. <sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a017 E21C1d019 E21C2a017 E21C2d019 E21C3a023 E21C3d025	Cooler Night Covers	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	1.00	n/a	0.00	0.00	0.00	0.00

In-Service Rates:

All installation have 100% in-service rate since all programs require verification of equipment installation.

Realization Rates:

Realization rate is 100% for energy savings and 0% for peak demand savings since night cover usage occurs outside of peak demand hours.

Coincidence Factors:

Coincidence factors are 0.00 since night cover usage occurs outside of peak demand hours.

**Energy Load Shape:**

See Appendix 1 – “C&I Refrigeration”.

**Endnotes:**

**1:** CL&P Program Savings Documentation for 2011 Program Year, 2010. Factors based on Southern California Edison (1997). Effects of the Low Emissive Shields on Performance and Power Use of a Refrigerated Display Case. <https://www.econofrost.com/wp-content/uploads/2016/03/Ashrae.pdf>

**2:** Energy & Resource Solutions, November 2005. Measure Life Study. Prepared for The Massachusetts Joint Utilities; Page 4-5 to 4-6. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

## 2.23. HVAC- Demand Control Ventilation

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	HVAC

### Description:

The measure controls the quantity of outside air to an air handling system based on detected space CO<sub>2</sub> levels. The installed systems monitor the CO<sub>2</sub> in the spaces or return air and reduce the outside air use when possible to save energy while meeting indoor air quality standards.

### Baseline Efficiency:

The baseline efficiency case assumes the relevant HVAC equipment has no ventilation control.

### High Efficiency:

The high efficiency case is the installation of an outside air intake control based on CO<sub>2</sub> sensors.

### Algorithms for Calculating Primary Energy Impact:

The energy and demand savings are calculated using the following algorithms and inputs:

$$\Delta kWh = kBtuh \times \frac{1 \text{ ton}}{12 \text{ kBtuh}} \times Save_{kWh}$$

$$\Delta kW = kBtuh \times \frac{1 \text{ ton}}{12 \text{ kBtuh}} \times Save_{kW}$$

Where:

$kBtuh$  = Capacity of the cooling equipment in kBtu per hour

$Save_{kW}$  = Average annual kWh reduction per ton of cooling capacity: 170 kWh/ton<sup>1</sup>

$Save_{kW}$  = Average kW reduction per ton of cooling capacity: 0.15 kW/ton<sup>2</sup>

### Measure Life:

The measure life is 10 years.<sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a018 E21C1d020 E21C2a018 E21C2d020 E21C3a024 E21C3d026	Demand Control Ventilation	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	1.01	n/a	1.09	1.57	0.82	0.05

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

Realization Rates are from an impact evaluation of 2006 HVAC installations and impact evaluation of 2007/2008 installations. <sup>4</sup>

Coincidence Factors:

CFs are based on Massachusetts TRM standard assumptions.

**Energy Load Shape:**

Appendix 1 – “C&I Heating and Cooling”

**Endnotes:**

**1:** Keena, Kevin, 2008. Analysis of CO2 Control Energy Savings on Unitary HVAC Units. Prepared for National Grid.

**2:** Keena, Kevin, 2008. Analysis of CO2 Control Energy Savings on Unitary HVAC Units. Prepared for National Grid.

**3:** Energy & Resource Solutions, November 2005. Measure Life Study. Prepared for The Massachusetts Joint Utilities; Table 1-1. Measure life is assumed to be the same as Enthalpy Economizer. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

**4:** RLW Analytics, 2008. Business & Construction Solutions (BS/CS) Programs Measurement & Verification 2006 Final Report. Prepared for NSTAR; Table 17.

## 2.24. HVAC- Dual Enthalpy Economizer Controls

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	HVAC

### Description:

The measure is to upgrade the outside-air dry-bulb economizer to a dual enthalpy economizer. The system will continuously monitor the enthalpy of both the outside air and return air. The system will control the system dampers adjust the outside quantity based on the two readings.

### Baseline Efficiency:

The baseline efficiency case for this measure assumes the relevant HVAC equipment is operating with a fixed dry-bulb economizer.

### High Efficiency:

The high efficiency case is the installation of an outside air economizer utilizing two enthalpy sensors, one for outdoor air and one for return air.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = kBtu/h \times \frac{1 \text{ ton}}{12 \text{ kBtu/h}} \times SAVE_{kWh}$$

$$\Delta kW = kBtu/h \times \frac{1 \text{ ton}}{12 \text{ kBtu/h}} \times SAVE_{kW}$$

Where:

kBtu/h = Capacity of the cooling equipment in kBtu per hour (1 ton of cooling capacity equals 12 kBtu/h)

$SAVE_{kWh}$  = Average annual kWh reduction per ton of cooling capacity: 289 kWh/ton<sup>1</sup>

$SAVE_{kW}$  = Average kW reduction per ton of cooling capacity: 0.289 kW/ton<sup>2</sup>

### Measure Life:

The measure life is 10 years.<sup>3</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a020 E21C1d022 E21C2a020 E21C2d022 E21C3a026 E21C3d028	Dual Enthalpy Economizer Controls	LBES Retro LBES DI SBES Retro SBES DI MES Retro MES DI	1.00	1.00	n/a	1.00	1.00	0.33	0.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

Realization Rates are the same as for the Unitary AC measure.

Coincidence Factors:

Coincidence factors are based on 2011 NEEP C&I Unitary AC Loadshape Project <sup>4</sup>

**Energy Load Shape:**

See Appendix 1 – “C&I Heating and Cooling”.

**Endnotes:**

**1, 2:** Patel, Dinesh, 2001. Energy Analysis: Dual Enthalpy Control. Prepared for Eversource (NSTAR).

**3:** Energy & Resource Solutions, November (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

**4:** KEMA, August 2011. C&I Unitary HVAC Loadshape Project - Final Report. Prepared for the Regional Evaluation, Measurement & Verification Forum. [https://neep.org/sites/default/files/resources/NEEP\\_HVAC\\_Load\\_Shape\\_Report\\_Final\\_August2\\_0.pdf](https://neep.org/sites/default/files/resources/NEEP_HVAC_Load_Shape_Report_Final_August2_0.pdf)

## 2.25. HVAC – Duct Insulation

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

For existing ductwork in non-conditioned spaces, insulate ductwork. This could include replacing un-insulated flexible duct with rigid insulated ductwork and installing 1" to 2" of duct-wrap insulation.

### Baseline Efficiency:

The baseline efficiency case is existing, uninsulated ductwork in unconditioned spaces (e.g. attic or basement).

### High Efficiency:

The high efficiency condition is insulated ductwork in unconditioned spaces.

### Algorithms for Calculating Primary Energy Impact:

Deemed average annual MMBtu savings of 0.13<sup>1</sup> are assumed per unit.

### Measure Life:

The measure life is 20 years.<sup>1</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C3a027 E21C3d029	Duct Insulation	Electric	Muni Retro Muni DI	1.00	1.00	1.00	1.00	1.00	0.35	0.00
E21C3a028 E21C3d030	Duct Insulation	Gas	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a029 E21C3d031	Duct Insulation	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C3a030 E21C3d032	Duct Insulation	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A summer coincidence factor of 35% is utilized.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

- 1: National Grid Staff Estimate, 2010. MA SBS-DI Duct Sealing and Insulation Scenario and Deemed Savings. <https://api-plus.anbetrack.com/etrm-gateway/etrm/api/v1/etrm/documents/5ee4885c6996f2b5047df743/view?authToken=fa8e547661bf80dea8750ffa5a1d3608215165882ceaf6ebc0b7193a1ab071622426a78ec0a491b80535c621447604a03ab75d3119793c326860fd96007eec8b851ba43c196fab>
- 2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 2.26. HVAC – Duct Sealing

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

For existing ductwork in non-conditioned spaces, seal ductwork. This could include sealing leaky fixed ductwork with mastic or aerosol.

### Baseline Efficiency:

The baseline efficiency case is existing, non-sealed (leaky) in unconditioned spaces (e.g. attic or basement).

### High Efficiency:

The high efficiency condition is air sealed ductwork in unconditioned spaces.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results:

$$\Delta \text{MMBtu} = \text{MMBtu/unit} \times \text{Units}$$

Where:

Unit = Number of square feet of ductwork treated

MMBtu/unit = Average annual MMBtu savings per unit: 0.13<sup>1</sup>

### Measure Life:

The measure life is 20 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a021 E21C1d023 E21C2a021 E21C2d023 E21C3a031 E21C3d033	Duct Sealing	Electric	LBES Retro LBES DI SBES Retro SBES DI	1.00	1.00	1.00	1.00	1.00	0.35	0.00

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
			Muni Retro Muni DI							
E21C3a032 E21C3d034	Duct Sealing	Gas	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a033 E21C3d035	Duct Sealing	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a034 E21C3d036	Duct Sealing	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A summer coincidence factor if 35% is utilized.<sup>2</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

1: National Grid Staff Estimate, 2010. MA SBS-DI Duct Sealing and Insulation Scenario and Deemed Savings. <https://api-plus.anbetrack.com/etrm-gateway/etrm/api/v1/etrm/documents/5ee4885c6996f2b5047df743/view?authToken=19819e606c75814de7e2d8af2fec676653fdc0f39f9bd79f566ee687c4851bcdb91e2216408550e53766db986dc9c0640b2776bb702f79b7f56a42e07d73a2cebf5c6abfb39bd1>

2: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 2.27. HVAC – Energy Management System

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

The measure is the installation of a new building energy management system (EMS) or the expansion of an existing energy management system for control of non-lighting electric and gas end-uses in an existing building on existing equipment.

### Baseline Efficiency:

The baseline for this measure assumes the relevant HVAC equipment has no centralized control.

### High Efficiency:

The high efficiency case is the installation of a new EMS or the expansion of an existing EMS to control additional non-lighting electric or gas equipment. The EMS must be installed in an existing building on existing equipment.

### Algorithms for Calculating Primary Energy Impact:

Gross energy and demand savings for energy management systems (EMS) are custom calculated using the EMS savings calculation tools from program administrators in Massachusetts. These tools are used to calculate energy and demand savings based on project-specific details including hours of operation, HVAC system equipment and efficiency and points controlled.

BC Measure ID	Measure Name	Fuel Type	Program	MMbtu/kWh
E21C1a025 E21C1d027 E21C2a025 E21C2d027 E21C3a038 E21C3d040	Energy Management System	Gas	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	0.001277
E21C1a025 E21C1d027 E21C2a025 E21C2d027 E21C3a038 E21C3d040	Energy Management System	Oil	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	0.002496

**Measure Life:**

The measure life is 10 years.<sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a025 E21C1d027 E21C2a025 E21C2d027 E21C3a038 E21C3d040	Energy Management System	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	1.00	1.00	1.00	1.00	0.95	1.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

A summer coincidence factor of 95% and a winter coincidence factor of 100% is utilized.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

- 1: Descriptions of the EMS savings calculation tools are included in the MA TRM Library “C&I Spreadsheet Tools” folder.
- 2: The Fleming Group, 1994. Persistence of Commercial/Industrial Non-Lighting Measures, Volume 3, Energy Management Control Systems. Prepared for New England Power Service Company.
- 3: New Hampshire common assumptions.

## 2.28. HVAC – Heat and Hot Water Combo Systems

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

Combo Condensing Furnace / Water Heater: Installation of a combination furnace.

Combo Condensing Boiler / Water Heater: This measure promotes the installation of a combined high-efficiency boiler and water heating unit. Combined boiler and water heating systems are more efficient than separate systems because they eliminate the standby heat losses of an additional tank.

### Baseline Efficiency:

Combo Condensing Furnace / Water Heater: It is assumed that the baseline is an 85% AFUE furnace <sup>1</sup> and a separate high draw gas fired storage water heater with an efficiency rating of 0.63 UEF.

Combo Condensing Boiler / Water Heater: The baseline efficiency case is a standard efficiency gas-fired storage tank hot water heater with a separate standard efficiency boiler for space heating purposes.

### High Efficiency:

Combo Condensing Furnace / Water Heater: A new combination 97% AFUE furnace and 0.90 tankless water heater.

Combo Condensing Boiler / Water Heater: The high efficiency case is either a condensing, integrated water heater/boiler with an AFUE of  $\geq 90\%$  or  $\text{AFUE} \geq 95\%$ .

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>2</sup>

BC Measure ID	Measure Name	$\Delta$ MMBtu
G21C1b012 G21C2b012	Combo Condensing Furnace/Water Heater, Gas	15.1
G21C1b011 G21C2b011	Combo Condensing Boiler/Water Heater, Gas	30.5

### Measure Life:

Combo Condensing Furnace / Water Heater: The measure life is 18 years.<sup>3</sup>

Combo Condensing Boiler/Water Heater: 20 years.<sup>4</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21C1b012 G21C2b012	Combo Condensing Furnace/Water Heater, Gas	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b011 G21C2b011	Combo Condensing Boiler/Water Heater, Gas	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** Massachusetts TRM 2019 Plan-Year Report Version, 2020. Measure 3.30: HVAC Combo Furnace/Water Heater, Commercial Page 477.

**2:** The Cadmus Group, March 2015. High Efficiency Heating Equipment Impact Evaluation. Prepared for The Electric and Gas Program Administrators of Massachusetts, Part of the Residential Evaluation Program Area <https://neep.org/sites/default/files/resources/High-Efficiency-Heating-Equipment-Impact-Evaluation-Final-Report.pdf>

**3:** Environmental Protection Agency, 2009. Lifecycle Cost Estimate for Energy Star Furnace.

**4:** Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks, GDS Associates, April 2009. [http://ma-eeac.org/wordpress/wp-content/uploads/5\\_Natural-Gas-EE-Potential-in-MA.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/5_Natural-Gas-EE-Potential-in-MA.pdf)

## 2.29. HVAC – Heating Systems - Boilers

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

The installation of a high efficiency natural gas fired condensing hot water boiler. High-efficiency condensing boilers can take advantage of improved design, sealed combustion, and condensing flue gases in a second heat exchanger to achieve improved efficiency.

### Baseline Efficiency:

Baseline efficiency is an 85% AFUE boiler.

### High Efficiency:

High efficiency is per table of efficiency thresholds below.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results. <sup>1</sup>

BC Measure ID	Measure Name	Program	ΔMMBtu
G21C1b010 G21C2b010	<= 300 MBH (0.95 TE)	LBES New SBES New	17.7
G21C1b009 G21C2b009	<= 300 MBH (0.90 TE)	LBES New SBES New	14.7
G21C1b008 G21C2b008	301-499 MBH (0.90 TE)	LBES New SBES New	28.0
G21C1b007 G21C2b007	500-999 MBH (0.90 TE)	LBES New SBES New	51.4
G21C1b006 G21C2b006	1000-1700 MBH (0.90 TE)	LBES New SBES New	94.5
G21C1b005 G21C2b005	1701+ MBH (0.90 TE)	LBES New SBES New	165.3

### Measure Life:

The measure life is 25 years. <sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21C1b010 G21C2b010	<= 300 MBH (0.95 TE)	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b009 G21C2b009	<= 300 MBH (0.90 TE)	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b008 G21C2b008	301-499 MBH (0.90 TE)	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b007 G21C2b007	500-999 MBH (0.90 TE)	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b006 G21C2b006	1000-1700 MBH (0.90 TE)	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1b005 G21C2b005	1701+ MBH (0.90 TE)	LBES New SBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1 “C&I Heating & Cooling”.

**Endnotes:**

**1:** DNV GL, NMR, March 2017. Gas Boiler Market Characterization Study Phase II. Prepared for Massachusetts Program Administrators and Energy Efficiency Advisory Council. <http://ma-eeac.org/wordpress/wp-content/uploads/Gas-Boiler-Market-Characterization-Study-Phase-II-Final-Report.pdf>

**2:** ASHRAE Applications Handbook, 2003; Page 36.3.

## 2.30. HVAC – Heating Systems – Condensing Unit Heaters

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

Installation of a condensing gas-fired unit heater for space heating with capacity up to 300 MBH and minimum combustion efficiency of 90%.

### Baseline Efficiency:

The baseline efficiency case is a standard efficiency gas fired unit heater with minimum combustion efficiency of 80%, interrupted or intermittent ignition device (IID), and either power venting or an automatic flue damper.<sup>1</sup> As a note, the baseline efficiency referenced applies to 2016. Baseline requirements for 2017 and on have not been finalized.

### High Efficiency:

The high efficiency case is a condensing gas unit heater with 90% AFUE or greater.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated as:

$$\Delta MMBtu = \frac{CAP}{OF} \times \left( \frac{EFLH}{1000} \right) \times \left( \frac{1}{\eta_b} - \frac{1}{AF \times \eta_{ee}} \right)$$

Where,

CAP = Installed capacity of the heater (KBtu/hr)

OF = Oversize factor. 1.15 for single installation and 1.3 for multiple installations.<sup>2</sup>

EFLH = Equivalent heating full load hours.

$\eta_b$  = Efficiency of the baseline heater. 0.8.<sup>1</sup>

AF = Adjustment factor. 0.97.<sup>2</sup>

$\eta_{ee}$  = Proposed heater efficiency. As installed with 0.9 minimum.

BC Measure ID	Measure Name	Program	$\Delta MMBtu$
G21C1b013 G21C2b013	Condensing Unit Heater (<= 300 MBH)	MES LBESS	Calculated

### Measure Life:

The measure life is 18 years.<sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21C1b013 G21C2b013	Condensing Unit Heater	MES New LBES New	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1 “C&I Heating & Cooling”.

Endnotes:

- 1: 2012 International Energy Conservation Code
- 2: Connecticut Program Savings Document, 2020. Measure 2.2.6. Natural Gas Fired Boilers and Furnaces.
- 3: Ecotrope, Inc., August 2003. Natural Gas Efficiency and Conservation Measure Resource Assessment for the Residential and Commercial Sectors. Prepared for the Energy Trust of Oregon.  
<https://library.cce1.org/system/files/library/1366/544.pdf>

## 2.31. HVAC – Heating Systems – Furnaces

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	HVAC

### Description:

The installation of a high efficiency natural gas warm air furnace with an electronically commutated motor (ECM) for the fan. High efficiency furnaces are better at converting fuel into direct heat and better insulated to reduce heat loss. ECM fan motors significantly reduce fan motor electric consumption as compared to both shaped-pole and permanent split capacitor motors.

### Baseline Efficiency:

The baseline efficiency in an 85% AFUE furnace.

### High Efficiency:

The high efficiency scenario assumes either a gas-fired furnace equal or higher than 95% AFUE or 97% AFUE.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results. <sup>1</sup>

BC Measure ID	Measure Name	Program	$\Delta$ MMBtu	$\Delta$ kWh	$\Delta$ kW
G21C1b014 G21C2b014	Furnace, 95%	LBES New SBES New	5.7	168	0.124
G21C1b015 G21C2b015	Furnace, 97%	LBES New SBES New	6.7	168	0.124

### Measure Life:

The measure life is 18 years. <sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>3</sup>**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21C1b014 G21C2b014	Furnace, 95%	LBES New SBES New	1.00	1.00	1.00	n/a	n/a	0.00	0.16
G21C1b015 G21C2b015	Furnace, 97%	LBES New SBES New	1.00	1.00	1.00	n/a	n/a	0.00	0.16

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A winter coincidence factor of 16% is utilized. Values pertain to other resource impacts for the EC motors.

**Energy Load Shape:**

See Appendix 1 “C&I Heating & Cooling”.

**Endnotes:**

- 1:** DNV-GL, 2015. Recalculation of Prescriptive Program Gas Furnace Savings Using New Baseline. Prepared for National Grid, Massachusetts.
- 2:** ASHRAE Applications Handbook, 2003; Page 36.
- 3:** Massachusetts TRM 2019 Plan-Year Report Version, 2020. Measure 3.42: HVAC Combo Furnace, Gas, Commercial Page 510

## 2.32. HVAC – Heating Systems – Infrared Heater

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

The installation of a gas-fired low intensity infrared heating system in place of unit heater, furnace, or other standard efficiency equipment. Infrared heating uses radiant heat as opposed to warm air to heat buildings. In commercial environments with high air exchange rates, heat loss is minimal because the space's heat comes from surfaces rather than air.

### Baseline Efficiency:

The baseline efficiency case is a standard efficiency gas-fired unit heater with combustion efficiency of 80%.

### High Efficiency:

The high efficiency case is a gas-fired low-intensity infrared heating unit.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated as:

$$\Delta MMBtu = \frac{kBtu}{hr_{input}} \times \frac{EFLH_{heating}}{1000} \times \left( 1 - \frac{HDD_{55} (55 - T_{design})}{HDD_{65} (55 - T_{design})} \right)$$

Where,

$\frac{kBtu}{hr_{input}}$  = Fuel input rating of the installed equipment

$EFLH_{heating}$  = Heating equivalent full-load hours

$HDD_{55}$  = Heating degree days with 55-degree bases

$HDD_{65}$  = Heating degree days with 65-degree base

$T_{design}$  = Equipment design temperature

Alternatively, unit savings are deemed based on study results. <sup>1</sup>

BC Measure ID	Measure Name	Fuel Type	Program	ΔMMBtu
G21C1b016 G21C2b016	Infrared Heaters	Gas	LBES New SBES New	12.0

### Measure Life:

The measure life is 17 years. <sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21C1b016 G21C2b016	Infrared Heaters	Gas	LBES New SBES New	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1 “C&I Heating & Cooling”.

Endnotes:

**1:** KEMA, June 2013. Impact Evaluation of 2011 Prescriptive Gas Measures; Page 1-5. <http://ma-eeac.org/wordpress/wp-content/uploads/Impact-Evaluation-of-2011-Prescription-Gas-Measures-6.27.13.pdf>

**2:** Nexant, 2006. DSM Market Characterization Report. Prepared for Questar Gas.

## 2.33. HVAC – High Efficiency Chiller

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

This measure promotes the installation of efficient water-cooled and air-cooled water chilling packages for comfort cooling applications. Eligible chillers include air-cooled, water cooled rotary screw and scroll, and water-cooled centrifugal chillers for single chiller systems or for the lead chiller only in multi-chiller systems.

### Baseline Efficiency:

The baseline efficiency case assumes compliance with the efficiency requirements as mandated by Massachusetts State Building Code. As described in Chapter 13 of the aforementioned document, energy efficiency must be met via compliance with the International Energy Conservation Code (IECC) 2015.

The table below details the specific efficiency requirements by equipment type and capacity.

Chiller - Minimum Efficiency Requirements <sup>1</sup>:

Size Category (Tons)	Units	Path A	Path A	Path B	Path B
		Full Load	IPLV	Full Load	IPLV
<b>Air-cooled chillers</b>					
< 150	EER	10.100	13.700	9.700	15.800
≥ 150	EER	10.100	14.000	9.700	16.100
<b>Water cooled, electrically operated, positive displacement (rotary screw and scroll)</b>					
< 75	kW/ton	0.750	0.600	0.780	0.500
≥ 75 and < 150	kW/ton	0.720	0.560	0.750	0.490
≥ 150 and < 300	kW/ton	0.660	0.540	0.680	0.440
≥ 300 and < 600	kW/ton	0.610	0.520	0.625	0.410
≥ 600	kW/ton	0.560	0.500	0.585	0.380
<b>Water cooled, electrically operated, centrifugal</b>					
< 150	kW/ton	0.610	0.550	0.695	0.440
≥ 150 and < 300	kW/ton	0.610	0.550	0.635	0.400

	≥ 300 and < 400	kW/ton	0.560	0.520	0.595	0.390
	≥ 400 and < 600	kW/ton	0.560	0.500	0.585	0.380
	≥ 600	kW/ton	0.560	0.500	0.585	0.380

For water cooled ≤300 tons positive displacement is the baseline. For > 300 tons Centrifugal is the baseline. 2 Path A is intended for applications where significant operating time is expected at full load. Path B is intended for applications where significant operating time is expected at part-load.

### High Efficiency:

The high efficiency scenario assumes water chilling packages that exceed the efficiency levels required by Massachusetts State Building Code and meet the minimum efficiency requirements as stated in the New Construction HVAC energy efficiency rebate forms.

### Algorithms for Calculating Primary Energy Impact:

Gross energy and demand savings for chiller installations may be custom calculated using the PA’s Chillers savings calculation tool. These tools are used to calculate energy and demand savings based on site-specific chiller plant details including specific chiller plan equipment, operational staging, operating load profile and load profile.

Alternatively, the energy and demand savings may be calculated using the algorithms and inputs below. Please note that consistent efficiency types (FL or IPLV) must be used between the baseline and high efficiency cases. It is recommended that IPLV be used over FL efficiency types when possible.

#### Air-Cooled Chillers:

$$\text{kWh} = \text{Tons} * (12/ \text{EER}_{\text{BASE}} - 12/ \text{EER}_{\text{EE}}) * \text{Hours}$$

$$\text{kW} = \text{Tons} * (12/ \text{EER}_{\text{BASE}} - 12/ \text{EER}_{\text{EE}})$$

#### Water-Cooled Chillers:

$$\text{kWh} = \text{Tons} * (\text{kW}/ \text{ton}_{\text{BASE}} - \text{kW}/ \text{ton}_{\text{EE}}) * \text{Hours}$$

$$\text{kW} = \text{Tons} * (\text{kW}/ \text{ton}_{\text{BASE}} - \text{kW}/ \text{ton}_{\text{EE}}) * (\text{LF}/100)$$

Where:

Tons = Rated capacity of the cooling equipment

EER<sub>BASE</sub> = Energy Efficiency Ratio of the baseline equipment. See table below for values.

EER<sub>EE</sub> = Energy Efficiency Ratio of the efficient equipment. Site-specific.

kW/ton<sub>BASE</sub> = Energy efficiency rating of the baseline equipment. See table below for values.

kW/ton<sub>EE</sub> = Energy efficiency rating of the efficient equipment. Site-specific.

Hours = Equivalent full load hours for chiller operation

### Measure Life:

The measure life is 23 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b052 E21C2b053 E21C3b084	Chillers – IPLV used	LBES New SBES New Muni New	All	1.00	n/a	1.00	1.00	0.49	0.06
E21C1b052 E21C2b052 E21C3b083	Chillers – FL used	LBES New SBES New Muni New	All	1.00	n/a	1.00	1.00	0.86	0.10

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

Realization rates are based on Massachusetts prospective results from 2015 prescriptive chiller study.<sup>3</sup> Prospective results are to be used in parallel with updated savings factors, as described above, from the same study

Coincidence Factors:

Coincidence factors are based on prospective statewide results from 2015 prescriptive chiller study.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1.

Endnotes:

- 1: Energy Solutions, 2018. Northeast Chillers Market Research.
- 2: Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures, GDS Associates, June 2007.  
[https://library.cce1.org/system/files/library/8842/CEE\\_Eval\\_MeasureLifeStudyLights%2526HVACGDS\\_1Jun2007.pdf](https://library.cce1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf)
- 3: DNV GL, October 2015. Impact Evaluation of Prescriptive Chiller and Compressed Air Installations. Prepared for the MA PAs and EEAC. [http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report\\_FINAL\\_151026.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA30-Prescriptive-Chiller-and-CAIR-Report_FINAL_151026.pdf)

## 2.34. HVAC – Hotel Occupancy Sensor

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	HVAC

### Description:

The measure is to the installation of hotel occupancy sensors (HOS) to control packaged terminal AC units (PTACs) with electric heat, heat pump units and/or fan coil units in hotels that operate all 12 months of the year.

### Baseline Efficiency:

The baseline efficiency case assumes the equipment has no occupancy-based controls.

### High Efficiency:

The high efficiency case is the installation of controls that include (a) occupancy sensors, (b) window/door switches for rooms that have operable window or patio doors, and (c) set back to 65°F in the heating mode and set forward to 78°F in the cooling mode when occupancy detector is in the unoccupied mode. Sensors controlled by a front desk system are not eligible.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on evaluation results:

$$\Delta kWh = SAVE_{kWh}$$

$$\Delta kW = SAVE_{kW}$$

Where:

Unit = Installed hotel room occupancy sensor

SAVE<sub>kWh</sub> = Average annual kWh reduction per unit: 438 kWh<sup>1</sup>

SAVE<sub>kW</sub> = Demand reduction per unit: 0.09 kW<sup>2</sup>

### Measure Life:

The measure life is 10 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1d031 E21C2a031 E21C2d031 E21C3a050 E21C3d050	Hotel Occupancy Sensor	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	All	1.00	1.00	1.00	1.00	0.82	0.05

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence factors are 82% for summer peak and 5% for winter peak.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** MassSave, 2010. Energy Analysis: Hotel Guest Occupancy Sensors. Prepared for National Grid and Eversource (NSTAR).

**2:** Energy and Resource Solutions, November 2005. Measure Life Study. Prepared for MA Joint Utilities. HOS measure life assumed to be the same as that for occupancy-based lighting controls. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)

**3:** New Hampshire Common Assumptions

## 2.35. HVAC – Pipe Wrap

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	HVAC

### Description:

Pipe Wrap – Heating: Install insulation on steam pipes located in non-conditioned spaces.

Pipe Wrap – Hot Water: Install insulation on hot water located in non-conditioned spaces.

### Baseline Efficiency:

Pipe Wrap – Heating: The baseline efficiency case is un-insulated steam piping in unconditioned space.

Pipe Wrap – Hot Water: The baseline efficiency case is un-insulated hot water piping in unconditioned space.

### High Efficiency:

Pipe Wrap – Heating: The high efficiency condition is steam piping in unconditioned space with insulation installed.

Pipe Wrap – Hot Water: The high efficiency condition is hot water piping in unconditioned space with insulation installed.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>1,2</sup> kW savings for hot water pipes with electric are calculated using the demand impact model.

Savings for steam pipes with electric heating is calculated as:

$$\Delta kWh = \frac{\left( \left( \frac{UA}{L} \right)_{baseline} - \left( \frac{UA}{L} \right)_{ee} \right)}{E_t \times 3,412} \times L \times \Delta T_{amb} \times hrs$$

Where,

$\left( \frac{UA}{L} \right)_{baseline}$  = Overall baseline heat transfer coefficient per unit length. 0.97 for 1.5”, 1.19 for 2”, and 1.70 for 3” copper pipes. For steel pipes, 1.23 for 1.5”, 1.51 for 2”, and 2.16 for 3”.

$\left( \frac{UA}{L} \right)_{ee}$  = Overall energy efficient heat transfer coefficient per unit length: 0.12 for all pipe sizes assuming fiber glass insulation of thickness equal to pipe diameter. Use 0.46 for rigid foam/cellular glass insulation of thickness equal to pipe diameter.

$L$  = Length of the pipe insulated.

$$\Delta T_{amb} = 85 \text{ }^\circ\text{F.}^1$$

$hrs$  = Annual operating hours.

$E_t$  = Thermal efficiency of electric heater. Default value of 0.98.

$$\Delta kW = \frac{\Delta kWh}{8760}$$

Measure Name	Program	$\Delta kWh$	$\Delta kW$	$\Delta MMBtu$ per linear foot
Pipe Wrap – Heating (Steam), Gas, $\leq 1.5''$	LBES Retro SBES Retro Muni Retro Muni DI			0.229
Pipe Wrap – Heating (Steam), Gas, $3''$	LBES Retro SBES Retro Muni Retro Muni DI			0.371
Pipe Wrap – Hot Water, Gas, $\leq 1.5''$	LBES Retro SBES Retro Muni Retro Muni DI			0.206
Pipe Wrap – Hot Water, Gas, $3''$	LBES Retro SBES Retro Muni Retro Muni DI			0.361
Pipe Wrap – Heating, Electric (Residential End Use)	LBES Retro SBES Retro SBES DI Muni Retro Muni DI	Calculated	Calculated	
Pipe Wrap – Hot Water, Electric (Residential End Use)	LBES Retro SBES Retro SBES DI Muni Retro Muni DI	129	0.03	

**Measure Life:**

The measure life is 15 years.<sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:<sup>4</sup>**

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a038 E21C1d038 E21C2d038 E21C3a067 E21C3d067	Pipe Wrap – Heating	Electric	LBES Retro SBES Retro SBES DI Muni Retro Muni DI	1.00	1.00	1.00	1.00	1.00	0.00	0.433
G21C1a013 G21C2a013 E21C3a068 E21C3d068	Pipe Wrap – Heating	Gas	LBES Retro SBES Retro Muni Retro Muni DI	1.00	n/a	1.00	n/	n/a	n/a	n/a
E21C3a069 E21C3d069	Pipe Wrap – Heating	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/	n/a	n/a	n/a
E21C3a070 E21C3d070	Pipe Wrap – Heating	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/	n/a	n/a	n/a
E21C1a039 E21C1d039 E21C2a039 E21C2d039 E21C3a071 E21C3d071	Pipe Wrap – Water Heating	Electric	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	1.00	1.00	1.00	1.00	0.312	0.808
G21C1a008 G21C2a008 E21C3a072 E21C3d072	Pipe Wrap – Water Heating	Gas	LBES Retro SBES Retro Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a073 E21C3d073	Pipe Wrap – Water Heating	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/	n/a	n/a	n/a
E21C3a074 E21C3d074	Pipe Wrap – Water Heating	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

A summer coincidence factor of 31.2% and a winter coincidence factor of 80.8% is utilized for insulation of hot water pipes with electric heating. For heating pipes with electric heating, a winter coincidence factor of 43.3% is utilized.<sup>4</sup>

### **Energy Load Shape:**

See Appendix 1.

### **Endnotes:**

- 1:** National Grid Staff Calculation, 2010. Pipe insulation for SBS DI measures 2010 Excel Workbook. <https://api-plus.anbetrack.com/etrm-gateway/etrm/api/v1/etrm/documents/5ee4885c6996f2d3357df744/view?authToken=962981283a7d38ac721edb179c5b7bf83c006a08da8c2f38866e381295963d8580eab751291c33061971c75a15dc0166f2c592d030d479cbaf9f7aa54c0ecbf2fc61aac2f00300>
- 2:** The Cadmus Group, July 2012. Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. <https://api-plus.anbetrack.com/etrm-gateway/etrm/api/v1/etrm/documents/5ee4885a6996f2cca27df73e/view?authToken=c3f41e9663355f5cba1ed024ab30ea4536bb2244f8e59bbbb2456444aad0600f2a7cd274d4a1ed7bdf33fa580f77ea7fb83e6341e0a43e7d5f9b52e5a311a397d19c852102c00d>
- 3:** Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks, GDS Associates, April 2009. [http://ma-eeac.org/wordpress/wp-content/uploads/5\\_Natural-Gas-EE-Potential-in-MA.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/5_Natural-Gas-EE-Potential-in-MA.pdf)
- 4:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 2.36. HVAC- Steam Traps

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	HVAC

### Description:

Repair or replace malfunctioning steam traps.

### Baseline Efficiency:

The baseline efficiency case is a failed steam trap.

### High Efficiency:

The high efficiency case is a repaired or replaced steam trap.

### Algorithms for Calculating Primary Energy Impact:

Deemed annual unit savings are as detailed in the table below: <sup>1</sup>

BC Measure ID	Measure Name	$\Delta$ MMBtu
G21C1a014 G21C2a014	Steam Trap	Low pressure ( $\leq$ 10 psig): 8.4 High pressure ( $>$ 10 psig): 35.6

### Measure Life:

The measure life is 6 years. <sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
G21C1a014 G21C2a014	Steam Trap	LBES Retro SBES Retro	1.00	1.00	1.00	n/a	n/a	n/a	n/a

### In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

Not applicable for this measure since no electric savings are claimed.

**Energy Load Shape:**

See Appendix 1 – “Boiler Distribution”.

**Endnotes:**

**1:** Energy and Resource Solutions, April 2018. Two-Tier Steam Trap Savings Study. Prepared for National Grid and Eversource of Massachusetts. <http://ma-eeac.org/wordpress/wp-content/uploads/MA-CIEC-Two-Tier-Steam-Traps-Memo-FINAL.pdf>

**2:** DNV GL, June 2015. Massachusetts 2013 Prescriptive Gas Impact Evaluation – Steam Trap Evaluation Phase I. Prepared for Massachusetts Gas Program Administrators and Massachusetts Energy Efficiency Advisory Council. <http://ma-eeac.org/wordpress/wp-content/uploads/MA-2013-Prescriptive-Gas-Impact-Evaluation-Steam-Trap-Evaluation-Phase-1.pdf>

## 2.38. HVAC – Thermostat – Wi-Fi Communicating

<b>Measure Code</b>	
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	HVAC

### Description:

A Wi-Fi enabled communicating thermostat which allows remote set point adjustment and control via remote application. System requires an outdoor air temperature algorithm in the control logic to operate heating and cooling system.

### Baseline Efficiency:

The baseline efficiency case is an HVAC system with either a manual or a programmable thermostat.

### High Efficiency:

The high efficiency case is an HVAC system that has a Wi-Fi thermostat installed.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on residential study results, adjusted for commercial buildings.<sup>1</sup>

BC Measure ID	Measure Name	Fuel Type	Program	ΔkWh	ΔkW	ΔMMbtu
E21C1a026 E21C1d028 E21C2a026 E21C2d028 E21C3a039 E21C3d041	Wi-Fi Thermostat	Electric	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	794	1.26	n/a
E21C3a040 E21C3d042 G21C1a016 G21C2a016	Wi-Fi Thermostat	Gas	Muni Retro Muni DI LBES Retro SBES Retro	n/a	n/a	9.86
E21C3a041 E21C3d043	Wi-Fi Thermostat	Oil	Muni Retro Muni DI	n/a	n/a	9.86
E21C3a042 E21C3d044	Wi-Fi Thermostat	Propane	Muni Retro Muni DI	n/a	n/a	9.86

### Measure Life:

The measure life is 15 years.<sup>2</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel Type	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a026 E21C1d028 E21C2a026 E21C2d028 E21C3a039 E21C3d041	Wi-Fi Thermostat	Electric	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	1.00	n/a	1.00	1.00	0.346	0.0
E21C3a040 E21C3d042 G21C1a016 G21C2a016	Wi-Fi Thermostat	Gas	Muni Retro Muni DI LBES Retro SBES Retro	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3d043	Wi-Fi Thermostat	Oil	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a
E21C3a042 E21C3d044	Wi-Fi Thermostat	Propane	Muni Retro Muni DI	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs have a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Summer and winter Coincidence Factors are estimated using demand allocation methodology described the Demand Impact Model.<sup>3</sup>

**Energy Load Shape:**

See Appendix 1 “Weighted HVAC- All Homes”

**Endnotes:**

**1:** Navigant Consulting, September 2018. Wi-Fi Thermostat Impact Evaluation--Secondary Research Study Memo. [http://ma-eeac.org/wordpress/wp-content/uploads/Wi-Fi-Thermostat-Impact-Evaluation-Secondary-Literature-Study\\_FINAL.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/Wi-Fi-Thermostat-Impact-Evaluation-Secondary-Literature-Study_FINAL.pdf)

(MA) This study is specifically applicable to residential settings and references New England RECS data. The savings values reported in this document use the same savings percentages as the “Best Fit for

Massachusetts' line (2.0% of whole building electric energy use and 4.5% of whole building gas energy use), applied to the average electric and fuel consumption of a commercial building located in New England that is 5,000 sq ft or less, as is likely to be the applicable building type for this style of thermostat. This is 219 MMBtu/yr fuel use and 39,700 kWh/yr electric use, as calculated using 2012 CBECS data<sup>4</sup>

**2:** Assumed to have the same lifetime as a regular programmable thermostat. Environmental Protection Agency, 2010. Life Cycle Cost Estimate for ENERGY STAR Programmable Thermostat.

**3:** Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

**4:** US EIA, 2016. 2012 CBECS microdata. Accessible in CSV and SAS format at <https://www.eia.gov/consumption/commercial/data/2012/index.php?view=microdata>

## 2.39. HVAC – Unitary Air Conditioner

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

This measure promotes the installation of high efficiency unitary air conditioning equipment in lost opportunity applications. Air conditioning (AC) systems are a major consumer of electricity and systems that exceed baseline efficiencies can save considerable amounts of energy. This measure applies to air, water, and evaporatively-cooled unitary AC systems, both single-package and split systems.

### Baseline Efficiency:

The baseline efficiency case for new installations assumes compliance with the efficiency requirements as mandated by New Hampshire State Building Code.

### High Efficiency:

The high efficiency case assumes the HVAC equipment meets or exceeds the Consortium for Energy Efficiency's (CEE) specification. This specification results in cost-effective energy savings by specifying higher efficiency HVAC equipment while ensuring that several manufacturers produce compliant equipment. The CEE specification is reviewed and updated annually to reflect changes to the ASHRAE and IECC energy code baseline as well as improvements in the HVAC equipment technology. Equipment efficiency is the rated efficiency of the installed equipment for each project.

### Algorithms for Calculating Primary Energy Impact:

For units with cooling capacities less than 65 kBtu/h:

$$\Delta \text{kWh} = (\text{kBtu/h}) (1/ \text{SEER}_{\text{BASE}} - 1/ \text{SEER}_{\text{EE}}) (\text{EFLH}_{\text{Cool}})$$

$$\Delta \text{kW} = (\text{kBtu/h}) (1/ \text{EER}_{\text{BASE}} - 1/ \text{EER}_{\text{EE}})$$

For units with cooling capacities equal to or greater than 65 kBtu/h and EER available:

$$\Delta \text{kWh} = (\text{kBtu/h}) (1/ \text{EER}_{\text{BASE}} - 1/ \text{EER}_{\text{EE}}) (\text{EFLH}_{\text{Cool}})$$

$$\Delta \text{kW} = (\text{kBtu/h}) (1/ \text{EER}_{\text{BASE}} - 1/ \text{EER}_{\text{EE}})$$

For units with cooling capacities equal to or greater than 65 kBtu/h and IEER available:

$$\Delta \text{kWh} = (\text{kBtu/h}) (1/ \text{IEER}_{\text{BASE}} - 1/ \text{IEER}_{\text{EE}}) (\text{HoursCool}) \quad \Delta \text{kW} = (\text{kBtu/h}) (1/ \text{IEER}_{\text{BASE}} - 1/ \text{IEER}_{\text{EE}})$$

Where:

$\Delta \text{kWh}$  = Gross annual kWh savings from the measure

$\Delta \text{kW}$  = Gross connected kW savings from the measure

kBtu/h = Capacity of the cooling equipment in kBtu per hour (1 ton of cooling capacity equals 12 kBtu/h).

$\text{SEER}_{\text{BASE}}$  = Seasonal Energy Efficiency Ratio of the baseline equipment

SEER<sub>EE</sub> = Seasonal Energy Efficiency Ratio of the energy efficient equipment  
 EFLH<sub>Cool</sub> = Cooling equivalent full load hours  
 EER<sub>BASE</sub> = Energy Efficiency Ratio of the baseline equipment  
 EER<sub>EE</sub> = Energy Efficiency Ratio of the energy efficient equipment  
 IEER<sub>BASE</sub> = Integrated Energy Efficiency Ratio of the baseline equipment  
 IEER<sub>EE</sub> = Integrated Energy Efficiency Ratio of the energy efficient equipment  
 HoursCool = Annual Cooling Hours

The baseline efficiency values are based on the IECC 2015.<sup>1</sup>

Size (Btu/h)	Units with Electric Resistance of No Heating	Units with Heating Section Other Than Electric Resistance
< 65,000	13.0 SEER (Split System) 14.0 SEER (Single Package)	13.0 SEER (Split System) 14.0 SEER (Single Package)
≥65,000 and <135,000	11.2 EER 12.8 IEER	11.0 EER 12.6 IEER
≥135,000 and <240,000	11.0 EER 12.4 IEER	10.8 EER 12.2 IEER
≥240,000 and <760,000	10.0 EER 11.6 IEER	9.8 EER 11.4 IEER
≥760,000	9.7 EER 11.2 IEER	9.5 EER 11.0 IEER

**Measure Life:**

The measure life is 12 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C2b049 E21C3b080	Unitary Air Conditioner	All	1.00	1.00	1.00	1.00	1.00	0.33	0.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

A summer coincidence factor of 33% is utilized.<sup>2</sup>

## **Energy Load Shape:**

See Appendix 1.

### **Endnotes:**

**1:** 2015 IECC (CT Code) Table C403.2.3(1).

**2:** KEMA, August 2011. C&I Unitary HVAC Loadshape Project.

[https://neep.org/sites/default/files/resources/NEEP\\_HVAC\\_Load\\_Shape\\_Report\\_Final\\_August2\\_0.pdf](https://neep.org/sites/default/files/resources/NEEP_HVAC_Load_Shape_Report_Final_August2_0.pdf)

## 2.40. Lighting – Controls

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit/Lost Opportunity
Category	Lighting

### Description:

This measure includes the installation of lighting controls in both lost-opportunity and retrofit applications. Occupancy sensors and daylight dimming controls are both included. Traffic-sensing occupancy sensors that control refrigerated case LEDs are also included as a separate section.

### Baseline Efficiency:

The baseline efficiency case for retrofit applications is no controls.

The baseline efficiency case for new construction is code-compliant controls as mandated by the New Hampshire Building Code, which currently reflects IECC 2015 and ASHRAE Standard 90.1-2013.

The baseline efficiency case for refrigerated case LEDs is no controls.

### High Efficiency:

The high efficiency case for retrofit applications is lighting fixtures connected to controls that reduce the pre-retrofit hours of operation.

The high efficiency case for new construction applications is lighting fixture controls that reduce the hours of operation further beyond code-compliant controls.

The high efficiency case for refrigerated case LEDs is traffic-sensing controls that are mounted on cases to dim case lighting from a high level to a low-power mode (assumed to be 25% of full power consumption) in less than 2 minutes when on traffic is sensed in the aisle.

### Algorithms for Calculating Primary Energy Impact:

For retrofit applications:

$$\Delta kWh = \text{Controlled\_kW} \times \text{Hours\_base} \times (\%\_sav)$$

$$\Delta kW = (\text{Controlled\_kW})$$

Where:

Controlled\_kW = controlled fixture wattage

Hours\_base = total annual hours that the connected kW operated in the pre-retrofit case

%\_sav = percentage of kWh that is saved by utilizing this control measure, as shown in the study-informed deemed savings table below.<sup>1</sup>

Control Type	% Savings Factor
Lighting Controls – Daylighting Dimming	0.28
Lighting Controls – Occupancy Sensor	0.24

Lighting Controls - Integral Dual Sensor	0.30
Lighting Controls - Integral Dual Sensors with Adaptive, Network-Capable Controls	0.35
Lighting Controls - Exterior Photocell	0.50

For lost opportunity applications:

$$\Delta kWh = \text{Controlled\_kW} \times (\text{Hours\_base} - \text{Hours\_ee})$$

$$\Delta kW = (\text{Controlled\_kW})$$

Where:

Controlled\_kW = controlled fixture wattage

Hours\_base = total annual hours that the connected Watts would have operated with code-compliant controls

Hours\_ee = total annual hours that the connected kW operate with controls implemented, as determined on a per-application basis.

For refrigerated case LED controls:

$$\Delta kWh = \Delta kWh\_lights + \Delta kWh\_refg$$

$$\Delta kWh\_lights = \Delta kW\_lights \times \text{Hours}$$

$$\Delta kW\_lights = kW\_hi - (0.85 \times kW\_hi + 0.15 \times kW\_lo)$$

$$\Delta kWh\_refg = \Delta kWh\_lights \times 0.28 \times \text{Eff\_RS}$$

Where:

$\Delta kWh\_lights$  = the lighting equipment contribution to savings

$\Delta kWh\_refg$  = refrigeration interactive effects

$kW\_hi$  = the high-level lighting power per case, with deemed values shown in the table below

$kW\_lo$  = the low-level lighting power per case, with deemed values shown in the table below

Hours = the number of operating hours at the site, from application or deemed value shown in table below

0.85 = deemed fraction of time at high power<sup>4</sup>

0.15 = deemed fraction of time at low power<sup>4</sup>

0.28 = unit conversion between kW and tons of refrigeration

Eff\_RS = efficiency of typical refrigeration system, with deemed values shown in the table below

Input	System type	Deemed Value	Unit	Source
kW_hi	5' case side mounted	13	W	4
	5' case center mounted	26	W	
	6' case side mounted	16	W	
	6' case center mounted	32	W	
kW_lo	5' case side mounted	8.5	W	4
	5' case center mounted	17	W	
	6' case side mounted	11	W	
	6' case center mounted	21	W	
Hours, if not available from site	All	4,910	Hr/yr	4
Eff_RS	Small business	1.6	kW/ton	5
	Large business	1.9	kW/ton	

**Measure Life:**

The table below provides measure life for control measures.<sup>2,4</sup>

BC Measure ID	Measure Name	Program	Measure Life
E21C1a009 E21C1b009 E21C1d011	Daylight Dimming	C1 - Large Business Energy Solutions	9
E21C1a014 E21C1b014 E21C1d016	Lighting Occupancy Sensors	C1 - Large Business Energy Solutions	9
E21C2a009 E21C2b009 E21C2d011	Daylight Dimming	C2 - Small Business Energy Solutions	9
E21C2a014 E21C2b014 E21C2d016	Lighting Occupancy Sensors	C2 - Small Business Energy Solutions	9
E21C3a009 E21C3b009 E21C3d011	Daylight Dimming	C3 - Municipal Energy Solutions	9
E21C3a014 E21C3b014 E21C3d016	Lighting Occupancy Sensors	C3 - Municipal Energy Solutions	9
E21C4a009	Daylight Dimming	C4 - Energy Rewards RFP Program	9
E21C4a014	Lighting Occupancy Sensors	C4 - Energy Rewards RFP Program	9
	Refrigerated Case Occupancy Sensor		8

**Other Resource Impacts:**

Heating penalties for large C&I occupancy sensors are from a 12-month MA data logging study.<sup>5</sup> Penalties for small business and municipal programs are from the 2018 MA small business lighting impact evaluation.<sup>7</sup>

BC Measure ID	Measure Name	Program	MMBtu/kWh
E21C1a009 E21C1b009 E21C1d011 E21C1a014 E21C1b014 E21C1d016	Lighting controls	Large Business Energy Solutions, Energy Rewards RFP Program	-0.000691

E21C4a009 E21C4a014			
E21C2a009 E21C2b009 E21C2d011 E21C2a014 E21C2b014 E21C2d016 E21C3a009 E21C3b009 E21C3d011 E21C3a014 E21C3b014 E21C3d016	Lighting controls	Small Business Energy Solutions, Municipal Energy Solutions	-0.004080
	Exterior lighting	C1, C2, C3, C4	n/a

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a009 E21C1b009 E21C1d011	Daylight Dimming	C1 - Large Business Energy Solutions	1.00	1.00	1.00	1.00	1.00	0.15	0.13
E21C1a014 E21C1b014 E21C1d016	Lighting Occupancy Sensors	C1 - Large Business Energy Solutions	1.00	1.00	1.00	1.00	1.00	0.15	0.13
E21C2a009 E21C2b009 E21C2d011	Daylight Dimming	C2 - Small Business Energy Solutions	1.00	1.00	1.00	1.00	1.00	0.17	0.13
E21C2a014 E21C2b014 E21C2d016	Lighting Occupancy Sensors	C2 - Small Business Energy Solutions	1.00	1.00	1.00	1.00	1.00	0.17	0.13
E21C3a009 E21C3b009 E21C3d011	Daylight Dimming	C3 - Municipal Energy Solutions	1.00	1.00	1.00	1.00	1.00	0.17	0.13
E21C3a014 E21C3b014 E21C3d016	Lighting Occupancy Sensors	C3 - Municipal Energy Solutions	1.00	1.00	1.00	1.00	1.00	0.17	0.13

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C4a009	Daylight Dimming	C4 - Energy Rewards RFP Program	1.00	1.00	1.00	1.00	1.00	0.15	0.13
E21C4a014	Lighting Occupancy Sensors	C4 - Energy Rewards RFP Program	1.00	1.00	1.00	1.00	1.00	0.15	0.13
	Refrigerated Case Occupancy Sensor		1.00	1.00	1.00	1.00	1.00	0.15	0.15

**In-Service Rates:**

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

**Realization Rates:**

Realization rates are 100% until evaluated. NH evaluations that have sampled a non-statistically significant number of lighting controls projects produced realization rates slightly greater than 100%, including for Large Business custom electric sites and Small Business and Municipal lighting projects, some of which included controls.<sup>9, 10</sup> For refrigerated case lighting controls, realization rates are defaulted to 100% as the cited research for savings calculations is a study, and not an evaluation.<sup>4</sup>

**Coincidence Factors:**

Summer and winter coincidence factors for small business and municipal programs are based on a MA study of lighting occupancy sensors in small businesses.<sup>6</sup> For large businesses, coincidence factors are based on a MA impact evaluation of the large C&I prescriptive lighting program.<sup>5</sup> For refrigerated case lighting controls, coincidence factors are based on a CA DEER workpaper.<sup>4</sup>

**Energy Load Shape:**

Energy load shapes are based on site-level metering of project sites in MA.<sup>8</sup>

Measure Name	Summer On-peak	Winter On-peak	Summer Off-peak	Winter Off-peak
Interior Lighting	33.7%	30.1%	18.4%	17.7%
Exterior Lighting	19.2%	20.1%	29.0%	31.6%

**Endnotes:**

**1:** DNV KEMA, October 27, 2014. Retrofit Lighting Controls Measures Summary of Findings. Final Report. (MA). <http://ma-eeac.org/wordpress/wp-content/uploads/Lighting-Retrofit-Control-Measures-Final-Report.pdf>

- 2: ERS, November 17, 2005. Measure Life Study. Prepared for MA Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)
- 3: Pacific Northwest National Laboratory, October 2009. Demonstration Assessment of Light-Emitting Diode (LED) Freezer Case Lighting. [https://www1.eere.energy.gov/buildings/publications/pdfs/ssl/gateway\\_freezer-case.pdf](https://www1.eere.energy.gov/buildings/publications/pdfs/ssl/gateway_freezer-case.pdf)
- 4: Southern California Edison, January 2016. Refrigerated Case Door Aisle Traffic Sensor. Work paper SCE13CS003, revision 2.. <http://www.deeresources.net/workpapers>
- 5: DNV KEMA, June 21, 2013. Impact Evaluation of 2010 Prescriptive Lighting Installations. (MA) <http://ma-eeac.org/wordpress/wp-content/uploads/Impact-Evaluation-of-2010-Prescriptive-Lighting-Installations-Final-Report-6-21-13.pdf>
- 6: Cadmus Group, October 23, 2012. Small Business Direct Install Program: Pre/Post Lighting Occupancy Sensor Study. (MA) Available as appendix C-1 in [http://ma-eeac.org/wordpress/wp-content/uploads/Massachusetts-Small-Business-Direct-Install\\_2010-2012-Impact-Evaluations-1.29.13.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/Massachusetts-Small-Business-Direct-Install_2010-2012-Impact-Evaluations-1.29.13.pdf)
- 7: DNV GL, ERS, June 7, 2018. Impact Evaluation of PY2016 Small Business Initiative: Phase I [http://ma-eeac.org/wordpress/wp-content/uploads/P69-Impact-Eval-of-MA-Small-Business-Initiative-Phase-I-Lighting\\_Report\\_FINAL.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/P69-Impact-Eval-of-MA-Small-Business-Initiative-Phase-I-Lighting_Report_FINAL.pdf)
- 8: DNV GL, 2018. P72 Prescriptive C&I Loadshapes of Savings.
- 9: DNV GL, June 21, 2018. Impact Evaluation of 2016 New Hampshire Commercial & Industrial Small Business and Municipal Lighting. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/small-business-and-municipal-lighting-impact-evaluation.pdf>. See sample projects including controls, which produced an overall realization rate of 106.6%.
- 10: DNV GL, September 25, 2015. New Hampshire Utilities Large Commercial & Industrial (C&I) Retrofit and New Equipment & Construction Program Impact Evaluation. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf> See 100.8% realization rate for custom electric measures in table 16.

## 2.41. Lighting – Exterior

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit/Lost Opportunity
Category	Lighting

### Description:

This measure provides savings for the installation of efficient exterior lighting, including LED and efficient fluorescent fixtures.

### Baseline Efficiency:

For retrofit cases, the baseline efficiency is project-specific and is determined using actual fixture counts from the existing space.

The baseline efficiency case for new construction is code-compliant lighting and controls as mandated by the New Hampshire Building Code, which currently reflects IECC 2015 and ASHRAE Standard 90.1-2013.

### High Efficiency:

The high efficiency case for both retrofit and lost opportunity applications is project-specific and is determined using the actual fixture counts and proposed operating wattages for the project.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = (\sum_{i=1}^n ((Count_i * Watts_i / 1000)_{BASE}) - \sum_{j=1}^n (Count_j * Watts_j / 1000)_{EE}) \times (Hours)$$

$$\Delta kW = \sum_{i=1}^n ((Count_i * Watts_i / 1000)_{BASE}) - \sum_{j=1}^n (Count_j * Watts_j / 1000)_{EE}$$

Where:

n = Total number of fixture types in baseline or pre-retrofit case

m = Total number of installed fixture types

Count<sub>i</sub> = Quantity of existing fixtures of type i.

Watts<sub>i</sub> = Existing fixture or baseline wattage for fixture type i

Count<sub>j</sub> = Quantity of efficient fixtures of type j.

Watts<sub>j</sub> = Efficient fixture wattage for fixture type j.

1000 = Conversion factor: 1000 watts per kW.

Hours = Lighting annual hours of operation.

For retrofit installations, the annual hours of operation is project-specific and determined using actual building operation data in which the lighting equipment was installed.

For lost opportunity installations, the annual hours of operation are typically 4,380 hr/yr, unless the fixture is exempt from code requirements for photocell controls.

**Measure Life:**

The table below includes measure lives for exterior lighting fixtures.<sup>1</sup>

BC Measure ID	Measure Name	Program	Measure Life
E21C1b010 E21C1a010 E21C1d012	Lighting Fixture - Exterior w/ Controls	C1 - Large Business Energy Solutions	15 (New Equipment and Construction) 13 (Retrofit) 10 (Direct Install)
E21C1b011 E21C1a011 E21C1d013	Lighting Fixture - Exterior w/o Controls	C1 - Large Business Energy Solutions	15 (New Equipment and Construction) 13 (Retrofit) 10 (Direct Install)
E21C2b010 E21C2a010 E21C2d012	Lighting Fixture - Exterior w/ Controls	C2 - Small Business Energy Solutions	15 (New Equipment and Construction) 13 (Retrofit) 10 (Direct Install)
E21C2b011 E21C2a011 E21C2d013	Lighting Fixture - Exterior w/o Controls	C2 - Small Business Energy Solutions	15 (New Equipment and Construction) 13 (Retrofit) 10 (Direct Install)
E21C3b010 E21C3a010 E21C3d012	Lighting Fixture - Exterior w/ Controls	C3 - Municipal Energy Solutions	15 (New Equipment and Construction) 13 (Retrofit) 10 (Direct Install)
E21C3b011 E21C3a011 E21C3d013	Lighting Fixture - Exterior w/o Controls	C3 - Municipal Energy Solutions	15 (New Equipment and Construction) 13 (Retrofit) 10 (Direct Install)
E21C4a010	Lighting Fixture - Exterior w/ Controls	C4 - Energy Rewards RFP Program	13
E21C4a011	Lighting Fixture - Exterior w/o Controls	C4 - Energy Rewards RFP Program	13
	Parking Lot Lighting		15
	Street Lights		15

**Other Resource Impacts:**

Because exterior lighting involves no HVAC interactivity, there are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b010 E21C1a010	Lighting Fixture - Exterior w/ Controls	C1 - Large Business Energy Solutions	1.00	0.968	n/a	1.00	1.00	0.00	1.00
E21C1b011 E21C1a011	Lighting Fixture - Exterior w/o Controls	C1 - Large Business Energy Solutions	1.00	0.968	n/a	1.00	1.00	0.00	1.00
E21C2b010 E21C2a010	Lighting Fixture - Exterior w/ Controls	C2 - Small Business Energy Solutions	1.00	102.7	n/a	1.00	1.00	0.00	1.00
E21C2b011 E21C2a011	Lighting Fixture - Exterior w/o Controls	C2 - Small Business Energy Solutions	1.00	102.7	n/a	1.00	1.00	0.00	1.00
E21C3b010 E21C3a010	Lighting Fixture - Exterior w/ Controls	C3 - Municipal Energy Solutions	1.00	102.7	n/a	1.00	1.00	0.00	1.00
E21C3b011 E21C3a011	Lighting Fixture - Exterior w/o Controls	C3 - Municipal Energy Solutions	1.00	102.7	n/a	1.00	1.00	0.00	1.00
E21C4a010	Lighting Fixture - Exterior w/ Controls	C4 - Energy Rewards RFP Program	1.00	0.968	n/a	1.00	1.00	0.00	1.00
E21C4a011	Lighting Fixture - Exterior w/o Controls	C4 - Energy Rewards	1.00	0.968	n/a	1.00	1.00	0.00	1.00

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
		RFP Program							
	Parking Lot Lighting		1.00	0.968	n/a	1.00	1.00	0.00	1.00
	Street Lights		1.00	0.968	n/a	1.00	1.00	0.00	1.00

**In-Service Rates:**

All installations have a 100% in-service-rate unless an evaluation finds otherwise.

**Realization Rates:**

Realization rates are based on a 2020 CT Lighting Impact Evaluation and NH evaluation results for municipal and small business facilities, not including adjustments made for HVAC interactivity.<sup>2, 3</sup>

**Coincidence Factors:**

Summer and winter coincidence factors are set to 0% and 100%, respectively, based on NH evaluation recommendations.<sup>3</sup>

**Energy Load Shape:**

Energy load shapes are based on site-level metering of project sites in MA.<sup>4</sup>

Measure Name	Summer On-peak	Winter On-peak	Summer Off-peak	Winter Off-peak
Exterior Lighting	19.2%	20.1%	29.0%	31.6%

**Endnotes:**

**1:** ERS. November 2005. Measure Life Study. November 17, 2005. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf) (MA)

**2:** DNV GL, Aug 2020. C1635 Impact Evaluation of PY 2016 & 2017 Energy Opportunities Program, Final Report, Aug 3, 2020, Tables 5-2, 5-3, and 5-20. <https://www.energizect.com/connecticut-energy-efficiency-board/evaluation-reports>

Note: Large Business and RFP Program kWh realization rates are based on lighting savings analysis, not including interactive adjustments, as exterior lighting equipment does not incur interactive effects.

**3:** DNV GL, June 21, 2018. Impact Evaluation of 2016 New Hampshire Commercial & Industrial Small Business and Municipal Lighting. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/small-business-and-municipal-lighting-impact-evaluation.pdf>

**4:** DNV GL, March 2018. P72 Prescriptive C&I Loadshapes of Savings.

## 2.42. Lighting - Retrofit

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Lighting

### Description:

This measure includes efficient lighting products including, but not limited to, efficient Light-Emitting Diode (LED) lamps and fixtures, promoted through direct install retrofit programs, and installed in commercial and industrial buildings (C&I).

### Baseline Efficiency:

For C&I lighting retrofit installations, the baseline efficiency case is project-specific and is determined using actual fixture counts and wattages from the existing space.

### High Efficiency:

For C&I lighting retrofit installations, the high efficiency case is project-specific and is determined using actual fixture counts and wattages for the project.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = (\sum_{i=1}^n ((Count_i * Watts_i / 1000)_{BASE}) - \sum_{j=1}^n (Count_j * Watts_j / 1000)_{EE}) \times (Hours)$$

$$\Delta kW = \sum_{i=1}^n ((Count_i * Watts_i / 1000)_{BASE}) - \sum_{j=1}^n (Count_j * Watts_j / 1000)_{EE}$$

Where:

n = Total number of fixture types in baseline or pre-retrofit case

m = Total number of installed fixture types

Count<sub>i</sub> = Quantity of existing fixtures of type i.

Watts<sub>i</sub> = Existing fixture or baseline wattage for fixture type i

Count<sub>j</sub> = Quantity of efficient fixtures of type j.

Watts<sub>j</sub> = Efficient fixture wattage for fixture type j.

1000 = Conversion factor: 1000 watts per kW.

Hours = Lighting annual hours of operation.

For retrofit installations, the annual hours of operation is project-specific and determined using actual building operation data in which the lighting equipment was installed. If site specific hours of operation are unavailable or if vendor estimates of building operating hours are unrealistically different from standard building type operating hours, then refer to the operating hours defined for midstream lighting, which is based on a program evaluation from CT.<sup>1</sup>

**Measure Life:**

The table below summarizes the adjusted measure lives (AML) for each measure. Note these AML values account for the estimated fraction of program lighting measures that are assumed to be lost opportunity (replace on failure) vs. retrofit (early replacement) based on MA evaluation research, as well as an outyear factor (accounting for future, naturally occurring adoption of LEDs) that calculates the second-period savings of early replacement dual baseline measures.<sup>2</sup>

BC Measure ID	Measure Category	Measure	AML
	Ambient Linear	TLED	10.53
	Ambient Linear	LED Fixture	10.99
	High/Low Bay	TLED	12.81
	High/Low Bay	LED Fixture	12.84
	High/Low Bay	LED Lamp	12.56
	Exterior/Outdoor	TLED	10.12
	Exterior/Outdoor	LED Fixture	10.18
	Exterior/Outdoor	LED Lamp	9.74
	Screw-Based	A-Line	4.69
	Screw-Based	Downlight/Track	5.86
	Screw-Based	Decorative	3.78

**Other Resource Impacts:**

Heating penalties for downstream, interior lighting systems (non-turnkey) are from a 12-month MA data logging study.<sup>3</sup> Penalties for interior turnkey are from the 2018 MA small business lighting impact evaluation.<sup>4</sup>

BC Measure ID	Measure Name	Program	MMBtu/kWh
E21C4a004 E21C1a004 E21C3a004 E21C2a004	Interior lighting	RFP, LBES, MES, SBES	-0.000691
E21C3a004 E21C2a004	Interior lighting (turnkey)	MES, SBES	-0.004080

E21C4a015 E21C1a047 E21C3a091 E21C2a047	Exterior lighting (both non-turnkey and turnkey)	RFP, LBES, MES, SBES	n/a
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**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C4a004 E21C1a004 E21C3a004 E21C2a004	Lighting Systems - Interior	RFP, LBES, MES, SBES	1.00	1.066	1.135	1.00	0.504	0.389
E21C4a015 E21C1a047 E21C3a091 E21C2a047	Lighting Systems - Exterior	RFP, LBES, MES, SBES	1.00	1.027	1.00	1.00	0.00	1.00
E21C3a004 E21C2a004	Lighting Systems - Interior (Turnkey)	MES, SBES	1.00	1.066	1.135	1.00	0.504	0.389
E21C3a091 E21C2a047	Lighting Systems - Exterior (Turnkey)	MES, SBES	1.00	1.027	1.00	1.00	0.00	1.00

In-Service Rates:

All downstream installations have 100% in service rate since programs include verification of equipment installations.

Realization Rates:

Realization rates are based on NH evaluation results for municipal and small business facilities.<sup>5</sup> They account for operational hours of use adjustments, electric HVAC interactive adjustments for kWh and summer peak kW, and other adjustments. Exterior lighting realization rates account for the same adjustments except the HVAC interactive adjustment.

Coincidence Factors:

Summer and winter coincidence factors are based on NH evaluation results.<sup>5,6</sup>

**Energy Load Shape:**

Energy load shapes are based on site-level metering of project sites in MA.<sup>7</sup>

Measure Name	Summer On-peak	Winter On-peak	Summer Off-peak	Winter Off-peak
Interior Lighting	33.7%	30.1%	18.4%	17.7%
Exterior Lighting	19.2%	20.1%	29.0%	31.6%

**Endnotes:**

- 1: DNV GL, June 30, 2020. C1635 Impact Evaluation of PY 2016 & 2017 Energy Opportunities Program, Draft Report. Table 5-17. Interior Fixture Hours of Use Results by Building Type. Available at: <https://www.energizect.com/connecticut-energy-efficiency-board/evaluation-reports>
- 2: DNV GL, April 6, 2020. MA19C14-E-LGHTMKT: 2019 C&I Lighting Inventory and Market Model Updates. [http://ma-eeac.org/wordpress/wp-content/uploads/MA19C14-E-LGHTMKT\\_2019-CI-Lighting-Inventory-and-Market-Model-Report\\_Final\\_2020.04.06.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA19C14-E-LGHTMKT_2019-CI-Lighting-Inventory-and-Market-Model-Report_Final_2020.04.06.pdf)
- 3: DNV KEMA, June 21, 2013. Impact Evaluation of 2010 Prescriptive Lighting Installations. <http://ma-eeac.org/wordpress/wp-content/uploads/Impact-Evaluation-of-2010-Prescriptive-Lighting-Installations-Final-Report-6-21-13.pdf>
- 4: DNV GL, ERS, June 7, 2018. Impact Evaluation of PY2016 Small Business Initiative: Phase I [http://ma-eeac.org/wordpress/wp-content/uploads/P69-Impact-Eval-of-MA-Small-Business-Initiative-Phase-I-Lighting\\_Report\\_FINAL.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/P69-Impact-Eval-of-MA-Small-Business-Initiative-Phase-I-Lighting_Report_FINAL.pdf)
- 5: DNV GL, June 21, 2018. Impact Evaluation of 2016 New Hampshire Commercial & Industrial Small Business and Municipal Lighting. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/small-business-and-municipal-lighting-impact-evaluation.pdf>
- 6: DNV GL, September 25, 2015. New Hampshire Utilities Large Commercial & Industrial (C&I) Retrofit and New Equipment & Construction Program Impact Evaluation. <https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf>
- 7: DNV GL, 2018. P72 Prescriptive C&I Loadshapes of Savings.

## 2.66. Lighting – New Construction and Major Renovation

Measure Code	TBD
Market	Commercial
Program Type	Lost opportunity
Category	Lighting

### Description:

The implementation of various lighting design principles aimed at creating a quality and appropriate lighting experience while reducing unnecessary light usage. This is often done by a professional in a new construction or major renovation situation. Advanced lighting design uses techniques like maximizing task lighting and efficient fixtures to create a system of optimal energy efficiency and functionality.

### Baseline Efficiency:

The Baseline Efficiency assumes compliance with lighting power density requirements as mandated by New Hampshire State Building Code, which currently reflects IECC 2015 with direct reference for compliance to ASHRAE Standard 90.1-2013. These standards specify the maximum lighting power densities (LPDs) by building type (building area method) and interior space type (space-by-space method). LPDs apply to all new construction and major renovation projects.

### High Efficiency:

The high efficiency scenario assumes lighting systems that achieve lighting power densities below those required by New Hampshire State Building Code. Actual site lighting power densities should be determined on a case-by-case basis. Please refer to the current year application form for minimum percentage better than code efficiency requirements.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \sum_{i=1}^n ((LPD\_base\_i - Controlled \times LPD\_proposed\_i) \times Area\_i \times Hours\_i \times 1/1000)$$

$$\Delta kW Fixture = \sum_{i=1}^n ((LPD\_base\_i - LPD\_proposed\_i) \times 1/1000 \times Area\_i \times 1/1000)$$

$$\Delta kW Controlled = \sum_{i=1}^n (LPD\_proposed\_i \times Area\_i \times 1/1000)$$

Where:

n = Total number of spaces, or 1 for Building Area Method

LPD\_base\_i = Baseline lighting power density for building or space type i (Watts/ft<sup>2</sup>)

Area\_i = Area of building or space i (ft<sup>2</sup>)

Hours\_i = Annual hours of operation of the lighting equipment for space type i

LPD\_proposed\_i = Proposed lighting power density for building or space type i (Watts/ft<sup>2</sup>)

Controlled = Min % of controlled lighting above required amounts

1000 = Conversion factor: 1000 watts per 1 kW

Note on HVAC system interaction: Additional Electric savings from cooling system interaction are included in the calculation of adjusted gross savings for Lighting Systems projects. The HVAC interaction adjustment factor is determined from lighting project evaluations and is included in the energy realization rates and demand coincidence factors and realization rates.

**Measure Life:**

Measure lives are deemed based on study results from MA.<sup>1</sup>

BC Measure ID	Measure Name	Program	Measure Life
E21C1b013 E21C2b013 E21C3b013 E21C4a013	Performance Lighting (Interior)	RFP, LBES, MES, SBES	15
E21C1b011 E21C2b011 E21C3b011 E21C4a011	Performance Lighting (Exterior)	RFP, LBES, MES, SBES	15
E21C1b012 E21C2b012 E21C3b012 E21C4a012	Performance Lighting w/ controls (Interior)	RFP, LBES, MES, SBES	12
E21C1b010 E21C2b010 E21C3b010 E21C4a010	Performance Lighting w/ controls (Exterior)	RFP, LBES, MES, SBES	12

**Other Resource Impacts:**

Heating penalties are from alighting program evaluation performed on lighting systems in Massachusetts.<sup>2</sup>

BC Measure ID	Measure Name	Program	MMBtu/kWh
E21C1b012 E21C2b012 E21C3b012 E21C4a012 E21C1b013 E21C2b013 E21C3b013 E21C4a013	Performance lighting (interior) w/ and w/out controls	RFP, LBES, MES, SBES	-0.000162279

E21C1b010 E21C2b010 E21C3b010 E21C4a010 E21C1b011 E21C2b011 E21C3b011 E21C4a011	Performance lighting (exterior) w/ and w/out controls	RFP, LBES, MES, SBES	n/a
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**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b012 E21C2b012 E21C3b012 E21C4a012 E21C1b013 E21C2b013 E21C3b013 E21C4a013	Performance lighting (interior) w/ and w/out controls	RFP, LBES, MES, SBES	1.0	106.6%	100.0%	1.135	1.00	0.504	0.389
E21C1b010 E21C2b010 E21C3b010 E21C4a010 E21C1b011 E21C2b011 E21C3b011 E21C4a011	Performance lighting (exterior) w/ and w/out controls	RFP, LBES, MES, SBES	1.0	102.7%	100.0%	100.0%	100.0%	0.00%	100.0%

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

Energy and demand realization rates are based on a NH study of municipal and small business customers.<sup>3</sup> Realization rates for summer peak demand savings in interior systems reflect a 113.5% HVAC interactive multiplier.

Coincidence Factors:

All coincidence factors are based on a NH study of municipal and small business customers.<sup>3</sup>

**Energy Load Shape:**

Energy load shapes are based the MA P72 C&I loadshape study.<sup>4</sup>

Measure Name	Summer On-peak	Winter On-peak	Summer Off-peak	Winter Off-peak
Interior Lighting	34.3%	30.3%	18.1%	17.4%
Exterior Lighting	19.2%	20.1%	29.0%	31.6%

**Endnotes:**

- 1: DNV GL, ERS, July 22, 2019. Lighting Outyear Factor and Equivalent Measure Life. [http://ma-eeac.org/wordpress/wp-content/uploads/Lighting-Outyear-Factor-and-Equivalent-Measure-Life-Update\\_Final.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/Lighting-Outyear-Factor-and-Equivalent-Measure-Life-Update_Final.pdf)
- 2: DNV GL, ERS, NMR, November 22, 2017. Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative <http://ma-eeac.org/wordpress/wp-content/uploads/Upstream-Lighting-Initiative-Impact-Evaluation-PY2015.pdf>
- 3: DNV GL, June 21, 2018. Impact Evaluation of 2016 New Hampshire Commercial & Industrial Small Business and Municipal Lighting <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/small-business-and-municipal-lighting-impact-evaluation.pdf>
- 4: DNV GL, 2018. P72 Prescriptive C&I Loadshapes of Savings
- 5: DNV GL June 30, 2020. C1635 Impact Evaluation of PY 2016 & 2017 Energy Opportunities Program, Table 5-20. (CT). Available at: <https://www.energizect.com/connecticut-energy-efficiency-board/evaluation-reports>



## 2.44. Motors & Drives - Variable Frequency Drive

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit/Lost Opportunity
<b>Category</b>	Motors and Drives

### Description:

This measure covers the installation of variable speed drives according to the terms and conditions stated on the statewide worksheet. The measure covers multiple end use types and building types. The installation of this measure saves energy since the power required to rotate a pump or fan at lower speeds requires less power than when rotated at full speed.

### Baseline Efficiency:

The baseline efficiency case measure varies with equipment type. All baselines assume either a constant or 2-speed motor. Air or water volume/temperature is controlled using valves, dampers, and/or reheats. If the project includes a motor replacement, air or water volume/temperature is controlled using valves, dampers, and/or reheats.

### High Efficiency:

In the high efficiency case, pump flow or fan air volume is directly controlled using downstream information. The pump or fan will automatically adjust its speed based on inputted set points and the downstream feedback it receives.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = HP \times \frac{kWh}{HP} \times \frac{1}{\eta}$$

$$\Delta kW_{SP} = HP \times \frac{kW_{SP}}{HP} \times \frac{1}{\eta}$$

$$\Delta kW_{WP} = HP \times \frac{kW_{WP}}{HP} \times \frac{1}{\eta}$$

Where:

$HP$  = Rated horsepower for the impacted motor

$\eta$  = Motor efficiency

$\frac{kWh}{HP}$  = Annual electric energy reduction based on building and equipment type. See table below.

$\frac{kW_{SP}}{HP}$  = Summer demand reduction based on building and equipment type. See table below.

$\frac{kW_{WP}}{HP}$  = Winter demand reduction based on building and equipment type. See table below.

Savings factors below already account for motor efficiency and consequently an adjustment is not required in the algorithm.

**Savings Factors for C&I VFDs without Motor Replacement (kWh/HP<sup>1</sup> and kW/HP)<sup>2</sup>**

Building Type	Building Exhaust Fan	Cooling Tower Fan	Chilled Water Pump	Boiler Feed Water Pump	Hot Water Circulating Pump	MAF - Make-up Air Fan	Return Fan	Supply Fan	WS Heat Pump
<b>Annual Energy Savings Factors (kWh/HP)</b>									
University/College	3641	449	745	2316	2344	3220	1067	1023	3061
Elem/High School	3563	365	628	1933	1957	3402	879	840	2561
Multi-Family	3202	889	1374	2340	2400	3082	1374	1319	3713
Hotel/Motel	3151	809	1239	2195	2239	3368	1334	1290	3433
Health	3375	1705	2427	2349	2406	3002	1577	1487	3670
Warehouse	3310	455	816	2002	2087	3229	1253	1205	2818
Restaurant	3440	993	1566	1977	2047	2628	1425	1363	3542
Retail	3092	633	1049	1949	2000	2392	1206	1146	2998
Grocery	3126	918	1632	1653	1681	2230	1408	1297	3285
Offices	3332	950	1370	1866	1896	3346	1135	1076	3235
<b>Summer Demand Savings Factors (kW/HP<sub>SP</sub>)</b>									
University/College	0.109	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Elem/High School	0.377	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Multi-Family	0.109	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Hotel/Motel	0.109	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Health	0.109	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Warehouse	0.109	-0.023	0.174	0.457	0.091	0.261	0.287	0.274	0.218
Restaurant	0.261	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Retail	0.109	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Grocery	0.261	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
Offices	0.109	-0.023	0.174	0.457	0.091	0.109	0.287	0.274	0.218
<b>Winter Demand Savings Factors (kW/HP<sub>WP</sub>)</b>									

University/College	0.377	-0.006	0.184	0.457	0.21	0.109	0.26	0.252	0.282
Elem/High School	0.457	-0.006	0.184	0.457	0.21	0.109	0.26	0.252	0.282
Multi-Family	0.109	-0.006	0.184	0.355	0.21	0.109	0.26	0.252	0.282
Hotel/Motel	0.109	-0.006	0.184	0.418	0.21	0.109	0.26	0.252	0.282
Health	0.377	-0.006	0.184	0.275	0.21	0.109	0.26	0.252	0.282
Warehouse	0.377	-0.006	0.184	0.178	0.21	0.261	0.26	0.252	0.282
Restaurant	0.109	-0.006	0.184	0.355	0.21	0.109	0.26	0.252	0.282
Retail	0.109	-0.006	0.184	0.275	0.21	0.109	0.26	0.252	0.282
Grocery	0.457	-0.006	0.184	0.418	0.21	0.109	0.26	0.252	0.282
Offices	0.457	-0.006	0.184	0.418	0.21	0.109	0.26	0.252	0.282

**Savings Factors for C&I VFDs with Motor Replacement (kWh/HP<sup>1</sup> and kW/HP<sup>2</sup>) :**

Building Type	Building Exhaust Fan	Cooling Tower Fan	Chilled Water Pump	Boiler Feed Water Pump	Hot Water Circulating Pump	MAF - Make-up Air Fan	Return Fan	Supply Fan
<b>Annual Energy Savings Factors (kWh/HP)</b>								
University/College	3,802	486	780	2,415	2,442	3,381	1,143	1,100
Elem/High School	3,721	396	657	2,015	2,040	3,561	941	903
Multi-Family	3,368	954	1,435	2,443	2,504	3,248	1,466	1,412
Hotel/Motel	3,317	866	1,294	2,291	2,335	3,534	1,425	1,381
Health	3,541	1,815	2,535	2,453	2,510	3,168	1,676	1,586
Warehouse	3,476	496	853	2,098	2,183	3,396	1,342	1,294
Restaurant	3,606	1,066	1,636	2,067	2,138	2,794	1,519	1,457
Retail	3,258	685	1,097	2,036	2,087	2,558	1,288	1,229
Grocery	3,292	1,001	1,710	1,724	1,753	2,396	1,498	1,386
Offices	3,498	1,014	1,432	1,947	1,977	3,512	1,210	1,151
<b>Summer Demand Savings Factors (kW/HP<sub>SP</sub>)</b>								
University/College	0.257	(0.004)	0.465	0.952	0.190	0.257	0.679	0.706
Elem/High School	1.187	(0.006)	0.697	1.428	0.286	0.385	1.019	1.058
Multi-Family	0.385	(0.006)	0.697	1.428	0.286	0.385	1.019	1.058
Hotel/Motel	0.257	(0.004)	0.465	0.952	0.190	0.257	0.679	0.706
Health	0.128	(0.002)	0.232	0.476	0.095	0.128	0.340	0.353
Warehouse	0.770	(0.012)	1.394	2.855	0.571	1.677	2.038	2.117
Restaurant	0.839	(0.006)	0.697	1.428	0.286	0.385	1.019	1.058
Retail	0.514	(0.008)	0.930	1.904	0.381	0.514	1.358	1.411
Grocery	0.280	(0.002)	0.232	0.476	0.095	0.128	0.340	0.353
Offices	0.257	(0.004)	0.465	0.952	0.190	0.257	0.679	0.706

<b>Winter Demand Savings Factors (kW/HP<sub>WP</sub>)</b>								
University/College	0.791	(0.001)	0.384	0.952	0.437	0.257	0.563	0.544
Elem/High School	1.428	(0.002)	0.575	1.428	0.655	0.385	0.844	0.816
Multi-Family	0.385	(0.002)	0.575	1.123	0.661	0.385	0.844	0.816
Hotel/Motel	0.257	(0.001)	0.384	0.874	0.438	0.257	0.563	0.544
Health	0.396	(0.001)	0.192	0.294	0.223	0.128	0.281	0.272
Warehouse	2.374	(0.003)	1.151	1.181	1.384	1.677	1.688	1.632
Restaurant	0.385	(0.002)	0.575	1.123	0.661	0.385	0.844	0.816
Retail	0.514	(0.002)	0.767	1.178	0.893	0.514	1.125	1.088
Grocery	0.476	(0.001)	0.192	0.437	0.219	0.128	0.281	0.272
Offices	0.952	(0.001)	0.384	0.874	0.438	0.257	0.563	0.544

**Measure Life:**

For lost-opportunity installations, the lifetime is 15 years. For retrofit, the lifetime is 13 years. <sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a043 E21C1d043 E21C2a043 E21C2d043 E21C3a087 E21C3d087	Variable Frequency Drive	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	0.86	n/a	0.86	0.86	1.00	1.00
E21C1a044 E21C1d044 E21C2a044 E21C2d044 E21C3a088 E21C3d088	Variable Frequency Drive with Motor	LBES Retro LBES DI SBES Retro SBES DI Muni Retro Muni DI	1.00	0.86	n/a	0.86	0.86	1.00	1.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

Realization rates are based on study results. <sup>4</sup>

Coincidence Factors:

CFs for all programs set to 100% since summer and winter demand savings are based on evaluation results.

**Energy Load Shape:**

See Appendix 1 – “C&I VFD (Combined)”.

**Endnotes:**

- 1:** Chan, Tumin, 2010. Formulation of a Prescriptive Incentive for the VFD and Motors & VFD impact tables at NSTAR.
- 2:** For Chilled Water Pump, Hot Water Circ. Pump, Return Fan, Supply Fan, and WSHP Circ. Loop: kW/HP estimates derived from Cadmus, 2012. Variable Speed Drive Loadshape Project. Prepared for the NEEP Regional Evaluation, Measurement & Verification Forum. Other drive type kW/HP savings estimates based on Chan, Tumin (2010). Formulation of a Prescriptive Incentive for the VFD and Motors & VFD impact tables at NSTAR. Prepared for NSTAR.
- 3:** Energy & Resource Solutions, November (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)
- 4:** Navigant Consulting, 2018. Multi-Family Program Impact and Net-to-Gross Evaluation estimates based on Chan, Tumin (2010). Formulation of a Prescriptive Incentive for the VFD and Motors & VFD impact tables at NSTAR. Prepared for NSTAR.

## 2.45. Plug Load – Advanced Power Strip

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Appliances

### Description:

Advanced power strips can automatically eliminate standby power loads of electronic peripheral devices that are not needed (DVD player, computer printer, scanner, etc.) either automatically or when an electronic control device (typically a television or personal computer) is in standby or off mode.

### Baseline Efficiency:

The baseline efficiency case is the customers' devices as they are currently operating.

### High Efficiency:

The high efficiency case is the installation of an advanced power strip.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.<sup>1</sup>

BC Measure ID	Measure Name	Program	ΔkWh	ΔkW
E21C1b015	Advanced Power Strip	LBES – New Equipment	153	0.017
E21C2b015	Advanced Power Strip	SBES – New Equipment	153	0.017
E21C3b015	Advanced Power Strip	Muni – New Equipment	153	0.017

### Measure Life:

The measure life is 5 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1b015	Advanced Power Strip	LBES – New Equipment	0.76	0.92	n/a	0.92	0.92	0.58	0.86
E21C2b015	Advanced Power Strip	SBES – New Equipment	0.76	0.92	n/a	0.92	0.92	0.58	0.86
E21C3b015	Advanced Power Strip	Muni – New Equipment	0.76	0.92	n/a	0.92	0.92	0.58	0.86

**In-Service Rates:**

In-Service Rates are based on consumer surveys, as found in the referenced study.<sup>3</sup>

**Realization Rates:**

Realization Rates account for the savings lost due to improper customer set-up/use of devices, as found in the referenced study.<sup>1</sup>

**Coincidence Factors:**

Summer and winter Coincidence Factors are estimated using demand allocation methodology described in the Navigant Demand Impact Model.<sup>4</sup>

**Energy Load Shape:**

See Appendix 1 – “Primary TV and Peripherals”.

**Endnotes:**

- 1: NMR Group, Inc. (2019). Advanced Power Strip Metering Study (RLPNC17-3). Energy savings calculated based on weighted average consumption (449 kWh/yr) and energy reduction factor (34%).
- 2: New Hampshire Common Assumption
- 3: NMR Group, Inc. (2018). Products Impact Evaluation of In-service and Short-Term Retention Rates Study (RLPNC 17-4/5).
- 4: Navigant Consulting, 2018. RES1 Demand Impact Model Update. <http://ma-eeac.org/wordpress/wp-content/uploads/RES-1-FINAL-Comprehensive-Report-2018-07-27.pdf>

## 2.46. Refrigeration - Case Motor Replacement

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	Refrigeration

### Description:

Replacement of shaded-pole (SP) or permanently-split capacitor (PSC) ) motors with electronically commutated motors (ECMs) in the evaporators for multi-deck and freestanding coolers and freezers, typically on the retail floor of convenience stores, liquor stores, and grocery stores.<sup>1</sup>

### Baseline Efficiency:

The baseline efficiency case is the existing case motor, either SP or PSC type.

### High Efficiency:

The high efficiency case is the replacement of the existing case motor with an ECM.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \Delta kWh_{Motor} + \Delta kWh_{Heat}$$

$$\Delta kWh_{Motor} = kW_{Motor} \times LRF \times Hours$$

$$\Delta kWh_{Heat} = \Delta kWh_{Motor} \times 0.28 \times Eff_{RS}$$

$$\Delta kW = \frac{\Delta kWh}{8,760}$$

Where:

$\Delta kWh_{Motor}$  = Energy savings due to increased efficiency of case motor

$\Delta kWh_{Heat}$  = Energy savings due to reduced heat from evaporator fans

$kW_{Motor}$  = Rated input power of the existing case motor

$LRF$  = Load reduction factor: 53% when SP motors are replaced, 29% when PSC motors are replaced<sup>2</sup>.

$Hours$  = Average runtime of case motors (8,500 hours)<sup>3</sup>

0.28 = Conversion of kW to tons: 3,413 Btuh/kW divided by 12,000 Btuh/ton.

$Eff_{RS}$  = Efficiency of typical refrigeration system (1.6 kW/ton)<sup>4</sup>

$\Delta kW$  = Average demand savings

8,760 = Hours per year

### Measure Life:

The measure life is 15 years<sup>5</sup>. This measure is determined to have an add-on single baseline in retrofit scenarios.

This measure is determined to have an add-on single baseline in retrofit scenarios. **Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a016	Case Motor Replacement	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C1d018	Case Motor Replacement	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2a016	Case Motor Replacement	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2d018	Case Motor Replacement	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3a016	Case Motor Replacement	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3d018	Case Motor Replacement	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

All programs use a coincidence factor of 100% since demand savings are average and expected to be consistent.

**Energy Load Shape:**

See Appendix 1 – “C&I Refrigeration”.

Endnotes:

- 1: The assumptions and algorithms used in this section are specific to NRM products.
- 2: Load factor is an estimate by NRM based on several pre- and post-meter readings of installations
- 3: Conservative value based on 15 years of NRM field observations and experience.
- 4: Select Energy (2004). Cooler Control Measure Impact Spreadsheet Users’ Manual. Prepared for NSTAR.

**5:** Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities; 15-year measure life for retrofit motor installations.

## 2.47. Refrigeration – Door Heater Controls

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Refrigeration

### Description:

Installation of controls to reduce the run time of door and frame heaters for freezers and walk-in or reach-in coolers. The reduced heating results in a reduced cooling load.

### Baseline Efficiency:

The baseline efficiency case is a cooler or freezer door heater that operates 8,760 hours per year without any controls.

### High Efficiency:

The high efficiency case is a cooler or freezer door heater connected to a heater control system, which controls the door heaters by measuring the ambient humidity and temperature of the store, calculating the dew point, and using pulse width modulation (PWM) to control the anti-sweat heater based on specific algorithms for freezer and cooler doors. Door temperature is typically maintained about 5°F above the store air dew point temperature.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kW = \frac{V \times A}{1,000} \times \%Off$$

$$\Delta kWh = \Delta kW \times 8,760$$

Where:

V = Nameplate heater voltage

A = Nameplate heater amperage

%Off = Controlled door heater off time: 46% for freezers and 74% for coolers<sup>1</sup>

8,760 = Hours per year

### Measure Life:

The measure life is 10 years<sup>2</sup>.

### Other Resource Impacts:

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

<b>BC Measure ID</b>	<b>Measure Name</b>	<b>Fuel</b>	<b>Program</b>	<b>ISR</b>	<b>RR<sub>E</sub></b>	<b>RR<sub>NE</sub></b>	<b>RR<sub>SP</sub></b>	<b>RR<sub>WP</sub></b>	<b>CF<sub>SP</sub></b>	<b>CF<sub>WP</sub></b>
E21C1a019	Door Heater Controls	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	0.50	1.00
E21C1d021	Door Heater Controls	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	0.50	1.00
E21C2a019	Door Heater Controls	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	0.50	1.00
E21C2d021	Door Heater Controls	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	0.50	1.00
E21C3a025	Door Heater Controls	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	0.50	1.00
E21C3d027	Door Heater Controls	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	0.50	1.00

**In-Service Rates:**

All installations have a 100% in service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

The CF values are based on MA TRM<sup>3</sup> until NH-specific evaluations are available.

**Energy Load Shape:**

See Appendix 1 – “C&I Refrigeration”

**Endnotes:**

- 1:** Calculated by NRM based on several pre- and post-meter readings of installations.
- 2:** Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities; Table 1-1
- 3:** MA TRM (2020). 2019 Pan-Year Report Version. 3.82. Refrigeration – Door Heater Controls

## 2.48. Refrigeration – Electric Defrost Control

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Refrigeration

### Description:

Install a controller to activate evaporator defrost only when necessary in a refrigeration system.

### Baseline Efficiency:

The baseline efficiency case is an evaporator electric defrost system that uses a time clock to initiate defrost.

### High Efficiency:

The high efficiency case is an evaporator electric defrost system with defrost controls based on refrigeration system runtime or load conditions.

### Algorithms for Calculating Primary Energy Impact:

$$\begin{aligned} \Delta kWh &= \Delta kWh_{Defrost} + \Delta kWh_{Heat} \\ \Delta kWh_{Defrost} &= kW_{Defrost} \times Hr/Day \times 365 \times DRF \\ \Delta kWh_{Heat} &= \Delta kWh_{Defrost} \times 0.28 \times Eff_{RS} \\ \Delta kW &= \frac{\Delta kWh}{8,760} \end{aligned}$$

Where:

$\Delta kWh_{Defrost}$  = Energy savings due to reduced runtime of defrost heaters

$\Delta kWh_{Heat}$  = Energy savings due to reduced heat from the defrost heaters

$kW_{Defrost}$  = Rated input power of the defrost heater

$Hr/Day$  = Existing scheduled defrost hours per day

$DRF$  = Defrost reduction factor – annual average of 35%<sup>1</sup>

365 = Days per year

0.28 = Conversion of kW to tons: 3,413 Btuh/kW divided by 12,000 Btuh/ton.

$Eff_{RS}$  = Efficiency of typical refrigeration system (1.6 kW/ton)<sup>2</sup>

$\Delta kW$  = Average demand savings

8,760 = Hours per year

### Measure Life:

The measure life is 9 years<sup>3</sup>.

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a024	Electronic Defrost Control	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C1d026	Electronic Defrost Control	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2a024	Electronic Defrost Control	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2d026	Electronic Defrost Control	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3a037	Electronic Defrost Control	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3d039	Electronic Defrost Control	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

All programs set coincident factors to 100% since demand savings are average and expected to be consistent.

**Energy Load Shape:**

See Appendix 1 – “C&I Refrigeration”

**Endnotes:**

- 1:** Supported by 3rd party evaluation: Independent Testing was performed by Intertek Testing Service on a Walk-in Freezer that was retrofitted with Smart Electric Defrost capability.
- 2:** Assumed average refrigeration efficiency for typical installations. Conservative value based on 15 years of NRM field observations and experience. Value supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet Users’ Manual. Prepared for NSTAR.
- 3:** Energy & Resource Solutions (2005). Measure Life Study – refrigeration controls for large C&I retrofit. Prepared for The Massachusetts Joint Utilities.

## 2.49. Refrigeration – Evaporator Fan Control

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Refrigeration

### Description:

Installation of controls to modulate the evaporator fans based on the temperature in a refrigerated space.

### Baseline Efficiency:

The baseline efficiency case is an evaporator fan which runs for 8,760 annual hours.

### High Efficiency:

The high efficiency case is an evaporator fan with controls to reduce the fan speed or cycle the fan off when the refrigerated space temperature setpoint is met.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \Delta kWh_{Fan} + \Delta kWh_{Heat} + \Delta kWh_{Control}$$

$$kW_{Fan} = \frac{V \times A \times PF \times \sqrt{Phase}}{1,000}$$

$$\Delta kWh_{Fan} = kW_{Fan} \times \%Off \times 8760$$

$$\Delta kWh_{Heat} = \Delta kWh_{Fan} \times 0.28 \times Eff_{RS}$$

$$\Delta kWh_{Control} = [kW_{CP} \times Hours_{CP} + kW_{Fan} \times (1 - \%Off) \times 8760] \times 5\%$$

$$\Delta kW = \frac{\Delta kWh}{8760}$$

Where:

$\Delta kWh_{Fan}$  = Energy savings due to reduced runtime of evaporator fans

$\Delta kWh_{Heat}$  = Energy savings due to reduced heat from the defrost heaters

$\Delta kWh_{Control}$  = Energy savings due to optimized controls, estimated at 5% of compressor and fan energy by consensus estimates used in MA TRM

$V$  = Rated fan motor voltage

$A$  = Rated fan motor amperage per, phase-to-ground

$PF$  = Typical evaporator fan motor power factor, 0.55<sup>1</sup>

$Phase$  = Phase of electric power supplying the evaporator motor

$\%Off$  = Reduction in annual evaporator fan run hours, 46%<sup>2</sup>.

8760 = Hours per year

$kW_{CP}$  = Nameplate input kW of the compressor

$Hours_{CP}$  = Equivalent full load hours of compressor operations: 4,072 hours<sup>3</sup>

0.28 = Conversion of kW to tons: 3,413 Btuh/kW divided by 12,000 Btuh/ton.

$Eff_{RS}$  = Efficiency of typical refrigeration system (1.6 kW/ton)<sup>3</sup>

$\Delta kW$  = Average demand savings  
 8,760 = Hours per year

**Measure Life:**

The measure life is 10 years<sup>4</sup>.

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a027	Evaporator Fan Control	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C1d029	Evaporator Fan Control	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2a027	Evaporator Fan Control	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2d029	Evaporator Fan Control	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3a043	Evaporator Fan Control	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3d045	Evaporator Fan Control	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

All programs use CF values of 100% since demand savings are average and expected to be consistent.

**Energy Load Shape:**

See Appendix 1 – “C&I Refrigeration”

Endnotes:

**1:** Conservative value based on 15 years of NRM field observations and experience.

**2:** The value is an estimate by NRM based on hundreds of downloads of hours of use data. These values are also supported by Select Energy Services, Inc. (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR

**3:** Conservative value based on 15 years of NRM field observations and experience. Value supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet Users' Manual. Prepared for NSTAR.

**4:** Energy & Resource Solutions (2005). Measure Life Study – fan control retrofit. Prepared for The Massachusetts Joint Utilities.

## 2.50. Refrigeration – Novelty Cooler Shutoff

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Retrofit
<b>Category</b>	Refrigeration

### Description:

Installation of controls to shut off a facility’s novelty coolers for non-perishable goods based on pre-programmed store hours.

### Baseline Efficiency:

The baseline efficiency case a novelty cooler energized for 8,760 annual hours.

### High Efficiency:

The high efficiency case is a novelty cooler whose energized hours follow the store’s occupied hours, and is de-energized during unoccupied hours.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = kW_{NC} \times DC_{AVG} \times (Hours_{UNOCC} - 1) \times 365$$

$$\Delta kW = 0$$

Where:

$kW_{NC}$  = Rated nameplate input power to the novelty cooler

$DC_{AVG}$  = Weighted average annual duty cycle: 49%<sup>1</sup>

$Hours_{UNOCC}$  = Daily unoccupied hours of the store

365 = Days per year

### Measure Life:

The measure life is 10 years<sup>2</sup>.

### Other Resource Impacts:

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

<b>BC Measure ID</b>	<b>Measure Name</b>	<b>Fuel</b>	<b>Program</b>	<b>ISR</b>	<b>RR<sub>E</sub></b>	<b>RR<sub>NE</sub></b>	<b>RR<sub>SP</sub></b>	<b>RR<sub>WP</sub></b>	<b>CF<sub>SP</sub></b>	<b>CF<sub>WP</sub></b>
E21C1a037	Novelty Cooler Shutoff	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C1d037	Novelty Cooler Shutoff	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C2a037	Novelty Cooler Shutoff	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C2d037	Novelty Cooler Shutoff	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C3a066	Novelty Cooler Shutoff	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C3d066	Novelty Cooler Shutoff	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	0.00	0.00

**In-Service Rates:**

All installations have a 100% in service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

Coincidence factors are zero since all energy savings occur during off-peak hours.

**Energy Load Shape:**

See Appendix 1.

**Endnotes:**

**1:** Estimated value from NRM experience, supported by Select Energy Services, Inc. (2004). Cooler Control Measure Impact Spreadsheet Users’ Manual. Prepared for NSTAR. The study gives a less conservative value than used by NRM.

**2:** Energy & Resource Solutions (2005). Measure Life Study – cooler shutoff retrofit. Prepared for The Massachusetts Joint Utilities.

## 2.51. Refrigeration – Vending Miser

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Refrigeration

### Description:

Installation of controls intended to reduce the energy consumption of vending machine lighting and refrigeration systems. Qualifying controls must power down these systems during periods of inactivity but, in the case of refrigerated machines, must always maintain a cool product that meets customer expectations. This measure applies to refrigerated beverage vending machines, non-refrigerated snack vending machines, and glass front refrigerated coolers. This measure should not be applied to ENERGY STAR® qualified vending machines, as they already have built-in controls.

### Baseline Efficiency:

The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, nonrefrigerated snack vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.

### High Efficiency:

The high efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = kW_{rated} \times Hours \times SAVE$$

$$\Delta kW = \frac{\Delta kWh}{8760}$$

Where:

$kW_{rated}$  = Rated kW of connected equipment; if not available, use default values in table below

$Hours$  = Annual operating hours of connected equipment; if not available, use default value of 8,760

$SAVE$  = Percent savings factor, see table below for values

### Vending Machine and Cooler Controls Savings Factors <sup>1</sup>

Equipment Type	kW rated	SAVE
Refrigerated Beverage Vending Machines	0.40	46%
Non-Refrigerated Snack Vending Machines	0.085	25%
Glass Front Refrigerated Coolers	0.46	35%

**Measure Life:**

The measure life is 5 years<sup>2</sup>.

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a045	Vending Miser	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C1d045	Vending Miser	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C2a045	Vending Miser	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C2d045	Vending Miser	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C3a089	Vending Miser	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	0.00	0.00
E21C3d089	Vending Miser	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	0.00	0.00

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence factors are 0.00 since energy savings occur during off-peak hours (hours of vending machine inactivity).

**Energy Load Shape:**

See Appendix 1 – “24 hour operation”.

**Endnotes:**

**1:** EnergyMisers – Reducing Energy Use for Vending Machines, Coolers and other Electronic Devices (2020). <https://www.energymisers.com/#:~:text=VM2iQ,Learn%20More>. Accessed 6/8/2020.

**2:** Energy & Resource Solutions (2005). Measure Life Study – vending control retrofit. Prepared for The Massachusetts Joint Utilities.

## 2.52. Refrigeration – ECM Evaporator Fan Motors for Walk-in Coolers and Freezers

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Retrofit
Category	Refrigeration

### Description:

Installation of various sizes of electronically commutated motors (ECMs) in walk-in coolers and freezers to replace existing evaporator fan motors.

### Baseline Efficiency:

The baseline efficiency case is an existing evaporator fan motor which is not ECM.

### High Efficiency:

The high efficiency case is the replacement of existing evaporator fan motors with ECMs.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \Delta kWh_{Motor} + \Delta kWh_{Heat}$$

$$\Delta kWh_{Motor} = \frac{V \times A \times PF \times \sqrt{Phase}}{1,000} \times LRF \times Hours$$

$$\Delta kWh_{Heat} = \Delta kWh_{Motor} \times 0.28 \times Eff_{RS}$$

$$\Delta kW = \frac{\Delta kWh}{8,760}$$

Where:

$\Delta kWh_{Motor}$  = Energy savings due to increased efficiency of evaporator motor

$\Delta kWh_{Heat}$  = Energy savings due to reduced heat from evaporator fans

$V$  = Rated fan motor voltage

$A$  = Rated fan motor amperage per, phase-to-ground

$PF$  = Typical existing fan motor power factor, 0.55<sup>1</sup>

$Phase$  = Phase of electric power supplying the evaporator motor

$LRF$  = Load reduction factor of 65%<sup>2</sup>.

$Hours$  = Annual fan operating hours

0.28 = Conversion of kW to tons: 3,413 Btuh/kW divided by 12,000 Btuh/ton.

$Eff_{RS}$  = Efficiency of typical refrigeration system (1.6 kW/ton)<sup>1</sup>

$\Delta kW$  = Average demand savings

8,760 = Hours per year

### Measure Life:

The measure life is 15 years<sup>3</sup>.

**Other Resource Impacts:**

There are no other resource impacts for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Fuel	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a023	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	Electric	LBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C1d025	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	Electric	LBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2a023	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	Electric	SBES - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C2d025	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	Electric	SBES – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3a036	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	Electric	Muni - Retrofit	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C3d038	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	Electric	Muni – Direct Install	1.00	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

All installations have a 100% in service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

All programs set coincident factors to 100% since demand savings are average and expected to be consistent.

**Energy Load Shape:**

See Appendix 1 – “C&I Refrigeration”

**Endnotes:**

- 1:** Conservative value based on 15 years of NRM field observations and experience.
- 2:** Load factor is an estimate by NRM based on several pre- and post-meter readings of installations; the value is supported by RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
- 3:** Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities; 15-year measure life for retrofit motor installations.

## 2.53. Midstream Hot Water – Water Heaters

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	Hot Water

### Description:

- Midstream Heat Pump Water Heater 120 gallons
- Midstream Heat Pump Water Heater 80 gallons.
- Midstream Heat Pump Water Heater 50 gallons.
- Midstream Indirect Water Heater, Gas: Indirect water heaters use a storage tank that is heated by the main boiler. The energy stored by the water tank allows the boiler to turn off and on less often, saving considerable energy.
- Midstream On Demand Tankless Water Heater, Gas: Tankless water heaters circulate water through a heat exchanger to be heated for immediate use, eliminating the standby heat loss associated with a storage tank.
- Midstream Volume Water Heater, Gas: Installation of a high-efficiency gas-fired water heater.

### Baseline Efficiency:

All Water Heaters: The baseline efficiency case assumes compliance with the efficiency requirements as mandated by Massachusetts State Building Code. As described in the MA State Building Code, energy efficiency must be met via compliance with the relevant International Energy Conservation Code (IECC).

- Midstream Heat Pump Water Heater
- Midstream Indirect Water Heater: For indirect water heaters the baseline is a hot water boiler operating at 78% recovery efficiency. Additionally, a baseline storage water heater was assumed for purposed of estimating standby losses.<sup>1</sup>
- Midstream On Demand Tankless Water Heater, Gas: For on-demand tankless water heaters the baseline is a code-compliant gas-fired storage water heater with  $EF = 0.61$ .<sup>1</sup>
- Midstream Volume Water Heater, Gas: The assumed baseline is a code specified 80% TE volume water heater.

### High Efficiency:

- Midstream Heat Pump Water Heater
- Midstream Indirect Water Heater: The high efficiency scenario is an indirect water heater with a Combined Appliance Efficiency (CAE) of 85% or greater.
- Midstream On Demand Tankless Water Heater, Gas: The high efficiency equipment is either a gas-fired instantaneous hot water heater with an Energy Factor of at least 0.90.
- Midstream Volume Water Heater, Gas: The high efficiency case is a volume water heater with a 94% TE

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on study results.

BC Measure ID	Measure Name	Program	ΔkWh	ΔMMBtu	ΔMMBtu / Mbtuh
E21C1c044 E21C2c044	Midstream Heat Pump Water Heater, 120 gallons	LBES Mid SBES Mid			
E21C1c046 E21C2c046	Midstream Heat Pump Water Heater, 80 gallons	LBES Mid SBES Mid			
E21C1c045 E21C2c045	Midstream Heat Pump Water Heater, 50 gallons	LBES Mid SBES Mid			
G21C1c009 G21C2c009	Midstream Indirect Water Heater	LBES Mid SBES Mid		19.0	
G21C1c010 G21C2c010	Midstream on Demand Tankless Water Heater	LBES Mid SBES Mid		8.9	
G21C1c011 G21C2c011	Midstream Volume Water Heater	LBES Mid SBES Mid			0.6077

**Measure Life:**

BC Measure ID	Measure Name	Program	Measure Life
E21C1c044 E21C2c044 E21C1c045 E21C2c045 E21C1c046 E21C2c046	Midstream Heat Pump Water Heater, 120 gallons Midstream Heat Pump Water Heater, 80 gallons Midstream Heat Pump Water Heater, 50 gallons	LBES Mid SBES Mid	
G21C1c009 G21C2c009	Midstream Indirect Water Heater:	LBES Mid SBES Mid	15 <sup>3</sup>
G21C1c010 G21C2c010	Midstream on Demand Tankless Water Heater, Gas:	LBES Mid SBES Mid	20 <sup>4</sup>
G21C1c011 G21C2c011	Midstream Volume Water Heater, Gas:	LBES Mid SBES Mid	15

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c044 E21C2c044	Midstream Heat Pump Water Heater, 120 gallons	LBES Mid SBES Mid	1.00	1.00	n/a	n/a	n/a		

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c046 E21C2c046	Midstream Heat Pump Water Heater, 80 gallons	LBES Mid SBES Mid	1.00	1.00	n/a	n/a	n/a		
E21C1c045 E21C2c045	Midstream Heat Pump Water Heater, 50 gallons	LBES Mid SBES Mid	1.00	1.00	n/a	n/a	n/a		
G21C1c009 G21C2c009	Midstream Indirect Water Heater	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1c010 G21C2c010	Midstream on Demand Tankless Water Heater, Gas	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1c011 G21C2c011	Midstream Volume Water Heater, Gas	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

A summer coincidence factor of 43.1% and a winter coincidence factor of 74.7% are utilized.

**Energy Load Shape:**

For heat pump water heaters, see Appendix 1 – “Water Heater - Heat Pump”.

For all remaining water heaters, see Appendix 1 – “Water Heater – Natural Gas/Fuel Oil”.

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only):<sup>5</sup>**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	2021 NTG
E21C1c044 E21C2c044 E21C1c045 E21C2c045 E21C1c046 E21C2c046	Midstream Heat Pump Water Heater, 120 gallons Midstream Heat Pump Water Heater, 80 gallons Midstream Heat Pump Water Heater, 50 gallons	LBES Mid SBES Mid	18.2%	7.6%	0.0%	89.4%
G21C1c009 G21C2c009	Midstream Indirect Water Heater	LBES Mid SBES Mid	18.2%	7.6%	0.0%	89.4%
G21C1c010 G21C2c010	Midstream on Demand Tankless Water Heater	LBES Mid SBES Mid	18.2%	7.6%	0.0%	89.4%
G21C1c011 G21C2c011	Midstream Volume Water Heater	LBES Mid SBES Mid	18.2%	7.6%	0.0%	89.4%

**Endnotes:**

1: Title 10, Code of Federal Regulations, Part 430 - Energy Conservation Program for Consumer Products, Subpart C - Energy and Water Conservation Standards and Their Effective Dates. January 1, 2010; Energy Conservation standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters: Final Rule, Federal Register, 75 FR 20112, April 16, 2010

2: Savings for indirect water heaters are based on: KEMA, June 27, 2013. Impact Evaluation of 2011 Prescriptive Gas Measures Final Report. <http://ma-eeac.org/wordpress/wp-content/uploads/Impact-Evaluation-of-2011-Prescription-Gas-Measures-6.27.13.pdf>

For volume and tankless water heaters, savings are based on: Massachusetts Technical Reference Manual for Estimating Savings from Energy Efficiency Measures. 2019 Plan-Year Report Version. May 2020.

3: GDS Associates, Inc. (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks; Table B-2a, measure C-WH-16. [http://ma-eeac.org/wordpress/wp-content/uploads/5\\_Natural-Gas-EE-Potential-in-MA.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/5_Natural-Gas-EE-Potential-in-MA.pdf)

4: Hewitt, D. Pratt, J. & Smith, G., December 2005. Tankless Gas Water Heaters: Oregon Market Status. Prepared for the Energy Trust of Oregon. [https://www.energytrust.org/wp-content/uploads/2016/11/051206\\_TanklessGasWaterHeaters0.pdf](https://www.energytrust.org/wp-content/uploads/2016/11/051206_TanklessGasWaterHeaters0.pdf)

5: NMR, DNV GL, and Tetra Tech, August 2018. Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study. Prepared for Massachusetts Program Administrators. [http://ma-eeac.org/wordpress/wp-content/uploads/TXC\\_49\\_CI-FR-SO-Report\\_14Aug2018.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/TXC_49_CI-FR-SO-Report_14Aug2018.pdf)

## 2.54. Midstream Lighting

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity/Retrofit
<b>Category</b>	Lighting

### Description:

This measure includes efficient lighting products including, but not limited to, efficient Light-Emitting Diode (LED) lamps and fixtures, promoted through point-of-sale (also referred to as midstream) distributors.

### Baseline Efficiency:

All midstream measures assume a blend of retrofit and lost opportunity baseline,<sup>1</sup> determined using assumed wattages for each of the replaced lamps or fixtures.

### High Efficiency:

The high efficiency case is project-specific and is determined using actual fixture counts for the project and the delta watt values in the table below.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = n * (\text{DeltaWatts}/1000) * \text{Hours}$$

$$\Delta kW = n * \text{DeltaWatts} / 1000$$

Where:

n = Total number of fixture or lamp types in project.

DeltaWatts = Calculated difference between efficient and baseline wattage (see table below)

1000 = Conversion factor: 1000 watts per kW.

Hours = Lighting annual hours of operation.

The following delta watt values are based on C&I Upstream Lighting, Mass Saves.<sup>2</sup>

Product	Product Type	delta Watts <sup>2</sup>
BR20/PAR20	Screw-In LEDs	28.1
BR20/PAR30	Screw-In LEDs	38.1
BR40/PAR38	Screw-In LEDs	44.2
MR16	Screw-In LEDs	22.1
A-line, 75/100w	Screw-In LEDs	30.5
Decoratives	Screw-In LEDs	13.6
LED Retrofit kit, <25W	Screw-In LEDs	38.4

LED Retrofit kit, >25W	Screw-In LEDs	56.6
Stairwell Kit, Low-Output w/sensor	LED Stairwell Kits	19.2
Stairwell Kit, Mid-Output w/sensor	LED Stairwell Kits	40.0
G24 LED	Screw-In LEDs	15.3
G23 LED	Screw-In LEDs	8.4
T8 TLED, 4ft	Linear LEDs	13.8
T8 TLED, 2ft	Linear LEDs	6.9
A-line, 40/60w	Screw-In LEDs	21.7
2x4 LED Fixture Standard	Linear LEDs	33.0
2x4 LED Fixture Premium	Linear LEDs	37.0
2x2 LED Fixture Standard	Linear LEDs	29.0
2x2 LED Fixture Premium	Linear LEDs	33.0
1x4 LED Fixture Standard	Linear LEDs	16.0
1x4 LED Fixture Premium	Linear LEDs	20.0
2x4 LED Fixture Standard w Controls	Linear LEDs w Controls	42.9
2x4 LED Fixture Premium w Controls	Linear LEDs w Controls	48.1
2x2 LED Fixture Standard w Controls	Linear LEDs w Controls	37.7
2x2 LED Fixture Premium w Controls	Linear LEDs w Controls	42.9
1x4 LED Fixture Standard w Controls	Linear LEDs w Controls	20.8
1x4 LED Fixture Premium w Controls	Linear LEDs w Controls	26.0
T5 LED	Linear LEDs	20.0
U-Bend LED	Linear LEDs	23.4
High/Low Bay 50-99W	High Bay/Low Bay	174.0
High/Low Bay 100-199W	High Bay/Low Bay	229.0
High/Low Bay >= 200W	High Bay/Low Bay	334.0
Exterior LED 20-99W	Exterior LEDs	101.5
Exterior LED 100-199W	Exterior LEDs	176.5
Exterior LED >= 200W	Exterior LEDs	231.5
1x4 LED Troffer Retrofit Kit - Premium	Linear LEDs	37.3
1x4 LED Troffer Retrofit Kit - Standard	Linear LEDs	29.5
2x2 LED Troffer Retrofit Kit - Premium	Linear LEDs	19.6
2x2 LED Troffer Retrofit Kit - Standard	Linear LEDs	18.1
2x4 LED Troffer Retrofit Kit - Premium	Linear LEDs	56.2
2x4 LED Troffer Retrofit Kit - Standard	Linear LEDs	53.5
LED Ambient/Strip/Wrap	Linear LEDs	21.8
Mogul High Bay	High Bay/Low Bay	283.6
Mogul Low Bay	High Bay/Low Bay	191.0
Mogul Ext 175W	Exterior LEDs	141.9
Mogul Ext 250W	Exterior LEDs	184.9
Mogul Ext 400W	Exterior LEDs	283.3
LED Tubes, 3ft Type A	Linear LEDs	12.0
LED Tubes, 8ft Type A	Linear LEDs	25.1
Parking Garage, 20-99W - Standard	Exterior LEDs	122.9

Parking Garage, 20-99W - Premium	Exterior LEDs	130.5
Parking Garage, 100-199W - Standard	Exterior LEDs	249.4
Parking Garage, 100-199W - Premium	Exterior LEDs	253.9
Parking Garage, >= 200W - Standard	Exterior LEDs	561.6
Parking Garage, >= 200W - Premium	Exterior LEDs	583.1
High/Low Bay LED, 20-99W w/controls	High Bay/Low Bay w Controls	189.5
High/Low Bay LED, 100-199W w/controls	High Bay/Low Bay w Controls	260.1
High/Low Bay LED, >= 200W w/controls	High Bay/Low Bay w Controls	388.4

Midstream lighting measures will calculate gross energy savings using annual hours of operation defined for the building type in which the lamp was installed. These categories and hours of use are defined in the table below.

### Midstream Hours of Use by Building Type

The following hours of operation are based on a program evaluation from CT.<sup>3</sup> Parking garages are included as an additional building type category that has not yet been evaluated. A review of TRM best practices indicates 8760 hours of use for parking garages.

Building Type	Hours of Use
24x7 lighting	8,760
Automotive	4,056
Education	2,967
Grocery	5,468
Health Care	5,564
Hotel/Motel	3,064
Industrial	5,793
Large Office	4,098
Other	6,211 *
Parking Lot/ Streetlights	6,887
Religious Building/ Convention Center	913
Restaurant	5,018
Retail	4,939
Small Office	3,748
Warehouse	5,667
Parking Garage	8,760

\*Other includes recreational and entertainment facilities, service-oriented facilities, and other miscellaneous building types.

**Measure Life:**

The table below summarizes the adjusted measure lives (AML) for each of the midstream measures. Note these AML values account for the estimated fraction of program lighting measures that are assumed to be lost opportunity (replace on failure) vs. retrofit (early replacement) based on MA evaluation research, as well as an outyear factor (accounting for future, naturally occurring adoption of LEDs) that calculates the second-period savings of early replacement dual baseline measures.<sup>4</sup>

<b>BC Measure ID</b>	<b>Measure Category</b>	<b>Measure</b>	<b>Program</b>	<b>AML</b>
E21C1c015 E21C2c015	Ambient Linear	TLED	LBES Midstream, SBES Midstream	10.53
E21C1c013 E21C2c013 E21C1c014 E21C2c014	Ambient Linear	LED Fixture	LBES Midstream, SBES Midstream	10.99
E21C1c012 E21C2c012	High/Low Bay	TLED	LBES Midstream, SBES Midstream	12.81
E21C1c012 E21C2c012	High/Low Bay	LED Fixture	LBES Midstream, SBES Midstream	12.84
E21C1c012 E21C2c012	High/Low Bay	LED Lamp	LBES Midstream, SBES Midstream	12.56
E21C1c011 E21C2c011	Exterior/Outdoor	TLED	LBES Midstream, SBES Midstream	10.12
E21C1c011 E21C2c011	Exterior/Outdoor	LED Fixture	LBES Midstream, SBES Midstream	10.18
E21C1c011 E21C2c011	Exterior/Outdoor	LED Lamp	LBES Midstream, SBES Midstream	9.74
E21C1c016 E21C2c016	Screw-Based	A-Line	LBES Midstream, SBES Midstream	4.69
E21C1c010 E21C2c010	Screw-Based	Downlight/Track	LBES Midstream, SBES Midstream	5.86
	Screw-Based	Decorative	LBES Midstream, SBES Midstream	3.78

**Other Resource Impacts:**

The following heating penalties are associated with lighting projects, determined from MA lighting evaluations.<sup>5</sup>

BC Measure ID	Measure Name	Program	MMBtu/kWh
E21C1c010 E21C2c010	LED Downlight	LBES Midstream, SBES Midstream	-0.000329
E21C1c011 E21C2c011	LED Exterior	LBES Midstream, SBES Midstream	N/A
E21C1c012 E21C2c012	LED High Bay/Low Bay	LBES Midstream, SBES Midstream	-0.000162
E21C1c013 E21C2c013	LED Linear Fixture	LBES Midstream, SBES Midstream	-0.000162
E21C1c014 E21C2c014	LED Linear Fixture with Controls	LBES Midstream, SBES Midstream	-0.000162
E21C1c015 E21C2c015	LED Linear Lamp	LBES Midstream, SBES Midstream	-0.000162
E21C1c016 E21C2c016	LED Screw In	LBES Midstream, SBES Midstream	-0.000329
E21C1c017 E21C2c017	LED Stairwell Kit	LBES Midstream, SBES Midstream	N/A

**Impact Factors for Calculating Adjusted Gross Savings:<sup>3 5</sup>**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c010 E21C2c010	LED Downlight	LBES Midstream, SBES Midstream	0.859	1.267	1.00	1.00	0.70	0.49
E21C1c011 E21C2c011	LED Exterior	LBES Midstream, SBES Midstream	0.955	0.989	1.00	1.00	0.00	1.00
E21C1c012 E21C2c012	LED High Bay/Low Bay	LBES Midstream, SBES Midstream	0.996	0.747	1.00	1.00	0.83	0.65
E21C1c013 E21C2c013	LED Linear Fixture	LBES Midstream, SBES Midstream	0.971	1.135	1.00	1.00	0.83	0.65
E21C1c014 E21C2c014	LED Linear Fixture with Controls	LBES Midstream, SBES Midstream	0.971	1.135	1.00	1.00	0.83	0.65

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c015 E21C2c015	LED Linear Lamp	LBES Midstream, SBES Midstream	0.971	1.135	1.00	1.00	0.83	0.65
E21C1c016 E21C2c016	LED Screw In	LBES Midstream, SBES Midstream	0.714	1.712	1.00	1.00	0.70	0.49
E21C1c017 E21C2c017	LED Stairwell Kit	LBES Midstream, SBES Midstream	0.955	0.989	1.00	1.00	0.82	0.82

**In-Service Rates:**

In-service rates are based on the C1635 Impact Evaluation of PY 2016 and 2017 Energy Opportunities (EO) Program Report.<sup>3</sup>

**Realization Rates:**

Realization rates are based on the C1635 Impact Evaluation of PY 2016 and 2017 Energy Opportunities (EO) Program Report.<sup>3</sup> The HVAC interaction adjustment factor is determined from MA<sup>3,4</sup> and CT<sup>8</sup> lighting project evaluations.

**Coincidence Factors:**

Summer and winter coincidence factors are based on MA 2017 Upstream Lighting Impact evaluation.<sup>5</sup> LED screw-in coincident factors also applied to LED downlights.

**Energy Load Shape:**

Energy load shapes are based on site-level metering of project sites in MA.<sup>6</sup>

Measure Name	Summer On-peak	Winter On-peak	Summer Off-peak	Winter Off-peak
Interior Lighting	33.7%	30.1%	18.4%	17.7%
Exterior Lighting	19.2%	20.1%	29.0%	31.6%

**Impact Factors for Calculating Net Savings:**

Free-ridership and spillover are based on study results from CT—which is the nearby jurisdiction with programs and markets most similar to those in NH.<sup>7</sup>

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c010 E21C2c010	LED Downlight	LBES Midstream, SBES Midstream	50%	23%	0%	73%
E21C1c011 E21C2c011	LED Exterior	LBES Midstream, SBES Midstream	50%	23%	0%	73%

E21C1c012 E21C2c012	LED High Bay/Low Bay	LBES Midstream, SBES Midstream	50%	23%	0%	73%
E21C1c013 E21C2c013	LED Linear Fixture	LBES Midstream, SBES Midstream	27%	11%	0%	84%
E21C1c014 E21C2c014	LED Linear Fixture with Controls	LBES Midstream, SBES Midstream	27%	11%	0%	84%
E21C1c015 E21C2c015	LED Linear Lamp	LBES Midstream, SBES Midstream	27%	11%	0%	84%
E21C1c016 E21C2c016	LED Screw In	LBES Midstream, SBES Midstream	50%	23%	0%	73%
E21C1c017 E21C2c017	LED Stairwell Kit	LBES Midstream, SBES Midstream	50%	23%	0%	73%

**Endnotes**

**1:** The blend of retrofit and lost opportunity lighting was determined based on MA evaluation results. See DNV GL (2015) Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative, Massachusetts Program Administrators and Energy Efficiency Advisory Council, November 22, 2017 <http://ma-eeac.org/wordpress/wp-content/uploads/Upstream-Lighting-Initiative-Impact-Evaluation-PY2015.pdf>

**2:** C&I Upstream Lighting Program. Mass Saves. Available at:

<https://www.masssave.com/en/learn/partners/upstream-lighting/>

**3:** DNV GL, June 30, 2020, C1653 Impact Evaluation of PY 2016 and 2017 Energy Opportunities (EO) Program. Prepared for Connecticut Energy Efficiency Board (EEB). Available at:

<https://www.energizect.com/connecticut-energy-efficiency-board/evaluation-reports>

**4:** DNV GL, April 6, 2020. MA19C14-E-LGHTMKT: 2019 C&I Lighting Inventory and Market Model Updates. [http://ma-eeac.org/wordpress/wp-content/uploads/MA19C14-E-LGHTMKT\\_2019-CI-Lighting-Inventory-and-Market-Model-Report\\_Final\\_2020.04.06.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA19C14-E-LGHTMKT_2019-CI-Lighting-Inventory-and-Market-Model-Report_Final_2020.04.06.pdf). Table 3-7.

**5:** DNV GL, November 22, 2017. Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative. <http://ma-eeac.org/wordpress/wp-content/uploads/Upstream-Lighting-Initiative-Impact-Evaluation-PY2015.pdf>

**6:** DNV GL (2018). P72 Prescriptive C&I Loadshapes of Savings.

**7:** EMI, September 25, 2019 . C1644 EO Net-to-Gross Study, Final Report (Table ES-1-1, and Recommendation 1 on p. 51). To separate the contribution of free-ridership and spillover to these NTG values, we used a proportion equivalent to the levels of free-ridership (40%) and spillover (23%) found for screw-based LEDs in 2020.

## 2.55. Midstream HVAC

Measure Code	[To Be Defined in ANB system]
Market	Commercial
Program Type	Lost Opportunity
Category	HVAC

### Description:

**Midstream Heat Pump Systems:** This measure includes the installation of ductless mini-split, ground source and water source heat pumps to serve the space heating and space cooling loads in a C&I facility. “Water source” refers to systems that use ground or lake water rather than a boiler as a loop heat source. The savings for this measure are realized through the increased nameplate efficiency between the baseline and installed equipment.

**Midstream VRF Systems:** This measure includes in the installation of high-efficiency variable flow refrigerant (VRF) heat pumps.

**Midstream Circulator Pump:** Single-phase circulator pumps up used in C&I buildings used for hydronic heating and system hot water.

**Midstream Demand Control Ventilation (DCV):** The measure controls the quantity of outside air to an air handling system based on detected space CO2 levels. The installed systems monitor the CO2 in the spaces or return air and reduce the outside air use when possible to save energy while \meeting indoor air quality standards.

**Midstream Dual Enthalpy Economizer Controls:** The measure is to upgrade the outside-air dry-bulb economizer to a dual enthalpy economizer. The system will continuously monitor the enthalpy of both the outside air and return air. The system will control the system dampers adjust the outside quantity based on the two readings.

**Midstream Unitary Air Conditioners:** This measure promotes the installation of high efficiency unitary air conditioning equipment in lost opportunity applications. Air conditioning (AC) systems are a major consumer of electricity and systems that exceed baseline efficiencies can save considerable amounts of energy. This measure applies to air, water, and evaporatively-cooled unitary AC systems, both single-package and split systems.

### Baseline Efficiency:

**Midstream Heat Pump Systems:** The baseline is a code compliant heat pump unit of the same type as the high efficiency unit. Details regarding heat pump baseline efficiencies based on capacity and type are provided in a tabular format along with the savings algorithms.

**Midstream Heat Pump Systems:** The baseline is a code compliant VRF heat pump unit. Details regarding heat pump baseline efficiencies based on capacity and type are provided in a tabular format along with the savings algorithms.

**Midstream Circulator Pump:** The baseline system is a pump without an EC motor. The baseline system may have no control, a timer, aquastat, or be on demand. The baseline system is assumed to run a weighted average of these four control types.

**Midstream Demand Control Ventilation (DCV):** The baseline efficiency case assumes the relevant HVAC equipment has no ventilation control.

**Midstream Dual Enthalpy Economizer Controls:** The baseline efficiency case for this measure assumes the relevant HVAC equipment is operating with a fixed dry-bulb economizer.

**Midstream Unitary Air Conditioners:** The baseline efficiency case for new installations assumes compliance with the efficiency requirements as mandated by Massachusetts State Building Code.

### High Efficiency:

**Midstream Heat Pump Systems:** The high efficiency case is the site-specific heat pump unit. The energy efficient heat pump unit is assumed to be of the same type as the baseline unit.

**Midstream VRF Systems:** The high efficiency case is the site-specific VRF heat pump unit.

**Midstream Circulator Pump:** The high efficiency case is a circulator pump with an ECM.

**Midstream Demand Control Ventilation (DCV):** The high efficiency case is the installation of an outside air intake control based on CO2 sensors.

**Midstream Dual Enthalpy Economizer Controls:** The high efficiency case is the installation of an outside air economizer utilizing two enthalpy sensors, one for outdoor air and one for return air.

**Midstream Unitary Air Conditioners:** The high efficiency case assumes the HVAC equipment meets or exceeds the Consortium for Energy Efficiency's (CEE) specification. This specification results in cost-effective energy savings by specifying higher efficiency HVAC equipment while ensuring that several manufacturers produce compliant equipment. The CEE specification is reviewed and updated annually to reflect changes to the ASHRAE and IECC energy code baseline as well as improvements in the HVAC equipment technology. Equipment efficiency is the rated efficiency of the installed equipment for each project.

### Algorithms for Calculating Primary Energy Impact:

**Midstream Heat Pump Systems:** The savings for this measure are attributable to the increase in nameplate efficiency between the baseline and installed units.

The algorithm for calculating electric demand savings is:

$$\Delta kW = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

Where:

$\Delta kW$  = Gross annual demand savings for heat pump unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient heat pump unit, from equipment specifications

$EER_{BASE}$  = Energy Efficiency Ratio of the baseline heat pump equipment

$EER_{EE}$  = Energy Efficiency Ratio of the energy efficient heat pump unit, from equipment specifications

The algorithm for calculating annual electric energy savings is:

$$\Delta kWh = \Delta kWh_{cool} + \Delta kWh_{heat}$$

For ductless mini split heat pumps

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{SEER_{BASE}} - \frac{1}{SEER_{EE}} \right) \times EFLH_{cool}$$

$$\Delta kWh_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right) \times EFLH_{heat}$$

$$Cap_{heat} = Cap_{cool} \times 1.0 \text{ if unit is a cold climate ductless mini split heat pump}$$

$$Cap_{heat} = Cap_{cool} \times 0.9 \text{ for all other ductless mini split heat pump}$$

For water source and ground source heat pumps

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right) \times EFLH_{cool}$$

$$\Delta kWh_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right) \times EFLH_{heat}$$

$$Cap_{heat} = Cap_{cool} \times \left( \frac{HSPF_{EE}}{EER_{EE}} \right)$$

Where:

$\Delta kWh_{cool}$  = Gross annual cooling savings for heat pump unit

$\Delta kWh_{heat}$  = Gross annual heating savings for heat pump unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient heat pump unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient pump unit, from equipment specifications. Use equation to convert from cooling capacity value if standard equipment literature does not provide this value.

$SEER_{BASE}$  = Seasonal Energy Efficiency Ratio of baseline heat pump equipment

$SEER_{EE}$  = Seasonal Energy Efficiency Ratio of energy efficient heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient heat pump unit, from equipment specifications

$EFLH_{cool}$  = Equivalent Full Load Hours for cooling

$EFLH_{heat}$  = Equivalent Full Load Hours for heating

0.9 = Conversion factor<sup>1</sup> to convert cooling capacity to heating capacity for ductless mini split heat pump units not on NEEP's cold climate air source heat pump (ccASHP) product list. The conversion factor for ccASHPs is 1.0.

Heat Pump Type	Cooling Capacity Range	Parameter	Value	Units
	≤65,000 Btu/h	EER <sub>BASE</sub>	12.72 <sup>1</sup>	Btu/W-h

Ductless Mini Split		SEER <sub>BASE</sub>	14.00 <sup>2</sup>	Btu/W-h
		HSPF <sub>BASE</sub>	8.20 <sup>2</sup>	Btu/W-h
Water Source	<17,000 Btu/h	EER <sub>BASE</sub>	12.20 <sup>2</sup>	Btu/W-h
		HSPF <sub>BASE</sub>	14.67 <sup>2</sup>	Btu/W-h
	≥17,000 Btu/h	EER <sub>BASE</sub>	13.00 <sup>2</sup>	Btu/W-h
		HSPF <sub>BASE</sub>	14.67 <sup>2</sup>	Btu/W-h
Ground Source (Open Loop)	All Sizes	EER <sub>BASE</sub>	18.00 <sup>2</sup>	Btu/W-h
		HSPF <sub>BASE</sub>	12.62 <sup>2</sup>	Btu/W-h
Ground Source (Closed Loop)	All Sizes	EER <sub>BASE</sub>	14.1 <sup>2</sup>	Btu/W-h
		HSPF <sub>BASE</sub>	10.91 <sup>2</sup>	Btu/W-h
All		EFLH <sub>cool</sub>	755 <sup>3</sup>	hours
		EFLH <sub>heat</sub>	1329 <sup>3</sup>	hours

**Midstream VRF Systems:** The savings for this measure are attributable to the increase in nameplate efficiency between the baseline and installed units.

The algorithm for calculating electric demand savings is :

$$\Delta kW = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

Where:

$\Delta kW$  = Gross annual demand savings for VRF unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient VRF unit, from equipment specifications

$EER_{BASE}$  = Energy Efficiency Ratio of the baseline VRF equipment

$EER_{EE}$  = Energy Efficiency Ratio of the energy efficient VRF unit, from equipment specifications

The algorithm for calculating annual electric energy savings is:

$$\Delta kWh = \Delta kWh_{cool} + \Delta kWh_{heat}$$

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{IEER_{BASE}} - \frac{1}{IEER_{EE}} \right) \times EFLH_{cool}$$

$$\Delta kWh_{heat} = \frac{Cap_{hea}}{3.412} \times \left( \frac{1}{COP_{BASE}} - \frac{1}{COP_{EE}} \right) \times EFLH_{heat}$$

Where:

$\Delta kWh_{cool}$  = Gross annual cooling savings for VRF unit

$\Delta kWh_{heat}$  = Gross annual heating savings for VRF unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient VRF unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient VRF unit, from equipment specifications.

$IEER_{BASE}$  = Integrated Energy Efficiency Ratio of baseline VRF equipment

$IEER_{EE}$  = Integrated Energy Efficiency Ratio of energy efficient VRF unit

$COP_{BASE}$  = Coefficient of performance in heating mode of baseline VRF equipment

$COP_{EE}$  = Coefficient of performance in heating mode of energy efficient VRF unit

VRF System Type	Parameter	Value <sup>4</sup>
Air Cooled	EER <sub>BASE</sub>	11
	IEER <sub>BASE</sub>	12.9
	COP <sub>BASE</sub>	3.3
Water Cooled	EER <sub>BASE</sub>	12
	IEER <sub>BASE</sub>	16.0
	COP <sub>BASE</sub>	4.2

**Midstream Circulator Pump:** Savings depend on application and pump size as described in table below<sup>5</sup>.

Size	Type	$\Delta kW$	$\Delta kWh$
≤ 1 HP	Hydronic Heating	$\Delta kW = 0.245 * HP_{rated} + 0.02$	$\Delta kWh = 1,325 * HP_{rated} + 111$
	Service Hot Water	$\Delta kW = 0.245 * HP_{rated} + 0.02$	$\Delta kWh = 2,780 * HP_{rated} + 233$
> 1 HP	Hydronic Heating	$\Delta kW = 0.265$	$\Delta kWh = 1,436$
	Service Hot Water	$\Delta kW = 0.265$	$\Delta kWh = 3,013$

**Midstream Demand Control Ventilation (DCV):** Gross energy and demand savings for implementation of demand control ventilation are custom calculated. Alternatively, the energy and demand savings may be calculated using the following algorithms and inputs:

$$\Delta kWh = kBtuh \times \frac{1 \text{ ton}}{12 \text{ kBtuh}} \times SAVE_{kWh}$$

$$\Delta kW = kBtuh \times \frac{1 \text{ ton}}{12 \text{ kBtuh}} \times SAVE_{kW}$$

Where:

$kBtuh$  = Capacity of the cooling equipment in kBtu per hour

$SAVE_{kWh}$  = Average annual kWh reduction per ton of cooling capacity: 170 kWh/ton <sup>6</sup>

$SAVE_{kW}$  = Average kW reduction per ton of cooling capacity: 0.15 kW/ton <sup>7</sup>

**Midstream Dual Enthalpy Economizer Controls:** Gross energy and demand savings for implementation of dual enthalpy economizer controls are custom calculated. Alternatively, the energy and demand savings may be calculated using the following algorithms and inputs:

$$\Delta kWh = kBtuh \times \frac{1 \text{ ton}}{12 \text{ kBtuh}} \times SAVE_{kWh}$$

$$\Delta kW = kBtuh \times \frac{1 \text{ ton}}{12 \text{ kBtuh}} \times SAVE_{kW}$$

Where:

$kBtuh$  = Capacity of the cooling equipment in kBtu per hour

$SAVE_{kWh}$  = Average annual kWh reduction per ton of cooling capacity: 289 kWh/ton <sup>8</sup>

$SAVE_{kW}$  = Average kW reduction per ton of cooling capacity: 0.289 kW/ton <sup>8</sup>

**Midstream Unitary Air Conditioners:**

For units with cooling capacities less than 65 kBtu/h:

$$\Delta kWh = kBtuh \times \left( \frac{1}{SEER_{BASE}} - \frac{1}{SEER_{EE}} \right) \times EFLH_{Cool}$$

$$\Delta kW = kBtuh \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

For units with cooling capacities equal to or greater than 65 kBtu/h and EER available:

$$\Delta kWh = kBtuh \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right) \times EFLH_{Cool}$$

$$\Delta kW = kBtuh \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

For units with cooling capacities equal to or greater than 65 kBtu/h and IEER available

$$\Delta kWh = kBtuh \times \left( \frac{1}{IEER_{BASE}} - \frac{1}{IEER_{EE}} \right) \times Hours_{Cool}$$

$$\Delta kW = kBtuh \times \left( \frac{1}{IEER_{BASE}} - \frac{1}{IEER_{EE}} \right)$$

Where:

$\Delta kWh$  = Gross annual kWh savings from the measure.

$\Delta kW$  = Gross connected kW savings from the measure.  
 kBtuh = Capacity of the cooling equipment in kBtu per hour (1 ton of cooling capacity equals 12 kBtuh)  
 $SEER_{BASE}$  = Seasonal Energy Efficiency Ratio of the baseline equipment.  
 $SEER_{EE}$  = Seasonal Energy Efficiency Ratio of the energy efficient equipment.  
 $EFLH_{Cool}$  = Cooling equivalent full load hours.  
 $EER_{BASE}$  = Energy Efficiency Ratio of the baseline equipment.  
 $EER_{EE}$  = Energy Efficiency Ratio of the energy efficient equipment.  
 $IEER_{BASE}$  = Integrated Energy Efficiency Ratio of the baseline equipment.  
 $IEER_{EE}$  = Integrated Energy Efficiency Ratio of the energy efficient equipment.  
 Hours $_{Cool}$  = Annual Cooling Hours

The baseline efficiency values are based on the IECC 2015.<sup>9</sup>

Size (Btu/h)	Units with Electric Resistance of No Heating	Units with Heating Section Other Than Electric Resistance
< 65,000	13.0 SEER (Split System) 14.0 SEER (Single Package)	13.0 SEER (Split System) 14.0 SEER (Single Package)
≥65,000 and <135,000	11.2 EER 12.8 IEER	11.0 EER 12.6 IEER
≥135,000 and <240,000	11.0 EER 12.4 IEER	10.8 EER 12.2 IEER
≥240,000 and <760,000	10.0 EER 11.6 IEER	9.8 EER 11.4 IEER
≥760,000	9.7 EER 11.2 IEER	9.5 EER 11.0 IEER

**Measure Life:**

BC Measure ID	Measure Name	Program	Measure Life
	Midstream Heat Pump Systems	LBES Mid SBES Mid	Ground source – 26 <sup>10</sup> All others – 12 <sup>11</sup>
	Midstream VRF Systems	LBES Mid SBES Mid	12 <sup>11</sup>
E21C1c001 E21C2c001	Midstream Circulator Pump	LBES Mid SBES Mid	15 <sup>11</sup>
E21C1c002 E21C2c002	Midstream Demand Control Ventilation (DCV)	LBES Mid SBES Mid	10 <sup>12</sup>
E21C1c004 E21C2c004	Midstream Dual Enthalpy Economizer Controls	LBES Mid SBES Mid	10 <sup>11</sup>
E21C1c007 E21C2c007	Midstream Unitary Air Conditioners	LBES Mid SBES Mid	12 <sup>3</sup>

**Other Resource Impacts:**

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
	Midstream Heat Pump Systems	LBES mid SBES mid	1.00	1.00	1.00	1.00	1.00	Ground-source: 0.43  All others: 0.45	0.00
	Midstream VRF Systems	LBES mid SBES mid	1.00	1.00	1.00	1.00	1.00	0.45	0.00
E21C1c001 E21C2c001	Midstream Circulator Pump	LBES mid SBES mid	1.00	0.86	0.86	0.86	0.86	0.82	0.05
E21C1c002 E21C2c002	Midstream Demand Control Ventilation (DCV)	LBES mid SBES mid	1.00	0.86	0.86	0.86	0.86	0.82	0.05
E21C1c004 E21C2c004	Midstream Dual Enthalpy Economizer Controls	LBES mid SBES mid	1.00	0.86	0.86	0.86	0.86	0.00	0.00
E21C1c007 E21C2c007	Midstream Unitary Air Conditioners	LBES mid SBES mid	1.00	0.86	0.86	0.86	0.86	0.45	0.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

In-Service Rates:

As shown in the table.

**Coincidence Factors:**

As shown in the table.

**Energy Load Shape:**

Midstream Heat Pump Systems: see Appendix 1 – “DMSHP” for ductless minisplit units, “Central Heat Pump” for all others.

Midstream VRF Systems: see Appendix 1 – “Central Heat Pump”.

Midstream Circulator Pump: see Appendix 1 – “Boiler Distribution”.

Midstream Demand Control Ventilation (DCV): see Appendix 1 – “C&I – Heating & Cooling”.

Midstream Dual Enthalpy Economizer Controls: see Appendix 1 – “C&I – Heating & Cooling”.

Midstream Unitary Air Conditioners: see Appendix 1 – “HVAC – Unitary Air Conditioner”.

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only):<sup>13</sup>**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	2021 NTG
	Midstream Heat Pump Systems	LBES mid SBES mid	31.5%	4.1%	0.0%	72.6%
	Midstream VRF Systems	LBES mid SBES mid	31.5%	4.1%	0.0%	72.6%
E21C1c001 E21C2c001	Midstream Circulator Pump	LBES mid SBES mid	31.5%	4.1%	0.0%	72.6%
E21C1c002 E21C2c002	Midstream Demand Control Ventilation (DCV)	LBES mid SBES mid	31.5%	4.1%	0.0%	72.6%
E21C1c004 E21C2c004	Midstream Dual Enthalpy Economizer Controls	LBES mid SBES mid	31.5%	4.1%	0.0%	72.6%
E21C1c007 E21C2c007	Midstream Unitary Air Conditioners	LBES mid SBES mid	31.5%	4.1%	0.0%	72.6%

**Endnotes:**

1: Since IECC 2015 does not provide EER requirements for air-cooled heat pumps < 65 kBtu/h, assume the following conversion from SEER to EER: EER≈SEER/1.1.

2: International Energy Conservation Code 2015, table C403.2.3(2) Minimum Efficiency Requirements: Electrically Operated Unitary and Applied Heat Pumps

3: KEMA, August 2011. C&I Unitary AC Load Shape Project - Final Report.

[https://neep.org/sites/default/files/resources/NEEP\\_HVAC\\_Load\\_Shape\\_Report\\_Final\\_August2\\_0.pdf](https://neep.org/sites/default/files/resources/NEEP_HVAC_Load_Shape_Report_Final_August2_0.pdf)

4: ANSI/ASHRAE/IES Standard 90.1-2013. Table 6.8.1-10

- 5:** The Cadmus Group, 2017. Circulator Pump Technical Memo. Prepared for National Grid and Eversource engineers.
- 6:** Keena, Kevin, 2008. Analysis of CO2 Control Energy Savings on Unitary HVAC Units. Prepared for National Grid
- 7:** Keena, Kevin, 2008. Analysis of CO2 Control Energy Savings on Unitary HVAC Units. Prepared for National Grid
- 8:** Patel, Dinesh, 2001. Energy Analysis: Dual Enthalpy Control. Prepared for Eversource (NSTAR).
- 9:** 2015 IECC Table C403.2.3(1).
- 10:** ASHRAE Owning and Operating Cost Database. Equipment Life/Maintenance Cost Survey. [http://weblegacy.ashrae.org/publicdatabase/system\\_service\\_life.asp?c\\_region=2&state=NA&building\\_function=NA&c\\_size=0&c\\_age=0&c\\_height=0&c\\_class=0&c\\_location=0&selected\\_system\\_type=1&c\\_equipment\\_type=NA](http://weblegacy.ashrae.org/publicdatabase/system_service_life.asp?c_region=2&state=NA&building_function=NA&c_size=0&c_age=0&c_height=0&c_class=0&c_location=0&selected_system_type=1&c_equipment_type=NA).
- 11:** Energy & Resource Solutions, November. Measure Life Study. Prepared for The Massachusetts Joint Utilities. [https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study\\_MA-Joint-Utilities\\_ERS.pdf](https://www.ers-inc.com/wp-content/uploads/2018/04/Measure-Life-Study_MA-Joint-Utilities_ERS.pdf)
- 12:** Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities; Table 1-1. Measure life is assumed to be the same as Enthalpy Economizer.
- 13:** NMR, DNV GL, and Tetra Tech, August 2018. Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study. Prepared for Massachusetts Program Administrators. [http://ma-eeac.org/wordpress/wp-content/uploads/TXC\\_49\\_CI-FR-SO-Report\\_14Aug2018.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/TXC_49_CI-FR-SO-Report_14Aug2018.pdf)

## 2.56. Midstream Food Service – Dishwasher

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Dishwasher High Temperature: Installation of a qualified ENERGY STAR high temperature commercial dishwasher in a building with gas domestic hot water. High temperature dishwashers use a booster heater to raise the rinse water temperature to 180 F – hot enough to sterilize dishes and assist in drying. Electric savings are achieved through savings to the electric booster.

Dishwasher Low Temperature: Installation of a qualified ENERGY STAR low temperature commercial dishwasher in a facility with electric hot water heating. Low temperature dishwashers use the hot water supplied by the kitchen’s existing water heater and use a chemical sanitizing agent in the final rinse cycle and sometimes a drying agent.

### Baseline Efficiency:

Dishwasher High Temp: The baseline efficiency case is a commercial dishwasher with idle energy rates and water consumption as defined by the U.S. Department of Energy (DOE) federal requirements. They are as follows:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
High Temp Under Counter Dishwasher	0.76	1.09
High Temp Door Type Dishwasher	0.87	1.29
High Temp Single Tank Conveyer Dishwasher	1.93	0.87
High Temp Multi Tank Conveyer Dishwasher	2.59	0.97
High Temp Pots & Pans Dishwasher	1.20	0.70

Dishwasher Low Temp: The baseline efficiency case is a commercial dishwasher with idle energy rates and water consumption as defined by the U.S. Department of Energy (DOE) federal requirements. They are as follows:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
Low Temp Under Counter Dishwasher	0.50	1.73
Low Temp Door Type Dishwasher	0.60	2.10

Low Temp Single Tank Conveyor Dishwasher	1.60	1.31
Low Temp Multi Tank Conveyor Dishwasher	2.00	1.04
Low Temp Pots & Pans Dishwasher	1.00	0.70

**High Efficiency:**

Dishwasher High Temp: The high efficiency case is a commercial dishwasher with idle energy rates and water consumption following ENERGY STAR Efficiency Requirements as follows:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
High Temp Under Counter Dishwasher	0.50	0.86
High Temp Door Type Dishwasher	0.70	0.89
High Temp Single Tank Conveyor Dishwasher	1.50	0.70
High Temp Multi Tank Conveyor Dishwasher	2.25	0.54
High Temp Pots & Pans Dishwasher	1.20	0.58

Dishwasher Low Temp: The high efficiency case is a commercial dishwasher with idle energy rates and water consumption following ENERGY STAR Efficiency Requirements as follows:

Dishwasher Type	Idle Energy Rate (kW)	Water Consumption (gal/rack)
Low Temp Under Counter Dishwasher	0.50	1.19
Low Temp Door Type Dishwasher	0.60	1.18
Low Temp Single Tank Conveyor Dishwasher	1.60	0.79
Low Temp Multi Tank Conveyor Dishwasher	2.00	0.54
Low Temp Pots & Pans Dishwasher	1.00	0.58

**Algorithms for Calculating Primary Energy Impact:**

kWh = kWh  
 kW = kWh / hours  
 MMBtu = MMBtu

Where:

kWh = gross annual kWh savings from the measure. See table below.  
 kW = gross average kW savings from the measure. See table below.

MMBtu = gross average natural gas MMBtu savings from the measure. See table below.  
 Hours = Average annual equipment operating hours, see section below.

BC Measure ID	Measure Name	Program	ΔkW	ΔkWh	ΔMMBtu
E21C1c024 E21C2c024	High Temp Under Counter Dishwasher	LBES Mid SBES Mid	0.32	1,791	n/a
E21C1c020 E21C2c020	High Temp Door Type Dishwasher	LBES Mid SBES Mid	0.74	4,151	n/a
E21C1c023 E21C2c023	High Temp Single Tank Conveyer Dishwasher	LBES Mid SBES Mid	0.75	4,243	n/a
E21C1c021 E21C2c021	High Temp Multi Tank Conveyer Dishwasher	LBES Mid SBES Mid	1.71	9,630	n/a
E21C1c022 E21C2c022	High Temp Pots & Pans Dishwasher	LBES Mid SBES Mid	0.18	1,032	n/a
E21C1c028 E21C2c028	Low Temp Under Counter Dishwasher	LBES Mid SBES Mid	0.39	2,178	n/a
E21C1c025 E21C2c025	Low Temp Door Type Dishwasher	LBES Mid SBES Mid	2.46	13,851	n/a
E21C1c027 E21C2c027	Low Temp Single Tank Conveyer Dishwasher	LBES Mid SBES Mid	2.07	11,685	n/a
E21C1c026 E21C2c026	Low Temp Multi Tank Conveyer Dishwasher	LBES Mid SBES Mid	2.86	16,131	n/a

**Hours:**

Operating hours include active and idle time.

Dishwasher Type	Number of Racks per Day (racks/day)	Operating Hours per Year (hr/yr)
Under Counter Dishwasher		
Door Type Dishwasher (including Pots and Pans)		
Conveyer Dishwasher		

**Measure Life:**

The measure life for a new high temperature dishwasher is given by type below<sup>1</sup>:

BC Measure ID	Measure Name	Program	Measure Life
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E21C1c024 E21C2c024	High Temp Under Counter Dishwasher	LBES Mid SBES Mid	10
E21C1c020 E21C2c020	High Temp Door Type Dishwasher	LBES Mid SBES Mid	15
E21C1c023 E21C2c023	High Temp Single Tank Conveyer Dishwasher	LBES Mid SBES Mid	20
E21C1c021 E21C2c021	High Temp Multi Tank Conveyer Dishwasher	LBES Mid SBES Mid	20
E21C1c022 E21C2c022	High Temp Pots & Pans Dishwasher	LBES Mid SBES Mid	10
E21C1c028 E21C2c028	Low Temp Under Counter Dishwasher	LBES Mid SBES Mid	10
E21C1c025 E21C2c025	Low Temp Door Type Dishwasher	LBES Mid SBES Mid	15
E21C1c027 E21C2c027	Low Temp Single Tank Conveyor Dishwasher	LBES Mid SBES Mid	20
E21C1c026 E21C2c026	Low Temp Multi Tank Conveyor Dishwasher	LBES Mid SBES Mid	20

**Other Resource Impacts:**

Dishwasher high temp: There are water savings associated with this measure.

Dishwasher Type	Annual water savings (gal/unit)
High Temp Under Counter Dishwasher	5,399
High Temp Door Type Dishwasher	35,056
High Temp Single Tank Conveyer Dishwasher	21,284
High Temp Multi Tank Conveyer Dishwasher	80,754
High Temp Pots & Pans Dishwasher	10,517

Dishwasher low temp: There are water savings associated with this measure.

Dishwasher Type	Annual water savings (gal/unit)
Low Temp Under Counter Dishwasher	12,677
Low Temp Door Type Dishwasher	80,629
Low Temp Single Tank Conveyor Dishwasher	65,104
Low Temp Multi Tank Conveyor Dishwasher	93,900

Low Temp Pots & Pans Dishwasher	TBD
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**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c024 E21C2c024	High Temp Under Counter Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c020 E21C2c020	High Temp Door Type Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c023 E21C2c023	High Temp Single Tank Conveyer Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c021 E21C2c021	High Temp Multi Tank Conveyer Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c022 E21C2c022	High Temp Pots & Pans Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c028 E21C2c028	Low Temp Under Counter Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c025 E21C2c025	Low Temp Door Type Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c027 E21C2c027	Low Temp Single Tank Conveyer Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c026 E21C2c026	Low Temp Multi Tank Conveyer Dishwasher	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>2</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
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E21C1c024 E21C2c024	High Temp Under Counter Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c020 E21C2c020	High Temp Door Type Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c023 E21C2c023	High Temp Single Tank Conveyor Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c021 E21C2c021	High Temp Multi Tank Conveyor Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c022 E21C2c022	High Temp Pots & Pans Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c028 E21C2c028	Low Temp Under Counter Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c025 E21C2c025	Low Temp Door Type Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c027 E21C2c027	Low Temp Single Tank Conveyor Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c026 E21C2c026	Low Temp Multi Tank Conveyor Dishwasher	LBES Mid SBES Mid	0.225	0.085	0	0.86

**Endnotes:**

- 1: ENERGY STAR Commercial Kitchen Equipment Calculator. Updated October 2016.
- 2: NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.57. Midstream Food Service – Fryer

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

**Electric Fryer:** Installation of a qualified ENERGY STAR standard or large vat commercial fryer. ENERGY STAR® commercial fryers save energy during cooking and idle times due to improved cooking efficiency and idle energy rates.

**Gas Fryer:** The installation of a natural-gas fired fryer that is either ENERGY STAR rated or has a heavy-load cooking efficiency of at least 50%. Qualified fryers use advanced burner and heat exchanger designs to use fuel more efficiently, as well as increased insulation to reduce standby heat loss.

### Baseline Efficiency:

**Electric Fryer:** The baseline efficiency case for both, standard sized fryers and large capacity fryers is an electric deep-fat fryer of the same size with a cooking energy efficiency, shortening capacity, and idle energy rate as defined by any relevant U.S. federal requirements.

**Gas Fryer:** The baseline efficiency case is a gas deep-fat fryer of the same size with a cooking energy efficiency, shortening capacity, and idle energy rate as defined by any relevant U.S. federal requirements.

### High Efficiency:

**Electric Fryer:** The high efficiency case for both, standard sized fryer and large capacity fryers is an electric deep-fat fryer with a cooking energy efficiency, shortening capacity, and idle energy rate in line with ENERGY STAR requirements.

**Gas Fryer:** The high efficiency case is an fryers is a deep-fat gas fryer with a cooking energy efficiency, shortening capacity, and idle energy rate in line with ENERGY STAR requirements.

### Algorithms for Calculating Primary Energy Impact:

$$\Delta kWh = \Delta kWh$$

$$\Delta kW = \Delta kWh / \text{Hours}$$

Where:

$\Delta kWh$  = gross annual kWh savings from the measure per table below

$\Delta kW$  = gross average kW savings from the measure per table below

Hours = Annual hours of operation

$$\Delta MMBtu = \Delta MMBtu$$

Where:

$\Delta MMBtu$  = gross annual MMBtu gas savings from the measure per table below

**Energy Savings for Commercial Fryer**

BC Measure ID	Measure Name	Program	$\Delta kW$	$\Delta kWh$	$\Delta MMBtu$
E21C1c032 E21C2c032	Electric Fryer, Standard Vat	LBES Mid SBES Mid	0.50	2,976	n/a
E21C1c031 E21C2c031	Electric Fryer, Large Vat	LBES Mid SBES Mid	0.50	2,841	n/a
G21C1c004 G21C2c004	Gas Fryer	LBES Mid SBES Mid	n/a	n/a	78.3

**Measure Life:**

The measure life for a new commercial fryer is 12 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c032 E21C2c032	Electric Fryer, Standard Vat	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c031 E21C2c031	Electric Fryer, Large Vat	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1c004 G21C2c004	Gas Fryer	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>2</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c032 E21C2c032	Electric Fryer, Standard Vat	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c031 E21C2c031	Electric Fryer, Large Vat	LBES Mid SBES Mid	0.225	0.085	0	0.86
G21C1c004 G21C2c004	Gas Fryer	LBES Mid SBES Mid	0.237	0.07	0	0.83

**Endnotes:**

**1:** SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>

**2:** NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.58. Midstream Food Service – Griddle

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Electric Griddle: Installation of a qualified ENERGY STAR electric griddle.

Gas Griddle: Installation of a qualified ENERGY STAR gas griddle.

ENERGY STAR griddles save energy cooking and idle times due to improved cooking efficiency and idle energy rates.

### Baseline Efficiency:

Electric Griddle: The baseline efficiency case is a typically sized, (6 sq. ft.) electric, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate as defined by any relevant U.S. federal requirements.

Gas Griddle: The baseline efficiency case is a typically sized, (6 sq. ft.) gas, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate as defined by any relevant federal requirements.

### High Efficiency:

Electric Griddle: The high efficiency case is a typically sized (6 sq. ft.), electric, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate meeting the minimum ENERGY STAR requirements.

Gas Griddle: The high efficiency case is a typically sized (6 sq. ft.), gas, commercial griddle with a cooking energy efficiency, production capacity, and idle energy rate meeting the minimum ENERGY STAR requirements.

### Algorithms for Calculating Primary Energy Impact:

BC Measure ID	Measure Name	Program	$\Delta kW$	$\Delta kWh$	$\Delta MMBtu$
E21C1c033 E21C2c033	Electric Griddle	LBES Mid SBES Mid	0.90	3,965	n/a
G21C1c005 G21C2c005	Gas Griddle	LBES Mid SBES Mid	n/a	n/a	37.9

For electric Griddle:

$$\Delta kWh = \Delta kWh$$

$$\Delta kW = \Delta kWh / \text{Hours}$$

Where:

$\Delta kWh$  = gross annual kWh savings from the measure per table above

$\Delta kW$  = gross average kW savings from the measure per table above

Hours = annual operating hours

For Gas Griddle:

$$\Delta MMBtu = MMBtu$$

Where:

$\Delta MMBtu$  = gross annual MMBtu gas savings from the measure per table above.

### Measure Life:

The measure life for a new commercial griddle is 12 years.<sup>1</sup>

### Other Resource Impacts:

There are no other resource impacts for these measures.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c033 E21C2c033	Electric Griddle	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.9	0.9
G21C1c005 G21C2c005	Gas Griddle	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a

### In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise

### Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

### Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

### Energy Load Shape:

See Appendix 1

### Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>2</sup>:

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c033 E21C2c033	Electric Griddle	LBES Mid SBES Mid	0.225	0.085	0	0.86
G21C1c005 G21C2c005	Gas Griddle	LBES Mid SBES Mid	0.237	0.07	0	0.83

**Endnotes:**

- 1: SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>
- 2: NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.59. Midstream Food Service – Holding Cabinet

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Installation of a qualified ENERGY STAR hot food holding cabinet (HFHC). ENERGY STAR hot food holding cabinets are more energy efficient than standard models. Models that meet this requirement incorporate better insulation, reducing heat loss, and may also offer additional energy saving devices such as magnetic door gaskets, auto-door closures, or Dutch doors. The insulation of the cabinet also offers better temperature uniformity within the cabinet from top to bottom. Offering full size, 3/4 size, and 1/2 half size HFHC.

### Baseline Efficiency:

The baseline case is a hot food holding cabinet (HFHC) with efficiency idle energy rate as defined by the U.S. Department of Energy (DOE) federal requirements .

### High Efficiency:

The high efficiency case is a hot food holding cabinet (HFHC) with efficiency idle energy rate value meeting the minimum ENERGY STAR requirements .

### Algorithms for Calculating Primary Energy Impact:

$$\text{kWh} = \Delta\text{kWh}$$

$$\text{kW} = \Delta\text{kWh} / \text{Hours}$$

Where:

kWh = gross annual kWh savings from the measure: See table below.

kW = gross average kW savings from the measure: See table below.

Hours = annual operating hours.

### Energy Savings for Commercial Hot Food Holding Cabinets

BC Measure ID	Equipment Type	Program	$\Delta\text{kW}$	$\Delta\text{kWh}$
E21C1c035 E21C2c035	Full Size – 20 cu.ft.	LBES Mid SBES Mid	0.50	2,737
E21C1c034 E21C2c034	3/4 Size – 12 cu.ft.	LBES Mid SBES Mid	0.20	1,095
E21C1c036	1/2 Size – 8 cu.ft.	LBES Mid	0.20	1,095

E21C2c036		<b>SBES Mid</b>		
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**Measure Life:**

The measure life for a new commercial HFHC is 12 years.<sup>1</sup>

**Other Resource Impacts:**

There are no other resource impacts for these measures.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c035 E21C2c035	Hot Food Holding Cabinet Full Size	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c034 E21C2c034	Hot Food Holding Cabinet 3/4 Size	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c036 E21C2c036	Hot Food Holding Cabinet Half Size	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>2</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c035 E21C2c035	Hot Food Holding Cabinet Full Size	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c034 E21C2c034	Hot Food Holding Cabinet 3/4 Size	LBES Mid SBES Mid	0.225	0.085	0	0.86

E21C1c036 E21C2c036	Hot Food Holding Cabinet Half Size	LBES Mid SBES Mid	0.225	0.085	0	0.86
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**Endnotes:**

**1:** SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>

**2:** NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.60. Midstream Food Service – Ice Machine

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Installation of a qualified ENERGY STAR commercial ice machine. Commercial ice machines meeting the ENERGY STAR specifications are more energy efficient and more water-efficient than standard models. ENERGY STAR qualified equipment includes ice-making head (IMH), self-contained (SCU), and remote condensing units (RCU).

### Baseline Efficiency:

The baseline efficiency case is a non-ENERGY STAR commercial ice machine, which must be compliant with the applicable federal standard.<sup>1</sup>

### High Efficiency:

The high efficiency case is a commercial ice machine meeting the ENERGY STAR efficiency requirements for commercial ice machines.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated on a per-unit basis, based on the equipment type and daily ice harvest rate.

$$\text{kWh} = \text{kWh}_{\text{baseline}} - \text{kWh}_{\text{ee}}$$

$$\text{kW} = \text{kWh} / \text{hours}$$

Where:

kWh = gross annual kWh savings from the measure.

kWh<sub>baseline</sub> = annual kWh usage for the base case, based on ice harvest rate H. See table below.

kWh<sub>ee</sub> = annual kWh usage for the efficient case, based on ice harvest rate H. See table below.

kW = gross average kW savings from the measure.

Hours = Average annual equipment operating hours.

Energy Savings Inputs for Commercial Ice Machine <sup>2</sup>

BC Measure ID	Measure Name	Program	Daily Ice Harvest Rate, H (lb ice/24 hr)	Baseline Daily Energy Use (kWh/100 lb ice) <sup>1</sup>	Efficient Daily Energy Use (kWh/100 lb ice) <sup>3</sup>
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E21C1c037 E21C2c037	Ice Making Head	LBES New SBES New	H < 300	$10 - 0.01233 \times H$	$9.20 - 0.01134 \times H$
			$300 \leq H < 800$	$7.05 - 0.0025 \times H$	$6.49 - 0.0023 \times H$
			$800 \leq H < 1500$	$5.55 - 0.00063 \times H$	$5.11 - 0.00058 \times H$
			$1500 \leq H < 4000$	4.61	4.24
E21C1c038 E21C2c038	Self Contained Unit	LBES New SBES New	$50 \leq H < 1000$	$7.97 - 0.00342 \times H$	$7.17 - 0.00308 \times H$
			$1000 \leq H < 4000$	4.55	4.13
			H < 110	$14.79 - 0.0469 \times H$	$12.57 - 0.0399 \times H$
E21C1c039 E21C2c039	Remote Condensing Unit (Batch)	LBES New SBES New	$110 \leq H < 200$	$12.42 - 0.02533 \times H$	$10.56 - 0.0215 \times H$
			$200 \leq H < 4000$	7.35	6.25
E21C1c040 E21C2c040	Remote Condensing Unit (Continuous)	LBES New SBES New	H < 800	$9.7 - 0.0058 \times H$	$7.76 - 0.00464 \times H$
			$800 \leq H < 4000$	5.06	4.05

### Measure Life:

The measure life for a new commercial griddle is 8 years.<sup>2</sup>

### Other Resource Impacts:

There are no other resource impacts for this measure.

### Impact Factors for Calculating Adjusted Gross Savings:

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c037 E21C2c037	Ice Machine - Ice Making Head	LBES New SBES New	1.00	1.00	n/a	1.00	1.00	0.9	0.9
E21C1c038 E21C2c038	Ice Machine - Remote Cond./Split Unit - Batch	LBES New SBES New	1.00	1.00	n/a	1.00	1.00	0.9	0.9
E21C1c039 E21C2c039	Ice Machine - Remote Cond./Split Unit - Continuous	LBES New SBES New	1.00	1.00	n/a	1.00	1.00	0.9	0.9

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c040 E21C2c040	Ice Machine - Self Contained	LBES New SBES New	1.00	1.00	n/a	1.00	1.00	0.9	0.9

**In-Service Rates:**

All installations have a 100% in-service rate unless an evaluation finds otherwise.

**Realization Rates:**

All programs use a 100% realization rate unless an evaluation finds otherwise.

**Coincidence Factors:**

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1.

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>3</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c037 E21C2c037	Ice Machine - Ice Making Head	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c038 E21C2c038	Ice Machine - Remote Cond./Split Unit - Batch	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c039 E21C2c039	Ice Machine - Remote Cond./Split Unit - Continuous	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c040 E21C2c040	Ice Machine - Self Contained	LBES Mid SBES Mid	0.225	0.085	0	0.86

**Endnotes:**

- 1: 10 CFR 431.136. Effective January 28, 2018
- 2: ENERGY STAR® Program Requirements For Automatic Commercial Ice Makers. V3.0.
- 3: NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.61. Midstream Food Service – Oven

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Combination Oven, Electric Convection Oven, Electric	Installation of a qualified ENERGY STAR commercial convection oven or commercial combination oven. ENERGY STAR commercial ovens save energy during preheat, cooking and idle times due to improved cooking efficiency, and preheat and idle energy rates. Combination ovens can be used either as convection ovens or as steamers.
Combination Oven, Gas Convection Oven, Gas Conveyor Oven, Gas Rack Oven, Gas	Installation of High Efficiency Gas Ovens

### Baseline Efficiency:

The baseline efficiency case is a convection, combination, conveyor, or rack oven that meets applicable minimum federal efficiency standards and uses the same fuel as the proposed high efficiency equipment.

### High Efficiency:

The high efficiency case is a commercial oven that meets the ENERGY STAR program requirements for its type and fuel, as shown below.<sup>1</sup> Note that combination ovens are rated based on their capacity in number of pans (P), and that no ENERGY STAR program requirements for conveyor ovens have yet been approved.

Oven Fuel	Measure Name	Efficiency Requirement	Idle rate
Electric	Convection Oven	$\geq 71\%$	$\leq 1.60 \text{ kW}$
Electric	Combination Oven	$\geq 55\%$ steam mode $\geq 76\%$ convection mode	$\leq 0.133P + 0.6400 \text{ kW}$ steam mode $\leq 0.080P + 0.4989 \text{ kW}$ convection mode
Gas	Convection Oven	$\geq 46\%$	$\leq 12,000 \text{ Btu/hr}$
Gas	Combination Oven	$\geq 41\%$ steam mode $\geq 56\%$ convection mode	$\leq 200P + 6,511 \text{ Btu/hr}$ steam mode $\leq 150P + 5,425 \text{ Btu/hr}$ convection mode

Gas	Conveyer Oven		
Gas	Rack Oven	≥ 48%	≤ 25,000 Btu/hr

Ovens must be rated based on ASTM F1496 (Convection Oven), ASTM F2861 (Combination Oven), and ASTM 2093 (Conveyor Oven and Rack Oven).

### Algorithms for Calculating Primary Energy Impact:

Unit savings are deemed based on the CA Energy Wise Foodservice Calculators for Ovens:<sup>5</sup>

$$\Delta kWh = kWh$$

$$\Delta kW = kWh / \text{hours}$$

$$\Delta MMBtu = MMBtu$$

Where:

$\Delta kWh$  = gross annual kWh savings from the measure. See table below.

$\Delta kW$  = gross average kW savings from the measure. See table below.

$\Delta MMBtu$  = gross average natural gas savings from the measure. See table below.

Hours = Annual hours of operation = 4,390 hr/yr at 12 hr/day

### Energy Savings for Commercial Ovens<sup>5</sup>

BC Measure ID	Equipment Type	Program	$\Delta kW$	$\Delta kWh$	$\Delta MMBtu$
E21C1c019 E21C2c019	Electric Full Size Convection Oven	LBES Mid SBES Mid	0.70	2,787	n/a
E21C1c018 E21C2c018	Electric Combination Oven	LBES Mid SBES Mid	3.50	15,095	n/a
G21C1c002 G21C2c002	Gas Convection Oven	LBES Mid SBES Mid	n/a	n/a	35.7
G21C1c001 G21C2c001	Gas Combination Oven	LBES Mid SBES Mid	n/a	n/a	110.3
<b>G21C1c003</b> <b>G21C2c003</b>	Gas Conveyer Oven	LBES Mid SBES Mid	n/a	n/a	88.4
<b>G21C1c007</b> <b>G21C2c007</b>	Gas Rack Oven	LBES Mid <b>SBES Mid</b>	n/a	n/a	211.3

### Measure Life:

The measure life for a new commercial oven is 12 years.<sup>2</sup>

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c019 E21C2c019	Electric Convection Oven	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
E21C1c018 E21C2c018	Electric Combination Oven	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1c002 G21C2c002	Gas Convection Oven	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1c001 G21C2c001	Gas Combination Oven	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1c003 G21C2c003	Gas Conveyer Oven	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a
G21C1c007 G21C2c007	Gas Rack Oven	LBES Mid SBES Mid	1.00	n/a	1.00	n/a	n/a	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Energy Load Shape:**

See Appendix 1.

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>7</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c019 E21C2c019	Electric Convection Oven	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c018 E21C2c018	Electric Combination Oven	LBES Mid SBES Mid	0.225	0.085	0	0.86
G21C1c002 G21C2c002	Gas Convection Oven	LBES Mid SBES Mid	0.225	0.085	0	0.86
G21C1c001 G21C2c001	Gas Combination Oven	LBES Mid SBES Mid	0.225	0.085	0	0.86

G21C1c003 G21C2c003	Gas Conveyer Oven	LBES Mid SBES Mid	0.225	0.085	0	0.86
G21C1c007 G21C2c007	Gas Rack Oven	LBES Mid SBES Mid	0.225	0.085	0	0.86

**Endnotes:**

**1:** ENERGY STAR Program Requirements for Commercial Ovens. Version 2.2.

<https://www.energystar.gov/sites/default/files/Commercial%20Ovens%20Final%20Version%202.2%20Specification.pdf>

**2:** FSTC Life Cycle Savings Calculators <https://fishnick.com/saveenergy/tools/calculators/>

## 2.62. Midstream Food Service – Steam Cooker

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Electric Steam Cooker: Installation of a qualified ENERGY STAR commercial steam cooker. ENERGY STAR steam cookers save energy during cooling and idle times due to improved cooking efficiency and idle energy rates.

Gas Steam Cooker: The installation of an ENERGY STAR rated natural-gas fired steamer, either connectionless or steam-generator design. Qualified steamers reduce heat loss due to better insulation, improved heat exchange, and more efficient steam delivery systems.

### Baseline Efficiency:

Electric Steam Cooker: The Baseline Efficiency case is an electric steam cooker with a cooking efficiency, pan production capacity, preheat energy, and idle energy rate as defined by any relevant U.S. federal requirements.

Gas Steam Cooker: The baseline efficiency case is a gas steam cooker with a cooking efficiency, pan production capacity, preheat energy, and idle energy rate as defined by any relevant U.S. federal requirements.

### High Efficiency:

Electric Steam Cooker: The High Efficiency case is an electric steam cooker with a cooking energy efficiency, pan production capacity, preheat energy, and an idle energy rate meeting the minimum ENERGY STAR requirements.

Gas Steam Cooker: The high efficiency case is a gas steam cooker with a cooking energy efficiency, pan production capacity, preheat energy, and an idle energy rate meeting the minimum ENERGY STAR requirements.

### Algorithms for Calculating Primary Energy Impact:

BC Measure ID	Measure Name	Program	$\Delta kW$	$\Delta kWh$	$\Delta mmbtu$
E21C1c043 E21C2c043	Electric Steam Cooker	LBES Mid SBES Mid	30,156	6.89	n/a
G21C1c008	Gas Steam Cooker	LBES Mid	n/a	n/a	370.7

G21C2c008		SBES Mid			
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Quantity = Number of pans.

Hours = Average annual equipment operating hours.

**Measure Life:**

The measure life for a new steamer is 12 years. <sup>1</sup>

**Other Resource Impacts:**

Electric Steam Cooker: Deemed annual water savings.

Gas Steam Cooker: Deemed annual water savings.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c043 E21C2c043	Electric Steam Cooker	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	0.90	0.90
G21C1c008 G21C2c008	Gas Steam Cooker	LBES Mid SBES Mid	1.00	n/a	1.00	1.00	1.00	n/a	n/a

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise.

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

Coincidence Factors are 0.9 for both summer and winter seasons to account for the fact that some restaurants close one day per week and some may not serve both lunch and dinner on weekdays.

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>2</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c043 E21C2c043	Electric Steam Cooker	LBES Mid SBES Mid	0.225	0.085	0	0.86
G21C1c008 G21C2c008	Gas Steam Cooker	LBES Mid SBES Mid	0.237	0.07	0	0.83

## **Energy Load Shape:**

See Appendix 1

Future application of measure-specific NEI values will be considered by the NH Benefit/Cost (B/C) Working Group, per Commission Order No. 26,323 , December 31, 2019.

### **Endnotes:**

**1:** SupportTable\_EUL.csv, from DEER Database for Energy-Efficient Resources; Version 2016, READI v.2.4.3 (Current Ex Ante data) found at <http://www.deeresources.com/>

**2:** NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.63. Midstream Food Service – Freezer

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Installation of a qualified ENERGY STAR qualified reach-in freezer that replaces a standard efficiency unit of the same configuration and capacity. The freezer may have a solid door or transparent door. Measure savings are defined by configuration and internal volume as specified in the ENERGY STAR commercial requirements presented below.

### Baseline Efficiency:

The baseline case includes standard-efficiency, reach-in, solid and transparent door freezers and are defined by the U.S. Department of Energy (DOE) federal requirements.

### High Efficiency:

The high efficiency case is an ENERGY STAR qualified reach-in freezer having the same configuration and capacity as the baseline equipment .

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated and based on the ENERGY STAR Commercial Kitchen Equipment Calculator.

$$\begin{aligned}\Delta kWh &= kWh_{BL} - kWh_{EE} \\ kWh_{BL} &= (kWh_D)_{BL} \times D \\ kWh_{EE} &= (kWh_D)_{EE} \times D\end{aligned}$$

Where,

$\Delta kWh$  = Annual electric energy savings (kWh)

$kWh_{BL}$  = Annual electric energy consumption of baseline equipment (kWh). Calculate from table below.

$kWh_{EE}$  = Annual electric energy consumption of efficient equipment (kWh). Calculate from table below.

$kWh_D$  = Daily electric energy consumption (kWh)

$D$  = Number of days of operation of the unit. Use site specific data if possible (365 days is default).

$V$  = Internal volume of equipment (ft<sup>3</sup>)

### Equipment Daily Consumption<sup>1,2</sup>

Door Type	Size Thresholds	Baseline Freezer Daily Energy Consumption (kWh <sub>D</sub> ) <sub>BL</sub>	Efficient Freezer Daily Energy Consumption (kWh <sub>D</sub> ) <sub>EE</sub>
Solid Door	0 < V < 15	(0.22 x V) + 1.38	(0.021 x V) + 0.90

	15 < V < 30		$(0.012 \times V) + 2.248$
	30 < V < 50		$(0.285 \times V) - 2.703$
	50 < V		$(0.142 \times V) + 4.445$
Transparent Door	All	$(0.29 \times V) + 2.95$	$(0.232 \times V) + 2.36$

**Measure Life<sup>3</sup>:**

BC Measure ID	Measure Name	Measure Life
E21C1c030 E21C2c030	Freezer, Transparent Door	12
E21C1c029 E21C2c029	Freezer, Solid Door	12

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c030 E21C2c030	Freezer, Transparent Door	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C1c029 E21C2c029	Freezer, Solid Door	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

All programs use a 100% coincidence factor unless an evaluation finds otherwise.

**Energy Load Shape:**

See Appendix 1

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>4</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>p</sub>	SO <sub>NP</sub>	NTG
E21C1c030 E21C2c030	Freezer, Transparent Door	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c029 E21C2c029	Freezer, Solid Door	LBES Mid SBES Mid	0.225	0.085	0	0.86

**Endnotes:**

**1:** Efficient equipment daily energy consumption is in line with ENERGY STAR. 2016. "ENERGY STAR® Program Requirements Product Specification for Commercial Refrigerators and Freezers - [Eligibility Criteria Version 4.0.](#)" Effective on March 27, 2017.

**2:** Baseline equipment daily energy consumption is defined by the U.S. Department of Energy (DOE) federal requirements. Code of Federal Regulations at 10 CFR 431.66.

**3:** California Public Utilities Commission (CPUC), Energy Division. 2014. "DEER2014-EUL-table-update\_2014-02-05.xlsx."

**4:** NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.65. Midstream Food Service – Refrigerator

<b>Measure Code</b>	[To Be Defined in ANB system]
<b>Market</b>	Commercial
<b>Program Type</b>	Lost Opportunity
<b>Category</b>	Food Service

### Description:

Installation of a qualified ENERGY STAR qualified reach-in refrigerator that replaces a standard efficiency unit of the same configuration and capacity. The refrigerator may have a solid door or transparent door. Measure savings are defined by configuration and internal volume as specified in the Energy Star commercial requirements presented below.

### Baseline Efficiency:

The baseline case includes standard-efficiency, reach-in solid and transparent door refrigerators and are defined by the U.S. Department of Energy (DOE) federal requirements.

### High Efficiency:

The high efficiency case is an ENERGY STAR qualified reach-in refrigerator having the same configuration and capacity as the baseline equipment.

### Algorithms for Calculating Primary Energy Impact:

Unit savings are calculated and based on the Energy Star Commercial Kitchen Equipment Calculator.

$$\begin{aligned}\Delta kWh &= kWh_{BL} - kWh_{EE} \\ kWh_{BL} &= (kWh_D)_{BL} \times D \\ kWh_{EE} &= (kWh_D)_{EE} \times D\end{aligned}$$

Where,

$\Delta kWh$  = Annual electric energy savings (kWh)

$kWh_{BL}$  = Annual electric energy consumption of baseline equipment (kWh). Calculate from table below.

$kWh_{EE}$  = Annual electric energy consumption of efficient equipment (kWh). Calculate from table below.

$kWh_D$  = Daily electric energy consumption (kWh)

$D$  = Number of days of operation of the unit. Use site specific data if possible (365 days is default).

$V$  = Internal volume of equipment (ft<sup>3</sup>)

### Equipment Daily Consumption<sup>1,2</sup>

Door Type	Size Thresholds	Baseline Refrigerator Daily Energy Consumption (kWh) <sub>BL</sub>	Efficient Refrigerator Daily Energy Consumption (kWh) <sub>EE</sub>
Solid Door	0 < V < 15	(0.05 x V) + 1.36	(0.022 x V) + 0.97
	15 < V < 30		(0.066 x V) + 0.31

	30 < V < 50		$(0.04 \times V) + 1.09$
	50 < V		$(0.024 \times V) + 1.89$
Transparent Door	0 < V < 15	$(0.1 \times V) + 0.86$	$(0.095 \times V) + 0.445$
	15 < V < 30		$(0.05 \times V) + 1.12$
	30 < V < 50		$(0.076 \times V) + 0.34$
	50 < V		$(0.105 \times V) - 1.111$

**Measure Life<sup>3</sup>:**

BC Measure ID	Measure Name	Program	Measure Life
E21C1c041 E21C2c041	Refrigerator, Transparent Door	LBES Mid SBES Mid	12
E21C1c042 E21C2c042	Refrigerator, Solid Door	LBES Mid SBES Mid	12

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1c041 E21C2c041	Refrigerator, Transparent Door	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	1.00	1.00
E21C1c042 E21C2c042	Refrigerator, Solid Door	LBES Mid SBES Mid	1.00	1.00	n/a	1.00	1.00	1.00	1.00

In-Service Rates:

All installations have a 100% in-service rate unless an evaluation finds otherwise

Realization Rates:

All programs use a 100% realization rate unless an evaluation finds otherwise.

Coincidence Factors:

All programs use a 100% coincidence factor unless an evaluation finds otherwise.

**Energy Load Shape:**

See Appendix 1

**Impact Factors for Calculating Net Savings (Upstream/Midstream Only)<sup>4</sup>:**

BC Measure ID	Measure Name	Program	FR	SO <sub>P</sub>	SO <sub>NP</sub>	NTG
E21C1c041 E21C2c041	Refrigerator, Transparent Door	LBES Mid SBES Mid	0.225	0.085	0	0.86
E21C1c042 E21C2c042	Refrigerator, Solid Door	LBES Mid SBES Mid	0.225	0.085	0	0.86

Future application of measure-specific NEI values will be considered by the NH Benefit/Cost (B/C) Working Group, per Commission Order No. 26,323 , December 31, 2019.

**Endnotes:**

- 1:** Efficient equipment daily energy consumption is in line with ENERGY STAR. 2016. "ENERGY STAR® Program Requirements Product Specification for Commercial Refrigerators and Freezers - [Eligibility Criteria Version 4.0.](#)" Effective on March 27, 2017.
- 2:** Baseline equipment daily energy consumption is defined by the U.S. Department of Energy (DOE) federal requirements. Code of Federal Regulations at 10 CFR 431.66.
- 3:** California Public Utilities Commission (CPUC), Energy Division. 2014. "DEER2014-EUL-table-update\_2014-02-05.xlsx."
- 4:** NMR, DNV-GL, and Tetra-Tech, Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study, Aug. 14, 2018 (Table 48, Table 52)

## 2.66. HVAC – Heat Pump Systems

Measure Code	[Code]
Market	Commercial
Program Type	Retrofit/Lost Opportunity
Category	HVAC

### Description:

This measure includes the installation of ductless mini-split, ground source and water source heat pumps to serve the space heating and space cooling loads in a C&I facility. “Water source” refers to systems that use ground or lake water rather than a boiler as a loop heat source. The savings for this measure are realized through the increased nameplate efficiency between the baseline and installed equipment.

### Baseline Efficiency:

For lost opportunity, the baseline is a code compliant heat pump unit of the same type as the high efficiency unit. Details regarding heat pump baseline efficiencies based on capacity and type are provided in a tabular format along with the savings algorithms.

For early retirement (retrofit), it is assumed that the new unit replaces the pre-existing heat pump unit, which is not at the end of its useful life. In this case, the baseline is the pre-existing, inefficient heat pump unit.

### High Efficiency:

The high efficiency (or energy efficient) case is the site-specific heat pump unit. The energy efficient heat pump unit is assumed to be of the same type as the baseline unit.

### Algorithms for Calculating Primary Energy Impact:

The savings for this measure are attributable to the increase in nameplate efficiency between the baseline and installed units.

The algorithm for calculating electric demand savings is:

$$\Delta kW = \Delta kW_{cool} + \Delta kW_{heat}$$

$$\Delta kW_{cool} = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right)$$

$$\Delta kW_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right)$$

$$Cap_{heat} = Cap_{cool} \times 1.0 \text{ if unit is a cold climate ductless mini split heat pump}$$

$$Cap_{hea} = Cap_{cool} \times 0.9 \text{ for all other ductless mini split heat pump}$$

$$Cap_{heat} = Cap_{cool} \times \left( \frac{HSPF_{EE}}{EER_{EE}} \right) \text{ for water source and ground source heat pumps}$$

Where:

$\Delta kW$  = Gross annual demand savings for heat pump unit

$\Delta kW_{cool}$  = Gross annual cooling demand savings for heat pump unit

$\Delta kW_{heat}$  = Gross annual heating demand savings for heat pump unit. For non cold-climate ductless mini-split heat pump OR for facilities that employ supplemental heating sources (such as fossil fuel or electric resistance heat),  $\Delta kW_{heat} = 0$

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient heat pump unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient pump unit, from equipment specifications. Use given equations to convert from cooling capacity value if standard equipment literature does not provide this value

$EER_{BASE}$  = Energy Efficiency Ratio of the baseline heat pump equipment

$EER_{EE}$  = Energy Efficiency Ratio of the energy efficient heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient heat pump unit, from equipment specifications

The algorithm for calculating annual electric energy savings is:

$$\Delta kWh = \Delta kWh_{cool} + \Delta kWh_{he}$$

For ductless mini split heat pumps

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{SEER_{BASE}} - \frac{1}{SEER_{EE}} \right) \times EFLH_{cool}$$

$$\Delta kWh_{heat} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right) \times EFLH_{heat}$$

$Cap_{heat} = Cap_{cool} \times 1.0$  if unit is a cold climate ductless mini split heat pump

$Cap_{heat} = Cap_{cool} \times 0.9$  for all other ductless mini split heat pump

For water source and ground source heat pumps

$$\Delta kWh_{cool} = Cap_{cool} \times \left( \frac{1}{EER_{BASE}} - \frac{1}{EER_{EE}} \right) \times EFLH_{cool}$$

$$\Delta kWh_{hea} = Cap_{heat} \times \left( \frac{1}{HSPF_{BASE}} - \frac{1}{HSPF_{EE}} \right) \times EFLH_{hea}$$

$$Cap_{heat} = Cap_{cool} \times \left( \frac{HSPF_{EE}}{EER_{EE}} \right) \quad Cap_{hea} = Cap_{cool} \times \left( \frac{HSPF_{EE}}{EER_{EE}} \right)$$

Where:

$\Delta kWh_{cool}$  = Gross annual cooling savings for heat pump unit

$\Delta kWh_{heat}$  = Gross annual heating savings for heat pump unit

$Cap_{cool}$  = Cooling capacity (in kBtu/h) of the energy efficient heat pump unit, from equipment specifications

$Cap_{heat}$  = Heating capacity (in kBtu/h) of the energy efficient pump unit, from equipment specifications.  
 Use equation to convert from cooling capacity value if standard equipment literature does not provide this value.

$SEER_{BASE}$  = Seasonal Energy Efficiency Ratio of baseline heat pump equipment

$SEER_{EE}$  = Seasonal Energy Efficiency Ratio of energy efficient heat pump unit, from equipment specifications

$HSPF_{BASE}$  = Heating Seasonal Performance Factor of baseline heat pump equipment

$HSPF_{EE}$  = Heating Seasonal Performance Factor of energy efficient heat pump unit, from equipment specifications

$EFLH_{cool}$  = Equivalent Full Load Hours for cooling

$EFLH_{hea}$  = Equivalent Full Load Hours for heating

0.9 = Conversion factor<sup>1</sup> to convert cooling capacity to heating capacity for ductless mini split heat pump units not on NEEP's cold climate air source heat pump (ccASHP) product list. The conversion factor for ccASHPs is 1.0.

Heat Pump Type	Cooling Capacity Range	Parameter	Value (Lost Opportunity)	Value (Retrofit)	Units
Ductless Mini Split	≤65,000 Btu/h	EER <sub>BASE</sub>	12.72 <sup>2</sup>	Pre-existing equipment EER	Btu/W-h
		SEER <sub>BASE</sub>	14.00 <sup>3</sup>	Pre-existing equipment SEER	Btu/W-h
		HSPF <sub>BASE</sub>	8.20 <sup>3</sup>	Pre-existing equipment HSPF	Btu/W-h
Water Source	<17,000 Btu/h	EER <sub>BASE</sub>	12.20 <sup>3</sup>	Pre-existing equipment EER	Btu/W-h
		HSPF <sub>BASE</sub>	14.67 <sup>3</sup>	Pre-existing equipment HSPF	Btu/W-h
	≥17,000 Btu/h	EER <sub>BASE</sub>	13.00 <sup>3</sup>	Pre-existing equipment EER	Btu/W-h
		HSPF <sub>BASE</sub>	14.67 <sup>3</sup>	Pre-existing equipment HSPF	Btu/W-h
Ground Source (Open Loop)	All Sizes	EER <sub>BASE</sub>	18.00 <sup>3</sup>	Pre-existing equipment EER	Btu/W-h
		HSPF <sub>BASE</sub>	12.62 <sup>3</sup>	Pre-existing equipment HSPF	Btu/W-h

Ground Source (Closed Loop)	All Sizes	EER <sub>BASE</sub>	14.1 <sup>3</sup>	Pre-existing equipment EER	Btu/W-h
		HSPF <sub>BASE</sub>	10.91 <sup>3</sup>	Pre-existing equipment HSPF	Btu/W-h
All		HSPF <sub>BASE</sub>	3.142 For when baseline/pre-existing system is electric resistance heat		Btu/W-h
All		EFLH <sub>cool</sub>	755 <sup>4</sup>		hours
		EFLH <sub>heat</sub>	1329 <sup>4</sup>		hours

**Measure Life:**

The measure life is listed below by measure.

BC Measure ID	Measure Name	Program	Measure Life
E21C1a022	Ductless Mini Split Heat Pump	LBES Retrofit	12
E21C1d024	Ductless Mini Split Heat Pump	LBES Direct Install	12
E21C2a022	Ductless Mini Split Heat Pump	SBES Retrofit	12
E21C2d024	Ductless Mini Split Heat Pump	SBES Direct Install	12
E21C3a035	Ductless Mini Split Heat Pump	Muni Retrofit	12
E21C3d037	Ductless Mini Split Heat Pump	Muni Direct Install	12
E21C1b050	Water Source Heat Pump	LBES NEC	26 <sup>5</sup>
E21C2b050	Water Source Heat Pump	SBES NEC	26 <sup>5</sup>
E21C3b081	Water Source Heat Pump	Muni NEC	26 <sup>5</sup>
E21C1b035	Ground Source Heat Pump	LBES NEC	26 <sup>5</sup>
E21C2b035	Ground Source Heat Pump	SBES NEC	26 <sup>5</sup>
E21C3b056	Ground Source Heat Pump	Muni NEC	26 <sup>5</sup>

**Other Resource Impacts:**

There are no other resource impacts identified for this measure.

**Impact Factors for Calculating Adjusted Gross Savings:**

BC Measure ID	Measure Name	Program	ISR	RR <sub>E</sub>	RR <sub>NE</sub>	RR <sub>SP</sub>	RR <sub>WP</sub>	CF <sub>SP</sub>	CF <sub>WP</sub>
E21C1a022	Ductless Mini Split Heat Pump	LBES Retrofit	1.00	0.99	1.00	1.00	1.00	0.37	0.000.00
E21C1d024	Ductless Mini Split Heat Pump	LBES Direct Install	1.00	0.99	1.00	1.00	1.00	0.37	0.00
E21C2a022	Ductless Mini Split Heat Pump	SBES Retrofit	1.00	1.00	1.00	1.00	1.00	0.37	0.00
E21C2d024	Ductless Mini Split Heat Pump	SBES Direct Install	1.00	1.00	1.00	1.00	1.00	0.37	0.00
E21C3a035	Ductless Mini Split Heat Pump	Muni Retrofit	1.00	1.00	1.00	1.00	1.00	0.37	0.00
E21C3d037	Ductless Mini Split Heat Pump	Muni Direct Install	1.00	1.00	1.00	1.00	1.00	0.37	0.00
E21C1b050	Water Source Heat Pump	LBES NEC	1.00	0.99	1.00	1.00	1.00	0.37	0.37
E21C2b050	Water Source Heat Pump	SBES NEC	1.00	1.00	1.00	1.00	1.00	0.37	0.37
E21C3b081	Water Source Heat Pump	Muni NEC	1.00	1.00	1.00	1.00	1.00	0.37	0.37
E21C1b035	Ground Source Heat Pump	LBES NEC	1.00	0.99	1.00	1.00	1.00	0.37	0.37
E21C2b035	Ground Source Heat Pump	SBES NEC	1.00	1.00	1.00	1.00	1.00	0.37	0.37
E21C3b056	Ground Source Heat Pump	Muni NEC	1.00	1.00	1.00	1.00	1.00	0.37	0.37

In-Service Rates:

All installations have 100% in-service-rates since programs include verification of equipment installations.

### Realization Rates<sup>6</sup>:

All programs use 100% realization rate except for LBES (Retrofit, Direct Install, and NEC), which use a value of 99.90%.

### Coincidence Factors<sup>7</sup>:

For ductless mini split heat pumps, summer coincidence factor is 37% and a winter coincidence factor is 0%.

For cold-climate ductless mini split heat pumps, is 37% and a winter coincidence factor is 37%.

For water source heat pumps and ground source heat pumps, summer & winter coincidence factor is 37%.

### **Energy Load Shape:**

For ductless minisplit heat pumps, see Appendix 1 – “DMSHP”

For water source and ground source heat pumps, see Appendix 1 – “Central Heat Pump”

### **Endnotes:**

1: Conversion factor is based on internal ERS analysis of Mass Save and NEEP ccASHP product data.

2: Since IECC 2015 does not provide EER requirements for air-cooled heat pumps < 65 kBtu/h, assume the following conversion from SEER to EER:  $EER \approx SEER/1.1$ .

3: International Energy Conservation Code 2015, table C403.2.3(2) Minimum Efficiency Requirements: Electrically Operated Unitary and Applied Heat Pumps

4: KEMA( (2011). C&I Unitary AC Loadshape Project - [Final Report](#). KEMA\_2011\_CI Unitary HVAC Load Shape Project

5:[http://weblegacy.ashrae.org/publicdatabase/system\\_service\\_life.asp?c\\_region=2&state=NA&building\\_function=NA&c\\_size=0&c\\_age=0&c\\_height=0&c\\_class=0&c\\_location=0&selected\\_system\\_type=1&c\\_equipment\\_type=NA](http://weblegacy.ashrae.org/publicdatabase/system_service_life.asp?c_region=2&state=NA&building_function=NA&c_size=0&c_age=0&c_height=0&c_class=0&c_location=0&selected_system_type=1&c_equipment_type=NA). . See mean age of replaced water-to-air, geothermal heat pumps

6: New Hampshire Utilities Large Commercial & Industrial (C&I) Retrofit and New Equipment & Construction Impact Evaluation [report](#). Table 3

7. Coincidence Factors are from 2011 NEEP HVAC Loadshape Study Table 0-6 (ISO\_NE on Peak for NE-North)

## Appendix 1: Energy Load Shapes

The section includes a table or reference with the time-of-use pattern of a typical customer’s electrical energy consumption for each segment and end use. Because the value of avoided energy varies throughout the year, load shapes are used to allocate energy savings into specific time periods in order to better reflect its time-dependent value. Load shapes are defined as follows based on ISO-NE definitions:

- Summer On-Peak: 7 am to 11 pm, weekdays, during the months of June through September, except ISO-NE holidays;
- Summer Off-Peak: All other hours during the months of June through September (includes weekends and holidays);
- Winter On-Peak: 7 am to 11 pm, weekdays, during the months of October through May, except ISO-NE holidays; and
- Winter Off-Peak: All other hours during the months of October through May (includes weekends and holidays).

**Table A1.1. Residential Energy Load Shapes**

Load Shape Description	Total Energy			
	Summer		Winter	
	On Peak	Off Peak	On Peak	Off Peak
Non-Electric Measures	0.0%	0.0%	0.0%	0.0%
Clothes Washer	18.3%	15.4%	36.4%	29.9%
24-hour operation	15.2%	18.3%	30.5%	36.1%
Clothes Dryer - Electric	16.9%	14.2%	38.9%	30.0%
Clothes Dryer - Natural Gas	15.9%	16.4%	37.6%	30.1%
Hardwired Electric Heat	0.0%	0.0%	43.1%	56.9%
Lighting	19.0%	15.1%	35.1%	30.7%
Primary TV and Peripherals	15.4%	17.6%	32.2%	34.8%
Primary Desktop Computer	17.5%	17.3%	33.5%	31.7%
Primary Refrigerator	18.2%	20.9%	29.0%	31.9%
Secondary Refrigerator	19.9%	23.6%	26.3%	30.2%
Freezer	17.1%	20.7%	28.7%	33.6%
Dehumidifier	24.9%	29.7%	22.0%	23.3%
Pool Pump	54.5%	38.2%	4.9%	2.4%
Dishwasher	14.8%	16.3%	34.1%	34.8%
Water Heater - Electric	15.2%	11.9%	41.5%	31.4%
Water Heater - Heat Pump	14.9%	13.0%	39.1%	33.0%
Water Heater - Natural Gas/Fuel Oil	13.3%	11.6%	40.9%	34.2%
Central Air Conditioner/Heat Pump (Cooling)	47.3%	42.2%	6.6%	3.8%
Room or Window Air Conditioner	47.5%	47.4%	2.9%	2.2%
Mini-Split Air Conditioner/Heat Pump (Cooling)	43.4%	40.2%	7.4%	9.0%
Mini-Split Heat Pump (Heating)	0.0%	0.0%	42.9%	57.1%

Furnace Fan	0.0%	0.0%	44.6%	55.4%
Boiler Distribution	0.0%	0.0%	45.0%	55.0%
Weighted HVAC - All Homes	23.2%	21.7%	25.4%	29.7%
Weighted HVAC - Multi-family	25.2%	23.7%	23.2%	27.9%
Weighted HVAC - Multi-family Low Income	22.4%	21.6%	25.4%	30.6%
Weighted HVAC - Single Family	22.5%	20.8%	26.1%	30.5%
Weighted HVAC - Single Family Low Income	23.1%	21.7%	25.3%	29.9%
Central Heat Pump	10.1%	9.0%	35.1%	45.7%
DMSHP	8.0%	7.4%	36.4%	48.2%
Electric Resistance with AC	6.0%	5.0%	45.0%	44.0%

Source: Navigant (2018). RES1 Demand Impact Model Update

C&I energy loadshapes are shown in each relevant measure chapter, and except where noted are derived from site-level metering of project sites in MA. See DNV GL, 2018. P72 Prescriptive C&I Loadshapes of Savings.

**NHSAVES PROGRAMS  
2021 Statewide Goals  
Statewide & Company-Specific Programs**

Description	Program Budget <sup>(1)</sup>	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
Statewide Programs	\$ 85,660,206	137,949,636	1,691,209,524	16,766	17,560	114,463	2,383,758	455,857
Municipal Program	\$ 1,955,558	3,769,585	52,433,933	433	504	3,615	77,427	227
All Other Statewide Programs								
Sub-total	\$ 87,615,764	141,719,221	1,743,643,457	17,199	18,064	118,078	2,461,185	456,085
Company Specific Programs <sup>(2)</sup>	\$ 5,966,697	7,085,254	61,795,254	988	779	-	-	34,759
<b>Total Electric</b>	<b>\$ 93,582,461</b>	<b>148,804,474</b>	<b>1,805,438,711</b>	<b>18,186</b>	<b>18,843</b>	<b>118,078</b>	<b>2,461,185</b>	<b>490,844</b>
<b><u>Gas Utilities</u></b>								
Statewide Programs	\$ 11,181,314	39,968	699,876	10	6	176,645	2,682,193	14,211
Company Specific Programs <sup>(2)</sup>	\$ 857,174	-	-			21,391	21,391	72,100
<b>Total Gas</b>	<b>\$ 12,038,488</b>	<b>39,968</b>	<b>699,876</b>	<b>10</b>	<b>6</b>	<b>198,036</b>	<b>2,703,583</b>	<b>86,311</b>
<b>Grand Total</b>	<b>\$ 105,620,948</b>	<b>148,844,442</b>	<b>1,806,138,587</b>	<b>18,196</b>	<b>18,849</b>	<b>316,114</b>	<b>5,164,768</b>	<b>577,155</b>

**Notes:**  
(1) Program budgets shown in this report exclude the performance incentive (PI).  
(2) Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES PROGRAMS**  
**2021 Statewide Goals**  
**Statewide Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 18,555,949	2,631,229	36,575,964	489.3	364.8	40,139.3	866,990.6	1,974
NH Home Performance w/Energy Star	\$ 8,607,418	1,610,469	19,877,078	367.0	245.1	50,171.4	986,415.7	3,094
EnergyStar® Homes	\$ 3,370,729	1,614,972	38,239,860	416.7	20.2	17,574.3	435,099.8	797
EnergyStar® Products	\$ 11,931,356	22,405,241	141,057,761	4,441.8	3,420.8	6,257.9	91,834.4	442,076
Sub-total	\$ 42,465,452	28,261,911	235,750,662	5,714.9	4,050.9	114,142.9	2,380,340.5	447,941
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 24,938,645	65,122,196	876,554,611	6,136.0	8,203.3	107.4	1,074.2	1,811
Small Business Energy Solutions	\$ 18,256,109	44,565,529	578,904,251	4,914.8	5,305.4	212.3	2,343.4	6,106
Municipal Program	\$ 1,955,558	3,769,585	52,433,933	433.1	504.3	3,615.1	77,426.9	227
Sub-total	\$ 45,150,312	113,457,309	1,507,892,795	11,483.9	14,013.0	3,934.8	80,844.5	8,144
<b>Total Electric</b>	<b>\$ 87,615,764</b>	<b>141,719,221</b>	<b>1,743,643,457</b>	<b>17,198.8</b>	<b>18,063.9</b>	<b>118,077.7</b>	<b>2,461,185.0</b>	<b>456,085</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 2,066,275	-	-	-	-	9,549.9	207,192.9	453
NH Home Performance w/Energy Star	\$ 1,448,128	8,754	197,735	-	4.8	12,472.0	229,868.1	843
EnergyStar® Homes	\$ 1,346,744	-	-	-	-	7,214.2	178,569.4	198
EnergyStar® Products	\$ 1,463,811	21,210	342,510	8.0	(0.4)	17,492.6	296,615.4	11,216
Sub-total	\$ 6,324,958	29,964	540,245	8.0	4.4	46,728.7	912,245.7	12,709
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 2,685,689	-	-	-	-	95,777.8	1,195,080.6	291
Small Business Energy Solutions	\$ 2,170,666	10,004	159,631	2.0	1.8	34,138.7	574,866.5	1,211
Sub-total	\$ 4,856,355	10,004	159,631	2.0	1.8	129,916.5	1,769,947.1	1,502
<b>Total Gas</b>	<b>\$ 11,181,314</b>	<b>39,968</b>	<b>699,876</b>	<b>10.0</b>	<b>6.2</b>	<b>176,645.2</b>	<b>2,682,192.7</b>	<b>14,211</b>
<b>Grand Total</b>	<b>\$ 98,797,078</b>	<b>141,759,188</b>	<b>1,744,343,333</b>	<b>17,208.8</b>	<b>18,070.1</b>	<b>294,722.9</b>	<b>5,143,378</b>	<b>470,296</b>

**Notes:**

(1) Amounts shown above pertain only to the Statewide programs. The amounts pertaining to the Company-Specific programs are shown on Attachment B, page 3.

**NHSAVES PROGRAMS**  
**2021 Statewide Goals**  
**Company-Specific Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 327,410	2,545,254	2,545,254	549.5	354.4	-	-	32,956
Education	\$ 268,757	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 104,305	-	-	-	-	-	-	-
Residential Active Demand Response	\$ 139,875	-	-	-	-	-	-	1,655
Energy Optimization Pilot	\$ 459,306	-	-	-	-	-	-	-
Sub-total	\$ 1,299,652	2,545,254	2,545,254	549.5	354.4	-	-	34,611
<b>Commercial &amp; Industrial</b>								
Smart Start	\$ 38,475	-	-	-	-	-	-	-
C&I Customer Partnerships	\$ 21,772	-	-	-	-	-	-	-
C&I RFP Program	\$ 2,997,161	4,540,000	59,250,000	438.1	424.2	-	-	10
Education	\$ 367,002	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 182,901	-	-	-	-	-	-	-
C&I Active Demand Response	\$ 1,059,735	-	-	-	-	-	-	139
Sub-total	\$ 4,667,045	4,540,000	59,250,000	438.1	424.2	-	-	148
<b>Total Residential and C&amp;I</b>	<b>\$ 5,966,697</b>	<b>7,085,254</b>	<b>61,795,254</b>	<b>987.6</b>	<b>778.6</b>	<b>-</b>	<b>-</b>	<b>34,759</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 216,300	-	-	-	-	16,390.7	16,390.7	39,100
Education	\$ 86,974	-	-	-	-	-	-	-
Residential Financing	\$ 7,500	-	-	-	-	-	-	-
AIM Initiative	\$ 460,250	-	-	-	-	5,000.0	5,000.0	33,000
Sub-total	\$ 771,024	-	-	-	-	21,391	21,391	72,100
<b>Commercial &amp; Industrial</b>								
Education	\$ 86,150	-	-	-	-	-	-	-
Sub-total	\$ 86,150	-	-	-	-	-	-	-
<b>Total Residential and C&amp;I</b>	<b>\$ 857,174</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>21,391</b>	<b>21,391</b>	<b>72,100</b>
<b>Grand Total</b>	<b>\$ 6,823,871</b>	<b>7,085,254</b>	<b>61,795,254</b>	<b>987.6</b>	<b>778.6</b>	<b>21,390.7</b>	<b>21,391</b>	<b>106,859</b>

**Notes:**

- (1) Amounts shown above pertain only to the Company-Specific programs. The amounts pertaining to the Statewide programs are shown on Attachment B, page 2. Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.
- (2) Amounts shown are budgeted expenses related to the electric utilities' participation in ISO-NE's Forward Capacity Market.

**NHSAVES PROGRAMS  
2022 Statewide Goals  
Statewide & Company-Specific Programs**

Description	Program Budget <sup>(1)</sup>	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
Statewide Programs	\$ 104,096,713	156,918,183	2,043,062,576	16,717	19,152	130,106	2,716,348	265,026
Municipal Program	\$ 1,955,089	3,520,545	50,268,690	392	448	3,715	79,927	224
All Other Statewide Programs								
Sub-total	\$ 106,051,802	160,438,728	2,093,331,266	17,109	19,600	133,821	2,796,275	265,251
Company Specific Programs <sup>(2)</sup>	\$ 9,502,480	10,539,690	99,839,690	1,388	1,108	-	-	35,656
<b>Total Electric</b>	<b>\$ 115,554,283</b>	<b>170,978,418</b>	<b>2,193,170,956</b>	<b>18,496</b>	<b>20,708</b>	<b>133,821</b>	<b>2,796,275</b>	<b>300,907</b>
<b><u>Gas Utilities</u></b>								
Statewide Programs	\$ 13,008,239	48,768	784,337	14	9	204,454	3,136,697	16,234
Company Specific Programs <sup>(2)</sup>	\$ 698,133	-	-			49,203	49,203	72,100
<b>Total Gas</b>	<b>\$ 13,706,372</b>	<b>48,768</b>	<b>784,337</b>	<b>14</b>	<b>9</b>	<b>253,657</b>	<b>3,185,900</b>	<b>88,334</b>
<b>Grand Total</b>	<b>\$ 129,260,654</b>	<b>171,027,186</b>	<b>2,193,955,293</b>	<b>18,511</b>	<b>20,716</b>	<b>387,478</b>	<b>5,982,175</b>	<b>389,241</b>

**Notes:**  
(1) Program budgets shown in this report exclude the performance incentive (PI).  
(2) Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES PROGRAMS  
2022 Statewide Goals  
Statewide Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 23,025,028	3,336,262	45,155,878	614.7	458.1	52,245.0	1,128,294.9	2,531
NH Home Performance w/Energy Star	\$ 9,696,828	1,695,769	21,260,740	374.0	258.9	51,412.8	1,012,623.7	3,132
EnergyStar® Homes	\$ 3,605,389	1,753,735	41,507,492	448.6	20.4	18,578.6	459,951.9	764
EnergyStar® Products	\$ 10,230,869	14,574,410	133,362,831	2,627.6	2,226.1	7,635.5	112,309.1	250,791
Sub-total	\$ 46,558,114	21,360,177	241,286,940	4,064.9	2,963.5	129,871.9	2,713,179.5	257,218
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 34,018,730	83,591,154	1,124,260,353	7,470.3	10,463.7	123.9	1,239.4	1,957
Small Business Energy Solutions	\$ 23,519,869	51,966,852	677,515,283	5,182.1	5,724.7	110.5	1,929.1	5,851
Municipal Program	\$ 1,955,089	3,520,545	50,268,690	391.5	448.1	3,715.1	79,926.9	224
Sub-total	\$ 59,493,688	139,078,551	1,852,044,326	13,043.9	16,636.5	3,949.6	83,095.4	8,032
<b>Total Electric</b>	<b>\$ 106,051,802</b>	<b>160,438,728</b>	<b>2,093,331,266</b>	<b>17,108.7</b>	<b>19,600.0</b>	<b>133,821.5</b>	<b>2,796,274.9</b>	<b>265,251</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 2,356,050	-	-	-	-	10,606.1	230,582.6	490
NH Home Performance w/Energy Star	\$ 1,600,824	13,897	221,875	3.2	7.3	13,584.3	249,786.8	887
EnergyStar® Homes	\$ 1,592,055	-	-	-	-	9,313.1	230,377.3	256
EnergyStar® Products	\$ 1,634,490	24,550	397,570	9.1	(0.5)	19,790.7	334,789.6	12,930
Sub-total	\$ 7,183,419	38,447	619,445	12.3	6.8	53,294.2	1,045,536.3	14,562
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 3,334,466	-	-	-	-	112,737.7	1,443,529.9	385
Small Business Energy Solutions	\$ 2,490,353	10,321	164,892	2.1	1.8	38,421.7	647,630.8	1,287
Sub-total	\$ 5,824,819	10,321	164,892	2.1	1.8	151,159.5	2,091,160.7	1,672
<b>Total Gas</b>	<b>\$ 13,008,239</b>	<b>48,768</b>	<b>784,337</b>	<b>14.4</b>	<b>8.6</b>	<b>204,453.7</b>	<b>3,136,697.1</b>	<b>16,234</b>
<b>Grand Total</b>	<b>\$ 119,060,041</b>	<b>160,487,496</b>	<b>2,094,115,603</b>	<b>17,123.2</b>	<b>19,608.6</b>	<b>338,275.1</b>	<b>5,932,972</b>	<b>281,485</b>

**Notes:**

(1) Amounts shown above pertain only to the Statewide programs. The amounts pertaining to the Company-Specific programs are shown on Attachment B, page 3.

**NHSAVES PROGRAMS**  
**2022 Statewide Goals**  
**Company-Specific Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 316,070	3,239,690	3,239,690	699.4	451.1	-	-	32,956
Education	\$ 341,818	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 151,903	-	-	-	-	-	-	-
Residential Active Demand Response	\$ 199,665	-	-	-	-	-	-	2,483
Energy Optimization Pilot	\$ 549,710	-	-	-	-	-	-	-
Sub-total	\$ 1,559,167	3,239,690	3,239,690	699.4	451.1	-	-	35,439
<b>Commercial &amp; Industrial</b>								
Smart Start	\$ 38,018	-	-	-	-	-	-	-
C&I Customer Partnerships	\$ 39,160	-	-	-	-	-	-	-
C&I RFP Program	\$ 5,611,934	7,300,000	96,600,000	688.3	656.5	-	-	16
Education	\$ 475,678	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 254,291	-	-	-	-	-	-	-
C&I Active Demand Response	\$ 1,524,233	-	-	-	-	-	-	202
Sub-total	\$ 7,943,313	7,300,000	96,600,000	688.3	656.5	-	-	218
<b>Total Residential and C&amp;I</b>	<b>\$ 9,502,480</b>	<b>10,539,690</b>	<b>99,839,690</b>	<b>1,387.7</b>	<b>1,107.6</b>	<b>-</b>	<b>-</b>	<b>35,656</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 217,250	-	-	-	-	21,502.9	21,502.9	39,100
Education	\$ 95,044	-	-	-	-	-	-	-
Residential Financing	\$ 8,300	-	-	-	-	-	-	-
AIM Initiative	\$ 280,250	-	-	-	-	27,700.0	27,700.0	33,000
Sub-total	\$ 600,844	-	-	-	-	49,203	49,203	72,100
<b>Commercial &amp; Industrial</b>								
Education	\$ 97,289	-	-	-	-	-	-	-
Sub-total	\$ 97,289	-	-	-	-	-	-	-
<b>Total Residential and C&amp;I</b>	<b>\$ 698,133</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>49,203</b>	<b>49,203</b>	<b>72,100</b>
<b>Grand Total</b>	<b>\$ 10,200,613</b>	<b>10,539,690</b>	<b>99,839,690</b>	<b>1,387.7</b>	<b>1,107.6</b>	<b>49,202.9</b>	<b>49,203</b>	<b>107,756</b>

**Notes:**

- (1) Amounts shown above pertain only to the Company-Specific programs. The amounts pertaining to the Statewide programs are shown on Attachment B, page 2. Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.
- (2) Amounts shown are budgeted expenses related to the electric utilities' participation in ISO-NE's Forward Capacity Market.

**NHSAVES PROGRAMS  
 2023 Statewide Goals  
 Statewide & Company-Specific Programs**

Description	Program Budget <sup>(1)</sup>	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
Statewide Programs	\$ 125,626,820	186,550,546	2,487,797,824	18,287	22,515	143,416	2,992,158	116,462
Municipal Program	\$ 1,961,055	3,409,955	48,703,610	381	451	3,715	79,927	220
All Other Statewide Programs								
Sub-total	\$ 127,587,875	189,960,501	2,536,501,434	18,669	22,966	147,131	3,072,085	116,683
Company Specific Programs <sup>(2)</sup>	\$ 14,103,954	15,590,000	146,330,000	1,772	1,434	-	-	36,968
<b>Total Electric</b>	<b>\$ 141,691,829</b>	<b>205,550,501</b>	<b>2,682,831,434</b>	<b>20,440</b>	<b>24,400</b>	<b>147,131</b>	<b>3,072,085</b>	<b>153,651</b>
<b><u>Gas Utilities</u></b>								
Statewide Programs	\$ 15,427,035	47,667	840,435	12	7	239,278	3,667,138	16,842
Company Specific Programs <sup>(2)</sup>	\$ 710,370	-	-			62,610	62,610	72,100
<b>Total Gas</b>	<b>\$ 16,137,405</b>	<b>47,667</b>	<b>840,435</b>	<b>12</b>	<b>7</b>	<b>301,888</b>	<b>3,729,748</b>	<b>88,942</b>
<b>Grand Total</b>	<b>\$ 157,829,233</b>	<b>205,598,168</b>	<b>2,683,671,869</b>	<b>20,452</b>	<b>24,407</b>	<b>449,020</b>	<b>6,801,833</b>	<b>242,592</b>

**Notes:**  
 (1) Program budgets shown in this report exclude the performance incentive (PI).  
 (2) Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES PROGRAMS**  
**2023 Statewide Goals**  
**Statewide Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 28,273,056	4,030,680	54,156,758	749.1	548.8	61,868.6	1,333,459.0	2,982
NH Home Performance w/Energy Star	\$ 10,758,305	1,786,000	22,657,112	383.5	274.0	52,608.7	1,036,392.1	3,171
EnergyStar® Homes	\$ 3,878,304	1,944,116	45,841,807	492.6	32.8	19,592.7	485,088.2	837
EnergyStar® Products	\$ 9,465,526	11,770,086	141,898,573	1,944.6	1,853.5	9,014.5	132,802.9	102,196
Sub-total	\$ 52,375,192	19,530,883	264,554,250	3,569.8	2,709.0	143,084.5	2,987,742.1	109,186
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 46,779,278	109,036,322	1,461,425,507	9,263.1	13,572.2	165.3	1,652.6	2,091
Small Business Energy Solutions	\$ 26,472,350	57,983,341	761,818,067	5,454.2	6,233.8	166.4	2,763.3	5,186
Municipal Program	\$ 1,961,055	3,409,955	48,703,610	381.4	451.3	3,715.1	79,926.9	220
Sub-total	\$ 75,212,684	170,429,618	2,271,947,183	15,098.7	20,257.3	4,046.7	84,342.7	7,497
<b>Total Electric</b>	<b>\$ 127,587,875</b>	<b>189,960,501</b>	<b>2,536,501,434</b>	<b>18,668.5</b>	<b>22,966.3</b>	<b>147,131.3</b>	<b>3,072,084.9</b>	<b>116,683</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 2,713,815	1,223	22,015	0.4	-	12,028.0	262,397.7	540
NH Home Performance w/Energy Star	\$ 1,791,511	10,512	237,036	-	5.8	15,012.6	276,563.6	947
EnergyStar® Homes	\$ 1,823,272	-	-	-	-	13,419.4	320,049.9	306
EnergyStar® Products	\$ 1,808,383	26,015	422,045	9.6	(0.5)	21,456.3	362,487.7	13,231
Sub-total	\$ 8,136,980	37,750	681,096	9.9	5.3	61,916.4	1,221,498.9	15,024
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 4,140,552	-	-	-	-	133,548.4	1,707,340.0	435
Small Business Energy Solutions	\$ 3,149,503	9,917	159,339	2.0	1.7	43,813.7	738,299.5	1,383
Sub-total	\$ 7,290,055	9,917	159,339	2.0	1.7	177,362.1	2,445,639.5	1,817
<b>Total Gas</b>	<b>\$ 15,427,035</b>	<b>47,667</b>	<b>840,435</b>	<b>12.0</b>	<b>7.0</b>	<b>239,278.5</b>	<b>3,667,138.5</b>	<b>16,842</b>
<b>Grand Total</b>	<b>\$ 143,014,910</b>	<b>190,008,168</b>	<b>2,537,341,869</b>	<b>18,680.5</b>	<b>22,973.3</b>	<b>386,409.8</b>	<b>6,739,223</b>	<b>133,525</b>

**Notes:**

(1) Amounts shown above pertain only to the Statewide programs. The amounts pertaining to the Company-Specific programs are shown on Attachment B, page 3.

**NHSAVES PROGRAMS**  
**2023 Statewide Goals**  
**Company-Specific Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 319,677	5,030,000	5,030,000	790.7	510.1	-	-	32,956
Education	\$ 398,961	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 200,574	-	-	-	-	-	-	-
Residential Active Demand Response	\$ 286,832	-	-	-	-	-	-	3,693
Energy Optimization Pilot	\$ 483,244	-	-	-	-	-	-	-
Sub-total	\$ 1,689,288	5,030,000	5,030,000	790.7	510.1	-	-	36,649
<b>Commercial &amp; Industrial</b>								
Smart Start	\$ 37,214	-	-	-	-	-	-	-
C&I Customer Partnerships	\$ 59,653	-	-	-	-	-	-	-
C&I RFP Program	\$ 9,172,068	10,560,000	141,300,000	981.0	923.8	-	-	23
Education	\$ 583,661	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 370,543	-	-	-	-	-	-	-
C&I Active Demand Response	\$ 2,191,526	-	-	-	-	-	-	296
Sub-total	\$ 12,414,666	10,560,000	141,300,000	981.0	923.8	-	-	319
<b>Total Residential and C&amp;I</b>	<b>\$ 14,103,954</b>	<b>15,590,000</b>	<b>146,330,000</b>	<b>1,771.7</b>	<b>1,433.9</b>	<b>-</b>	<b>-</b>	<b>36,968</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 218,300	-	-	-	-	34,910.0	34,910.0	39,100
Education	\$ 95,540	-	-	-	-	-	-	-
Residential Financing	\$ 8,500	-	-	-	-	-	-	-
AIM Initiative	\$ 280,250	-	-	-	-	27,700.0	27,700.0	33,000
Sub-total	\$ 602,590	-	-	-	-	62,610	62,610	72,100
<b>Commercial &amp; Industrial</b>								
Education	\$ 107,780	-	-	-	-	-	-	-
Sub-total	\$ 107,780	-	-	-	-	-	-	-
<b>Total Residential and C&amp;I</b>	<b>\$ 710,370</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>62,610</b>	<b>62,610</b>	<b>72,100</b>
<b>Grand Total</b>	<b>\$ 14,814,324</b>	<b>15,590,000</b>	<b>146,330,000</b>	<b>1,771.7</b>	<b>1,433.9</b>	<b>62,610.0</b>	<b>62,610</b>	<b>109,068</b>

**Notes:**

- (1) Amounts shown above pertain only to the Company-Specific programs. The amounts pertaining to the Statewide programs are shown on Attachment B, page 2. Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.
- (2) Amounts shown are budgeted expenses related to the electric utilities' participation in ISO-NE's Forward Capacity Market.

**NHSAVES PROGRAMS**  
**2021-2023 Statewide Goals**  
**Statewide & Company-Specific Programs**

Description	Program Budget <sup>(1)</sup>	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
Statewide Programs	\$ 315,383,740	481,418,364	6,222,069,924	51,770	59,227	387,985	8,092,264	837,346
Municipal Program	\$ 5,871,702	10,700,086	151,406,233	1,206	1,404	11,045	237,281	672
All Other Statewide Programs								
Sub-total	\$ 321,255,442	492,118,450	6,373,476,157	52,976	60,630	399,030	8,329,545	838,018
Company Specific Programs <sup>(2)</sup>	\$ 29,573,131	33,214,944	307,964,944	4,147	3,320	-	-	61,984
<b>Total Electric</b>	<b>\$ 350,828,573</b>	<b>525,333,394</b>	<b>6,681,441,101</b>	<b>57,123</b>	<b>63,950</b>	<b>399,030</b>	<b>8,329,545</b>	<b>900,002</b>
<b><u>Gas Utilities</u></b>								
Statewide Programs	\$ 39,616,587	136,402	2,324,648	36	22	620,377	9,486,028	47,287
Company Specific Programs <sup>(2)</sup>	\$ 2,265,677	-	-			133,204	133,204	198,100
<b>Total Gas</b>	<b>\$ 41,882,264</b>	<b>136,402</b>	<b>2,324,648</b>	<b>36</b>	<b>22</b>	<b>753,581</b>	<b>9,619,232</b>	<b>245,387</b>
<b>Grand Total</b>	<b>\$ 392,710,836</b>	<b>525,469,796</b>	<b>6,683,765,749</b>	<b>57,159</b>	<b>63,972</b>	<b>1,152,611</b>	<b>17,948,777</b>	<b>1,145,389</b>

**Notes:**  
 (1) Program budgets shown in this report exclude the performance incentive (PI).  
 (2) Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES PROGRAMS**  
**2021-2023 Statewide Goals**  
**Statewide Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 69,854,034	9,998,172	135,888,600	1,853.1	1,371.7	154,252.9	3,328,744.5	7,487
NH Home Performance w/Energy Star	\$ 29,062,551	5,092,237	63,794,930	1,124.6	778.0	154,193.0	3,035,431.4	9,397
EnergyStar® Homes	\$ 10,854,423	5,312,824	125,589,158	1,357.8	73.3	55,745.6	1,380,139.9	2,398
EnergyStar® Products	\$ 31,627,751	48,749,738	416,319,165	9,014.1	7,500.4	22,907.9	336,946.4	795,062
Sub-total	\$ 141,398,758	69,152,971	741,591,853	13,349.6	9,723.5	387,099.3	8,081,262.1	814,345
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 105,736,654	257,749,671	3,462,240,471	22,869.4	32,239.1	396.6	3,966.2	5,859
Small Business Energy Solutions	\$ 68,248,328	154,515,722	2,018,237,600	15,551.1	17,263.9	489.2	7,035.8	17,143
Municipal Program	\$ 5,871,702	10,700,086	151,406,233	1,206.0	1,403.7	11,045.3	237,280.7	672
Sub-total	\$ 179,856,684	422,965,479	5,631,884,304	39,626.5	50,906.7	11,931.1	248,282.6	23,673
<b>Total Electric</b>	<b>\$ 321,255,442</b>	<b>492,118,450</b>	<b>6,373,476,157</b>	<b>52,976.1</b>	<b>60,630.2</b>	<b>399,030.4</b>	<b>8,329,544.7</b>	<b>838,018</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Assistance	\$ 7,136,139	1,223	22,015	0.4	-	32,184.0	700,173.1	1,483
NH Home Performance w/Energy Star	\$ 4,840,463	33,163	656,646	3.2	17.9	41,068.9	756,218.5	2,676
EnergyStar® Homes	\$ 4,762,071	-	-	-	-	29,946.7	728,996.6	760
EnergyStar® Products	\$ 4,906,684	71,775	1,162,125	26.7	(1.4)	58,739.6	993,892.7	37,377
Sub-total	\$ 21,645,358	106,161	1,840,786	30.3	16.5	161,939.2	3,179,280.9	42,296
<b>Commercial &amp; Industrial</b>								
Large Business Energy Solutions	\$ 10,160,707	-	-	-	-	342,064.0	4,345,950.5	1,110
Small Business Energy Solutions	\$ 7,810,522	30,241	483,862	6.1	5.3	116,374.1	1,960,796.8	3,881
Sub-total	\$ 17,971,229	30,241	483,862	6.1	5.3	458,438.1	6,306,747.3	4,991
<b>Total Gas</b>	<b>\$ 39,616,587</b>	<b>136,402</b>	<b>2,324,648</b>	<b>36.4</b>	<b>21.8</b>	<b>620,377.3</b>	<b>9,486,028.3</b>	<b>47,287</b>
<b>Grand Total</b>	<b>\$ 360,872,029</b>	<b>492,254,852</b>	<b>6,375,800,805</b>	<b>53,012.5</b>	<b>60,652.0</b>	<b>1,019,407.8</b>	<b>17,815,573</b>	<b>885,305</b>

**Notes:**

(1) Amounts shown above pertain only to the Statewide programs. The amounts pertaining to the Company-Specific programs are shown on Attachment B, page 3.

**NHSAVES PROGRAMS**  
**2021-2023 Statewide Goals**  
**Company-Specific Programs <sup>(1)</sup>**

Description	Program Budget	kWh Savings		kW Savings		MMBtu Savings		Customers Count
		Annual	Lifetime	Winter kW	Summer kW	Annual	Lifetime	
<b><u>Electric Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 963,157	10,814,944	10,814,944	2,039.6	1,315.6	-	-	53,468
Education	\$ 1,009,536	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 456,782	-	-	-	-	-	-	-
Residential Active Demand Response	\$ 626,372	-	-	-	-	-	-	7,830
Energy Optimization Pilot	\$ 1,492,259	-	-	-	-	-	-	-
Sub-total	\$ 4,548,107	10,814,944	10,814,944	2,039.6	1,315.6	-	-	61,298
<b>Commercial &amp; Industrial</b>								
Smart Start	\$ 113,707	-	-	-	-	-	-	-
C&I Customer Partnerships	\$ 120,584	-	-	-	-	-	-	-
C&I RFP Program	\$ 17,781,164	22,400,000	297,150,000	2,107.4	2,004.5	-	-	49
Education	\$ 1,426,340	-	-	-	-	-	-	-
Forward Capacity Market Expenses <sup>(2)</sup>	\$ 807,735	-	-	-	-	-	-	-
C&I Active Demand Response	\$ 4,775,494	-	-	-	-	-	-	636
Sub-total	\$ 25,025,024	22,400,000	297,150,000	2,107.4	2,004.5	-	-	686
<b>Total Residential and C&amp;I</b>	<b>\$ 29,573,131</b>	<b>33,214,944</b>	<b>307,964,944</b>	<b>4,147.0</b>	<b>3,320.1</b>	<b>-</b>	<b>-</b>	<b>61,984</b>
<b><u>Gas Utilities</u></b>								
<b>Residential</b>								
Home Energy Reports	\$ 651,850	-	-	-	-	72,803.6	72,803.6	99,100
Education	\$ 277,558	-	-	-	-	-	-	-
Residential Financing	\$ 24,300	-	-	-	-	-	-	-
AIM Initiative	\$ 1,020,750	-	-	-	-	60,400.0	60,400.0	99,000
Sub-total	\$ 1,974,458	-	-	-	-	133,204	133,204	198,100
<b>Commercial &amp; Industrial</b>								
Education	\$ 291,219	-	-	-	-	-	-	-
Sub-total	\$ 291,219	-	-	-	-	-	-	-
<b>Total Residential and C&amp;I</b>	<b>\$ 2,265,677</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>133,204</b>	<b>133,204</b>	<b>198,100</b>
<b>Grand Total</b>	<b>\$ 31,838,808</b>	<b>33,214,944</b>	<b>307,964,944</b>	<b>4,147.0</b>	<b>3,320.1</b>	<b>133,203.6</b>	<b>133,204</b>	<b>260,084</b>

**Notes:**

- (1) Amounts shown above pertain only to the Company-Specific programs. The amounts pertaining to the Statewide programs are shown on Attachment B, page 2. Company-specific includes company-specific programs, education, forward capacity market administration and loan program administration.
- (2) Amounts shown are budgeted expenses related to the electric utilities' participation in ISO-NE's Forward Capacity Market.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Home Energy Assistance	Internal Admin	\$ 39,810	\$ 57,108	\$ 179,500	\$ 108,000	\$ 384,418	\$ 42,660	\$ 41,841	\$ 84,501	\$ 468,919
	External Admin	\$ 2,844	\$ 35,232	\$ 15,181	\$ 70,967	\$ 124,223	\$ 3,047	\$ 7,500	\$ 10,547	\$ 134,771
	Rebate/Services	\$ 1,177,231	\$ 1,053,294	\$ 12,111,611	\$ 1,182,247	\$ 15,524,384	\$ 1,261,516	\$ 430,409	\$ 1,691,925	\$ 17,216,309
	Implementation Services	\$ 78,198	\$ 169,848	\$ 619,960	\$ 171,262	\$ 1,039,267	\$ 83,796	\$ 30,955	\$ 114,751	\$ 1,154,018
	Marketing	\$ 52,606	\$ 32,086	\$ 465,157	\$ 35,000	\$ 584,848	\$ 56,372	\$ 12,000	\$ 68,372	\$ 653,220
	EM&V	\$ 71,089	\$ 53,477	\$ 704,243	\$ 70,000	\$ 898,809	\$ 76,179	\$ 20,000	\$ 96,179	\$ 994,988
	Total	\$ 1,421,776	\$ 1,401,044	\$ 14,095,653	\$ 1,637,476	\$ 18,555,949	\$ 1,523,570	\$ 542,705	\$ 2,066,275	\$ 20,622,224
HP w/EnergyStar®	Internal Admin	\$ 12,802	\$ 53,108	\$ 82,359	\$ 60,000	\$ 208,269	\$ 33,762	\$ 25,000	\$ 58,762	\$ 267,032
	External Admin	\$ 914	\$ 15,232	\$ 6,966	\$ 1,750	\$ 24,862	\$ 2,412	\$ 2,500	\$ 4,912	\$ 29,774
	Rebate/Services	\$ 378,579	\$ 854,809	\$ 5,607,076	\$ 313,685	\$ 7,154,150	\$ 998,401	\$ 189,830	\$ 1,188,231	\$ 8,342,380
	Implementation Services	\$ 25,147	\$ 109,185	\$ 284,453	\$ 100,000	\$ 518,786	\$ 66,319	\$ 9,000	\$ 75,319	\$ 594,104
	Marketing	\$ 16,917	\$ 33,657	\$ 213,435	\$ 15,000	\$ 279,009	\$ 44,615	\$ 6,000	\$ 50,615	\$ 329,624
	EM&V	\$ 22,861	\$ 56,095	\$ 323,386	\$ 20,000	\$ 422,342	\$ 60,290	\$ 10,000	\$ 70,290	\$ 492,632
	Total	\$ 457,221	\$ 1,122,087	\$ 6,517,675	\$ 510,435	\$ 8,607,418	\$ 1,205,798	\$ 242,330	\$ 1,448,128	\$ 10,055,546
EnergyStar® Homes	Internal Admin	\$ 7,570	\$ 45,535	\$ 25,437	\$ 35,000	\$ 113,542	\$ 29,101	\$ 20,000	\$ 49,101	\$ 162,643
	External Admin	\$ 541	\$ 14,609	\$ 2,151	\$ 5,500	\$ 22,801	\$ 2,079	\$ 3,500	\$ 5,579	\$ 28,380
	Rebate/Services	\$ 223,853	\$ 458,387	\$ 1,716,354	\$ 290,155	\$ 2,688,749	\$ 860,545	\$ 251,938	\$ 1,112,483	\$ 3,801,232
	Implementation Services	\$ 14,869	\$ 98,288	\$ 87,855	\$ 50,000	\$ 251,013	\$ 57,162	\$ 11,000	\$ 68,162	\$ 319,175
	Marketing	\$ 10,003	\$ 19,989	\$ 65,921	\$ 12,000	\$ 107,913	\$ 38,454	\$ 6,000	\$ 44,454	\$ 152,367
	EM&V	\$ 13,518	\$ 33,315	\$ 99,880	\$ 40,000	\$ 186,712	\$ 51,965	\$ 15,000	\$ 66,965	\$ 253,678
	Total	\$ 270,354	\$ 670,122	\$ 1,997,598	\$ 432,655	\$ 3,370,729	\$ 1,039,306	\$ 307,438	\$ 1,346,744	\$ 4,717,473
Energy Star® Products	Internal Admin	\$ 26,547	\$ 92,133	\$ 100,413	\$ 58,000	\$ 277,093	\$ 27,322	\$ 25,000	\$ 52,322	\$ 329,415
	External Admin	\$ 1,896	\$ 24,464	\$ 8,492	\$ 2,000	\$ 36,853	\$ 1,952	\$ 1,500	\$ 3,452	\$ 40,304
	Rebate/Services	\$ 785,027	\$ 1,096,814	\$ 6,775,281	\$ 1,286,964	\$ 9,944,087	\$ 807,961	\$ 416,513	\$ 1,224,474	\$ 11,168,561
	Implementation Services	\$ 52,146	\$ 164,068	\$ 346,808	\$ 61,000	\$ 624,021	\$ 53,669	\$ 10,000	\$ 63,669	\$ 687,690
	Marketing	\$ 35,080	\$ 44,907	\$ 343,412	\$ 50,000	\$ 473,399	\$ 36,105	\$ 15,000	\$ 51,105	\$ 524,504
	EM&V	\$ 47,405	\$ 74,846	\$ 398,653	\$ 55,000	\$ 575,904	\$ 48,790	\$ 20,000	\$ 68,790	\$ 644,694
	Total	\$ 948,100	\$ 1,497,232	\$ 7,973,060	\$ 1,512,964	\$ 11,931,356	\$ 975,798	\$ 488,013	\$ 1,463,811	\$ 13,395,167

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs (Continued)**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Other*	Internal Admin	\$ 7,052	\$ 8,129	\$ 8,542	\$ 13,000	\$ 36,724	\$ 19,752	\$ 3,500	\$ 23,252	\$ 59,976
	External Admin	\$ 428	\$ -	\$ 722	\$ 4,500	\$ 5,650	\$ 1,411	\$ 3,000	\$ 4,411	\$ 10,061
	Rebate/Services	\$ 177,214	\$ 25,000	\$ 576,367	\$ 256,183	\$ 1,034,764	\$ 590,995	\$ 42,300	\$ 633,295	\$ 1,668,059
	Implementation Services	\$ 13,853	\$ 11,586	\$ 29,503	\$ 43,000	\$ 97,941	\$ 38,798	\$ 5,830	\$ 44,628	\$ 142,569
	Marketing	\$ 7,919	\$ 645	\$ 25,239	\$ 2,750	\$ 36,553	\$ 19,197	\$ 8,970	\$ 28,167	\$ 64,720
	EM&V	\$ 45,401	\$ 7,073	\$ 15,346	\$ 20,200	\$ 88,020	\$ 35,271	\$ 2,000	\$ 37,271	\$ 125,291
	Total	\$ 251,867	\$ 52,434	\$ 655,718	\$ 339,633	\$ 1,299,652	\$ 705,424	\$ 65,600	\$ 771,024	\$ 2,070,676
Total Residential	Internal Admin	\$ 93,781	\$ 256,012	\$ 396,252	\$ 274,000	\$ 1,020,045	\$ 152,597	\$ 115,341	\$ 267,938	\$ 1,287,983
	External Admin	\$ 6,623	\$ 89,537	\$ 33,513	\$ 84,717	\$ 214,390	\$ 10,900	\$ 18,000	\$ 28,900	\$ 243,289
	Rebate/Services	\$ 2,741,904	\$ 3,488,305	\$ 26,786,690	\$ 3,329,233	\$ 36,346,133	\$ 4,519,418	\$ 1,330,991	\$ 5,850,408	\$ 42,196,541
	Implementation Services	\$ 184,213	\$ 552,974	\$ 1,368,578	\$ 425,262	\$ 2,531,027	\$ 299,744	\$ 66,785	\$ 366,529	\$ 2,897,556
	Marketing	\$ 122,525	\$ 131,285	\$ 1,113,163	\$ 114,750	\$ 1,481,722	\$ 194,742	\$ 47,970	\$ 242,712	\$ 1,724,435
	EM&V	\$ 200,273	\$ 224,806	\$ 1,541,508	\$ 205,200	\$ 2,171,787	\$ 272,495	\$ 67,000	\$ 339,495	\$ 2,511,282
	Total	\$ 3,349,318	\$ 4,742,919	\$ 31,239,704	\$ 4,433,162	\$ 43,765,104	\$ 5,449,896	\$ 1,646,086	\$ 7,095,982	\$ 50,861,087
Total %	Internal Admin	2.8%	5.4%	1.3%	6.2%	2.3%	2.8%	7.0%	3.8%	2.5%
	External Admin	0.2%	1.9%	0.1%	1.9%	0.5%	0.2%	1.1%	0.4%	0.5%
	Rebate/Services	81.9%	73.5%	85.7%	75.1%	83.0%	82.9%	80.9%	82.4%	83.0%
	Implementation Services	5.5%	11.7%	4.4%	9.6%	5.8%	5.5%	4.1%	5.2%	5.7%
	Marketing	3.7%	2.8%	3.6%	2.6%	3.4%	3.6%	2.9%	3.4%	3.4%
	EM&V	6.0%	4.7%	4.9%	4.6%	5.0%	5.0%	4.1%	4.8%	4.9%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Programs**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Large Business Energy Solutions	Internal Admin	\$ 47,852	\$ 69,056	\$ 213,590	\$ 95,000	\$ 425,498	\$ 50,919	\$ 85,000	\$ 135,919	\$ 561,417
	External Admin	\$ 3,418	\$ 12,185	\$ 18,064	\$ 10,000	\$ 43,667	\$ 3,637	\$ -	\$ 3,637	\$ 47,304
	Rebate/Services	\$ 1,415,040	\$ 654,376	\$ 17,406,011	\$ 1,937,665	\$ 21,413,091	\$ 1,505,751	\$ 682,168	\$ 2,187,920	\$ 23,601,011
	Implementation Services	\$ 93,994	\$ 163,498	\$ 680,149	\$ 120,000	\$ 1,057,642	\$ 100,020	\$ 43,981	\$ 144,000	\$ 1,201,642
	Marketing	\$ 63,232	\$ 39,072	\$ 659,202	\$ 25,000	\$ 786,506	\$ 67,286	\$ 15,000	\$ 82,286	\$ 868,792
	EM&V	\$ 85,449	\$ 58,001	\$ 998,790	\$ 70,000	\$ 1,212,240	\$ 90,927	\$ 41,000	\$ 131,927	\$ 1,344,167
	Total	\$ 1,708,986	\$ 996,188	\$ 19,975,807	\$ 2,257,665	\$ 24,938,645	\$ 1,818,540	\$ 867,149	\$ 2,685,689	\$ 27,624,334
Small Business Energy Solutions	Internal Admin	\$ 40,294	\$ 74,368	\$ 147,782	\$ 95,000	\$ 357,443	\$ 45,727	\$ 46,039	\$ 91,766	\$ 449,210
	External Admin	\$ 2,878	\$ 12,185	\$ 12,499	\$ 15,000	\$ 42,562	\$ 3,266	\$ -	\$ 3,266	\$ 45,828
	Rebate/Services	\$ 1,191,537	\$ 702,498	\$ 12,043,100	\$ 1,664,838	\$ 15,601,973	\$ 1,352,223	\$ 428,508	\$ 1,780,731	\$ 17,382,704
	Implementation Services	\$ 79,148	\$ 170,967	\$ 470,591	\$ 95,000	\$ 815,706	\$ 89,822	\$ 25,000	\$ 114,822	\$ 930,528
	Marketing	\$ 53,245	\$ 31,153	\$ 456,097	\$ 25,000	\$ 565,495	\$ 60,425	\$ 12,000	\$ 72,425	\$ 637,920
	EM&V	\$ 71,953	\$ 44,921	\$ 691,056	\$ 65,000	\$ 872,930	\$ 81,656	\$ 26,000	\$ 107,656	\$ 980,586
	Total	\$ 1,439,054	\$ 1,036,092	\$ 13,821,124	\$ 1,959,838	\$ 18,256,109	\$ 1,633,120	\$ 537,546	\$ 2,170,666	\$ 20,426,775
Municipal	Internal Admin	\$ 4,972	\$ 15,936	\$ 15,076	\$ 10,000	\$ 45,984	\$ -	\$ -	\$ -	\$ 45,984
	External Admin	\$ 355	\$ 6,093	\$ 1,275	\$ -	\$ 7,723	\$ -	\$ -	\$ -	\$ 7,723
	Rebate/Services	\$ 147,040	\$ 92,819	\$ 1,228,571	\$ 160,000	\$ 1,628,430	\$ -	\$ -	\$ -	\$ 1,628,430
	Implementation Services	\$ 9,767	\$ 22,407	\$ 48,007	\$ 22,200	\$ 102,381	\$ -	\$ -	\$ -	\$ 102,381
	Marketing	\$ 6,571	\$ 4,479	\$ 46,529	\$ 5,000	\$ 62,578	\$ -	\$ -	\$ -	\$ 62,578
	EM&V	\$ 8,879	\$ 21,584	\$ 70,498	\$ 7,500	\$ 108,461	\$ -	\$ -	\$ -	\$ 108,461
	Total	\$ 177,584	\$ 163,318	\$ 1,409,956	\$ 204,700	\$ 1,955,558	\$ -	\$ -	\$ -	\$ 1,955,558
Other*	Internal Admin	\$ 9,933	\$ 8,129	\$ 43,145	\$ 10,500	\$ 71,707	\$ 1,697	\$ -	\$ 1,697	\$ 73,404
	External Admin	\$ 609	\$ -	\$ 3,649	\$ 9,000	\$ 13,258	\$ 121	\$ -	\$ 121	\$ 13,379
	Rebate/Services	\$ 229,660	\$ 25,000	\$ 3,515,959	\$ 101,250	\$ 3,871,870	\$ 50,177	\$ 20,000	\$ 70,177	\$ 3,942,046
	Implementation Services	\$ 19,512	\$ 16,586	\$ 135,443	\$ 52,500	\$ 224,041	\$ 3,333	\$ 5,550	\$ 8,883	\$ 232,924
	Marketing	\$ 33,816	\$ 809	\$ 131,891	\$ 7,500	\$ 174,016	\$ 2,242	\$ -	\$ 2,242	\$ 176,258
	EM&V	\$ 61,227	\$ 15,343	\$ 201,584	\$ 34,000	\$ 312,153	\$ 3,030	\$ -	\$ 3,030	\$ 315,183
	Total	\$ 354,757	\$ 65,867	\$ 4,031,671	\$ 214,750	\$ 4,667,045	\$ 60,600	\$ 25,550	\$ 86,150	\$ 4,753,195

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Program Total and Grand Total (Residential, C&I and Municipal)**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Total C&I and Municipal	Internal Admin	\$ 103,051	\$ 167,490	\$ 419,592	\$ 210,500	\$ 900,633	\$ 98,343	\$ 131,039	\$ 229,382	\$ 1,130,015
	External Admin	\$ 7,260	\$ 30,463	\$ 35,487	\$ 34,000	\$ 107,210	\$ 7,025	\$ -	\$ 7,025	\$ 114,235
	Rebate/Services	\$ 2,983,277	\$ 1,474,693	\$ 34,193,641	\$ 3,863,753	\$ 42,515,364	\$ 2,908,151	\$ 1,130,676	\$ 4,038,827	\$ 46,554,191
	Implementation Services	\$ 202,421	\$ 373,458	\$ 1,334,191	\$ 289,700	\$ 2,199,770	\$ 193,174	\$ 74,531	\$ 267,705	\$ 2,467,475
	Marketing	\$ 156,864	\$ 75,512	\$ 1,293,718	\$ 62,500	\$ 1,588,595	\$ 129,954	\$ 27,000	\$ 156,954	\$ 1,745,548
	EM&V	\$ 227,508	\$ 139,849	\$ 1,961,928	\$ 176,500	\$ 2,505,785	\$ 175,613	\$ 67,000	\$ 242,613	\$ 2,748,398
	Total	\$ 3,680,381	\$ 2,261,465	\$ 39,238,558	\$ 4,636,953	\$ 49,817,357	\$ 3,512,260	\$ 1,430,245	\$ 4,942,505	\$ 54,759,862
Total C&I and Municipal %	Internal Admin	2.8%	7.4%	1.1%	4.5%	1.8%	2.8%	9.2%	4.6%	2.1%
	External Admin	0.2%	1.3%	0.1%	0.7%	0.2%	0.2%	0.0%	0.1%	0.2%
	Rebate/Services	81.1%	65.2%	87.1%	83.3%	85.3%	82.8%	79.1%	81.7%	85.0%
	Implementation Services	5.5%	16.5%	3.4%	6.2%	4.4%	5.5%	5.2%	5.4%	4.5%
	Marketing	4.3%	3.3%	3.3%	1.3%	3.2%	3.7%	1.9%	3.2%	3.2%
	EM&V	6.2%	6.2%	5.0%	3.8%	5.0%	5.0%	4.7%	4.9%	5.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Grand Total (Residential, C&I and Municipal)	Internal Admin	\$ 196,832	\$ 423,502	\$ 815,845	\$ 484,500	\$ 1,920,678	\$ 250,940	\$ 246,380	\$ 497,320	\$ 2,417,998
	External Admin	\$ 13,883	\$ 120,000	\$ 69,000	\$ 118,717	\$ 321,600	\$ 17,924	\$ 18,000	\$ 35,924	\$ 357,524
	Rebate/Services	\$ 5,725,181	\$ 4,962,998	\$ 60,980,331	\$ 7,192,986	\$ 78,861,497	\$ 7,427,569	\$ 2,461,667	\$ 9,889,236	\$ 88,750,733
	Implementation Services	\$ 386,633	\$ 926,432	\$ 2,702,769	\$ 714,962	\$ 4,730,797	\$ 492,919	\$ 141,315	\$ 634,234	\$ 5,365,031
	Marketing	\$ 279,389	\$ 206,797	\$ 2,406,881	\$ 177,250	\$ 3,070,317	\$ 324,696	\$ 74,970	\$ 399,666	\$ 3,469,983
	EM&V	\$ 427,781	\$ 364,655	\$ 3,503,436	\$ 381,700	\$ 4,677,572	\$ 448,108	\$ 134,000	\$ 582,108	\$ 5,259,680
	Total	\$ 7,029,699	\$ 7,004,385	\$ 70,478,262	\$ 9,070,115	\$ 93,582,461	\$ 8,962,156	\$ 3,076,332	\$ 12,038,488	\$ 105,620,948
Grand Total % (Residential, C&I and Municipal)	Internal Admin	2.8%	6.0%	1.2%	5.3%	2.1%	2.8%	8.0%	4.1%	2.3%
	External Admin	0.2%	1.7%	0.1%	1.3%	0.3%	0.2%	0.6%	0.3%	0.3%
	Rebate/Services	81.4%	70.9%	86.5%	79.3%	84.3%	82.9%	80.0%	82.1%	84.0%
	Implementation Services	5.5%	13.2%	3.8%	7.9%	5.1%	5.5%	4.6%	5.3%	5.1%
	Marketing	4.0%	3.0%	3.4%	2.0%	3.3%	3.6%	2.4%	3.3%	3.3%
	EM&V	6.1%	5.2%	5.0%	4.2%	5.0%	5.0%	4.4%	4.8%	5.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2022 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Home Energy Assistance	Internal Admin	\$ 50,885	\$ 57,108	\$ 234,789	\$ 110,000	\$ 452,782	\$ 50,449	\$ 60,000	\$ 110,449	\$ 563,231
	External Admin	\$ 3,283	\$ 35,232	\$ 19,857	\$ 60,000	\$ 118,372	\$ 3,255	\$ 16,169	\$ 19,424	\$ 137,796
	Rebate/Services	\$ 1,349,264	\$ 1,062,073	\$ 15,214,834	\$ 1,638,881	\$ 19,265,052	\$ 1,337,723	\$ 578,043	\$ 1,915,765	\$ 21,180,817
	Implementation Services	\$ 95,204	\$ 169,848	\$ 1,117,500	\$ 142,016	\$ 1,524,568	\$ 94,389	\$ 33,250	\$ 127,639	\$ 1,652,207
	Marketing	\$ 60,733	\$ 41,339	\$ 590,461	\$ 35,000	\$ 727,533	\$ 60,214	\$ 17,188	\$ 77,402	\$ 804,935
	EM&V	\$ 82,072	\$ 69,327	\$ 715,323	\$ 70,000	\$ 936,722	\$ 81,370	\$ 24,000	\$ 105,370	\$ 1,042,092
	Total	\$ 1,641,440	\$ 1,434,927	\$ 17,892,764	\$ 2,055,898	\$ 23,025,028	\$ 1,627,400	\$ 728,650	\$ 2,356,050	\$ 25,381,078
HP w/EnergyStar®	Internal Admin	\$ 19,761	\$ 55,763	\$ 93,427	\$ 63,000	\$ 231,950	\$ 40,528	\$ 32,000	\$ 72,528	\$ 304,478
	External Admin	\$ 1,275	\$ 15,994	\$ 7,902	\$ 2,000	\$ 27,170	\$ 2,615	\$ 3,500	\$ 6,115	\$ 33,285
	Rebate/Services	\$ 523,974	\$ 971,311	\$ 6,104,204	\$ 404,020	\$ 8,003,509	\$ 1,074,642	\$ 230,974	\$ 1,305,616	\$ 9,309,125
	Implementation Services	\$ 36,971	\$ 114,644	\$ 444,673	\$ 120,000	\$ 716,288	\$ 75,826	\$ 9,000	\$ 84,826	\$ 801,115
	Marketing	\$ 23,585	\$ 36,693	\$ 234,960	\$ 20,000	\$ 315,238	\$ 48,372	\$ 8,000	\$ 56,372	\$ 371,610
	EM&V	\$ 31,872	\$ 61,000	\$ 284,800	\$ 25,000	\$ 402,672	\$ 65,368	\$ 10,000	\$ 75,368	\$ 478,040
	Total	\$ 637,438	\$ 1,255,404	\$ 7,169,966	\$ 634,020	\$ 9,696,828	\$ 1,307,350	\$ 293,474	\$ 1,600,824	\$ 11,297,652
EnergyStar® Homes	Internal Admin	\$ 9,783	\$ 47,812	\$ 29,000	\$ 38,000	\$ 124,595	\$ 36,226	\$ 38,000	\$ 74,226	\$ 198,821
	External Admin	\$ 631	\$ 15,339	\$ 2,453	\$ 6,500	\$ 24,923	\$ 2,337	\$ 3,500	\$ 5,837	\$ 30,760
	Rebate/Services	\$ 259,418	\$ 457,904	\$ 1,879,251	\$ 242,756	\$ 2,839,329	\$ 960,571	\$ 340,977	\$ 1,301,548	\$ 4,140,877
	Implementation Services	\$ 18,304	\$ 103,202	\$ 138,027	\$ 55,000	\$ 314,534	\$ 67,778	\$ 11,000	\$ 78,778	\$ 393,312
	Marketing	\$ 11,677	\$ 19,889	\$ 72,932	\$ 14,000	\$ 118,498	\$ 43,237	\$ 12,000	\$ 55,237	\$ 173,735
	EM&V	\$ 15,780	\$ 34,327	\$ 88,403	\$ 45,000	\$ 183,510	\$ 58,429	\$ 18,000	\$ 76,429	\$ 259,938
	Total	\$ 315,594	\$ 678,473	\$ 2,210,065	\$ 401,256	\$ 3,605,389	\$ 1,168,578	\$ 423,477	\$ 1,592,055	\$ 5,197,444
Energy Star® Products	Internal Admin	\$ 27,505	\$ 96,739	\$ 87,648	\$ 65,000	\$ 276,893	\$ 32,571	\$ 35,000	\$ 67,571	\$ 344,463
	External Admin	\$ 1,775	\$ 25,687	\$ 7,413	\$ 2,100	\$ 36,975	\$ 2,101	\$ 1,575	\$ 3,676	\$ 40,651
	Rebate/Services	\$ 729,333	\$ 787,242	\$ 5,679,795	\$ 1,236,210	\$ 8,432,579	\$ 863,645	\$ 490,252	\$ 1,353,897	\$ 9,786,477
	Implementation Services	\$ 51,461	\$ 172,335	\$ 417,170	\$ 55,000	\$ 695,966	\$ 60,938	\$ 12,000	\$ 72,938	\$ 768,905
	Marketing	\$ 32,829	\$ 35,132	\$ 265,017	\$ 34,500	\$ 367,478	\$ 38,875	\$ 20,000	\$ 58,875	\$ 426,353
	EM&V	\$ 44,363	\$ 57,571	\$ 269,043	\$ 50,000	\$ 420,978	\$ 52,533	\$ 25,000	\$ 77,533	\$ 498,511
	Total	\$ 887,266	\$ 1,174,707	\$ 6,726,086	\$ 1,442,810	\$ 10,230,869	\$ 1,050,663	\$ 583,827	\$ 1,634,490	\$ 11,865,359

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2022 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs (Continued)**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Other*	Internal Admin	\$ 8,124	\$ 8,536	\$ 10,827	\$ 15,500	\$ 42,986	\$ 16,507	\$ 4,000	\$ 20,507	\$ 63,494
	External Admin	\$ 524	\$ -	\$ 916	\$ 7,750	\$ 9,190	\$ 1,065	\$ 3,000	\$ 4,065	\$ 13,255
	Rebate/Services	\$ 215,413	\$ 25,000	\$ 701,583	\$ 243,874	\$ 1,185,870	\$ 437,710	\$ 43,600	\$ 481,310	\$ 1,667,180
	Implementation Services	\$ 15,199	\$ 12,171	\$ 51,530	\$ 52,500	\$ 131,400	\$ 30,885	\$ 6,030	\$ 36,915	\$ 168,315
	Marketing	\$ 9,696	\$ 1,695	\$ 29,905	\$ 4,500	\$ 45,796	\$ 19,702	\$ 8,970	\$ 28,672	\$ 74,468
	EM&V	\$ 13,103	\$ 2,690	\$ 96,883	\$ 31,250	\$ 143,926	\$ 26,625	\$ 2,750	\$ 29,375	\$ 173,301
	Total	\$ 262,060	\$ 50,091	\$ 891,643	\$ 355,374	\$ 1,559,167	\$ 532,494	\$ 68,350	\$ 600,844	\$ 2,160,011
Total Residential	Internal Admin	\$ 116,058	\$ 265,958	\$ 455,690	\$ 291,500	\$ 1,129,206	\$ 176,281	\$ 169,000	\$ 345,281	\$ 1,474,487
	External Admin	\$ 7,488	\$ 92,252	\$ 38,540	\$ 78,350	\$ 216,630	\$ 11,373	\$ 27,744	\$ 39,117	\$ 255,747
	Rebate/Services	\$ 3,077,402	\$ 3,303,530	\$ 29,579,666	\$ 3,765,741	\$ 39,726,339	\$ 4,674,291	\$ 1,683,846	\$ 6,358,137	\$ 46,084,476
	Implementation Services	\$ 217,140	\$ 572,200	\$ 2,168,899	\$ 424,516	\$ 3,382,756	\$ 329,816	\$ 71,280	\$ 401,096	\$ 3,783,852
	Marketing	\$ 138,521	\$ 134,747	\$ 1,193,276	\$ 108,000	\$ 1,574,543	\$ 210,400	\$ 66,158	\$ 276,558	\$ 1,851,101
	EM&V	\$ 187,190	\$ 224,915	\$ 1,454,452	\$ 221,250	\$ 2,087,807	\$ 284,324	\$ 79,750	\$ 364,074	\$ 2,451,882
	Total	\$ 3,743,798	\$ 4,593,602	\$ 34,890,524	\$ 4,889,357	\$ 48,117,281	\$ 5,686,485	\$ 2,097,778	\$ 7,784,263	\$ 55,901,545
Total %	Internal Admin	3.1%	5.8%	1.3%	6.0%	2.3%	3.1%	8.1%	4.4%	2.6%
	External Admin	0.2%	2.0%	0.1%	1.6%	0.5%	0.2%	1.3%	0.5%	0.5%
	Rebate/Services	82.2%	71.9%	84.8%	77.0%	82.6%	82.2%	80.3%	81.7%	82.4%
	Implementation Services	5.8%	12.5%	6.2%	8.7%	7.0%	5.8%	3.4%	5.2%	6.8%
	Marketing	3.7%	2.9%	3.4%	2.2%	3.3%	3.7%	3.2%	3.6%	3.3%
	EM&V	5.0%	4.9%	4.2%	4.5%	4.3%	5.0%	3.8%	4.7%	4.4%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2022 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Programs**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Large Business Energy Solutions	Internal Admin	\$ 65,548	\$ 72,509	\$ 245,383	\$ 115,000	\$ 498,440	\$ 61,804	\$ 89,000	\$ 150,804	\$ 649,244
	External Admin	\$ 4,229	\$ 12,947	\$ 20,753	\$ 12,000	\$ 49,929	\$ 3,987	\$ 6,000	\$ 9,987	\$ 59,917
	Rebate/Services	\$ 1,738,089	\$ 733,587	\$ 24,385,835	\$ 2,668,856	\$ 29,526,368	\$ 1,638,801	\$ 1,109,756	\$ 2,748,557	\$ 32,274,925
	Implementation Services	\$ 122,639	\$ 171,743	\$ 1,076,724	\$ 150,000	\$ 1,521,106	\$ 115,633	\$ 59,035	\$ 174,668	\$ 1,695,774
	Marketing	\$ 78,235	\$ 31,836	\$ 915,908	\$ 35,000	\$ 1,060,980	\$ 73,766	\$ 25,000	\$ 98,766	\$ 1,159,746
	EM&V	\$ 105,723	\$ 45,992	\$ 1,110,192	\$ 100,000	\$ 1,361,907	\$ 99,684	\$ 52,000	\$ 151,684	\$ 1,513,591
	<b>Total</b>	<b>\$ 2,114,464</b>	<b>\$ 1,068,615</b>	<b>\$ 27,754,795</b>	<b>\$ 3,080,856</b>	<b>\$ 34,018,730</b>	<b>\$ 1,993,675</b>	<b>\$ 1,340,791</b>	<b>\$ 3,334,466</b>	<b>\$ 37,353,196</b>
Small Business Energy Solutions	Internal Admin	\$ 52,173	\$ 78,087	\$ 161,509	\$ 110,000	\$ 401,769	\$ 56,590	\$ 60,000	\$ 116,590	\$ 518,358
	External Admin	\$ 3,366	\$ 12,946	\$ 13,660	\$ 20,000	\$ 49,972	\$ 3,651	\$ 6,000	\$ 9,651	\$ 59,623
	Rebate/Services	\$ 1,383,428	\$ 885,914	\$ 16,050,598	\$ 1,946,317	\$ 20,266,257	\$ 1,500,536	\$ 526,646	\$ 2,027,182	\$ 22,293,438
	Implementation Services	\$ 97,614	\$ 179,594	\$ 708,693	\$ 125,000	\$ 1,110,901	\$ 105,877	\$ 32,000	\$ 137,877	\$ 1,248,778
	Marketing	\$ 62,271	\$ 37,058	\$ 602,845	\$ 30,000	\$ 732,174	\$ 67,542	\$ 10,238	\$ 77,780	\$ 809,954
	EM&V	\$ 84,150	\$ 53,926	\$ 730,721	\$ 90,000	\$ 958,797	\$ 91,273	\$ 30,000	\$ 121,273	\$ 1,080,071
	<b>Total</b>	<b>\$ 1,683,002</b>	<b>\$ 1,247,525</b>	<b>\$ 18,268,026</b>	<b>\$ 2,321,317</b>	<b>\$ 23,519,869</b>	<b>\$ 1,825,469</b>	<b>\$ 664,884</b>	<b>\$ 2,490,353</b>	<b>\$ 26,010,223</b>
Municipal	Internal Admin	\$ 5,505	\$ 16,733	\$ 12,481	\$ 12,000	\$ 46,719	\$ -	\$ -	\$ -	\$ 46,719
	External Admin	\$ 355	\$ 6,093	\$ 1,056	\$ -	\$ 7,503	\$ -	\$ -	\$ -	\$ 7,503
	Rebate/Services	\$ 145,974	\$ 89,545	\$ 1,240,332	\$ 150,000	\$ 1,625,851	\$ -	\$ -	\$ -	\$ 1,625,851
	Implementation Services	\$ 10,300	\$ 23,554	\$ 54,765	\$ 25,000	\$ 113,619	\$ -	\$ -	\$ -	\$ 113,619
	Marketing	\$ 6,571	\$ 4,847	\$ 46,586	\$ 7,500	\$ 65,503	\$ -	\$ -	\$ -	\$ 65,503
	EM&V	\$ 8,879	\$ 22,547	\$ 56,467	\$ 8,000	\$ 95,894	\$ -	\$ -	\$ -	\$ 95,894
	<b>Total</b>	<b>\$ 177,584</b>	<b>\$ 163,318</b>	<b>\$ 1,411,687</b>	<b>\$ 202,500</b>	<b>\$ 1,955,089</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,955,089</b>
Other*	Internal Admin	\$ 15,139	\$ 8,536	\$ 63,158	\$ 12,100	\$ 98,933	\$ 2,086	\$ -	\$ 2,086	\$ 101,019
	External Admin	\$ 871	\$ -	\$ 5,342	\$ 11,200	\$ 17,412	\$ 135	\$ -	\$ 135	\$ 17,547
	Rebate/Services	\$ 341,897	\$ 25,000	\$ 6,276,616	\$ 130,000	\$ 6,773,513	\$ 55,312	\$ 23,500	\$ 78,812	\$ 6,852,324
	Implementation Services	\$ 28,165	\$ 17,171	\$ 274,220	\$ 63,125	\$ 382,681	\$ 3,903	\$ 6,500	\$ 10,403	\$ 393,084
	Marketing	\$ 32,063	\$ 1,852	\$ 233,900	\$ 8,250	\$ 276,064	\$ 2,490	\$ -	\$ 2,490	\$ 278,554
	EM&V	\$ 70,218	\$ 2,940	\$ 285,551	\$ 36,000	\$ 394,709	\$ 3,364	\$ -	\$ 3,364	\$ 398,074
	<b>Total</b>	<b>\$ 488,353</b>	<b>\$ 55,498</b>	<b>\$ 7,138,787</b>	<b>\$ 260,675</b>	<b>\$ 7,943,313</b>	<b>\$ 67,289</b>	<b>\$ 30,000</b>	<b>\$ 97,289</b>	<b>\$ 8,040,602</b>

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2022 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Program Total and Grand Total (Residential, C&I and Municipal)**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Total C&I and Municipal	Internal Admin	\$ 138,365	\$ 175,864	\$ 482,531	\$ 249,100	\$ 1,045,861	\$ 120,479	\$ 149,000	\$ 269,479	\$ 1,315,340
	External Admin	\$ 8,821	\$ 31,986	\$ 40,810	\$ 43,200	\$ 124,817	\$ 7,773	\$ 12,000	\$ 19,773	\$ 144,590
	Rebate/Services	\$ 3,609,388	\$ 1,734,046	\$ 47,953,381	\$ 4,895,173	\$ 58,191,988	\$ 3,194,648	\$ 1,659,903	\$ 4,854,551	\$ 63,046,539
	Implementation Services	\$ 258,718	\$ 392,062	\$ 2,114,402	\$ 363,125	\$ 3,128,307	\$ 225,413	\$ 97,535	\$ 322,948	\$ 3,451,255
	Marketing	\$ 179,139	\$ 75,593	\$ 1,799,238	\$ 80,750	\$ 2,134,720	\$ 143,798	\$ 35,238	\$ 179,036	\$ 2,313,756
	EM&V	\$ 268,971	\$ 125,405	\$ 2,182,932	\$ 234,000	\$ 2,811,307	\$ 194,322	\$ 82,000	\$ 276,322	\$ 3,087,629
	Total	\$ 4,463,403	\$ 2,534,956	\$ 54,573,294	\$ 5,865,348	\$ 67,437,002	\$ 3,886,433	\$ 2,035,675	\$ 5,922,108	\$ 73,359,110
Total C&I and Municipal %	Internal Admin	3.1%	6.9%	0.9%	4.2%	1.6%	3.1%	7.3%	4.6%	1.8%
	External Admin	0.2%	1.3%	0.1%	0.7%	0.2%	0.2%	0.6%	0.3%	0.2%
	Rebate/Services	80.9%	68.4%	87.9%	83.5%	86.3%	82.2%	81.5%	82.0%	85.9%
	Implementation Services	5.8%	15.5%	3.9%	6.2%	4.6%	5.8%	4.8%	5.5%	4.7%
	Marketing	4.0%	3.0%	3.3%	1.4%	3.2%	3.7%	1.7%	3.0%	3.2%
	EM&V	6.0%	4.9%	4.0%	4.0%	4.2%	5.0%	4.0%	4.7%	4.2%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Grand Total (Residential, C&I and Municipal)	Internal Admin	\$ 254,423	\$ 441,822	\$ 938,221	\$ 540,600	\$ 2,175,067	\$ 296,760	\$ 318,000	\$ 614,760	\$ 2,789,827
	External Admin	\$ 16,308	\$ 124,238	\$ 79,350	\$ 121,550	\$ 341,447	\$ 19,146	\$ 39,744	\$ 58,890	\$ 400,337
	Rebate/Services	\$ 6,686,790	\$ 5,037,576	\$ 77,533,047	\$ 8,660,914	\$ 97,918,328	\$ 7,868,939	\$ 3,343,749	\$ 11,212,688	\$ 109,131,015
	Implementation Services	\$ 475,859	\$ 964,262	\$ 4,283,301	\$ 787,641	\$ 6,511,063	\$ 555,229	\$ 168,815	\$ 724,044	\$ 7,235,107
	Marketing	\$ 317,660	\$ 210,340	\$ 2,992,514	\$ 188,750	\$ 3,709,263	\$ 354,198	\$ 101,396	\$ 455,594	\$ 4,164,857
	EM&V	\$ 456,161	\$ 350,320	\$ 3,637,384	\$ 455,250	\$ 4,899,115	\$ 478,646	\$ 161,750	\$ 640,396	\$ 5,539,511
	Total	\$ 8,207,201	\$ 7,128,559	\$ 89,463,818	\$ 10,754,705	\$ 115,554,283	\$ 9,572,918	\$ 4,133,454	\$ 13,706,372	\$ 129,260,654
Grand Total % (Residential, C&I and Municipal)	Internal Admin	3.1%	6.2%	1.0%	5.0%	1.9%	3.1%	7.7%	4.5%	2.2%
	External Admin	0.2%	1.7%	0.1%	1.1%	0.3%	0.2%	1.0%	0.4%	0.3%
	Rebate/Services	81.5%	70.7%	86.7%	80.5%	84.7%	82.2%	80.9%	81.8%	84.4%
	Implementation Services	5.8%	13.5%	4.8%	7.3%	5.6%	5.8%	4.1%	5.3%	5.6%
	Marketing	3.9%	3.0%	3.3%	1.8%	3.2%	3.7%	2.5%	3.3%	3.2%
	EM&V	5.6%	4.9%	4.1%	4.2%	4.2%	5.0%	3.9%	4.7%	4.3%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2023 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Home Energy Assistance	Internal Admin	\$ 64,403	\$ 58,551	\$ 294,139	\$ 162,231	\$ 579,324	\$ 61,005	\$ 52,432	\$ 113,436	\$ 692,760
	External Admin	\$ 3,788	\$ 16,793	\$ 24,877	\$ 65,000	\$ 110,459	\$ 3,589	\$ 9,000	\$ 12,589	\$ 123,047
	Rebate/Services	\$ 1,545,676	\$ 1,113,967	\$ 19,000,076	\$ 1,877,768	\$ 23,537,488	\$ 1,464,108	\$ 782,333	\$ 2,246,441	\$ 25,783,929
	Implementation Services	\$ 115,547	\$ 120,377	\$ 1,777,054	\$ 200,000	\$ 2,212,977	\$ 109,449	\$ 27,000	\$ 136,449	\$ 2,349,427
	Marketing	\$ 70,086	\$ 45,778	\$ 742,958	\$ 55,000	\$ 913,822	\$ 66,387	\$ 18,800	\$ 85,187	\$ 999,009
	EM&V	\$ 94,711	\$ 64,512	\$ 674,764	\$ 85,000	\$ 918,987	\$ 89,713	\$ 30,000	\$ 119,713	\$ 1,038,699
	Total	\$ 1,894,211	\$ 1,419,978	\$ 22,513,869	\$ 2,444,999	\$ 28,273,056	\$ 1,794,250	\$ 919,565	\$ 2,713,815	\$ 30,986,871
HP w/EnergyStar®	Internal Admin	\$ 24,692	\$ 58,551	\$ 102,141	\$ 68,000	\$ 253,383	\$ 49,794	\$ 35,000	\$ 84,794	\$ 338,177
	External Admin	\$ 1,452	\$ 16,793	\$ 8,639	\$ 2,200	\$ 29,084	\$ 2,929	\$ 4,000	\$ 6,929	\$ 36,013
	Rebate/Services	\$ 592,597	\$ 1,105,846	\$ 6,647,780	\$ 477,765	\$ 8,823,988	\$ 1,195,054	\$ 253,484	\$ 1,448,538	\$ 10,272,526
	Implementation Services	\$ 44,300	\$ 120,377	\$ 617,086	\$ 140,000	\$ 921,763	\$ 89,336	\$ 10,000	\$ 99,336	\$ 1,021,099
	Marketing	\$ 26,870	\$ 41,009	\$ 258,002	\$ 30,000	\$ 355,881	\$ 54,187	\$ 12,500	\$ 66,687	\$ 422,569
	EM&V	\$ 36,311	\$ 68,348	\$ 234,547	\$ 35,000	\$ 374,207	\$ 73,226	\$ 12,000	\$ 85,226	\$ 459,433
	Total	\$ 726,222	\$ 1,410,924	\$ 7,868,194	\$ 752,965	\$ 10,758,305	\$ 1,464,527	\$ 326,984	\$ 1,791,511	\$ 12,549,816
EnergyStar® Homes	Internal Admin	\$ 11,493	\$ 50,202	\$ 31,799	\$ 40,000	\$ 133,494	\$ 43,357	\$ 40,000	\$ 83,357	\$ 216,851
	External Admin	\$ 676	\$ 16,106	\$ 2,689	\$ 7,000	\$ 26,472	\$ 2,550	\$ 4,000	\$ 6,550	\$ 33,022
	Rebate/Services	\$ 275,831	\$ 456,938	\$ 2,054,069	\$ 270,143	\$ 3,056,980	\$ 1,040,580	\$ 459,552	\$ 1,500,131	\$ 4,557,111
	Implementation Services	\$ 20,620	\$ 108,362	\$ 192,114	\$ 36,750	\$ 357,846	\$ 77,788	\$ 14,500	\$ 92,288	\$ 450,135
	Marketing	\$ 12,507	\$ 20,910	\$ 80,322	\$ 15,000	\$ 128,740	\$ 47,183	\$ 15,000	\$ 62,183	\$ 190,923
	EM&V	\$ 16,901	\$ 34,850	\$ 73,020	\$ 50,000	\$ 174,772	\$ 63,761	\$ 15,000	\$ 78,761	\$ 253,533
	Total	\$ 338,028	\$ 687,369	\$ 2,434,014	\$ 418,893	\$ 3,878,304	\$ 1,275,220	\$ 548,052	\$ 1,823,272	\$ 5,701,576
Energy Star® Products	Internal Admin	\$ 27,712	\$ 101,576	\$ 82,461	\$ 58,000	\$ 269,749	\$ 37,266	\$ 36,000	\$ 73,266	\$ 343,015
	External Admin	\$ 1,630	\$ 26,972	\$ 6,974	\$ 1,000	\$ 36,576	\$ 2,192	\$ 5,000	\$ 7,192	\$ 43,768
	Rebate/Services	\$ 665,094	\$ 572,067	\$ 5,326,574	\$ 1,175,856	\$ 7,739,591	\$ 894,387	\$ 602,070	\$ 1,496,457	\$ 9,236,048
	Implementation Services	\$ 49,719	\$ 181,015	\$ 498,188	\$ 55,000	\$ 783,922	\$ 66,860	\$ 18,000	\$ 84,860	\$ 868,782
	Marketing	\$ 30,157	\$ 28,635	\$ 223,588	\$ 30,000	\$ 312,381	\$ 40,554	\$ 25,000	\$ 65,554	\$ 377,935
	EM&V	\$ 40,753	\$ 47,726	\$ 189,828	\$ 45,000	\$ 323,307	\$ 54,803	\$ 26,250	\$ 81,053	\$ 404,361
	Total	\$ 815,066	\$ 957,991	\$ 6,327,614	\$ 1,364,856	\$ 9,465,526	\$ 1,096,063	\$ 712,320	\$ 1,808,383	\$ 11,273,908

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2023 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs (Continued)**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Other*	Internal Admin	\$ 9,409	\$ 4,629	\$ 13,504	\$ 17,200	\$ 44,742	\$ 18,394	\$ 4,500	\$ 22,894	\$ 67,636
	External Admin	\$ 468	\$ -	\$ 1,142	\$ 5,500	\$ 7,110	\$ 1,082	\$ 3,000	\$ 4,082	\$ 11,192
	Rebate/Services	\$ 191,072	\$ -	\$ 872,305	\$ 246,625	\$ 1,310,002	\$ 441,448	\$ 35,800	\$ 477,248	\$ 1,787,250
	Implementation Services	\$ 16,880	\$ 12,785	\$ 81,586	\$ 61,500	\$ 172,751	\$ 33,000	\$ 8,400	\$ 41,400	\$ 214,151
	Marketing	\$ 8,664	\$ 957	\$ 36,308	\$ 3,800	\$ 49,729	\$ 20,017	\$ 6,900	\$ 26,917	\$ 76,646
	EM&V	\$ 50,234	\$ 7,295	\$ 19,874	\$ 27,550	\$ 104,953	\$ 27,050	\$ 3,000	\$ 30,050	\$ 135,003
	Total	\$ 276,727	\$ 25,666	\$ 1,024,720	\$ 362,175	\$ 1,689,288	\$ 540,990	\$ 61,600	\$ 602,590	\$ 2,291,878
Total Residential	Internal Admin	\$ 137,709	\$ 273,509	\$ 524,044	\$ 345,431	\$ 1,280,692	\$ 209,816	\$ 167,932	\$ 377,747	\$ 1,658,439
	External Admin	\$ 8,015	\$ 76,665	\$ 44,321	\$ 80,700	\$ 209,701	\$ 12,342	\$ 25,000	\$ 37,342	\$ 247,043
	Rebate/Services	\$ 3,270,270	\$ 3,248,817	\$ 33,900,805	\$ 4,048,157	\$ 44,468,049	\$ 5,035,577	\$ 2,133,238	\$ 7,168,815	\$ 51,636,864
	Implementation Services	\$ 247,065	\$ 542,916	\$ 3,166,028	\$ 493,250	\$ 4,449,259	\$ 376,434	\$ 77,900	\$ 454,334	\$ 4,903,593
	Marketing	\$ 148,284	\$ 137,290	\$ 1,341,178	\$ 133,800	\$ 1,760,553	\$ 228,329	\$ 78,200	\$ 306,529	\$ 2,067,082
	EM&V	\$ 238,910	\$ 222,731	\$ 1,192,035	\$ 242,550	\$ 1,896,226	\$ 308,553	\$ 86,250	\$ 394,803	\$ 2,291,029
	Total	\$ 4,050,254	\$ 4,501,928	\$ 40,168,410	\$ 5,343,888	\$ 54,064,480	\$ 6,171,050	\$ 2,568,520	\$ 8,739,570	\$ 62,804,050
Total %	Internal Admin	3.4%	6.1%	1.3%	6.5%	2.4%	3.4%	6.5%	4.3%	2.6%
	External Admin	0.2%	1.7%	0.1%	1.5%	0.4%	0.2%	1.0%	0.4%	0.4%
	Rebate/Services	80.7%	72.2%	84.4%	75.8%	82.3%	81.6%	83.1%	82.0%	82.2%
	Implementation Services	6.1%	12.1%	7.9%	9.2%	8.2%	6.1%	3.0%	5.2%	7.8%
	Marketing	3.7%	3.0%	3.3%	2.5%	3.3%	3.7%	3.0%	3.5%	3.3%
	EM&V	5.9%	4.9%	3.0%	4.5%	3.5%	5.0%	3.4%	4.5%	3.6%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2023 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Programs**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Large Business Energy Solutions	Internal Admin	\$ 85,769	\$ 76,135	\$ 298,763	\$ 125,000	\$ 585,668	\$ 75,145	\$ 100,000	\$ 175,145	\$ 760,812
	External Admin	\$ 5,045	\$ 13,747	\$ 25,268	\$ 15,000	\$ 59,060	\$ 4,420	\$ 6,000	\$ 10,420	\$ 69,480
	Rebate/Services	\$ 2,058,459	\$ 725,781	\$ 34,540,301	\$ 3,697,788	\$ 41,022,329	\$ 1,803,475	\$ 1,680,215	\$ 3,483,690	\$ 44,506,019
	Implementation Services	\$ 153,880	\$ 180,400	\$ 1,663,975	\$ 170,000	\$ 2,168,255	\$ 134,819	\$ 63,000	\$ 197,819	\$ 2,366,074
	Marketing	\$ 93,337	\$ 32,057	\$ 1,286,483	\$ 40,000	\$ 1,451,877	\$ 81,775	\$ 20,000	\$ 101,775	\$ 1,553,652
	EM&V	\$ 126,131	\$ 46,429	\$ 1,169,530	\$ 150,000	\$ 1,492,089	\$ 110,507	\$ 61,196	\$ 171,703	\$ 1,663,792
	<b>Total</b>		\$ 2,522,621	\$ 1,074,549	\$ 38,984,320	\$ 4,197,788	\$ 46,779,278	\$ 2,210,141	\$ 1,930,411	\$ 4,140,552
Small Business Energy Solutions	Internal Admin	\$ 68,509	\$ 81,991	\$ 158,021	\$ 125,000	\$ 433,521	\$ 71,330	\$ 60,000	\$ 131,330	\$ 564,850
	External Admin	\$ 4,030	\$ 13,747	\$ 13,365	\$ 25,000	\$ 56,141	\$ 4,196	\$ 6,300	\$ 10,496	\$ 66,637
	Rebate/Services	\$ 1,644,212	\$ 808,209	\$ 18,268,928	\$ 2,191,118	\$ 22,912,467	\$ 1,711,913	\$ 893,071	\$ 2,604,983	\$ 25,517,450
	Implementation Services	\$ 122,913	\$ 188,653	\$ 880,104	\$ 150,000	\$ 1,341,670	\$ 127,974	\$ 38,000	\$ 165,974	\$ 1,507,643
	Marketing	\$ 74,554	\$ 34,953	\$ 680,442	\$ 45,000	\$ 834,949	\$ 77,623	\$ 20,000	\$ 97,623	\$ 932,572
	EM&V	\$ 100,748	\$ 49,272	\$ 618,583	\$ 125,000	\$ 893,603	\$ 104,897	\$ 34,200	\$ 139,097	\$ 1,032,700
	<b>Total</b>		\$ 2,014,966	\$ 1,176,825	\$ 20,619,441	\$ 2,661,118	\$ 26,472,350	\$ 2,097,932	\$ 1,051,571	\$ 3,149,503
Municipal	Internal Admin	\$ 6,038	\$ 17,570	\$ 10,838	\$ 15,000	\$ 49,445	\$ -	\$ -	\$ -	\$ 49,445
	External Admin	\$ 355	\$ 6,092	\$ 917	\$ -	\$ 7,363	\$ -	\$ -	\$ -	\$ 7,363
	Rebate/Services	\$ 144,909	\$ 86,107	\$ 1,252,947	\$ 140,000	\$ 1,623,962	\$ -	\$ -	\$ -	\$ 1,623,962
	Implementation Services	\$ 10,833	\$ 24,758	\$ 60,361	\$ 30,000	\$ 125,951	\$ -	\$ -	\$ -	\$ 125,951
	Marketing	\$ 6,571	\$ 4,916	\$ 46,667	\$ 8,500	\$ 66,653	\$ -	\$ -	\$ -	\$ 66,653
	EM&V	\$ 8,879	\$ 23,875	\$ 42,425	\$ 12,500	\$ 87,679	\$ -	\$ -	\$ -	\$ 87,679
	<b>Total</b>		\$ 177,584	\$ 163,318	\$ 1,414,153	\$ 206,000	\$ 1,961,055	\$ -	\$ -	\$ -
Other*	Internal Admin	\$ 23,991	\$ 8,963	\$ 87,289	\$ 13,500	\$ 133,743	\$ 2,560	\$ -	\$ 2,560	\$ 136,303
	External Admin	\$ 1,298	\$ -	\$ 7,382	\$ 13,400	\$ 22,081	\$ 151	\$ -	\$ 151	\$ 22,231
	Rebate/Services	\$ 505,907	\$ -	\$ 10,091,521	\$ 133,750	\$ 10,731,178	\$ 61,428	\$ 25,000	\$ 86,428	\$ 10,817,607
	Implementation Services	\$ 43,043	\$ 17,785	\$ 482,036	\$ 73,781	\$ 616,646	\$ 4,592	\$ 7,500	\$ 12,092	\$ 628,738
	Marketing	\$ 47,859	\$ 1,327	\$ 373,300	\$ 9,000	\$ 431,486	\$ 2,785	\$ -	\$ 2,785	\$ 434,272
	EM&V	\$ 83,529	\$ 15,512	\$ 341,491	\$ 39,000	\$ 479,532	\$ 3,764	\$ -	\$ 3,764	\$ 483,296
	<b>Total</b>		\$ 705,629	\$ 43,587	\$ 11,383,018	\$ 282,431	\$ 12,414,666	\$ 75,280	\$ 32,500	\$ 107,780

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2023 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Program Total and Grand Total (Residential, C&I and Municipal)**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Total C&I and Municipal	Internal Admin	\$ 184,307	\$ 184,659	\$ 554,911	\$ 278,500	\$ 1,202,377	\$ 149,034	\$ 160,000	\$ 309,034	\$ 1,511,411
	External Admin	\$ 10,729	\$ 33,585	\$ 46,932	\$ 53,400	\$ 144,646	\$ 8,767	\$ 12,300	\$ 21,067	\$ 165,712
	Rebate/Services	\$ 4,353,487	\$ 1,620,097	\$ 64,153,696	\$ 6,162,657	\$ 76,289,936	\$ 3,576,816	\$ 2,598,286	\$ 6,175,102	\$ 82,465,038
	Implementation Services	\$ 330,669	\$ 411,596	\$ 3,086,476	\$ 423,781	\$ 4,252,522	\$ 267,385	\$ 108,500	\$ 375,885	\$ 4,628,406
	Marketing	\$ 222,321	\$ 73,254	\$ 2,386,891	\$ 102,500	\$ 2,784,965	\$ 162,184	\$ 40,000	\$ 202,184	\$ 2,987,149
	EM&V	\$ 319,288	\$ 135,088	\$ 2,172,028	\$ 326,500	\$ 2,952,903	\$ 219,168	\$ 95,396	\$ 314,564	\$ 3,267,467
	Total	\$ 5,420,800	\$ 2,458,279	\$ 72,400,933	\$ 7,347,338	\$ 87,627,349	\$ 4,383,353	\$ 3,014,482	\$ 7,397,835	\$ 95,025,184
Total C&I and Municipal %	Internal Admin	3.4%	7.5%	0.8%	3.8%	1.4%	3.4%	5.3%	4.2%	1.6%
	External Admin	0.2%	1.4%	0.1%	0.7%	0.2%	0.2%	0.4%	0.3%	0.2%
	Rebate/Services	80.3%	65.9%	88.6%	83.9%	87.1%	81.6%	86.2%	83.5%	86.8%
	Implementation Services	6.1%	16.7%	4.3%	5.8%	4.9%	6.1%	3.6%	5.1%	4.9%
	Marketing	4.1%	3.0%	3.3%	1.4%	3.2%	3.7%	1.3%	2.7%	3.1%
	EM&V	5.9%	5.5%	3.0%	4.4%	3.4%	5.0%	3.2%	4.3%	3.4%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Grand Total (Residential, C&I and Municipal)	Internal Admin	\$ 322,016	\$ 458,168	\$ 1,078,954	\$ 623,931	\$ 2,483,069	\$ 358,850	\$ 327,932	\$ 686,781	\$ 3,169,850
	External Admin	\$ 18,744	\$ 110,250	\$ 91,253	\$ 134,100	\$ 354,347	\$ 21,109	\$ 37,300	\$ 58,409	\$ 412,755
	Rebate/Services	\$ 7,623,757	\$ 4,868,914	\$ 98,054,501	\$ 10,210,814	\$ 120,757,985	\$ 8,612,393	\$ 4,731,524	\$ 13,343,917	\$ 134,101,902
	Implementation Services	\$ 577,734	\$ 954,512	\$ 6,252,504	\$ 917,031	\$ 8,701,781	\$ 643,819	\$ 186,400	\$ 830,219	\$ 9,532,000
	Marketing	\$ 370,605	\$ 210,544	\$ 3,728,069	\$ 236,300	\$ 4,545,518	\$ 390,513	\$ 118,200	\$ 508,713	\$ 5,054,231
	EM&V	\$ 558,198	\$ 357,819	\$ 3,364,063	\$ 569,050	\$ 4,849,129	\$ 527,720	\$ 181,646	\$ 709,366	\$ 5,558,496
	Total	\$ 9,471,054	\$ 6,960,207	\$ 112,569,343	\$ 12,691,225	\$ 141,691,829	\$ 10,554,403	\$ 5,583,002	\$ 16,137,405	\$ 157,829,233
Grand Total % (Residential, C&I and Municipal)	Internal Admin	3.4%	6.6%	1.0%	4.9%	1.8%	3.4%	5.9%	4.3%	2.0%
	External Admin	0.2%	1.6%	0.1%	1.1%	0.3%	0.2%	0.7%	0.4%	0.3%
	Rebate/Services	80.5%	70.0%	87.1%	80.5%	85.2%	81.6%	84.7%	82.7%	85.0%
	Implementation Services	6.1%	13.7%	5.6%	7.2%	6.1%	6.1%	3.3%	5.1%	6.0%
	Marketing	3.9%	3.0%	3.3%	1.9%	3.2%	3.7%	2.1%	3.2%	3.2%
	EM&V	5.9%	5.1%	3.0%	4.5%	3.4%	5.0%	3.3%	4.4%	3.5%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021-2023 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Home Energy Assistance	Internal Admin	\$ 155,098	\$ 172,767	\$ 708,429	\$ 380,231	\$ 1,416,524	\$ 154,114	\$ 154,272	\$ 308,386	\$ 1,724,910
	External Admin	\$ 9,915	\$ 87,257	\$ 59,915	\$ 195,967	\$ 353,054	\$ 9,890	\$ 32,669	\$ 42,560	\$ 395,614
	Rebate/Services	\$ 4,072,171	\$ 3,229,334	\$ 46,326,522	\$ 4,698,897	\$ 58,326,923	\$ 4,063,347	\$ 1,790,785	\$ 5,854,132	\$ 64,181,055
	Implementation Services	\$ 288,948	\$ 460,073	\$ 3,514,513	\$ 513,278	\$ 4,776,812	\$ 287,635	\$ 91,205	\$ 378,840	\$ 5,155,651
	Marketing	\$ 183,425	\$ 119,203	\$ 1,798,575	\$ 125,000	\$ 2,226,203	\$ 182,973	\$ 47,988	\$ 230,961	\$ 2,457,164
	EM&V	\$ 247,871	\$ 187,316	\$ 2,094,331	\$ 225,000	\$ 2,754,518	\$ 247,261	\$ 74,000	\$ 321,261	\$ 3,075,779
	Total	\$ 4,957,427	\$ 4,255,950	\$ 54,502,285	\$ 6,138,372	\$ 69,854,034	\$ 4,945,220	\$ 2,190,919	\$ 7,136,139	\$ 76,990,173
HP w/EnergyStar®	Internal Admin	\$ 57,254	\$ 167,422	\$ 277,927	\$ 191,000	\$ 693,603	\$ 124,084	\$ 92,000	\$ 216,084	\$ 909,687
	External Admin	\$ 3,642	\$ 48,019	\$ 23,506	\$ 5,950	\$ 81,116	\$ 7,955	\$ 10,000	\$ 17,955	\$ 99,072
	Rebate/Services	\$ 1,495,150	\$ 2,931,966	\$ 18,359,061	\$ 1,195,470	\$ 23,981,647	\$ 3,268,096	\$ 674,288	\$ 3,942,385	\$ 27,924,031
	Implementation Services	\$ 106,418	\$ 344,207	\$ 1,346,212	\$ 360,000	\$ 2,156,836	\$ 231,481	\$ 28,000	\$ 259,481	\$ 2,416,318
	Marketing	\$ 67,373	\$ 111,359	\$ 706,397	\$ 65,000	\$ 950,128	\$ 147,174	\$ 26,500	\$ 173,674	\$ 1,123,802
	EM&V	\$ 91,044	\$ 185,444	\$ 842,733	\$ 80,000	\$ 1,199,221	\$ 198,884	\$ 32,000	\$ 230,884	\$ 1,430,105
	Total	\$ 1,820,881	\$ 3,788,415	\$ 21,555,834	\$ 1,897,420	\$ 29,062,551	\$ 3,977,675	\$ 862,788	\$ 4,840,463	\$ 33,903,014
EnergyStar® Homes	Internal Admin	\$ 28,846	\$ 143,548	\$ 86,236	\$ 113,000	\$ 371,631	\$ 108,684	\$ 98,000	\$ 206,684	\$ 578,315
	External Admin	\$ 1,848	\$ 46,055	\$ 7,293	\$ 19,000	\$ 74,196	\$ 6,966	\$ 11,000	\$ 17,966	\$ 92,162
	Rebate/Services	\$ 759,102	\$ 1,373,229	\$ 5,649,673	\$ 803,054	\$ 8,585,058	\$ 2,861,696	\$ 1,052,467	\$ 3,914,163	\$ 12,499,221
	Implementation Services	\$ 53,794	\$ 309,852	\$ 417,997	\$ 141,750	\$ 923,393	\$ 202,728	\$ 36,500	\$ 239,228	\$ 1,162,621
	Marketing	\$ 34,187	\$ 60,788	\$ 219,175	\$ 41,000	\$ 355,150	\$ 128,875	\$ 33,000	\$ 161,875	\$ 517,025
	EM&V	\$ 46,199	\$ 102,492	\$ 261,303	\$ 135,000	\$ 544,994	\$ 174,155	\$ 48,000	\$ 222,155	\$ 767,149
	Total	\$ 923,976	\$ 2,035,965	\$ 6,641,678	\$ 1,252,804	\$ 10,854,423	\$ 3,483,104	\$ 1,278,967	\$ 4,762,071	\$ 15,616,493
Energy Star® Products	Internal Admin	\$ 81,764	\$ 290,448	\$ 270,522	\$ 181,000	\$ 823,734	\$ 97,159	\$ 96,000	\$ 193,159	\$ 1,016,893
	External Admin	\$ 5,301	\$ 77,123	\$ 22,879	\$ 5,100	\$ 110,403	\$ 6,245	\$ 8,075	\$ 14,320	\$ 124,723
	Rebate/Services	\$ 2,179,453	\$ 2,456,123	\$ 17,781,651	\$ 3,699,029	\$ 26,116,257	\$ 2,565,993	\$ 1,508,835	\$ 4,074,828	\$ 30,191,085
	Implementation Services	\$ 153,326	\$ 517,418	\$ 1,262,165	\$ 171,000	\$ 2,103,909	\$ 181,467	\$ 40,000	\$ 221,467	\$ 2,325,376
	Marketing	\$ 98,066	\$ 108,675	\$ 832,018	\$ 114,500	\$ 1,153,259	\$ 115,533	\$ 60,000	\$ 175,533	\$ 1,328,792
	EM&V	\$ 132,522	\$ 180,142	\$ 857,525	\$ 150,000	\$ 1,320,189	\$ 156,126	\$ 71,250	\$ 227,376	\$ 1,547,565
	Total	\$ 2,650,432	\$ 3,629,929	\$ 21,026,760	\$ 4,320,629	\$ 31,627,751	\$ 3,122,524	\$ 1,784,160	\$ 4,906,684	\$ 36,534,435

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021-2023 UTILITY BUDGETS BY ACTIVITY**  
**Residential Programs (Continued)**

Description	Electric Utilities					Gas Utilities			Grand Total	
	Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas		
Other*	Internal Admin	\$ 24,585	\$ 21,294	\$ 32,873	\$ 45,700	\$ 124,452	\$ 54,653	\$ 12,000	\$ 66,653	\$ 191,105
	External Admin	\$ 1,420	\$ -	\$ 2,780	\$ 17,750	\$ 21,951	\$ 3,558	\$ 9,000	\$ 12,558	\$ 34,509
	Rebate/Services	\$ 583,700	\$ 50,000	\$ 2,150,255	\$ 746,682	\$ 3,530,636	\$ 1,470,153	\$ 121,700	\$ 1,591,853	\$ 5,122,489
	Implementation Services	\$ 45,933	\$ 36,541	\$ 162,618	\$ 157,000	\$ 402,092	\$ 102,683	\$ 20,260	\$ 122,943	\$ 525,035
	Marketing	\$ 26,279	\$ 3,297	\$ 91,452	\$ 11,050	\$ 132,078	\$ 58,916	\$ 24,840	\$ 83,756	\$ 215,834
	EM&V	\$ 108,737	\$ 17,058	\$ 132,103	\$ 79,000	\$ 336,899	\$ 88,945	\$ 7,750	\$ 96,695	\$ 433,594
	Total	\$ 790,654	\$ 128,191	\$ 2,572,081	\$ 1,057,182	\$ 4,548,107	\$ 1,778,908	\$ 195,550	\$ 1,974,458	\$ 6,522,565
Total Residential	Internal Admin	\$ 347,547	\$ 795,479	\$ 1,375,986	\$ 910,931	\$ 3,429,943	\$ 538,694	\$ 452,272	\$ 990,966	\$ 4,420,909
	External Admin	\$ 22,126	\$ 258,454	\$ 116,374	\$ 243,767	\$ 640,720	\$ 34,615	\$ 70,744	\$ 105,359	\$ 746,080
	Rebate/Services	\$ 9,089,576	\$ 10,040,652	\$ 90,267,161	\$ 11,143,132	\$ 120,540,521	\$ 14,229,285	\$ 5,148,075	\$ 19,377,360	\$ 139,917,881
	Implementation Services	\$ 648,418	\$ 1,668,090	\$ 6,703,505	\$ 1,343,028	\$ 10,363,042	\$ 1,005,994	\$ 215,965	\$ 1,221,959	\$ 11,585,002
	Marketing	\$ 409,330	\$ 403,322	\$ 3,647,617	\$ 356,550	\$ 4,816,818	\$ 633,471	\$ 192,328	\$ 825,799	\$ 5,642,617
	EM&V	\$ 626,373	\$ 672,453	\$ 4,187,995	\$ 669,000	\$ 6,155,821	\$ 865,372	\$ 233,000	\$ 1,098,372	\$ 7,254,192
	Total	\$ 11,143,370	\$ 13,838,450	\$ 106,298,638	\$ 14,666,407	\$ 145,946,865	\$ 17,307,431	\$ 6,312,385	\$ 23,619,816	\$ 169,566,681
Total %	Internal Admin	3.1%	5.7%	1.3%	6.2%	2.4%	3.1%	7.2%	4.2%	2.6%
	External Admin	0.2%	1.9%	0.1%	1.7%	0.4%	0.2%	1.1%	0.4%	0.4%
	Rebate/Services	81.6%	72.6%	84.9%	76.0%	82.6%	82.2%	81.6%	82.0%	82.5%
	Implementation Services	5.8%	12.1%	6.3%	9.2%	7.1%	5.8%	3.4%	5.2%	6.8%
	Marketing	3.7%	2.9%	3.4%	2.4%	3.3%	3.7%	3.0%	3.5%	3.3%
	EM&V	5.6%	4.9%	3.9%	4.6%	4.2%	5.0%	3.7%	4.7%	4.3%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021-2023 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Programs**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Large Business Energy Solutions	Internal Admin	\$ 199,169	\$ 217,700	\$ 757,736	\$ 335,000	\$ 1,509,606	\$ 187,868	\$ 274,000	\$ 461,868	\$ 1,971,473
	External Admin	\$ 12,692	\$ 38,879	\$ 64,085	\$ 37,000	\$ 152,657	\$ 12,045	\$ 12,000	\$ 24,045	\$ 176,702
	Rebate/Services	\$ 5,211,589	\$ 2,113,744	\$ 76,332,147	\$ 8,304,309	\$ 91,961,788	\$ 4,948,027	\$ 3,472,140	\$ 8,420,167	\$ 100,381,955
	Implementation Services	\$ 370,513	\$ 515,641	\$ 3,420,849	\$ 440,000	\$ 4,747,003	\$ 350,471	\$ 166,015	\$ 516,487	\$ 5,263,490
	Marketing	\$ 234,805	\$ 102,966	\$ 2,861,592	\$ 100,000	\$ 3,299,363	\$ 222,827	\$ 60,000	\$ 282,827	\$ 3,582,190
	EM&V	\$ 317,304	\$ 150,422	\$ 3,278,512	\$ 320,000	\$ 4,066,237	\$ 301,118	\$ 154,196	\$ 455,314	\$ 4,521,551
	<b>Total</b>	<b>\$ 6,346,071</b>	<b>\$ 3,139,353</b>	<b>\$ 86,714,921</b>	<b>\$ 9,536,309</b>	<b>\$ 105,736,654</b>	<b>\$ 6,022,356</b>	<b>\$ 4,138,351</b>	<b>\$ 10,160,707</b>	<b>\$ 115,897,361</b>
Small Business Energy Solutions	Internal Admin	\$ 160,975	\$ 234,446	\$ 467,312	\$ 330,000	\$ 1,192,733	\$ 173,647	\$ 166,039	\$ 339,685	\$ 1,532,418
	External Admin	\$ 10,274	\$ 38,878	\$ 39,523	\$ 60,000	\$ 148,675	\$ 11,113	\$ 12,300	\$ 23,413	\$ 172,088
	Rebate/Services	\$ 4,219,177	\$ 2,396,621	\$ 46,362,626	\$ 5,802,273	\$ 58,780,697	\$ 4,564,671	\$ 1,848,224	\$ 6,412,896	\$ 65,193,593
	Implementation Services	\$ 299,675	\$ 539,214	\$ 2,059,387	\$ 370,000	\$ 3,268,277	\$ 323,673	\$ 95,000	\$ 418,673	\$ 3,686,949
	Marketing	\$ 190,070	\$ 103,164	\$ 1,739,384	\$ 100,000	\$ 2,132,617	\$ 205,591	\$ 42,238	\$ 247,829	\$ 2,380,446
	EM&V	\$ 256,851	\$ 148,118	\$ 2,040,360	\$ 280,000	\$ 2,725,330	\$ 277,826	\$ 90,200	\$ 368,026	\$ 3,093,356
	<b>Total</b>	<b>\$ 5,137,022</b>	<b>\$ 3,460,442</b>	<b>\$ 52,708,591</b>	<b>\$ 6,942,273</b>	<b>\$ 68,248,328</b>	<b>\$ 5,556,521</b>	<b>\$ 2,254,001</b>	<b>\$ 7,810,522</b>	<b>\$ 76,058,851</b>
Municipal	Internal Admin	\$ 16,515	\$ 50,239	\$ 38,394	\$ 37,000	\$ 142,149	\$ -	\$ -	\$ -	\$ 142,149
	External Admin	\$ 1,066	\$ 18,277	\$ 3,247	\$ -	\$ 22,590	\$ -	\$ -	\$ -	\$ 22,590
	Rebate/Services	\$ 437,922	\$ 268,471	\$ 3,721,850	\$ 450,000	\$ 4,878,244	\$ -	\$ -	\$ -	\$ 4,878,244
	Implementation Services	\$ 30,900	\$ 70,719	\$ 163,133	\$ 77,200	\$ 341,952	\$ -	\$ -	\$ -	\$ 341,952
	Marketing	\$ 19,712	\$ 14,241	\$ 139,781	\$ 21,000	\$ 194,734	\$ -	\$ -	\$ -	\$ 194,734
	EM&V	\$ 26,638	\$ 68,007	\$ 169,390	\$ 28,000	\$ 292,034	\$ -	\$ -	\$ -	\$ 292,034
	<b>Total</b>	<b>\$ 532,752</b>	<b>\$ 489,954</b>	<b>\$ 4,235,796</b>	<b>\$ 613,200</b>	<b>\$ 5,871,702</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 5,871,702</b>
Other*	Internal Admin	\$ 49,064	\$ 25,628	\$ 193,592	\$ 36,100	\$ 304,383	\$ 6,342	\$ -	\$ 6,342	\$ 310,726
	External Admin	\$ 2,778	\$ -	\$ 16,373	\$ 33,600	\$ 52,751	\$ 406	\$ -	\$ 406	\$ 53,158
	Rebate/Services	\$ 1,077,465	\$ 50,000	\$ 19,884,096	\$ 365,000	\$ 21,376,560	\$ 166,917	\$ 68,500	\$ 235,417	\$ 21,611,977
	Implementation Services	\$ 90,720	\$ 51,541	\$ 891,700	\$ 189,406	\$ 1,223,368	\$ 11,828	\$ 19,550	\$ 31,378	\$ 1,254,746
	Marketing	\$ 113,738	\$ 3,988	\$ 739,090	\$ 24,750	\$ 881,566	\$ 7,517	\$ -	\$ 7,517	\$ 889,083
	EM&V	\$ 214,974	\$ 33,795	\$ 828,626	\$ 109,000	\$ 1,186,395	\$ 10,158	\$ -	\$ 10,158	\$ 1,196,553
	<b>Total</b>	<b>\$ 1,548,739</b>	<b>\$ 164,953</b>	<b>\$ 22,553,476</b>	<b>\$ 757,856</b>	<b>\$ 25,025,024</b>	<b>\$ 203,169</b>	<b>\$ 88,050</b>	<b>\$ 291,219</b>	<b>\$ 25,316,243</b>

\* Other includes company-specific programs, education, forward capacity market administration and loan program administration.

**NHSAVES ENERGY EFFICIENCY PROGRAM - 2021-2023 UTILITY BUDGETS BY ACTIVITY**  
**C&I and Municipal Program Total and Grand Total (Residential, C&I and Municipal)**

		Electric Utilities					Gas Utilities			Grand Total
		Liberty	NHEC	Eversource	Unitil	Sub-total Electric	Liberty	Unitil	Sub-total Gas	
Total C&I and Municipal	Internal Admin	\$ 425,723	\$ 528,013	\$ 1,457,034	\$ 738,100	\$ 3,148,871	\$ 367,857	\$ 440,039	\$ 807,896	\$ 3,956,766
	External Admin	\$ 26,810	\$ 96,035	\$ 123,229	\$ 130,600	\$ 376,673	\$ 23,564	\$ 24,300	\$ 47,864	\$ 424,537
	Rebate/Services	\$ 10,946,152	\$ 4,828,836	\$ 146,300,718	\$ 14,921,582	\$ 176,997,289	\$ 9,679,615	\$ 5,388,864	\$ 15,068,479	\$ 192,065,769
	Implementation Services	\$ 791,808	\$ 1,177,116	\$ 6,535,069	\$ 1,076,606	\$ 9,580,599	\$ 685,972	\$ 280,565	\$ 966,537	\$ 10,547,136
	Marketing	\$ 558,324	\$ 224,358	\$ 5,479,847	\$ 245,750	\$ 6,508,280	\$ 435,936	\$ 102,238	\$ 538,174	\$ 7,046,454
	EM&V	\$ 815,766	\$ 400,342	\$ 6,316,888	\$ 737,000	\$ 8,269,996	\$ 589,102	\$ 244,396	\$ 833,498	\$ 9,103,494
	Total	\$ 13,564,584	\$ 7,254,701	\$ 166,212,785	\$ 17,849,638	\$ 204,881,708	\$ 11,782,046	\$ 6,480,402	\$ 18,262,448	\$ 223,144,156
Total C&I and Municipal %	Internal Admin	3.1%	7.3%	0.9%	4.1%	1.5%	3.1%	6.8%	4.4%	1.8%
	External Admin	0.2%	1.3%	0.1%	0.7%	0.2%	0.2%	0.4%	0.3%	0.2%
	Rebate/Services	80.7%	66.6%	88.0%	83.6%	86.4%	82.2%	83.2%	82.5%	86.1%
	Implementation Services	5.8%	16.2%	3.9%	6.0%	4.7%	5.8%	4.3%	5.3%	4.7%
	Marketing	4.1%	3.1%	3.3%	1.4%	3.2%	3.7%	1.6%	2.9%	3.2%
	EM&V	6.0%	5.5%	3.8%	4.1%	4.0%	5.0%	3.8%	4.6%	4.1%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Grand Total (Residential, C&I and Municipal)	Internal Admin	\$ 773,271	\$ 1,323,492	\$ 2,833,020	\$ 1,649,031	\$ 6,578,814	\$ 906,551	\$ 892,311	\$ 1,798,862	\$ 8,377,675
	External Admin	\$ 48,936	\$ 354,488	\$ 239,603	\$ 374,367	\$ 1,017,393	\$ 58,179	\$ 95,044	\$ 153,223	\$ 1,170,617
	Rebate/Services	\$ 20,035,728	\$ 14,869,489	\$ 236,567,879	\$ 26,064,714	\$ 297,537,810	\$ 23,908,900	\$ 10,536,940	\$ 34,445,840	\$ 331,983,650
	Implementation Services	\$ 1,440,226	\$ 2,845,206	\$ 13,238,574	\$ 2,419,634	\$ 19,943,641	\$ 1,691,966	\$ 496,530	\$ 2,188,497	\$ 22,132,138
	Marketing	\$ 967,654	\$ 627,680	\$ 9,127,464	\$ 602,300	\$ 11,325,098	\$ 1,069,407	\$ 294,566	\$ 1,363,973	\$ 12,689,071
	EM&V	\$ 1,442,139	\$ 1,072,795	\$ 10,504,882	\$ 1,406,000	\$ 14,425,816	\$ 1,454,474	\$ 477,396	\$ 1,931,870	\$ 16,357,686
	Total	\$ 24,707,954	\$ 21,093,151	\$ 272,511,423	\$ 32,516,045	\$ 350,828,573	\$ 29,089,477	\$ 12,792,787	\$ 41,882,264	\$ 392,710,834
Grand Total % (Residential, C&I and Municipal)	Internal Admin	3.1%	6.3%	1.0%	5.1%	1.9%	3.1%	7.0%	4.3%	2.1%
	External Admin	0.2%	1.7%	0.1%	1.2%	0.3%	0.2%	0.7%	0.4%	0.3%
	Rebate/Services	81.1%	70.5%	86.8%	80.2%	84.8%	82.2%	82.4%	82.2%	84.5%
	Implementation Services	5.8%	13.5%	4.9%	7.4%	5.7%	5.8%	3.9%	5.2%	5.6%
	Marketing	3.9%	3.0%	3.3%	1.9%	3.2%	3.7%	2.3%	3.3%	3.2%
	EM&V	5.8%	5.1%	3.9%	4.3%	4.1%	5.0%	3.7%	4.6%	4.2%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**NHSAVES ELECTRIC PROGRAMS - 2021 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	293	5,975,636	90	1,882,243	1,466	26,183,626	124	2,534,459	1,974	36,575,964
B/C Ratio <sup>1</sup> / Planned Budget	2.45	\$1,421,776	1.25	\$1,401,044	1.97	\$14,095,653	1.79	\$1,637,476	1.94	\$18,555,949
/ Lifetime MMBtu Savings		42,528		47,147		709,300		68,015		866,991
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	50	1,209,514	166	3,316,751	2,824	14,098,218	54	1,252,595	3,094	19,877,078
B/C Ratio <sup>1</sup> / Planned Budget	1.82	\$457,221	2.64	\$1,122,087	3.53	\$6,517,675	1.80	\$510,435	3.22	\$8,607,418
/ Lifetime MMBtu Savings		26,957		102,874		828,962		27,622		986,416
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	60	2,600,397	100	7,779,914	517	26,394,738	120	1,464,811	797	38,239,860
B/C Ratio <sup>1</sup> / Planned Budget	6.19	\$270,354	6.64	\$670,122	4.54	\$1,997,598	3.23	\$432,655	4.92	\$3,370,729
/ Lifetime MMBtu Savings		47,096		121,188		227,506		39,310		435,100
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	28,290	12,445,042	51,969	18,370,946	300,151	90,536,207	61,666	19,705,566	442,076	141,057,761
B/C Ratio <sup>1</sup> / Planned Budget	1.55	\$948,100	1.70	\$1,497,232	1.55	\$7,973,060	2.30	\$1,512,964	1.66	\$11,931,356
/ Lifetime MMBtu Savings		1,667		5,939		49,045		35,182		91,834
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	235	70,814,653	31	38,770,202	1,361	694,223,072	184	72,746,685	1,811	876,554,611
B/C Ratio <sup>1</sup> / Planned Budget	4.01	\$1,708,986	1.79	\$996,188	3.68	\$19,975,807	2.01	\$2,257,665	3.47	\$24,938,645
/ Lifetime MMBtu Savings		0		0		0		1,074		1,074
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	318	59,028,227	210	34,557,910	5,130	432,850,927	448	52,467,187	6,106	578,904,251
B/C Ratio <sup>1</sup> / Planned Budget	4.31	\$1,439,054	3.07	\$1,036,092	3.16	\$13,821,124	2.31	\$1,959,838	3.15	\$18,256,109
/ Lifetime MMBtu Savings		0		0		313		2,031		2,343
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	94	5,108,213	15	2,129,149	108	37,868,000	11	7,328,571	227	52,433,933
B/C Ratio <sup>1</sup> / Planned Budget	2.42	\$177,584	1.77	\$163,318	3.61	\$1,409,956	5.41	\$204,700	3.54	\$1,955,558
/ Lifetime MMBtu Savings		1,104		3,170		70,653		2,500		77,427
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$72,760	0	\$92,869	0	\$385,680	0	\$84,450	0	\$635,758
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	10,290	796	0	0	1,625	59,250	22,844	1,749	34,759	61,795
/ Planned Budget		\$533,864		\$20,000		\$4,268,667		\$469,933		\$5,292,464
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$5,432	0	\$33,043	0	\$0	0	\$38,475
<b>Utility Performance Incentive</b>										
Planned Budget		\$386,633		\$384,942		\$3,874,487		\$498,856		\$5,144,919
<b>TOTAL PLANNED BUDGET</b>		<b>\$7,416,333</b>		<b>\$7,389,327</b>		<b>\$74,352,749</b>		<b>\$9,568,971</b>		<b>\$98,727,380</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS**  
**SBC<sup>1</sup> and RGGI Funding Allocation**  
**2021 Budget**

**Program Allocation Summary**

Program	RGGI	SBC <sup>1</sup>	TOTAL
<b>HEA<sup>2</sup></b>			
Liberty	2.94355%	97.05645%	100.00000%
NHEC	2.54110%	97.45890%	100.00000%
Eversource	2.53744%	97.46256%	100.00000%
Unitil	3.28140%	96.71860%	100.00000%
<b>Municipal</b>			
Liberty	100.00000%	0.00000%	100.00000%
NHEC	100.00000%	0.00000%	100.00000%
Eversource	100.00000%	0.00000%	100.00000%
Unitil	100.00000%	0.00000%	100.00000%

A	B	C	D
Utility	HEA Budget	RGGI HEA <sup>3</sup>	SBC HEA <sup>4</sup>
Liberty	\$ 1,421,776	\$41,851	\$1,379,926
NHEC	\$ 1,401,044	\$35,602	\$1,365,442
Eversource	\$ 14,095,653	\$357,669	\$13,737,983
Unitil	\$ 1,637,476	\$53,732	\$1,583,744
Total	\$ 18,555,949	\$488,854	\$18,067,095

Notes:

<sup>1</sup> SBC = System Benefits Charge, Forward Capacity Market and Carryforward/Interest

<sup>2</sup> HEA Allocation

RGGI HEA = RGGI HEA (C) /Total HEA Funds (B)

SBC HEA = SBC HEA (D) /Total HEA Funds (B)

<sup>3</sup> 17.0% of Total RGGI Funds including SB 268 funding less RGGI HEA Performance Incentive

<sup>4</sup> SBC HEA = Utility's total HEA program budget (B) less RGGI HEA (C)

**NHSAVES ELECTRIC PROGRAMS - 2021 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

(System Benefits Charge, Forward Capacity Market and Interest Funds Only)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	285	5,799,740	88	1,834,413	1,429	25,519,231	120	2,451,294	1,922	35,604,678
B/C Ratio <sup>1</sup> / Planned Budget	2.45	\$1,379,926	1.25	\$1,365,442	1.97	\$13,737,983	1.79	\$1,583,744	1.94	\$18,067,095
/ Lifetime MMBtu Savings		41,276		45,949		691,302		65,783		844,311
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	50	1,209,514	166	3,316,751	2,824	14,098,218	54	1,252,595	3,094	19,877,078
B/C Ratio <sup>1</sup> / Planned Budget	1.82	\$457,221	2.64	\$1,122,087	3.53	\$6,517,675	1.80	\$510,435	3.22	\$8,607,418
/ Lifetime MMBtu Savings		26,957		102,874		828,962		27,622		986,416
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	60	2,600,397	100	7,779,914	517	26,394,738	120	1,464,811	797	38,239,860
B/C Ratio <sup>1</sup> / Planned Budget	6.19	\$270,354	6.64	\$670,122	4.54	\$1,997,598	3.23	\$432,655	4.92	\$3,370,729
/ Lifetime MMBtu Savings		47,096		121,188		227,506		39,310		435,100
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	28,290	12,445,042	51,969	18,370,946	300,151	90,536,207	61,666	19,705,566	442,076	141,057,761
B/C Ratio <sup>1</sup> / Planned Budget	1.55	\$948,100	1.70	\$1,497,232	1.55	\$7,973,060	2.30	\$1,512,964	1.66	\$11,931,356
/ Lifetime MMBtu Savings		1,667		5,939		49,045		35,182		91,834
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	235	70,814,653	31	38,770,202	1,361	694,223,072	184	72,746,685	1,811	876,554,611
B/C Ratio <sup>1</sup> / Planned Budget	4.01	\$1,708,986	1.79	\$996,188	3.68	\$19,975,807	2.01	\$2,257,665	3.47	\$24,938,645
/ Lifetime MMBtu Savings		0		0		0		1,074		1,074
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	318	59,028,227	210	34,557,910	5,130	432,850,927	448	52,467,187	6,106	578,904,251
B/C Ratio <sup>1</sup> / Planned Budget	4.31	\$1,439,054	3.07	\$1,036,092	3.16	\$13,821,124	2.31	\$1,959,838	3.15	\$18,256,109
/ Lifetime MMBtu Savings		0		0		313		2,031		2,343
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	0	0	0	0	0	0	0	0	0	0
B/C Ratio <sup>1</sup> / Planned Budget	2.42	\$0	1.77	\$0	3.61	\$0	5.41	\$0	3.54	\$0
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$72,760	0	\$92,869	0	\$385,680	0	\$84,450	0	\$635,758
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	10,290	796	0	0	1,625	59,250	22,844	1,749	34,759	61,795
/ Planned Budget		\$533,864		\$20,000		\$4,268,667		\$469,933		\$5,292,464
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$5,432	0	\$33,043	0	\$0	0	\$38,475
<b>Utility Performance Incentive</b>										
Planned Budget		\$374,565		\$374,002		\$3,777,268		\$484,643		\$5,010,477
<b>TOTAL PLANNED BUDGET</b>		<b>\$7,184,829</b>		<b>\$7,179,467</b>		<b>\$72,487,905</b>		<b>\$9,296,325</b>		<b>\$96,148,526</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS - 2021 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**  
 (Energy Efficiency Fund Only - Regional Greenhouse Gas Initiative)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	9	175,896	2	47,830	37	664,395	4	83,166	52	971,286
B/C Ratio <sup>1</sup> / Planned Budget	2.45	\$41,851	1.25	\$35,602	1.97	\$357,669	1.79	\$53,732	1.94	\$488,854
/ Lifetime MMBtu Savings		1,252		1,198		17,998		2,232		22,680
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	94	5,108,213	15	2,129,149	108	37,868,000	11	7,328,571	227	52,433,933
B/C Ratio <sup>1</sup> / Planned Budget	2.42	\$177,584	1.77	\$163,318	3.61	\$1,409,956	5.41	\$204,700	3.54	\$1,955,558
/ Lifetime MMBtu Savings		1,104		3,170		70,653		2,500		77,427
<b>Educational Programs</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
/ Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Utility Performance Incentive</b>										
Planned Budget		\$12,069		\$10,941		\$97,219		\$14,214		\$134,443
<b>TOTAL PLANNED BUDGET</b>		<b>\$231,504</b>		<b>\$209,861</b>		<b>\$1,864,844</b>		<b>\$272,646</b>		<b>\$2,578,854</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES GAS PROGRAMS - 2021 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets and Lifetime MMBtu Savings**

	Liberty		Unitil		Total	
<b>Home Energy Assistance</b>						
Number of Units / Lifetime MMBtu Savings	369	154,909	84	52,284	453	207,193
B/C Ratio <sup>1</sup> / Planned Budget	1.08	\$1,523,570	1.70	\$542,705	1.24	\$2,066,275
<b>Home Performance w/ENERGY STAR</b>						
Number of Participants / Lifetime MMBtu Savings	768	200,162	75	29,706	843	229,868
B/C Ratio <sup>1</sup> / Planned Budget	1.70	\$1,205,798	1.29	\$242,330	1.63	\$1,448,128
<b>ENERGY STAR Homes</b>						
Number of Homes / Lifetime MMBtu Savings	98	111,642	100	66,928	198	178,569
B/C Ratio <sup>1</sup> / Planned Budget	1.07	\$1,039,306	2.17	\$307,438	1.32	\$1,346,744
<b>ENERGY STAR Products</b>						
Number of Participants / Lifetime MMBtu Savings	1,623	187,594	9,593	109,021	11,216	296,615
B/C Ratio <sup>1</sup> / Planned Budget	1.92	\$975,798	2.19	\$488,013	2.01	\$1,463,811
/ Lifetime kWh Savings		407,870		-65,360		342,510
<b>Large Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	207	913,272	84	281,808	291	1,195,081
B/C Ratio <sup>1</sup> / Planned Budget	4.55	\$1,818,540	2.90	\$867,149	4.02	\$2,685,689
<b>Small Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	1,080	453,389	131	121,478	1,211	574,867
B/C Ratio <sup>1</sup> / Planned Budget	2.63	\$1,633,120	2.09	\$537,546	2.50	\$2,170,666
<b>Education</b>						
/ Planned Budget		\$120,774		\$52,350		\$173,124
<b>Company Specific Programs</b>						
Number of Participants / Lifetime MMBtu Savings	63,000	18,169	9,100	3,222	72,100	21,391
/ Planned Budget		\$645,250		\$38,800		\$684,050
<b>Utility Performance Incentive</b>						
Planned Budget		\$492,919		\$169,198		\$662,117
<b>Total Program Expenses</b>		<b>\$9,455,075</b>		<b>\$3,245,530</b>		<b>\$12,700,605</b>

**NHSAVES ELECTRIC PROGRAMS - 2022 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	331	6,737,431	102	1,644,926	1,930	34,240,472	168	2,533,049	2,531	45,155,878
B/C Ratio <sup>1</sup> / Planned Budget	2.53	\$1,641,440	1.41	\$1,434,927	2.17	\$17,892,764	2.04	\$2,055,898	2.14	\$23,025,028
/ Lifetime MMBtu Savings		48,639		51,767		933,752		94,137		1,128,295
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	69	1,672,842	174	3,475,049	2,824	14,632,665	65	1,480,185	3,132	21,260,740
B/C Ratio <sup>1</sup> / Planned Budget	1.91	\$637,438	2.64	\$1,255,404	3.45	\$7,169,966	2.20	\$634,020	3.16	\$9,696,828
/ Lifetime MMBtu Savings		36,559		107,369		829,077		39,619		1,012,624
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	70	3,033,776	100	7,779,914	569	29,034,212	25	1,659,590	764	41,507,492
B/C Ratio <sup>1</sup> / Planned Budget	6.61	\$315,594	7.01	\$678,473	4.82	\$2,210,065	3.21	\$401,256	5.21	\$3,605,389
/ Lifetime MMBtu Savings		54,945		121,188		250,257		33,563		459,952
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	18,758	12,769,818	28,368	14,372,330	161,169	86,343,615	42,495	19,877,068	250,791	133,362,831
B/C Ratio <sup>1</sup> / Planned Budget	1.76	\$887,266	1.89	\$1,174,707	1.81	\$6,726,086	2.82	\$1,442,810	1.96	\$10,230,869
/ Lifetime MMBtu Savings		1,667		5,939		60,725		43,978		112,309
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	276	81,531,276	31	38,891,501	1,479	906,858,499	170	96,979,077	1,957	1,124,260,353
B/C Ratio <sup>1</sup> / Planned Budget	3.67	\$2,114,464	1.77	\$1,068,615	3.66	\$27,754,795	1.84	\$3,080,856	3.44	\$34,018,730
/ Lifetime MMBtu Savings		0		0		0		1,239		1,239
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	380	65,617,498	240	39,647,058	4,875	520,275,066	356	51,975,661	5,851	677,515,283
B/C Ratio <sup>1</sup> / Planned Budget	3.42	\$1,683,002	3.18	\$1,247,525	3.00	\$18,268,026	1.85	\$2,321,317	2.92	\$23,519,869
/ Lifetime MMBtu Savings		0		0		391		1,538		1,929
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	93	5,049,262	15	1,882,927	105	37,026,500	11	6,310,000	224	50,268,690
B/C Ratio <sup>1</sup> / Planned Budget	2.52	\$177,584	1.73	\$163,318	3.77	\$1,411,687	5.30	\$202,500	3.64	\$1,955,089
/ Lifetime MMBtu Savings		1,104		3,170		70,653		5,000		79,927
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$93,100	0	\$100,181	0	\$520,315	0	\$103,900	0	\$817,496
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	10,307	1,153	0	0	2,439	96,600	22,911	2,087	35,656	99,840
/ Planned Budget		\$657,313		\$0		\$7,477,505		\$512,149		\$8,646,967
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$5,408	0	\$32,610	0	\$0	0	\$38,018
<b>Utility Performance Incentive</b>										
Planned Budget		\$451,396		\$391,773		\$4,918,716		\$591,509		\$6,353,395
<b>TOTAL PLANNED BUDGET</b>		<b>\$8,658,597</b>		<b>\$7,520,332</b>		<b>\$94,382,535</b>		<b>\$11,346,214</b>		<b>\$121,907,678</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS**  
**SBC<sup>1</sup> and RGGI Funding Allocation**  
**2022 Budget**

**Program Allocation Summary**

Program	RGGI	SBC <sup>1</sup>	TOTAL
<b>HEA<sup>2</sup></b>			
Liberty	2.44959%	97.55041%	100.00000%
NHEC	2.38374%	97.61626%	100.00000%
Eversource	1.92052%	98.07948%	100.00000%
Unitil	2.51101%	97.48899%	100.00000%
<b>Municipal</b>			
Liberty	100.00000%	0.00000%	100.00000%
NHEC	100.00000%	0.00000%	100.00000%
Eversource	100.00000%	0.00000%	100.00000%
Unitil	100.00000%	0.00000%	100.00000%

A	B	C	D
Utility	HEA Budget	RGGI HEA <sup>3</sup>	SBC HEA <sup>4</sup>
Liberty	\$ 1,641,440	\$40,209	\$1,601,231
NHEC	\$ 1,434,927	\$34,205	\$1,400,722
Eversource	\$ 17,892,764	\$343,635	\$17,549,129
Unitil	\$ 2,055,898	\$51,624	\$2,004,274
Total	\$ 23,025,028	\$469,672	\$22,555,356

Notes:

<sup>1</sup> SBC = System Benefits Charge, Forward Capacity Market and Carryforward/Interest

<sup>2</sup> HEA Allocation

RGGI HEA = RGGI HEA (C) /Total HEA Funds (B)

SBC HEA = SBC HEA (D) /Total HEA Funds (B)

<sup>3</sup> 17.0% of Total RGGI Funds including SB 268 funding less RGGI HEA Performance Incentive

<sup>4</sup> SBC HEA = Utility's total HEA program budget (B) less RGGI HEA (C)

**NHSAVES ELECTRIC PROGRAMS - 2022 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**  
 (System Benefits Charge, Forward Capacity Market and Interest Funds Only)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	323	6,572,392	100	1,605,715	1,893	33,582,875	164	2,469,444	2,480	44,230,426
B/C Ratio <sup>1</sup> / Planned Budget	2.53	\$1,601,231	1.41	\$1,400,722	2.17	\$17,549,129	2.04	\$2,004,274	2.14	\$22,555,356
/ Lifetime MMBtu Savings		47,447		50,533		915,819		91,774		1,105,573
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	69	1,672,842	174	3,475,049	2,824	14,632,665	65	1,480,185	3,132	21,260,740
B/C Ratio <sup>1</sup> / Planned Budget	1.91	\$637,438	2.64	\$1,255,404	3.45	\$7,169,966	2.20	\$634,020	3.16	\$9,696,828
/ Lifetime MMBtu Savings		36,559		107,369		829,077		39,619		1,012,624
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	70	3,033,776	100	7,779,914	569	29,034,212	25	1,659,590	764	41,507,492
B/C Ratio <sup>1</sup> / Planned Budget	6.61	\$315,594	7.01	\$678,473	4.82	\$2,210,065	3.21	\$401,256	5.21	\$3,605,389
/ Lifetime MMBtu Savings		54,945		121,188		250,257		33,563		459,952
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	18,758	12,769,818	28,368	14,372,330	161,169	86,343,615	42,495	19,877,068	250,791	133,362,831
B/C Ratio <sup>1</sup> / Planned Budget	1.76	\$887,266	1.89	\$1,174,707	1.81	\$6,726,086	2.82	\$1,442,810	1.96	\$10,230,869
/ Lifetime MMBtu Savings		1,667		5,939		60,725		43,978		112,309
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	276	81,531,276	31	38,891,501	1,479	906,858,499	170	96,979,077	1,957	1,124,260,353
B/C Ratio <sup>1</sup> / Planned Budget	3.67	\$2,114,464	1.77	\$1,068,615	3.66	\$27,754,795	1.84	\$3,080,856	3.44	\$34,018,730
/ Lifetime MMBtu Savings		0		0		0		1,239		1,239
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	380	65,617,498	240	39,647,058	4,875	520,275,066	356	51,975,661	5,851	677,515,283
B/C Ratio <sup>1</sup> / Planned Budget	3.42	\$1,683,002	3.18	\$1,247,525	3.00	\$18,268,026	1.85	\$2,321,317	2.92	\$23,519,869
/ Lifetime MMBtu Savings		0		0		391		1,538		1,929
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	0	0	0	0	0	0	0	0	0	0
B/C Ratio <sup>1</sup> / Planned Budget	2.52	\$0	1.73	\$0	3.77	\$0	5.30	\$0	3.64	\$0
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$93,100	0	\$100,181	0	\$520,315	0	\$103,900	0	\$817,496
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	10,307	1,153	0	0	2,439	96,600	22,911	2,087	35,656	99,840
/ Planned Budget		\$657,313		\$0		\$7,477,505		\$512,149		\$8,646,967
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$5,408	0	\$32,610	0	\$0	0	\$38,018
<b>Utility Performance Incentive</b>										
Planned Budget		\$439,417		\$380,910		\$4,822,174		\$577,532		\$6,220,033
<b>TOTAL PLANNED BUDGET</b>		<b>\$8,428,826</b>		<b>\$7,311,945</b>		<b>\$92,530,670</b>		<b>\$11,078,113</b>		<b>\$119,349,555</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS - 2022 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

(Energy Efficiency Fund Only - Regional Greenhouse Gas Initiative)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	8	165,039	2	39,211	37	657,596	4	63,605	52	925,452
B/C Ratio <sup>1</sup> / Planned Budget	2.53	\$40,209	1.41	\$34,205	2.17	\$343,635	2.04	\$51,624	2.14	\$469,672
/ Lifetime MMBtu Savings		1,191		1,234		17,933		2,364		22,722
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	93	5,049,262	15	1,882,927	105	37,026,500	11	6,310,000	224	50,268,690
B/C Ratio <sup>1</sup> / Planned Budget	2.52	\$177,584	1.73	\$163,318	3.77	\$1,411,687	5.30	\$202,500	3.64	\$1,955,089
/ Lifetime MMBtu Savings		1,104		3,170		70,653		5,000		79,927
<b>Educational Programs</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
/ Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Utility Performance Incentive</b>										
Planned Budget		\$11,979		\$10,864		\$96,543		\$13,977		\$133,362
<b>TOTAL PLANNED BUDGET</b>		<b>\$229,771</b>		<b>\$208,387</b>		<b>\$1,851,865</b>		<b>\$268,101</b>		<b>\$2,558,123</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES GAS PROGRAMS - 2022 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets and Lifetime MMBtu Savings**

	Liberty		Unitil		Total	
<b>Home Energy Assistance</b>						
Number of Units / Lifetime MMBtu Savings	385	164,504	105	66,078	490	230,583
B/C Ratio <sup>1</sup> / Planned Budget	1.14	\$1,627,400	1.64	\$728,650	1.29	\$2,356,050
<b>Home Performance w/ENERGY STAR</b>						
Number of Participants / Lifetime MMBtu Savings	802	217,262	85	32,524	887	249,787
B/C Ratio <sup>1</sup> / Planned Budget	1.81	\$1,307,350	1.24	\$293,474	1.71	\$1,600,824
<b>ENERGY STAR Homes</b>						
Number of Homes / Lifetime MMBtu Savings	116	137,202	140	93,175	256	230,377
B/C Ratio <sup>1</sup> / Planned Budget	1.24	\$1,168,578	2.33	\$423,477	1.53	\$1,592,055
<b>ENERGY STAR Products</b>						
Number of Participants / Lifetime MMBtu Savings	1,743	203,036	11,187	131,753	12,930	334,790
B/C Ratio <sup>1</sup> / Planned Budget	2.05	\$1,050,663	2.35	\$583,827	2.16	\$1,634,490
/ Lifetime kWh Savings		471,100		-73,530		397,570
<b>Large Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	218	1,005,446	167	438,084	385	1,443,530
B/C Ratio <sup>1</sup> / Planned Budget	4.87	\$1,993,675	3.13	\$1,340,791	4.17	\$3,334,466
<b>Small Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	1,127	498,467	160	149,164	1,287	647,631
B/C Ratio <sup>1</sup> / Planned Budget	2.74	\$1,825,469	2.21	\$664,884	2.59	\$2,490,353
<b>Education</b>						
/ Planned Budget		\$134,533		\$57,800		\$192,333
<b>Company Specific Programs</b>						
Number of Participants / Lifetime MMBtu Savings	63,000	45,025	9,100	4,178	72,100	49,203
/ Planned Budget		\$465,250		\$40,550		\$505,800
<b>Utility Performance Incentive</b>						
Planned Budget		\$526,510		\$227,340		\$753,850
<b>Total Program Expenses</b>		<b>\$10,099,428</b>		<b>\$4,360,794</b>		<b>\$14,460,222</b>

**NHSAVES ELECTRIC PROGRAMS - 2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	396	8,052,516	102	2,390,174	2,294	40,737,655	190	2,976,414	2,982	54,156,758
B/C Ratio <sup>1</sup> / Planned Budget	2.73	\$1,894,211	1.62	\$1,419,978	2.18	\$22,513,869	2.19	\$2,444,999	2.19	\$28,273,056
/ Lifetime MMBtu Savings		57,000		54,355		1,109,557		112,547		1,333,459
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	88	2,100,110	183	3,641,262	2,824	15,167,112	77	1,748,628	3,171	22,657,112
B/C Ratio <sup>1</sup> / Planned Budget	2.31	\$726,222	2.62	\$1,410,924	3.37	\$7,868,194	2.38	\$752,965	3.13	\$10,758,305
/ Lifetime MMBtu Savings		47,275		112,088		829,191		47,837		1,036,392
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	80	3,551,310	100	7,779,914	626	32,641,797	31	1,868,786	837	45,841,807
B/C Ratio <sup>1</sup> / Planned Budget	7.56	\$338,028	7.37	\$687,369	5.17	\$2,434,014	2.64	\$418,893	5.49	\$3,878,304
/ Lifetime MMBtu Savings		62,794		121,188		275,229		25,878		485,088
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	18,758	13,596,441	8,811	12,806,430	56,314	94,609,015	18,312	20,886,688	102,196	141,898,573
B/C Ratio <sup>1</sup> / Planned Budget	2.14	\$815,066	2.26	\$957,991	2.25	\$6,327,614	3.54	\$1,364,856	2.43	\$9,465,526
/ Lifetime MMBtu Savings		1,686		5,939		72,404		52,774		132,803
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	276	93,277,708	31	40,488,329	1,613	1,200,167,020	170	127,492,450	2,091	1,461,425,507
B/C Ratio <sup>1</sup> / Planned Budget	3.78	\$2,522,621	1.96	\$1,074,549	3.67	\$38,984,320	1.79	\$4,197,788	3.47	\$46,779,278
/ Lifetime MMBtu Savings		0		0		0		1,653		1,653
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	380	72,483,092	205	37,377,756	4,245	597,737,496	356	54,219,723	5,186	761,818,067
B/C Ratio <sup>1</sup> / Planned Budget	3.42	\$2,014,966	3.27	\$1,176,825	3.21	\$20,619,441	1.73	\$2,661,118	3.08	\$26,472,350
/ Lifetime MMBtu Savings		0		0		469		2,294		2,763
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	93	5,031,100	14	1,662,264	103	36,210,245	11	5,800,000	220	48,703,610
B/C Ratio <sup>1</sup> / Planned Budget	2.67	\$177,584	1.71	\$163,318	3.95	\$1,414,153	5.63	\$206,000	3.82	\$1,961,055
/ Lifetime MMBtu Savings		1,104		3,170		70,653		5,000		79,927
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$120,060	0	\$43,654	0	\$701,158	0	\$117,750	0	\$982,622
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	10,333	1,914	0	0	3,658	141,300	22,977	3,116	36,968	146,330
/ Planned Budget		\$862,296		\$20,600		\$11,674,366		\$526,856		\$13,084,118
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$5,000	0	\$32,214	0	\$0	0	\$37,214
<b>Utility Performance Incentive</b>										
Planned Budget		\$520,908		\$382,536		\$6,189,542		\$698,017		\$7,791,004
<b>TOTAL PLANNED BUDGET</b>		<b>\$9,991,962</b>		<b>\$7,342,743</b>		<b>\$118,758,885</b>		<b>\$13,389,243</b>		<b>\$149,482,833</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS**  
**SBC<sup>1</sup> and RGGI Funding Allocation**  
**2023 Budget**

**Program Allocation Summary**

Program	RGGI	SBC <sup>1</sup>	TOTAL
<b>HEA<sup>2</sup></b>			
Liberty	2.03600%	97.96400%	100.00000%
NHEC	2.31044%	97.68956%	100.00000%
Eversource	1.46398%	98.53602%	100.00000%
Unitil	2.02515%	97.97485%	100.00000%
<b>Municipal</b>			
Liberty	100.00000%	0.00000%	100.00000%
NHEC	100.00000%	0.00000%	100.00000%
Eversource	100.00000%	0.00000%	100.00000%
Unitil	100.00000%	0.00000%	100.00000%

A	B	C	D
Utility	HEA Budget	RGGI HEA <sup>3</sup>	SBC HEA <sup>4</sup>
Liberty	\$ 1,894,211	\$38,566	\$1,855,645
NHEC	\$ 1,419,978	\$32,808	\$1,387,170
Eversource	\$ 22,513,869	\$329,598	\$22,184,271
Unitil	\$ 2,444,999	\$49,515	\$2,395,484
Total	\$ 28,273,056	\$450,487	\$27,822,570

Notes:

<sup>1</sup> SBC = System Benefits Charge, Forward Capacity Market and Carryforward/Interest

<sup>2</sup> HEA Allocation

RGGI HEA = RGGI HEA (C) /Total HEA Funds (B)

SBC HEA = SBC HEA (D) /Total HEA Funds (B)

<sup>3</sup> 17.0% of Total RGGI Funds including SB 268 funding less RGGI HEA Performance Incentive

<sup>4</sup> SBC HEA = Utility's total HEA program budget (B) less RGGI HEA (C)

**NHSAVES ELECTRIC PROGRAMS - 2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

(System Benefits Charge, Forward Capacity Market and Interest Funds Only)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	388	7,888,566	100	2,334,950	2,260	40,141,265	186	2,916,137	2,934	53,280,919
B/C Ratio <sup>1</sup> / Planned Budget	2.73	\$1,855,645	1.62	\$1,387,170	2.18	\$22,184,271	2.19	\$2,395,484	2.19	\$27,822,570
/ Lifetime MMBtu Savings		55,840		53,099		1,093,314		110,267		1,312,520
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	88	2,100,110	183	3,641,262	2,824	15,167,112	77	1,748,628	3,171	22,657,112
B/C Ratio <sup>1</sup> / Planned Budget	2.31	\$726,222	2.62	\$1,410,924	3.37	\$7,868,194	2.38	\$752,965	3.13	\$10,758,305
/ Lifetime MMBtu Savings		47,275		112,088		829,191		47,837		1,036,392
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	80	3,551,310	100	7,779,914	626	32,641,797	31	1,868,786	837	45,841,807
B/C Ratio <sup>1</sup> / Planned Budget	7.56	\$338,028	7.37	\$687,369	5.17	\$2,434,014	2.64	\$418,893	5.49	\$3,878,304
/ Lifetime MMBtu Savings		62,794		121,188		275,229		25,878		485,088
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	18,758	13,596,441	8,811	12,806,430	56,314	94,609,015	18,312	20,886,688	102,196	141,898,573
B/C Ratio <sup>1</sup> / Planned Budget	2.14	\$815,066	2.26	\$957,991	2.25	\$6,327,614	3.54	\$1,364,856	2.43	\$9,465,526
/ Lifetime MMBtu Savings		1,686		5,939		72,404		52,774		132,803
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	276	93,277,708	31	40,488,329	1,613	1,200,167,020	170	127,492,450	2,091	1,461,425,507
B/C Ratio <sup>1</sup> / Planned Budget	3.78	\$2,522,621	1.96	\$1,074,549	3.67	\$38,984,320	1.79	\$4,197,788	3.47	\$46,779,278
/ Lifetime MMBtu Savings		0		0		0		1,653		1,653
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	380	72,483,092	205	37,377,756	4,245	597,737,496	356	54,219,723	5,186	761,818,067
B/C Ratio <sup>1</sup> / Planned Budget	3.42	\$2,014,966	3.27	\$1,176,825	3.21	\$20,619,441	1.73	\$2,661,118	3.08	\$26,472,350
/ Lifetime MMBtu Savings		0		0		469		2,294		2,763
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	0	0	0	0	0	0	0	0	0	0
B/C Ratio <sup>1</sup> / Planned Budget	2.67	\$0	1.71	\$0	3.95	\$0	5.63	\$0	3.82	\$0
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$120,060	0	\$43,654	0	\$701,158	0	\$117,750	0	\$982,622
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	10,333	1,914	0	0	3,658	141,300	22,977	3,116	36,968	146,330
/ Planned Budget		\$862,296		\$20,600		\$11,674,366		\$526,856		\$13,084,118
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$5,000	0	\$32,214	0	\$0	0	\$37,214
<b>Utility Performance Incentive</b>										
Planned Budget		\$509,020		\$371,749		\$6,093,636		\$683,964		\$7,658,369
<b>TOTAL PLANNED BUDGET</b>		<b>\$9,763,923</b>		<b>\$7,135,831</b>		<b>\$116,919,228</b>		<b>\$13,119,675</b>		<b>\$146,938,656</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS - 2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**  
 (Energy Efficiency Fund Only - Regional Greenhouse Gas Initiative)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	8	163,949	2	55,224	34	596,390	4	60,277	48	875,840
B/C Ratio <sup>1</sup> / Planned Budget	2.73	\$38,566	1.62	\$32,808	2.18	\$329,598	2.19	\$49,515	2.19	\$450,487
/ Lifetime MMBtu Savings		1,161		1,256		16,244		2,279		20,939
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	93	5,031,100	14	1,662,264	103	36,210,245	11	5,800,000	220	48,703,610
B/C Ratio <sup>1</sup> / Planned Budget	2.67	\$177,584	1.71	\$163,318	3.95	\$1,414,153	5.63	\$206,000	3.82	\$1,961,055
/ Lifetime MMBtu Savings		1,104		3,170		70,653		5,000		79,927
<b>Educational Programs</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
/ Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Utility Performance Incentive</b>										
Planned Budget		\$11,888		\$10,787		\$95,906		\$14,053		\$132,635
<b>TOTAL PLANNED BUDGET</b>		<b>\$228,038</b>		<b>\$206,912</b>		<b>\$1,839,657</b>		<b>\$269,568</b>		<b>\$2,544,176</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES GAS PROGRAMS - 2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets and Lifetime MMBtu Savings**

	Liberty		Unitil		Total	
<b>Home Energy Assistance</b>						
Number of Units / Lifetime MMBtu Savings	410	179,185	130	83,213	540	262,398
B/C Ratio <sup>1</sup> / Planned Budget	1.20	\$1,794,250	1.71	\$919,565	1.37	\$2,713,815
<b>Home Performance w/ENERGY STAR</b>						
Number of Participants / Lifetime MMBtu Savings	843	241,288	104	35,275	947	276,564
B/C Ratio <sup>1</sup> / Planned Budget	1.91	\$1,464,527	1.28	\$326,984	1.80	\$1,791,511
<b>ENERGY STAR Homes</b>						
Number of Homes / Lifetime MMBtu Savings	126	188,137	180	131,913	306	320,050
B/C Ratio <sup>1</sup> / Planned Budget	1.65	\$1,275,220	2.70	\$548,052	1.97	\$1,823,272
<b>ENERGY STAR Products</b>						
Number of Participants / Lifetime MMBtu Savings	1,779	209,230	11,453	153,258	13,231	362,488
B/C Ratio <sup>1</sup> / Planned Budget	2.15	\$1,096,063	2.38	\$712,320	2.25	\$1,808,383
/ Lifetime kWh Savings		503,745		-81,700		422,045
<b>Large Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	234	1,103,797	200	603,543	435	1,707,340
B/C Ratio <sup>1</sup> / Planned Budget	5.14	\$2,210,141	3.19	\$1,930,411	4.23	\$4,140,552
<b>Small Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	1,194	554,761	189	183,539	1,383	738,300
B/C Ratio <sup>1</sup> / Planned Budget	2.81	\$2,097,932	1.82	\$1,051,571	2.48	\$3,149,503
<b>Education</b>						
/ Planned Budget		\$151,020		\$52,300		\$203,320
<b>Company Specific Programs</b>						
Number of Participants / Lifetime MMBtu Savings	63,000	56,110	9,100	6,500	72,100	62,610
/ Planned Budget		\$465,250		\$41,800		\$507,050
<b>Utility Performance Incentive</b>						
Planned Budget		\$580,492		\$307,065		\$887,557
<b>Total Program Expenses</b>		<b>\$11,134,895</b>		<b>\$5,890,067</b>		<b>\$17,024,962</b>

**NHSAVES ELECTRIC PROGRAMS - 2021-2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	1,020	20,765,583	294	5,917,342	5,690	101,161,752	482	8,043,923	7,487	135,888,600
B/C Ratio <sup>1</sup> / Planned Budget	2.58	\$4,957,427	1.43	\$4,255,950	2.12	\$54,502,285	2.03	\$6,138,372	2.10	\$69,854,034
/ Lifetime MMBtu Savings		148,167		153,269		2,752,610		274,699		3,328,744
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	207	4,982,466	523	10,433,061	8,471	43,897,995	196	4,481,408	9,397	63,794,930
B/C Ratio <sup>1</sup> / Planned Budget	2.04	\$1,820,881	2.63	\$3,788,415	3.45	\$21,555,834	2.16	\$1,897,420	3.17	\$29,062,551
/ Lifetime MMBtu Savings		110,792		322,331		2,487,230		115,078		3,035,431
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	210	9,185,482	301	23,339,742	1,711	88,070,747	176	4,993,187	2,398	125,589,158
B/C Ratio <sup>1</sup> / Planned Budget	6.82	\$923,976	7.00	\$2,035,965	4.85	\$6,641,678	3.03	\$1,252,804	5.21	\$10,854,423
/ Lifetime MMBtu Savings		164,836		363,563		752,991		98,750		1,380,140
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	65,807	38,811,301	89,148	45,549,706	517,635	271,488,837	122,473	60,469,322	795,062	416,319,165
B/C Ratio <sup>1</sup> / Planned Budget	1.79	\$2,650,432	1.91	\$3,629,929	1.84	\$21,026,760	2.85	\$4,320,629	1.98	\$31,627,751
/ Lifetime MMBtu Savings		5,021		17,818		182,174		131,934		336,946
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	788	245,623,638	93	118,150,033	4,453	2,801,248,590	524	297,218,211	5,859	3,462,240,471
B/C Ratio <sup>1</sup> / Planned Budget	3.81	\$6,346,071	1.84	\$3,139,353	3.67	\$86,714,921	1.86	\$9,536,309	3.46	\$105,736,654
/ Lifetime MMBtu Savings		0		0		0		3,966		3,966
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	1,077	197,128,816	655	111,582,724	14,250	1,550,863,489	1,161	158,662,570	17,143	2,018,237,600
B/C Ratio <sup>1</sup> / Planned Budget	3.68	\$5,137,022	3.18	\$3,460,442	3.12	\$52,708,591	1.94	\$6,942,273	3.05	\$68,248,328
/ Lifetime MMBtu Savings		0		0		1,173		5,863		7,036
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	279	15,188,576	44	5,674,341	316	111,104,745	33	19,438,571	672	151,406,233
B/C Ratio <sup>1</sup> / Planned Budget	2.53	\$532,752	1.74	\$489,954	3.77	\$4,235,796	5.45	\$613,200	3.67	\$5,871,702
/ Lifetime MMBtu Savings		3,311		9,511		211,958		12,500		237,281
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$285,920	0	\$236,704	0	\$1,607,153	0	\$306,100	0	\$2,435,877
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	30,930	3,863	0	0	7,723	297,150	23,332	6,952	61,984	307,965
/ Planned Budget		\$2,053,473		\$40,600		\$23,420,537		\$1,508,938		\$27,023,548
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$15,840	0	\$97,867	0	\$0	0	\$113,707
<b>Utility Performance Incentive</b>										
Planned Budget		\$1,358,937		\$1,159,252		\$14,982,746		\$1,788,382		\$19,289,318
<b>TOTAL PLANNED BUDGET</b>		<b>\$26,066,892</b>		<b>\$22,252,403</b>		<b>\$287,494,169</b>		<b>\$34,304,428</b>		<b>\$370,117,891</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS**  
**SBC<sup>1</sup> and RGGI Funding Allocation**  
**2021-2023 Budget**

**Program Allocation Summary**

Program	RGGI	SBC <sup>1</sup>	TOTAL
<b>HEA<sup>2</sup></b>			
Liberty	2.43323%	97.56677%	100.00000%
NHEC	2.41109%	97.58891%	100.00000%
Eversource	1.89148%	98.10852%	100.00000%
Unitil	2.52299%	97.47701%	100.00000%
<b>Municipal</b>			
Liberty	100.00000%	0.00000%	100.00000%
NHEC	100.00000%	0.00000%	100.00000%
Eversource	100.00000%	0.00000%	100.00000%
Unitil	100.00000%	0.00000%	100.00000%

A	B	C	D
Utility	HEA Budget	RGGI HEA <sup>3</sup>	SBC HEA <sup>4</sup>
Liberty	\$ 4,957,427	\$ 120,625	\$4,836,802
NHEC	\$ 4,255,950	\$ 102,615	\$4,153,335
Eversource	\$ 54,502,285	\$ 1,030,902	\$53,471,383
Unitil	\$ 6,138,372	\$ 154,871	\$5,983,502
Total	\$ 69,854,034	\$1,409,013	\$68,445,021

Notes:

<sup>1</sup> SBC = System Benefits Charge, Forward Capacity Market and Carryforward/Interest

<sup>2</sup> HEA Allocation

RGGI HEA = RGGI HEA (C) /Total HEA Funds (B)

SBC HEA = SBC HEA (D) /Total HEA Funds (B)

<sup>3</sup> 17.0% of Total RGGI Funds including SB 268 funding less RGGI HEA Performance Incentive

<sup>4</sup> SBC HEA = Utility's total HEA program budget (B) less RGGI HEA (C)

**NHSAVES ELECTRIC PROGRAMS - 2021-2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

(System Benefits Charge, Forward Capacity Market and Interest Funds Only)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	996	20,260,698	287	5,775,078	5,583	99,243,371	470	7,836,875	7,335	133,116,023
B/C Ratio <sup>1</sup> / Planned Budget	2.58	\$4,836,802	1.43	\$4,153,335	2.12	\$53,471,383	2.03	\$5,983,502	2.10	\$68,445,021
/ Lifetime MMBtu Savings		144,563		149,581		2,700,435		267,824		3,262,403
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	207	4,982,466	523	10,433,061	8,471	43,897,995	196	4,481,408	9,397	63,794,930
B/C Ratio <sup>1</sup> / Planned Budget	2.04	\$1,820,881	2.63	\$3,788,415	3.45	\$21,555,834	2.16	\$1,897,420	3.17	\$29,062,551
/ Lifetime MMBtu Savings		110,792		322,331		2,487,230		115,078		3,035,431
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	210	9,185,482	301	23,339,742	1,711	88,070,747	176	4,993,187	2,398	125,589,158
B/C Ratio <sup>1</sup> / Planned Budget	6.82	\$923,976	7.00	\$2,035,965	4.85	\$6,641,678	3.03	\$1,252,804	5.21	\$10,854,423
/ Lifetime MMBtu Savings		164,836		363,563		752,991		98,750		1,380,140
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	65,807	38,811,301	89,148	45,549,706	517,635	271,488,837	122,473	60,469,322	795,062	416,319,165
B/C Ratio <sup>1</sup> / Planned Budget	1.79	\$2,650,432	1.91	\$3,629,929	1.84	\$21,026,760	2.85	\$4,320,629	1.98	\$31,627,751
/ Lifetime MMBtu Savings		5,021		17,818		182,174		131,934		336,946
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	788	245,623,638	93	118,150,033	4,453	2,801,248,590	524	297,218,211	5,859	3,462,240,471
B/C Ratio <sup>1</sup> / Planned Budget	3.81	\$6,346,071	1.84	\$3,139,353	3.67	\$86,714,921	1.86	\$9,536,309	3.46	\$105,736,654
/ Lifetime MMBtu Savings		0		0		0		3,966		3,966
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	1,077	197,128,816	655	111,582,724	14,250	1,550,863,489	1,161	158,662,570	17,143	2,018,237,600
B/C Ratio <sup>1</sup> / Planned Budget	3.68	\$5,137,022	3.18	\$3,460,442	3.12	\$52,708,591	1.94	\$6,942,273	3.05	\$68,248,328
/ Lifetime MMBtu Savings		0		0		1,173		5,863		7,036
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	0	0	0	0	0	0	0	0	0	0
B/C Ratio <sup>1</sup> / Planned Budget	2.53	\$0	1.74	\$0	3.77	\$0	5.45	\$0	0.00	\$0
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Educational Programs</b>										
Number of Participants / Planned Budget	0	\$285,920	0	\$236,704	0	\$1,607,153	0	\$306,100	0	\$2,435,877
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	30,930	3,863	0	0	7,723	297,150	23,332	6,952	61,984	307,965
/ Planned Budget		\$2,053,473		\$40,600		\$23,420,537		\$1,508,938		\$27,023,548
/ Lifetime MMBtu Savings		0		0		0		0		0
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	0	\$0	0	\$15,840	0	\$97,867	0	\$0	0	\$113,707
<b>Utility Performance Incentive</b>										
Planned Budget		\$1,323,002		\$1,126,661		\$14,693,077		\$1,746,139		\$18,888,878
<b>TOTAL PLANNED BUDGET</b>		<b>\$25,377,579</b>		<b>\$21,627,243</b>		<b>\$281,937,802</b>		<b>\$33,494,113</b>		<b>\$362,436,737</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES ELECTRIC PROGRAMS - 2021-2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets, Lifetime kWh and MMBtu Savings**

(Energy Efficiency Fund Only - Regional Greenhouse Gas Initiative)

	Liberty		NHEC		Eversource		Unitil		Total	
<b>Home Energy Assistance</b>										
Number of Units / Lifetime kWh Savings	25	504,884	7	142,264	108	1,918,381	12	207,048	152	2,772,577
B/C Ratio <sup>1</sup> / Planned Budget	2.58	\$120,625	1.43	\$102,615	2.12	\$1,030,902	2.03	\$154,871	2.10	\$1,409,013
/ Lifetime MMBtu Savings		3,604		3,688		52,175		6,875		66,341
<b>Home Performance w/ENERGY STAR</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Homes</b>										
Number of Homes / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>ENERGY STAR Products</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Large Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Small Business Energy Solutions</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
B/C Ratio <sup>1</sup> / Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Municipal</b>										
Number of Participants / Lifetime kWh Savings	279	15,188,576	44	5,674,341	316	111,104,745	33	19,438,571	672	151,406,233
B/C Ratio <sup>1</sup> / Planned Budget	2.53	\$532,752	1.74	\$489,954	3.77	\$4,235,796	5.45	\$613,200	3.67	\$5,871,702
/ Lifetime MMBtu Savings		3,311		9,511		211,958		12,500		237,281
<b>Educational Programs</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Company Specific Programs / FCM Expenses</b>										
Number of Participants / Lifetime kWh Savings	-	-	-	-	-	-	-	-	-	-
/ Planned Budget	-	-	-	-	-	-	-	-	-	-
/ Lifetime MMBtu Savings	-	-	-	-	-	-	-	-	-	-
<b>Smart Start (Eversource/NHEC)</b>										
Number of Participants / Planned Budget	-	-	-	-	-	-	-	-	-	-
<b>Utility Performance Incentive</b>										
Planned Budget		\$35,936		\$32,591		\$289,668		\$42,244		\$400,439
<b>TOTAL PLANNED BUDGET</b>		<b>\$689,313</b>		<b>\$625,160</b>		<b>\$5,556,366</b>		<b>\$810,315</b>		<b>\$7,681,154</b>

Note: (1) B/C Ratios based on Utility Costs set to 2021 dollars

**NHSAVES GAS PROGRAMS - 2021-2023 UTILITY GOALS BY PROGRAM**  
**Total Customers Served, Program Budgets and Lifetime MMBtu Savings**

	Liberty		Unitil		Total	
<b>Home Energy Assistance</b>						
Number of Units / Lifetime MMBtu Savings	1,165	498,598	319	201,575	1,483	700,173
B/C Ratio <sup>1</sup> / Planned Budget	1.14	\$4,945,220	1.68	\$2,190,919	1.31	\$7,136,139
<b>Home Performance w/ENERGY STAR</b>						
Number of Participants / Lifetime MMBtu Savings	2,412	658,713	264	97,506	2,676	756,219
B/C Ratio <sup>1</sup> / Planned Budget	1.81	\$3,977,675	1.27	\$862,788	1.72	\$4,840,463
<b>ENERGY STAR Homes</b>						
Number of Homes / Lifetime MMBtu Savings	340	436,981	420	292,016	760	728,997
B/C Ratio <sup>1</sup> / Planned Budget	1.33	\$3,483,104	2.44	\$1,278,967	1.63	\$4,762,071
<b>ENERGY STAR Products</b>						
Number of Participants / Lifetime MMBtu Savings	5,144	599,861	32,232	394,032	37,377	993,893
B/C Ratio <sup>1</sup> / Planned Budget	2.04	\$3,122,524	2.32	\$1,784,160	2.14	\$4,906,684
/ Lifetime kWh Savings		1,382,715		-220,590		1,162,125
<b>Large Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	659	3,022,516	451	1,323,435	1,110	4,345,950
B/C Ratio <sup>1</sup> / Planned Budget	4.87	\$6,022,356	3.11	\$4,138,351	4.15	\$10,160,707
<b>Small Business Energy Solutions</b>						
Number of Participants / Lifetime MMBtu Savings	3,401	1,506,616	480	454,181	3,881	1,960,797
B/C Ratio <sup>1</sup> / Planned Budget	2.73	\$5,556,521	2.00	\$2,254,001	2.52	\$7,810,522
<b>Education</b>						
/ Planned Budget		\$406,327		\$162,450		\$568,777
<b>Company Specific Programs</b>						
Number of Participants / Lifetime MMBtu Savings	189,000	119,305	9,100	13,899	198,100	133,204
/ Planned Budget		\$1,575,750		\$121,150		\$1,696,900
<b>Utility Performance Incentive</b>						
Planned Budget		\$1,599,921		\$703,603		\$2,303,525
<b>Total Program Expenses</b>		<b>\$30,689,398</b>		<b>\$13,496,390</b>		<b>\$44,185,788</b>

**Program Cost-Effectiveness - 2021 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.97	0.19	2.04	27,742.7	2,671.6	28,759.9	14,095.7	-	1,933.9	26,183.6	350.7	272.0	1,466	32,835.1	709,300.4
A1 - Energy Star Homes	4.54	0.81	5.04	9,066.4	1,614.1	13,059.9	1,997.6	595.0	1,124.7	26,394.7	291.9	13.5	517	9,115.5	227,506.0
A2 - Home Performance with Energy Star	3.53	0.27	3.87	23,006.3	1,766.0	31,391.2	6,517.7	1,590.5	1,263.5	14,098.2	268.3	206.7	2,824	42,246.9	828,962.3
A3 - Energy Star Products	1.55	1.28	2.63	12,346.3	10,245.3	20,424.8	7,973.1	(211.2)	14,588.7	90,536.2	2,966.8	2,216.5	300,151	3,343.0	49,045.3
A5 - Residential Active Demand Response	2.32	2.32	2.32	240.8	240.8	240.6	103.9	-	-	-	-	-	1,530	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	47.5	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	155.6	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	348.8	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.32</b>	<b>0.53</b>	<b>2.83</b>	<b>72,402.6</b>	<b>16,537.8</b>	<b>93,876.4</b>	<b>31,239.7</b>	<b>1,974.3</b>	<b>18,910.8</b>	<b>157,212.8</b>	<b>3,877.7</b>	<b>2,708.7</b>	<b>306,488</b>	<b>87,540.5</b>	<b>1,814,814.1</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.68	3.68	2.26	73,451.6	73,451.6	115,873.7	19,975.8	31,348.4	51,258.7	694,223.1	5,155.2	7,086.6	1,361	-	-
C2 - Small Business Energy Solutions	3.16	3.16	2.91	43,633.7	43,627.7	69,765.6	13,821.1	10,172.4	33,212.7	432,850.9	3,467.7	4,131.1	5,130	21.9	312.8
C3 - Municipal Energy Solutions	3.61	2.57	1.61	5,092.7	3,621.1	7,569.2	1,410.0	3,279.5	2,750.0	37,868.0	341.5	297.9	108	3,332.7	70,652.7
C4 - Energy Rewards RFP Program	1.89	1.89	0.92	5,667.4	5,667.4	9,206.0	2,997.2	6,956.1	4,540.0	59,250.0	438.1	424.2	10	-	-
C5 - C&I Active Demand Response	2.95	2.95	2.95	1,917.9	1,917.9	1,917.5	649.8	-	-	-	-	-	86	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	99.7	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	230.1	-	-	-	-	-	-	-	-
C6d - C&I Customer Partnerships	-	-	-	-	-	-	21.8	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.31</b>	<b>3.27</b>	<b>2.25</b>	<b>129,763.4</b>	<b>128,285.9</b>	<b>204,332.0</b>	<b>39,205.5</b>	<b>51,756.4</b>	<b>91,761.4</b>	<b>1,224,192.0</b>	<b>9,402.6</b>	<b>11,939.8</b>	<b>6,694</b>	<b>3,354.5</b>	<b>70,965.6</b>
C6e - Smart Start	-	-	-	-	-	-	33.0	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.87</b>	<b>2.05</b>	<b>2.40</b>	<b>202,166.0</b>	<b>144,823.6</b>	<b>298,208.4</b>	<b>70,478.3</b>	<b>53,730.6</b>	<b>110,672.1</b>	<b>1,381,404.8</b>	<b>13,280.3</b>	<b>14,648.5</b>	<b>313,182</b>	<b>90,895.0</b>	<b>1,885,779.7</b>

**Notes:**

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars.

	<b>Annual kWh Savings</b>	110,672,131	80.6%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	1,381,404,788	71.4%	<b>kWh &gt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	26,638,704	19.4%		<b>Lifetime MMBTU Savings (in kWh)</b>	552,667,490	28.6%	
		<b>137,310,835</b>	100.0%			<b>1,934,072,278</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	1.44%							
		<b>Spending per Customer</b>		Low-Income	\$	593.10		
				Residential	\$	40.99		
				C&I	\$	503.69		

Present Value Benefits - 2021 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)													Non-Resource Benefits (\$000)			Environmental Benefits (\$000)	
				CAPACITY					ENERGY				Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits	Total Non-Resource Benefits			
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak	Summer Peak	Summer Off Peak	Electric DRIPE	Total Electric Benefit					Other Fuels		Water Benefit
<b>Residential Programs</b>																					
B1 - Home Energy Assistance	\$ 27,743	\$ 2,672	\$ 28,760	\$ 310	\$ -	\$ 325	\$ 282	\$ -	\$ 584	\$ 640	\$ 238	\$ 197	\$ 95	\$ 2,672	\$ 16,600	\$ 114	\$ 19,385	\$ 1,267	\$ 7,090	\$ 8,357	\$ 1,017
A1 - Energy Star Homes	\$ 9,066	\$ 1,614	\$ 13,060	\$ 8	\$ -	\$ 9	\$ 8	\$ -	\$ 700	\$ 813	\$ 8	\$ 6	\$ 62	\$ 1,614	\$ 7,033	\$ 32	\$ 8,679	\$ 388	\$ 3,137	\$ 3,524	\$ 857
A2 - Home Performance with Energy Star	\$ 23,006	\$ 1,766	\$ 31,391	\$ 266	\$ -	\$ 274	\$ 237	\$ -	\$ 293	\$ 321	\$ 183	\$ 139	\$ 54	\$ 1,766	\$ 19,780	\$ 49	\$ 21,594	\$ 1,412	\$ 7,816	\$ 9,228	\$ 569
A3 - Energy Star Products	\$ 12,346	\$ 10,245	\$ 20,425	\$ 1,126	\$ -	\$ 1,352	\$ 1,171	\$ -	\$ 2,310	\$ 2,152	\$ 926	\$ 683	\$ 526	\$ 10,245	\$ 985	\$ 1,049	\$ 12,279	\$ 67	\$ 4,074	\$ 4,141	\$ 4,005
A5 - Residential Active Demand Response	\$ 241	\$ 241	\$ 241	\$ 24	\$ -	\$ 89	\$ 77	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 51	\$ 241	\$ -	\$ -	\$ 241	\$ -	\$ -	\$ -	\$ (0)
A6a - Res Customer Engagement Platform	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A6b - Res ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Residential</b>	<b>\$ 72,403</b>	<b>\$ 16,538</b>	<b>\$ 93,876</b>	<b>\$ 1,734</b>	<b>\$ -</b>	<b>\$ 2,049</b>	<b>\$ 1,775</b>	<b>\$ -</b>	<b>\$ 3,886</b>	<b>\$ 3,926</b>	<b>\$ 1,355</b>	<b>\$ 1,025</b>	<b>\$ 788</b>	<b>\$ 16,537</b>	<b>\$ 44,397</b>	<b>\$ 1,244</b>	<b>\$ 62,179</b>	<b>\$ 3,134</b>	<b>\$ 22,117</b>	<b>\$ 25,251</b>	<b>\$ 6,447</b>
<b>Commercial/Industrial Programs</b>																					
C1 - Large Business Energy Solutions	\$ 73,452	\$ 73,452	\$ 115,874	\$ 7,986	\$ -	\$ 8,779	\$ 7,605	\$ -	\$ 22,506	\$ 8,111	\$ 10,488	\$ 4,836	\$ 3,141	\$ 73,452	\$ -	\$ -	\$ 73,452	\$ -	\$ 12,941	\$ 12,941	\$ 29,481
C2 - Small Business Energy Solutions	\$ 43,634	\$ 43,628	\$ 69,766	\$ 4,447	\$ -	\$ 4,931	\$ 4,272	\$ -	\$ 11,153	\$ 5,322	\$ 7,740	\$ 3,799	\$ 1,964	\$ 43,628	\$ 0	\$ 6	\$ 43,633	\$ 0	\$ 7,687	\$ 7,687	\$ 18,445
C3 - Municipal Energy Solutions	\$ 5,093	\$ 3,621	\$ 7,569	\$ 330	\$ -	\$ 364	\$ 316	\$ -	\$ 974	\$ 527	\$ 609	\$ 338	\$ 163	\$ 3,621	\$ 1,344	\$ -	\$ 4,965	\$ 128	\$ 875	\$ 1,003	\$ 1,602
C4 - Energy Rewards RFP Program	\$ 5,667	\$ 5,667	\$ 9,206	\$ 447	\$ -	\$ 498	\$ 432	\$ -	\$ 2,307	\$ 658	\$ 770	\$ 269	\$ 286	\$ 5,667	\$ -	\$ -	\$ 5,667	\$ -	\$ 999	\$ 999	\$ 2,540
C5 - C&I Active Demand Response	\$ 1,918	\$ 1,918	\$ 1,918	\$ 118	\$ -	\$ 829	\$ 718	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 252	\$ 1,917	\$ -	\$ -	\$ 1,918	\$ -	\$ -	\$ -	\$ (0)
C6a - C&I Customer Engagement Platform	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6b - C&I ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6d - C&I Customer Partnerships	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Commercial &amp; Industrial</b>	<b>\$ 129,763</b>	<b>\$ 128,286</b>	<b>\$ 204,332</b>	<b>\$ 13,328</b>	<b>\$ -</b>	<b>\$ 15,402</b>	<b>\$ 13,343</b>	<b>\$ -</b>	<b>\$ 36,940</b>	<b>\$ 14,618</b>	<b>\$ 19,608</b>	<b>\$ 9,242</b>	<b>\$ 5,806</b>	<b>\$ 128,285</b>	<b>\$ 1,344</b>	<b>\$ 6</b>	<b>\$ 129,635</b>	<b>\$ 128</b>	<b>\$ 22,501</b>	<b>\$ 22,629</b>	<b>\$ 52,068</b>
C6e - Smart Start	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total</b>	<b>\$ 202,166</b>	<b>\$ 144,824</b>	<b>\$ 298,208</b>	<b>\$ 15,061</b>	<b>\$ -</b>	<b>\$ 17,451</b>	<b>\$ 15,118</b>	<b>\$ -</b>	<b>\$ 40,826</b>	<b>\$ 18,544</b>	<b>\$ 20,963</b>	<b>\$ 10,266</b>	<b>\$ 6,594</b>	<b>\$ 144,823</b>	<b>\$ 45,740</b>	<b>\$ 1,250</b>	<b>\$ 191,814</b>	<b>\$ 3,262</b>	<b>\$ 44,618</b>	<b>\$ 47,880</b>	<b>\$ 58,515</b>

Portfolio Planned Versus Actual Performance - 2021										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime kWh Savings	1,381,404,788	897,913,112		-	1.925%	-	\$ 1,356,070	\$ 1,695,088	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	110,672,131	71,936,885		-	0.550%	-	\$ 387,449	\$ 484,311	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	14,648	9,521		-	0.495%	-	\$ 348,704	\$ 435,880	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	13,280	8,632		-	0.330%	-	\$ 232,469	\$ 290,587	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	9,312	6,053		-	0.275%	-	\$ 193,724	\$ 242,155	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 191,813,724			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 70,445,219			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 121,368,505	\$ 78,889,528	\$ -	-	1.925%	-	\$ 1,356,070	\$ 1,695,088	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 3,874,487	\$ 4,843,109	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 202,165,977		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 3,874,487	\$ -	from row 9 above
12 Total Utility Costs	\$ 70,445,219	\$ -	from row 7 above
13 Portfolio GST BCR	2.72	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

Program Cost-Effectiveness - 2022 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.17	0.21	2.25	37,666.8	3,593.0	39,008.6	17,329.6	-	2,533.2	34,240.5	457.6	358.1	1,930	43,225.5	933,751.9
A1 - Energy Star Homes	4.82	0.85	5.34	10,309.2	1,823.1	14,819.1	2,140.5	633.9	1,237.2	29,034.2	321.1	14.9	569	10,027.1	250,256.6
A2 - Home Performance with Energy Star	3.45	0.27	3.77	23,949.5	1,877.6	32,659.5	6,944.3	1,722.1	1,309.8	14,632.7	272.6	216.0	2,824	42,255.1	829,076.8
A3 - Energy Star Products	1.81	1.43	2.77	11,816.0	9,300.4	19,409.9	6,514.4	493.8	9,113.6	86,343.6	1,682.5	1,330.0	161,169	4,127.7	60,724.5
A5 - Residential Active Demand Response	2.42	2.42	2.42	369.7	369.7	369.4	152.5	-	-	-	-	-	2,295	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	84.7	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	205.5	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	420.9	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.49</b>	<b>0.50</b>	<b>2.90</b>	<b>84,111.1</b>	<b>16,963.8</b>	<b>106,266.4</b>	<b>33,792.3</b>	<b>2,849.7</b>	<b>14,193.8</b>	<b>164,251.0</b>	<b>2,733.8</b>	<b>1,918.9</b>	<b>168,787</b>	<b>99,635.3</b>	<b>2,073,809.8</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.66	3.66	2.26	98,499.3	98,499.3	154,739.6	26,881.2	41,480.9	67,142.5	906,858.5	6,419.2	9,253.1	1,479	-	-
C2 - Small Business Energy Solutions	3.00	2.99	2.75	52,991.3	52,983.6	84,697.9	17,693.0	13,154.2	39,636.8	520,275.1	3,871.4	4,738.4	4,875	27.3	391.1
C3 - Municipal Energy Solutions	3.77	2.65	1.67	5,154.5	3,623.6	7,618.7	1,367.3	3,201.8	2,685.5	37,026.5	333.0	290.6	105	3,332.7	70,652.7
C4 - Energy Rewards RFP Program	1.73	1.73	0.83	9,402.9	9,402.9	15,233.9	5,435.3	13,029.1	7,300.0	96,600.0	688.3	656.5	16	-	-
C5 - C&I Active Demand Response	3.13	3.13	3.13	2,934.7	2,934.7	2,934.2	936.3	-	-	-	-	-	128	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	174.6	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	298.4	-	-	-	-	-	-	-	-
C6d - C&I Customer Partnerships	-	-	-	-	-	-	37.9	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.20</b>	<b>3.17</b>	<b>2.14</b>	<b>168,982.7</b>	<b>167,444.1</b>	<b>265,224.3</b>	<b>52,823.9</b>	<b>70,866.0</b>	<b>116,764.8</b>	<b>1,560,760.1</b>	<b>11,311.8</b>	<b>14,938.6</b>	<b>6,604</b>	<b>3,360.0</b>	<b>71,043.8</b>
C6e - Smart Start	-	-	-	-	-	-	31.6	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.92</b>	<b>2.13</b>	<b>2.32</b>	<b>253,093.8</b>	<b>184,407.9</b>	<b>371,490.7</b>	<b>86,647.8</b>	<b>73,715.6</b>	<b>130,958.6</b>	<b>1,725,011.0</b>	<b>14,045.6</b>	<b>16,857.5</b>	<b>175,391</b>	<b>102,995.3</b>	<b>2,144,853.6</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars.

	<b>Annual kWh Savings</b>	130,958,645	81.3%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	1,725,011,028	73.3%	<b>kWh &gt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	<u>30,184,947</u>	<u>18.7%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>628,594,576</u>	<u>26.7%</u>	
		<b>161,143,592</b>	100.0%			<b>2,353,605,604</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	1.70%			<b>Spending per Customer</b>	Low-Income	\$ 729.17		
					Residential	\$ 39.36		
					C&I	\$ 678.65		



Portfolio Planned Versus Actual Performance - 2022										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime kWh Savings	1,725,011,028	1,121,257,168		-	1.925%	-	\$ 1,667,362	\$ 2,084,202	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	130,958,645	85,123,119		-	0.550%	-	\$ 476,389	\$ 595,486	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	16,858	10,957		-	0.495%	-	\$ 428,750	\$ 535,938	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	14,046	9,130		-	0.330%	-	\$ 285,833	\$ 357,292	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	14,018	9,112		-	0.275%	-	\$ 238,195	\$ 297,743	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 239,563,545			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 86,616,182			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 152,947,362	\$ 99,415,786	\$ -	-	1.925%	-	\$ 1,667,362	\$ 2,084,202	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 4,763,890	\$ 5,954,863	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 253,093,756		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 4,763,890	\$ -	from row 9 above
12 Total Utility Costs	\$ 86,616,182	\$ -	from row 7 above
13 <b>Portfolio GST BCR</b>	<b>2.77</b>	<b>-</b>	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2022\$) is \$4,918,716.45.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

**Program Cost-Effectiveness - 2023 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.18	0.21	2.26	46,125.4	4,404.5	47,736.0	21,118.8	-	3,012.9	40,737.7	544.7	425.5	2,294	51,363.9	1,109,557.3
A1 - Energy Star Homes	5.17	0.95	5.73	11,795.9	2,164.2	16,945.2	2,283.2	674.9	1,395.7	32,641.8	358.7	25.7	626	11,026.0	275,228.7
A2 - Home Performance with Energy Star	3.37	0.27	3.67	24,871.3	2,004.3	33,895.4	7,380.7	1,858.2	1,356.2	15,167.1	276.9	225.3	2,824	42,263.3	829,191.3
A3 - Energy Star Products	2.25	1.75	2.98	13,331.3	10,380.6	21,763.2	5,935.5	1,360.8	7,446.3	94,609.0	1,267.1	1,093.4	56,314	4,912.4	72,403.7
A5 - Residential Active Demand Response	2.53	2.53	2.53	565.3	565.3	564.8	223.2	-	-	-	-	-	3,443	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	127.4	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	270.8	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	339.8	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.57</b>	<b>0.52</b>	<b>2.91</b>	<b>96,689.2</b>	<b>19,518.9</b>	<b>120,904.6</b>	<b>37,679.4</b>	<b>3,893.9</b>	<b>13,211.2</b>	<b>183,155.6</b>	<b>2,447.3</b>	<b>1,769.8</b>	<b>65,500</b>	<b>109,565.5</b>	<b>2,286,381.1</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.67	3.67	2.34	134,195.2	134,195.2	209,755.4	36,568.7	53,167.6	89,084.2	1,200,167.0	8,124.2	12,204.9	1,613	-	-
C2 - Small Business Energy Solutions	3.21	3.21	2.79	62,127.1	62,117.8	98,991.2	19,341.8	16,202.2	45,259.2	597,737.5	4,159.1	5,247.4	4,245	32.8	469.3
C3 - Municipal Energy Solutions	3.95	2.75	1.73	5,236.4	3,648.8	7,691.5	1,326.5	3,127.4	2,622.9	36,210.2	324.7	283.6	103	3,332.7	70,652.7
C4 - Energy Rewards RFP Program	1.64	1.64	0.77	14,082.4	14,082.4	22,716.9	8,603.7	21,081.9	10,560.0	141,300.0	981.0	923.8	23	-	-
C5 - C&I Active Demand Response	3.33	3.33	3.33	4,474.2	4,474.2	4,473.4	1,342.3	-	-	-	-	-	193	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	258.6	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	386.9	-	-	-	-	-	-	-	-
C6d - C&I Customer Partnerships	-	-	-	-	-	-	56.0	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.24</b>	<b>3.22</b>	<b>2.13</b>	<b>220,115.4</b>	<b>218,518.4</b>	<b>343,628.4</b>	<b>67,884.5</b>	<b>93,579.1</b>	<b>147,526.3</b>	<b>1,975,414.8</b>	<b>13,589.0</b>	<b>18,659.7</b>	<b>6,176</b>	<b>3,365.5</b>	<b>71,122.0</b>
C6e - Smart Start	-	-	-	-	-	-	30.2	-	-	-	-	-	-	-	-
<b>Total</b>	<b>3.00</b>	<b>2.25</b>	<b>2.29</b>	<b>316,804.6</b>	<b>238,037.3</b>	<b>464,532.9</b>	<b>105,594.2</b>	<b>97,473.0</b>	<b>160,737.4</b>	<b>2,158,570.3</b>	<b>16,036.4</b>	<b>20,429.5</b>	<b>71,676</b>	<b>112,931.0</b>	<b>2,357,503.1</b>

Notes:  
 (1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.  
 (2) Utility and Customer Costs Expressed in 2021 Dollars.

<b>Annual kWh Savings</b>	160,737,444	82.9%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	2,158,570,339	75.8%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>33,096,807</u>	<u>17.1%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>690,915,984</u>	<u>24.2%</u>	
	<b>193,834,252</b>	<b>100.0%</b>			<b>2,849,486,323</b>	<b>100.0%</b>	
<b>Annual Savings as a % of 2019 Sales</b>	2.09%			<b>Spending per Customer</b>	Low-Income \$ 888.62		
					Residential \$ 39.59		
					C&I \$ 872.14		



Portfolio Planned Versus Actual Performance - 2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of	Actual PI	Source
								Planned PI		
1 Lifetime kWh Savings	2,158,570,339	1,403,070,720		-	1.925%	-	\$ 2,032,106	\$ 2,540,133	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	160,737,444	104,479,339		-	0.550%	-	\$ 580,602	\$ 725,752	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	20,430	13,279		-	0.495%	-	\$ 522,542	\$ 653,177	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	16,036	10,424		-	0.330%	-	\$ 348,361	\$ 435,451	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	20,978	13,635		-	0.275%	-	\$ 290,301	\$ 362,876	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 300,509,850			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 105,563,969			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 194,945,881	\$ 126,714,823	\$ -	-	1.925%	-	\$ 2,032,106	\$ 2,540,133	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 5,806,018	\$ 7,257,523	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 316,804,617		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 5,806,018	\$ -	from row 9 above
12 Total Utility Costs	\$ 105,563,969	\$ -	from row 7 above
13 <b>Portfolio GST BCR</b>	<b>2.84</b>	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2023\$) is \$6,189,542.07.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

**Program Cost-Effectiveness - 2021-2023 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.12	0.20	2.20	111,534.8	10,669.0	115,504.4	52,544.0	-	7,480.1	101,161.8	1,353.0	1,055.5	5,690	127,424.4	2,752,609.6
A1 - Energy Star Homes	4.85	0.87	5.38	31,171.4	5,601.4	44,824.2	6,421.3	1,903.7	3,757.6	88,070.7	971.7	54.1	1,711	30,168.6	752,991.3
A2 - Home Performance with Energy Star	3.45	0.27	3.77	71,827.1	5,647.9	97,946.1	20,842.6	5,170.8	3,929.5	43,898.0	817.8	648.0	8,471	126,765.3	2,487,230.4
A3 - Energy Star Products	1.84	1.47	2.79	37,493.6	29,926.3	61,597.9	20,423.0	1,643.3	31,148.5	271,488.8	5,916.4	4,639.9	517,635	12,383.0	182,173.6
A5 - Residential Active Demand Response	2.45	2.45	2.45	1,175.8	1,175.8	1,174.9	479.6	-	-	-	-	-	7,268	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	259.5	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	631.9	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	1,109.5	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.47</b>	<b>0.52</b>	<b>2.88</b>	<b>253,202.8</b>	<b>53,020.5</b>	<b>321,047.4</b>	<b>102,711.4</b>	<b>8,717.9</b>	<b>46,315.7</b>	<b>504,619.3</b>	<b>9,058.8</b>	<b>6,397.4</b>	<b>540,775</b>	<b>296,741.3</b>	<b>6,175,005.0</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.67	3.67	2.29	306,146.2	306,146.2	480,368.7	83,425.7	125,996.9	207,485.4	2,801,248.6	19,698.6	28,544.6	4,453	-	-
C2 - Small Business Energy Solutions	3.12	3.12	2.80	158,752.1	158,729.2	253,454.7	50,855.9	39,528.9	118,108.6	1,550,863.5	11,498.2	14,116.9	14,250	82.0	1,173.2
C3 - Municipal Energy Solutions	3.77	2.65	1.67	15,483.7	10,893.5	22,879.4	4,103.7	9,608.6	8,058.4	111,104.7	999.2	872.1	316	9,998.0	211,958.2
C4 - Energy Rewards RFP Program	1.71	1.71	0.81	29,152.8	29,152.8	47,156.8	17,036.2	41,067.1	22,400.0	297,150.0	2,107.4	2,004.5	49	-	-
C5 - C&I Active Demand Response	3.18	3.18	3.18	9,326.8	9,326.8	9,325.0	2,928.4	-	-	-	-	-	406	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	533.0	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	915.4	-	-	-	-	-	-	-	-
C6d - C&I Customer Partnerships	-	-	-	-	-	-	115.7	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.24</b>	<b>3.22</b>	<b>2.16</b>	<b>518,861.5</b>	<b>514,248.3</b>	<b>813,184.6</b>	<b>159,913.9</b>	<b>216,201.4</b>	<b>356,052.5</b>	<b>4,760,366.8</b>	<b>34,303.5</b>	<b>45,538.1</b>	<b>19,474</b>	<b>10,080.0</b>	<b>213,131.4</b>
C6e - Smart Start	-	-	-	-	-	-	94.8	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.94</b>	<b>2.16</b>	<b>2.33</b>	<b>772,064.4</b>	<b>567,268.8</b>	<b>1,134,232.1</b>	<b>262,720.2</b>	<b>224,919.3</b>	<b>402,368.2</b>	<b>5,264,986.2</b>	<b>43,362.3</b>	<b>51,935.5</b>	<b>560,249</b>	<b>306,821.3</b>	<b>6,388,136.4</b>

Notes:  
(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.  
(2) Utility and Customer Costs Expressed in 2021 Dollars.

<b>Annual kWh Savings</b>	402,368,220	81.7%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	5,264,986,155	73.8%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>89,920,458</u>	<u>18.3%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>1,872,178,050</u>	<u>26.2%</u>	
	<b>492,288,678</b>	100.0%			<b>7,137,164,205</b>	100.0%	
<b>Cumulative Savings as a % of 2019 Sales</b>	5.24%		<b>Spending per Customer</b>	Low-Income	\$ 2,210.89		
				Residential	\$ 119.94		
				C&I	\$ 2,054.47		



Portfolio Planned Versus Actual Performance - 2021-2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	5,264,986,155	3,422,241,001		-	1.925%	-	\$ 5,055,538	\$ 6,319,423	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	402,368,220	261,539,343		-	0.550%	-	\$ 1,444,440	\$ 1,805,549	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	51,936	33,758		-	0.495%	-	\$ 1,299,996	\$ 1,624,994	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	43,362	28,185		-	0.330%	-	\$ 866,664	\$ 1,083,330	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	44,308	28,800		-	0.275%	-	\$ 722,220	\$ 902,775	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 731,887,119			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 262,625,370			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 469,261,749	\$ 305,020,137	\$ -	-	1.925%	-	\$ 5,055,538	\$ 6,319,423	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 14,444,395	\$ 18,055,494	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 772,064,350		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 14,444,395	\$ -	from row 9 above
12 Total Utility Costs	\$ 262,625,370	\$ -	from row 7 above
13 Portfolio GST BCR	2.79	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars. Three-year nominal PI is \$14,982,745.58.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

ADR Program Cost-Effectiveness

2021									
	Benefit/Cost		Utility Costs (\$000 - 2021\$) <sup>1</sup>	Customer Costs (\$000 - 2021\$) <sup>1</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served
	Ratio Granite State Test	Benefit (\$000) Granite State Test							
<b>Residential Programs</b>									
A5 - Residential Active Demand Response	2.32	240.8	103.9	-	(4.0)	(4.0)	-	900.0	1,530
<b>Sub-Total Residential</b>	<b>2.32</b>	<b>240.8</b>	<b>103.9</b>	<b>-</b>	<b>(4.0)</b>	<b>(4.0)</b>	<b>-</b>	<b>900.0</b>	<b>1,530</b>
<b>Commercial, Industrial &amp; Municipal</b>									
C5 - C&I Active Demand Response	2.95	1,917.9	649.8	-	(7.9)	(7.9)	-	8,412.2	86
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.95</b>	<b>1,917.9</b>	<b>649.8</b>	<b>-</b>	<b>(7.9)</b>	<b>(7.9)</b>	<b>-</b>	<b>8,412.2</b>	<b>86</b>
<b>Total</b>	<b>2.86</b>	<b>2,158.7</b>	<b>753.7</b>	<b>-</b>	<b>(11.9)</b>	<b>(11.9)</b>	<b>-</b>	<b>9,312.2</b>	<b>1,616</b>

(1) Utility and Customer Costs in 2021 Dollars

2022									
	Benefit/Cost		Utility Costs (\$000 - 2021\$) <sup>1</sup>	Customer Costs (\$000 - 2021\$) <sup>1</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served
	Ratio Granite State Test	Benefit (\$000) Granite State Test							
<b>Residential Programs</b>									
A5 - Residential Active Demand Response	2.42	369.7	152.5	-	(6.0)	(6.0)	-	1,350.0	2,295
<b>Sub-Total Residential</b>	<b>2.42</b>	<b>369.7</b>	<b>152.5</b>	<b>-</b>	<b>(6.0)</b>	<b>(6.0)</b>	<b>-</b>	<b>1,350.0</b>	<b>2,295</b>
<b>Commercial, Industrial &amp; Municipal</b>									
C5 - C&I Active Demand Response	3.13	2,934.7	936.3	-	(10.9)	(10.9)	-	12,668.3	128
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.13</b>	<b>2,934.7</b>	<b>936.3</b>	<b>-</b>	<b>(10.9)</b>	<b>(10.9)</b>	<b>-</b>	<b>12,668.3</b>	<b>128</b>
<b>Total</b>	<b>3.03</b>	<b>3,304.4</b>	<b>1,088.8</b>	<b>-</b>	<b>(16.9)</b>	<b>(16.9)</b>	<b>-</b>	<b>14,018.3</b>	<b>2,423</b>

(1) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs tab.

2023									
	Benefit/Cost		Utility Costs (\$000 - 2021\$) <sup>1</sup>	Customer Costs (\$000 - 2021\$) <sup>1</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served
	Ratio Granite State Test	Benefit (\$000) Granite State Test							
<b>Residential Programs</b>									
A5 - Residential Active Demand Response	2.53	565.3	223.2	-	(8.9)	(8.9)	-	2,025.0	3,443
<b>Sub-Total Residential</b>	<b>2.53</b>	<b>565.3</b>	<b>223.2</b>	<b>-</b>	<b>(8.9)</b>	<b>(8.9)</b>	<b>-</b>	<b>2,025.0</b>	<b>3,443</b>
<b>Commercial, Industrial &amp; Municipal</b>									
C5 - C&I Active Demand Response	3.33	4,474.2	1,342.3	-	(16.2)	(16.2)	-	18,952.5	193
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.33</b>	<b>4,474.2</b>	<b>1,342.3</b>	<b>-</b>	<b>(16.2)</b>	<b>(16.2)</b>	<b>-</b>	<b>18,952.5</b>	<b>193</b>
<b>Total</b>	<b>3.22</b>	<b>5,039.5</b>	<b>1,565.5</b>	<b>-</b>	<b>(25.2)</b>	<b>(25.2)</b>	<b>-</b>	<b>20,977.5</b>	<b>3,635</b>

(1) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs tab.

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
B1a - HEA (Weatherization)	Air Sealing, Cord Wood	E21B1a001	12	16	20	0.2	0.3	0.4	3.6	4.7	5.6	-	-	-	-	-	-	183.1	241.1	286.4	2,746.7	3,615.9	4,296.7
B1a - HEA (Weatherization)	Air Sealing, Electric	E21B1a002	146	193	229	162.2	213.5	253.7	2,432.8	3,202.6	3,805.6	51.5	67.8	80.5	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Gas	E21B1a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1a - HEA (Weatherization)	Air Sealing, Kerosene	E21B1a004	187	247	293	11.1	14.6	17.4	166.8	219.5	260.9	-	-	-	-	-	-	1,620.7	2,133.6	2,535.3	24,310.9	32,003.8	38,029.4
B1a - HEA (Weatherization)	Air Sealing, Oil	E21B1a005	602	792	941	49.3	64.9	77.1	739.3	973.2	1,156.5	-	-	-	-	-	-	4,654.2	6,127.0	7,280.6	69,813.0	91,904.7	109,208.4
B1a - HEA (Weatherization)	Air Sealing, Propane	E21B1a006	212	280	332	23.6	31.0	36.9	353.7	465.6	553.3	-	-	-	-	-	-	1,140.8	1,501.7	1,784.5	17,111.4	22,526.2	26,767.4
B1a - HEA (Weatherization)	Air Sealing, Wood Pellets	E21B1a007	12	16	20	0.2	0.3	0.4	3.6	4.7	5.6	-	-	-	-	-	-	183.1	241.1	286.4	2,746.7	3,615.9	4,296.7
B1a - HEA (Weatherization)	Faucet Aerator, Electric	E21B1a009	54	70	84	2.3	3.0	3.6	16.0	21.0	25.0	0.4	0.6	0.7	0.2	0.2	0.3	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Gas	E21B1a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1a - HEA (Weatherization)	Faucet Aerator, Kerosene	E21B1a011	69	90	107	-	-	-	-	-	-	-	-	-	-	-	-	9.7	12.8	15.2	68.1	89.7	106.6
B1a - HEA (Weatherization)	Faucet Aerator, Oil	E21B1a012	220	290	344	-	-	-	-	-	-	-	-	-	-	-	-	31.2	41.1	48.9	218.7	287.9	342.1
B1a - HEA (Weatherization)	Faucet Aerator, Propane	E21B1a013	78	102	122	-	-	-	-	-	-	-	-	-	-	-	-	11.0	14.5	17.3	77.2	101.7	120.8
B1a - HEA (Weatherization)	Hand Held Showerhead, Electric	E21B1a016	20	27	31	2.7	3.5	4.2	18.6	24.5	29.1	0.5	0.7	0.8	0.2	0.3	0.3	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Gas	E21B1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Kerosene	E21B1a018	26	34	40	-	-	-	-	-	-	-	-	-	-	-	-	14.8	19.5	23.2	103.9	136.8	162.6
B1a - HEA (Weatherization)	Hand Held Showerhead, Oil	E21B1a019	83	109	129	-	-	-	-	-	-	-	-	-	-	-	-	47.7	62.7	74.6	333.6	439.2	521.9
B1a - HEA (Weatherization)	Hand Held Showerhead, Propane	E21B1a020	29	38	46	-	-	-	-	-	-	-	-	-	-	-	-	16.8	22.2	26.3	117.8	155.1	184.3
B1a - HEA (Weatherization)	Insulation, Cord Wood	E21B1a022	13	17	20	2.4	3.1	3.7	59.5	78.3	93.1	-	-	-	1.3	1.7	2.1	268.0	352.8	419.3	6,700.3	8,820.6	10,481.3
B1a - HEA (Weatherization)	Insulation, Electric	E21B1a023	150	198	235	211.1	277.9	330.2	5,276.9	6,946.7	8,254.7	67.0	88.2	104.8	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Gas	E21B1a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Kerosene	E21B1a025	192	253	301	25.1	33.1	39.3	628.6	827.6	983.4	-	-	-	13.9	18.3	21.7	3,331.2	4,385.4	5,211.0	83,280.7	109,634.1	130,275.9
B1a - HEA (Weatherization)	Insulation, Oil	E21B1a026	617	812	965	106.1	139.7	166.0	2,653.4	3,493.1	4,150.7	-	-	-	58.5	77.0	91.6	10,697.3	14,082.3	16,733.7	267,431.8	352,058.0	418,343.0
B1a - HEA (Weatherization)	Insulation, Propane	E21B1a027	218	287	341	31.9	42.0	49.9	797.7	1,050.1	1,247.8	-	-	-	17.6	23.2	27.5	2,312.8	3,044.7	3,617.9	57,820.0	76,116.6	90,447.7
B1a - HEA (Weatherization)	Insulation, Wood Pellets	E21B1a028	13	17	20	2.4	3.1	3.7	59.5	78.3	93.1	-	-	-	1.3	1.7	2.1	268.0	352.8	419.3	6,700.3	8,820.6	10,481.3
B1a - HEA (Weatherization)	Low Flow Showerhead, Electric	E21B1a030	22	29	34	2.9	3.8	4.5	20.3	26.7	31.8	0.6	0.8	0.9	0.2	0.3	0.3	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Gas	E21B1a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Kerosene	E21B1a032	28	37	44	-	-	-	-	-	-	-	-	-	-	-	-	16.2	21.3	25.3	113.4	149.3	177.4
B1a - HEA (Weatherization)	Low Flow Showerhead, Oil	E21B1a033	90	119	141	-	-	-	-	-	-	-	-	-	-	-	-	52.0	68.4	81.3	363.9	479.1	569.3
B1a - HEA (Weatherization)	Low Flow Showerhead, Propane	E21B1a034	32	42	50	-	-	-	-	-	-	-	-	-	-	-	-	18.4	24.2	28.7	128.5	169.2	201.0
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Electric	E21B1a037	13	17	20	1.3	1.8	2.1	20.1	26.5	31.5	0.3	0.3	0.4	0.1	0.1	0.2	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Gas	E21B1a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Kerosene	E21B1a039	16	22	26	-	-	-	-	-	-	-	-	-	-	-	-	6.0	7.9	9.3	89.6	117.9	140.1
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Oil	E21B1a040	53	69	82	-	-	-	-	-	-	-	-	-	-	-	-	19.2	25.2	30.0	287.5	378.4	449.7
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Propane	E21B1a041	19	24	29	-	-	-	-	-	-	-	-	-	-	-	-	6.8	8.9	10.6	101.5	133.6	158.8
B1a - HEA (Weatherization)	DHW Heat Pump Water Heater	E21B1a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, General Service Lamps	E21B1a044	12,625	16,620	19,749	405.6	533.9	634.4	811.1	1,067.8	1,268.8	87.5	115.3	137.0	56.5	74.3	88.3	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Linear	E21B1a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Other Specialty	E21B1a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Reflector	E21B1a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Fixture	E21B1a048	505	665	790	17.2	22.6	26.9	34.4	45.3	53.8	3.7	4.9	5.8	2.4	3.2	3.7	-	-	-	-	-	-
B1a - HEA (Weatherization)	Refrigerator	E21B1a049	601	791	940	460.6	606.4	720.6	5,527.8	7,277.0	8,647.1	52.6	69.3	82.3	64.5	85.0	101.0	-	-	-	-	-	-
B1a - HEA (Weatherization)	Freezer	E21B1a050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Clothes Washer	E21B1a051	361	475	564	29.1	38.3	45.5	407.5	536.4	637.4	4.1	5.4	6.4	3.9	5.1	6.0	88.3	116.2	138.1	1,236.2	1,627.4	1,933.8
B1a - HEA (Weatherization)	Clothes Dryer	E21B1a052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Dehumidifier	E21B1a053	156	206	245	45.6	60.0	71.3	546.7	719.7	855.2	1.8	2.4	2.9	8.7	11.5	13.7	-	-	-	-	-	-
B1a - HEA (Weatherization)	Room Air Conditioner	E21B1a054	721	950	1,129	74.2	97.7	116.0	593.5	781.3	928.4	-	-	-	38.4	50.6	60.1	-	-	-	-	-	-
B1a - HEA (Weatherization)	Triple Pane Window	E21B1a055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Visual Audit	E21B1a056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Baseload Audit - SF	E21B1a057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Baseload Audit - MF	E21B1a058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Income Kits	E21B1a059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC System)	Boiler Replacement, Gas	E21B1b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC System)	Boiler Replacement, Kerosene	E21B1b002	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	26.6	35.1	41.7	666.2	877.0	1,042.1
B1b - HEA (HVAC System)	Boiler Replacement, Oil	E21B1b003	146	193	229	10.2	13.4	16.0	255.0	335.7	398.9	3.0	4.0	4.7	-	-	-	2,118.4	2,788.7	3,313.8	52,959.9	69,718.6	82,845.1
B1b - HEA (HVAC System)	Boiler Replacement, Propane	E21B1b004	25	33	39	9.1	12.0	14.3	228.4	300.7	357.3	2.7	3.5	4.2	-	-	-	382.4	503.4	598.2	9,560.5	12,585.8	14,955.4
B1b - HEA (HVAC System)	Furnace Replacement, Gas	E21B1b005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC System)	Furnace Replacement, Kerosene	E21B1b006	140	184	218	11.1	14.6	17.4	222.5	292.9	348.0	3.2											

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
B1b - HEA (HVAC Systems)	Wifi Thermostat, Gas	E21B1b016	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Kerosene	E21B1b017	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Oil	E21B1b018	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Propane	E21B1b019	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Wood Pellets	E21B1b020	-	-	-																		
B1b - HEA (HVAC Systems)	Mini Split HP (cooling)	E21B1b021	-	-	-																		
B1b - HEA (HVAC Systems)	Mini Split HP (heating)	E21B1b022	40	50	60	191.2	239.1	286.9	3,442.4	4,303.0	5,163.6	60.7	75.9	91.1	-	-	-	-	-	-	-	-	-
<b>Home Energy Assistance Subtotal</b>						<b>1,933.9</b>	<b>2,533.2</b>	<b>3,012.9</b>	<b>26,183.6</b>	<b>34,240.5</b>	<b>40,737.7</b>	<b>350.7</b>	<b>457.6</b>	<b>544.7</b>	<b>272.0</b>	<b>358.1</b>	<b>425.5</b>	<b>32,835.1</b>	<b>43,225.5</b>	<b>51,363.9</b>	<b>709,300.4</b>	<b>933,751.9</b>	<b>1,109,557.3</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A1a - ES Homes	Cooling, Electric, SF	E21A1a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Electric, SF	E21A1a002	32	35	39	524.1	576.5	634.1	13,101.5	14,411.7	15,852.8	166.4	183.0	201.3	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Gas, SF	E21A1a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Heating, Oil, SF	E21A1a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Heating, Propane, SF	E21A1a005	226	249	273	127.8	140.6	154.6	3,195.0	3,514.5	3,866.0	-	-	-	-	-	-	8,812.0	9,693.2	10,662.5	220,299.4	242,329.4	266,562.3
A1a - ES Homes	Heating, Wood Pellets, SF	E21A1a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Electric, SF	E21A1a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Gas, SF	E21A1a008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Oil, SF	E21A1a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Propane, SF	E21A1a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Wood Pellets, SF	E21A1a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Cooling, Electric, MF	E21A1a012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Heating, Electric, MF	E21A1a013	235	259	284	339.2	373.1	410.4	8,479.6	9,327.6	10,260.3	107.7	118.5	130.3	-	-	-	-	-	-	-	-	
A1a - ES Homes	Heating, Gas, MF	E21A1a014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Heating, Oil, MF	E21A1a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Heating, Propane, MF	E21A1a016	24	26	29	35.0	38.6	42.4	876.2	963.8	1,060.2	-	-	-	-	-	-	268.8	295.7	325.2	6,720.0	7,392.0	8,131.2
A1a - ES Homes	Heating, Wood Pellets, MF	E21A1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Electric, MF	E21A1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Gas, MF	E21A1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Oil, MF	E21A1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Propane, MF	E21A1a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Hot Water, Wood Pellets, MF	E21A1a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	LED Bulb	E21A1a023	5,319	5,850	6,436	33.9	37.3	41.0	101.6	111.8	123.0	7.3	8.0	8.8	4.7	5.2	5.7	-	-	-	-	-	
A1a - ES Homes	LED Fixture	E21A1a024	3,208	3,529	3,882	17.6	19.4	21.3	52.9	58.2	64.0	3.8	4.2	4.6	2.5	2.7	3.0	-	-	-	-	-	
A1a - ES Homes	Refrigerator	E21A1a025	414	455	501	17.0	18.7	20.5	203.6	223.9	246.3	1.9	2.1	2.3	2.4	2.6	2.9	-	-	-	-	-	
A1a - ES Homes	Clothes Washer	E21A1a026	129	142	142	11.5	12.6	12.6	160.4	176.4	176.4	1.6	1.8	1.8	1.5	1.7	1.7	34.8	38.2	38.2	486.6	535.2	535.2
A1a - ES Homes	Clothes Dryer	E21A1a027	116	128	141	18.7	20.5	22.6	223.9	246.2	270.9	3.2	3.5	3.8	2.4	2.7	3.0	-	-	-	-	-	
A1a - ES Homes	HERS - Lighting and Appliances	E21A1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A1a - ES Homes	Residential New Construction Code Compliance	E21A1a029	1	1	1	-	-	36.1	-	-	721.8	-	-	5.7	-	-	9.5	-	-	-	-	-	
<b>ES Homes Subtotal</b>						<b>1,124.7</b>	<b>1,237.2</b>	<b>1,395.7</b>	<b>26,394.7</b>	<b>29,034.2</b>	<b>32,641.8</b>	<b>291.9</b>	<b>321.1</b>	<b>358.7</b>	<b>13.5</b>	<b>14.9</b>	<b>25.7</b>	<b>9,115.5</b>	<b>10,027.1</b>	<b>11,026.0</b>	<b>227,506.0</b>	<b>250,256.6</b>	<b>275,228.7</b>



Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A2b - HPwES (HVAC Syst	Wifi Thermostat, Kerosene	E21A2b017	0	0	0	0.0	0.0	0.0	0.2	0.2	0.2	-	-	-	0.0	0.0	0.0	0.7	0.7	0.7	10.6	10.6	10.6
A2b - HPwES (HVAC Syst	Wifi Thermostat, Oil	E21A2b018	21	21	21	1.0	1.0	1.0	14.5	14.5	14.5	-	-	-	0.5	0.5	0.5	124.4	124.4	124.4	1,865.9	1,865.9	1,865.9
A2b - HPwES (HVAC Syst	Wifi Thermostat, Propane	E21A2b019	6	6	6	0.3	0.3	0.3	4.3	4.3	4.3	-	-	-	0.2	0.2	0.2	35.8	35.8	35.8	537.1	537.1	537.1
A2b - HPwES (HVAC Syst	Wifi Thermostat, Wood Pellets	E21A2b020	1	1	1	0.0	0.0	0.0	0.7	0.7	0.7	-	-	-	0.0	0.0	0.0	3.0	3.0	3.0	45.4	45.4	45.4
<b>Home Performance with Energy Star Subtotal</b>						<b>1,263.5</b>	<b>1,309.8</b>	<b>1,356.2</b>	<b>14,098.2</b>	<b>14,632.7</b>	<b>15,167.1</b>	<b>268.3</b>	<b>272.6</b>	<b>276.9</b>	<b>206.7</b>	<b>216.0</b>	<b>225.3</b>	<b>42,246.9</b>	<b>42,255.1</b>	<b>42,263.3</b>	<b>828,962.3</b>	<b>829,076.8</b>	<b>829,191.3</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A3a - ES Lighting	LED Bulb, General Service Lamps	E21A3a001	580,944	290,472	-	4,965.1	1,730.3	-	14,895.4	5,190.8	-	1,071.8	373.5	-	691.4	240.9	-	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Linear	E21A3a002	94,058	44,954	7,377	262.7	87.5	8.1	2,626.8	875.0	73.0	56.7	18.9	1.8	36.6	12.2	1.1	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Other Specialty	E21A3a003	165,984	110,656	73,771	1,590.1	738.8	278.4	4,770.2	2,216.4	556.8	343.3	159.5	60.1	221.4	102.9	38.8	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Reflector	E21A3a004	193,648	48,412	-	2,052.8	357.7	-	4,105.6	715.4	-	443.1	77.2	-	285.8	49.8	-	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, General Service Lamps (Hard to Reach)	E21A3a005	30,576	20,384	13,589	419.7	227.0	116.1	1,259.1	681.0	232.3	90.6	49.0	25.1	58.4	31.6	16.2	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Linear (Hard to Reach)	E21A3a006	5,460	3,640	2,427	24.5	13.2	6.8	244.9	132.5	61.0	5.3	2.9	1.5	3.4	1.8	0.9	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Other Specialty (Hard to Reach)	E21A3a007	8,736	5,824	3,883	134.4	72.7	37.2	403.2	218.1	74.4	29.0	15.7	8.0	18.7	10.1	5.2	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Reflector (Hard to Reach)	E21A3a008	15,288	10,192	6,795	260.3	140.8	72.0	520.6	281.6	72.0	56.2	30.4	15.5	36.2	19.6	10.0	-	-	-	-	-	-
A3a - ES Lighting	LED Fixture	E21A3a009	41,325	27,550	18,367	327.6	152.2	57.4	982.9	456.7	114.7	70.7	32.9	12.4	45.6	21.2	8.0	-	-	-	-	-	-
A3a - ES Lighting	LED Fixture (Hard to Reach)	E21A3a010	2,175	1,450	967	27.7	15.0	7.7	83.1	44.9	15.3	6.0	3.2	1.7	3.9	2.1	1.1	-	-	-	-	-	-
A3b - ES Appliances	Advanced Power Strip, Tier I	E21A3b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Advanced Power Strip, Tier II	E21A3b002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (cooling)	E21A3b003	47	62	79	10.3	13.7	-	186.1	246.1	311.0	-	-	-	5.7	7.5	9.5	-	-	-	-	-	-
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (heating)	E21A3b004	47	62	79	98.1	129.7	163.9	1,765.6	2,335.0	2,950.1	31.1	41.2	52.0	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Mini Split HP - Lost Opportunity (cooling)	E21A3b005	1,700	2,587	3,524	175.0	266.3	362.7	3,149.6	4,792.6	6,529.4	-	-	-	96.5	146.8	200.0	-	-	-	-	-	-
A3c - ES HVAC Systems	Mini Split HP - Lost Opportunity (heating)	E21A3b006	1,700	2,587	3,524	558.1	849.3	1,157.0	10,046.0	15,286.6	20,826.2	177.2	269.6	367.3	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 50 gal - Downstream	E21A3b007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 80 gal - Downstream	E21A3b008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Heat Pump Swimming Pool Heater	E21A3b009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	ES Clothes Dryers	E21A3b010	1,900	1,978	2,056	304.8	317.3	329.8	3,657.1	3,807.3	3,957.4	51.9	54.1	56.2	40.0	41.6	43.3	-	-	-	-	-	-
A3b - ES Appliances	Dryer Heat Pump	E21A3b011	45	45	45	18.9	18.9	18.9	227.4	227.4	227.4	3.2	3.2	3.2	2.5	2.5	2.5	-	-	-	-	-	-
A3b - ES Appliances	Dryer Hybrid	E21A3b012	45	45	45	9.6	9.6	9.6	115.2	115.2	115.2	1.6	1.6	1.6	1.3	1.3	1.3	-	-	-	-	-	-
A3c - ES HVAC Systems	ECM Motor for FWH Circulating Pump - Midstream	E21A3b013	1,300	3,000	4,200	61.0	140.8	197.1	1,097.9	2,533.7	3,547.2	18.0	41.5	58.1	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	ES AC (central) 3 ton	E21A3b015	149	173	197	29.8	34.6	39.4	417.0	484.2	551.3	-	-	-	16.4	19.1	21.7	-	-	-	-	-	-
A3c - ES HVAC Systems	Room Air Conditioner	E21A3b016	900	1,073	1,246	14.4	17.2	19.9	115.2	137.3	159.5	-	-	-	7.5	8.9	10.3	-	-	-	-	-	-
A3b - ES Appliances	ES Clothes Washers	E21A3b017	1,700	2,041	2,382	150.7	181.0	211.2	2,110.3	2,533.7	2,957.0	21.2	25.4	29.7	20.0	24.0	28.0	457.3	549.0	640.8	6,402.2	7,686.4	8,970.6
A3b - ES Appliances	Washer Tier CEE Tier 2+	E21A3b018	1,455	1,455	1,455	226.8	226.8	226.8	3,175.7	3,175.7	3,175.7	31.9	31.9	31.9	30.1	30.1	30.1	641.7	641.7	641.7	8,983.2	8,983.2	8,983.2
A3b - ES Appliances	ES Dehumidifier	E21A3b019	1,996	2,292	2,588	288.4	331.2	374.0	3,461.1	3,974.3	4,487.6	11.6	13.3	15.0	55.3	63.5	71.7	-	-	-	-	-	-
A3b - ES Appliances	ES Dishwasher	E21A3b020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	ES Freezers	E21A3b021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Refrigerator	E21A3b022	1,800	2,200	2,600	73.8	90.2	106.6	885.6	1,082.4	1,279.2	8.4	10.3	12.2	10.3	12.6	14.9	-	-	-	-	-	-
A3b - ES Appliances	Refrigerator CEE Tier 2+	E21A3b023	250	449	648	24.1	43.3	62.5	289.2	519.4	749.6	2.8	4.9	7.1	3.4	6.1	8.8	-	-	-	-	-	-
A3b - ES Appliances	ES Pool Pumps (Variable Speed)	E21A3b024	348	396	444	369.6	420.6	471.5	3,695.8	4,205.5	4,715.3	-	-	-	213.6	243.1	272.6	-	-	-	-	-	-
A3b - ES Appliances	Room Air Purifier	E21A3b025	900	1,098	1,296	351.5	428.8	506.1	3,163.1	3,858.9	4,554.8	40.1	48.9	57.8	40.1	48.9	57.8	-	-	-	-	-	-
A3c - ES HVAC Systems	Wifi Thermostat (Heating & Cooling)	E21A3b026	340	445	550	8.5	11.1	13.7	126.8	165.9	205.1	-	-	-	4.7	6.1	7.5	2,244.0	2,937.0	3,630.0	33,660.0	44,055.0	54,450.0
A3b - ES Appliances	Primary Refrigerator Recycling	E21A3b027	300	301	302	147.5	148.0	148.5	1,179.8	1,183.8	1,187.7	16.8	16.9	17.0	20.7	20.7	20.8	-	-	-	-	-	-
A3b - ES Appliances	Secondary Refrigerator Recycling	E21A3b028	350	478	606	264.3	360.9	457.5	2,114.0	2,887.1	3,660.2	24.8	33.8	42.9	41.3	56.4	71.5	-	-	-	-	-	-
A3b - ES Appliances	Secondary Freezer Recycling	E21A3b029	78	168	258	51.3	110.5	169.8	410.6	884.4	1,358.1	5.0	10.8	16.6	6.8	14.6	22.4	-	-	-	-	-	-
A3b - ES Appliances	Room Air Conditioner Recycling	E21A3b030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Ductless Mini-split Heat Pump - Retrofit Resistance	E21A3b031	100	100	100	503.9	503.9	503.9	9,070.2	9,070.2	9,070.2	219.8	160.0	160.0	127.8	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Ductless Mini-split Heat Pump - Retrofit HP	E21A3b032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air-source Heat Pump - Retrofit HP	E21A3b033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air-source Heat Pump - Retrofit Resistance	E21A3b034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 50 gal - Midstream	E21A3b035	1,000	1,250	1,750	740.0	925.0	1,294.9	9,619.6	12,024.5	16,834.3	121.4	151.8	212.5	67.1	83.9	117.5	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 80 gal - Midstream	E21A3b036	100	-	-	43.5	-	-	565.6	-	-	7.1	-	-	3.9	-	-	-	-	-	-	-	-
<b>ES Products Subtotal</b>						<b>14,588.7</b>	<b>9,113.6</b>	<b>7,446.3</b>	<b>90,536.2</b>	<b>86,343.6</b>	<b>94,609.0</b>	<b>2,968.8</b>	<b>1,682.5</b>	<b>1,267.1</b>	<b>2,216.5</b>	<b>1,330.0</b>	<b>1,093.4</b>	<b>3,343.0</b>	<b>4,127.7</b>	<b>4,912.4</b>	<b>49,045.3</b>	<b>60,724.5</b>	<b>72,403.7</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1a - LCI Retrofit	Custom Large Compressed Air Retro	E21C1a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Hot Water Retro	E21C1a002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large HVAC Retro	E21C1a003	1	1	1	799.2	999.0	1,198.8	10,229.8	12,787.2	15,344.6	68.0	85.0	102.0	56.0	70.0	84.0	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Interior	E21C1a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Exterior	E21C1a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Controls	E21C1a048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Motors Retro	E21C1a005	1	1	1	51.4	558.7	1,105.9	719.6	7,821.2	15,482.2	4.6	50.3	99.6	4.7	51.4	101.8	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Process Retro	E21C1a006	1	1	1	3,996.0	5,994.0	8,991.0	47,152.8	70,729.2	106,093.8	360.0	540.0	810.0	380.0	570.0	855.0	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Refrigeration Retro	E21C1a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Other Retro	E21C1a008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Daylight Dimming	E21C1a009	3	4	5	28.0	37.3	46.7	252.1	336.1	420.1	0.4	0.5	0.6	0.4	0.6	0.7	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C1a010	19	23	26	558.5	674.7	789.7	7,819.0	9,446.3	11,055.7	111.8	135.1	158.1	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C1a011	105	128	150	2,097.9	2,547.5	2,997.0	29,370.6	35,664.3	41,958.0	420.0	510.0	600.0	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C1a012	23	28	33	1,037.2	1,253.1	1,466.6	12,446.5	15,036.9	17,598.9	126.7	153.0	179.1	166.1	200.7	234.9	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C1a013	420	510	600	16,783.2	20,379.6	23,976.0	201,398.4	244,555.2	287,712.0	2,049.6	2,488.8	2,928.0	2,688.0	3,264.0	3,840.0	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Occupancy Sensors	E21C1a014	15	20	26	54.6	72.8	94.6	491.4	655.3	851.8	0.7	0.9	1.2	0.8	1.1	1.4	-	-	-	-	-	-
C1a - LCI Retrofit	Boiler Reset Controls, Electric	E21C1a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Case Motor Replacement	E21C1a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Cooler Night Cover	E21C1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Demand Control Ventilation	E21C1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Door Heater Controls	E21C1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Duct Sealing, Electric	E21C1a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Ductless Mini Split Heat Pump	E21C1a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C1a023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Electronic Defrost Control	E21C1a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Energy Management System, Electric	E21C1a025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C1a026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Evaporator Fan Control	E21C1a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Faucet Aerator, Electric	E21C1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Hotel Occupancy Sensor	E21C1a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Low Pressure Drop Filter	E21C1a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C1a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Low-Flow Showerhead, Electric	E21C1a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Motors, Open Drip	E21C1a035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Motors, Totally Enclosed Fan Cooled	E21C1a036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Novelty Cooler Shutoff	E21C1a037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Pipe Wrap - Heating, Electric	E21C1a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Pipe Wrap - Hot Water, Electric	E21C1a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Pre Rinse Spray Valve, Electric	E21C1a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Programmable Thermostat, Electric	E21C1a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Steam Trap, Electric	E21C1a042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Variable Frequency Drive	E21C1a043	7	10	13	448.1	640.1	832.2	6,721.5	9,602.2	12,482.9	17.6	25.1	32.6	17.6	25.1	32.6	-	-	-	-	-	-
C1a - LCI Retrofit	Variable Frequency Drive with Motor	E21C1a044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Vending Miser	E21C1a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Zero Loss Condensate Drain	E21C1a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Large Retrocommissioning	E21C1a049	1	1	1	151.0	453.1	1,208.2	453.1	1,359.2	3,624.5	7.9	23.6	62.9	6.8	20.4	54.4	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Compressed Air New	E21C1b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Hot Water New	E21C1b002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large HVAC New	E21C1b003	1	1	1	8,686.8	13,247.4	17,699.4	125,958.4	192,087.0	256,640.9	519.1	791.6	1,057.7	1,346.8	2,053.8	2,744.0	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Lighting New - Interior	E21C1b004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Lighting New - Exterior	E21C1b054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Lighting New - Controls	E21C1b055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Motors New	E21C1b005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Process New	E21C1b006	1	1	1	7,943.5	12,723.2	21,655.0	112,003.2	179,396.6	305,335.4	521.5	835.2	1,421.6	1,100.9	1,763.3	3,001.1	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Refrigeration New	E21C1b007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Other New	E21C1b008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Custom Large Comprehensive Design	E21C1b056	1	1	1	2,997.0	2,397.6	1,918.1	50,949.0	40,759.2	32,607.4	356.6	285.3	228.2	356.6	285.3	228.2	-	-	-	-	-	-
C1b - LCI New Equipment	Daylight Dimming	E21C1b009	3	4	5	16.8	22.4	28.0	167.8	223.7	279.6	0.2	0.3	0.4	0.3	0.3	0.4	-	-	-	-	-	-
C1b - LCI New Equipment	Performance Lighting - Exterior w/ Controls	E21C1b010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Performance Lighting - Exterior w/o Controls	E21C1b011	50	60	72	499.5	599.4	719.3	7,492.5	8,991.0	10,789.2	100.0	120.0	144.0	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Performance Lighting - Interior w/ Controls	E21C1b012	6	5	5	127.0	120.2	113.4	1,904.8	1,802.6	1,700.5	15.5	14.7	13.8	20.3	19.2	18.2	-	-	-	-	-	-
C1b - LCI New Equipment	Performance Lighting - Interior w/o Controls	E21C1b013	75	45	27	1,498.5	899.1	539.5	22,477.5	13,486.5	8,091.9	183.0	109.8	65.9	240.0	144.0	86.4	-	-	-	-	-	-
C1b - LCI New Equipment	Lighting Occupancy Sensors	E21C1b014	5	6	7	6.1	7.3	8.5	60.9	73.1	85.3	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-
C1b - LCI New Equipment	Advanced Power Strip	E21C1b015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Air Compressor	E21C1b016	25	33	43	48.5	64.0	83.2	727.7	960.6	1,248.7	11.4	15.1	19.6	13.7	18.0	23.4	-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1b - LCI New Equipment	Air Nozzle	E21C1b017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Circulator Pump	E21C1b018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Combination Oven, Electric	E21C1b019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Compressor Storage	E21C1b020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Convection Oven, Electric	E21C1b021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - High Temp Door Type	E21C1b022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - High Temp Multi Tank Conveyor	E21C1b023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - High Temp Pot, Pan, Utensil	E21C1b024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - High Temp Single Tank Conveyor	E21C1b025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - High Temp Under Counter	E21C1b026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - Low Temp Door Type	E21C1b027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - Low Temp Multi Tank Conveyor	E21C1b028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - Low Temp Single Tank Conveyor	E21C1b029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Dishwasher - Low Temp Under Counter	E21C1b030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Faucet Aerator, Electric	E21C1b031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Fryer Large Vat, Electric	E21C1b032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Fryer Standard Vat, Electric	E21C1b033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Griddle, Electric	E21C1b034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Ground Source Heat Pump	E21C1b035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Hot Food Holding Cabinet 3/4 Size	E21C1b036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Hot Food Holding Cabinet Full Size	E21C1b037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Hot Food Holding Cabinet Half Size	E21C1b038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Ice Machine - Ice Making Head	E21C1b039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Ice Machine - Remote Cond./Split Unit - Batch	E21C1b040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Ice Machine - Remote Cond./Split Unit - Continuous	E21C1b041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Ice Machine - Self Contained	E21C1b042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Low Pressure Drop Filter	E21C1b043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Low-Flow Showerhead With Thermostatic Valve, Electric	E21C1b044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Low-Flow Showerhead, Electric	E21C1b045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Pre Rinse Spray Valve, Electric	E21C1b046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Refrigerated Air Dryer	E21C1b047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Steam Cooker, Electric	E21C1b048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Unitary Air Conditioner	E21C1b049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Water Source Heat Pump	E21C1b050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	Zero Loss Condensate Drain	E21C1b051	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	High Efficiency Chiller - FL	E21C1b052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment	High Efficiency Chiller - IPLV	E21C1b053	12	16	21	1,303.2	1,737.6	2,280.6	29,974.0	39,965.3	52,454.4	48.1	64.1	84.1	392.6	523.5	687.1	-	-	-	-	-	-
C1b - LCI New Equipment	C&I Large New Construction Code Compliance	E21C1b057	1	1	1	-	-	131.7	-	-	2,634.5	-	-	20.7	-	-	34.7	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Circulator Pump	E21C1c001	35	42	50	13.9	16.6	20.0	277.1	332.6	399.1	0.1	0.2	0.2	2.3	2.7	3.3	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Demand Control Ventilation	E21C1c002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream DMSHP Systems	E21C1c003	10	12	15	10.2	12.2	14.7	122.3	146.8	176.2	-	-	-	2.8	3.3	4.0	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dual Enthalpy Economizer Controls	E21C1c004	8	10	12	26.0	31.2	37.5	260.4	312.5	375.0	-	-	-	11.7	14.1	16.9	-	-	-	-	-	-
C1c - LCI Midstream	Midstream ECM Fan Motors	E21C1c005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Heat Pump Systems	E21C1c006	0	0	0	0.1	0.1	0.1	0.7	0.8	1.0	-	-	-	-	0.0	0.0	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Unitary Air Conditioners	E21C1c007	40	48	57	131.3	157.6	189.1	1,576.1	1,891.3	2,269.6	-	-	-	11.8	14.2	17.0	-	-	-	-	-	-
C1c - LCI Midstream	Midstream VRF	E21C1c008	19	23	27	142.8	171.3	205.6	2,855.3	3,426.3	4,111.6	1.4	1.7	2.1	23.4	28.1	33.7	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Water Source Heat Pump Systems	E21C1c009	32	38	46	18.0	21.6	26.0	216.4	259.6	311.5	-	-	-	4.9	5.8	7.0	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Downlight	E21C1c010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Exterior	E21C1c011	298	238	143	90.7	66.5	36.3	883.3	647.8	353.3	18.1	13.3	7.3	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED High Bay/Low Bay	E21C1c012	1,322	1,058	635	957.9	702.4	383.1	12,030.8	8,822.6	4,812.3	125.8	92.2	50.3	141.3	103.7	56.5	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Linear Fixture	E21C1c013	2,660	2,128	1,277	294.5	215.9	117.8	3,236.1	2,373.2	1,294.5	34.2	25.1	13.7	38.4	28.2	15.4	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Linear Fixture with Controls	E21C1c014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Linear Lamp	E21C1c015	5,447	4,358	2,615	327.3	240.0	130.9	3,446.8	2,527.6	1,378.7	38.0	27.9	15.2	42.7	31.3	17.1	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Screw In	E21C1c016	1,530	1,224	734	111.7	77.1	38.9	524.0	361.8	182.6	14.6	10.1	5.1	15.3	10.5	5.3	-	-	-	-	-	-
C1c - LCI Midstream	Midstream LED Stairwell Kit	E21C1c017	15	12	7	2.4	1.7	0.9	23.5	17.2	9.4	0.3	0.2	0.1	0.4	0.3	0.2	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Combination Oven, Electric	E21C1c018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Convection Oven, Electric	E21C1c019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - High Temp Door Type	E21C1c020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - High Temp Multi Tank Conveyor	E21C1c021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - High Temp Pot, Pan, Utensil	E21C1c022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - High Temp Single Tank Conveyor	E21C1c023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - High Temp Under Counter	E21C1c024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Door Type	E21C1c025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Multi Tank Conveyor	E21C1c026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Single Tank Conveyor	E21C1c027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Under Counter	E21C1c028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1c - LCI Midstream	Midstream Freezer - Solid Door	E21C1c029	-	-	-																		
C1c - LCI Midstream	Midstream Freezer -Glass Door	E21C1c030	-	-	-																		
C1c - LCI Midstream	Midstream Fryer Large Vat, Electric	E21C1c031	-	-	-																		
C1c - LCI Midstream	Midstream Fryer Standard Vat, Electric	E21C1c032	-	-	-																		
C1c - LCI Midstream	Midstream Griddle, Electric	E21C1c033	-	-	-																		
C1c - LCI Midstream	Midstream Hot Food Holding Cabinet 3/4 Size	E21C1c034	-	-	-																		
C1c - LCI Midstream	Midstream Hot Food Holding Cabinet Full Size	E21C1c035	-	-	-																		
C1c - LCI Midstream	Midstream Hot Food Holding Cabinet Half Size	E21C1c036	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Ice Making Head	E21C1c037	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Batch	E21C1c038	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Contin	E21C1c039	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Self Contained	E21C1c040	-	-	-																		
C1c - LCI Midstream	Midstream Refrigerator - Glass Door	E21C1c041	-	-	-																		
C1c - LCI Midstream	Midstream Refrigerator - Solid Door	E21C1c042	-	-	-																		
C1c - LCI Midstream	Midstream Steam Cooker, Electric	E21C1c043	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Water Heater, 120 gallons	E21C1c044	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Water Heater, 50 gallons	E21C1c045	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Water Heater, 80 gallons	E21C1c046	-	-	-																		
C1d - LCI Direct Install	Custom Large Compressed Air Direct Install	E21C1d001	-	-	-																		
C1d - LCI Direct Install	Custom Large Hot Water Direct Install	E21C1d002	-	-	-																		
C1d - LCI Direct Install	Custom Large HVAC Direct Install	E21C1d003	-	-	-																		
C1d - LCI Direct Install	Custom Large Lighting Direct Install - Interior	E21C1d004	-	-	-																		
C1d - LCI Direct Install	Custom Large Lighting Direct Install - Exterior	E21C1d005	-	-	-																		
C1d - LCI Direct Install	Custom Large Lighting Direct Install - Controls	E21C1d006	-	-	-																		
C1d - LCI Direct Install	Custom Large Motors Direct Install	E21C1d007	-	-	-																		
C1d - LCI Direct Install	Custom Large Process Direct Install	E21C1d008	-	-	-																		
C1d - LCI Direct Install	Custom Large Refrigeration Direct Install	E21C1d009	-	-	-																		
C1d - LCI Direct Install	Custom Large Other Direct Install	E21C1d010	-	-	-																		
C1d - LCI Direct Install	Daylight Dimming	E21C1d011	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Exterior w/ Controls	E21C1d012	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Exterior w/o Controls	E21C1d013	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Interior w/ Controls	E21C1d014	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Interior w/o Controls	E21C1d015	-	-	-																		
C1d - LCI Direct Install	Lighting Occupancy Sensors	E21C1d016	-	-	-																		
C1d - LCI Direct Install	Boiler Reset Controls, Electric	E21C1d017	-	-	-																		
C1d - LCI Direct Install	Case Motor Replacement	E21C1d018	-	-	-																		
C1d - LCI Direct Install	Cooler Night Cover	E21C1d019	-	-	-																		
C1d - LCI Direct Install	Demand Control Ventilation	E21C1d020	-	-	-																		
C1d - LCI Direct Install	Door Heater Controls	E21C1d021	-	-	-																		
C1d - LCI Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C1d022	-	-	-																		
C1d - LCI Direct Install	Duct Sealing, Electric	E21C1d023	-	-	-																		
C1d - LCI Direct Install	Ductless Mini Split Heat Pump	E21C1d024	-	-	-																		
C1d - LCI Direct Install	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C1d025	-	-	-																		
C1d - LCI Direct Install	Electronic Defrost Control	E21C1d026	-	-	-																		
C1d - LCI Direct Install	Energy Management System, Electric	E21C1d027	-	-	-																		
C1d - LCI Direct Install	Energy Star Wifi Thermostat, Electric	E21C1d028	-	-	-																		
C1d - LCI Direct Install	Evaporator Fan Control	E21C1d029	-	-	-																		
C1d - LCI Direct Install	Faucet Aerator, Electric	E21C1d030	-	-	-																		
C1d - LCI Direct Install	Hotel Occupancy Sensor	E21C1d031	-	-	-																		
C1d - LCI Direct Install	Low Pressure Drop Filter	E21C1d032	-	-	-																		
C1d - LCI Direct Install	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C1d033	-	-	-																		
C1d - LCI Direct Install	Low-Flow Showerhead, Electric	E21C1d034	-	-	-																		
C1d - LCI Direct Install	Motors, Open Drip	E21C1d035	-	-	-																		
C1d - LCI Direct Install	Motors, Totally Enclosed Fan Cooled	E21C1d036	-	-	-																		
C1d - LCI Direct Install	Novelty Cooler Shutoff	E21C1d037	-	-	-																		
C1d - LCI Direct Install	Pipe Wrap - Heating, Electric	E21C1d038	-	-	-																		
C1d - LCI Direct Install	Pipe Wrap - Hot Water, Electric	E21C1d039	-	-	-																		
C1d - LCI Direct Install	Pre Rinse Spray Valve, Electric	E21C1d040	-	-	-																		
C1d - LCI Direct Install	Programmable Thermostat, Electric	E21C1d041	-	-	-																		
C1d - LCI Direct Install	Steam Trap, Electric	E21C1d042	-	-	-																		
C1d - LCI Direct Install	Variable Frequency Drive	E21C1d043	-	-	-																		
C1d - LCI Direct Install	Variable Frequency Drive with Motor	E21C1d044	-	-	-																		
C1d - LCI Direct Install	Vending Miser	E21C1d045	-	-	-																		
C1d - LCI Direct Install	Zero Loss Condensate Drain	E21C1d046	-	-	-																		
<b>Large Business Energy Solutions Subtotal</b>						<b>51,258.7</b>	<b>67,142.5</b>	<b>89,084.2</b>	<b>694,223.1</b>	<b>906,858.5</b>	<b>1,200,167.0</b>	<b>5,155.2</b>	<b>6,419.2</b>	<b>8,124.2</b>	<b>7,086.6</b>	<b>9,253.1</b>	<b>12,204.9</b>						

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2a - SCI Retrofit	Custom Small Compressed Air Retro	E21C2a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Hot Water Retro	E21C2a002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small HVAC Retro	E21C2a003	1	1	1	150.0	300.0	550.0	1,950.0	3,900.0	7,150.0	12.8	25.5	46.8	10.5	21.0	38.5	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Lighting Retro - Interior	E21C2a004	1	1	1	6,822.4	10,233.6	13,644.8	88,691.2	133,036.8	177,382.4	780.8	1,171.2	1,561.6	1,024.0	1,536.0	2,048.0	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Lighting Retro - Exterior	E21C2a047	1	1	1	718.9	1,078.4	1,437.8	9,345.7	14,018.6	18,691.4	140.0	210.0	280.0	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Lighting Retro - Controls	E21C2a048	1	1	1	640.0	960.0	1,280.0	5,760.0	8,640.0	11,520.0	8.3	12.5	16.6	9.6	14.4	19.2	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Motors Retro	E21C2a005	1	1	1	10.0	15.0	20.0	130.0	195.0	260.0	0.9	1.4	1.8	0.9	1.4	1.8	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Process Retro	E21C2a006	1	1	1	333.3	500.0	666.7	4,333.3	6,500.0	8,666.7	30.0	45.0	60.0	31.7	47.5	63.3	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Refrigeration Retro	E21C2a007	1	1	1	130.0	195.0	292.5	1,690.0	2,535.0	3,802.5	12.9	19.3	29.0	11.7	17.6	26.3	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Other Retro	E21C2a008	1	1	1	200.0	300.0	400.0	2,600.0	3,900.0	5,200.0	10.4	15.6	20.8	9.0	13.5	18.0	-	-	-	-	-	
C2a - SCI Retrofit	Daylight Dimming	E21C2a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C2a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C2a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C2a012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C2a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Lighting Occupancy Sensors	E21C2a014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Boiler Reset Controls, Electric	E21C2a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Case Motor Replacement	E21C2a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Cooler Night Cover	E21C2a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Demand Control Ventilation	E21C2a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Door Heater Controls	E21C2a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C2a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Duct Sealing, Electric	E21C2a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Ductless Mini Split Heat Pump	E21C2a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C2a023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Electronic Defrost Control	E21C2a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Energy Management System, Electric	E21C2a025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C2a026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Evaporator Fan Control	E21C2a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Faucet Aerator, Electric	E21C2a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Hotel Occupancy Sensor	E21C2a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Low Pressure Drop Filter	E21C2a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C2a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Low-Flow Showerhead, Electric	E21C2a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Motors, Open Drip	E21C2a035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Motors, Totally Enclosed Fan Cooled	E21C2a036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Novelty Cooler Shutoff	E21C2a037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Pipe Wrap - Heating, Electric	E21C2a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Pipe Wrap - Hot Water, Electric	E21C2a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Pre Rinse Spray Valve, Electric	E21C2a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Programmable Thermostat, Electric	E21C2a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Steam Trap, Electric	E21C2a042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Variable Frequency Drive	E21C2a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Variable Frequency Drive with Motor	E21C2a044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Vending Miser	E21C2a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Zero Loss Condensate Drain	E21C2a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2a - SCI Retrofit	Small Retrocommissioning	E21C2a049	1	1	1	19.9	59.6	159.0	59.6	178.9	477.0	1.0	3.1	8.3	0.9	2.7	7.2	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Compressed Air New	E21C2b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Hot Water New	E21C2b002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small HVAC New	E21C2b003	1	1	1	1,000.0	1,500.0	2,000.0	15,000.0	22,500.0	30,000.0	59.7	89.5	119.4	154.9	232.3	309.8	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Lighting New - Interior	E21C2b004	1	1	1	2,500.0	2,800.0	2,500.0	37,500.0	42,000.0	37,500.0	305.0	341.6	305.0	400.0	448.0	400.0	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Lighting New - Exterior	E21C2b054	1	1	1	416.7	500.0	500.0	6,250.0	7,500.0	7,500.0	83.3	100.0	100.0	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Lighting New - Controls	E21C2b055	1	1	1	250.0	280.0	250.0	2,250.0	2,520.0	2,250.0	3.3	3.6	3.3	3.8	4.2	3.8	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Motors New	E21C2b005	1	1	1	100.0	200.0	300.0	1,500.0	3,000.0	4,500.0	11.8	23.6	35.4	14.0	28.0	42.0	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Process New	E21C2b006	1	1	1	700.0	1,050.0	1,575.0	10,500.0	15,750.0	23,625.0	45.9	68.9	103.3	96.9	145.4	218.1	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Refrigeration New	E21C2b007	1	1	1	15.0	50.0	85.0	225.0	750.0	1,275.0	1.4	4.6	7.8	1.4	4.6	7.8	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Other New	E21C2b008	1	1	1	200.0	200.0	200.0	3,000.0	3,000.0	3,000.0	25.9	25.9	25.9	28.8	28.8	28.8	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Comprehensive Design	E21C2b056	1	1	1	2,250.0	1,800.0	1,440.0	38,250.0	30,600.0	24,480.0	267.4	214.0	171.2	267.4	214.0	171.2	-	-	-	-	-	
C2b - SCI New Equipment	Daylight Dimming	E21C2b009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Performance Lighting - Exterior w/ Controls	E21C2b010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Performance Lighting - Exterior w/o Controls	E21C2b011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Performance Lighting - Interior w/ Controls	E21C2b012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Performance Lighting - Interior w/o Controls	E21C2b013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Lighting Occupancy Sensors	E21C2b014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Advanced Power Strip	E21C2b015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C2b - SCI New Equipment	Air Compressor	E21C2b016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2b - SCI New Equipment	Air Nozzle	E21C2b017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Circulator Pump	E21C2b018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Combination Oven, Electric	E21C2b019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Compressor Storage	E21C2b020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Convection Oven, Electric	E21C2b021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - High Temp Door Type	E21C2b022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - High Temp Multi Tank Conveyor	E21C2b023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - High Temp Pot, Pan, Utensil	E21C2b024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - High Temp Single Tank Conveyor	E21C2b025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - High Temp Under Counter	E21C2b026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - Low Temp Door Type	E21C2b027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - Low Temp Multi Tank Conveyor	E21C2b028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - Low Temp Single Tank Conveyor	E21C2b029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Dishwasher - Low Temp Under Counter	E21C2b030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Faucet Aerator, Electric	E21C2b031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Fryer Large Vat, Electric	E21C2b032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Fryer Standard Vat, Electric	E21C2b033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Griddle, Electric	E21C2b034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Ground Source Heat Pump	E21C2b035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Hot Food Holding Cabinet 3/4 Size	E21C2b036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Hot Food Holding Cabinet Full Size	E21C2b037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Hot Food Holding Cabinet Half Size	E21C2b038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Ice Machine - Ice Making Head	E21C2b039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Ice Machine - Remote Cond./Split Unit - Batch	E21C2b040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Ice Machine - Remote Cond./Split Unit - Continuous	E21C2b041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Ice Machine - Self Contained	E21C2b042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Low Pressure Drop Filter	E21C2b043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Low-Flow Showerhead With Thermostatic Valve, Electric	E21C2b044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Low-Flow Showerhead, Electric	E21C2b045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Pre Rinse Spray Valve, Electric	E21C2b046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Refrigerated Air Dryer	E21C2b047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Steam Cooker, Electric	E21C2b048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Unitary Air Conditioner	E21C2b049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Water Source Heat Pump	E21C2b050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Zero Loss Condensate Drain	E21C2b051	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	High Efficiency Chiller - FL	E21C2b052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	High Efficiency Chiller - IPLV	E21C2b053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	C&I Small New Construction Code Compliance	E21C2b057	1	1	1	-	-	43.9	-	-	878.2	-	-	6.9	-	-	11.6	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Circulator Pump	E21C2c001	198	238	286	78.5	94.2	113.0	1,569.5	1,883.4	2,260.1	0.8	0.9	1.1	12.9	15.4	18.5	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Demand Control Ventilation	E21C2c002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream DMSHP Systems	E21C2c003	58	70	84	57.7	69.3	83.1	692.8	831.3	997.6	-	-	-	15.6	18.7	22.4	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Dual Enthalpy Economizer Controls	E21C2c004	47	56	67	147.5	177.0	212.4	1,474.7	1,769.7	2,123.6	-	-	-	66.4	79.6	95.6	-	-	-	-	-	-
C2c - SCI Midstream	Midstream ECM Fan Motors	E21C2c005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Heat Pump Systems	E21C2c006	0	1	1	0.3	0.4	0.5	3.9	4.7	5.6	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Unitary Air Conditioners	E21C2c007	225	270	324	743.8	892.6	1,071.1	8,925.8	10,711.0	12,853.2	-	-	-	66.9	80.3	96.4	-	-	-	-	-	-
C2c - SCI Midstream	Midstream VRF	E21C2c008	107	128	154	808.5	970.2	1,164.3	16,170.2	19,404.2	23,285.1	8.1	9.7	11.6	132.6	159.1	190.9	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Water Source Heat Pump Systems	E21C2c009	179	215	258	102.1	122.5	147.0	1,225.3	1,470.3	1,764.4	-	-	-	27.6	33.1	39.7	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Downlight	E21C2c010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Exterior	E21C2c011	1,687	1,349	810	513.6	376.6	205.4	5,002.4	3,668.4	2,001.0	102.7	75.3	41.1	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED High Bay/Low Bay	E21C2c012	7,488	5,991	3,594	5,424.7	3,978.1	2,169.9	68,134.0	49,964.9	27,253.6	712.2	522.3	284.9	800.5	587.0	320.2	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Linear Fixture	E21C2c013	15,065	12,052	7,231	1,667.6	1,222.9	667.1	18,327.3	13,440.0	7,330.9	193.5	141.9	77.4	217.5	159.5	87.0	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Linear Fixture with Controls	E21C2c014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Linear Lamp	E21C2c015	30,850	24,680	14,808	1,853.8	1,359.4	741.5	19,520.0	14,314.7	7,808.0	215.1	157.7	86.0	241.8	177.3	96.7	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Screw In	E21C2c016	8,663	6,931	4,158	632.8	436.9	220.5	2,967.8	2,049.0	1,034.3	82.9	57.3	28.9	86.4	59.6	30.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream LED Stairwell Kit	E21C2c017	86	69	41	13.3	9.8	5.3	133.1	97.6	53.3	1.7	1.2	0.7	2.1	1.6	0.9	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Combination Oven, Electric	E21C2c018	1	2	2	19.2	24.0	28.8	230.5	288.1	345.7	4.0	5.0	6.0	4.0	5.0	6.0	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Convection Oven, Electric	E21C2c019	2	3	4	5.7	7.1	8.5	68.1	85.1	102.1	1.3	1.6	1.9	1.3	1.6	1.9	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Dishwasher - High Temp Door Type	E21C2c020	0	0	0	1.1	1.3	1.6	15.8	19.8	23.8	0.2	0.2	0.3	0.2	0.2	0.3	6.4	8.0	9.6	96.2	120.2	144.3
C2c - SCI Midstream	Midstream Dishwasher - High Temp Multi Tank Conveyor	E21C2c021	0	0	0	0.8	1.0	1.2	16.3	20.4	24.5	0.1	0.2	0.2	0.1	0.2	0.2	4.9	6.2	7.4	98.4	123.0	147.6
C2c - SCI Midstream	Midstream Dishwasher - High Temp Pot, Pan, Utensil	E21C2c022	0	0	0	0.2	0.2	0.3	1.8	2.2	2.6	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.6	1.9	12.9	16.1	19.3
C2c - SCI Midstream	Midstream Dishwasher - High Temp Single Tank Conveyor	E21C2c023	0	0	0	0.4	0.4	0.5	7.2	9.0	10.8	0.1	0.1	0.1	0.1	0.1	0.1	1.3	1.6	1.9	26.0	32.4	38.9
C2c - SCI Midstream	Midstream Dishwasher - High Temp Under Counter	E21C2c024	2	3	4	3.6	4.6	5.5	36.5	45.6	54.7	0.6	0.7	0.9	0.6	0.7	0.9	7.9	9.9	11.9	79.4	99.2	119.1
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Door Type	E21C2c025	0	0	0	1.2	1.5	1.8	17.6	22.0	26.4	0.2	0.2	0.3	0.2	0.2	0.3	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Multi Tank Conveyor	E21C2c026	0	0	0	1.4	1.7	2.1	27.4	34.2	41.1	0.2	0.3	0.3	0.2	0.3	0.3	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Single Tank Conveyor	E21C2c027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Under Counter	E21C2c028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2c - SCI Midstream	Midstream Freezer - Solid Door	E21C2c029	34	43	51																		
C2c - SCI Midstream	Midstream Freezer -Glass Door	E21C2c030	-	-	-	6.2	7.8	9.3	74.6	93.2	111.9	23.8	29.7	35.6	23.8	29.7	35.6	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Fryer Large Vat, Electric	E21C2c031	-	-	-																		
C2c - SCI Midstream	Midstream Fryer Standard Vat, Electric	E21C2c032	0	0	0	0.3	0.3	0.4	3.0	3.8	4.5	0.0	0.0	0.1	0.0	0.0	0.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Griddle, Electric	E21C2c033	0	0	0	0.3	0.4	0.5	4.0	5.0	6.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Hot Food Holding Cabinet 3/4 Size	E21C2c034	0	0	0	0.1	0.1	0.1	1.1	1.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Hot Food Holding Cabinet Full Size	E21C2c035	1	1	1	2.1	2.6	3.1	25.1	31.3	37.6	0.3	0.4	0.5	0.3	0.4	0.5	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Hot Food Holding Cabinet Half Size	E21C2c036	4	5	6	4.0	5.0	6.0	47.9	59.9	71.9	0.7	0.8	1.0	0.7	0.8	1.0	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Ice Machine Ice Making Head	E21C2c037	1	1	1	0.9	1.1	1.3	6.8	8.5	10.2	0.2	0.3	0.3	0.2	0.3	0.3	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Batch	E21C2c038	0	0	0	0.4	0.6	0.7	3.5	4.4	5.3	0.0	0.1	0.1	0.0	0.1	0.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Contin	E21C2c039	-	-	-																		
C2c - SCI Midstream	Midstream Ice Machine Self Contained	E21C2c040	0	0	0	0.1	0.2	0.2	1.1	1.4	1.6	0.0	0.1	0.1	0.0	0.1	0.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Refrigerator - Glass Door	E21C2c041	3	4	5	0.7	0.9	1.1	8.5	10.6	12.7	1.8	2.3	2.7	1.8	2.3	2.7	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Refrigerator - Solid Door	E21C2c042	12	15	18	1.8	2.2	2.7	21.5	26.8	32.2	33.1	41.4	49.7	33.1	41.4	49.7	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Steam Cooker, Electric	E21C2c043	1	1	1	17.9	22.4	26.9	214.9	268.6	322.3	2.1	2.6	3.1	2.1	2.6	3.1	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Heat Pump Water Heater, 120 gallons	E21C2c044	-	-	-																		
C2c - SCI Midstream	Midstream Heat Pump Water Heater, 50 gallons	E21C2c045	-	-	-																		
C2c - SCI Midstream	Midstream Heat Pump Water Heater, 80 gallons	E21C2c046	-	-	-																		
C2d - SCI Direct Install	Custom Small Compressed Air Direct Install	E21C2d001	-	-	-																		
C2d - SCI Direct Install	Custom Small Hot Water Direct Install	E21C2d002	-	-	-																		
C2d - SCI Direct Install	Custom Small HVAC Direct Install	E21C2d003	-	-	-																		
C2d - SCI Direct Install	Custom Small Lighting Direct Install - Interior	E21C2d004	1	1	1	3,840.0	6,400.0	8,960.0	49,920.0	83,200.0	116,480.0	234.2	390.4	546.6	307.2	512.0	716.8	-	-	-	-	-	-
C2d - SCI Direct Install	Custom Small Lighting Direct Install - Exterior	E21C2d005	1	1	1	270.0	450.0	630.0	3,510.0	5,850.0	8,190.0	27.0	45.0	63.0	-	-	-	-	-	-	-	-	-
C2d - SCI Direct Install	Custom Small Lighting Direct Install - Controls	E21C2d006	1	1	1	384.0	640.0	896.0	3,456.0	5,760.0	8,064.0	5.0	8.3	11.6	5.8	9.6	13.4	-	-	-	-	-	-
C2d - SCI Direct Install	Custom Small Motors Direct Install	E21C2d007	-	-	-																		
C2d - SCI Direct Install	Custom Small Process Direct Install	E21C2d008	-	-	-																		
C2d - SCI Direct Install	Custom Small Refrigeration Direct Install	E21C2d009	1	1	1	150.0	330.0	525.0	1,950.0	4,290.0	6,825.0	14.9	-	-	13.5	-	-	-	-	-	-	-	-
C2d - SCI Direct Install	Custom Small Other Direct Install	E21C2d010	-	-	-																		
C2d - SCI Direct Install	Daylight Dimming	E21C2d011	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Exterior w/ Controls	E21C2d012	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Exterior w/o Controls	E21C2d013	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Interior w/ Controls	E21C2d014	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Interior w/o Controls	E21C2d015	-	-	-																		
C2d - SCI Direct Install	Lighting Occupancy Sensors	E21C2d016	-	-	-																		
C2d - SCI Direct Install	Boiler Reset Controls, Electric	E21C2d017	-	-	-																		
C2d - SCI Direct Install	Case Motor Replacement	E21C2d018	-	-	-																		
C2d - SCI Direct Install	Cooler Night Cover	E21C2d019	-	-	-																		
C2d - SCI Direct Install	Demand Control Ventilation	E21C2d020	-	-	-																		
C2d - SCI Direct Install	Door Heater Controls	E21C2d021	-	-	-																		
C2d - SCI Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C2d022	-	-	-																		
C2d - SCI Direct Install	Duct Sealing, Electric	E21C2d023	-	-	-																		
C2d - SCI Direct Install	Ductless Mini Split Heat Pump	E21C2d024	-	-	-																		
C2d - SCI Direct Install	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C2d025	-	-	-																		
C2d - SCI Direct Install	Electronic Defrost Control	E21C2d026	-	-	-																		
C2d - SCI Direct Install	Energy Management System, Electric	E21C2d027	-	-	-																		
C2d - SCI Direct Install	Energy Star Wifi Thermostat, Electric	E21C2d028	-	-	-																		
C2d - SCI Direct Install	Evaporator Fan Control	E21C2d029	-	-	-																		
C2d - SCI Direct Install	Faucet Aerator, Electric	E21C2d030	-	-	-																		
C2d - SCI Direct Install	Hotel Occupancy Sensor	E21C2d031	-	-	-																		
C2d - SCI Direct Install	Low Pressure Drop Filter	E21C2d032	-	-	-																		
C2d - SCI Direct Install	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C2d033	-	-	-																		
C2d - SCI Direct Install	Low-Flow Showerhead, Electric	E21C2d034	-	-	-																		
C2d - SCI Direct Install	Motors, Open Drip	E21C2d035	-	-	-																		
C2d - SCI Direct Install	Motors, Totally Enclosed Fan Cooled	E21C2d036	-	-	-																		
C2d - SCI Direct Install	Novelty Cooler Shutoff	E21C2d037	-	-	-																		
C2d - SCI Direct Install	Pipe Wrap - Heating, Electric	E21C2d038	-	-	-																		
C2d - SCI Direct Install	Pipe Wrap - Hot Water, Electric	E21C2d039	-	-	-																		
C2d - SCI Direct Install	Pre Rinse Spray Valve, Electric	E21C2d040	-	-	-																		
C2d - SCI Direct Install	Programmable Thermostat, Electric	E21C2d041	-	-	-																		
C2d - SCI Direct Install	Steam Trap, Electric	E21C2d042	-	-	-																		
C2d - SCI Direct Install	Variable Frequency Drive	E21C2d043	-	-	-																		
C2d - SCI Direct Install	Variable Frequency Drive with Motor	E21C2d044	-	-	-																		
C2d - SCI Direct Install	Vending Miser	E21C2d045	-	-	-																		
C2d - SCI Direct Install	Zero Loss Condensate Drain	E21C2d046	-	-	-																		
<b>Small Business Energy Solutions Subtotal</b>						<b>33,212.7</b>	<b>39,636.8</b>	<b>45,259.2</b>	<b>432,850.9</b>	<b>520,275.1</b>	<b>597,737.5</b>	<b>3,467.7</b>	<b>3,871.4</b>	<b>4,159.1</b>	<b>4,131.1</b>	<b>4,738.4</b>	<b>5,247.4</b>	<b>21.9</b>	<b>27.3</b>	<b>32.8</b>	<b>312.8</b>	<b>391.1</b>	<b>469.3</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3a - Muni Retrofit	Custom Muni Compressed Air Retro	E21C3a001	-	-	-																		
C3a - Muni Retrofit	Custom Muni Hot Water Retro	E21C3a002	-	-	-																		
C3a - Muni Retrofit	Custom Muni HVAC Retro	E21C3a003	1	1	1	235.0	235.0	235.0	4,982.0	4,982.0	4,982.0	20.0	20.0	20.0	16.5	16.5	16.5	3,332.7	3,332.7	3,332.7	70,652.7	70,652.7	70,652.7
C3a - Muni Retrofit	Custom Muni Lighting Retro - Interior	E21C3a004	1	1	1	1,500.0	1,455.0	1,411.4	19,650.0	19,060.5	18,488.7	183.0	177.5	172.2	240.0	232.8	225.8	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Lighting Retro - Exterior	E21C3a091	1	1	1	500.0	485.0	470.5	7,050.0	6,838.5	6,633.3	100.0	97.0	94.1	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Lighting Retro - Controls	E21C3a092	1	1	1	150.0	145.5	141.1	1,350.0	1,309.5	1,270.2	2.0	1.9	1.8	2.3	2.2	2.1	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Motors Retro	E21C3a005	1	1	1	45.0	45.0	45.0	508.5	508.5	508.5	4.1	4.1	4.1	4.1	4.1	4.1	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Process Retro	E21C3a006	1	1	1	225.0	225.0	225.0	2,902.5	2,902.5	2,902.5	20.3	20.3	20.3	21.4	21.4	21.4	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Refrigeration Retro	E21C3a007	-	-	-																		
C3a - Muni Retrofit	Custom Muni Other Retro	E21C3a008	1	1	1	95.0	95.0	95.0	1,425.0	1,425.0	1,425.0	12.3	12.3	12.3	13.7	13.7	13.7	-	-	-	-	-	-
C3a - Muni Retrofit	Daylight Dimming	E21C3a009	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Exterior w/ Controls	E21C3a010	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Exterior w/o Controls	E21C3a011	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Interior w/ Controls	E21C3a012	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Interior w/o Controls	E21C3a013	-	-	-																		
C3a - Muni Retrofit	Lighting Occupancy Sensors	E21C3a014	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Electric	E21C3a015	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Gas	E21C3a016	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Oil	E21C3a017	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Propane	E21C3a018	-	-	-																		
C3a - Muni Retrofit	Boiler Reset Controls, Gas	E21C3a019	-	-	-																		
C3a - Muni Retrofit	Boiler Reset Controls, Oil	E21C3a020	-	-	-																		
C3a - Muni Retrofit	Boiler Reset Controls, Propane	E21C3a021	-	-	-																		
C3a - Muni Retrofit	Case Motor Replacement	E21C3a022	-	-	-																		
C3a - Muni Retrofit	Cooler Night Cover	E21C3a023	-	-	-																		
C3a - Muni Retrofit	Demand Control Ventilation	E21C3a024	-	-	-																		
C3a - Muni Retrofit	Door Heater Controls	E21C3a025	-	-	-																		
C3a - Muni Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C3a026	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Electric	E21C3a027	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Gas	E21C3a028	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Oil	E21C3a029	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Propane	E21C3a030	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Electric	E21C3a031	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Gas	E21C3a032	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Oil	E21C3a033	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Propane	E21C3a034	-	-	-																		
C3a - Muni Retrofit	Ductless Mini Split Heat Pump	E21C3a035	-	-	-																		
C3a - Muni Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C3a036	-	-	-																		
C3a - Muni Retrofit	Electronic Defrost Control	E21C3a037	-	-	-																		
C3a - Muni Retrofit	Energy Management System, Electric	E21C3a038	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Electric	E21C3a039	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Gas	E21C3a040	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Oil	E21C3a041	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Propane	E21C3a042	-	-	-																		
C3a - Muni Retrofit	Evaporator Fan Control	E21C3a043	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Electric	E21C3a044	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Gas	E21C3a045	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Oil	E21C3a046	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Propane	E21C3a047	-	-	-																		
C3a - Muni Retrofit	Hotel Occupancy Sensor	E21C3a050	-	-	-																		
C3a - Muni Retrofit	Insulation, Electric	E21C3a051	-	-	-																		
C3a - Muni Retrofit	Insulation, Gas	E21C3a052	-	-	-																		
C3a - Muni Retrofit	Insulation, Oil	E21C3a053	-	-	-																		
C3a - Muni Retrofit	Insulation, Propane	E21C3a054	-	-	-																		
C3a - Muni Retrofit	Low Pressure Drop Filter	E21C3a055	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C3a056	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Gas	E21C3a057	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Oil	E21C3a058	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Propa	E21C3a059	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Electric	E21C3a060	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Gas	E21C3a061	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Oil	E21C3a062	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Propane	E21C3a063	-	-	-																		
C3a - Muni Retrofit	Motors, Open Drip	E21C3a064	-	-	-																		
C3a - Muni Retrofit	Motors, Totally Enclosed Fan Cooled	E21C3a065	-	-	-																		
C3a - Muni Retrofit	Novelty Cooler Shutoff	E21C3a066	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU			
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	
C3a - Muni Retrofit	Pipe Wrap - Heating, Electric	E21C3a067	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Heating, Gas	E21C3a068	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Heating, Oil	E21C3a069	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Heating, Propane	E21C3a070	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Electric	E21C3a071	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Gas	E21C3a072	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Oil	E21C3a073	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Propane	E21C3a074	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pre Rinse Spray Valve, Electric	E21C3a075	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pre Rinse Spray Valve, Gas	E21C3a076	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pre Rinse Spray Valve, Oil	E21C3a077	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Pre Rinse Spray Valve, Propane	E21C3a078	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Programmable Thermostat, Electric	E21C3a079	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Programmable Thermostat, Gas	E21C3a080	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Programmable Thermostat, Oil	E21C3a081	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Programmable Thermostat, Propane	E21C3a082	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Steam Trap, Electric	E21C3a083	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Steam Trap, Gas	E21C3a084	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Steam Trap, Oil	E21C3a085	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Steam Trap, Propane	E21C3a086	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Variable Frequency Drive	E21C3a087	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Variable Frequency Drive with Motor	E21C3a088	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Vending Miser	E21C3a089	-	-	-														-	-	-	-	-	-
C3a - Muni Retrofit	Zero Loss Condensate Drain	E21C3a090	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Compressed Air New	E21C3b001	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Hot Water New	E21C3b002	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni HVAC New	E21C3b003	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Lighting New - Interior	E21C3b004	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Lighting New - Exterior	E21C3b085	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Lighting New - Controls	E21C3b086	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Motors New	E21C3b005	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Process New	E21C3b006	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Refrigeration New	E21C3b007	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Other New	E21C3b008	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Custom Muni Comprehensive Design	E21C3b087	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Daylight Dimming	E21C3b009	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Performance Lighting - Exterior w/ Controls	E21C3b010	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Performance Lighting - Exterior w/o Controls	E21C3b011	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Performance Lighting - Interior w/ Controls	E21C3b012	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Performance Lighting - Interior w/o Controls	E21C3b013	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Lighting Occupancy Sensors	E21C3b014	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Advanced Power Strip	E21C3b015	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Air Compressor	E21C3b016	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Air Nozzle	E21C3b017	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 1000 to 1700 MBH 90 AFUE, Oil	E21C3b018	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 1000 to 1700 MBH 90 AFUE, Propane	E21C3b019	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 1701 to 2000 MBH 85 AFUE, Oil	E21C3b020	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 1701 to 2000 MBH 90 AFUE, Propane	E21C3b021	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 301 to 499 MBH 85 AFUE, Oil	E21C3b022	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 301 to 499 MBH 90 AFUE, Propane	E21C3b023	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 500 to 999 MBH 85 AFUE, Oil	E21C3b024	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler 500 to 999 MBH 90 AFUE, Propane	E21C3b025	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler to 300 MBH 85 AFUE, Oil	E21C3b026	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler to 300 MBH 87 AFUE, Oil	E21C3b027	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler to 300 MBH 90 AFUE, Propane	E21C3b028	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Boiler to 300 MBH 95 AFUE, Propane	E21C3b029	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Circulator Pump	E21C3b030	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Combination Oven, Electric	E21C3b031	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Compressor Storage	E21C3b032	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Condensing Unit Heater up to 300 MBH, Oil	E21C3b033	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Condensing Unit Heater up to 300 MBH, Propane	E21C3b034	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Convection Oven, Electric	E21C3b035	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - High Temp Door Type	E21C3b036	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - High Temp Multi Tank Conveyor	E21C3b037	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - High Temp Pot, Pan, Utensil	E21C3b038	-	-	-														-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - High Temp Single Tank Conveyor	E21C3b039	-	-	-														-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3b - Muni New Equipment	Dishwasher - High Temp Under Counter	E21C3b040	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - Low Temp Door Type	E21C3b041	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - Low Temp Multi Tank Conveyor	E21C3b042	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - Low Temp Single Tank Conveyor	E21C3b043	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Dishwasher - Low Temp Under Counter	E21C3b044	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Faucet Aerator, Electric	E21C3b045	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Faucet Aerator, Gas	E21C3b046	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Faucet Aerator, Oil	E21C3b047	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Faucet Aerator, Propane	E21C3b048	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Fryer Large Vat, Electric	E21C3b049	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Fryer Standard Vat, Electric	E21C3b050	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Furnace w/ ECM 85 AFUE up to 150 MBH, Oil	E21C3b051	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Furnace w/ ECM 87 AFUE up to 150 MBH, Oil	E21C3b052	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Furnace w/ ECM 95 AFUE up to 150 MBH, Propane	E21C3b053	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Furnace w/ ECM 97 AFUE up to 150 MBH, Propane	E21C3b054	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Griddle, Electric	E21C3b055	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Ground Source Heat Pump	E21C3b056	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Hot Food Holding Cabinet 3/4 Size	E21C3b057	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Hot Food Holding Cabinet Full Size	E21C3b058	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Hot Food Holding Cabinet Half Size	E21C3b059	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Ice Machine - Ice Making Head	E21C3b060	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Ice Machine - Remote Cond./Split Unit - Batch	E21C3b061	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Ice Machine - Remote Cond./Split Unit - Continuous	E21C3b062	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Ice Machine - Self Contained	E21C3b063	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Infrared Heater	E21C3b064	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low Pressure Drop Filter	E21C3b065	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C3b066	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead With Thermostatic Valve, Gas	E21C3b067	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead With Thermostatic Valve, Oil	E21C3b068	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead With Thermostatic Valve, Propane	E21C3b069	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead, Electric	E21C3b070	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead, Gas	E21C3b071	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead, Oil	E21C3b072	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Low-Flow Showerhead, Propane	E21C3b073	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Pre Rinse Spray Valve, Electric	E21C3b074	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Pre Rinse Spray Valve, Gas	E21C3b075	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Pre Rinse Spray Valve, Oil	E21C3b076	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Pre Rinse Spray Valve, Propane	E21C3b077	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Refrigerated Air Dryer	E21C3b078	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Steam Cooker, Electric	E21C3b079	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Unitary Air Conditioner	E21C3b080	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Water Source Heat Pump	E21C3b081	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	Zero Loss Condensate Drain	E21C3b082	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	High Efficiency Chiller - FL	E21C3b083	-	-	-													-	-	-	-	-	-
C3b - Muni New Equipment	High Efficiency Chiller - IPLV	E21C3b084	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Compressed Air Direct Install	E21C3d001	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Hot Water Direct Install	E21C3d002	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni HVAC Direct Install	E21C3d003	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Interior	E21C3d004	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Exterior	E21C3d005	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Controls	E21C3d006	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Motors Direct Install	E21C3d007	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Process Direct Install	E21C3d008	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Refrigeration Direct Install	E21C3d009	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Other Direct Install	E21C3d010	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Daylight Dimming	E21C3d011	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Exterior w/ Controls	E21C3d012	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Exterior w/o Controls	E21C3d013	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Interior w/ Controls	E21C3d014	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Interior w/o Controls	E21C3d015	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Occupancy Sensors	E21C3d016	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Electric	E21C3d017	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Gas	E21C3d018	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Oil	E21C3d019	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Propane	E21C3d020	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Boiler Reset Controls, Gas	E21C3d021	-	-	-													-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3d - Muni Direct Install	Boiler Reset Controls, Oil	E21C3d022	-	-	-																		
C3d - Muni Direct Install	Boiler Reset Controls, Propane	E21C3d023	-	-	-																		
C3d - Muni Direct Install	Case Motor Replacement	E21C3d024	-	-	-																		
C3d - Muni Direct Install	Cooler Night Cover	E21C3d025	-	-	-																		
C3d - Muni Direct Install	Demand Control Ventilation	E21C3d026	-	-	-																		
C3d - Muni Direct Install	Door Heater Controls	E21C3d027	-	-	-																		
C3d - Muni Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C3d028	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Electric	E21C3d029	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Gas	E21C3d030	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Oil	E21C3d031	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Propane	E21C3d032	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Electric	E21C3d033	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Gas	E21C3d034	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Oil	E21C3d035	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Propane	E21C3d036	-	-	-																		
C3d - Muni Direct Install	Ductless Mini Split Heat Pump	E21C3d037	-	-	-																		
C3d - Muni Direct Install	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C3d038	-	-	-																		
C3d - Muni Direct Install	Electronic Defrost Control	E21C3d039	-	-	-																		
C3d - Muni Direct Install	Energy Management System, Electric	E21C3d040	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Electric	E21C3d041	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Gas	E21C3d042	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Oil	E21C3d043	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Propane	E21C3d044	-	-	-																		
C3d - Muni Direct Install	Evaporator Fan Control	E21C3d045	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Electric	E21C3d046	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Gas	E21C3d047	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Oil	E21C3d048	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Propane	E21C3d049	-	-	-																		
C3d - Muni Direct Install	Hotel Occupancy Sensor	E21C3d050	-	-	-																		
C3d - Muni Direct Install	Insulation, Electric	E21C3d051	-	-	-																		
C3d - Muni Direct Install	Insulation, Gas	E21C3d052	-	-	-																		
C3d - Muni Direct Install	Insulation, Oil	E21C3d053	-	-	-																		
C3d - Muni Direct Install	Insulation, Propane	E21C3d054	-	-	-																		
C3d - Muni Direct Install	Low Pressure Drop Filter	E21C3d055	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Electric	E21C3d056	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Gas	E21C3d057	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Oil	E21C3d058	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Propane	E21C3d059	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Electric	E21C3d060	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Gas	E21C3d061	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Oil	E21C3d062	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Propane	E21C3d063	-	-	-																		
C3d - Muni Direct Install	Motors, Open Drip	E21C3d064	-	-	-																		
C3d - Muni Direct Install	Motors, Totally Enclosed Fan Cooled	E21C3d065	-	-	-																		
C3d - Muni Direct Install	Novelty Cooler Shutoff	E21C3d066	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Electric	E21C3d067	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Gas	E21C3d068	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Oil	E21C3d069	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Propane	E21C3d070	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Electric	E21C3d071	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Gas	E21C3d072	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Oil	E21C3d073	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Propane	E21C3d074	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Electric	E21C3d075	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Gas	E21C3d076	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Oil	E21C3d077	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Propane	E21C3d078	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Electric	E21C3d079	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Gas	E21C3d080	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Oil	E21C3d081	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Propane	E21C3d082	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Electric	E21C3d083	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Gas	E21C3d084	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Oil	E21C3d085	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Propane	E21C3d086	-	-	-																		
C3d - Muni Direct Install	Variable Frequency Drive	E21C3d087	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3d - Muni Direct Install	Variable Frequency Drive with Motor	E21C3d088	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Vending Miser	E21C3d089	-	-	-													-	-	-	-	-	-
C3d - Muni Direct Install	Zero Loss Condensate Drain	E21C3d090	-	-	-													-	-	-	-	-	-
<b>Municipal Energy Solutions Subtotal</b>						<b>2,750.0</b>	<b>2,685.5</b>	<b>2,622.9</b>	<b>37,868.0</b>	<b>37,026.5</b>	<b>36,210.2</b>	<b>341.5</b>	<b>333.0</b>	<b>324.7</b>	<b>297.9</b>	<b>290.6</b>	<b>283.6</b>	<b>3,332.7</b>	<b>3,332.7</b>	<b>3,332.7</b>	<b>70,652.7</b>	<b>70,652.7</b>	<b>70,652.7</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C4a - Energy Rewards RFP	Custom RFP Program Compressed Air	E21C4a001	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Hot Water	E21C4a002	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program HVAC	E21C4a003	1	1	1	1,500.0	3,000.0	5,000.0	22,050.0	44,100.0	73,500.0	127.5	255.0	425.0	105.0	210.0	350.0	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Lighting - Interior	E21C4a004	1	1	1	800.0	1,000.0	1,200.0	10,400.0	13,000.0	15,600.0	97.6	122.0	146.4	128.0	160.0	192.0	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Lighting - Exterior	E21C4a015	1	1	1	160.0	200.0	240.0	2,080.0	2,600.0	3,120.0	32.0	40.0	48.0	-	-	-	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Lighting - Controls	E21C4a016	1	1	1	80.0	100.0	120.0	720.0	900.0	1,080.0	1.0	1.3	1.6	1.2	1.5	1.8	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Motors	E21C4a005	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Process	E21C4a006	1	1	1	2,000.0	3,000.0	4,000.0	24,000.0	36,000.0	48,000.0	180.0	270.0	360.0	190.0	285.0	380.0	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Refrigeration	E21C4a007	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Other	E21C4a008	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Daylight Dimming	E21C4a009	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Exterior w/ Controls	E21C4a010	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Exterior w/o Controls	E21C4a011	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Interior w/ Controls	E21C4a012	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Interior w/o Controls	E21C4a013	-	-	-													-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Occupancy Sensors	E21C4a014	-	-	-													-	-	-	-	-	-
<b>Energy Rewards RFP Subtotal</b>						<b>4,540.0</b>	<b>7,300.0</b>	<b>10,560.0</b>	<b>59,250.0</b>	<b>96,600.0</b>	<b>141,300.0</b>	<b>438.1</b>	<b>688.3</b>	<b>981.0</b>	<b>424.2</b>	<b>656.5</b>	<b>923.8</b>	-	-	-	-	-	-

PSNH d/b/a Eversource Energy  
 2021-2023 System Benefits Charge ("SBC") Calculation  
 (\$ in 000's)

Year	Customer Sector	EE Total Budget	RGGI Revenues	FCM Revenues	Other Revenues	Carryforward with Interest	Current Year Interest	SBC Requirement	Forecasted Distribution (MWH)	SBC Rate EE Portion (cents/kWh)	SBC Rate EAP Portion (cents/kWh)	SBC Rate LBR Portion (cents/kWh)	Total SBC Rate (cents/kWh)
Col. A	Col. B	Col. C*	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N
2021	Residential	\$ 22,609	\$ 377	\$ 1,558	\$ -	\$ -	\$ 4	\$ 20,673	3,177,552	0.651	0.150	0.065	0.866
2021	C&I	\$ 51,744	\$ 1,532	\$ 3,635	\$ -	\$ -	\$ (7)	\$ 46,577	4,527,763	1.029	0.150	0.091	1.270
2021	Total	\$ 74,353	\$ 1,909	\$ 5,193	\$ -	\$ -	\$ (3)	\$ 67,251	7,705,315	0.873	0.150	0.080	1.103
2022	Residential	\$ 22,416	\$ 363	\$ 1,433	\$ -	\$ (4)	\$ 3	\$ 20,620	3,190,363	0.646	0.150	0.102	0.898
2022	C&I	\$ 71,966	\$ 1,532	\$ 3,344	\$ -	\$ 7	\$ (9)	\$ 67,091	4,480,182	1.498	0.150	0.159	1.807
2022	Total	\$ 94,382	\$ 1,894	\$ 4,777	\$ -	\$ 3	\$ (6)	\$ 87,711	7,670,545	1.143	0.150	0.135	1.428
2023	Residential	\$ 23,282	\$ 348	\$ 1,198	\$ -	\$ (7)	\$ 4	\$ 21,736	3,229,120	0.673	0.150	0.118	0.941
2023	C&I	\$ 95,477	\$ 1,532	\$ 2,796	\$ -	\$ 16	\$ (16)	\$ 91,149	4,420,775	2.062	0.150	0.220	2.432
2023	Total	\$ 118,759	\$ 1,879	\$ 3,994	\$ -	\$ 9	\$ (12)	\$ 112,885	7,649,896	1.476	0.150	0.177	1.803
2021 to 2023	Residential	\$ 68,306	\$ 1,088	\$ 4,189	\$ -	\$ (11)	\$ 11	\$ 63,029					
2021 to 2023	C&I	\$ 219,187	\$ 4,595	\$ 9,775	\$ -	\$ 23	\$ (32)	\$ 204,817					
2021 to 2023	Total	\$ 287,493	\$ 5,682	\$ 13,964	\$ -	\$ 12	\$ (21)	\$ 267,847					

Col. A: Effective year (January 1 - December 31)  
 Col. B: Customer Sector  
 Col. C: Company Forecast \*Excludes Current Year Interest  
 Col. D: Company Forecast  
 Col. E: Company Forecast  
 Col. F: Company Forecast  
 Col. G: Pages 3, 4, 5, 6 Line 9 Col. N + Line 11 Col. O  
 Col. H: Pages 3, 4, 5, 6, 7, 8, Line 11, Col. O  
 Col. I: Col. C - Col. D - Col. E - Col. F  
 Col. J: Company Forecast  
 Col. K: (Col. I / Col. J) x 100  
 Col. L: EAP Portion of SBC Rate  
 Col. M: Page 9, Col. H  
 Col. N: Col. K + Col. L + Col. M

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation**  
**January 1, 2020 to December 31, 2020**  
 (\$ in 000's)

Line	Description	Carryover 12/31/2019	Actual Jan 2020	Actual Feb 2020	Actual Mar 2020	Actual Apr 2020	Actual May 2020	Actual Jun 2020	Actual Jul 2020	Forecast Aug 2020	Forecast Sep 2020	Forecast Oct 2020	Forecast Nov 2020	Forecast Dec 2020	2020 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		3,031	3,451	3,153	3,118	2,956	3,180	3,938	3,804	3,210	3,213	3,190	3,587	39,829
2	RGGI Revenues		-	-	-	-	462	599	(25)	-	173	-	-	173	1,382
3	FCM Revenues		436	454	449	448	443	446	520	528	528	528	528	528	5,834
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>3,468</b>	<b>3,905</b>	<b>3,602</b>	<b>3,565</b>	<b>3,861</b>	<b>4,226</b>	<b>4,432</b>	<b>4,331</b>	<b>3,911</b>	<b>3,741</b>	<b>3,718</b>	<b>4,287</b>	<b>47,045</b>
6	Program Expenses		997	1,800	3,578	1,251	2,158	2,687	1,873	6,633	6,633	6,633	6,633	6,633	47,508
7	<b>Total Program Expenses</b>		<b>997</b>	<b>1,800</b>	<b>3,578</b>	<b>1,251</b>	<b>2,158</b>	<b>2,687</b>	<b>1,873</b>	<b>6,633</b>	<b>6,633</b>	<b>6,633</b>	<b>6,633</b>	<b>6,633</b>	<b>47,508</b>
8	Current Month (Over)/Under Recovery		(2,470)	(2,105)	(24)	(2,314)	(1,702)	(1,539)	(2,559)	2,302	2,722	2,892	2,915	2,346	
9	Cumulative (Over)/Under Recovery	(1,735)	(4,205)	(6,310)	(6,334)	(8,648)	(10,351)	(11,890)	(14,449)	(12,148)	(9,425)	(6,533)	(3,618)	(1,272)	
10	Interest @ Prime Rate		0.3958%	0.3958%	0.3150%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>(12)</b>	<b>(21)</b>	<b>(20)</b>	<b>(20)</b>	<b>(26)</b>	<b>(30)</b>	<b>(36)</b>	<b>(36)</b>	<b>(29)</b>	<b>(22)</b>	<b>(14)</b>	<b>(7)</b>	<b>(271)</b>
12	<b>Monthly Sales (MWh)</b>		690,301	653,598	596,912	590,377	562,797	601,793	745,552	720,362	608,001	608,508	604,191	679,307	7,661,698
13	<b>EE SBC Rate (cents/kWh)</b>		0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528	

Line 1: Actual = Company records, Forecast = (Line 12 x Line 13) / 100  
 Line 2: Company Records  
 Line 3: Company Records  
 Line 4: Company Records  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Company Records  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Approved Rate in DE 17-136, 2020 Update

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Residential)**  
**January 1, 2021 to December 31, 2021**  
**(\$ in 000's)**

Line	Description	Carryover 12/31/2020	Forecast Jan 2021	Forecast Feb 2021	Forecast Mar 2021	Forecast Apr 2021	Forecast May 2021	Forecast June 2021	Forecast July 2021	Forecast Aug 2021	Forecast Sep 2021	Forecast Oct 2021	Forecast Nov 2021	Forecast Dec 2021	2021 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		2,175	1,742	1,758	1,511	1,401	1,586	2,039	1,942	1,486	1,435	1,579	2,020	20,673
2	RGGI Revenues		-	-	94	-	-	94	-	-	94	-	-	94	377
3	FCM Revenues		130	130	130	130	130	130	130	130	130	130	130	130	1,558
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>2,305</b>	<b>1,872</b>	<b>1,982</b>	<b>1,640</b>	<b>1,531</b>	<b>1,810</b>	<b>2,169</b>	<b>2,072</b>	<b>1,710</b>	<b>1,565</b>	<b>1,709</b>	<b>2,244</b>	<b>22,609</b>
6	Program Expenses		1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	22,609
7	<b>Total Program Expenses</b>		<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>1,884</b>	<b>22,609</b>
8	Current Month (Over)/Under Recovery		(421)	12	(98)	244	353	74	(284)	(188)	174	319	175	(360)	
9	Cumulative (Over)/Under Recovery	-	(421)	(409)	(506)	(263)	90	164	(120)	(309)	(134)	185	360	(0)	
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(1)</b>	<b>(1)</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>(4)</b>
12	<b>Monthly Sales (MWh)</b>		<b>334,360</b>	<b>267,732</b>	<b>270,141</b>	<b>232,183</b>	<b>215,344</b>	<b>243,792</b>	<b>313,357</b>	<b>298,549</b>	<b>228,360</b>	<b>220,538</b>	<b>242,749</b>	<b>310,450</b>	<b>3,177,552</b>
13	<b>EE SBC Rate (Residential) (cents/kWh)</b>		<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	<b>0.651</b>	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. D  
 Line 3: Page 1, Col. E  
 Line 4: Page 1, Col. F  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. C  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. K

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (C&I)**  
**January 1, 2021 to December 31, 2021**  
 (\$ in 000's)

Line	Description	Carryover 12/31/2020	Forecast Jan 2021	Forecast Feb 2021	Forecast Mar 2021	Forecast Apr 2021	Forecast May 2021	Forecast June 2021	Forecast Jul 2021	Forecast Aug 2021	Forecast Sep 2021	Forecast Oct 2021	Forecast Nov 2021	Forecast Dec 2021	2021 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		3,841	3,594	3,884	3,596	3,857	4,073	4,312	4,294	3,870	3,876	3,641	3,739	46,577
2	RGGI Revenues		-	-	383	-	-	383	-	-	383	-	-	383	1,532
3	FCM Revenues		303	303	303	303	303	303	303	303	303	303	303	303	3,635
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>4,144</b>	<b>3,897</b>	<b>4,569</b>	<b>3,899</b>	<b>4,160</b>	<b>4,759</b>	<b>4,615</b>	<b>4,597</b>	<b>4,556</b>	<b>4,179</b>	<b>3,944</b>	<b>4,424</b>	<b>51,744</b>
6	Program Expenses		4,312	4,312	4,312	4,312	4,312	4,312	4,312	4,312	4,312	4,312	4,312	4,312	51,744
7	<b>Total Program Expenses</b>		<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>4,312</b>	<b>51,744</b>
8	Current Month (Over)/Under Recovery		168	415	(257)	413	152	(447)	(303)	(285)	(244)	133	368	(112)	
9	Cumulative (Over)/Under Recovery	-	168	583	325	739	891	444	141	(144)	(389)	(256)	112	(0)	
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>(0)</b>	<b>(1)</b>	<b>(1)</b>	<b>(0)</b>	<b>0</b>	<b>7</b>
12	<b>Monthly Sales (MWh)</b>		<b>373,417</b>	<b>349,368</b>	<b>377,530</b>	<b>349,541</b>	<b>374,957</b>	<b>395,911</b>	<b>419,204</b>	<b>417,437</b>	<b>376,237</b>	<b>376,790</b>	<b>353,943</b>	<b>363,427</b>	<b>4,527,763</b>
13	<b>EE SBC Rate (C&amp;I) (cents/kWh)</b>		<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	<b>1.029</b>	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. D  
 Line 3: Page 1, Col. E  
 Line 4: Page 1, Col. F  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. C  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. K

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Residential)**  
**January 1, 2022 to December 31, 2022**  
 (\$ in 000's)

Line	Description	Carryover 12/31/2021	Forecast Jan 2022	Forecast Feb 2022	Forecast Mar 2022	Forecast Apr 2022	Forecast May 2022	Forecast June 2022	Forecast Jul 2022	Forecast Aug 2022	Forecast Sep 2022	Forecast Oct 2022	Forecast Nov 2022	Forecast Dec 2022	2022 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		2,163	1,731	1,748	1,503	1,392	1,579	2,034	1,940	1,486	1,438	1,583	2,023	20,620
2	RGGI Revenues		-	-	91	-	-	91	-	-	91	-	-	91	363
3	FCM Revenues		119	119	119	119	119	119	119	119	119	119	119	119	1,433
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>2,282</b>	<b>1,851</b>	<b>1,958</b>	<b>1,622</b>	<b>1,512</b>	<b>1,789</b>	<b>2,153</b>	<b>2,059</b>	<b>1,696</b>	<b>1,558</b>	<b>1,702</b>	<b>2,233</b>	<b>22,416</b>
6	Program Expenses		1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	22,416
7	<b>Total Program Expenses</b>		<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>1,868</b>	<b>22,416</b>
8	Current Month (Over)/Under Recovery		(414)	17	(90)	246	356	79	(285)	(191)	172	310	166	(366)	
9	Cumulative (Over)/Under Recovery	(4)	(418)	(401)	(491)	(245)	111	190	(95)	(286)	(114)	196	362	(4)	
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(1)</b>	<b>(1)</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>(3)</b>
12	<b>Monthly Sales (MWh)</b>		334,664	267,849	270,411	232,542	215,388	244,337	314,651	300,108	229,943	222,517	244,887	313,066	3,190,363
13	<b>EE SBC Rate (Residential) (cents/kWh)</b>		0.646	0.646	0.646	0.646	0.646	0.646	0.646	0.646	0.646	0.646	0.646	0.646	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. D  
 Line 3: Page 1, Col. E  
 Line 4: Page 1, Col. F  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. C  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. K

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (C&I)**  
**January 1, 2022 to December 31, 2022**  
 (\$ in 000's)

Line	Description	Carryover 12/31/2021	Forecast Jan 2022	Forecast Feb 2022	Forecast Mar 2022	Forecast Apr 2022	Forecast May 2022	Forecast June 2022	Forecast Jul 2022	Forecast Aug 2022	Forecast Sep 2022	Forecast Oct 2022	Forecast Nov 2022	Forecast Dec 2022	2022 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		5,495	5,154	5,573	5,295	5,578	5,839	6,192	6,162	5,578	5,582	5,254	5,388	67,091
2	RGGI Revenues		-	-	383	-	-	383	-	-	383	-	-	383	1,532
3	FCM Revenues		279	279	279	279	279	279	279	279	279	279	279	279	3,344
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>5,774</b>	<b>5,432</b>	<b>6,235</b>	<b>5,574</b>	<b>5,856</b>	<b>6,501</b>	<b>6,470</b>	<b>6,441</b>	<b>6,240</b>	<b>5,860</b>	<b>5,533</b>	<b>6,050</b>	<b>71,966</b>
6	Program Expenses		5,997	5,997	5,997	5,997	5,997	5,997	5,997	5,997	5,997	5,997	5,997	5,997	71,966
7	<b>Total Program Expenses</b>		<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>5,997</b>	<b>71,966</b>
8	Current Month (Over)/Under Recovery		223	565	(238)	423	141	(504)	(473)	(443)	(242)	137	464	(53)	
9	Cumulative (Over)/Under Recovery	7	230	795	558	981	1,122	618	145	(299)	(541)	(404)	60	7	
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>(0)</b>	<b>(1)</b>	<b>(1)</b>	<b>(0)</b>	<b>0</b>	<b>9</b>
12	<b>Monthly Sales (MWh)</b>		366,976	344,140	372,167	353,613	372,470	389,948	413,462	411,476	372,492	372,738	350,877	359,824	4,480,182
13	<b>EE SBC Rate (C&amp;I) (cents/kWh)</b>		1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. D  
 Line 3: Page 1, Col. E  
 Line 4: Page 1, Col. F  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. C  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. K

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Residential)**  
**January 1, 2023 to December 31, 2023**  
**(\$ in 000's)**

Line	Description	Carryover 12/31/2022	Forecast Jan 2023	Forecast Feb 2023	Forecast Mar 2023	Forecast Apr 2023	Forecast May 2023	Forecast June 2023	Forecast Jul 2023	Forecast Aug 2023	Forecast Sep 2023	Forecast Oct 2023	Forecast Nov 2023	Forecast Dec 2023	2023 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		2,275	1,824	1,842	1,586	1,471	1,667	2,143	2,044	1,569	1,518	1,667	2,127	21,736
2	RGGI Revenues		-	-	87	-	-	87	-	-	87	-	-	87	348
3	FCM Revenues		100	100	100	100	100	100	100	100	100	100	100	100	1,198
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>2,375</b>	<b>1,924</b>	<b>2,029</b>	<b>1,686</b>	<b>1,571</b>	<b>1,854</b>	<b>2,243</b>	<b>2,144</b>	<b>1,756</b>	<b>1,618</b>	<b>1,767</b>	<b>2,314</b>	<b>23,282</b>
6	Program Expenses		1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	23,282
7	<b>Total Program Expenses</b>		<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>1,940</b>	<b>23,282</b>
8	Current Month (Over)/Under Recovery		(435)	16	(88)	254	369	86	(303)	(204)	184	322	173	(374)	
9	Cumulative (Over)/Under Recovery	(7)	(442)	(426)	(515)	(260)	109	195	(108)	(312)	(128)	194	367	(7)	
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(1)</b>	<b>(1)</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>(4)</b>
12	<b>Monthly Sales (MWh)</b>		338,049	271,022	273,618	235,598	218,586	247,710	318,408	303,703	233,090	225,571	247,718	316,047	3,229,120
13	<b>EE SBC Rate (Residential) (cents/kWh)</b>		0.673	0.673	0.673	0.673	0.673	0.673	0.673	0.673	0.673	0.673	0.673	0.673	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. D  
 Line 3: Page 1, Col. E  
 Line 4: Page 1, Col. F  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. C  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. K

**PSNH d/b/a Eversource Energy**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (C&I)**  
**January 1, 2023 to December 31, 2023**  
 (\$ in 000's)

Line	Description	Carryover 12/31/2022	Forecast Jan 2023	Forecast Feb 2023	Forecast Mar 2023	Forecast Apr 2023	Forecast May 2023	Forecast June 2023	Forecast Jul 2023	Forecast Aug 2023	Forecast Sep 2023	Forecast Oct 2023	Forecast Nov 2023	Forecast Dec 2023	2023 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	SBC Revenues		7,448	6,989	7,564	7,028	7,514	7,928	8,404	8,357	7,594	7,778	7,205	7,340	91,149
2	RGGI Revenues		-	-	383	-	-	383	-	-	383	-	-	383	1,532
3	FCM Revenues		233	233	233	233	233	233	233	233	233	233	233	233	2,796
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	<b>Total Revenues</b>		<b>7,681</b>	<b>7,222</b>	<b>8,180</b>	<b>7,261</b>	<b>7,747</b>	<b>8,544</b>	<b>8,637</b>	<b>8,590</b>	<b>8,210</b>	<b>8,011</b>	<b>7,438</b>	<b>7,956</b>	<b>95,477</b>
6	Program Expenses		7,956	7,956	7,956	7,956	7,956	7,956	7,956	7,956	7,956	7,956	7,956	7,956	95,477
7	<b>Total Program Expenses</b>		<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>7,956</b>	<b>95,477</b>
8	Current Month (Over)/Under Recovery		275	735	(223)	695	209	(588)	(680)	(634)	(253)	(54)	518	0	
9	Cumulative (Over)/Under Recovery	16	291	1,026	803	1,498	1,707	1,119	439	(195)	(448)	(503)	16	16	
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	<b>Interest on Deferral Balance</b>		<b>0</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>(1)</b>	<b>(1)</b>	<b>(1)</b>	<b>0</b>	<b>16</b>
12	<b>Monthly Sales (MWh)</b>		361,233	338,955	366,843	340,860	364,454	384,520	407,592	405,323	368,308	377,229	349,459	355,999	4,420,775
13	<b>EE SBC Rate (C&amp;I) (cents/kWh)</b>		2.062	2.062	2.062	2.062	2.062	2.062	2.062	2.062	2.062	2.062	2.062	2.062	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. D  
 Line 3: Page 1, Col. E  
 Line 4: Page 1, Col. F  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. C  
 Line 7: Sum of Line 6  
 Line 8: Line 5 - Line 7  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. K

**PSNH d/b/a Eversource Energy  
2021-2023 System Benefits Charge Calculation (LBR Component)  
(\$ in 000's)**

Year	Customer Sector	Forecasted LBR Revenue	Prior Year Deferral with Interest	Current Year Interest	Total LBR Revenue	Forecasted Distribution (MWH)	SBC Rate LBR Portion (cents/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H
2021	Residential	\$ 2,684	\$ (621)	\$ (12)	\$ 2,051	3,177,552	0.065
2021	C&I	\$ 5,030	\$ (885)	\$ (19)	\$ 4,127	4,527,763	0.091
2021	Total	<u>\$ 7,714</u>	<u>\$ (1,505)</u>	<u>\$ (31)</u>	<u>\$ 6,178</u>	<u>7,705,315</u>	<u>0.080</u>
2022	Residential	\$ 3,260	\$ (1)	\$ (2)	\$ 3,258	3,190,363	0.102
2022	C&I	\$ 7,114	\$ 18	\$ (5)	\$ 7,127	4,480,182	0.159
2022	Total	<u>\$ 10,374</u>	<u>\$ 17</u>	<u>\$ (7)</u>	<u>\$ 10,385</u>	<u>7,670,545</u>	<u>0.135</u>
2023	Residential	\$ 3,808	\$ (0)	\$ (2)	\$ 3,805	3,229,120	0.118
2023	C&I	\$ 9,711	\$ 19	\$ (6)	\$ 9,724	4,420,775	0.220
2023	Total	<u>\$ 13,519</u>	<u>\$ 19</u>	<u>\$ (8)</u>	<u>\$ 13,529</u>	<u>7,649,896</u>	<u>0.177</u>
2021 to 2023	Residential	\$ 9,752	\$ (622)	\$ (17)	\$ 9,114		
2021 to 2023	C&I	\$ 21,855	\$ (848)	\$ (30)	\$ 20,977		
2021 to 2023	Total	<u>\$ 31,607</u>	<u>\$ (1,469)</u>	<u>\$ (46)</u>	<u>\$ 30,091</u>		

Col. A: Effective year (January 1 - December 31)  
Col. B: Customer Sector  
Col. C: Pages 11, 12, 13, Lines 23, 24 Col. O / 1000  
Col. D: Pages 15, 16, 17, 18, 19, 20 Line 4, Col. B  
Col. E: Pages 15, 16, 17, 18, 19, 20, Line 6, Col. O  
Col. F: Col. C + Col. D + Col. E  
Col. G: Company Forecast  
Col. H: (Col. F \* 100) / Col. G

**PSNH d/b/a Eversource Energy  
 Monthly and Cumulative Savings and Lost Base Revenue  
 January 1, 2020 to December 31, 2020**

Line	Description	Cumulative Annual kWh Savings / Monthly														2020 Annual kWh and Monthly kW Savings	Cumulative Annual kWh Savings / Monthly kW Savings 12/31/2020
		Col. B 12/31/2019	Col. C Jan 2020	Col. D Feb 2020	Col. E Mar 2020	Col. F Apr 2020	Col. G May 2020	Col. H June 2020	Col. I Jul 2020	Col. J Aug 2020	Col. K Sep 2020	Col. L Oct 2020	Col. M Nov 2020	Col. N Dec 2020			
1	Residential Annual kWh Savings (2018, 2019, & 2020)	26,234,462	2,699,389	1,344,524	1,945,177	1,875,167	2,545,990	1,805,737	2,908,955	2,250,528	2,250,528	2,250,528	2,250,528	2,250,528	26,377,578	52,194,669	
2	C&I Annual kWh Savings (2018)	38,157,478	-	-	-	-	-	-	-	-	-	-	-	-	-	38,157,478	
3	C&I Annual kWh Savings (2019 & 2020)	70,845,870	958,116	1,088,643	6,630,329	1,701,819	1,618,721	1,802,612	1,393,340	8,744,315	8,744,315	8,744,315	8,744,315	8,744,315	58,915,156	129,761,027	
4	C&I Monthly Installed kW Savings	10,647	189	236	1,071	411	344	365	331	1,362	1,362	1,362	1,362	1,362	9,756	20,403	
<b>Total 2020</b>																	
5	Monthly Residential Savings (2020)	112,475	56,022	81,049	78,132	106,083	75,239	121,206	93,772	93,772	93,772	93,772	93,772	93,772	1,714,316		
6	Retired Measures	-	3,351	-	-	-	-	4,624	6,174	8,323	889	11,420	-	-	-		
7	Cumulative Residential Savings	2,186,205	2,298,680	2,463,825	2,600,896	2,760,077	2,944,292	3,125,614	3,317,435	3,526,239	3,705,461	3,892,116	4,068,240	4,255,784			
8	Average Residential kWh Distribution Rate (\$/kWh)	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400			
9	Total Lost Residential Revenue	\$ 101,150	\$ 108,417	\$ 114,448	\$ 121,453	\$ 129,559	\$ 137,538	\$ 145,979	\$ 155,167	\$ 163,053	\$ 171,267	\$ 179,017	\$ 187,269	\$ 187,269	\$	1,714,316	
10	Monthly C&I Savings (2018)	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790		
11	Average C&I kWh Distribution Rate (\$/kWh)	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798			
12	Lost C&I kWh Revenue	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973			
13	Monthly C&I Savings (2019 & 2020)	39,921	45,360	276,264	70,909	67,447	75,109	58,056	364,346	364,346	364,346	364,346	364,346	364,346	7,899,778		
14	Cumulative C&I Savings	5,903,823	5,943,744	6,029,026	6,350,649	6,697,822	6,836,178	6,978,734	7,111,898	7,534,301	8,262,994	8,991,687	9,720,379	10,449,072	8,046,632		
15	Average C&I kWh Distribution Rate (\$/kWh)	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	146,855		
16	Lost C&I kWh Revenue	\$ 66,636	\$ 67,592	\$ 71,198	\$ 75,090	\$ 76,641	\$ 78,240	\$ 79,733	\$ 84,468	\$ 92,638	\$ 100,807	\$ 108,977	\$ 117,146	\$ 117,146			
17	Monthly C&I kW Savings (2019)	95	118	535	205	172	182	165	681	681	681	681	681	681			
18	Cumulative Monthly C&I kW Savings	10,647	10,742	10,955	11,608	12,349	12,726	13,080	13,428	14,274	15,636	16,998	18,360	19,722			
19	Average C&I Demand Rate (\$/kW)	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46			
20	Lost C&I Demand Revenue	\$ 69,380	\$ 70,753	\$ 74,973	\$ 79,758	\$ 82,195	\$ 84,483	\$ 86,730	\$ 92,196	\$ 100,993	\$ 109,789	\$ 118,586	\$ 127,383	\$ 127,383			
21	Total Lost C&I kWh and Demand Revenue	\$ 224,989	\$ 227,318	\$ 235,144	\$ 243,821	\$ 247,809	\$ 251,696	\$ 255,435	\$ 265,637	\$ 282,603	\$ 299,569	\$ 316,535	\$ 333,502	\$ 333,502	\$	3,184,060	
22	<b>Total Lost Revenue</b>	<b>\$ 326,139</b>	<b>\$ 335,735</b>	<b>\$ 349,592</b>	<b>\$ 365,274</b>	<b>\$ 377,368</b>	<b>\$ 389,234</b>	<b>\$ 401,414</b>	<b>\$ 420,804</b>	<b>\$ 445,656</b>	<b>\$ 470,836</b>	<b>\$ 495,552</b>	<b>\$ 520,771</b>	<b>\$ 520,771</b>	<b>\$</b>	<b>4,898,376</b>	

Lines 1-4: Company Actuals and Forecast  
 Line 5: Line 1 / 24  
 Line 6: Company Actuals and Forecast  
 Line 7: Prior Month Line 7 + Current Month Line 5 + Previous Month Line 5 - Current Month Line 6  
 Line 8: Page 21, Column 8  
 Line 9: Line 7 x Line 8  
 Line 10: Line 1, Column B / 12  
 Line 11: Page 21, Column 8  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3 / 24  
 Line 14: Prior Month Line 14 + Current Month Line 13  
 Line 15: Page 21, Column 7  
 Line 16: Line 14 x Line 15  
 Line 17: Line 4 / 12  
 Line 18: Prior Month Line 18 + Current Month Line 17  
 Line 19: Page 21, Column 6  
 Line 20: Line 18 x Line 19  
 Line 21: Line 12 + Line 16 + Line 20  
 Line 22: Line 9 + Line 21

**PSNH d/b/a Eversource Energy**  
**Monthly and Cumulative Savings and Lost Base Revenue**  
**January 1, 2021 to December 31, 2021**

Line	Description	Annual kWh	Forecast												2021 Annual kWh and Monthly kWh Savings	Cumulative Annual kWh Savings / Monthly kWh Savings 12/31/2021	
		Savings / Monthly kW Savings 12/31/2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	June 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021			
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O		
1	Residential Annual kWh Savings (2018-2021)	52,194,669	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	1,575,897	18,910,761	69,377,877
2	C&I Annual kWh Savings (2018)	38,157,478	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38,157,478
3	C&I Annual kWh Savings (2019-2021)	129,761,027	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	7,646,781	91,761,370	221,522,397
4	C&I Monthly Installed kW Savings	20,403	886	886	886	886	886	886	886	886	886	886	886	886	886	10,638	31,041
			<b>Total 2021</b>														
			<b>Lost Base Revenue</b>														
5	Monthly Residential Savings (2021)		65,662	65,662	65,662	65,662	65,662	65,662	65,662	65,662	65,662	65,662	65,662	65,662	65,662		
6	Retired Measures		14,219	-	-	-	29,405	-	-	12,569	-	24,608	24,975	38,188			
7	Cumulative Residential Savings	4,349,556	4,400,999	4,532,324	4,663,649	4,765,569	4,896,894	5,028,218	5,159,543	5,278,299	5,409,624	5,516,341	5,622,691	5,715,827			
8	Average Residential kWh Distribution Rate		0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400			
9	Total Lost Residential Revenue		\$ 193,659	\$ 199,438	\$ 205,217	\$ 209,702	\$ 215,480	\$ 221,259	\$ 227,038	\$ 232,263	\$ 238,042	\$ 242,738	\$ 247,418	\$ 251,516	\$	2,683,770	
10	Monthly C&I Savings (2018)	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790		
11	Average C&I kWh Distribution Rate		0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798		
12	Lost C&I kWh Revenue		\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$		
13	Monthly C&I Savings (2021)		318,616	318,616	318,616	318,616	318,616	318,616	318,616	318,616	318,616	318,616	318,616	318,616	318,616		
14	Cumulative C&I Savings	10,813,419	11,132,035	11,769,266	12,406,498	13,043,730	13,680,962	14,318,193	14,955,425	15,592,657	16,229,889	16,867,120	17,504,352	18,141,584			
15	Average C&I kWh Distribution Rate		0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121			
16	Lost C&I kWh Revenue		\$ 124,803	\$ 131,947	\$ 139,091	\$ 146,235	\$ 153,379	\$ 160,523	\$ 167,668	\$ 174,812	\$ 181,956	\$ 189,100	\$ 196,244	\$ 203,388			
17	Monthly C&I kW Savings (2021)		443	443	443	443	443	443	443	443	443	443	443	443			
18	Cumulative Monthly C&I kW Savings	20,403	20,847	21,733	22,619	23,506	24,392	25,279	26,165	27,052	27,938	28,825	29,711	30,598			
19	Average C&I Demand Rate		6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46			
20	Lost C&I Demand Revenue		\$ 134,644	\$ 140,369	\$ 146,095	\$ 151,820	\$ 157,545	\$ 163,271	\$ 168,996	\$ 174,722	\$ 180,447	\$ 186,173	\$ 191,898	\$ 197,624			
21	Total Lost C&I kWh and Demand Revenue		\$ 348,419	\$ 361,289	\$ 374,159	\$ 387,028	\$ 399,898	\$ 412,767	\$ 425,637	\$ 438,506	\$ 451,376	\$ 464,246	\$ 477,115	\$ 489,985	\$	5,030,425	
22	<b>Total Lost Revenue</b>		<b>\$ 542,079</b>	<b>\$ 560,727</b>	<b>\$ 579,375</b>	<b>\$ 596,730</b>	<b>\$ 615,378</b>	<b>\$ 634,026</b>	<b>\$ 652,675</b>	<b>\$ 670,770</b>	<b>\$ 689,418</b>	<b>\$ 706,984</b>	<b>\$ 724,533</b>	<b>\$ 741,501</b>	<b>\$</b>	<b>7,714,195</b>	
23	<b>Total Lost Revenue - Res</b>		<b>\$ 193,659</b>	<b>\$ 199,438</b>	<b>\$ 205,217</b>	<b>\$ 209,702</b>	<b>\$ 215,480</b>	<b>\$ 221,259</b>	<b>\$ 227,038</b>	<b>\$ 232,263</b>	<b>\$ 238,042</b>	<b>\$ 242,738</b>	<b>\$ 247,418</b>	<b>\$ 251,516</b>	<b>\$</b>	<b>2,683,770</b>	
24	<b>Total Lost Revenue - C&amp;I</b>		<b>\$ 348,419</b>	<b>\$ 361,289</b>	<b>\$ 374,159</b>	<b>\$ 387,028</b>	<b>\$ 399,898</b>	<b>\$ 412,767</b>	<b>\$ 425,637</b>	<b>\$ 438,506</b>	<b>\$ 451,376</b>	<b>\$ 464,246</b>	<b>\$ 477,115</b>	<b>\$ 489,985</b>	<b>\$</b>	<b>5,030,425</b>	

Lines 1-4: Company Forecast  
 Line 5: Line 1 / 24  
 Line 6: Company Forecast  
 Line 7: Prior Month Line 7 + Current Month Line 5 + Previous Month Line 5 - Current Month Line 6  
 Line 8: Page 21, Column 8  
 Line 9: Line 7 x Line 8  
 Line 10: Line 1, Column B / 12  
 Line 11: Page 21, Column 8  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3 / 24  
 Line 14: Prior Month Line 14 + Current Month Line 13  
 Line 15: Page 21, Column 7  
 Line 16: Line 14 x Line 15  
 Line 17: Line 4 / 12  
 Line 18: Prior Month Line 18 + Current Month Line 17  
 Line 19: Page 21, Column 6  
 Line 20: Line 18 x Line 19  
 Line 21: Line 12 + Line 16 + Line 20

PSNH d/b/a Eversource Energy  
 Monthly and Cumulative Savings and Lost Base Revenue  
 January 1, 2022 to December 31, 2022

Line	Description	Cumulative Annual kWh Savings / Monthly kW Savings 12/31/2021	Forecast	2022 Annual kWh and Monthly kW Savings	Cumulative Annual kWh Savings / Monthly kW Savings 12/31/2022													
			Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022				
			Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	Residential Annual kWh Savings (2018-2022)	69,377,877	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	1,182,817	14,193,803	79,933,606
2	C&I Annual kWh Savings (2018)	38,157,478	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38,157,478
3	C&I Annual kWh Savings (2019-2022)	221,522,397	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	9,730,403	116,764,842	338,287,239
4	C&I Monthly Installed kW Savings	31,041	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	12,958	43,999
			<b>Total 2020</b>															
			Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Total 2020 Lost Base Revenue			
5	Monthly Residential Savings (2022)		49,284	49,284	49,284	49,284	49,284	49,284	49,284	49,284	49,284	49,284	49,284	49,284				
6	Retired Measures		27,546	27,913	34,891	41,502	40,768	35,259	28,280	26,077	28,648	12,288	-	-				
7	Cumulative Residential Savings	5,781,490	5,803,228	5,873,883	5,937,559	5,994,625	6,052,425	6,115,735	6,186,022	6,258,514	6,328,434	6,414,714	6,513,282	6,611,850				
8	Average Residential kWh Distribution Rate		0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400				
9	Total Lost Residential Revenue		\$ 255,362	\$ 258,471	\$ 261,273	\$ 263,784	\$ 266,328	\$ 269,114	\$ 272,206	\$ 275,396	\$ 278,473	\$ 282,270	\$ 286,607	\$ 290,944	\$ 3,260,229			
10	Monthly C&I Savings (2018)	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790				
11	Average C&I kWh Distribution Rate		0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798				
12	Lost C&I kWh Revenue		\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973				
13	Monthly C&I Savings (2022)		405,433	405,433	405,433	405,433	405,433	405,433	405,433	405,433	405,433	405,433	405,433	405,433				
14	Cumulative C&I Savings	18,460,200	18,865,633	19,676,500	20,487,367	21,298,234	22,109,101	22,919,968	23,730,835	24,541,702	25,352,569	26,163,436	26,974,303	27,785,170				
15	Average C&I kWh Distribution Rate		0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121				
16	Lost C&I kWh Revenue		\$ 211,505	\$ 220,596	\$ 229,687	\$ 238,778	\$ 247,868	\$ 256,959	\$ 266,050	\$ 275,141	\$ 284,232	\$ 293,322	\$ 302,413	\$ 311,504				
17	Monthly C&I kW Savings (2022)		540	540	540	540	540	540	540	540	540	540	540	540				
18	Cumulative Monthly C&I kW Savings	31,041	31,581	32,661	33,740	34,820	35,900	36,980	38,060	39,140	40,219	41,299	42,379	43,459				
19	Average C&I Demand Rate		6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46				
20	Lost C&I Demand Revenue		\$ 203,974	\$ 210,948	\$ 217,923	\$ 224,897	\$ 231,871	\$ 238,846	\$ 245,820	\$ 252,795	\$ 259,769	\$ 266,744	\$ 273,718	\$ 280,693				
21	Total Lost C&I kWh and Demand Revenue		\$ 504,452	\$ 520,517	\$ 536,582	\$ 552,648	\$ 568,713	\$ 584,778	\$ 600,843	\$ 616,909	\$ 632,974	\$ 649,039	\$ 665,104	\$ 681,169	\$ 7,113,729			
22	<b>Total Lost Revenue</b>		<b>\$ 759,814</b>	<b>\$ 778,988</b>	<b>\$ 797,856</b>	<b>\$ 816,432</b>	<b>\$ 835,041</b>	<b>\$ 853,892</b>	<b>\$ 873,050</b>	<b>\$ 892,305</b>	<b>\$ 911,447</b>	<b>\$ 931,309</b>	<b>\$ 951,711</b>	<b>\$ 972,114</b>	<b>\$ 10,373,957</b>			
23	<b>Total Lost Revenue - Res</b>		<b>\$ 255,362</b>	<b>\$ 258,471</b>	<b>\$ 261,273</b>	<b>\$ 263,784</b>	<b>\$ 266,328</b>	<b>\$ 269,114</b>	<b>\$ 272,206</b>	<b>\$ 275,396</b>	<b>\$ 278,473</b>	<b>\$ 282,270</b>	<b>\$ 286,607</b>	<b>\$ 290,944</b>	<b>\$ 3,260,229</b>			
24	<b>Total Lost Revenue - C&amp;I</b>		<b>\$ 504,452</b>	<b>\$ 520,517</b>	<b>\$ 536,582</b>	<b>\$ 552,648</b>	<b>\$ 568,713</b>	<b>\$ 584,778</b>	<b>\$ 600,843</b>	<b>\$ 616,909</b>	<b>\$ 632,974</b>	<b>\$ 649,039</b>	<b>\$ 665,104</b>	<b>\$ 681,169</b>	<b>\$ 7,113,729</b>			

\*Numbers provided for illustrative purposes only and subject to change.  
 Lines 1-4: Company Forecast  
 Line 5: Line 1 / 24  
 Line 6: Company Forecast  
 Line 7: Prior Month Line 7 + Current Month Line 5 + Previous Month Line 5 - Current Month Line 6  
 Line 8: Page 21, Column 8  
 Line 9: Line 7 x Line 8  
 Line 10: Line 1, Column B / 12  
 Line 11: Page 21, Column 8  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3 / 24  
 Line 14: Prior Month Line 14 + Current Month Line 13  
 Line 15: Page 21, Column 7  
 Line 16: Line 14 x Line 15  
 Line 17: Line 4 / 12  
 Line 18: Prior Month Line 18 + Current Month Line 17  
 Line 19: Page 21, Column 6  
 Line 20: Line 18 x Line 19  
 Line 21: Line 12 + Line 16 + Line 20  
 Line 22: Line 9 + Line 21  
 Line 23: Line 9  
 Line 24: Line 21

PSNH d/b/a Eversource Energy  
 Monthly and Cumulative Savings and Lost Base Revenue  
 January 1, 2023 to December 31, 2023

Line	Description	Cumulative Annual kWh Savings / Monthly kW Savings 12/31/2022	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2023 Annual kWh and Monthly kW Savings	Cumulative Annual kWh Savings / Monthly kW Savings 12/31/2023
			Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023		
1	Residential Annual kWh Savings (2018-2023)	79,933,606	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	1,100,931	13,211,175	93,144,781
2	C&I Annual kWh Savings (2018)	38,157,478	-	-	-	-	-	-	-	-	-	-	-	-	-	38,157,478
3	C&I Annual kWh Savings (2019-2023)	338,287,239	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	12,293,856	147,526,270	485,813,508
4	C&I Monthly Installed kW Savings	43,999	1,319	1,319	1,319	1,319	1,319	1,319	1,319	1,319	1,319	1,319	1,319	1,319	15,822	59,821
<b>Total 2020</b>																
5	Monthly Residential Savings (2023)		45,872	45,872	45,872	45,872	45,872	45,872	45,872	45,872	45,872	45,872	45,872	45,872		
6	Retired Measures		-	-	-	-	-	-	-	-	-	-	-	-		
7	Cumulative Residential Savings	6,661,134	6,707,006	6,798,750	6,890,495	6,982,239	7,073,983	7,165,727	7,257,472	7,349,216	7,440,960	7,532,704	7,624,449	7,716,193		
8	Average Residential kWh Distribution Rate		0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400	0.04400		
9	Total Lost Residential Revenue		\$ 295,131	\$ 299,169	\$ 303,206	\$ 307,243	\$ 311,280	\$ 315,317	\$ 319,354	\$ 323,391	\$ 327,428	\$ 331,465	\$ 335,502	\$ 339,539	\$	3,808,024
10	Monthly C&I Savings (2018)	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790	3,179,790		
11	Average C&I kWh Distribution Rate		0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798	0.02798		
12	Lost C&I kWh Revenue		\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973	\$ 88,973		
13	Monthly C&I Savings (2023)		512,244	512,244	512,244	512,244	512,244	512,244	512,244	512,244	512,244	512,244	512,244	512,244		
14	Cumulative C&I Savings	28,190,603	28,702,847	29,727,335	30,751,823	31,776,311	32,800,799	33,825,287	34,849,775	35,874,263	36,898,751	37,923,239	38,947,727	39,972,215		
15	Average C&I kWh Distribution Rate		0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121	0.01121		
16	Lost C&I kWh Revenue		\$ 321,792	\$ 333,278	\$ 344,763	\$ 356,249	\$ 367,735	\$ 379,220	\$ 390,706	\$ 402,192	\$ 413,678	\$ 425,163	\$ 436,649	\$ 448,135		
17	Monthly C&I kW Savings (2023)		659	659	659	659	659	659	659	659	659	659	659	659		
18	Cumulative Monthly C&I kW Savings	43,999	44,658	45,317	45,976	46,635	47,294	47,953	48,612	49,271	49,930	50,589	51,248	51,907		
19	Average C&I Demand Rate		6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46		
20	Lost C&I Demand Revenue		\$ 288,438	\$ 296,954	\$ 305,470	\$ 313,986	\$ 322,502	\$ 331,019	\$ 339,535	\$ 348,051	\$ 356,567	\$ 365,083	\$ 373,599	\$ 382,115		
21	Total Lost C&I kWh and Demand Revenue		\$ 699,203	\$ 719,205	\$ 739,207	\$ 759,208	\$ 779,210	\$ 799,212	\$ 819,214	\$ 839,216	\$ 859,217	\$ 879,219	\$ 899,221	\$ 919,223	\$	9,710,554
22	<b>Total Lost Revenue</b>		<b>\$ 994,334</b>	<b>\$ 1,018,373</b>	<b>\$ 1,042,412</b>	<b>\$ 1,066,451</b>	<b>\$ 1,090,490</b>	<b>\$ 1,114,529</b>	<b>\$ 1,138,568</b>	<b>\$ 1,162,606</b>	<b>\$ 1,186,645</b>	<b>\$ 1,210,684</b>	<b>\$ 1,234,723</b>	<b>\$ 1,258,762</b>	<b>\$</b>	<b>13,518,578</b>
23	<b>Total Lost Revenue - Res</b>		<b>\$ 295,131</b>	<b>\$ 299,169</b>	<b>\$ 303,206</b>	<b>\$ 307,243</b>	<b>\$ 311,280</b>	<b>\$ 315,317</b>	<b>\$ 319,354</b>	<b>\$ 323,391</b>	<b>\$ 327,428</b>	<b>\$ 331,465</b>	<b>\$ 335,502</b>	<b>\$ 339,539</b>	<b>\$</b>	<b>3,808,024</b>
24	<b>Total Lost Revenue - C&amp;I</b>		<b>\$ 699,203</b>	<b>\$ 719,205</b>	<b>\$ 739,207</b>	<b>\$ 759,208</b>	<b>\$ 779,210</b>	<b>\$ 799,212</b>	<b>\$ 819,214</b>	<b>\$ 839,216</b>	<b>\$ 859,217</b>	<b>\$ 879,219</b>	<b>\$ 899,221</b>	<b>\$ 919,223</b>	<b>\$</b>	<b>9,710,554</b>

\*Numbers provided for illustrative purposes only and subject to change.  
 Lines 1-4: Company Forecast  
 Line 5: Line 1 / 24  
 Line 6: Company Forecast  
 Line 7: Prior Month Line 7 + Current Month Line 5 + Previous Month Line 5 - Current Month Line 6  
 Line 8: Page 21, Column 8  
 Line 9: Line 7 x Line 8  
 Line 10: Line 1, Column B / 12  
 Line 11: Page 21, Column 8  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3 / 24  
 Line 14: Prior Month Line 14 + Current Month Line 13  
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 Line 17: Line 4 / 12  
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 Line 21: Line 12 + Line 16 + Line 20  
 Line 22: Line 9 + Line 21  
 Line 23: Line 9  
 Line 24: Line 21

**PSNH d/b/a Eversource Energy  
 Lost Base Revenue Reconciliation  
 January 1, 2020 to December 31, 2020  
 (\$ in 000's)**

Line	Description	Actual Carryover 12/31/2019	Actual Jan 2020	Actual Feb 2020	Actual Mar 2020	Actual Apr 2020	Actual May 2020	Actual Jun 2020	Actual Jul 2020	Forecast Aug 2020	Forecast Sep 2020	Forecast Oct 2020	Forecast Nov 2020	Forecast Dec 2020	2020 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		449	425	388	384	366	391	485	468	395	396	393	442	4,980
2	Lost Revenues		<u>326</u>	<u>336</u>	<u>350</u>	<u>365</u>	<u>377</u>	<u>389</u>	<u>401</u>	<u>421</u>	<u>446</u>	<u>471</u>	<u>496</u>	<u>521</u>	<u>4,898</u>
3	Current Month (Over)/Under Recovery		(123)	(89)	(38)	(18)	12	(2)	(83)	(47)	50	75	103	79	(82)
4	Cumulative (Over)/Under Recovery	(1,367)	(1,490)	(1,579)	(1,617)	(1,636)	(1,624)	(1,626)	(1,709)	(1,757)	(1,706)	(1,631)	(1,528)	(1,449)	
5	Interest @ Prime Rate		0.3958%	0.3958%	0.3150%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(6)	(6)	(5)	(4)	(4)	(4)	(5)	(5)	(5)	(5)	(4)	(4)	(57)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(1,495)</u>	<u>(1,590)</u>	<u>(1,634)</u>	<u>(1,657)</u>	<u>(1,650)</u>	<u>(1,656)</u>	<u>(1,744)</u>	<u>(1,796)</u>	<u>(1,750)</u>	<u>(1,679)</u>	<u>(1,581)</u>	<u>(1,505)</u>	
8	Monthly Sales (MWh)		690,301	653,598	596,912	590,377	562,797	601,793	745,552	720,362	608,001	608,508	604,191	679,307	7,661,698
9	SBC Rate (LBR Component) (cents/kWh)		0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	

Line 1: (Line 8 x Line 9) / 100  
 Line 2: Page 10, Line 22 / 1000  
 Line 3: Line 2 - Line 1  
 Line 4: Prior month Line 4 + Current month Line 3  
 Line 5: Prime Rate / 12  
 Line 6: (Prior Month Line 4 + Current Month Line 4) / 2 x Line 5  
 Line 7: Line 4 + Line 6  
 Line 8: Company Actuals and Forecast  
 Line 9: Approved Rates

**PSNH d/b/a Eversource Energy  
 Lost Base Revenue Reconciliation - Residential  
 January 1, 2021 to December 31, 2021  
 (\$ in 000's)**

Line	Description	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2021
		Carryover 12/31/2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	June 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		216	173	174	150	139	157	202	193	147	142	157	200	2,051
2	Lost Revenues		<u>194</u>	<u>199</u>	<u>205</u>	<u>210</u>	<u>215</u>	<u>221</u>	<u>227</u>	<u>232</u>	<u>238</u>	<u>243</u>	<u>247</u>	<u>252</u>	<u>2,684</u>
3	Current Month (Over)/Under Recovery		(22)	27	31	60	76	64	25	40	91	100	91	51	632
4	Cumulative (Over)/Under Recovery	(621)	(643)	(616)	(585)	(526)	(449)	(385)	(360)	(321)	(230)	(130)	(39)	12	
5	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(1)	(0)	(0)	(0)	(12)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(644)</u>	<u>(620)</u>	<u>(590)</u>	<u>(532)</u>	<u>(457)</u>	<u>(394)</u>	<u>(370)</u>	<u>(332)</u>	<u>(242)</u>	<u>(142)</u>	<u>(52)</u>	<u>(1)</u>	
8	Monthly Sales (MWh)		334,360	267,732	270,141	232,183	215,344	243,792	313,357	298,549	228,360	220,538	242,749	310,450	3,177,552
9	SBC Rate (LBR Component) (cents/kWh)		0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	

Line 1: (Line 8 x Line 9) / 100  
 Line 2: Page 11, Line 23 / 1000  
 Line 3: Line 2 - Line 1  
 Line 4: Prior month Line 4 + Current month Line 3  
 Line 5: Prime Rate / 12  
 Line 6: (Prior Month Line 4 + Current Month Line 4) / 2 x Line 5  
 Line 7: Line 4 + Line 6  
 Line 8: Company Forecast  
 Line 9: Company Forecast

**PSNH d/b/a Eversource Energy**  
**Lost Base Revenue Reconciliation - C&I**  
**January 1, 2021 to December 31, 2021**  
**(\$ in 000's)**

Line	Description	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2021
		Carryover 12/31/2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	June 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		339	317	343	317	340	359	380	379	341	342	321	330	4,109
2	Lost Revenues		<u>348</u>	<u>361</u>	<u>374</u>	<u>387</u>	<u>400</u>	<u>413</u>	<u>426</u>	<u>439</u>	<u>451</u>	<u>464</u>	<u>477</u>	<u>490</u>	<u>5,030</u>
3	Current Month (Over)/Under Recovery		10	44	32	70	60	53	45	60	110	122	156	160	922
4	Cumulative (Over)/Under Recovery	(885)	(875)	(831)	(800)	(730)	(670)	(617)	(571)	(512)	(402)	(279)	(124)	37	
5	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(2)	(2)	(2)	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	(19)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(878)</u>	<u>(836)</u>	<u>(807)</u>	<u>(739)</u>	<u>(681)</u>	<u>(629)</u>	<u>(586)</u>	<u>(527)</u>	<u>(419)</u>	<u>(297)</u>	<u>(142)</u>	<u>18</u>	
8	Monthly Sales (MWh)		373,417	349,368	377,530	349,541	374,957	395,911	419,204	417,437	376,237	376,790	353,943	363,427	4,527,763
9	SBC Rate (LBR Component) (cents/kWh)		0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	

Line 1: (Line 8 x Line 9) / 100  
 Line 2: Page 12, Line 24 / 1000  
 Line 3: Line 2 - Line 1  
 Line 4: Prior month Line 4 + Current month Line 3  
 Line 5: Prime Rate / 12  
 Line 6: (Prior Month Line 4 + Current Month Line 4) / 2 x Line 5  
 Line 7: Line 4 + Line 6  
 Line 8: Company Forecast  
 Line 9: Company Forecast

**PSNH d/b/a Eversource Energy  
 Lost Base Revenue Reconciliation - Residential  
 January 1, 2022 to December 31, 2022  
 (\$ in 000's)**

Line	Description	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2022
		Carryover 12/31/2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		342	274	276	237	220	250	321	306	235	227	250	320	3,258
2	Lost Revenues		<u>255</u>	<u>258</u>	<u>261</u>	<u>264</u>	<u>266</u>	<u>269</u>	<u>272</u>	<u>275</u>	<u>278</u>	<u>282</u>	<u>287</u>	<u>291</u>	<u>3,260</u>
3	Current Month (Over)/Under Recovery		(86)	(15)	(15)	26	46	20	(49)	(31)	44	55	37	(29)	2
4	Cumulative (Over)/Under Recovery	(1)	(87)	(102)	(117)	(91)	(44)	(25)	(74)	(105)	(61)	(6)	30	1	
5	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0	0	(2)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(87)</u>	<u>(102)</u>	<u>(118)</u>	<u>(92)</u>	<u>(45)</u>	<u>(26)</u>	<u>(75)</u>	<u>(107)</u>	<u>(63)</u>	<u>(8)</u>	<u>28</u>	<u>(0)</u>	
8	Monthly Sales (MWh)		334,664	267,849	270,411	232,542	215,388	244,337	314,651	300,108	229,943	222,517	244,887	313,066	3,190,363
9	SBC Rate (LBR Component) (cents/kWh)		0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	

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**PSNH d/b/a Eversource Energy**  
**Lost Base Revenue Reconciliation - C&I**  
**January 1, 2022 to December 31, 2022**  
**(\$ in 000's)**

Line	Description	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2022
		Carryover 12/31/2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		582	546	590	561	591	619	656	653	591	591	557	571	7,108
2	Lost Revenues		<u>504</u>	<u>521</u>	<u>537</u>	<u>553</u>	<u>569</u>	<u>585</u>	<u>601</u>	<u>617</u>	<u>633</u>	<u>649</u>	<u>665</u>	<u>681</u>	<u>7,114</u>
3	Current Month (Over)/Under Recovery		(78)	(25)	(54)	(8)	(22)	(34)	(55)	(36)	42	58	108	110	6
4	Cumulative (Over)/Under Recovery	18	(60)	(85)	(139)	(147)	(169)	(203)	(258)	(294)	(252)	(195)	(86)	24	
5	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(1)	(1)	(1)	(1)	(1)	(0)	(0)	(5)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(60)</u>	<u>(85)</u>	<u>(139)</u>	<u>(148)</u>	<u>(171)</u>	<u>(205)</u>	<u>(261)</u>	<u>(298)</u>	<u>(256)</u>	<u>(199)</u>	<u>(91)</u>	<u>19</u>	
8	Monthly Sales (MWh)		366,976	344,140	372,167	353,613	372,470	389,948	413,462	411,476	372,492	372,738	350,877	359,824	4,480,182
9	SBC Rate (LBR Component) (cents/kWh)		0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	

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**PSNH d/b/a Eversource Energy**  
**Lost Base Revenue Reconciliation - Residential**  
**January 1, 2023 to December 31, 2023**  
**(\$ in 000's)**

Line	Description	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2023
		Carryover 12/31/2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023	Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		398	319	323	278	258	292	375	358	275	266	292	373	3,806
2	Lost Revenues		<u>295</u>	<u>299</u>	<u>303</u>	<u>307</u>	<u>311</u>	<u>315</u>	<u>319</u>	<u>323</u>	<u>327</u>	<u>331</u>	<u>336</u>	<u>340</u>	<u>3,808</u>
3	Current Month (Over)/Under Recovery		(103)	(20)	(19)	30	54	23	(56)	(35)	53	66	44	(33)	2
4	Cumulative (Over)/Under Recovery	(0)	(104)	(124)	(143)	(114)	(60)	(37)	(93)	(127)	(75)	(9)	35	2	
5	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0	0	(2)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(104)</u>	<u>(124)</u>	<u>(144)</u>	<u>(115)</u>	<u>(61)</u>	<u>(38)</u>	<u>(94)</u>	<u>(129)</u>	<u>(77)</u>	<u>(11)</u>	<u>32</u>	<u>(1)</u>	
8	Monthly Sales (MWh)		338,049	271,022	273,618	235,598	218,586	247,710	318,408	303,703	233,090	225,571	247,718	316,047	3,229,120
9	SBC Rate (LBR Component) (cents/kWh)		0.118	0.118	0.118	0.118	0.118	0.118	0.118	0.118	0.118	0.118	0.118	0.118	

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**PSNH d/b/a Eversource Energy  
 Lost Base Revenue Reconciliation - C&I  
 January 1, 2023 to December 31, 2023  
 (\$ in 000's)**

Line	Description	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	2023
		Carryover 12/31/2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023	Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023	Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Revenue Recovery		794	745	806	749	801	845	895	890	809	829	768	782	9,712
2	Lost Revenues		<u>699</u>	<u>719</u>	<u>739</u>	<u>759</u>	<u>779</u>	<u>799</u>	<u>819</u>	<u>839</u>	<u>859</u>	<u>879</u>	<u>899</u>	<u>919</u>	<u>9,711</u>
3	Current Month (Over)/Under Recovery		(94)	(25)	(67)	10	(21)	(46)	(76)	(51)	50	51	132	137	(1)
4	Cumulative (Over)/Under Recovery	19	(75)	(101)	(167)	(157)	(178)	(224)	(300)	(351)	(301)	(251)	(119)	18	
5	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
6	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(0)	(6)
7	Cumulative (Over)/Under Recovery Incl Carrying Charge		<u>(75)</u>	<u>(101)</u>	<u>(168)</u>	<u>(158)</u>	<u>(180)</u>	<u>(226)</u>	<u>(303)</u>	<u>(355)</u>	<u>(306)</u>	<u>(256)</u>	<u>(125)</u>	<u>12</u>	
8	Monthly Sales (MWh)		361,233	338,955	366,843	340,860	364,454	384,520	407,592	405,323	368,308	377,229	349,459	355,999	4,420,775
9	SBC Rate (LBR Component) (cents/kWh)		0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	

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Eversource  
Calculation of Forecasted Average Distribution Rate for Lost Revenue  
Based on Actual Billing Determinants and Distribution Rates\*

	(1)	(2)	(3) = (1) + (2)	(4)	(5)	(6) = (1) + (4)	(7) = (2) / (5)	(8) = (3) / (5)
<b>For the Period 08/01/19 Through 07/31/20</b>								
<u>Rate Class</u>	<u>Revenue</u>			<u>Delivery</u> <u>kW</u>	<u>Delivery</u> <u>kWh</u>	<u>Average</u> <u>Distribution Rate</u> <u>\$/kW</u>	<u>Average</u> <u>Distribution Rate</u> <u>\$/kWh<sup>(a)</sup></u>	<u>Average</u> <u>Distribution Rate</u> <u>\$/kWh<sup>(b)</sup></u>
	<u>Demand</u> <u>Charges</u>	<u>kWh</u> <u>Charges</u>	<u>Total Demand</u> <u>and kWh Charges</u>					
<b>Residential</b>	\$ -	\$ 143,644,797	\$ 143,644,797	\$ -	3,264,397,495	N/A	N/A	\$ 0.04400
General Service Rate G	\$ 35,544,082	\$ 33,222,513	\$ 68,766,596	3,741,939	1,623,547,912	\$ 8.88	\$ 0.02046	\$ 0.04236
Primary General Service Rate GV	\$ 23,479,235	\$ 10,026,765	\$ 33,506,000	3,986,165	1,569,188,304	\$ 2.52	\$ 0.00639	\$ 0.02135
Large General Service Rate LG	\$ 14,237,367	\$ 5,728,400	\$ 19,965,767	3,614,672	1,175,920,781	\$ 1.58	\$ 0.00487	\$ 0.01698
<b>Commercial and Industrial</b>	\$ 73,260,685	\$ 48,977,678	\$ 122,238,363	11,342,776	4,368,656,997	\$ 6.46	\$ 0.01121	\$ 0.02798

\* Excludes the outdoor lighting rates (Rate OL and Rate EOL), the Customer/Meter charge revenue from each rate, and the on/off peak kWh associated with Rate B >= 115 kV under Rate LG.

(a) For 2019 and 2020 C&I Savings

(b) For 2017 and 2018 C&I Savings

**Bill Impacts of Changes in System Benefits Charge - PSNH d/b/a Eversource Energy**

	<b>Current Rates*</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Total System Benefits Charge (\$/kWh) - Residential	\$ 0.00743	\$ 0.00866	\$ 0.00898	\$ 0.00941
Total System Benefits Charge (\$/kWh) - C&I	\$ 0.00743	\$ 0.01270	\$ 0.01807	\$ 0.02432
<u>Bill per month, including PSNH default energy service</u>				
Residential Rate R (625 kWh/month)	\$ 115.76	\$ 116.53	\$ 116.73	\$ 117.00
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)	\$ 1,610.64	\$ 1,663.35	\$ 1,717.05	\$ 1,779.54
<u>Change from previous rate level - \$ per month</u>				
Residential Rate R (625 kWh/month)		\$ 0.77	\$ 0.20	\$ 0.27
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		\$ 52.71	\$ 53.69	\$ 62.49
<u>Change from previous rate level - %</u>				
Residential Rate R (625 kWh/month)		0.7%	0.2%	0.2%
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		3.3%	3.2%	3.6%

\* Stated at Eversource's rate levels effective August 1, 2020 - December 31, 2020

**Eversource**

**Calculation of Distribution Revenue at the Rate Levels in Effect August 2019 - July 2020  
 Based on Billing Determinants for the Twelve Months Ending July 2020**

<b>Residential Rate R</b>				
<b>Rate</b>	<b>Source</b>	<b>August 1, 2019 - July 31, 2020</b>		
		<b>Units</b>	<b>Rate/Charge</b>	<b>Revenue</b>
<b>Standard</b>	Customer Charge	5,334,232	\$ 13.81	\$ 73,665,744
	All kWh	3,140,464,324	\$ 0.04508	\$ 141,572,132
<b>Uncontrolled Water Heating</b>	Customer Charge	494,086	\$ 4.87	\$ 2,406,199
	All kWh	90,414,551	\$ 0.02210	\$ 1,998,162
<b>Controlled Water Heating</b>	Customer Charge	2,794	\$ 8.58	\$ 23,973
	All kWh	496,217	\$ 0.00131	\$ 650.0
<b>LCS - Radio-controlled &amp; 8 Hour Switch</b>	Customer Charge	40,086	\$ 9.92	\$ 397,653
	All kWh	31,986,382	\$ 0.00131	\$ 41,902
<b>LCS - 8 Hour No Switch</b>	Customer Charge	1,158	\$ 8.58	\$ 9,936
	All kWh	322,416	\$ 0.00131	\$ 422
<b>LCS - 10,11 Hour Switch</b>	Customer Charge	47	\$ 9.92	\$ 466
	All kWh	8,397	\$ 0.02665	\$ 224
<b>LCS - 10,11 Hour No Switch</b>	Customer Charge	1,011	\$ 8.58	\$ 8,674
	All kWh	241,324	\$ 0.02665	\$ 6,431
<b>Time of Day</b>	Customer Charge	500	\$ 32.08	\$ 16,040
	On Peak kWh	168,343	\$ 0.14407	\$ 24,253
	Off Peak kWh	295,541	\$ 0.00210	\$ 621
<b>Total Residential</b>	Customer/Meter	5,873,914		\$ 76,528,685
	Demand	-		-
	kWh	3,264,397,495		\$ 143,644,797
				<u>\$ 220,173,481</u>

<b>General Service Rate G</b>				
<b>Rate</b>	<b>Source</b>	<b>August 1, 2019 - July 31, 2020</b>		
		<b>Units</b>	<b>Rate/Charge</b>	<b>Revenue</b>
<b>Standard</b>	Single Phase Customer Charge	679,744	\$ 16.21	\$ 11,018,650
	Three Phase Customer Charge	241,642	\$ 32.39	\$ 7,826,784
	Demand Charge > 5 kW	3,733,095	\$ 9.49	\$ 35,427,067
	First 500 kWh Charge	270,805,121	\$ 0.07604	\$ 20,592,021
	Next 1,000 kWh Charge	281,867,544	\$ 0.01884	\$ 5,310,385
	All Additional kWh Charge	1,059,128,827	\$ 0.00666	\$ 7,053,798
<b>Time of Day</b>	Single Phase Customer Charge	189	\$ 41.98	\$ 7,934
	Three Phase Customer Charge	250	\$ 60.00	\$ 15,000
	Demand Charge	8,845	\$ 13.23	\$ 117,015
	On peak kWh	301,120	\$ 0.05335	\$ 16,065
	Off peak kWh	249,690	\$ 0.00836	\$ 2,087
<b>Space Heating</b>	Meter Charge	4,795	\$ 3.24	\$ 15,536
	All kWh	4,566,882	\$ 0.03729	\$ 170,299
<b>Uncontrolled Water Heating</b>	Customer Charge	14,567	\$ 4.87	\$ 70,941
	All kWh	3,278,380	\$ 0.02210	\$ 72,452
<b>Controlled Water Heating</b>	Customer Charge	1	\$ 8.58	\$ 9
	All kWh	4,151	\$ 0.00131	\$ 5
<b>LCS - Radio-controlled &amp; 8 Hour Switch</b>	Customer Charge	1,825	\$ 9.92	\$ 18,104
	All kWh	3,242,216	\$ 0.00131	\$ 4,247
<b>LCS - 8 Hour No Switch</b>	Customer Charge	55	\$ 8.58	\$ 472
	All kWh	63,837	\$ 0.00131	\$ 84
<b>LCS - 10,11 Hour Switch</b>	Customer Charge	-	\$ 9.92	\$ -
	All kWh	-	\$ 0.00131	\$ -
<b>LCS - 10,11 Hour No Switch</b>	Customer Charge	14	\$ 8.58	\$ 120
	All kWh	40,144	\$ 0.02665	\$ 1,070
<b>Total General Service</b>	Customer/Meter	943,082		\$ 18,973,551
	Demand	3,741,939		\$ 35,544,082
	kWh	1,623,547,912		\$ 33,222,513
				<b>\$ 87,740,146</b>

<b>Primary General Service Rate GV</b>				
Rate	Source	August 1, 2019 - July 31, 2020		
		Units	Rate/Charge	Revenue
<b>Standard</b>	Customer Charge	16,528	\$ 211.21	\$ 3,490,879
	Minimum Charge	352	\$ 972.00	\$ 342,144
	First 100 kW Demand Charge	1,377,516	\$ 6.07	\$ 8,361,522
	All Additional kW Demand Charge	2,567,211	\$ 5.81	\$ 14,915,496
	First 200,000 kWh	1,255,754,797	\$ 0.00660	\$ 8,287,982
	All Additional kWh	311,021,859	\$ 0.00554	\$ 1,723,061
<b>Rate B &lt; 115 KV</b>	Administrative Charge	136	\$ 372.10	\$ 50,606
	Translation Charge	644	\$ 62.42	\$ 40,198
	Demand Charge	41,438	\$ 4.88	\$ 202,217
	First 200,000 kWh	2,227,577	\$ 0.00660	\$ 14,702
	All Additional kWh	184,071	\$ 0.00554	\$ 1,020
<b>Space Heating</b>	Meter Charge	-		\$ -
	All kWh	-		\$ -
<b>Total GV</b>	Customer/Meter	16,664		\$ 3,923,827
	Demand	3,986,165		\$ 23,479,235
	kWh	1,569,188,304		\$ 10,026,765
				<u>\$ 37,429,827</u>

<b>Large General Service Rate LG</b>				
Rate	Source	August 1, 2019 - July 31, 2020		
		Units	Rate/Charge	Revenue
<b>Standard</b>	Customer Charge	1,279	\$ 660.15	\$ 844,332
	Demand Charge	2,510,681	\$ 5.17	\$ 12,980,221
	On peak kWh	480,866,381	\$ 0.00553	\$ 2,659,191
	Off Peak kWh	625,553,109	\$ 0.00467	\$ 2,921,333
<b>Rate B &lt; 115 KV</b>	Administrative Charge	117	\$ 372.10	\$ 43,536
	Translation Charge	15	\$ 62.42	\$ 936
	Demand charge	257,612	\$ 4.88	\$ 1,257,147
	On peak kWh	10,768,634	\$ 0.00553	\$ 59,551
	Off Peak kWh	18,913,371	\$ 0.00467	\$ 88,325
<b>Rate B &gt;= 115 KV</b>	Administrative Charge	58	\$ 372.10	\$ 21,582
	Translation Charge	-	\$ 62.42	\$ -
	Demand charge	846,379	\$ -	\$ -
	On peak kWh	12,230,986	\$ -	\$ -
	Off Peak kWh	27,588,300	\$ -	\$ -
<b>Total LG</b>	Customer/Meter	1,454		\$ 910,386
	Demand	3,614,672		\$ 14,237,367
	kWh	1,175,920,781		\$ 5,728,400
				<u>\$ 20,876,153</u>

Outdoor Lighting Rate OL				
Type	Fixture	August 1, 2019 - July 31, 2020		
		Units	Rate/Charge	Revenue
High Pressure Sodium	4,000 Lumens	42,804	\$ 17.23	\$ 737,521
	5,800 Lumens	7,247	\$ 17.23	\$ 124,874
	9,500 Lumens	11,157	\$ 22.91	\$ 255,611
	16,000 Lumens	9,977	\$ 32.41	\$ 323,364
	30,000 Lumens	15,683	\$ 33.21	\$ 520,843
	50,000 Lumens	23,191	\$ 33.58	\$ 778,753
	130,000 Lumens	4,534	\$ 53.89	\$ 244,334
	12,000 Lumens	97	\$ 23.70	\$ 2,292
	34,200 Lumens	62	\$ 30.34	\$ 1,882
Mercury	3,500 Lumens	57,205	\$ 15.20	\$ 869,512
	7,000 Lumens	11,171	\$ 18.29	\$ 204,324
	11,000 Lumens	721	\$ 22.61	\$ 16,291
	15,000 Lumens	36	\$ 25.86	\$ 931
	20,000 Lumens	4,873	\$ 27.92	\$ 136,047
	56,000 Lumens	1,675	\$ 44.38	\$ 74,349
Metal Halide	5,000 Lumens	2,735	\$ 17.97	\$ 49,144
	8,000 Lumens	1,543	\$ 24.60	\$ 37,958
	13,500 Lumens	1,532	\$ 33.76	\$ 51,728
	20,000 Lumens	3,550	\$ 34.47	\$ 122,353
	36,000 Lumens	5,305	\$ 34.79	\$ 184,553
Incandescent	100,000 Lumens	3,041	\$ 52.15	\$ 158,606
	600 Lumens	1,009	\$ 9.93	\$ 10,019
	1,000 Lumens	2,628	\$ 11.08	\$ 29,118
	2,500 Lumens	2	\$ 14.22	\$ 22
Fluorescent	20,000 Lumens	24	\$ 37.87	\$ 909
<b>Total Rate OL</b>	Fixtures	211,802		\$ 4,935,339
	Demand	-		
	kWh	16,878,003		
				<u>\$ 4,935,339</u>

Outdoor Lighting Rate EOL				
Type	Fixture	August 1, 2019 - July 31, 2020		
		Units	Rate/Charge	Revenue
High Pressure Sodium	4,000 Lumens	45,939	\$ 9.17	\$ 421,261
	5,800 Lumens	2,268	\$ 9.17	\$ 20,798
	9,500 Lumens	4,631	\$ 11.28	\$ 52,238
	16,000 Lumens	6,298	\$ 12.40	\$ 78,095
	30,000 Lumens	20,223	\$ 12.40	\$ 250,765
	50,000 Lumens	1,563	\$ 12.80	\$ 20,006
	130,000 Lumens	660	\$ 24.30	\$ 16,038
Metal Halide	5,000 Lumens	7,284	\$ 9.52	\$ 69,344
	8,000 Lumens	831	\$ 12.59	\$ 10,462
	13,000 Lumens	-	\$ 13.44	\$ -
	13,500 Lumens	1,036	\$ 14.15	\$ 14,659
	20,000 Lumens	768	\$ 14.39	\$ 11,052
	36,000 Lumens	467	\$ 14.79	\$ 6,907
	100,000 Lumens	1,236	\$ 26.35	\$ 32,569
LED's	Per Fixture	393,981	\$ 3.67	\$ 1,445,910
	Per Watt	5,687,940	\$ 0.0558	\$ 317,387
	Maintenance credit (contract)	9	(\$1.90)	\$ (17)
<b>Total Rate EOL</b>	Fixtures	487,185		\$ 2,767,473
	Demand	-		\$ -
	kWh	11,115,834		\$ -
				<b>\$ 2,767,473</b>

Total Retail			
Type	Source	August 1, 2019 - July 31, 2020	
		Units	Revenue
<b>Total Retail</b>	Customer/Meter	6,835,114	\$ 100,336,448
	Fixtures	698,987	\$ 7,702,813
	Demand	11,342,776	\$ 73,260,685
	kWh	7,661,048,329	\$ 192,622,475
			<b>\$ 373,922,420</b>

<b>Lost Base Revenue</b>			
<b>Summary of Data Included in the Calculation of the Average Distribution Rates*</b>			
<b>Type</b>	<b>Source</b>	<b>August 1, 2019 - July 31, 2020</b>	
		<b>Units</b>	<b>Revenue</b>
<b>Total Residential</b>	Demand kWh	-	\$ -
		3,264,397,495	\$ 143,644,797
			<u>\$ 143,644,797</u>
<b>Total General Service</b>	Demand kWh	3,741,939	\$ 35,544,082
		1,623,547,912	\$ 33,222,513
			<u>\$ 68,766,596</u>
<b>Total GV</b>	Demand kWh	3,986,165	\$ 23,479,235
		1,569,188,304	\$ 10,026,765
			<u>\$ 33,506,000</u>
<b>Total LG</b>	Demand kWh	2,768,293	\$ 14,237,367
		1,136,101,495	\$ 5,728,400
			<u>\$ 19,965,767</u>
<b>Total</b>	Demand kWh	10,496,397	\$ 73,260,685
		7,593,235,206	\$ 192,622,475
			<u>\$ 265,883,160</u>

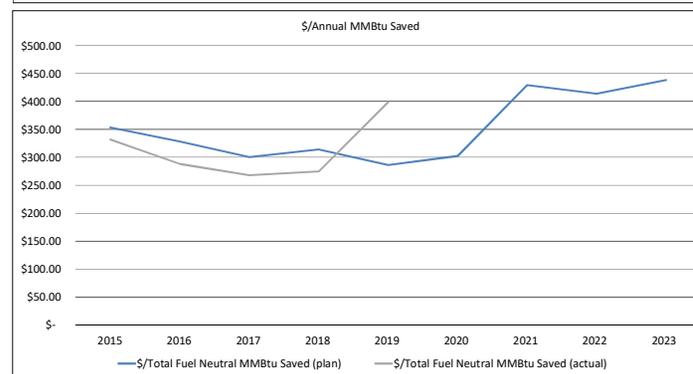
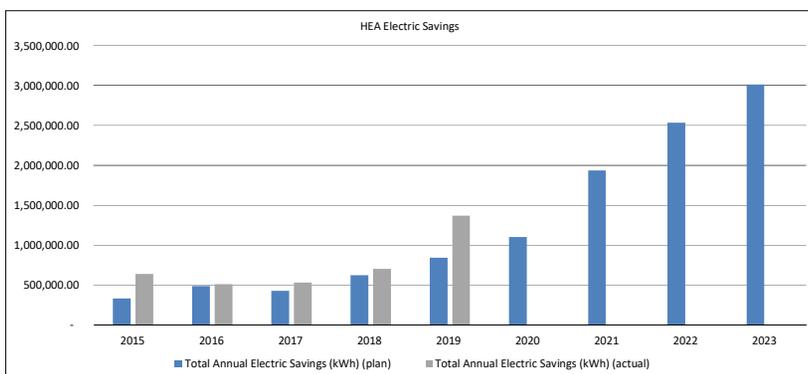
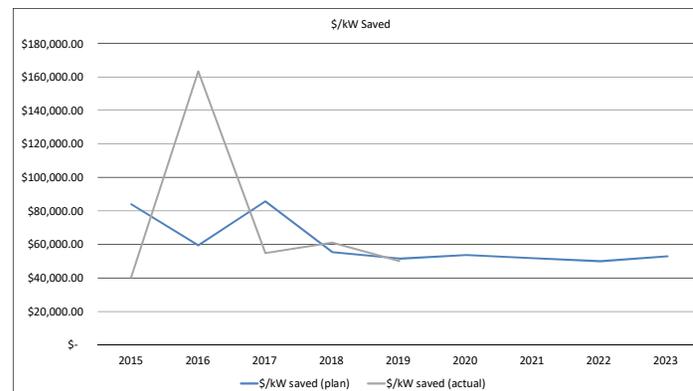
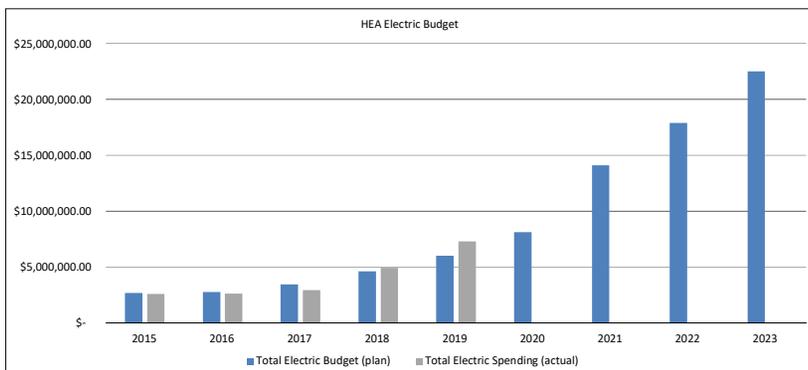
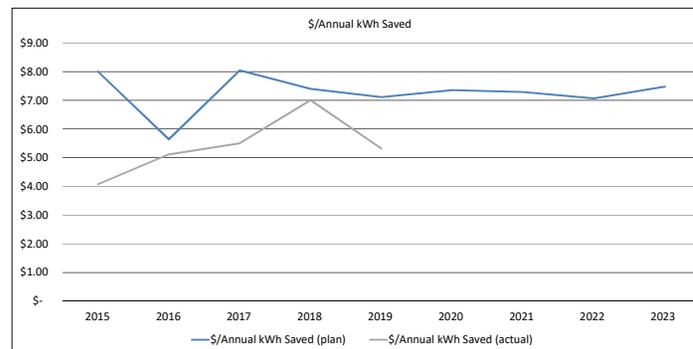
\* The Lost Base Revenue calculation excludes the outdoor lighting rates (Rate OL and Rate EOL), the Customer/Meter charge revenue from each rate, and the on/off peak kWh associated with Rate B >= 115 kV under Rate LG.

### Home Energy Assistance

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 2,661,464.00	\$ 2,751,286.00	\$ 3,450,394.00	\$ 4,611,266.00	\$ 6,015,106.66	\$ 8,110,148.68	\$ 14,095,652.59	\$ 17,892,763.69	\$ 22,513,868.56
	Total Annual Electric Savings (kWh) (plan)	332,704.68	487,614.55	429,219.81	623,609.04	845,586.10	1,102,644.60	1,933,931.17	2,533,199.04	3,012,948.11
	\$/Annual kWh Saved (plan)	\$ 8.00	\$ 5.64	\$ 8.04	\$ 7.39	\$ 7.11	\$ 7.36	\$ 7.29	\$ 7.06	\$ 7.47
2)	Total Electric Budget	\$ 2,661,464.00	\$ 2,751,286.00	\$ 3,450,394.00	\$ 4,611,266.00	\$ 6,015,106.66	\$ 8,110,148.68	\$ 14,095,652.59	\$ 17,892,763.69	\$ 22,513,868.56
	Total kW saved	31.70	46.33	40.26	83.25	116.74	151.12	271.99	358.06	425.48
	\$/kW saved (plan)	\$ 83,961.98	\$ 59,383.90	\$ 85,705.87	\$ 55,388.90	\$ 51,526.89	\$ 53,666.52	\$ 51,823.56	\$ 49,971.02	\$ 52,914.25
3)	Total Electric Budget	\$ 2,661,464.00	\$ 2,751,286.00	\$ 3,450,394.00	\$ 4,611,266.00	\$ 6,015,106.66	\$ 8,110,148.68	\$ 14,095,652.59	\$ 17,892,763.69	\$ 22,513,868.56
	Total Fuel Neutral MMBtu Saved	7,527.20	8,371.96	11,489.26	14,683.27	21,015.45	26,820.91	32,835.09	43,225.45	51,363.87
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 353.58	\$ 328.63	\$ 300.31	\$ 314.05	\$ 286.22	\$ 302.38	\$ 429.29	\$ 413.94	\$ 438.32

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 2,602,622.35	\$ 2,630,799.37	\$ 2,930,672.42	\$ 4,934,976.47	\$ 7,295,395.97
	Total Annual Electric Savings (kWh) (actu)	638,554.22	514,041.71	532,325.13	704,706.70	1,371,330.52
	\$/Annual kWh Saved (actual)	\$ 4.08	\$ 5.12	\$ 5.51	\$ 7.00	\$ 5.32
2)	Total Electric Spending	\$ 2,602,622.35	\$ 2,630,799.37	\$ 2,930,672.42	\$ 4,934,976.47	\$ 7,295,395.97
	Total kW saved	64.34	16.12	53.36	80.75	145.71
	\$/kW saved (actual)	\$ 40,451.13	\$ 163,221.09	\$ 54,918.84	\$ 61,113.05	\$ 50,069.62
3)	Total Electric Spending	\$ 2,602,622.35	\$ 2,630,799.37	\$ 2,930,672.42	\$ 4,934,976.47	\$ 7,295,395.97
	Total Fuel Neutral MMBtu Saved	7,839.29	9,126.57	10,943.68	17,951.87	18,300.71
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 332.00	\$ 288.26	\$ 267.80	\$ 274.90	\$ 398.64

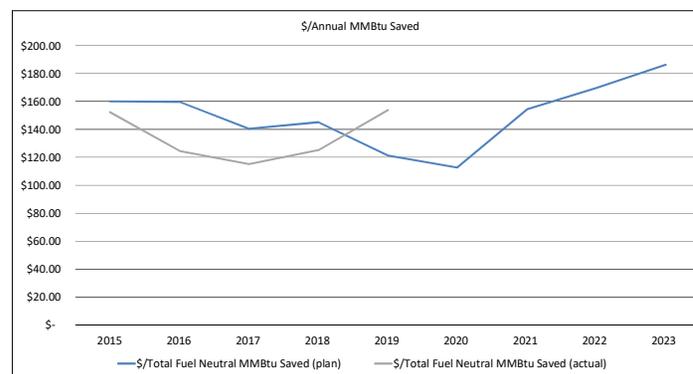
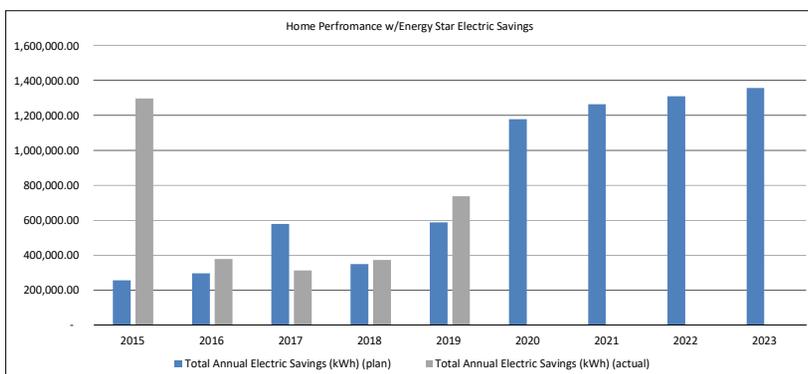
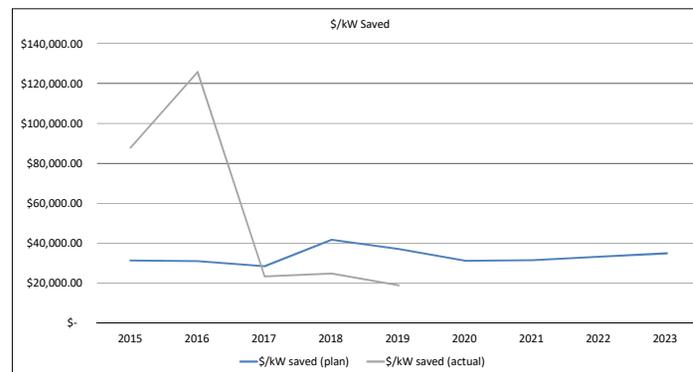
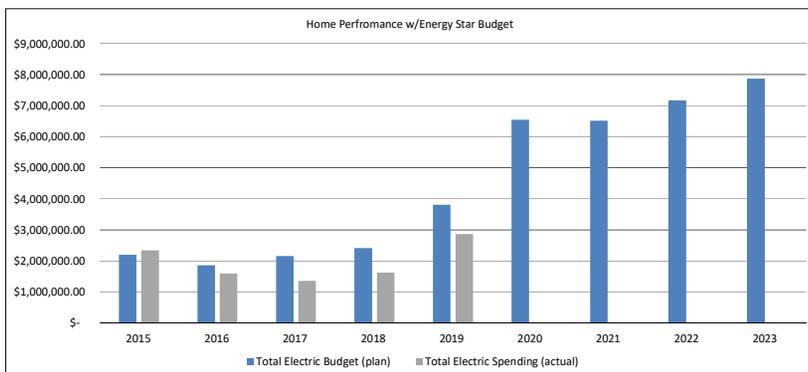
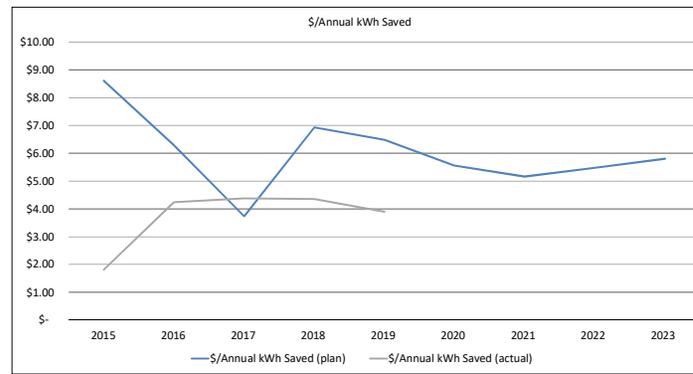


### Home Performance w/Energy Star

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 2,203,268.95	\$ 1,860,400.33	\$ 2,161,078.61	\$ 2,415,741.54	\$ 3,808,340.70	\$ 6,543,679.57	\$ 6,517,674.95	\$ 7,169,965.60	\$ 7,868,193.94
	Total Annual Electric Savings (kWh) (plan)	256,056.96	295,674.17	578,126.50	348,885.75	587,878.50	1,178,594.79	1,263,470.95	1,309,849.26	1,356,227.57
	\$/Annual kWh Saved (plan)	\$ 8.60	\$ 6.29	\$ 3.74	\$ 6.92	\$ 6.48	\$ 5.55	\$ 5.16	\$ 5.47	\$ 5.80
2)	Total Electric Budget	\$ 2,203,268.95	\$ 1,860,400.33	\$ 2,161,078.61	\$ 2,415,741.54	\$ 3,808,340.70	\$ 6,543,679.57	\$ 6,517,674.95	\$ 7,169,965.60	\$ 7,868,193.94
	Total kW saved	70.29	59.98	75.98	57.84	102.69	210.06	206.70	215.99	225.28
	\$/kW saved (plan)	\$ 31,344.04	\$ 31,015.03	\$ 28,442.09	\$ 41,764.27	\$ 37,085.52	\$ 31,151.48	\$ 31,532.44	\$ 33,195.82	\$ 34,925.88
3)	Total Electric Budget	\$ 2,203,268.95	\$ 1,860,400.33	\$ 2,161,078.61	\$ 2,415,741.54	\$ 3,808,340.70	\$ 6,543,679.57	\$ 6,517,674.95	\$ 7,169,965.60	\$ 7,868,193.94
	Total Fuel Neutral MMBtu Saved	13,764.71	11,649.95	15,376.05	16,650.12	31,408.42	58,069.10	42,246.91	42,255.09	42,263.27
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 160.07	\$ 159.69	\$ 140.55	\$ 145.09	\$ 121.25	\$ 112.69	\$ 154.28	\$ 169.68	\$ 186.17

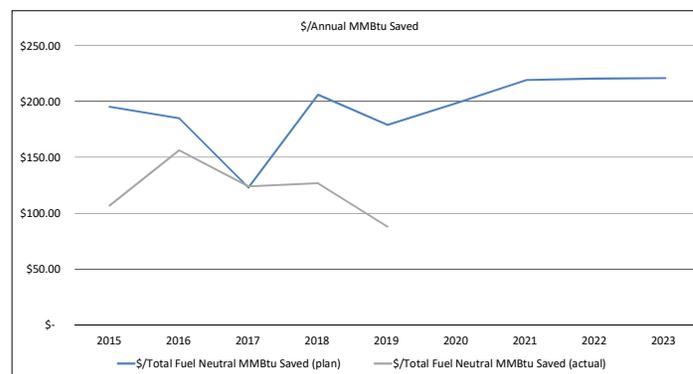
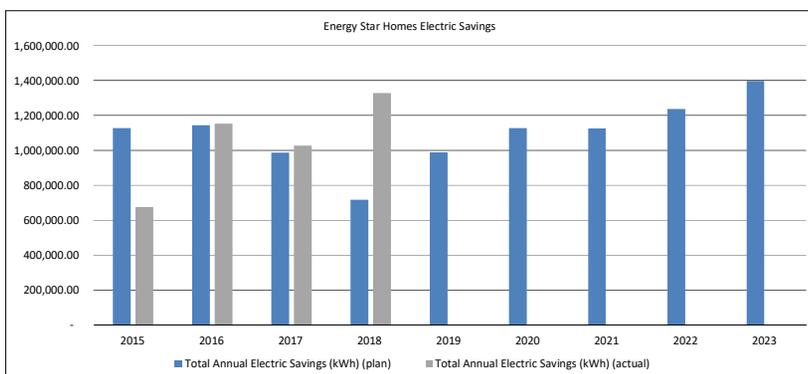
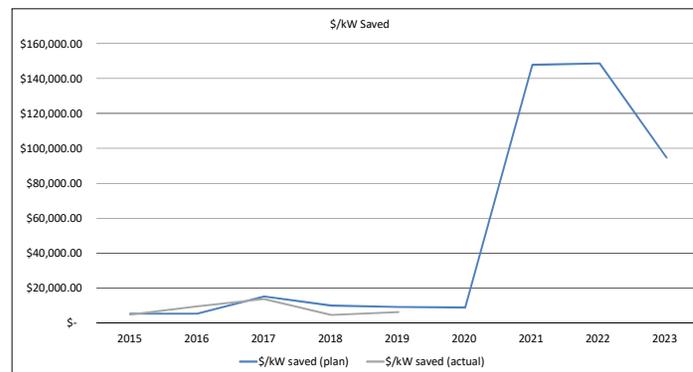
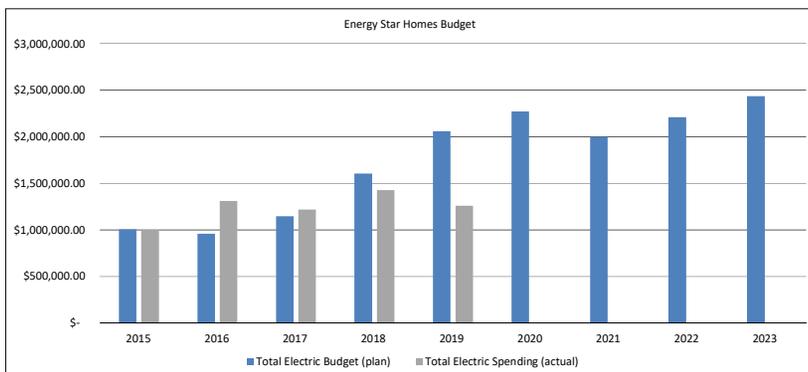
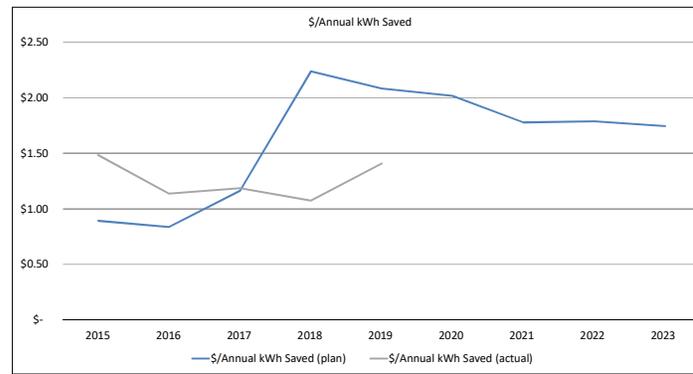
  

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 2,349,224.06	\$ 1,599,052.72	\$ 1,365,080.05	\$ 1,623,435.97	\$ 2,869,834.58
	Total Annual Electric Savings (kWh) (actu)	1,297,571.81	377,818.52	311,703.00	373,104.96	736,533.00
	\$/Annual kWh Saved (actual)	\$ 1.81	\$ 4.23	\$ 4.38	\$ 4.35	\$ 3.90
2)	Total Electric Spending	\$ 2,349,224.06	\$ 1,599,052.72	\$ 1,365,080.05	\$ 1,623,435.97	\$ 2,869,834.58
	Total kW saved	26.75	12.71	58.41	65.33	151.43
	\$/kW saved (actual)	\$ 87,835.36	\$ 125,789.42	\$ 23,371.81	\$ 24,850.64	\$ 18,951.97
3)	Total Electric Spending	\$ 2,349,224.06	\$ 1,599,052.72	\$ 1,365,080.05	\$ 1,623,435.97	\$ 2,869,834.58
	Total Fuel Neutral MMBtu Saved	15,422.74	12,836.50	11,843.32	12,974.04	18,665.69
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 152.32	\$ 124.57	\$ 115.26	\$ 125.13	\$ 153.75



Energy Star Homes

	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Planned</b>									
1) Total Electric Budget (plan)	\$ 1,006,618.95	\$ 957,269.48	\$ 1,147,210.86	\$ 1,603,217.35	\$ 2,060,103.01	\$ 2,271,812.43	\$ 1,997,598.43	\$ 2,210,065.50	\$ 2,434,014.41
Total Annual Electric Savings (kWh) (plan)	1,127,834.31	1,143,193.79	986,318.15	717,397.53	989,389.19	1,127,346.10	1,124,693.30	1,237,162.63	1,395,709.04
\$/Annual kWh Saved (plan)	\$ 0.89	\$ 0.84	\$ 1.16	\$ 2.23	\$ 2.08	\$ 2.02	\$ 1.78	\$ 1.79	\$ 1.74
2) Total Electric Budget	\$ 1,006,618.95	\$ 957,269.48	\$ 1,147,210.86	\$ 1,603,217.35	\$ 2,060,103.01	\$ 2,271,812.43	\$ 1,997,598.43	\$ 2,210,065.50	\$ 2,434,014.41
Total kW saved	187.30	176.08	75.75	159.13	222.81	253.71	13.52	14.87	25.69
\$/kW saved (plan)	\$ 5,374.24	\$ 5,436.52	\$ 15,143.81	\$ 10,075.13	\$ 9,245.91	\$ 8,954.39	\$ 147,775.50	\$ 148,630.08	\$ 94,756.97
3) Total Electric Budget	\$ 1,006,618.95	\$ 957,269.48	\$ 1,147,210.86	\$ 1,603,217.35	\$ 2,060,103.01	\$ 2,271,812.43	\$ 1,997,598.43	\$ 2,210,065.50	\$ 2,434,014.41
Total Fuel Neutral MMBtu Saved	5,158.61	5,177.38	9,335.70	7,781.99	11,505.24	11,436.23	9,115.53	10,027.08	11,025.97
\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 195.13	\$ 184.89	\$ 122.88	\$ 206.02	\$ 179.06	\$ 198.65	\$ 219.14	\$ 220.41	\$ 220.75
<b>Actuals</b>									
1) Total Electric Spending (actual)	\$ 1,000,669.85	\$ 1,309,689.49	\$ 1,218,908.50	\$ 1,426,308.42	\$ 1,259,222.58				
Total Annual Electric Savings (kWh) (actu)	674,639.98	1,153,065.16	1,027,593.90	1,327,854.25	894,232.60				
\$/Annual kWh Saved (actual)	\$ 1.48	\$ 1.14	\$ 1.19	\$ 1.07	\$ 1.41				
2) Total Electric Spending	\$ 1,000,669.85	\$ 1,309,689.49	\$ 1,218,908.50	\$ 1,426,308.42	\$ 1,259,222.58				
Total kW saved	204.73	136.81	88.78	305.62	197.31				
\$/kW saved (actual)	\$ 4,887.75	\$ 9,572.72	\$ 13,729.43	\$ 4,666.98	\$ 6,382.11				
3) Total Electric Spending	\$ 1,000,669.85	\$ 1,309,689.49	\$ 1,218,908.50	\$ 1,426,308.42	\$ 1,259,222.58				
Total Fuel Neutral MMBtu Saved	9,364.77	8,379.13	9,833.29	11,250.73	14,295.72				
\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 106.85	\$ 156.30	\$ 123.96	\$ 126.77	\$ 88.08				

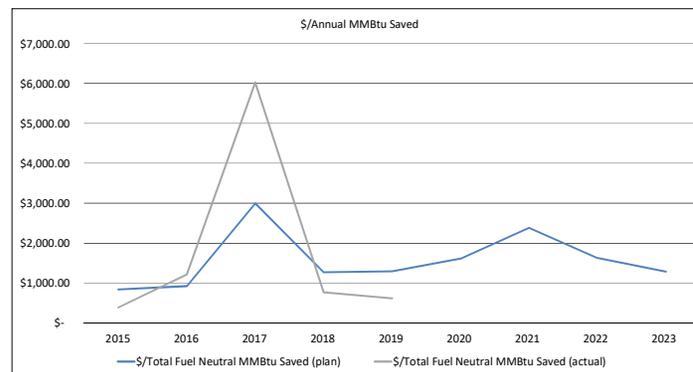
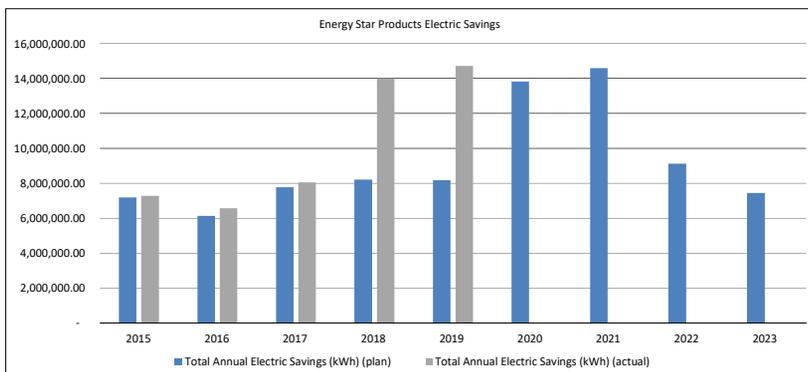
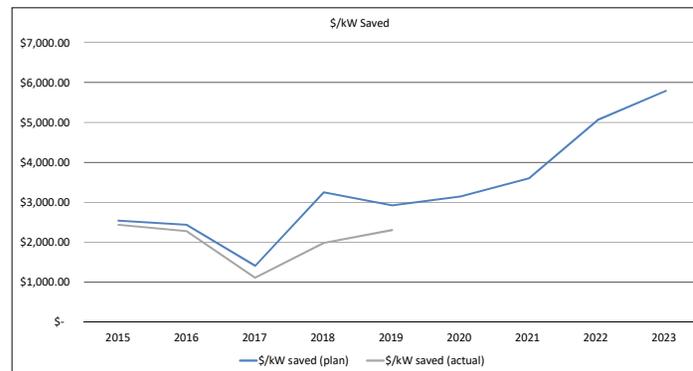
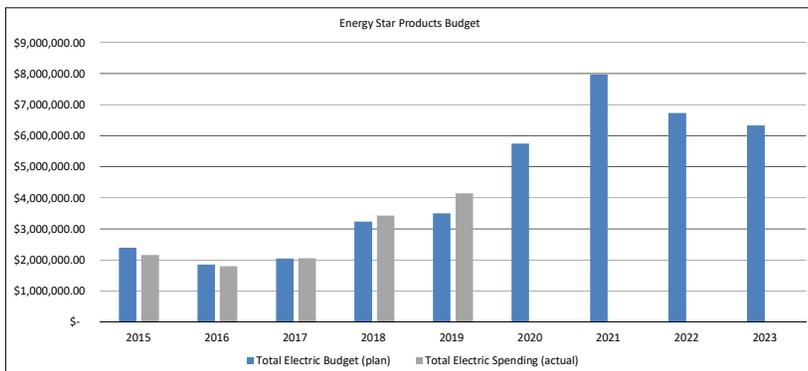
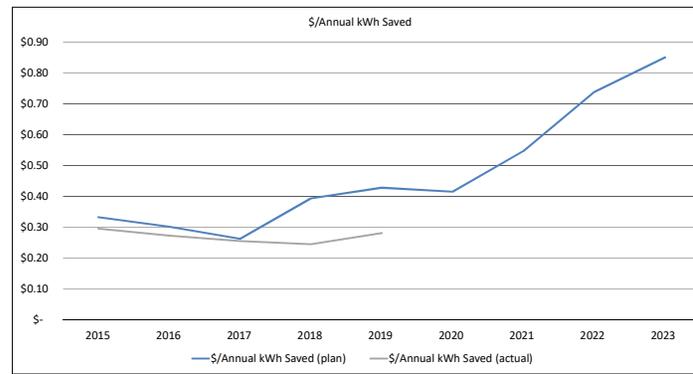


Energy Star Products

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 2,397,437.10	\$ 1,853,017.79	\$ 2,044,263.55	\$ 3,235,076.39	\$ 3,502,801.21	\$ 5,745,856.20	\$ 7,973,059.87	\$ 6,726,086.41	\$ 6,327,613.57
	Total Annual Electric Savings (kWh) (plan)	7,197,903.64	6,137,671.04	7,773,228.53	8,217,144.12	8,177,720.12	13,830,606.84	14,588,665.35	9,113,591.98	7,446,289.79
	\$/Annual kWh Saved (plan)	\$ 0.33	\$ 0.30	\$ 0.26	\$ 0.39	\$ 0.43	\$ 0.42	\$ 0.55	\$ 0.74	\$ 0.85
2)	Total Electric Budget	\$ 2,397,437.10	\$ 1,853,017.79	\$ 2,044,263.55	\$ 3,235,076.39	\$ 3,502,801.21	\$ 5,745,856.20	\$ 7,973,059.87	\$ 6,726,086.41	\$ 6,327,613.57
	Total kW saved	944.51	761.13	1,452.08	1,982.25	1,198.26	1,826.44	2,216.45	1,330.01	1,093.40
	\$/kW saved (plan)	\$ 2,538.28	\$ 2,434.55	\$ 1,407.82	\$ 3,247.25	\$ 2,923.23	\$ 3,145.94	\$ 3,597.22	\$ 5,057.18	\$ 5,787.11
3)	Total Electric Budget	\$ 2,397,437.10	\$ 1,853,017.79	\$ 2,044,263.55	\$ 3,235,076.39	\$ 3,502,801.21	\$ 5,745,856.20	\$ 7,973,059.87	\$ 6,726,086.41	\$ 6,327,613.57
	Total Fuel Neutral MMBtu Saved	2,839.32	1,998.41	681.99	2,545.57	2,709.02	3,560.83	3,342.95	4,127.68	4,912.41
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 844.37	\$ 927.25	\$ 2,997.51	\$ 1,270.86	\$ 1,293.01	\$ 1,613.63	\$ 2,385.04	\$ 1,629.51	\$ 1,288.09

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 2,159,065.92	\$ 1,799,457.82	\$ 2,058,666.85	\$ 3,432,567.81	\$ 4,148,857.09
	Total Annual Electric Savings (kWh) (actu)	7,288,383.41	6,571,188.82	8,039,990.99	13,993,423.29	14,715,500.88
	\$/Annual kWh Saved (actual)	\$ 0.30	\$ 0.27	\$ 0.26	\$ 0.25	\$ 0.28
2)	Total Electric Spending	\$ 2,159,065.92	\$ 1,799,457.82	\$ 2,058,666.85	\$ 3,432,567.81	\$ 4,148,857.09
	Total kW saved	886.37	790.47	1,851.20	1,731.45	1,800.49
	\$/kW saved (actual)	\$ 2,435.84	\$ 2,276.43	\$ 1,112.07	\$ 1,982.48	\$ 2,304.29
3)	Total Electric Spending	\$ 2,159,065.92	\$ 1,799,457.82	\$ 2,058,666.85	\$ 3,432,567.81	\$ 4,148,857.09
	Total Fuel Neutral MMBtu Saved	5,526.86	1,478.74	341.59	4,447.45	6,681.88
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 390.65	\$ 1,216.89	\$ 6,026.76	\$ 771.81	\$ 620.91

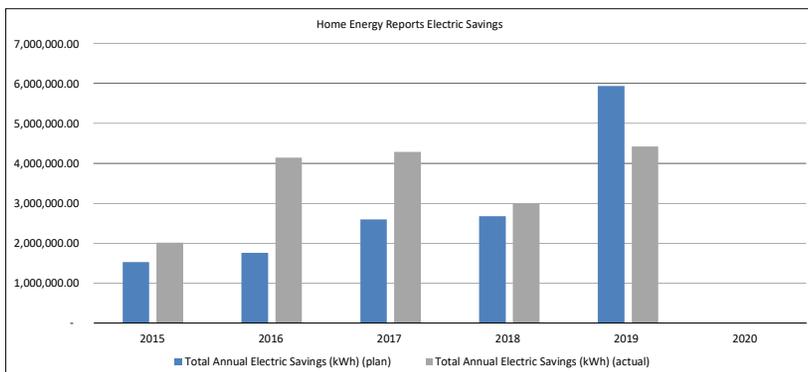
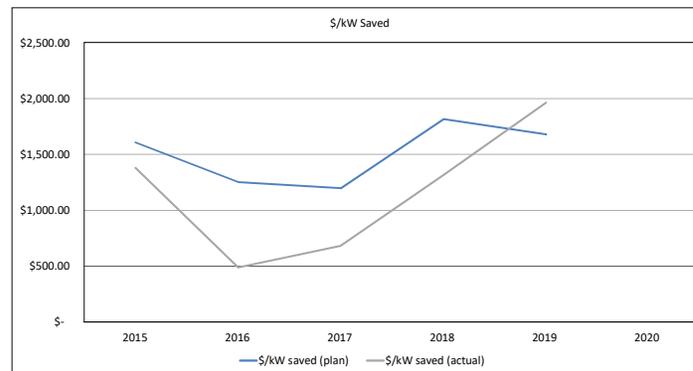
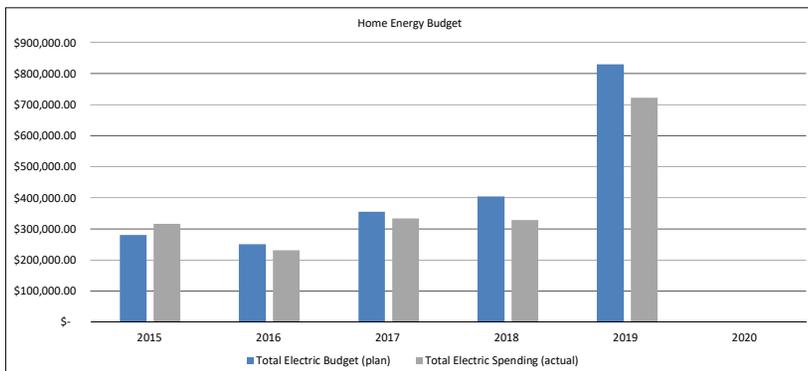
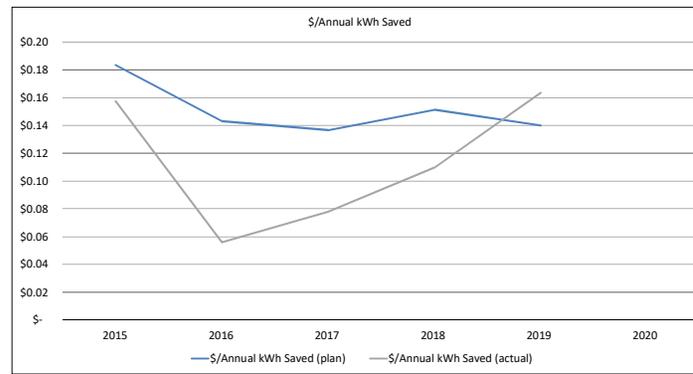


Home Energy Reports

Planned		2015	2016	2017	2018	2019	2020
1)	Total Electric Budget (plan)	\$ 280,402.00	\$ 251,006.39	\$ 355,117.61	\$ 404,663.00	\$ 829,581.11	\$ -
	Total Annual Electric Savings (kWh) (plan)	1,529,834.00	1,755,680.67	2,600,000.00	2,675,775.15	5,933,600.00	-
	\$/Annual kWh Saved (plan)	\$ 0.18	\$ 0.14	\$ 0.14	\$ 0.15	\$ 0.14	-
2)	Total Electric Budget	\$ 280,402.00	\$ 251,006.39	\$ 355,117.61	\$ 404,663.00	\$ 829,581.11	\$ -
	Total kW saved	174.64	200.42	296.80	222.98	494.47	-
	\$/kW saved (plan)	\$ 1,605.60	\$ 1,252.40	\$ 1,196.47	\$ 1,814.78	\$ 1,677.73	-
3)	Total Electric Budget	\$ 280,402.00	\$ 251,006.39	\$ 355,117.61	\$ 404,663.00	\$ 829,581.11	\$ -
	Total Fuel Neutral MMBtu Saved						
	\$/Total Fuel Neutral MMBtu Saved (plan)						

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 316,754.26	\$ 231,662.02	\$ 333,867.14	\$ 328,178.45	\$ 722,318.03
	Total Annual Electric Savings (kWh) (actu)	2,013,872.00	4,142,136.00	4,283,639.00	2,990,649.57	4,420,562.20
	\$/Annual kWh Saved (actual)	\$ 0.16	\$ 0.06	\$ 0.08	\$ 0.11	\$ 0.16
2)	Total Electric Spending	\$ 316,754.26	\$ 231,662.02	\$ 333,867.14	\$ 328,178.45	\$ 722,318.03
	Total kW saved	229.89	472.85	489.00	249.22	368.38
	\$/kW saved (actual)	\$ 1,377.83	\$ 489.93	\$ 682.76	\$ 1,316.82	\$ 1,960.80
3)	Total Electric Spending	\$ 316,754.26	\$ 231,662.02	\$ 333,867.14	\$ 328,178.45	\$ 722,318.03
	Total Fuel Neutral MMBtu Saved					
	\$/Total Fuel Neutral MMBtu Saved (actual)					

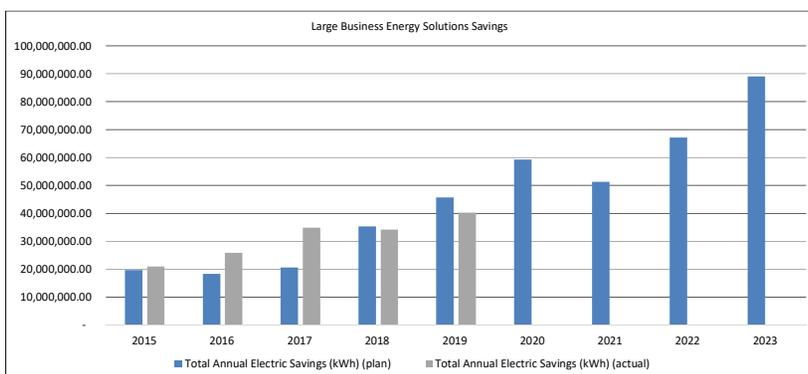
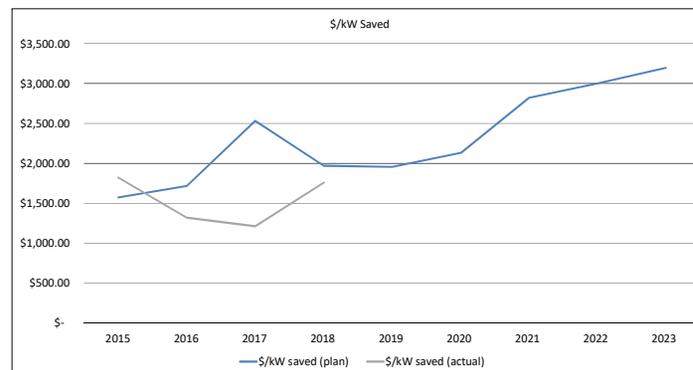
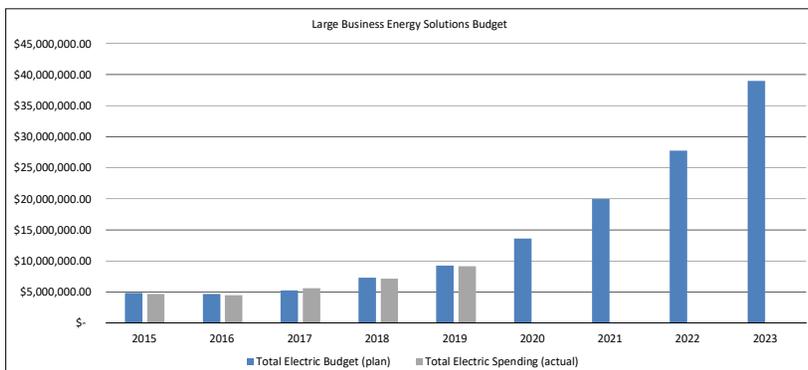
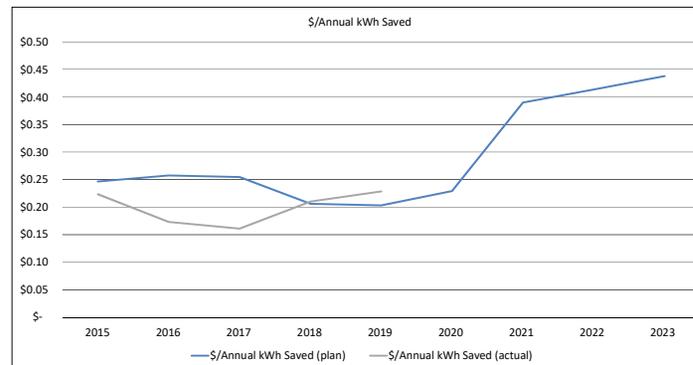


### Large Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 4,858,386.57	\$ 4,704,790.31	\$ 5,257,680.00	\$ 7,291,994.08	\$ 9,277,317.90	\$ 13,583,836.37	\$ 19,975,806.79	\$ 27,754,794.60	\$ 38,984,319.76
	Total Annual Electric Savings (kWh) (plan)	19,691,600.38	18,265,965.37	20,649,114.70	35,375,682.52	45,645,047.14	59,273,604.82	51,258,697.05	67,142,543.15	89,084,166.75
	\$/Annual kWh Saved (plan)	\$ 0.25	\$ 0.26	\$ 0.25	\$ 0.21	\$ 0.20	\$ 0.23	\$ 0.39	\$ 0.41	\$ 0.44
2)	Total Electric Budget	\$ 4,858,386.57	\$ 4,704,790.31	\$ 5,257,680.00	\$ 7,291,994.08	\$ 9,277,317.90	\$ 13,583,836.37	\$ 19,975,806.79	\$ 27,754,794.60	\$ 38,984,319.76
	Total kW saved	3,090.57	2,739.43	2,076.70	3,702.66	4,740.28	6,375.44	7,086.59	9,253.06	12,204.92
	\$/kW saved (plan)	\$ 1,572.00	\$ 1,717.44	\$ 2,531.75	\$ 1,969.39	\$ 1,957.13	\$ 2,130.65	\$ 2,818.82	\$ 2,999.52	\$ 3,194.15
3)	Total Electric Budget	\$ 4,858,386.57	\$ 4,704,790.31	\$ 5,257,680.00	\$ 7,291,994.08	\$ 9,277,317.90	\$ 13,583,836.37	\$ 19,975,806.79	\$ 27,754,794.60	\$ 38,984,319.76
	Total Fuel Neutral MMBtu Saved									
	\$/Total Fuel Neutral MMBtu Saved (plan)									

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 4,674,280.43	\$ 4,476,682.34	\$ 5,610,438.18	\$ 7,168,041.24	\$ 9,179,261.33
	Total Annual Electric Savings (kWh) (actu)	20,925,520.22	25,882,542.70	34,891,136.25	34,106,169.33	40,199,699.59
	\$/Annual kWh Saved (actual)	\$ 0.22	\$ 0.17	\$ 0.16	\$ 0.21	\$ 0.23
2)	Total Electric Spending	\$ 4,674,280.43	\$ 4,476,682.34	\$ 5,610,438.18	\$ 7,168,041.24	\$ 9,179,261.33
	Total kW saved	2,564.23	3,392.39	4,628.74	4,073.47	4,495.05
	\$/kW saved (actual)	\$ 1,822.88	\$ 1,319.62	\$ 1,212.09	\$ 1,759.69	\$ 2,042.08
3)	Total Electric Spending	\$ 4,674,280.43	\$ 4,476,682.34	\$ 5,610,438.18	\$ 7,168,041.24	\$ 9,179,261.33
	Total Fuel Neutral MMBtu Saved					
	\$/Total Fuel Neutral MMBtu Saved (actual)					

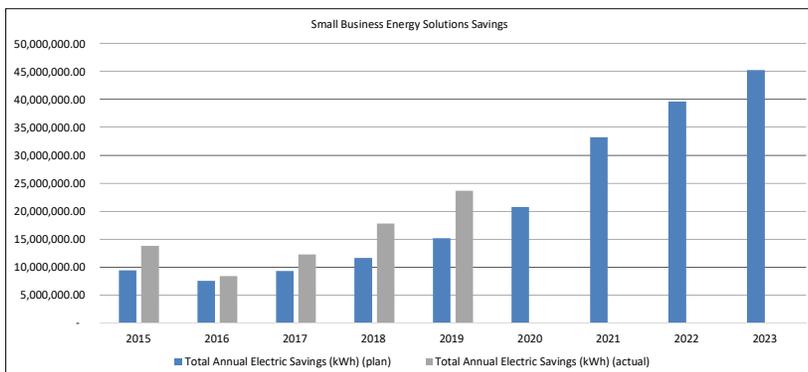
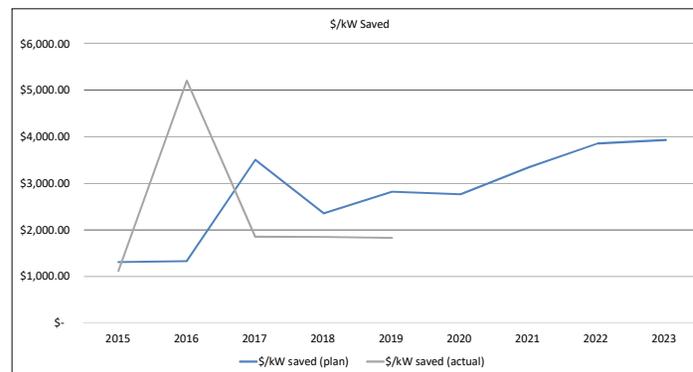
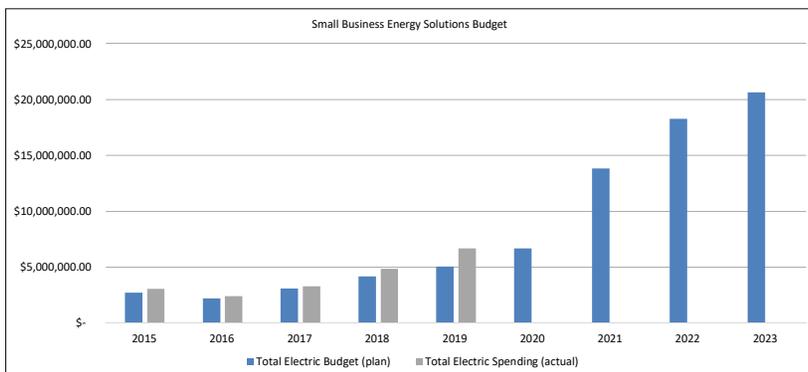
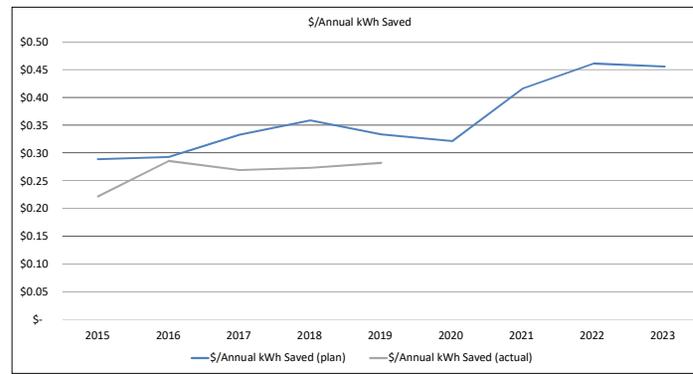


Small Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 2,729,372.64	\$ 2,205,961.93	\$ 3,104,617.49	\$ 4,184,601.47	\$ 5,056,170.81	\$ 6,678,372.17	\$ 13,821,124.31	\$ 18,268,025.52	\$ 20,619,441.47
	Total Annual Electric Savings (kWh) (plan)	9,447,957.26	7,535,748.40	9,330,764.44	11,667,553.31	15,162,512.29	20,790,420.72	33,212,673.22	39,636,798.75	45,259,167.99
	\$/Annual kWh Saved (plan)	\$ 0.29	\$ 0.29	\$ 0.33	\$ 0.36	\$ 0.33	\$ 0.32	\$ 0.42	\$ 0.46	\$ 0.46
2)	Total Electric Budget	\$ 2,729,372.64	\$ 2,205,961.93	\$ 3,104,617.49	\$ 4,184,601.47	\$ 5,056,170.81	\$ 6,678,372.17	\$ 13,821,124.31	\$ 18,268,025.52	\$ 20,619,441.47
	Total kW saved	2,082.66	1,659.37	885.51	1,774.87	1,791.78	2,414.33	4,131.10	4,738.41	5,247.37
	\$/kW saved (plan)	\$ 1,310.52	\$ 1,329.39	\$ 3,506.02	\$ 2,357.70	\$ 2,821.87	\$ 2,766.14	\$ 3,345.63	\$ 3,855.31	\$ 3,929.48
3)	Total Electric Budget	\$ 2,729,372.64	\$ 2,205,961.93	\$ 3,104,617.49	\$ 4,184,601.47	\$ 5,056,170.81	\$ 6,678,372.17	\$ 13,821,124.31	\$ 18,268,025.52	\$ 20,619,441.47
	Total Fuel Neutral MMBtu Saved							21.86	27.33	32.79
	\$/Total Fuel Neutral MMBtu Saved (plan)							\$ 632,247.43	\$ 668,536.77	\$ 628,824.33

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 3,059,995.12	\$ 2,401,441.56	\$ 3,301,924.13	\$ 4,863,267.41	\$ 6,674,555.27
	Total Annual Electric Savings (kWh) (actu)	13,805,821.64	8,410,520.19	12,254,082.00	17,810,515.28	23,655,091.03
	\$/Annual kWh Saved (actual)	\$ 0.22	\$ 0.29	\$ 0.27	\$ 0.27	\$ 0.28
2)	Total Electric Spending	\$ 3,059,995.12	\$ 2,401,441.56	\$ 3,301,924.13	\$ 4,863,267.41	\$ 6,674,555.27
	Total kW saved	2,731.04	461.50	1,781.57	2,629.00	3,653.67
	\$/kW saved (actual)	\$ 1,120.45	\$ 5,203.55	\$ 1,853.38	\$ 1,849.86	\$ 1,826.81
3)	Total Electric Spending	\$ 3,059,995.12	\$ 2,401,441.56	\$ 3,301,924.13	\$ 4,863,267.41	\$ 6,674,555.27
	Total Fuel Neutral MMBtu Saved					
	\$/Total Fuel Neutral MMBtu Saved (actual)					

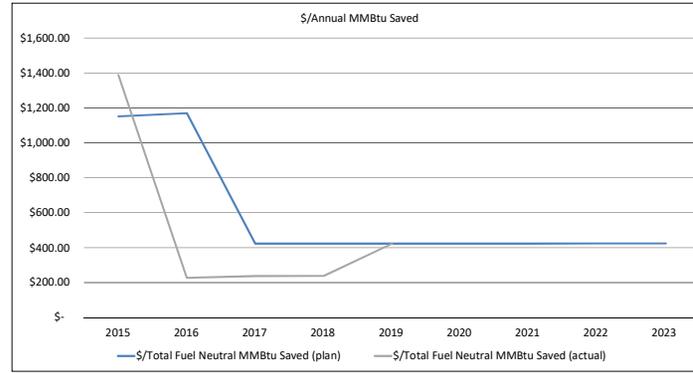
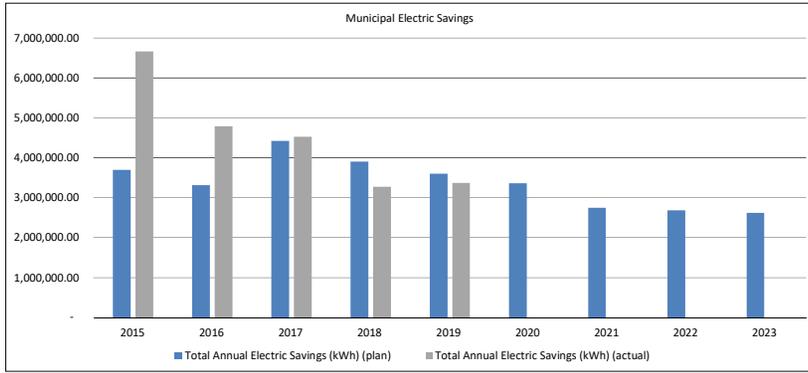
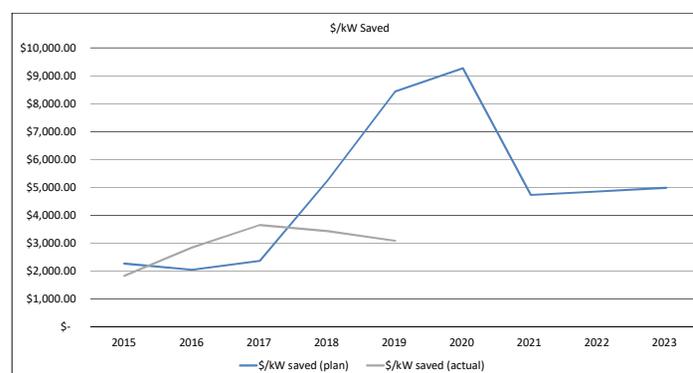
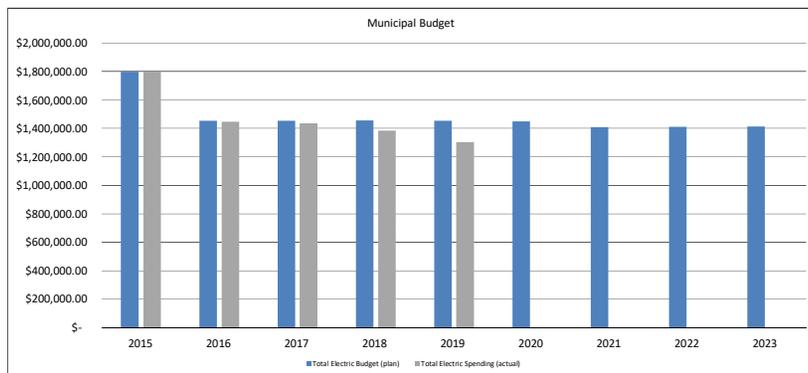
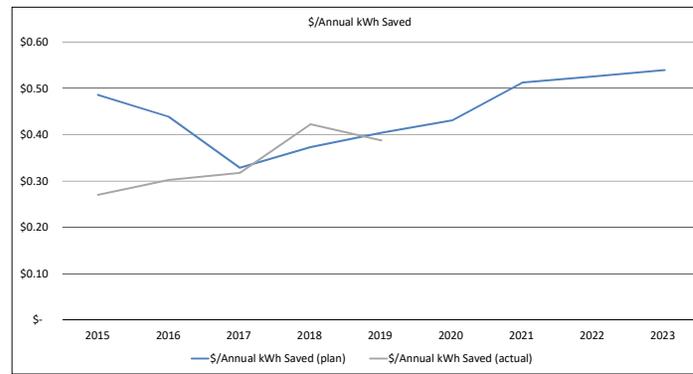


Municipal

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 1,797,393.00	\$ 1,453,463.00	\$ 1,452,442.83	\$ 1,456,555.00	\$ 1,453,178.57	\$ 1,447,984.57	\$ 1,409,955.83	\$ 1,411,687.20	\$ 1,414,153.04
	Total Annual Electric Savings (kWh) (plan)	3,698,108.00	3,312,917.02	4,419,676.13	3,905,245.08	3,599,497.95	3,364,139.17	2,750,000.00	2,685,500.00	2,622,935.00
	\$/Annual kWh Saved (plan)	\$ 0.49	\$ 0.44	\$ 0.33	\$ 0.37	\$ 0.40	\$ 0.43	\$ 0.51	\$ 0.53	\$ 0.54
2)	Total Electric Budget	\$ 1,797,393.00	\$ 1,453,463.00	\$ 1,452,442.83	\$ 1,456,555.00	\$ 1,453,178.57	\$ 1,447,984.57	\$ 1,409,955.83	\$ 1,411,687.20	\$ 1,414,153.04
	Total kW saved	791.05	709.12	614.36	277.96	172.13	156.23	297.91	290.64	283.59
	\$/kW saved (plan)	\$ 2,272.16	\$ 2,049.67	\$ 2,364.18	\$ 5,240.16	\$ 8,442.44	\$ 9,268.28	\$ 4,732.85	\$ 4,857.15	\$ 4,986.58
3)	Total Electric Budget	\$ 1,797,393.00	\$ 1,453,463.00	\$ 1,452,442.83	\$ 1,456,555.00	\$ 1,453,178.57	\$ 1,447,984.57	\$ 1,409,955.83	\$ 1,411,687.20	\$ 1,414,153.04
	Total Fuel Neutral MMBtu Saved	1,561.73	1,242.64	3,433.10	3,442.82	3,434.84	3,422.56	3,332.68	3,332.68	3,332.68
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 1,150.90	\$ 1,169.65	\$ 423.07	\$ 423.07	\$ 423.07	\$ 423.07	\$ 423.07	\$ 423.59	\$ 424.33

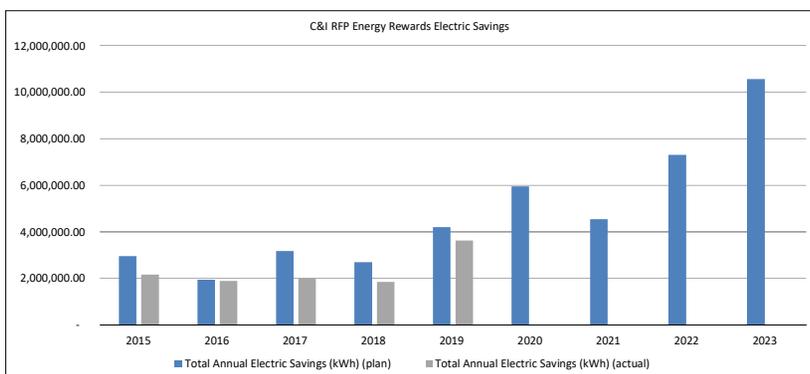
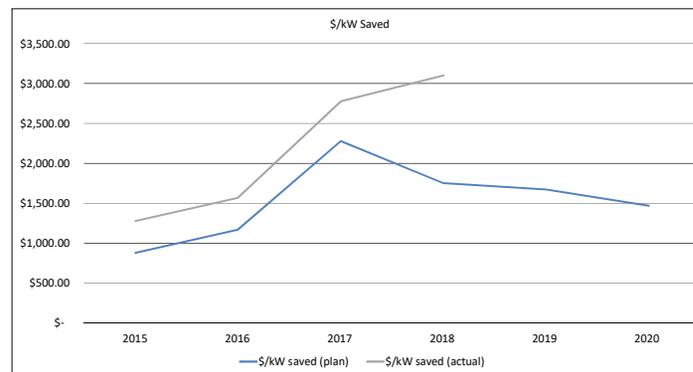
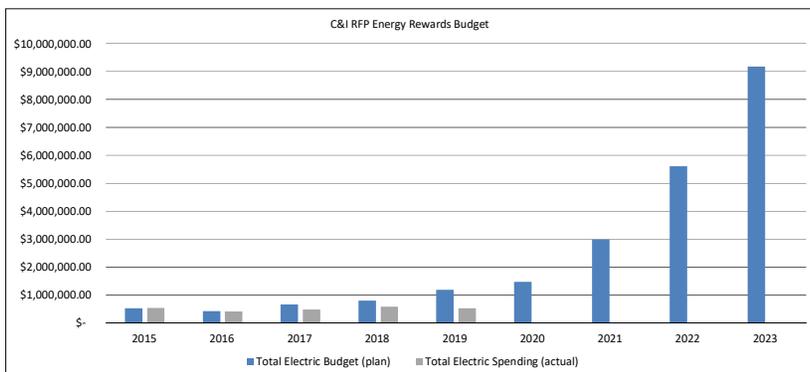
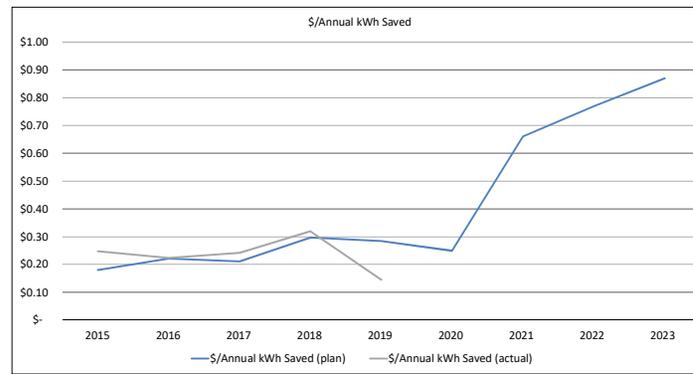
  

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 1,798,133.05	\$ 1,447,065.12	\$ 1,436,276.77	\$ 1,384,622.44	\$ 1,304,495.23
	Total Annual Electric Savings (kWh) (actu)	6,663,323.93	4,783,558.00	4,524,552.20	3,277,457.00	3,365,247.69
	\$/Annual kWh Saved (actual)	\$ 0.27	\$ 0.30	\$ 0.32	\$ 0.42	\$ 0.39
2)	Total Electric Spending	\$ 1,798,133.05	\$ 1,447,065.12	\$ 1,436,276.77	\$ 1,384,622.44	\$ 1,304,495.23
	Total kW saved	983.31	508.31	393.39	403.01	421.89
	\$/kW saved (actual)	\$ 1,828.66	\$ 2,846.84	\$ 3,651.03	\$ 3,435.72	\$ 3,092.01
3)	Total Electric Spending	\$ 1,798,133.05	\$ 1,447,065.12	\$ 1,436,276.77	\$ 1,384,622.44	\$ 1,304,495.23
	Total Fuel Neutral MMBtu Saved	1,296.50	6,349.80	6,050.72	5,803.47	3,083.40
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 1,386.91	\$ 227.89	\$ 237.37	\$ 238.59	\$ 423.07



**C&I RFP Energy Rewards Program**

<b>Planned</b>		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
1)	Total Electric Budget (plan)	\$ 532,143.26	\$ 431,354.63	\$ 668,686.55	\$ 801,059.90	\$ 1,195,560.67	\$ 1,482,952.11	\$ 2,997,161.04	\$ 5,611,934.43	\$ 9,172,068.33
	Total Annual Electric Savings (kWh) (plan)	2,955,930.84	1,948,183.50	3,171,974.18	2,693,943.49	4,205,420.01	5,948,560.33	4,540,000.00	7,300,000.00	10,560,000.00
	\$/Annual kWh Saved (plan)	\$ 0.18	\$ 0.22	\$ 0.21	\$ 0.30	\$ 0.28	\$ 0.25	\$ 0.66	\$ 0.77	\$ 0.87
2)	Total Electric Budget	\$ 532,143.26	\$ 431,354.63	\$ 668,686.55	\$ 801,059.90	\$ 1,195,560.67	\$ 1,482,952.11	\$ 2,997,161.04	\$ 5,611,934.43	\$ 9,172,068.33
	Total kW saved	606.12	367.83	293.53	457.56	714.28	1,010.34	424.20	656.50	923.80
	\$/kW saved (plan)	\$ 877.95	\$ 1,172.69	\$ 2,278.10	\$ 1,750.73	\$ 1,673.81	\$ 1,467.77	\$ 7,065.44	\$ 8,548.26	\$ 9,928.63
3)	Total Electric Budget	\$ 532,143.26	\$ 431,354.63	\$ 668,686.55	\$ 801,059.90	\$ 1,195,560.67	\$ 1,482,952.11	\$ 2,997,161.04	\$ 5,611,934.43	\$ 9,172,068.33
	Total Fuel Neutral MMBtu Saved									
	\$/Total Fuel Neutral MMBtu Saved (plan)									
<b>Actuals</b>		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>				
1)	Total Electric Spending (actual)	\$ 537,929.38	\$ 422,586.60	\$ 486,616.60	\$ 592,467.61	\$ 528,249.27				
	Total Annual Electric Savings (kWh) (actu)	2,169,714.00	1,888,877.00	2,011,970.00	1,854,063.00	3,625,832.00				
	\$/Annual kWh Saved (actual)	\$ 0.25	\$ 0.22	\$ 0.24	\$ 0.32	\$ 0.15				
2)	Total Electric Spending	\$ 537,929.38	\$ 422,586.60	\$ 486,616.60	\$ 592,467.61	\$ 528,249.27				
	Total kW saved	420.48	269.00	175.38	191.18	349.39				
	\$/kW saved (actual)	\$ 1,279.31	\$ 1,570.93	\$ 2,774.69	\$ 3,099.02	\$ 1,511.93				
3)	Total Electric Spending	\$ 537,929.38	\$ 422,586.60	\$ 486,616.60	\$ 592,467.61	\$ 528,249.27				
	Total Fuel Neutral MMBtu Saved									
	\$/Total Fuel Neutral MMBtu Saved (actual)									



Program Cost-Effectiveness - 2021 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.45	0.39	2.62	3,488.1	556.0	3,726.7	1,421.8	0.0	364.3	5,975.6	65.5	40.4	293	2,029.4	42,528.0
A1 - Energy Star Homes	6.19	0.50	7.70	1,674.6	134.2	2,337.7	270.4	33.2	112.0	2,600.4	24.3	1.6	60	1,885.6	47,096.2
A2 - Home Performance with Energy Star	1.82	0.33	2.16	834.1	150.8	1,176.2	457.2	86.3	77.0	1,209.5	14.0	16.8	50	1,349.4	26,957.5
A3 - Energy Star Products	1.55	1.39	2.62	1,465.1	1,319.2	2,517.0	948.1	12.1	1,716.4	12,445.0	312.3	240.5	28,290	119.1	1,667.3
A4 - Home Energy Reports	0.72	0.72	1.29	93.4	93.4	167.1	129.2	-	796.254	796.3	171.9	110.9	10,256	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	37.8	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	39.8	-	-	-	-	-	-	-	-
A6d - Res Energy Optimization	-	-	-	-	-	-	45.0	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.26</b>	<b>0.67</b>	<b>2.85</b>	<b>7,555.3</b>	<b>2,253.6</b>	<b>9,924.7</b>	<b>3,349.3</b>	<b>131.6</b>	<b>3,066.0</b>	<b>23,026.8</b>	<b>588.0</b>	<b>410.2</b>	<b>38,949</b>	<b>5,383.5</b>	<b>118,248.9</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	4.01	4.01	3.04	6,845.5	6,845.5	11,312.1	1,709.0	2,011.7	5,215.4	70,814.7	530.6	603.7	235	-	-
C2 - Small Business Energy Solutions	4.31	4.31	3.77	6,208.7	6,207.9	10,048.9	1,439.1	1,223.6	4,406.2	59,028.2	720.0	623.4	318	-	-
C3 - Municipal Energy Solutions	2.42	2.21	1.73	429.3	393.2	701.3	177.6	226.9	386.4	5,108.2	45.4	31.0	94	55.6	1,103.7
C5 - C&I Active Demand Response	2.67	2.67	2.94	726.2	726.2	798.8	271.6	-	-	-	-	-	34	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	50.2	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	33.0	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.86</b>	<b>3.85</b>	<b>3.20</b>	<b>14,209.7</b>	<b>14,172.8</b>	<b>22,861.1</b>	<b>3,680.4</b>	<b>3,462.1</b>	<b>10,008.0</b>	<b>134,951.1</b>	<b>1,296.0</b>	<b>1,258.1</b>	<b>681</b>	<b>55.6</b>	<b>1,103.7</b>
<b>Total</b>	<b>3.10</b>	<b>2.34</b>	<b>3.09</b>	<b>21,765.0</b>	<b>16,426.4</b>	<b>32,785.8</b>	<b>7,029.7</b>	<b>3,593.8</b>	<b>13,074.0</b>	<b>157,977.9</b>	<b>1,884.1</b>	<b>1,668.3</b>	<b>39,630</b>	<b>5,439.1</b>	<b>119,352.6</b>

Notes:  
 (1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.  
 (2) Utility and Customer Costs Expressed in 2021 Dollars

<b>Annual kWh Savings</b>	13,073,992	89.1%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	157,977,934	81.9%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>1,594,037</u>	<u>10.9%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>34,978,803</u>	<u>18.1%</u>	
	<b>14,668,030</b>	100.0%			<b>192,956,737</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.45%
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<b>Spending per Customer</b>	Low-Income	\$ 1,156.86
	Residential	\$ 50.15
	C&I	\$ 441.40

Program Cost-Effectiveness - 2022 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.53	0.40	2.70	4,015.4	642.8	4,286.8	1,589.8	0.0	410.7	6,737.4	73.9	45.6	331	2,315.7	48,638.8
A1 - Energy Star Homes	6.61	0.53	8.21	2,021.2	160.8	2,817.7	305.7	37.5	130.7	3,033.8	28.4	1.8	70	2,199.9	54,945.2
A2 - Home Performance with Energy Star	1.91	0.35	2.27	1,180.2	215.8	1,662.5	617.4	115.9	106.6	1,672.8	19.2	23.6	69	1,824.1	36,559.3
A3 - Energy Star Products	1.76	1.58	2.83	1,510.5	1,361.3	2,590.4	859.3	57.1	1,341.8	12,769.8	225.9	183.7	18,758	119.1	1,667.2
A4 - Home Energy Reports	1.05	1.05	1.90	133.0	133.0	239.5	126.1	-	1,153	1,152.7	248.8	160.5	10,256	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	38.7	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	45.4	-	-	-	-	-	-	-	-
A6d - Res Energy Optimization	-	-	-	-	-	-	43.6	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.44</b>	<b>0.69</b>	<b>3.02</b>	<b>8,860.3</b>	<b>2,513.6</b>	<b>11,596.9</b>	<b>3,626.0</b>	<b>210.5</b>	<b>3,142.5</b>	<b>25,366.6</b>	<b>596.2</b>	<b>415.3</b>	<b>29,484</b>	<b>6,458.7</b>	<b>141,810.5</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.67	3.67	2.74	7,514.8	7,514.8	12,289.0	2,047.9	2,432.8	6,035.9	81,531.3	601.6	703.0	276	-	-
C2 - Small Business Energy Solutions	3.42	3.42	3.00	5,572.8	5,571.6	9,130.1	1,630.0	1,410.9	4,927.5	65,617.5	694.5	521.4	380	-	-
C3 - Municipal Energy Solutions	2.52	2.30	1.81	433.4	396.0	705.4	172.0	216.9	382.0	5,049.3	44.8	30.3	93	55.6	1,103.7
C5 - C&I Active Demand Response	2.95	2.95	3.25	1,112.2	1,112.2	1,223.5	376.9	-	-	-	-	-	51	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	51.3	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	44.7	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.39</b>	<b>3.38</b>	<b>2.78</b>	<b>14,633.3</b>	<b>14,594.7</b>	<b>23,348.0</b>	<b>4,322.9</b>	<b>4,060.6</b>	<b>11,345.4</b>	<b>152,198.0</b>	<b>1,340.9</b>	<b>1,254.6</b>	<b>800</b>	<b>55.6</b>	<b>1,103.7</b>
<b>Total</b>	<b>2.96</b>	<b>2.15</b>	<b>2.86</b>	<b>23,493.6</b>	<b>17,108.3</b>	<b>34,944.9</b>	<b>7,948.9</b>	<b>4,271.1</b>	<b>14,487.9</b>	<b>177,564.6</b>	<b>1,937.2</b>	<b>1,669.9</b>	<b>30,284</b>	<b>6,514.3</b>	<b>142,914.2</b>

Notes:

- (1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.
- (2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	14,487,921	88.4%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	177,564,593	80.9%	<b>kWh &gt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	<u>1,909,154</u>	<u>11.6%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>41,884,008</u>	<u>19.1%</u>	
		<b>16,397,075</b>	100.0%			<b>219,448,602</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	1.61%				<b>Spending per Customer</b>	Low-Income	\$	1,293.55
						Residential	\$	52.97
						C&I	\$	518.46

Program Cost-Effectiveness - 2023 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.73	0.44	2.92	4,855.7	789.9	5,182.7	1,776.8	0.0	492.1	8,052.5	88.5	54.6	396	2,725.4	57,000.0
A1 - Energy Star Homes	7.56	0.63	9.31	2,396.1	201.2	3,339.1	317.1	41.5	153.9	3,551.3	33.2	3.3	80	2,514.1	62,794.4
A2 - Home Performance with Energy Star	2.31	0.41	2.68	1,574.7	280.7	2,212.0	681.2	143.6	136.2	2,100.1	24.5	30.3	88	2,370.8	47,275.0
A3 - Energy Star Products	2.14	1.94	3.01	1,634.0	1,479.7	2,793.5	764.6	164.8	1,147.0	13,596.4	177.7	155.5	18,758	120.4	1,686.1
A4 - Home Energy Reports	1.83	1.83	3.30	225.6	225.6	405.6	123.0	-	1,914.0	1,914.0	413.2	266.5	10,256	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	39.9	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	54.4	-	-	-	-	-	-	-	-
A6d - Res Energy Optimization	-	-	-	-	-	-	42.2	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.81</b>	<b>0.78</b>	<b>3.36</b>	<b>10,686.1</b>	<b>2,977.1</b>	<b>13,932.9</b>	<b>3,799.3</b>	<b>350.0</b>	<b>3,843.3</b>	<b>29,214.4</b>	<b>737.1</b>	<b>510.2</b>	<b>29,579</b>	<b>7,730.8</b>	<b>168,755.6</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.78	3.78	2.81	8,944.6	8,944.6	14,562.2	2,366.3	2,813.7	6,939.2	93,277.7	676.4	817.6	276	-	-
C2 - Small Business Energy Solutions	3.42	3.42	3.04	6,461.3	6,459.8	10,507.8	1,890.1	1,569.4	5,460.4	72,483.1	767.0	600.4	380	-	-
C3 - Municipal Energy Solutions	2.67	2.44	1.91	444.8	406.1	720.0	166.6	209.5	380.7	5,031.1	44.7	30.1	93	55.6	1,103.7
C5 - C&I Active Demand Response	3.09	3.09	3.39	1,699.8	1,699.8	1,869.8	550.8	-	-	-	-	-	77	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	52.9	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	58.2	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.45</b>	<b>3.44</b>	<b>2.86</b>	<b>17,550.5</b>	<b>17,510.3</b>	<b>27,659.8</b>	<b>5,084.9</b>	<b>4,592.7</b>	<b>12,780.3</b>	<b>170,791.9</b>	<b>1,488.1</b>	<b>1,448.0</b>	<b>825</b>	<b>55.6</b>	<b>1,103.7</b>
<b>Total</b>	<b>3.18</b>	<b>2.31</b>	<b>3.01</b>	<b>28,236.6</b>	<b>20,487.4</b>	<b>41,592.7</b>	<b>8,884.2</b>	<b>4,942.7</b>	<b>16,623.6</b>	<b>200,006.3</b>	<b>2,225.2</b>	<b>1,958.3</b>	<b>30,404</b>	<b>7,786.4</b>	<b>169,859.3</b>

Notes:  
(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.  
(2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	16,623,566	87.9%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	200,006,278	80.1%	<b>kWh &gt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	2,281,965	12.1%		<b>Lifetime MMBTU Savings (in kWh)</b>	49,780,845	19.9%	
		<b>18,905,531</b>	100.0%			<b>249,787,123</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	1.85%			<b>Spending per Customer</b>	Low-Income	\$ 1,445.76		
					Residential	\$ 52.62		
					C&I	\$ 609.85		

Program Cost-Effectiveness - 2021-2023 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.58	0.42	2.76	12,359.3	1,988.6	13,196.3	4,788.4	0.1	1,267.2	20,765.6	227.9	140.7	1,020	7,070.5	148,166.8
A1 - Energy Star Homes	6.82	0.56	8.45	6,091.9	496.1	8,494.5	893.1	112.1	396.6	9,185.5	85.9	6.7	210	6,599.6	164,835.8
A2 - Home Performance with Energy Star	2.04	0.37	2.40	3,589.0	647.2	5,050.6	1,755.8	345.8	319.8	4,982.5	57.7	70.7	207	5,544.2	110,791.8
A3 - Energy Star Products	1.79	1.62	2.82	4,609.6	4,160.3	7,900.9	2,572.0	234.0	4,205.3	38,811.3	715.9	579.7	65,807	358.6	5,020.6
A4 - Home Energy Reports	1.19	1.19	2.15	452.0	452.0	812.2	378.3	-	3,862.9	3,862.9	833.9	537.9	30,768	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	116.5	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	139.7	-	-	-	-	-	-	-	-
A6d - Res Energy Optimization	-	-	-	-	-	-	130.8	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.52</b>	<b>0.72</b>	<b>3.09</b>	<b>27,101.8</b>	<b>7,744.3</b>	<b>35,454.5</b>	<b>10,774.6</b>	<b>692.1</b>	<b>10,051.7</b>	<b>77,607.8</b>	<b>1,921.4</b>	<b>1,335.7</b>	<b>98,012</b>	<b>19,573.0</b>	<b>428,815.0</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	3.81	3.81	2.85	23,304.9	23,304.9	38,163.3	6,123.2	7,258.2	18,190.5	245,623.6	1,808.7	2,124.3	788	-	-
C2 - Small Business Energy Solutions	3.68	3.68	3.24	18,242.8	18,239.4	29,686.8	4,959.2	4,203.9	14,794.1	197,128.8	2,181.5	1,745.1	1,077	-	-
C3 - Municipal Energy Solutions	2.53	2.32	1.82	1,307.5	1,195.3	2,126.7	516.2	653.3	1,149.1	15,188.6	134.9	91.3	279	166.8	3,311.1
C5 - C&I Active Demand Response	2.95	2.95	3.25	3,538.2	3,538.2	3,892.0	1,199.3	-	-	-	-	-	162	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	154.4	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	135.9	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.54</b>	<b>3.54</b>	<b>2.93</b>	<b>46,393.4</b>	<b>46,277.8</b>	<b>73,868.9</b>	<b>13,088.2</b>	<b>12,115.4</b>	<b>34,133.8</b>	<b>457,941.0</b>	<b>4,125.0</b>	<b>3,960.8</b>	<b>2,306</b>	<b>166.8</b>	<b>3,311.1</b>
<b>Total</b>	<b>3.08</b>	<b>2.26</b>	<b>2.98</b>	<b>73,495.2</b>	<b>54,022.1</b>	<b>109,323.4</b>	<b>23,862.8</b>	<b>12,807.5</b>	<b>44,185.5</b>	<b>535,548.8</b>	<b>6,046.4</b>	<b>5,296.5</b>	<b>100,318</b>	<b>19,739.8</b>	<b>432,126.1</b>

Notes:  
 (1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.  
 (2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	44,185,479	88.4%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	535,548,805	80.9%	<b>kWh &gt; 55%</b>		
	<b>Annual MMBTU Savings (in kWh)</b>	5,785,156	11.6%		<b>Lifetime MMBTU Savings (in kWh)</b>	126,643,657	19.1%			
		<b>49,970,636</b>	100.0%			<b>662,192,462</b>	100.0%			
<b>Cumulative Savings as a % of 2019 Sales</b>	4.91%									
	<b>Spending per Customer</b>	Low-Income	\$	3,896.17	Residential	\$	155.74	C&I	\$	1,569.70

Present Value Benefits - 2021 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)											Non-Resource Benefits (\$000)			Environmental Benefits (\$000)			
				CAPACITY					Electric				Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits		Total Non-Resource Benefits		
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak	Summer Peak	Summer Off Peak	Electric DRIPE	Total Electric Benefit						Other Fuels	Water Benefit
<b>Residential Programs</b>																					
B1 - Home Energy Assistance	\$ 3,488	\$ 556	\$ 3,727	\$ 47	\$ -	\$ 51	\$ 44	\$ -	\$ 151	\$ 167	\$ 40	\$ 36	\$ 21	\$ 556	\$ 1,117	\$ 11	\$ 1,684	\$ 73	\$ 1,730	\$ 1,804	\$ 239
A1 - Energy Star Homes	\$ 1,675	\$ 134	\$ 2,338	\$ 1	\$ -	\$ 1	\$ 1	\$ -	\$ 58	\$ 67	\$ 1	\$ 1	\$ 5	\$ 134	\$ 1,456	\$ 4	\$ 1,594	\$ 80	\$ 592	\$ 673	\$ 71
A2 - Home Performance with Energy Star	\$ 834	\$ 151	\$ 1,176	\$ 23	\$ -	\$ 24	\$ 21	\$ -	\$ 25	\$ 27	\$ 16	\$ 12	\$ 4	\$ 151	\$ 640	\$ 1	\$ 792	\$ 42	\$ 295	\$ 337	\$ 48
A3 - Energy Star Products	\$ 1,465	\$ 1,319	\$ 2,517	\$ 128	\$ -	\$ 154	\$ 134	\$ -	\$ 309	\$ 296	\$ 126	\$ 100	\$ 71	\$ 1,319	\$ 30	\$ 113	\$ 1,463	\$ 2	\$ 503	\$ 505	\$ 549
A4 - Home Energy Reports	\$ 93	\$ 93	\$ 167	\$ 7	\$ -	\$ 11	\$ 9	\$ -	\$ 22	\$ 18	\$ 10	\$ 7	\$ 8	\$ 93	\$ -	\$ -	\$ 93	\$ -	\$ 35	\$ 35	\$ 39
A6b - Res ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A6c - Res Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A6d - Res Energy Optimization	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Residential	\$ 7,555	\$ 2,254	\$ 9,925	\$ 206	\$ -	\$ 241	\$ 209	\$ -	\$ 565	\$ 575	\$ 192	\$ 156	\$ 110	\$ 2,254	\$ 3,244	\$ 129	\$ 5,627	\$ 198	\$ 3,154	\$ 3,353	\$ 945
<b>Commercial/Industrial Programs</b>																					
C1 - Large Business Energy Solutions	\$ 6,846	\$ 6,846	\$ 11,312	\$ 651	\$ -	\$ 723	\$ 626	\$ -	\$ 1,669	\$ 891	\$ 1,322	\$ 656	\$ 308	\$ 6,846	\$ -	\$ -	\$ 6,846	\$ -	\$ 1,459	\$ 1,459	\$ 3,008
C2 - Small Business Energy Solutions	\$ 6,209	\$ 6,208	\$ 10,049	\$ 697	\$ -	\$ 770	\$ 667	\$ -	\$ 1,491	\$ 868	\$ 884	\$ 569	\$ 261	\$ 6,208	\$ -	\$ 1	\$ 6,209	\$ -	\$ 1,323	\$ 1,323	\$ 2,518
C3 - Municipal Energy Solutions	\$ 429	\$ 393	\$ 701	\$ 34	\$ -	\$ 38	\$ 33	\$ -	\$ 82	\$ 65	\$ 73	\$ 49	\$ 19	\$ 393	\$ 34	\$ -	\$ 428	\$ 2	\$ 91	\$ 93	\$ 181
C5 - C&I Active Demand Response	\$ 726	\$ 726	\$ 799	\$ 36	\$ -	\$ 329	\$ 285	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 76	\$ 726	\$ -	\$ -	\$ 726	\$ -	\$ 72.62	\$ 73	\$ -
C6b - C&I ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C5c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Commercial & Industrial	\$ 14,210	\$ 14,173	\$ 22,861	\$ 1,418	\$ -	\$ 1,860	\$ 1,611	\$ -	\$ 3,242	\$ 1,824	\$ 2,280	\$ 1,274	\$ 664	\$ 14,173	\$ 34	\$ 1	\$ 14,208	\$ 2	\$ 2,945	\$ 2,947	\$ 5,706
<b>Total</b>	\$ 21,765	\$ 16,426	\$ 32,786	\$ 1,624	\$ -	\$ 2,101	\$ 1,820	\$ -	\$ 3,807	\$ 2,399	\$ 2,472	\$ 1,430	\$ 773	\$ 16,426	\$ 3,278	\$ 130	\$ 19,835	\$ 200	\$ 6,099	\$ 6,299	\$ 6,652







Portfolio Planned Versus Actual Performance - 2021										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	157,977,934	102,685,657		-	1.925%	-	\$ 135,322	\$ 169,152	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	13,073,992	8,498,095		-	0.550%	-	\$ 38,663	\$ 48,329	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	1,668	1,084		-	0.495%	-	\$ 34,797	\$ 43,496	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	1,884	1,225		-	0.330%	-	\$ 23,198	\$ 28,998	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	3,343	2,173		-	0.275%	-	\$ 19,332	\$ 24,165	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 19,834,863			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 7,029,699			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 12,805,164	\$ 8,323,356	\$ -	-	1.925%	-	\$ 135,322	\$ 169,152	\$ -	Line 5 minus line 6
9 Total				-	5.500%	-	\$ 386,633	\$ 483,292	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 21,765,021		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 386,633	\$ -	from row 9 above
12 Total Utility Costs	\$ 7,029,699	\$ -	from row 7 above
13 Portfolio GST BCR	2.93	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Portfolio Planned Versus Actual Performance - 2022										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	177,564,593	115,416,986		-	1.925%	-	\$ 153,016	\$ 191,270	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	14,487,921	9,417,149		-	0.550%	-	\$ 43,719	\$ 54,648	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	1,670	1,085		-	0.495%	-	\$ 39,347	\$ 49,184	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	1,937	1,259		-	0.330%	-	\$ 26,231	\$ 32,789	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	5,015	3,260		-	0.275%	-	\$ 21,859	\$ 27,324	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 21,284,994			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 7,948,863			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 13,336,131	\$ 8,668,485	\$ -	-	1.925%	-	\$ 153,016	\$ 191,270	\$ -	Line 5 minus line 6
9 Total				-	5.500%	-	\$ 437,187	\$ 546,484	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 23,493,569		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 437,187	\$ -	from row 9 above
12 Total Utility Costs	\$ 7,948,863	\$ -	from row 7 above
13 Portfolio GST BCR	2.80	-	row 10 divided by rows 11+12

Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2022\$) is \$451,396.06.

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Portfolio Planned Versus Actual Performance - 2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	200,006,278	130,004,080		-	1.925%	-	\$ 171,021	\$ 213,776	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	16,623,566	10,805,318		-	0.550%	-	\$ 48,863	\$ 61,079	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	1,958	1,273		-	0.495%	-	\$ 43,977	\$ 54,971	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	2,225	1,446		-	0.330%	-	\$ 29,318	\$ 36,647	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	7,522	4,889		-	0.275%	-	\$ 24,432	\$ 30,539	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 25,567,590			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 8,884,197			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 16,683,393	\$ 10,844,206	\$ -	-	1.925%	-	\$ 171,021	\$ 213,776	\$ -	Line 5 minus line 6
9 Total				-	5.500%	-	\$ 488,631	\$ 610,789	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 28,236,605		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 488,631	\$ -	from row 9 above
12 Total Utility Costs	\$ 8,884,197	\$ -	from row 7 above
13 Portfolio GST BCR	3.01	-	row 10 divided by rows 11+12

Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2023\$) is \$520,907.96.

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Portfolio Planned Versus Actual Performance - 2021-2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	535,548,805	348,106,723		-	1.925%	-	\$ 459,358	\$ 574,198	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	44,185,479	28,720,562		-	0.550%	-	\$ 131,245	\$ 164,056	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	5,296	3,443		-	0.495%	-	\$ 118,121	\$ 147,651	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	6,046	3,930		-	0.330%	-	\$ 78,747	\$ 98,434	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	15,880	10,322		-	0.275%	-	\$ 65,623	\$ 82,028	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 66,687,447			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 23,862,759			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 42,824,688	\$ 27,836,047	\$ -	-	1.925%	-	\$ 459,358	\$ 574,198	\$ -	Line 5 minus line 6
9 Total				-	5.500%	-	\$ 1,312,452	\$ 1,640,565	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 73,495,195		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 1,312,452	\$ -	from row 9 above
12 Total Utility Costs	\$ 23,862,759	\$ -	from row 7 above
13 Portfolio GST BCR	2.92	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars. Three-year nominal PI is \$1,358,937.48.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

ADR Program Cost-Effectiveness

2021									
	Benefit/Cost	Benefit (\$000)	Utility Costs (\$000 - 2021\$) <sup>1</sup>	Customer Costs (\$000 - 2021\$) <sup>1</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served
	Ratio Granite State Test								
<b>Residential Programs</b>									
A5 - Residential Active Demand Response	0.00	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>0.00</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Commercial, Industrial &amp; Municipal</b>									
C5 - C&I Active Demand Response	2.67	726.2	271.6	-	-	-	-	3,343.2	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.67</b>	<b>726.2</b>	<b>271.6</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3,343.2</b>	<b>-</b>
<b>Total</b>	<b>2.67</b>	<b>726.2</b>	<b>271.6</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3,343.2</b>	<b>-</b>

(1) Utility and Customer Costs in 2021 Dollars

2022									
	Benefit/Cost	Benefit (\$000)	Utility Costs (\$000 - 2021\$) <sup>1</sup>	Customer Costs (\$000 - 2021\$) <sup>1</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served
	Ratio Granite State Test								
<b>Residential Programs</b>									
A5 - Residential Active Demand Response	0.00	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>0.00</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Commercial, Industrial &amp; Municipal</b>									
C5 - C&I Active Demand Response	2.95	1,112.2	376.9	-	-	-	-	5,014.8	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.95</b>	<b>1,112.2</b>	<b>376.9</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5,014.8</b>	<b>-</b>
<b>Total</b>	<b>2.95</b>	<b>1,112.2</b>	<b>376.9</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5,014.8</b>	<b>-</b>

(1) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs tab.

2023									
	Benefit/Cost	Benefit (\$000)	Utility Costs (\$000 - 2021\$) <sup>1</sup>	Customer Costs (\$000 - 2021\$) <sup>1</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served
	Ratio Granite State Test								
<b>Residential Programs</b>									
A5 - Residential Active Demand Response	0.00	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>0.00</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Commercial, Industrial &amp; Municipal</b>									
C5 - C&I Active Demand Response	3.09	1,699.8	550.8	-	-	-	-	7,522.2	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.09</b>	<b>1,699.8</b>	<b>550.8</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7,522.2</b>	<b>-</b>
<b>Total</b>	<b>3.09</b>	<b>1,699.8</b>	<b>550.8</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7,522.2</b>	<b>-</b>

(1) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs tab.

Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU								
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023									
B1a - HEA (Weatherization)	Air Sealing, Cord Wood	E21B1a001	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
B1a - HEA (Weatherization)	Air Sealing, Electric	E21B1a002	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
B1a - HEA (Weatherization)	Air Sealing, Gas	E21B1a003	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
B1a - HEA (Weatherization)	Air Sealing, Kerosene	E21B1a004	2	2	2	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	0.7	0.8	0.9	10.4	11.7	14.0	-	-	-	-	-	-	13.5	15.2	18.3	202.8	228.6	274.0					
B1a - HEA (Weatherization)	Air Sealing, Oil	E21B1a005	6	7	8	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	0.4	0.5	0.6	6.7	7.6	9.1	-	-	-	-	-	-	-	-	28.4	32.0	38.4	426.3	480.4	575.8			
B1a - HEA (Weatherization)	Air Sealing, Propane	E21B1a006	3	3	4	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	0.7	0.7	0.9	9.8	11.0	13.2	-	-	-	-	-	-	-	-	22.3	25.1	30.1	334.7	377.2	452.2			
B1a - HEA (Weatherization)	Air Sealing, Wood Pellets	E21B1a007	2	2	2	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	2.4	2.7	3.3	36.4	41.1	49.2	-	-	-	-	-	-	-	-	10.5	11.9	14.2	158.1	178.2	213.6			
B1a - HEA (Weatherization)	Faucet Aerator, Cord Wood	E21B1a008	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
B1a - HEA (Weatherization)	Faucet Aerator, Electric	E21B1a009	80	90	108	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	3.4	3.8	4.6	23.8	26.9	32.2	0.7	0.8	0.9	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-		
B1a - HEA (Weatherization)	Faucet Aerator, Gas	E21B1a010	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
B1a - HEA (Weatherization)	Faucet Aerator, Kerosene	E21B1a011	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Faucet Aerator, Oil	E21B1a012	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Faucet Aerator, Propane	E21B1a013	17	19	23	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2	3.6	4.4	22.6	25.5	30.6		
B1a - HEA (Weatherization)	Faucet Aerator, Wood Pellets	E21B1a014	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Hand Held Showerhead, Cord Wood	E21B1a015	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Hand Held Showerhead, Electric	E21B1a016	35	40	48	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	4.7	5.3	6.3	32.7	36.9	44.2	0.9	1.0	1.2	0.4	0.4	0.5	-	-	-	-	-	-	-	-	-	-	
B1a - HEA (Weatherization)	Hand Held Showerhead, Gas	E21B1a017	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Hand Held Showerhead, Kerosene	E21B1a018	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Hand Held Showerhead, Oil	E21B1a019	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Hand Held Showerhead, Propane	E21B1a020	8	9	10	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.9	11.1	13.3	69.1	77.9	93.3	
B1a - HEA (Weatherization)	Hand Held Showerhead, Wood Pellets	E21B1a021	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Insulation, Cord Wood	E21B1a022	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Insulation, Electric	E21B1a023	171	192	230	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	116.8	131.6	157.7	2,918.9	3,289.3	3,942.9	37.1	41.8	50.1	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1a - HEA (Weatherization)	Insulation, Gas	E21B1a024	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Insulation, Kerosene	E21B1a025	12	14	17	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	2.2	2.5	3.0	56.2	63.4	76.0	-	-	-	1.2	1.4	1.7	273.8	308.6	369.9	6,846.2	7,715.0	9,247.8	-	-	-		
B1a - HEA (Weatherization)	Insulation, Oil	E21B1a026	66	74	89	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	6.5	7.4	8.8	163.6	184.3	220.9	-	-	-	3.6	4.1	4.9	252.5	284.5	341.1	6,312.5	7,113.6	8,526.9	-	-	-		
B1a - HEA (Weatherization)	Insulation, Propane	E21B1a027	43	48	58	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	2.2	2.5	3.0	55.0	62.0	74.3	-	-	-	1.2	1.4	1.6	343.2	386.8	463.6	8,580.7	9,669.6	11,590.8	-	-	-		
B1a - HEA (Weatherization)	Insulation, Wood Pellets	E21B1a028	2	2	2	25	25	25	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	3.0	3.4	4.0	74.4	83.8	100.5	-	-	-	1.6	1.8	2.2	12.6	14.3	17.1	316.2	356.3	427.1	-	-	-		
B1a - HEA (Weatherization)	Low Flow Showerhead, Cord Wood	E21B1a029	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Low Flow Showerhead, Electric	E21B1a030	6	7	8	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	0.8	0.9	1.1	5.7	6.4	7.7	0.2	0.2	0.2	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	
B1a - HEA (Weatherization)	Low Flow Showerhead, Gas	E21B1a031	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Low Flow Showerhead, Kerosene	E21B1a032	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Low Flow Showerhead, Oil	E21B1a033	6	7	8	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
B1a - HEA (Weatherization)	Low Flow Showerhead, Propane	E21B1a034	78	88	106	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64.2	72.3	86.7	449.3	506.3	606.9
B1a - HEA (Weatherization)	Low Flow Showerhead, Wood Pellets	E21B1a035	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Cord Wood	E21B1a036	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Electric	E21B1a037	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	91%	91%	91%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Gas	E21B1a038	-	-	-	15	15	15	100%	100%																															

Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU					
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023						
B1b - HEA (HVAC System)	Wifi Thermostat, Oil	E21B1b018	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	91%	91%	91%																					
B1b - HEA (HVAC System)	Wifi Thermostat, Propane	E21B1b019	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	91%	91%	91%																					
B1b - HEA (HVAC System)	Wifi Thermostat, Wood Pellets	E21B1b020	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	91%	91%	91%																					
B1b - HEA (HVAC System)	Mini Split HP (cooling)	E21B1b021	-	-	-	18	18	18	100%	100%	100%	100%	100%	100%	91%	91%	91%																					
B1b - HEA (HVAC System)	Mini Split HP (heating)	E21B1b022	-	-	-	18	18	18	100%	100%	100%	100%	100%	100%	91%	91%	91%																					
<b>Home Energy Assistance Subtotal</b>																		<b>364.3</b>	<b>410.7</b>	<b>492.1</b>	<b>5,975.6</b>	<b>6,737.4</b>	<b>8,052.5</b>	<b>65.5</b>	<b>73.9</b>	<b>88.5</b>	<b>40.4</b>	<b>45.6</b>	<b>54.6</b>	<b>2,029.4</b>	<b>2,315.7</b>	<b>2,725.4</b>	<b>42,528.0</b>	<b>48,638.8</b>	<b>57,000.0</b>			



Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU			
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	
A2a - HPwES (Weatheriza)	Air Sealing, Cord Wood	E21A2a001	3	5	6	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	4.1	6.2	7.8	62.1	92.4	117.7	-	-	-	2.3	3.4	4.3	22.7	33.8	43.1	340.9	507.0	646.0	
A2a - HPwES (Weatheriza)	Air Sealing, Electric	E21A2a002	6	8	10	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	7.8	10.9	13.9	117.4	163.3	208.1	2.5	3.5	4.4	-	-	-	-	-	-	-	-		
A2a - HPwES (Weatheriza)	Air Sealing, Gas	E21A2a003	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A2a - HPwES (Weatheriza)	Air Sealing, Kerosene	E21A2a004	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A2a - HPwES (Weatheriza)	Air Sealing, Oil	E21A2a005	18	24	31	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	2.8	3.7	4.8	41.6	56.1	71.5	-	-	-	1.5	2.1	2.6	228.3	308.3	392.8	3,425.2	4,624.8	5,891.9	
A2a - HPwES (Weatheriza)	Air Sealing, Propane	E21A2a006	8	11	15	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	2.0	2.7	3.5	30.2	40.9	52.1	-	-	-	1.1	1.5	1.9	83.3	112.9	143.9	1,250.2	1,694.0	2,158.1	
A2a - HPwES (Weatheriza)	Air Sealing, Wood Pellets	E21A2a007	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A2a - HPwES (Weatheriza)	Faucet Aerator, Cord Wood	E21A2a008	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A2a - HPwES (Weatheriza)	Faucet Aerator, Electric	E21A2a009	2	2	3	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	0.1	0.1	0.1	0.5	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Faucet Aerator, Gas	E21A2a010	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Faucet Aerator, Kerosene	E21A2a011	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Faucet Aerator, Oil	E21A2a012	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Faucet Aerator, Propane	E21A2a013	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Faucet Aerator, Wood Pellets	E21A2a014	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Cord Wood	E21A2a015	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Electric	E21A2a016	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Gas	E21A2a017	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Kerosene	E21A2a018	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Oil	E21A2a019	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Propane	E21A2a020	0	1	1	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Hand Held Showerhead, Wood Pellets	E21A2a021	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Insulation, Cord Wood	E21A2a022	3	5	6	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	0.9	1.2	1.5	21.8	30.0	38.2	-	-	-	0.5	0.7	0.8	49.7	68.5	87.3	1,243.6	1,712.8	2,182.1	
A2a - HPwES (Weatheriza)	Insulation, Electric	E21A2a023	4	6	8	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	21.1	29.1	37.0	527.4	726.5	925.4	6.7	9.2	11.8	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatheriza)	Insulation, Gas	E21A2a024	-	-	-	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Insulation, Kerosene	E21A2a025	-	-	-	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Insulation, Oil	E21A2a026	34	47	59	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	8.6	11.8	15.1	214.6	295.6	376.6	-	-	-	4.7	6.5	8.3	471.7	649.7	827.6	11,791.7	16,241.5	20,691.2	
A2a - HPwES (Weatheriza)	Insulation, Propane	E21A2a027	8	11	15	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	2.1	2.9	3.7	52.9	72.8	92.8	-	-	-	1.2	1.6	2.0	143.4	197.6	251.7	3,586.0	4,939.2	6,292.3	
A2a - HPwES (Weatheriza)	Insulation, Wood Pellets	E21A2a028	-	-	-	25	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Cord Wood	E21A2a029	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Electric	E21A2a030	3	4	5	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	0.4	0.6	0.7	3.0	4.1	5.2	0.1	0.1	0.1	0.0	0.0	0.1	-	-	-	-	-	-	-
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Gas	E21A2a031	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Kerosene	E21A2a032	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Oil	E21A2a033	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Propane	E21A2a034	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Low Flow Showerhead, Wood Pellets	E21A2a035	-	-	-	7	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Pipe Insulation - Hot Water, Cord Wood	E21A2a036	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Pipe Insulation - Hot Water, Electric	E21A2a037	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Pipe Insulation - Hot Water, Gas	E21A2a038	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Pipe Insulation - Hot Water, Kerosene	E21A2a039	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Pipe Insulation - Hot Water, Oil	E21A2a040	-	-	-	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza)	Pipe Insulation - Hot Water, Propane	E21A2a041	3	4	5	15	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%																			

Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A3a - ES Lighting	LED Bulb, General Service Lamps	E21A3a001	53,079	35,047	-	3	3	2	33%	23%	13%	89%	89%	89%	100%	100%	100%	453.7	208.8	0.8	1,361.0	626.3	7.3	97.9	45.1	63.2	29.1	-	-	-	-	-	-		
A3a - ES Lighting	LED Bulb, Linear	E21A3a002	9,906	5,996	738	10	10	9	33%	23%	13%	91%	91%	91%	100%	100%	100%	27.7	11.7	0.8	276.7	116.7	7.3	6.0	2.5	0.2	3.9	1.6	0.1	-	-	-	-	-	
A3a - ES Lighting	LED Bulb, Other Specialty	E21A3a003	14,598	11,066	7,377	3	3	2	33%	23%	13%	91%	91%	91%	100%	100%	100%	139.8	73.9	27.8	419.5	221.7	55.7	30.2	15.9	6.0	19.5	10.3	3.9	-	-	-	-	-	
A3a - ES Lighting	LED Bulb, Reflector	E21A3a004	15,365	4,841	-	2	2	1	33%	23%	13%	91%	91%	91%	100%	100%	100%	162.9	35.8	0.8	325.8	71.5	35.2	35.2	7.7	22.7	5.0	-	-	-	-	-	-		
A3a - ES Lighting	LED Bulb, General Service Lamps (Hard to Reach)	E21A3a005	3,058	2,038	1,359	3	3	2	53%	43%	33%	89%	89%	89%	100%	100%	100%	42.0	22.7	11.6	125.9	68.1	23.2	9.1	4.9	2.5	5.8	3.2	1.6	-	-	-	-	-	
A3a - ES Lighting	LED Bulb, Linear (Hard to Reach)	E21A3a006	546	364	243	10	10	9	53%	43%	33%	91%	91%	91%	100%	100%	100%	2.4	1.3	0.7	24.5	13.2	6.1	0.5	0.3	0.1	0.3	0.2	0.1	-	-	-	-	-	
A3a - ES Lighting	LED Bulb, Other Specialty (Hard to Reach)	E21A3a007	874	582	388	3	3	2	53%	43%	33%	91%	91%	91%	100%	100%	100%	13.4	7.3	3.7	40.3	21.8	7.4	2.9	1.6	0.8	1.9	1.0	0.5	-	-	-	-	-	
A3a - ES Lighting	LED Bulb, Reflector (Hard to Reach)	E21A3a008	1,529	1,019	679	2	2	1	53%	43%	33%	91%	91%	91%	100%	100%	100%	26.0	14.1	7.2	52.1	28.2	7.2	5.6	3.0	1.6	3.6	2.0	1.0	-	-	-	-	-	
A3a - ES Lighting	LED Fixture	E21A3a009	4,133	3,155	1,894	3	3	3	33%	23%	13%	91%	91%	91%	100%	100%	100%	32.8	17.4	5.9	98.3	52.3	17.7	7.1	3.8	1.3	4.6	2.4	0.8	-	-	-	-	-	
A3a - ES Lighting	LED Fixture (Hard to Reach)	E21A3a010	218	145	97	3	3	3	53%	43%	33%	91%	91%	91%	100%	100%	100%	2.8	1.5	0.8	8.3	4.5	2.3	0.6	0.3	0.2	0.4	0.2	0.1	-	-	-	-	-	
A3b - ES Appliances	Advanced Power Strip, Tier I	E21A3b001	-	-	-	5	5	5	100%	100%	100%	81%	81%	81%	92%	92%	92%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3b - ES Appliances	Advanced Power Strip, Tier II	E21A3b002	-	-	-	5	5	5	100%	100%	100%	74%	74%	74%	92%	92%	92%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (cooling)	E21A3b003	5	5	6	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	1.1	1.1	1.3	19.8	19.8	23.8	-	-	-	0.6	0.6	0.7	-	-	-	-	-	
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (heating)	E21A3b004	5	5	6	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	10.4	10.4	12.5	187.8	187.8	225.4	3.3	3.3	4.0	-	-	-	-	-	-	-	-	
A3c - ES HVAC Systems	Mini Split HP (assumed 1.5 ton) (cooling)-Mini Split Ba	E21A3b005	225	301	410	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	23.2	31.0	42.2	416.9	558.2	759.6	-	-	-	12.8	17.1	23.3	-	-	-	-	-	
A3c - ES HVAC Systems	Mini Split HP (assumed 1.5 ton) (heating)-Mini Split Ba	E21A3b006	225	301	410	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	73.9	98.9	134.6	1,329.6	1,780.6	2,422.9	23.5	31.4	42.7	-	-	-	-	-	-	-	-	
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 50 gal	E21A3b007	70	125	180	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	67.3	120.1	173.0	874.5	1,561.6	2,248.7	11.0	19.7	28.4	6.1	10.9	15.7	-	-	-	-	-	
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 80 gal	E21A3b008	9	-	-	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	5.1	-	-	66.1	-	2,248.7	0.8	-	-	-	-	-	-	-	-	-	-	
A3c - ES HVAC Systems	Heat Pump Swimming Pool Heater	E21A3b009	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3b - ES Appliances	ES Clothes Dryers	E21A3b010	200	200	200	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	32.1	32.1	32.1	385.0	385.0	385.0	5.5	5.5	5.5	4.2	4.2	4.2	-	-	-	-	-	
A3b - ES Appliances	Dryer Heat Pump	E21A3b011	5	5	5	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	2.1	2.1	2.1	25.3	25.3	25.3	0.4	0.4	0.4	0.3	0.3	0.3	-	-	-	-	-	
A3b - ES Appliances	Dryer Hybrid	E21A3b012	4	4	4	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	0.9	0.9	0.9	10.2	10.2	10.2	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	
A3c - ES HVAC Systems	ECM Motor for FWH Circulating Pump - Midstream	E21A3b013	-	-	-	18	18	18	69%	69%	69%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3c - ES HVAC Systems	ECM Motors for FHA Furnace Fans	E21A3b014	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3c - ES HVAC Systems	ES AC (central) 3 ton	E21A3b015	15	15	15	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	3.0	3.0	3.0	42.0	42.0	42.0	-	-	-	1.7	1.7	1.7	-	-	-	-	-	
A3c - ES HVAC Systems	Room Air Conditioner	E21A3b016	105	105	115	8	8	8	100%	100%	100%	100%	100%	100%	100%	100%	100%	1.7	1.7	1.8	13.4	13.4	14.7	-	-	-	0.9	0.9	1.0	-	-	-	-	-	
A3b - ES Appliances	ES Clothes Washers	E21A3b017	205	205	210	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	18.2	18.2	18.6	254.5	254.5	260.7	2.6	2.6	2.6	2.4	2.4	2.5	55.1	55.1	56.5	772.0	772.0	790.9
A3b - ES Appliances	Washer Tier CEE Tier 2+	E21A3b018	145	145	145	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	22.6	22.6	22.6	316.5	316.5	316.5	3.2	3.2	3.2	3.0	3.0	3.0	63.9	63.9	63.9	895.2	895.2	895.2
A3b - ES Appliances	ES Dehumidifier	E21A3b019	280	285	290	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	40.5	41.2	41.9	485.5	494.2	502.9	1.6	1.7	1.7	7.8	7.9	8.0	-	-	-	-	-	
A3b - ES Appliances	ES Dishwasher	E21A3b020	-	-	-	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3b - ES Appliances	ES Freezers	E21A3b021	-	-	-	16	16	16	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3b - ES Appliances	Refrigerator	E21A3b022	230	240	250	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	9.4	9.8	10.3	113.2	118.1	123.0	1.1	1.1	1.2	1.3	1.4	1.4	-	-	-	-	-	
A3b - ES Appliances	Refrigerator CEE Tier 2+	E21A3b023	45	50	55	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	4.3	4.8	5.3	52.1	57.8	63.6	0.5	0.6	0.6	0.6	0.7	0.7	-	-	-	-	-	
A3b - ES Appliances	ES Pool Pumps (Variable Speed)	E21A3b024	40	40	45	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	42.5	42.5	47.8	424.8	424.8	477.9	-	-	-	24.6	24.6	27.6	-	-	-	-	-	
A3b - ES Appliances	Room Air Purifier	E21A3b025	650	700	750	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	253.8	273.4	292.9	2,284.4	2,460.2	2,635.9	29.0	31.2	33.4	29.0	31.2	33.4	-	-	-	-	-	
A3c - ES HVAC Systems	Wifi Thermostat (Heating & Cooling)	E21A3b026	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
A3b - ES Appliances	Primary Refrigerator Recycling	E21A3b027	35	35	45	8	8	8	100%	100%	100%	100%	100%	100%	100%	100%	100%	17.2	17.2	22.1	137.6	137.6	177.0	2.0	2.0	2.5	2.4	2.4	3.1	-	-	-	-	-	
A3b - ES Appliances	Secondary Refrigerator Recycling	E21A3b028	80	80	85	8	8	8	100%	100%	100%	100%	100%	100%	100%	100%	100%	60.4	60.4	64.2	483.2	483.2	513.4	5.7	5.7	6.0	9.4	9.4	10.0	-	-	-	-	-	
A3b - ES Appliances	Secondary Freezer Recycling	E21A3b029	20	20	25	8	8	8	100%																										

Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU			
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023				
A4a - Home Energy Report	Home Energy Reports	E21A4a001	10,256	10,256	10,256	1	1	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	796.3	1,152.7	1,914.0	796.3	1,152.7	1,914.0	171.9	248.8	413.2	110.9	160.5	266.5	-	-	-	-	-	-
<b>Residential Behavior Subtotal</b>																			<b>796.3</b>	<b>1,152.7</b>	<b>1,914.0</b>	<b>796.3</b>	<b>1,152.7</b>	<b>1,914.0</b>	<b>171.9</b>	<b>248.8</b>	<b>413.2</b>	<b>110.9</b>	<b>160.5</b>	<b>266.5</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU				
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023		
C1a - LCI Retrofit	Custom Large Compressed Air Retro	E21C1a001	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C1a - LCI Retrofit	Custom Large Hot Water Retro	E21C1a002	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C1a - LCI Retrofit	Custom Large HVAC Retro	E21C1a003	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Lighting Retro - Interior	E21C1a004	8	9	10	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Lighting Retro - Exterior	E21C1a047	20	24	28	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Lighting Retro - Controls	E21C1a048	16	20	24	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Motors Retro	E21C1a005	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Process Retro	E21C1a006	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Refrigeration Retro	E21C1a007	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Custom Large Other Retro	E21C1a008	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Daylight Dimming	E21C1a009	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C1a010	-	-	-	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C1a011	-	-	-	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C1a012	125	175	225	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C1a013	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Lighting Occupancy Sensors	E21C1a014	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Boiler Reset Controls, Electric	E21C1a015	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C1a - LCI Retrofit	Case Motor Replacement	E21C1a016	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Cooler Night Cover	E21C1a017	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Demand Control Ventilation	E21C1a018	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Door Heater Controls	E21C1a019	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C1a020	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Duct Sealing, Electric	E21C1a021	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Ductless Mini Split Heat Pump	E21C1a022	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	E21C1a023	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Electronic Defrost Control	E21C1a024	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Energy Management System, Electric	E21C1a025	-	-	-	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C1a026	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Evaporator Fan Control	E21C1a027	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Faucet Aerator, Electric	E21C1a028	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Hotel Occupancy Sensor	E21C1a031	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Low Pressure Drop Filter	E21C1a032	-	-	-	5	5	5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electric	E21C1a033	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Low-Flow Showerhead, Electric	E21C1a034	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C1a - LCI Retrofit	Motors, Open Drip	E21C1a035	-	-	-	10	10																														











Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU					
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023			
C3a - Muni Retrofit	Custom Muni Compressed Air Retro	E21C3a001	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			
C3a - Muni Retrofit	Custom Muni Hot Water Retro	E21C3a002	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			
C3a - Muni Retrofit	Custom Muni HVAC Retro	E21C3a003	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Lighting Retro - Interior	E21C3a004	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Lighting Retro - Exterior	E21C3a091	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Lighting Retro - Controls	E21C3a092	12	12	12	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Motors Retro	E21C3a005	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Process Retro	E21C3a006	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Refrigeration Retro	E21C3a007	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Custom Muni Other Retro	E21C3a008	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Daylight Dimming	E21C3a009	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Lighting Fixture - Exterior w/ Controls	E21C3a010	-	-	-	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Lighting Fixture - Exterior w/o Controls	E21C3a011	-	-	-	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Lighting Fixture - Interior w/ Controls	E21C3a012	18	17	17	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Lighting Fixture - Interior w/o Controls	E21C3a013	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Lighting Occupancy Sensors	E21C3a014	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Air Sealing, Electric	E21C3a015	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Air Sealing, Gas	E21C3a016	-	-	-	16	16	16	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Air Sealing, Oil	E21C3a017	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Air Sealing, Propane	E21C3a018	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Boiler Reset Controls, Gas	E21C3a019	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Boiler Reset Controls, Oil	E21C3a020	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Boiler Reset Controls, Propane	E21C3a021	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Case Motor Replacement	E21C3a022	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Cooler Night Cover	E21C3a023	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Demand Control Ventilation	E21C3a024	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Door Heater Controls	E21C3a025	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
C3a - Muni Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C3a026	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Duct Insulation, Electric	E21C3a027	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Duct Insulation, Gas	E21C3a028	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Duct Insulation, Oil	E21C3a029	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Duct Insulation, Propane	E21C3a030	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C3a - Muni Retrofit	Duct Sealing, Electric	E21C3a031	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Duct Sealing, Gas	E21C3a032	-	-	-	21	21	21	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
C3a - Muni Retrofit	Duct Sealing, Oil	E21C3a033	-	-	-	20	20	20	100%	100%	100%	100%																										



Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU			
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	
C3b - Muni New Equipment	Unitary Air Conditioner	E21C3b080	1	-	1	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2.3	2.3	2.3	35.0	35.0	35.0	-	-	-	-	-	-	-	-	-	-		
C3b - Muni New Equipment	Water Source Heat Pump	E21C3b081	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
C3b - Muni New Equipment	Zero Loss Condensate Drain	E21C3b082	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C3b - Muni New Equipment	High Efficiency Chiller - FL	E21C3b083	-	-	-	23	23	23	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C3b - Muni New Equipment	High Efficiency Chiller - IPLV	E21C3b084	-	-	-	23	23	23	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Compressed Air Direct Install	E21C3d001	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C3d - Muni Direct Install	Custom Muni Hot Water Direct Install	E21C3d002	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni HVAC Direct Install	E21C3d003	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Interior	E21C3d004	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Exterior	E21C3d005	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Controls	E21C3d006	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Motors Direct Install	E21C3d007	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Process Direct Install	E21C3d008	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Refrigeration Direct Install	E21C3d009	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Custom Muni Other Direct Install	E21C3d010	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Daylight Dimming	E21C3d011	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Exterior w/ Controls	E21C3d012	-	-	-	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Exterior w/o Controls	E21C3d013	-	-	-	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Interior w/ Controls	E21C3d014	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Fixture - Interior w/o Controls	E21C3d015	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Lighting Occupancy Sensors	E21C3d016	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Electric	E21C3d017	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Gas	E21C3d018	-	-	-	16	16	16	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Oil	E21C3d019	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Air Sealing, Propane	E21C3d020	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Boiler Reset Controls, Gas	E21C3d021	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Boiler Reset Controls, Oil	E21C3d022	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Boiler Reset Controls, Propane	E21C3d023	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Case Motor Replacement	E21C3d024	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Cooler Night Cover	E21C3d025	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Demand Control Ventilation	E21C3d026	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Door Heater Controls	E21C3d027	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C3d028	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Insulation, Electric	E21C3d029	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Insulation, Gas	E21C3d030	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Insulation, Oil	E21C3d031	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Insulation, Propane	E21C3d032	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Sealing, Electric	E21C3d033	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Sealing, Gas	E21C3d034	-	-	-	21	21	21	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Sealing, Oil	E21C3d035	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Duct Sealing, Propane	E21C3d036	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3d - Muni Direct Install	Ductless Mini Split Heat Pump	E21C3d037	-	-	-	12	12	12	100%</																											



Subprogram	Measure	Measure ID	Quantity			Measure Life			Net to Gross			In Service Rate			kWh Realization Rate			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU				
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023					
C4a - Energy Rewards RFP	Custom RFP Program Compressed Air	E21C4a001	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Hot Water	E21C4a002	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program HVAC	E21C4a003	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Lighting - Interior	E21C4a004	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Lighting - Exterior	E21C4a015	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Lighting - Controls	E21C4a016	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Motors	E21C4a005	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Process	E21C4a006	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Refrigeration	E21C4a007	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Custom RFP Program Other	E21C4a008	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Daylight Dimming	E21C4a009	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Exterior w/ Controls	E21C4a010	-	-	-	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Exterior w/o Controls	E21C4a011	-	-	-	14	14	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Interior w/ Controls	E21C4a012	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Fixture - Interior w/o Controls	E21C4a013	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
C4a - Energy Rewards RFP	Lighting Occupancy Sensors	E21C4a014	-	-	-	9	9	9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-
<b>Energy Rewards RFP Subtotal</b>																																					

**Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities  
 2021 System Benefits Charge ("SBC") Calculation**

Year	EE Total Budget	RGGI Revenues	FCM Revenues	Other Revenues	Carryforward with Interest	Current Year Interest	SBC Requirement	Forecasted Distribution (MWH)	SBC Rate EE Portion (cents/kWh)	SBC Rate EAP Portion (cents/kWh)	SBC Rate LBR Portion (cents/kWh)	2020 Total SBC Rate (cents/kWh)
Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	
2021	\$2,541,946	\$44,153	\$263,079	\$0	\$0	\$0	\$2,234,714	295,126	0.568	0.150	0.00072	0.719
2021	\$4,853,502	\$177,584	\$348,732	\$0	\$0	\$0	\$4,327,186	607,490	0.561	0.150	0.00072	0.712
	\$7,395,448	\$221,737	\$611,811	\$0	\$0	\$14,572,231	\$6,561,901	902,615				

Customer Type  
 Effective year (January 1, 2020 - December 31, 2020)  
 Company Forecast  
 Company Forecast  
 Company Forecast  
 Company Forecast  
 Page 2, Line 9 Col. N + Line 11 Col. O  
 Page 3, Line 11, Col. O  
 Col. B - Col. C - Col. D - Col. E - Col. F  
 Company Forecast  
 (Col. H / Col. I) x 100  
 EAP Portion of SBC Rate  
 Page 4 column Q plus Page 5 column s

**Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities  
 Energy Efficiency Expense & SBC Revenue Reconciliation Residential  
 January 1, 2021 to December 31, 2021**

Line	Description	Carryover 2018-2020	Forecast Jan-21	Forecast Feb-21	Forecast Mar-21	Forecast Apr-21	Forecast May-21	Forecast Jun-21	Forecast Jul-21	Forecast Aug-21	Forecast Sep-21	Forecast Oct-21	Forecast Nov-21	Forecast Dec-21	2021 Total
	Col. A	Col. B	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	Col. N
1	SBC Revenues		\$170	\$144	\$143	\$122	\$119	\$136	\$158	\$156	\$126	\$119	\$128	\$156	\$1,676
2	RGGI Revenues		\$0	\$0	\$11,038	\$0	\$0	\$11,038	\$0	\$0	\$11,038	\$0	\$0	\$11,038	\$44,153
3	FCM Revenues		\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$633
4	Other Revenues		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	<b>Total Revenues</b>		<b>\$223</b>	<b>\$197</b>	<b>\$11,234</b>	<b>\$175</b>	<b>\$171</b>	<b>\$11,227</b>	<b>\$210</b>	<b>\$208</b>	<b>\$11,217</b>	<b>\$172</b>	<b>\$181</b>	<b>\$11,247</b>	<b>\$46,462</b>
6	Program Expenses		\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$211,829	\$2,541,946
7	<b>Total Program Expenses</b>		<b>\$211,829</b>	<b>\$2,541,946</b>											
8	Current Month (Over)/Under Recovery		\$211,606	\$211,632	\$200,595	\$211,654	\$211,657	\$200,602	\$211,618	\$211,620	\$200,612	\$211,657	\$211,648	\$200,582	
9	Cumulative (Over)/Under Recovery	\$	\$211,606	\$423,238	\$623,833	\$835,487	\$1,047,145	\$1,247,747	\$1,459,365	\$1,670,985	\$1,871,597	\$2,083,254	\$2,294,902	\$2,495,484	
10	Interest @ Prime		3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	
11	<b>Interest on Deferral Balance</b>		<b>\$3,439</b>	<b>\$10,316</b>	<b>\$17,015</b>	<b>\$23,714</b>	<b>\$30,593</b>	<b>\$37,292</b>	<b>\$43,991</b>	<b>\$50,868</b>	<b>\$57,567</b>	<b>\$64,266</b>	<b>\$71,145</b>	<b>\$77,844</b>	<b>\$488,049</b>
12	<b>Monthly Sales (MWh)</b>		29,914	25,390	25,139	21,463	20,904	23,964	27,773	27,408	22,178	20,940	22,602	27,451	295,126
13	<b>EE SBC Rate</b>		0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. C  
 Line 3: Page 1, Col. D  
 Line 4: Page 1, Col. E  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. B  
 Line 7: Sum of Line 6  
 Line 8: Line 7 - Line 5  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. J

**Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities  
 Energy Efficiency Expense & SBC Revenue Reconciliation Commercial  
 January 1, 2021 to December 31, 2021**

Line	Description	Carryover 2018-2020	Forecast Jan-21	Forecast Feb-21	Forecast Mar-21	Forecast Apr-21	Forecast May-21	Forecast Jun-21	Forecast Jul-21	Forecast Aug-21	Forecast Sep-21	Forecast Oct-21	Forecast Nov-21	Forecast Dec-21	2021 Total
	Col. A	Col. B	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	Col. N
1	SBC Revenues		\$276	\$251	\$275	\$262	\$279	\$296	\$327	\$326	\$286	\$288	\$266	\$276	\$3,408
2	RGGI Revenues		\$0	\$0	\$11,038	\$0	\$0	\$11,038	\$0	\$0	\$11,038	\$0	\$0	\$11,038	\$44,153
3	FCM Revenues		\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$53	\$633
4	Other Revenues		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	<b>Total Revenues</b>		<b>\$329</b>	<b>\$304</b>	<b>\$11,366</b>	<b>\$314</b>	<b>\$332</b>	<b>\$11,387</b>	<b>\$380</b>	<b>\$379</b>	<b>\$11,377</b>	<b>\$340</b>	<b>\$318</b>	<b>\$11,367</b>	<b>\$48,194</b>
6	Program Expenses		\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$404,459	\$4,853,502
7	<b>Total Program Expenses</b>		<b>\$404,459</b>	<b>\$4,853,502</b>											
8	Current Month (Over)/Under Recovery		\$404,130	\$404,154	\$393,093	\$404,144	\$404,127	\$393,071	\$404,079	\$404,080	\$393,081	\$404,118	\$404,140	\$393,092	
9	Cumulative (Over)/Under Recovery	\$	\$ 404,130	\$808,284	\$1,201,377	\$1,605,521	\$2,009,648	\$2,402,719	\$2,806,798	\$3,210,878	\$3,603,959	\$4,008,077	\$4,412,217	\$4,805,309	
10	Interest @ Prime		3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	
11	<b>Interest on Deferral Balance</b>		<b>\$6,567</b>	<b>\$19,702</b>	<b>\$32,657</b>	<b>\$45,612</b>	<b>\$58,746</b>	<b>\$71,701</b>	<b>\$84,655</b>	<b>\$97,787</b>	<b>\$110,741</b>	<b>\$123,696</b>	<b>\$136,830</b>	<b>\$149,785</b>	<b>\$938,478</b>
12	<b>Monthly Sales (MWh)</b>		49,228	44,828	48,979	46,654	49,760	52,829	58,269	58,080	51,064	51,279	47,361	49,158	607,490
13	<b>EE SBC Rate</b>		0.561	0.561	0.561	0.561	0.561	0.561	0.561	0.561	0.561	0.561	0.561	0.561	

Line 1: (Line 12 x Line 13) / 100  
 Line 2: Page 1, Col. C  
 Line 3: Page 1, Col. D  
 Line 4: Page 1, Col. E  
 Line 5: Sum of Lines 1 through Lines 4  
 Line 6: Page 1, Col. B  
 Line 7: Sum of Line 6  
 Line 8: | Line 7 - Line 5  
 Line 9: Prior month Line 9 + Current month Line 8  
 Line 10: Prime Rate / 12  
 Line 11: (Prior Month Line 9 + Current Month Line 9) / 2 x Line 10  
 Line 12: Company Forecast  
 Line 13: Page 1, Col. J

Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities  
 Lost Base Revenue Reconciliation  
 January 1, 2019 to December 31, 2020

Line	Description	Balance			Collections 2020	Forecast Jan-21	Forecast Feb-21	Forecast Mar-21	Forecast Apr-21	Forecast May-21	Forecast Jun-21	Forecast Jul-21	Forecast Aug-21	Forecast Sep-21	Forecast Oct-21	Forecast Nov-21	Forecast Dec-21	2021 Total
		Cumulative 2019 kWh	Cumulative 2020 kWh	Carryover 12/31/2019														
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O			
1	Revenue Recovery				(\$5,323)													\$0
2	Monthly Residential kWh	187,203	146,882			\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$17,816	\$213,786
3	Monthly Commercial kWh	581,493	903,036			\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$18,799	\$225,593
4	Monthly Commercial Kw	75	95			\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$1,471	\$17,648
5	Total					\$32,763	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$451,704
6	Monthly (Over)/Under Recovery					\$32,763	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$38,086	\$451,704
7	Cumulative (Over)/Under Recovery			\$180,238		\$213,001	\$251,086	\$289,172	\$327,257	\$365,343	\$403,428	\$441,514	\$479,600	\$517,685	\$555,771	\$593,856	\$631,942	
8	Interest @ Prime Rate					0.40%	0.65%	0.40%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	
9	Interest on Deferral Balance					\$778	\$1,499	\$1,069	\$835	\$938	\$1,041	\$1,144	\$1,247	\$1,350	\$1,454	\$1,557	\$1,660	\$14,572
10	Cummulative (Over)/Under Recovery Incl Carrying Charge					\$213,779	\$253,363	\$292,518	\$331,438	\$370,462	\$409,588	\$448,818	\$488,151	\$527,587	\$567,126	\$606,769	\$646,514	\$646,514
11	Monthly Sales Residential					29,914	25,390	25,139	21,463	20,904	23,964	27,773	27,408	22,178	20,940	22,602	27,451	295,126
12	Monthly Sales Commercial					49,228	44,828	48,979	46,654	49,760	52,829	58,269	58,080	51,064	51,279	47,361	49,158	607,490
13	SBC Rate (LBR Component) Residential																	\$0.00072
14	SBC Rate (LBR Component) Commercial																	\$0.00072

Line 1: Actual Revenues Jan-Jul. LBR rate was not approved for 2020, thus no LBR revenues forecasted Aug-Dec  
 Line 2: Col B + Col C x pg 6 line 27  
 Line 3: Line 2 - Line 1  
 Line 4: Prior month Line 4 + Current month Line 3  
 Line 5: Prime Rate / 12  
 Line 6: (Prior Month Line 4 + Current Month Line 4) / 2 x Line 5  
 Line 7: Line 4 + line 6  
 Line 8: Company Forecast

**Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities  
Calculation of Forecasted Average Distribution Rate for Lost Revenue  
Based on Actual Billing Determinants and Distribution Rates for 2018\***

	(1)	(2)	(3) = (1) + (2)	(4)	(5)	(6) = (1) + (4)	(7) = (2) / (5)	(8) = (3) / (5)
<b>For the Period 01/01/20 Through 12/31/20</b>								
<u>Rate Class</u>	<u>Revenue</u>			<u>Delivery kW</u>	<u>Delivery kWh</u>	<u>Average Distribution Rate \$/kW</u>	<u>Average Distribution Rate \$/kWh</u>	<u>Average Distribution Rate \$/kWh</u>
	<u>Demand Charges<sup>(a)</sup></u>	<u>kWh Charges</u>	<u>Total Demand and kWh Charges</u>					
Rate D	\$ -	\$ 14,868,722	\$ 14,868,722	\$ -	278,824,882	<b>N/A</b>	<b>N/A</b>	<b>\$ 0.05333</b>
Rate D-10	\$ -	\$ 237,101	\$ 237,101	\$ -	-			
Rate T	\$ -	\$ 663,486	\$ 663,486	\$ -	-			
<b>Total Residential</b>	\$ -	\$ 15,769,308	\$ 15,769,308	\$ -	-			
Rate G-1	\$ 8,209,771	\$ 1,374,403	\$ 9,584,174	951,329	379,539,341	\$ 8.63	\$ 0.00362	\$ 0.02525
Rate G-2	\$ -	\$ 2,054,567	\$ 2,054,567	-	147,995,065	\$ -	\$ 0.01388	\$ 0.01388
Rate G-3	\$ -	\$ 4,354,581	\$ 4,354,581	-	88,095,304	\$ -	\$ 0.04943	\$ 0.04943
Rate V	\$ -	\$ 16,652	\$ 16,652	-	328,389	\$ -	\$ 0.05071	\$ 0.05071
<b>Total Commercial and Industrial</b>	\$ 8,209,771	\$ 7,800,203	\$ 16,009,974	951,329	615,958,099	<b>\$ 8.63</b>	<b>\$ 0.01266</b>	<b>\$ 0.02599</b>

\* Excludes the outdoor lighting Rate OL and the Customer/Meter charge revenue from each rate. Used billing determinants from DE 19-064

(a) For Rate G-2, the demand charge is excluded from the average rate calculation as ratchet for rate class is under internal review.

**Bill Impacts of Changes in System Benefits Charge - Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities**

	<u>Current Rates*</u>	<u>2021 Res</u>	<u>2021 C&amp;I</u>
System Benefits Charge (\$/kWh)	\$ 0.00678	\$ 0.00719	0.00712
 <u>Bill per month, including GSE default energy service</u>			
Residential Rate D (650 kWh/month)	\$ 112.82	\$ 113.08	
Rate G-2, 25 kW, 9,000 kWh per month	\$ 874.40		\$ 877.77
 <u>Change from previous rate level - \$ per month</u>			
Residential Rate D (650 kWh/month)		\$ 0.26	
Rate G-2, 25 kW, 9,000 kWh per month			\$ 3.37
 <u>Change from previous rate level - %</u>			
Residential Rate D (650 kWh/month)		0.23%	
Rate G-2, 25 kW, 9,000 kWh per month			0.39%

\* Stated at Liberty's most recent rate levels (effective August 1, 2019). Rate G-2 energy service rate is based on September 1, 2019 rate.

Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities  
 Calculation of Distribution Revenue at the Rate Levels in Effect During 2020  
 Based on Billing Determinants for the Twelve Months Ending December 2018

Residential Rate D												
Rate	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	141,213	\$ 14.67	\$ 2,071,595	70,576	\$ 14.74	\$ 1,040,290	212,778	\$ 14.74	\$ 3,136,348	424,567	\$ 6,248,233
	All kWh	95,419,680	\$0.04950	\$ 4,723,274	39,012,006	\$0.04930	\$ 1,923,292	141,608,595	\$0.05713	\$ 8,090,099	276,040,281	\$14,736,665
Off Peak kWh 16 Hour	All kWh	425,641	\$0.04281	\$ 18,222	168,850	\$0.04258	\$ 7,190	525,957	\$0.04934	\$ 25,951	1,120,448	\$ 51,362
Farm kWh	All kWh	336,408	\$0.04675	\$ 15,727	136,211	\$0.04654	\$ 6,339	422,161	\$0.05393	\$ 22,767	894,780	\$ 44,833
D-6 kWh	All kWh	285,950	\$0.04360	\$ 12,467	130,531	\$0.04337	\$ 5,661	352,892	\$0.05025	\$ 17,733	769,373	\$ 35,861
Total Residential	Customer/Meter	141,213		\$ 2,071,595	70,576		\$ 1,040,290	212,778		\$ 3,136,348	424,567	\$ 6,248,233
	Demand	-		-	-		-	-		-	-	-
	kWh	96,467,679		\$ 4,769,690	39,447,598		\$ 1,942,482	142,909,605		\$ 8,156,550	278,824,882	\$14,868,722
				\$ 6,841,285			\$ 2,982,772			\$11,292,897		\$21,116,955

Residential Rate D-10												
Col. B - Col. C - Col. D - Col. E - Col. F	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	1,763	\$ 14.67	\$ 25,863	879	\$ 14.74	\$ 12,956	2,635	\$ 14.74	\$ 38,840	5,277	\$ 77,660
	On Peak kWh	819,396	\$0.10580	\$ 86,692	264,793	\$0.10588	\$ 28,036	953,429	\$0.12151	\$ 115,851	2,037,618	\$ 230,580
	Off Peak kWh	1,647,511	\$0.00197	\$ 3,246	439,551	\$0.00153	\$ 673	1,504,599	\$0.00173	\$ 2,603	3,591,661	\$ 6,521
Total Rate D-10	Customer/Meter	1,763		\$ 25,863	879		\$ 12,956	2,635		\$ 38,840	5,277	\$ 77,660
	Demand	-		-	-		-	-		-	-	-
	kWh	2,466,907		\$ 89,938	704,344		\$ 28,709	2,458,028		\$ 118,454	5,629,279	\$ 237,101
				\$ 115,801			\$ 41,665			\$ 157,294		\$ 314,760

Commercial & Industrial Rate G-1												
Rate	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	533	\$ 382.48	\$ 203,862	279	\$ 384.39	\$ 107,245	845	\$ 426.78	\$ 360,629	1,657	\$ 671,736
	Demand Charge	293,661	\$ 8.14	\$ 2,390,401	158,070	\$ 8.18	\$ 1,293,013	499,598	\$ 9.06	\$ 4,526,358	951,329	\$ 8,209,771
	On Peak kWh	64,013,730	\$0.00575	\$ 368,079	36,141,242	\$0.00533	\$ 192,633	112,351,130	\$0.00588	\$ 660,625	212,506,102	\$ 1,221,336
	Off Peak kWh	48,788,724	\$0.00208	\$ 101,481	29,394,681	\$0.00164	\$ 48,207	88,495,485	\$0.00180	\$ 159,292	166,678,890	\$ 308,980
	Credit for High Voltage Delivery	90,841	\$ (0.44)	\$ (39,970)	86,717	\$ (0.44)	\$ (38,155)	176,791	\$ (0.44)	\$ (77,788)	354,349	\$ (155,914)
Total Rate G-1	Customer/Meter	533		\$ 203,862	279		\$ 107,245	845		\$ 360,629	1,657	\$ 671,736
	Demand	293,661		\$ 2,390,401	158,070		\$ 1,293,013	499,598		\$ 4,526,358	951,329	\$ 8,209,771
	kWh	112,893,295		\$ 429,589	65,622,640		\$ 202,685	201,023,406		\$ 742,128	379,539,341	\$ 1,374,403
				\$ 3,023,852			\$ 1,602,942			\$ 5,629,115		\$10,255,909

Commercial Rate G-2												
Rate	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	3,621	\$ 63.77	\$ 230,911	1,817	\$ 64.08	\$ 116,433	5,444	\$ 71.14	\$ 387,286	10,882	\$ 734,631
	Demand Charge	163,850	\$ 8.19	\$ 1,341,932	86,590	\$ 8.23	\$ 712,636	259,668	\$ 9.11	\$ 2,365,575	510,108	\$ 4,420,143
	All kWh	48,549,883	\$0.00257	\$ 124,773	24,347,591	\$0.00214	\$ 52,104	75,095,642	\$0.00238	\$ 178,728	147,993,116	\$ 355,605
	Credit for High Voltage Delivery	577	\$ (0.44)	\$ (254)	302	\$ (0.44)	\$ (133)	1,070	\$ (0.44)	\$ (471)	1,949	\$ (858)
Total Rate G-2	Customer/Meter	3,621		\$ 230,911	1,817		\$ 116,433	5,444		\$ 387,286	10,882	\$ 347,345
	Demand	163,850		\$ 1,341,932	86,590		\$ 712,636	259,668		\$ 2,365,575	510,108	\$ 2,054,567
	kWh	48,550,460		\$ 124,519	24,347,893		\$ 51,971	75,096,712		\$ 178,257	147,995,065	\$ 176,490
				\$ 1,697,362			\$ 881,040			\$ 2,931,118		\$ 2,578,402

General Service Rate G-3												
Rate	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	22,671	\$ 14.67	\$ 332,584	11,288	\$ 14.74	\$ 166,385	34,081	\$ 14.74	\$ 502,354	68,040	\$ 1,001,323
	All kWh	30,521,195	\$0.04703	\$ 1,435,412	13,568,301	\$0.04682	\$ 635,268	44,005,808	\$0.05190	\$ 2,283,901	88,095,304	\$ 4,354,581
Total Rate G-3	Customer/Meter	22,671		\$ 332,584	11,288		\$ 166,385	34,081		\$ 502,354	68,040	\$ 1,001,323
	Demand	-		-	-		-	-		-	-	-
	kWh	30,521,195		\$ 1,435,412	13,568,301		\$ 635,268	44,005,808		\$ 2,283,901	88,095,304	\$ 4,354,581
				\$ 1,767,995			\$ 801,653			\$ 2,786,255		\$ 5,355,904

Electric Heat Rate T												
Rate	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	3,898	\$ 14.67	\$ 57,184	1,935	\$ 14.74	\$ 28,522	5,733	\$ 14.74	\$ 84,504	11,566	\$ 170,210
	All kWh	7,115,111	\$0.04099	\$ 291,648	1,821,872	\$0.04075	\$ 74,241	6,415,090	\$0.04639	\$ 297,596	15,352,073	\$ 663,486
Total Rate T	Customer/Meter	3,898		\$ 57,184	1,935		\$ 28,522	5,733		\$ 84,504	11,566	\$ 170,210
	Demand	-		\$ -	-		\$ -	-		\$ -	-	\$ -
	kWh	7,115,111		\$ 291,648	1,821,872		\$ 74,241	6,415,090		\$ 297,596	15,352,073	\$ 663,486
				\$ 348,832			\$ 102,763			\$ 382,100		\$ 833,696

Electric Heat Rate V												
Rate	Source	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
Standard	Customer Charge	72	\$ 14.37	\$ 1,035	36	\$ 14.74	\$ 531	103	\$ 16.36	\$ 1,685	211	\$ 3,250
	All kWh	127,747	\$0.04834	\$ 6,175	44,462	\$0.04813	\$ 2,140	156,180	\$0.05338	\$ 8,337	328,389	\$ 16,652
Total Rate V	Customer/Meter	72		\$ 1,035	36		\$ 531	103		\$ 1,685	211	\$ 3,250
	Demand	-		\$ -	-		\$ -	-		\$ -	-	\$ -
	kWh	127,747		\$ 6,175	44,462		\$ 2,140	156,180		\$ 8,337	328,389	\$ 16,652
				\$ 7,210			\$ 2,671			\$ 10,022		\$ 19,902

Outdoor Lighting Rate OL												
Type	Fixture	January 1, 2020 - April 30, 2020			May 1, 2020 - June 30, 2020			July 1, 2020 - December 31, 2020			2020 Total	
		Units	Rate	Revenue	Units	Rate	Revenue	Units	Rate	Revenue	Units	Revenue
High Pressure Sodium	HPS RWY 50W	8,846	\$ 7.69	\$ 68,026	5,813	\$ 7.72	\$ 44,876	14,588	\$ 8.39	\$ 122,393	29,247	\$ 235,295
	HPS RWY 100W	6,320	\$ 9.35	\$ 59,092	4,534	\$ 9.39	\$ 42,574	10,927	\$ 9.69	\$ 105,883	21,781	\$ 207,549
	HPS RWY 250W	1,963	\$ 16.43	\$ 32,252	1,120	\$ 16.51	\$ 18,491	3,010	\$ 16.07	\$ 48,371	6,093	\$ 99,114
	HPS RWY 400W	754	\$ 21.41	\$ 16,143	199	\$ 21.51	\$ 4,280	477	\$ 19.98	\$ 9,530	1,430	\$ 29,954
	HPS POST 100W	1,240	\$ 10.77	\$ 13,355	1,192	\$ 10.82	\$ 12,897	2,416	\$ 11.36	\$ 27,446	4,848	\$ 53,698
	HPS FLD 250W	1,030	\$ 16.57	\$ 17,067	534	\$ 16.65	\$ 8,891	1,518	\$ 16.24	\$ 24,652	3,082	\$ 50,611
Incandescent	HPS FLD 400W	1,680	\$ 22.88	\$ 38,438	864	\$ 22.99	\$ 19,863	2,500	\$ 21.69	\$ 54,225	5,044	\$ 112,527
	INC RWY 103W	92	\$ 10.29	\$ 947	46	\$ 10.34	\$ 476	138	\$ 10.75	\$ 1,484	276	\$ 2,906
Mercury	MV RWY 100W	288	\$ 7.43	\$ 2,140	142	\$ 7.46	\$ 1,059	378	\$ 7.44	\$ 2,812	808	\$ 6,011
	MV RWY 175W	570	\$ 9.06	\$ 5,164	280	\$ 9.10	\$ 2,548	725	\$ 8.36	\$ 6,061	1,575	\$ 13,773
POLES	MV RWY 400W	201	\$ 17.14	\$ 3,445	100	\$ 17.22	\$ 1,722	300	\$ 14.93	\$ 4,479	601	\$ 9,646
	MV RWY 1000W	4	\$ 32.54	\$ 130	2	\$ 32.70	\$ 65	6	\$ 25.21	\$ 151	12	\$ 347
	MV FLD 400W	85	\$ 18.96	\$ 1,612	42	\$ 19.05	\$ 800	121	\$ 17.08	\$ 2,067	248	\$ 4,478
	MV FLD 1000W	-	\$ 32.75	\$ -	-	\$ 32.91	\$ -	-	\$ 33.06	\$ -	-	\$ -
	WOOD	468	\$ 9.09	\$ 4,254	237	\$ 9.14	\$ 2,166	685	\$ 9.47	\$ 6,487	1,390	\$ 12,907
	POLE FIBER DIRECT EMBEDDED	747	\$ 9.41	\$ 7,029	723	\$ 9.46	\$ 6,840	1,470	\$ 9.81	\$ 14,421	2,940	\$ 28,290
	POLE FIBER RWY <25FT	478	\$ 15.98	\$ 7,638	412	\$ 16.06	\$ 6,617	852	\$ 16.65	\$ 14,186	1,742	\$ 28,441
	POLE FIBER RWY =>25FT	12	\$ 26.69	\$ 320	12	\$ 26.82	\$ 322	24	\$ 27.84	\$ 668	48	\$ 1,310
	POLE METAL EMBEDDED	568	\$ 19.04	\$ 10,815	404	\$ 19.14	\$ 7,733	972	\$ 19.85	\$ 19,294	1,944	\$ 37,841
	POLE METAL =>25FT	376	\$ 22.97	\$ 8,637	222	\$ 23.08	\$ 5,124	590	\$ 23.94	\$ 14,125	1,188	\$ 27,885
LED	LED 30W	56	\$ 11.38	\$ 637	28	\$ 11.43	\$ 320	89	\$ 5.44	\$ 484	173	\$ 1,441
	LED 50W	112	\$ 11.85	\$ 1,327	193	\$ 11.90	\$ 2,297	474	\$ 5.67	\$ 2,688	779	\$ 6,311
	LED 130W	123	\$ 13.69	\$ 1,684	382	\$ 13.75	\$ 5,253	858	\$ 8.75	\$ 7,508	1,363	\$ 14,444
	LED 190W	13	\$ 18.02	\$ 234	11	\$ 18.11	\$ 199	19	\$ 16.75	\$ 318	43	\$ 752
	LED 30W URD	42	\$ 13.00	\$ 546	36	\$ 13.08	\$ 471	78	\$ 12.67	\$ 988	156	\$ 2,005
	LED 90W FLOOD	-	\$ 13.12	\$ -	-	\$ 13.18	\$ -	17	\$ 8.62	\$ 147	17	\$ 147
	LED 130W FLOOD	-	\$ 14.37	\$ -	4	\$ 14.44	\$ 58	26	\$ 9.90	\$ 257	30	\$ 315
	LED 50W BARN	-	\$ 5.00	\$ -	-	\$ 5.02	\$ -	2	\$ 4.88	\$ 10	2	\$ 10
	All kWh	-	\$ -	\$ -	-	\$ -	\$ -	-	\$0.03993	\$ -	-	\$ -
	Total Rate OL	Fixtures	26,068		\$ 300,933	17,532		\$ 195,942	43,260		\$ 491,134	86,860
Demand		-		\$ -	-		\$ -	-		\$ -	-	\$ -
kWh		-		\$ 300,933	-		\$ 195,942	-		\$ 491,134	-	\$ 988,009

Total Retail											
Type	Source	January 1, 2020 - April 30, 2020		May 1, 2020 - June 30, 2020		July 1, 2020 - December 31, 2020		2020 Total			
		Units	Revenue	Units	Revenue	Units	Revenue	Units	Revenue		
Total Retail	Customer/Meter	173,771	\$2,923,032.80	86,810	\$ 1,472,363	261,619	\$ 4,511,646	522,200	\$ 8,907,042		
	Fixtures	26,068	\$ 300,933	17,532	\$ 195,942	43,260	\$ 491,134	86,860	\$ 988,009		
	Demand	457,511	\$ 3,732,332	244,660	\$ 1,967,360	759,266	\$ 6,813,675	1,461,437	\$12,513,367		
	kWh	298,142,394	\$ 7,146,972	145,557,110	\$ 2,937,495	472,064,829	\$11,785,223	915,764,333	\$21,869,691		
			\$ 14,103,270		\$ 6,573,160		\$23,601,678		\$44,278,109		

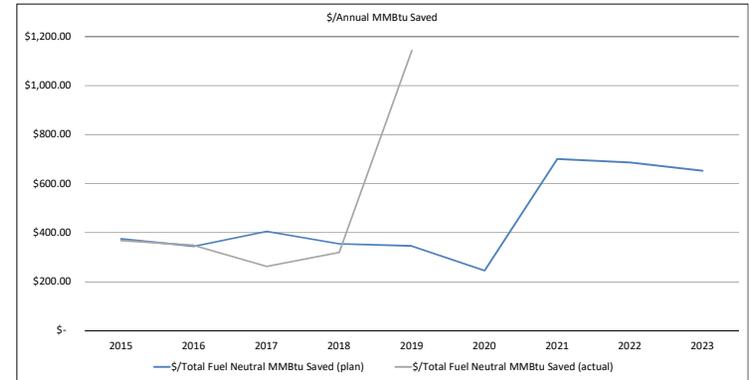
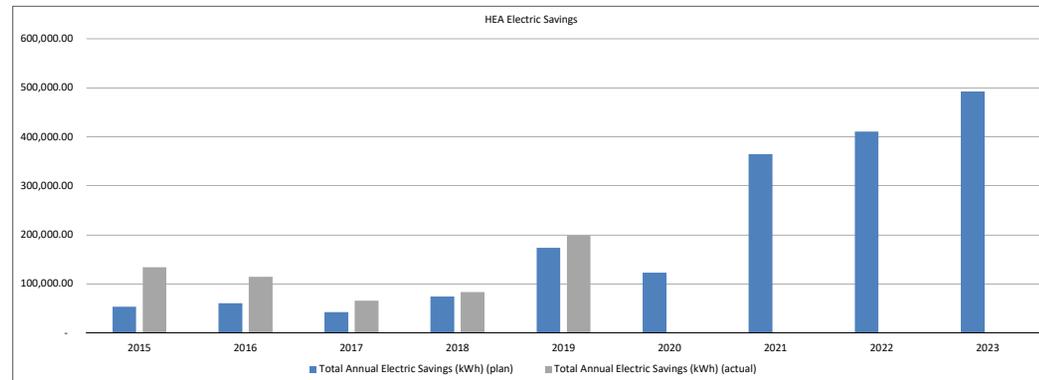
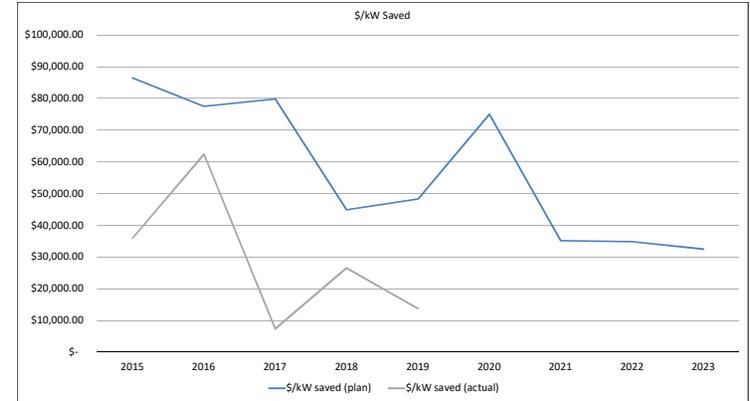
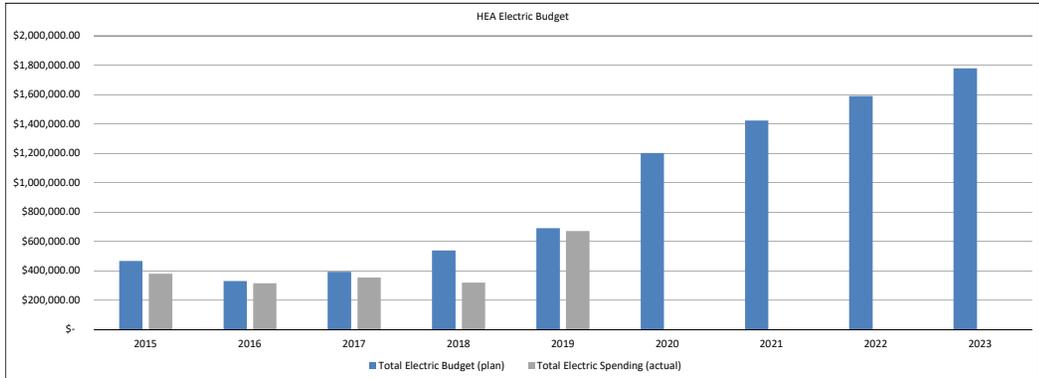
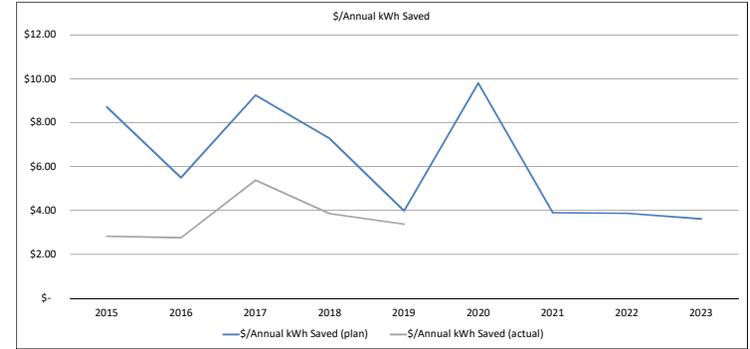
Lost Base Revenue Summary of Data Included in the Calculation of the Average Distribution Rates*									
Type	Source	January 1, 2020 - April 30, 2020		May 1, 2020 - June 30, 2020		July 1, 2020 - December 31, 2020		2020 Total	
		Units	Revenue	Units	Revenue	Units	Revenue	Units	Revenue
<b>Total Rate D</b>	Demand kWh	-	\$ -	-	\$ -	-	\$ -	-	\$ -
		96,467,679	\$ 4,769,690	39,447,598	\$ 1,942,482	142,909,605	\$ 8,156,550	278,824,882	\$14,868,722
			\$ 4,769,690		\$ 1,942,482		\$ 8,156,550		\$14,868,722
<b>Total Rate D-10</b>	Demand kWh	-	\$ -	-	\$ -	-	\$ -	-	\$ -
		2,466,907	\$ 89,938	704,344	\$ 28,709	2,458,028	\$ 118,454	5,629,279	\$ 237,101
			\$ 89,938		\$ 28,709		\$ 118,454		\$ 237,101
<b>Total Rate G-1</b>	Demand kWh	293,661	\$ 2,390,401	158,070	\$ 1,293,013	499,598	\$ 4,526,358	951,329	\$ 8,209,771
		112,893,295	\$ 429,589	65,622,640	\$ 202,685	201,023,406	\$ 742,128	379,539,341	\$ 1,374,403
			\$ 2,819,990		\$ 1,495,697		\$ 5,268,486		\$ 9,584,174
<b>Total Rate G-2</b>	Demand kWh	163,850	\$ 1,341,932	86,590	\$ 712,636	259,668	\$ 2,365,575	510,108	\$ 4,420,143
		48,550,460	\$ 124,519	24,347,893	\$ 51,971	75,096,712	\$ 178,257	147,995,065	\$ 354,747
			\$ 1,466,451		\$ 764,607		\$ 2,543,832		\$ 4,774,890
<b>Total Rate G-3</b>	Demand kWh	-	\$ -	-	\$ -	-	\$ -	-	\$ -
		30,521,195	\$ 1,435,412	13,568,301	\$ 635,268	44,005,808	\$ 2,283,901	88,095,304	\$ 4,354,581
			\$ 1,435,412		\$ 635,268		\$ 2,283,901		\$ 4,354,581
<b>Total Rate T</b>	Demand kWh	-	\$ -	-	\$ -	-	\$ -	-	\$ -
		7,115,111	\$ 291,648	1,821,872	\$ 74,241	6,415,090	\$ 297,596	15,352,073	\$ 663,486
			\$ 291,648		\$ 74,241		\$ 297,596		\$ 663,486
<b>Total Rate V</b>	Demand kWh	-	\$ -	-	\$ -	-	\$ -	-	\$ -
		127,747	\$ 6,175	44,462	\$ 2,140	156,180	\$ 8,337	328,389	\$ 16,652
			\$ 6,175		\$ 2,140		\$ 8,337		\$ 16,652
<b>Total</b>	Demand kWh	457,511	\$ 3,732,332	39,692,258	\$ 2,005,648	143,668,871	\$ 6,891,933	1,461,437	\$12,629,914
		267,621,199	\$ 5,711,561	131,988,809	\$ 2,302,228	428,059,021	\$ 9,501,322	827,669,029	\$17,515,110
			\$ 9,443,893		\$ 4,307,876		\$16,393,255		\$30,145,024

Home Energy Assistance

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 465,548.53	\$ 330,589.02	\$ 392,167.81	\$ 536,897.99	\$ 690,347.57	\$ 1,201,848.73	\$ 1,421,776.44	\$ 1,589,772.40	\$ 1,776,839.40
	Total Annual Electric Savings (kWh) (plan)	53,434.31	60,075.89	42,395.61	73,782.18	173,346.85	122,542.44	364,335.34	410,710.99	492,109.08
	\$/Annual kWh Saved (plan)	\$ 8.71	\$ 5.50	\$ 9.25	\$ 7.28	\$ 3.98	\$ 9.81	\$ 3.90	\$ 3.87	\$ 3.61
2)	Total Electric Budget	\$ 465,548.53	\$ 330,589.02	\$ 392,167.81	\$ 536,897.99	\$ 690,347.57	\$ 1,201,848.73	\$ 1,421,776.44	\$ 1,589,772.40	\$ 1,776,839.40
	Total kWh saved	5.38	4.26	4.92	11.95	14.29	16.02	40.44	45.58	54.63
	\$/kW saved (plan)	\$ 86,467.08	\$ 77,552.06	\$ 79,786.89	\$ 44,945.12	\$ 48,311.93	\$ 75,013.17	\$ 35,154.31	\$ 34,880.04	\$ 32,523.29
3)	Total Electric Budget	\$ 465,548.53	\$ 330,589.02	\$ 392,167.81	\$ 536,897.99	\$ 690,347.57	\$ 1,201,848.73	\$ 1,421,776.44	\$ 1,589,772.40	\$ 1,776,839.40
	Total Fuel Neutral MMBtu Saved	1,242.74	960.66	966.87	1,513.48	1,997.75	4,889.84	2,029.41	2,315.68	2,725.40
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 374.61	\$ 344.13	\$ 405.61	\$ 354.74	\$ 345.56	\$ 245.78	\$ 700.59	\$ 686.53	\$ 651.96

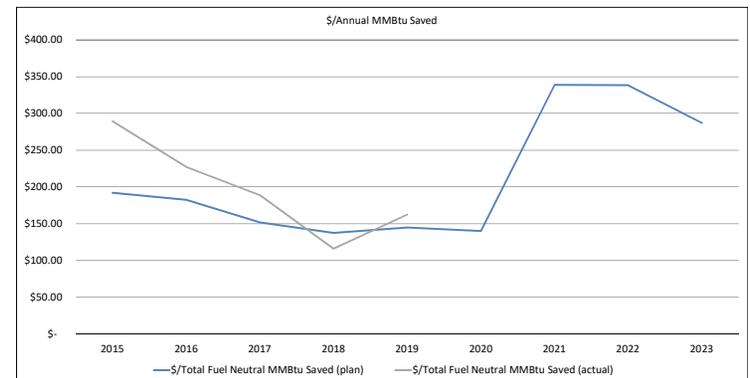
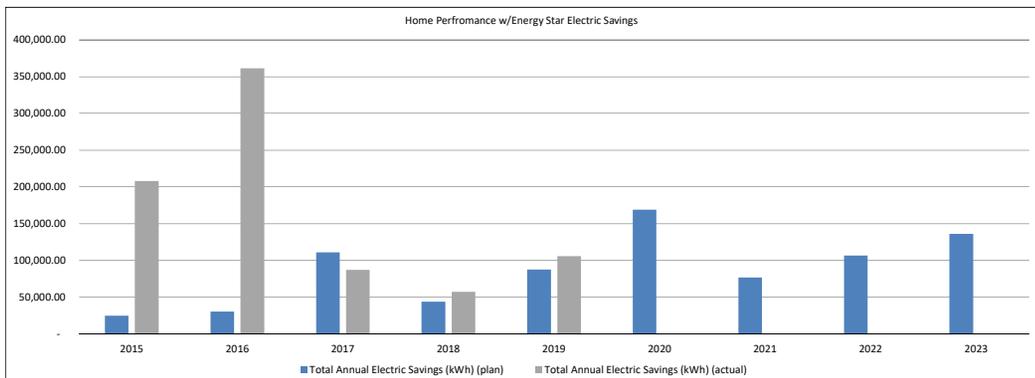
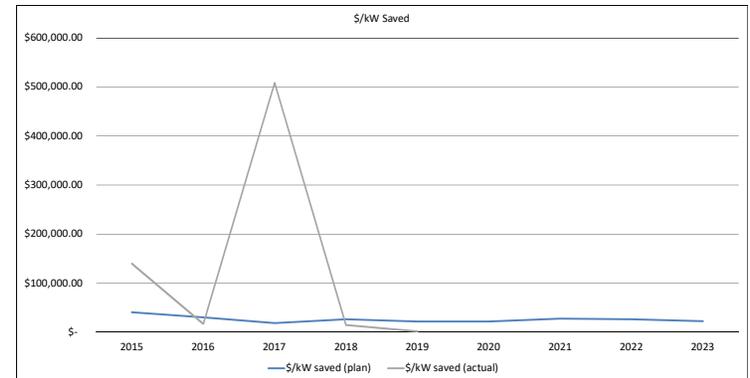
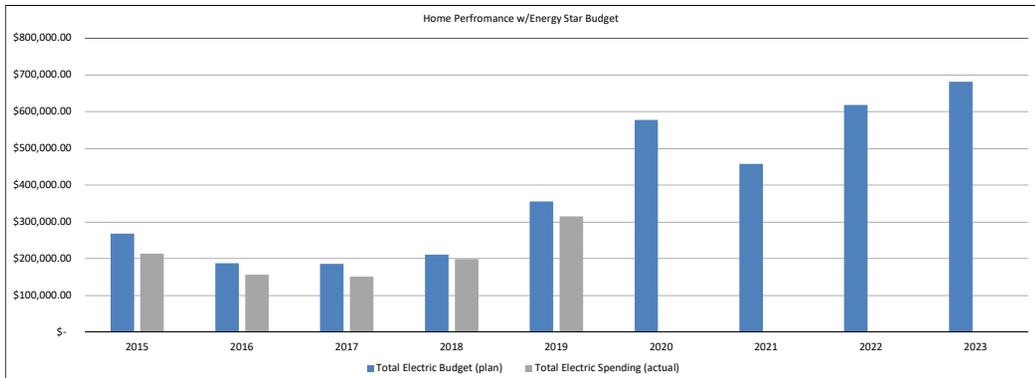
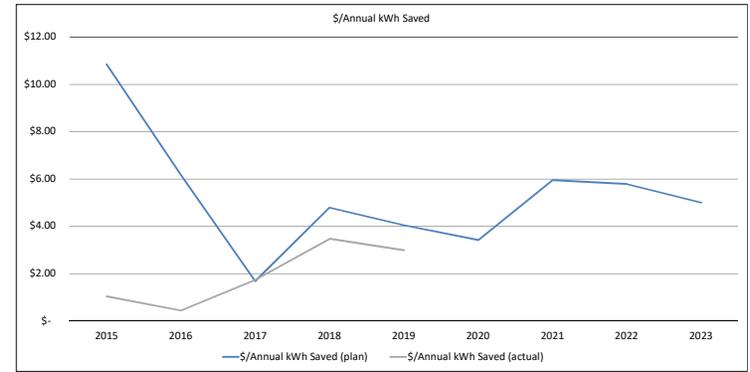
  

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 378,874.12	\$ 314,957.99	\$ 352,987.37	\$ 319,646.44	\$ 670,521.88
	Total Annual Electric Savings (kWh) (actu)	134,001.08	114,076.40	65,578.70	82,911.32	198,796.35
	\$/Annual kWh Saved (actual)	\$ 2.83	\$ 2.76	\$ 5.38	\$ 3.86	\$ 3.37
2)	Total Electric Spending	\$ 378,874.12	\$ 314,957.99	\$ 352,987.37	\$ 319,646.44	\$ 670,521.88
	Total kWh saved	10.54	5.04	48.06	12.04	48.80
	\$/kW saved (actual)	\$ 35,939.11	\$ 62,434.91	\$ 7,345.02	\$ 26,558.81	\$ 13,739.89
3)	Total Electric Spending	\$ 378,874.12	\$ 314,957.99	\$ 352,987.37	\$ 319,646.44	\$ 670,521.88
	Total Fuel Neutral MMBtu Saved	1,031.25	905.27	1,344.94	998.82	586.74
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 367.39	\$ 347.91	\$ 262.45	\$ 320.02	\$ 1,142.79



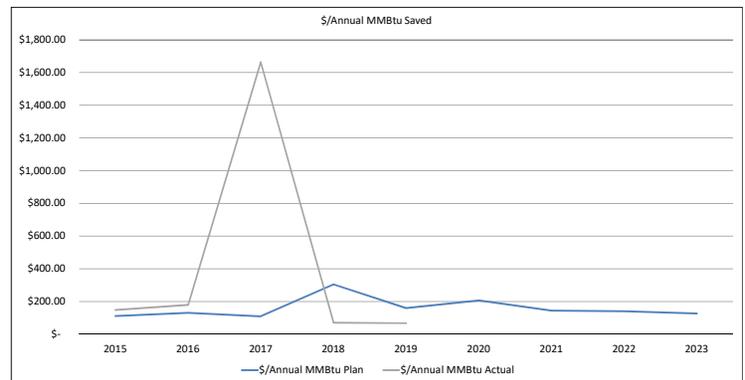
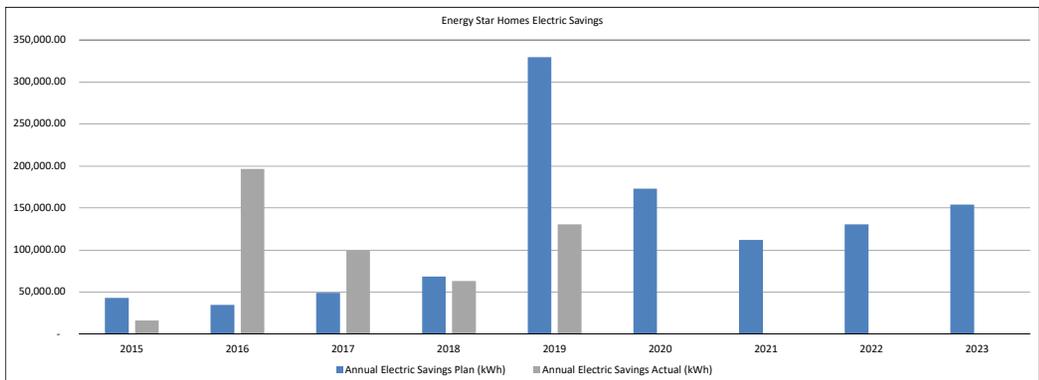
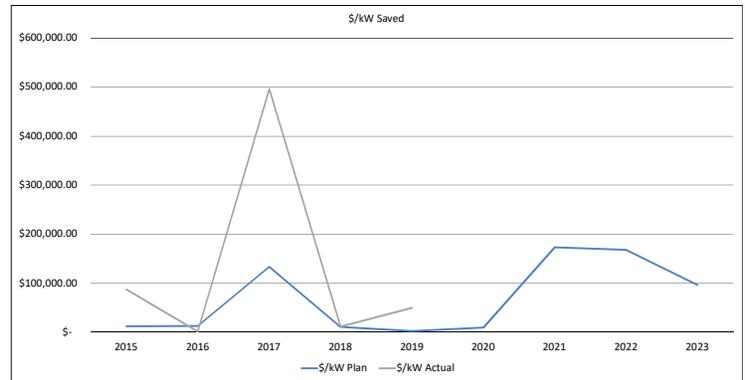
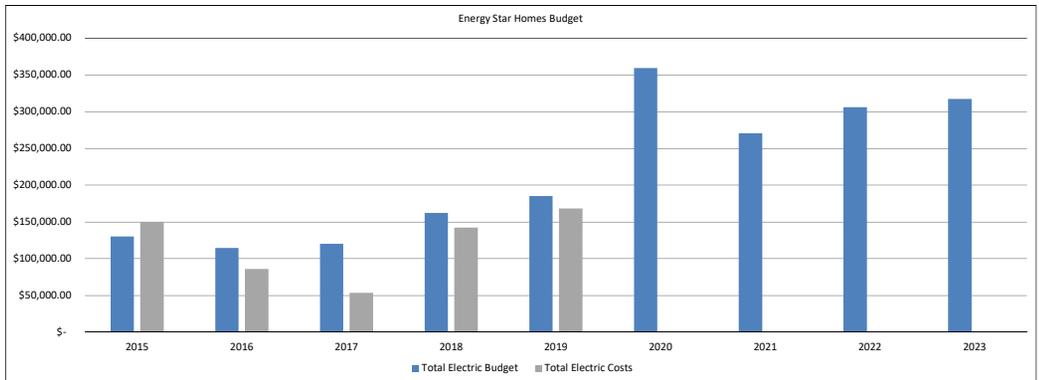
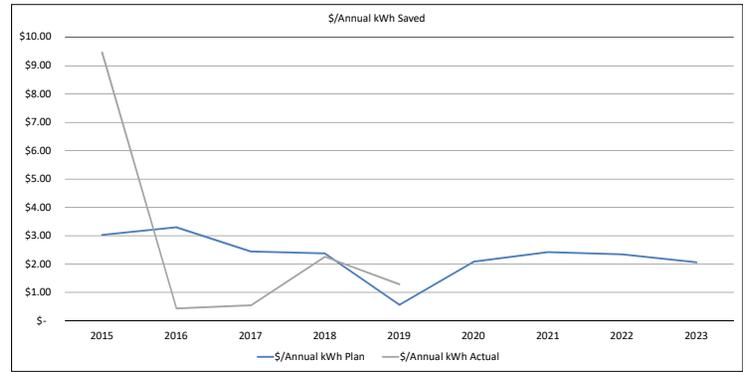
Home Performance w/Energy Star

	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Planned</b>									
1) Total Electric Budget (plan)	\$ 267,815.68	\$ 187,613.45	\$ 185,502.63	\$ 210,304.44	\$ 355,054.17	\$ 577,161.92	\$ 457,221.00	\$ 617,373.37	\$ 681,222.97
Total Annual Electric Savings (kWh) (plan)	24,689.24	30,442.48	110,909.35	43,887.81	87,789.63	169,081.22	76,961.77	106,647.47	136,188.54
\$/Annual kWh Saved (plan)	\$ 10.85	\$ 6.16	\$ 1.67	\$ 4.79	\$ 4.04	\$ 3.41	\$ 5.94	\$ 5.79	\$ 5.00
2) Total Electric Budget	\$ 267,815.68	\$ 187,613.45	\$ 185,502.63	\$ 210,304.44	\$ 355,054.17	\$ 577,161.92	\$ 457,221.00	\$ 617,373.37	\$ 681,222.97
Total kW saved	6.20	6.20	9.94	8.10	16.29	26.64	16.83	23.63	30.30
\$/kW saved (plan)	\$ 40,437.10	\$ 30,241.93	\$ 18,661.03	\$ 25,963.96	\$ 21,799.23	\$ 21,666.27	\$ 27,174.74	\$ 26,128.95	\$ 22,485.19
3) Total Electric Budget	\$ 267,815.68	\$ 187,613.45	\$ 185,502.63	\$ 210,304.44	\$ 355,054.17	\$ 577,161.92	\$ 457,221.00	\$ 617,373.37	\$ 681,222.97
Total Fuel Neutral MMBtu Saved	1,394.32	1,029.31	1,224.48	1,530.01	2,452.03	4,125.69	1,349.36	1,824.06	2,370.81
\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 192.08	\$ 182.27	\$ 151.49	\$ 137.45	\$ 144.80	\$ 139.89	\$ 338.84	\$ 338.46	\$ 287.34
<b>Actuals</b>									
1) Total Electric Spending (actual)	\$ 213,206.14	\$ 155,978.47	\$ 150,522.13	\$ 198,333.60	\$ 314,423.99				
Total Annual Electric Savings (kWh) (actu)	208,056.02	361,214.88	87,034.75	57,194.00	105,608.00				
\$/Annual kWh Saved (actual)	\$ 1.02	\$ 0.43	\$ 1.73	\$ 3.47	\$ 2.98				
2) Total Electric Spending	\$ 213,206.14	\$ 155,978.47	\$ 150,522.13	\$ 198,333.60	\$ 314,423.99				
Total kW saved	1.52	9.32	0.30	13.80	187.14				
\$/kW saved (actual)	\$ 140,107.53	\$ 16,730.56	\$ 508,674.12	\$ 14,369.57	\$ 1,680.13				
3) Total Electric Spending	\$ 213,206.14	\$ 155,978.47	\$ 150,522.13	\$ 198,333.60	\$ 314,423.99				
Total Fuel Neutral MMBtu Saved	737.17	685.57	796.59	1,709.56	1,936.06				
\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 289.22	\$ 227.52	\$ 188.96	\$ 116.01	\$ 162.40				



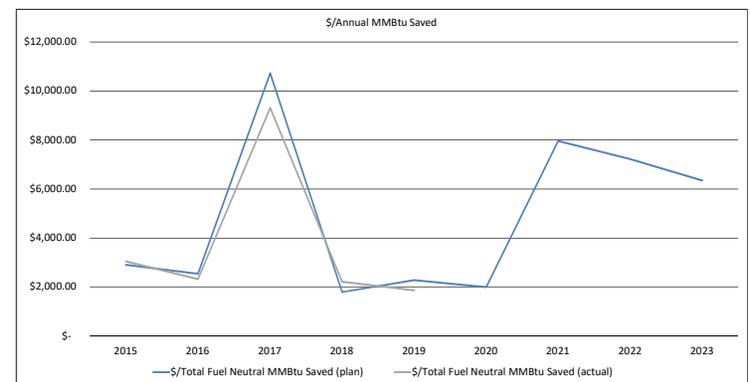
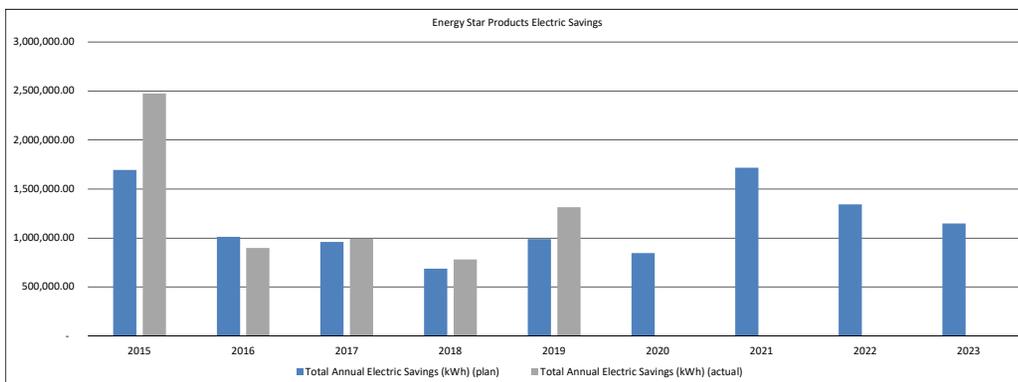
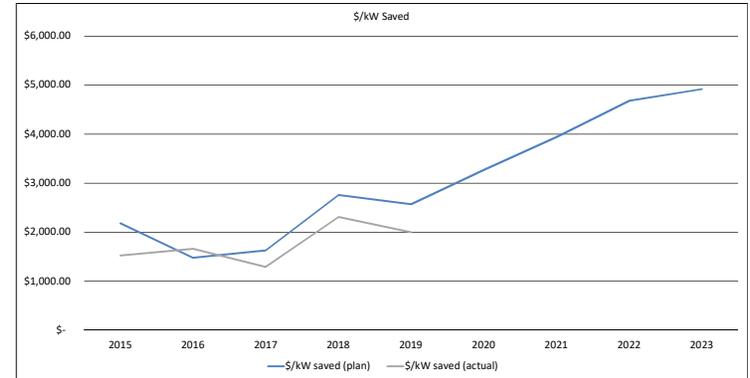
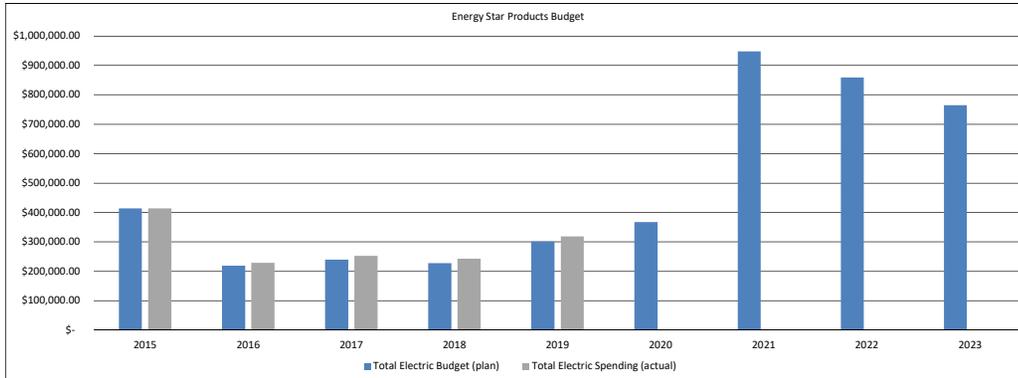
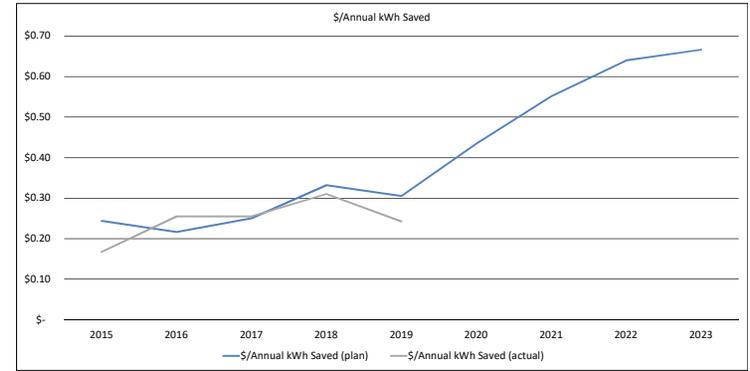
Energy Star Homes

Planned	2015	2016	2017	2018	2019	2020	2021	2022	2023
1) Total Electric Budget	\$ 129,850.03	\$ 114,652.66	\$ 120,031.11	\$ 162,234.85	\$ 185,137.81	\$ 359,195.01	\$ 270,354.00	\$ 305,660.05	\$ 317,082.71
Annual Electric Savings Plan (kWh)	42,970.69	34,754.68	49,089.91	68,431.30	329,428.18	172,775.98	111,989.77	130,653.85	153,924.42
\$/Annual kWh Plan	\$ 3.02	\$ 3.30	\$ 2.45	\$ 2.37	\$ 0.56	\$ 2.08	\$ 2.41	\$ 2.34	\$ 2.06
2) Total Electric Budget	\$ 129,850.03	\$ 114,652.66	\$ 120,031.11	\$ 162,234.85	\$ 185,137.81	\$ 359,195.01	\$ 270,354.00	\$ 305,660.05	\$ 317,082.71
Total summer peak kW Plan	10.91	9.11	0.90	14.91	76.83	39.79	1.56	1.82	3.30
\$/kW Plan	\$ 11,899.51	\$ 12,590.64	\$ 133,400.23	\$ 10,880.75	\$ 2,409.86	\$ 9,027.79	\$ 172,986.70	\$ 167,638.88	\$ 96,205.08
3) Total Electric Budget	\$ 129,850.03	\$ 114,652.66	\$ 120,031.11	\$ 162,234.85	\$ 185,137.81	\$ 359,195.01	\$ 270,354.00	\$ 305,660.05	\$ 317,082.71
Total Annual MMBtu Plan	1,186.87	888.95	1,105.64	533.16	1,171.12	1,746.11	1,885.62	2,199.88	2,514.14
\$/Annual MMBtu Plan	\$ 109.41	\$ 128.98	\$ 108.56	\$ 304.29	\$ 158.09	\$ 205.71	\$ 143.38	\$ 138.94	\$ 126.12
<b>Home Energy Assistance</b>									
Actuals	2015	2016	2017	2018	2019				
1) Total Electric Costs	\$ 149,953.01	\$ 85,986.60	\$ 53,359.58	\$ 141,967.71	\$ 167,964.07				
Annual Electric Savings Actual (kWh)	15,851.36	196,439.12	99,035.15	62,863.80	130,469.24				
\$/Annual kWh Actual	\$ 9.46	\$ 0.44	\$ 0.54	\$ 2.26	\$ 1.29				
2) Total Electric Costs	\$ 149,953.01	\$ 85,986.60	\$ 53,359.58	\$ 141,967.71	\$ 167,964.07				
Total summer peak kW Actual	1.72	64.41	0.11	12.49	3.39				
\$/kW Actual	\$ 87,032.94	\$ 1,334.91	\$ 496,168.23	\$ 11,368.13	\$ 49,501.61				
3) Total Electric Costs	\$ 149,953.01	\$ 85,986.60	\$ 53,359.58	\$ 141,967.71	\$ 167,964.07				
Total Annual MMBtu Actual	1,017.91	480.69	32.07	2,084.36	2,535.83				
\$/Annual MMBtu Actual	\$ 147.32	\$ 178.88	\$ 1,663.95	\$ 68.11	\$ 66.24				



Energy Star Products

	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Planned</b>									
1) Total Electric Budget (plan)	\$ 413,896.97	\$ 218,882.36	\$ 240,062.22	\$ 228,330.53	\$ 301,611.91	\$ 367,436.22	\$ 948,100.00	\$ 859,337.53	\$ 764,561.91
Total Annual Electric Savings (kWh) (plan)	1,694,349.54	1,010,711.22	959,637.02	687,811.49	987,874.85	844,952.37	1,716,436.79	1,341,796.08	1,147,028.26
\$/Annual kWh Saved (plan)	\$ 0.24	\$ 0.22	\$ 0.25	\$ 0.33	\$ 0.31	\$ 0.43	\$ 0.55	\$ 0.64	\$ 0.67
2) Total Electric Budget	\$ 413,896.97	\$ 218,882.36	\$ 240,062.22	\$ 228,330.53	\$ 301,611.91	\$ 367,436.22	\$ 948,100.00	\$ 859,337.53	\$ 764,561.91
Total kW saved	189.91	148.30	147.58	82.84	117.55	112.41	240.51	183.74	155.48
\$/kW saved (plan)	\$ 2,179.47	\$ 1,475.95	\$ 1,626.67	\$ 2,756.42	\$ 2,565.89	\$ 3,268.79	\$ 3,942.05	\$ 4,676.98	\$ 4,917.58
3) Total Electric Budget	\$ 413,896.97	\$ 218,882.36	\$ 240,062.22	\$ 228,330.53	\$ 301,611.91	\$ 367,436.22	\$ 948,100.00	\$ 859,337.53	\$ 764,561.91
Total Fuel Neutral MMBtu Saved	142.88	86.18	22.38	127.38	131.99	183.87	119.09	119.09	120.44
\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 2,896.73	\$ 2,539.71	\$ 10,728.47	\$ 1,792.52	\$ 2,285.09	\$ 1,998.37	\$ 7,961.11	\$ 7,216.12	\$ 6,348.11
<b>Actuals</b>									
1) Total Electric Spending (actual)	\$ 413,643.25	\$ 228,647.55	\$ 252,360.43	\$ 242,907.54	\$ 318,446.85				
Total Annual Electric Savings (kWh) (actu)	2,473,522.93	896,766.75	990,531.96	782,494.70	1,312,686.74				
\$/Annual kWh Saved (actual)	\$ 0.17	\$ 0.25	\$ 0.25	\$ 0.31	\$ 0.24				
2) Total Electric Spending	\$ 413,643.25	\$ 228,647.55	\$ 252,360.43	\$ 242,907.54	\$ 318,446.85				
Total kW saved	272.18	137.68	195.41	105.17	159.64				
\$/kW saved (actual)	\$ 1,519.74	\$ 1,660.70	\$ 1,291.44	\$ 2,309.77	\$ 1,994.77				
3) Total Electric Spending	\$ 413,643.25	\$ 228,647.55	\$ 252,360.43	\$ 242,907.54	\$ 318,446.85				
Total Fuel Neutral MMBtu Saved	135.63	98.49	27.12	109.77	170.72				
\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 3,049.87	\$ 2,321.58	\$ 9,305.12	\$ 2,212.86	\$ 1,865.35				

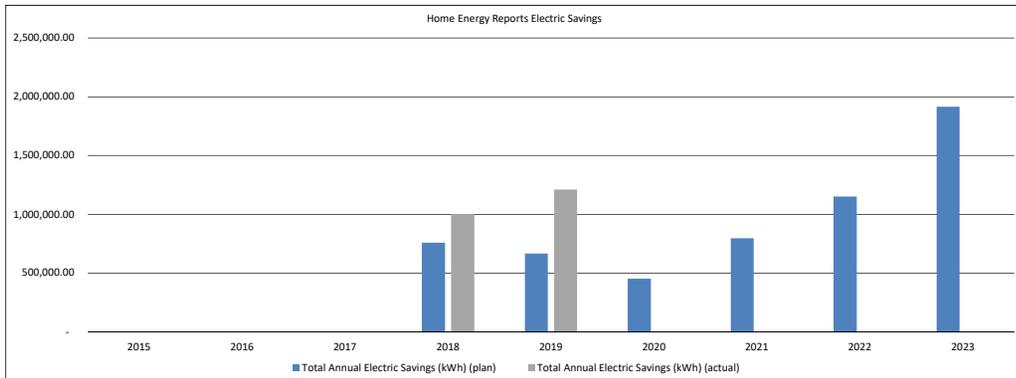
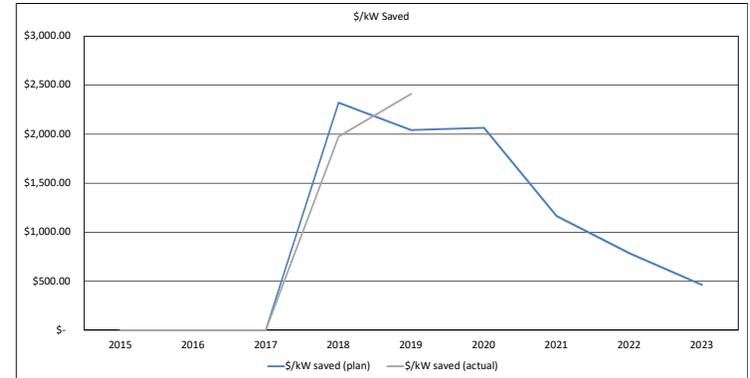
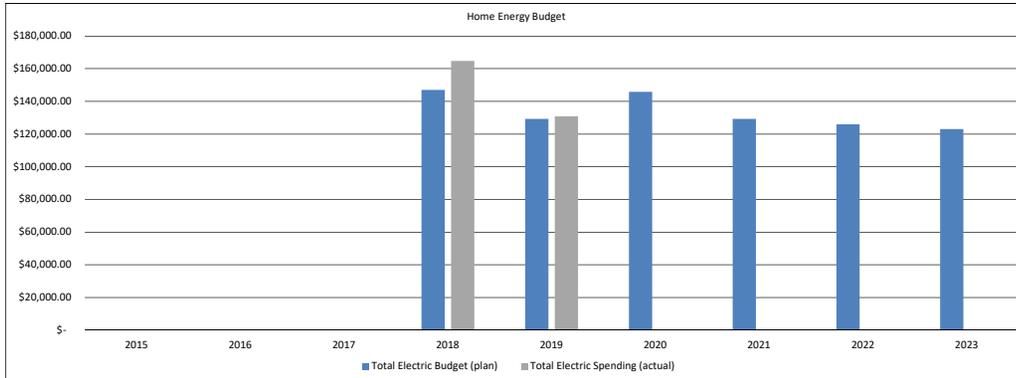
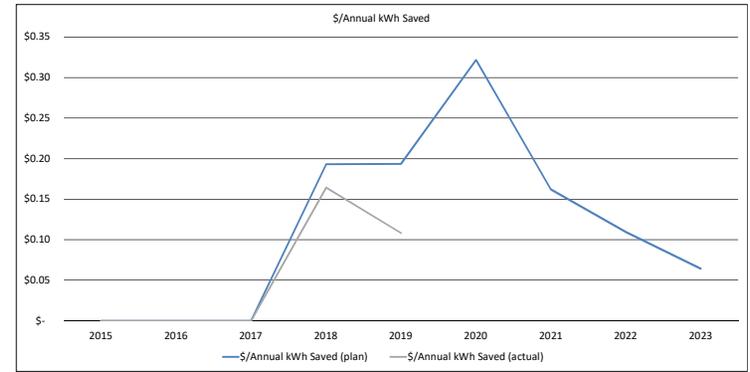


Home Energy Reports

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ -	\$ -	\$ -	\$ 146,950.00	\$ 129,300.00	\$ 145,823.39	\$ 129,227.00	\$ 126,072.64	\$ 123,001.95
	Total Annual Electric Savings (kWh) (plan)	-	-	-	760,000.00	668,000.00	453,050.35	796,253.66	1,152,690.33	1,914,000.00
	\$/Annual kWh Saved (plan)	\$ -	\$ -	\$ -	\$ 0.19	\$ 0.19	\$ 0.32	\$ 0.16	\$ 0.11	\$ 0.06
2)	Total Electric Budget	\$ -	\$ -	\$ -	\$ 146,950.00	\$ 129,300.00	\$ 145,823.39	\$ 129,227.00	\$ 126,072.64	\$ 123,001.95
	Total kW saved	-	-	-	63.33	63.33	70.68	110.88	160.51	266.52
	\$/kW saved (plan)	\$ -	\$ -	\$ -	\$ 2,320.26	\$ 2,041.58	\$ 2,063.22	\$ 1,165.49	\$ 785.45	\$ 461.51
3)	Total Electric Budget	\$ -	\$ -	\$ -	\$ 146,950.00	\$ 129,300.00	\$ 145,823.39	\$ 129,227.00	\$ 126,072.64	\$ 123,001.95
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-	-	-	-	-
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

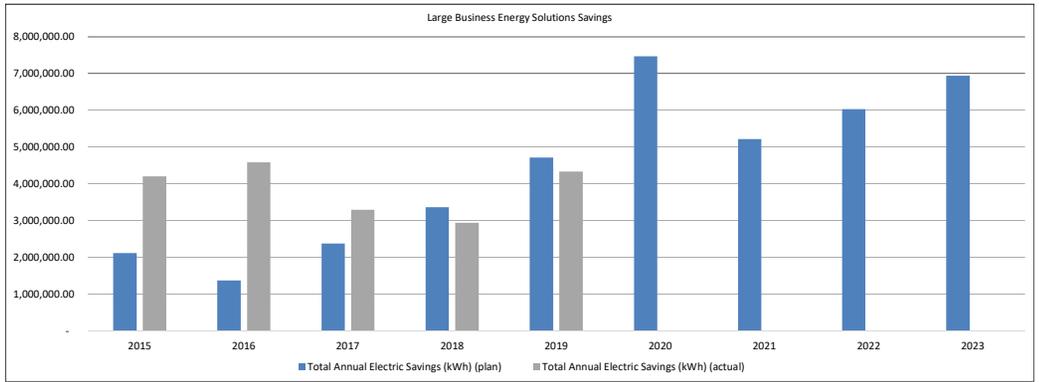
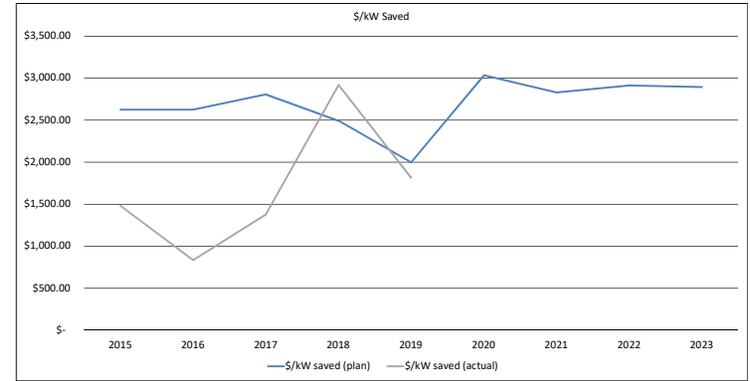
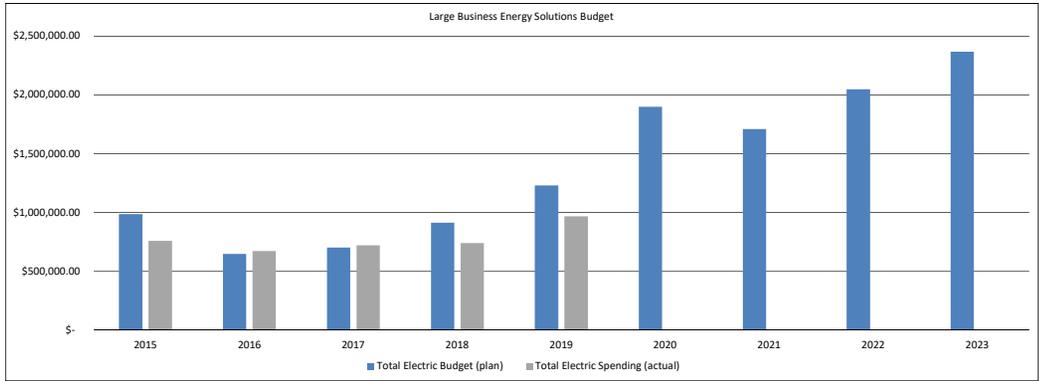
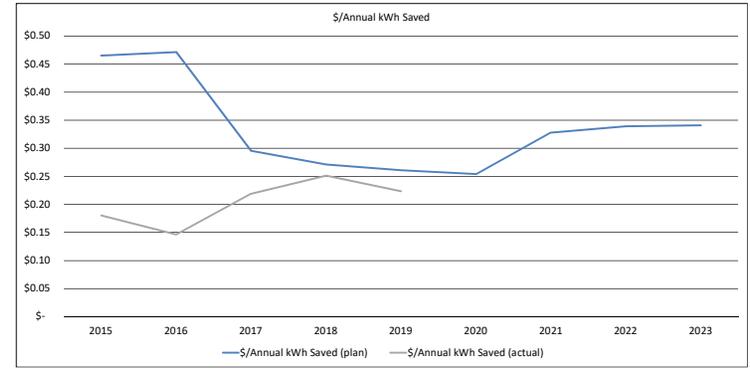
  

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ -	\$ -	\$ -	\$ 164,702.60	\$ 130,923.88
	Total Annual Electric Savings (kWh) (actu)	-	-	-	1,001,918.20	1,210,000.00
	\$/Annual kWh Saved (actual)	\$ -	\$ -	\$ -	\$ 0.16	\$ 0.11
2)	Total Electric Spending	\$ -	\$ -	\$ -	\$ 164,702.60	\$ 130,923.88
	Total kW saved	-	-	-	83.49	54.30
	\$/kW saved (actual)	\$ -	\$ -	\$ -	\$ 1,972.65	\$ 2,410.97
3)	Total Electric Spending	\$ -	\$ -	\$ -	\$ 164,702.60	\$ 130,923.88
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ -	\$ -	\$ -	\$ -	\$ -



Large Business Energy Solutions

	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Planned</b>									
1) Total Electric Budget (plan)	\$ 986,516.79	\$ 648,100.80	\$ 703,049.76	\$ 912,650.57	\$ 1,231,211.44	\$ 1,898,823.97	\$ 1,708,986.00	\$ 2,047,907.02	\$ 2,366,311.35
Total Annual Electric Savings (kWh) (plan)	2,119,438.41	1,374,366.90	2,378,148.71	3,363,034.81	4,717,156.03	7,475,706.83	5,215,407.24	6,035,949.30	6,939,182.30
\$/Annual kWh Saved (plan)	\$ 0.47	\$ 0.47	\$ 0.30	\$ 0.27	\$ 0.26	\$ 0.25	\$ 0.33	\$ 0.34	\$ 0.34
2) Total Electric Budget	\$ 986,516.79	\$ 648,100.80	\$ 703,049.76	\$ 912,650.57	\$ 1,231,211.44	\$ 1,898,823.97	\$ 1,708,986.00	\$ 2,047,907.02	\$ 2,366,311.35
Total kW saved	375.77	246.88	250.40	366.51	616.65	625.86	603.74	702.99	817.61
\$/kW saved (plan)	\$ 2,625.32	\$ 2,625.16	\$ 2,807.71	\$ 2,490.11	\$ 1,996.63	\$ 3,033.96	\$ 2,830.68	\$ 2,913.15	\$ 2,894.18
3) Total Electric Budget	\$ 986,516.79	\$ 648,100.80	\$ 703,049.76	\$ 912,650.57	\$ 1,231,211.44	\$ 1,898,823.97	\$ 1,708,986.00	\$ 2,047,907.02	\$ 2,366,311.35
Total Fuel Neutral MMBtu Saved	-	-	-	-	-	-	-	-	-
\$/Total Fuel Neutral MMBtu Saved (plan)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Actuals</b>									
1) Total Electric Spending (actual)	\$ 758,942.69	\$ 671,700.75	\$ 722,352.73	\$ 739,766.19	\$ 968,272.22				
Total Annual Electric Savings (kWh) (actu)	4,209,731.13	4,591,503.58	3,298,929.54	2,945,170.28	4,337,868.93				
\$/Annual kWh Saved (actual)	\$ 0.18	\$ 0.15	\$ 0.22	\$ 0.25	\$ 0.22				
2) Total Electric Spending	\$ 758,942.69	\$ 671,700.75	\$ 722,352.73	\$ 739,766.19	\$ 968,272.22				
Total kW saved	512.42	804.65	525.73	253.49	534.26				
\$/kW saved (actual)	\$ 1,481.09	\$ 834.77	\$ 1,374.01	\$ 2,918.28	\$ 1,812.37				
3) Total Electric Spending	\$ 758,942.69	\$ 671,700.75	\$ 722,352.73	\$ 739,766.19	\$ 968,272.22				
Total Fuel Neutral MMBtu Saved	-	-	-	-	-				
\$/Total Fuel Neutral MMBtu Saved (actu)	\$ -	\$ -	\$ -	\$ -	\$ -				

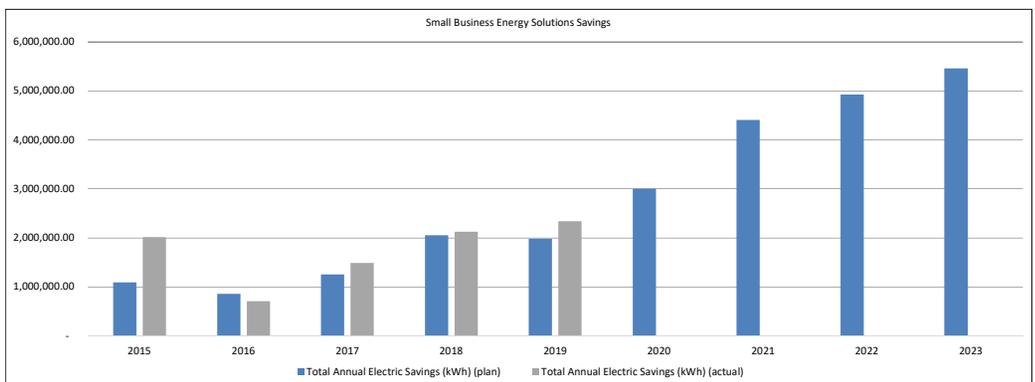
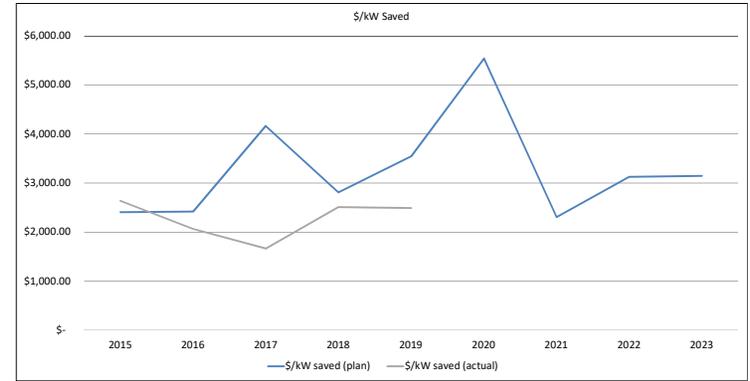
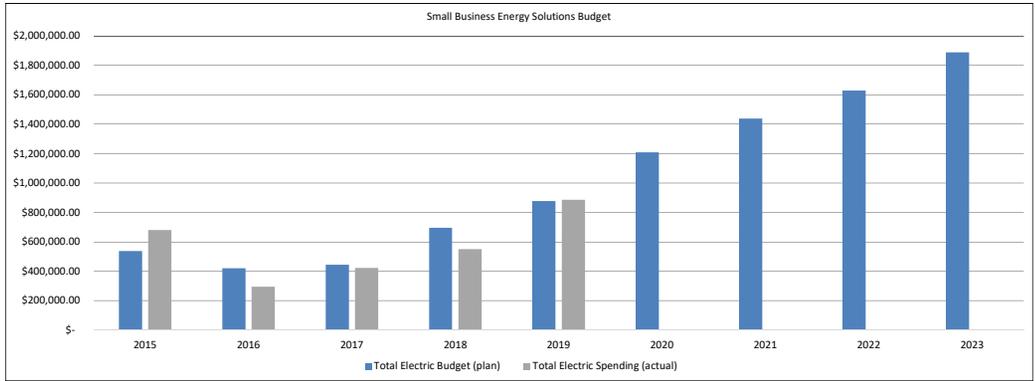
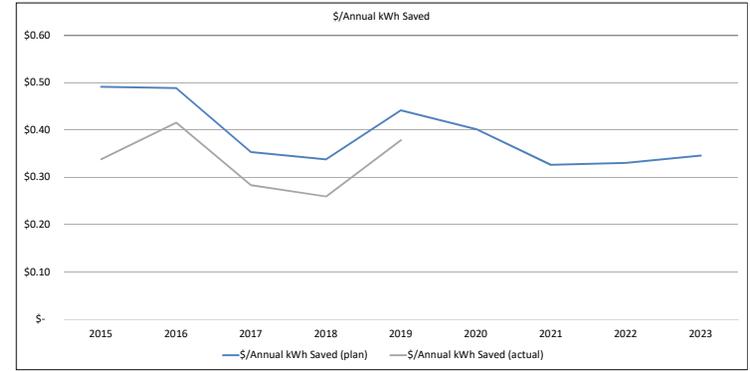


Small Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 539,501.37	\$ 421,265.52	\$ 445,264.85	\$ 695,978.13	\$ 877,784.36	\$ 1,208,871.38	\$ 1,439,054.00	\$ 1,630,026.15	\$ 1,890,112.27
	Total Annual Electric Savings (kWh) (plan)	1,097,858.23	860,961.22	1,259,303.25	2,058,733.62	1,986,225.15	3,007,126.22	4,406,229.79	4,927,488.28	5,460,402.98
	\$/Annual kWh Saved (plan)	\$ 0.49	\$ 0.49	\$ 0.35	\$ 0.34	\$ 0.44	\$ 0.40	\$ 0.33	\$ 0.33	\$ 0.35
2)	Total Electric Budget	\$ 539,501.37	\$ 421,265.52	\$ 445,264.85	\$ 695,978.13	\$ 877,784.36	\$ 1,208,871.38	\$ 1,439,054.00	\$ 1,630,026.15	\$ 1,890,112.27
	Total kW saved	224.27	173.92	106.80	247.48	247.65	218.14	623.40	521.37	600.36
	\$/kW saved (plan)	\$ 2,405.55	\$ 2,422.14	\$ 4,169.17	\$ 2,812.23	\$ 3,544.45	\$ 5,541.82	\$ 2,308.39	\$ 3,126.44	\$ 3,148.31
3)	Total Electric Budget	\$ 539,501.37	\$ 421,265.52	\$ 445,264.85	\$ 695,978.13	\$ 877,784.36	\$ 1,208,871.38	\$ 1,439,054.00	\$ 1,630,026.15	\$ 1,890,112.27
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-	-	-	-	-
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

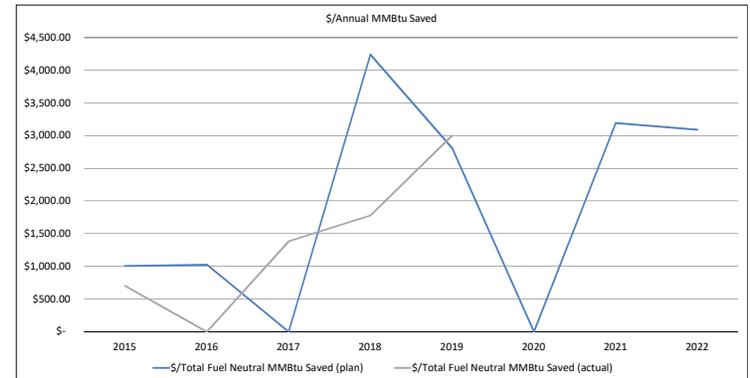
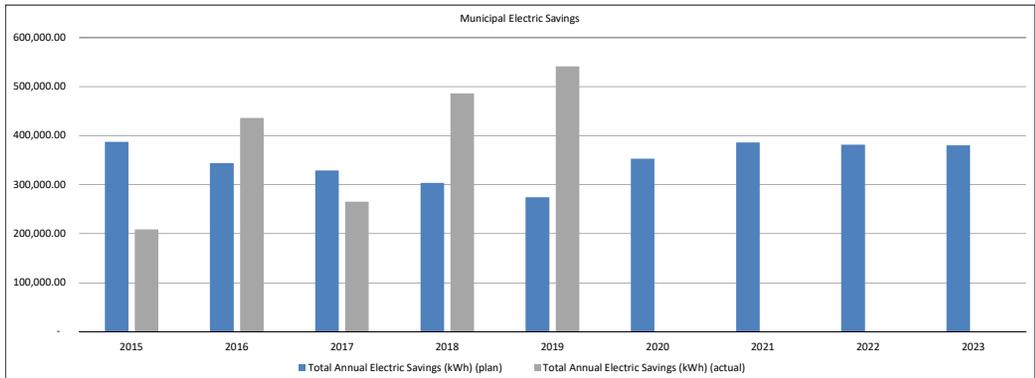
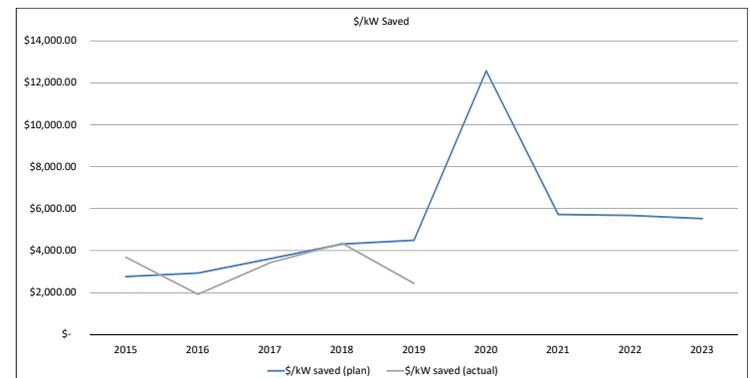
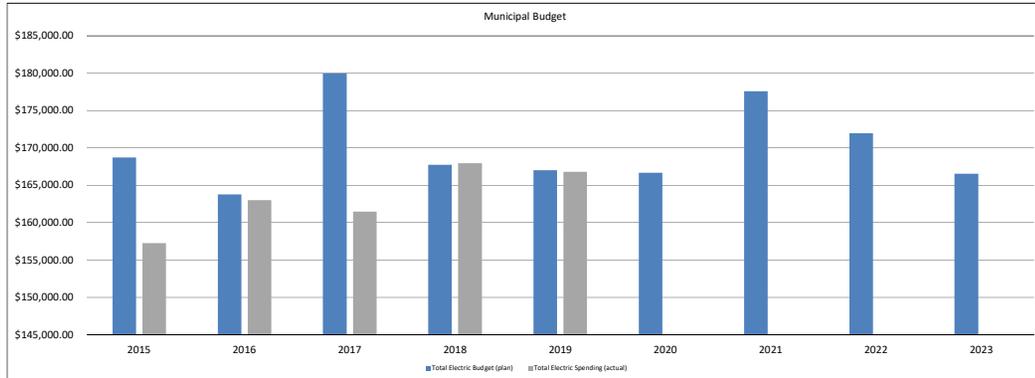
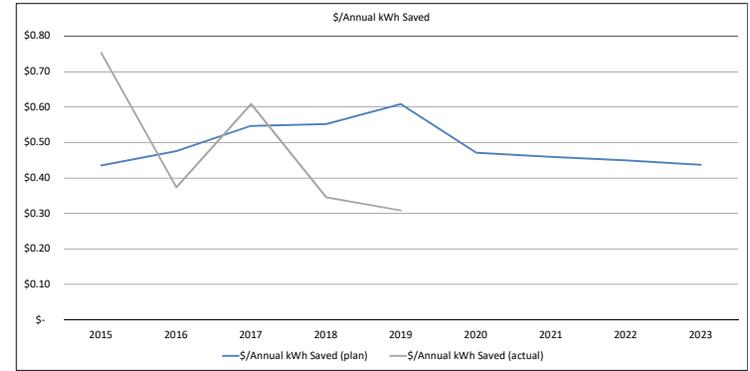
  

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 681,255.21	\$ 295,732.97	\$ 423,319.49	\$ 552,031.47	\$ 886,126.77
	Total Annual Electric Savings (kWh) (actu)	2,015,429.01	711,323.10	1,492,157.24	2,126,374.28	2,342,104.99
	\$/Annual kWh Saved (actual)	\$ 0.34	\$ 0.42	\$ 0.28	\$ 0.26	\$ 0.38
2)	Total Electric Spending	\$ 681,255.21	\$ 295,732.97	\$ 423,319.49	\$ 552,031.47	\$ 886,126.77
	Total kW saved	258.17	143.16	254.31	219.57	355.76
	\$/kW saved (actual)	\$ 2,638.78	\$ 2,065.69	\$ 1,664.55	\$ 2,514.11	\$ 2,490.81
3)	Total Electric Spending	\$ 681,255.21	\$ 295,732.97	\$ 423,319.49	\$ 552,031.47	\$ 886,126.77
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ -	\$ -	\$ -	\$ -	\$ -



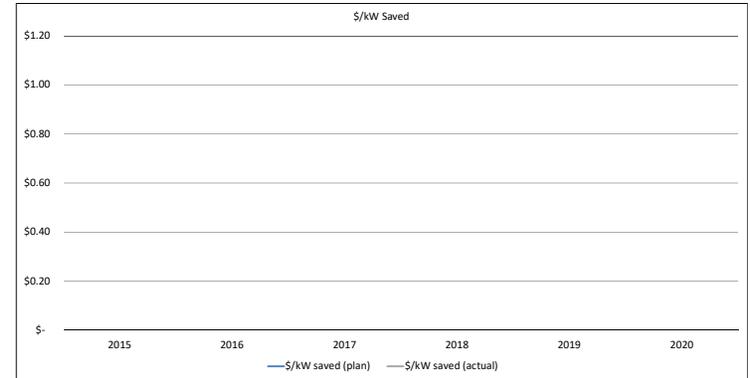
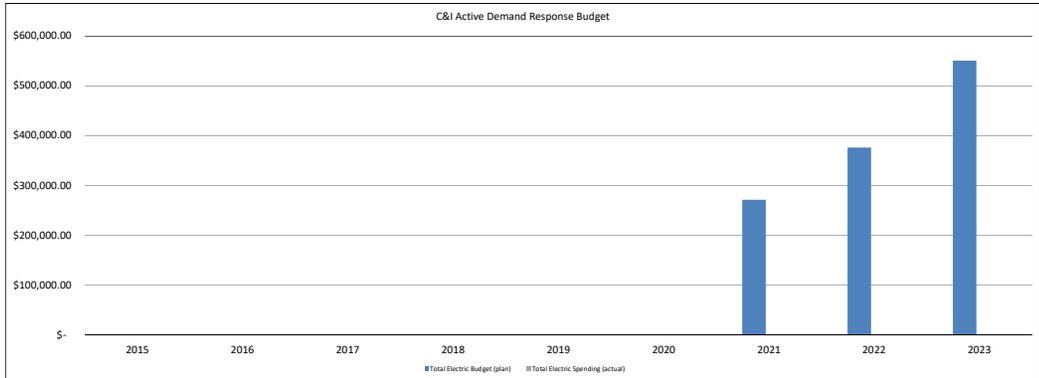
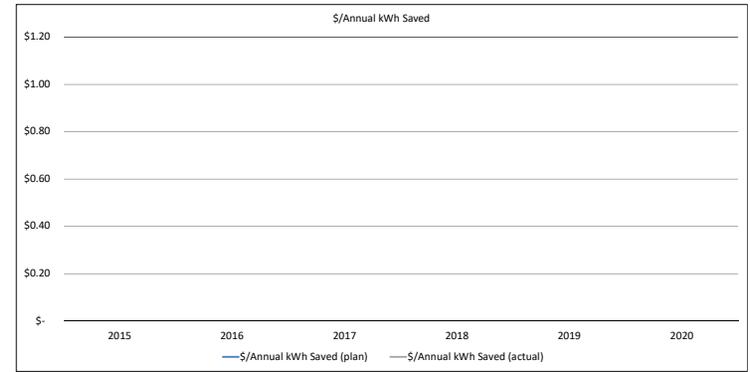
Municipal

	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Planned</b>									
1) Total Electric Budget (plan)	\$ 168,757.07	\$ 163,787.53	\$ 179,990.30	\$ 167,754.53	\$ 167,047.78	\$ 166,712.82	\$ 177,584.00	\$ 171,994.19	\$ 166,580.33
Total Annual Electric Savings (kWh) (plan)	387,462.02	344,320.92	329,094.14	303,814.79	274,539.99	353,603.33	386,378.06	381,984.72	380,730.41
\$/Annual kWh Saved (plan)	\$ 0.44	\$ 0.48	\$ 0.55	\$ 0.55	\$ 0.61	\$ 0.47	\$ 0.46	\$ 0.45	\$ 0.44
2) Total Electric Budget	\$ 168,757.07	\$ 163,787.53	\$ 179,990.30	\$ 167,754.53	\$ 167,047.78	\$ 166,712.82	\$ 177,584.00	\$ 171,994.19	\$ 166,580.33
Total kW saved	60.88	55.57	49.75	38.77	37.03	13.27	30.98	30.26	30.07
\$/kW saved (plan)	\$ 2,771.77	\$ 2,947.59	\$ 3,618.26	\$ 4,327.39	\$ 4,510.93	\$ 12,563.97	\$ 5,732.86	\$ 5,684.16	\$ 5,539.22
3) Total Electric Budget	\$ 168,757.07	\$ 163,787.53	\$ 179,990.30	\$ 167,754.53	\$ 167,047.78	\$ 166,712.82	\$ 177,584.00	\$ 171,994.19	\$ 166,580.33
Total Fuel Neutral MMBtu Saved	167.47	159.50	-	39.55	59.41	-	55.60	55.60	55.60
\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 1,007.71	\$ 1,026.91	\$ -	\$ 4,241.36	\$ 2,811.83	\$ -	\$ 3,193.96	\$ 3,093.42	\$ 2,996.05
<b>Actuals</b>									
1) Total Electric Spending (actual)	\$ 157,291.46	\$ 163,041.91	\$ 161,504.59	\$ 167,984.97	\$ 166,842.35				
Total Annual Electric Savings (kWh) (actu)	208,878.40	436,335.10	265,410.20	486,351.10	541,529.25				
\$/Annual kWh Saved (actual)	\$ 0.75	\$ 0.37	\$ 0.61	\$ 0.35	\$ 0.31				
2) Total Electric Spending	\$ 157,291.46	\$ 163,041.91	\$ 161,504.59	\$ 167,984.97	\$ 166,842.35				
Total kW saved	42.75	84.37	47.08	38.61	68.12				
\$/kW saved (actual)	\$ 3,679.72	\$ 1,932.35	\$ 3,430.31	\$ 4,350.56	\$ 2,449.23				
3) Total Electric Spending	\$ 157,291.46	\$ 163,041.91	\$ 161,504.59	\$ 167,984.97	\$ 166,842.35				
Total Fuel Neutral MMBtu Saved	224.40	-	116.80	94.50	55.60				
\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 700.94	\$ -	\$ 1,382.74	\$ 1,777.62	\$ 3,000.76				



**C&I Active Demand Response**

<b>Planned</b>		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)							\$ 271,637.00	\$ 376,893.95	\$ 550,786.13
	Total Annual Electric Savings (kWh) (plan)							-	-	-
	\$/Annual kWh Saved (plan)							\$ -	\$ -	\$ -
2)	Total Electric Budget							\$ 271,637.00	\$ 376,893.95	\$ 550,786.13
	Total kW saved							-	-	-
	\$/kW saved (plan)							\$ -	\$ -	\$ -
3)	Total Electric Budget							\$ 271,637.00	\$ 376,893.95	\$ 550,786.13
	Total Fuel Neutral MMBtu Saved							-	-	-
	\$/Total Fuel Neutral MMBtu Saved (plan)							\$ -	\$ -	\$ -
<b>Actuals</b>		2015	2016	2017	2018	2019				
1)	Total Electric Spending (actual)									
	Total Annual Electric Savings (kWh) (actual)									
	\$/Annual kWh Saved (actual)									
2)	Total Electric Spending									
	Total kW saved									
	\$/kW saved (actual)									
3)	Total Electric Spending									
	Total Fuel Neutral MMBtu Saved									
	\$/Total Fuel Neutral MMBtu Saved (actual)									



Program Cost-Effectiveness - 2021 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.25	0.11	1.31	1,757.9	160.0	1,835.5	1,401.0	-	134.0	1,882.2	28.4	10.7	90	1,952.2	47,147.1
A1 - Energy Star Homes	6.64	0.73	6.41	4,451.4	488.9	5,130.8	670.1	130.1	313.7	7,779.9	83.7	2.6	100	4,919.1	121,187.6
A2 - Home Performance with Energy Star	2.64	0.21	2.51	2,965.7	241.2	3,378.8	1,122.1	222.7	196.0	3,316.8	60.5	2.3	166	5,196.1	102,873.9
A3 - Energy Star Products	1.70	1.35	2.30	2,548.2	2,027.9	3,575.6	1,497.2	58.8	2,767.8	18,370.9	507.3	414.4	51,969	424.2	5,939.4
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	6.0	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	46.4	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.47</b>	<b>0.62</b>	<b>2.70</b>	<b>11,723.2</b>	<b>2,918.0</b>	<b>13,920.7</b>	<b>4,742.9</b>	<b>411.6</b>	<b>3,411.5</b>	<b>31,349.9</b>	<b>679.9</b>	<b>430.0</b>	<b>52,325</b>	<b>12,491.6</b>	<b>277,148.0</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.79	1.79	1.25	1,782.0	1,782.0	2,667.5	996.2	1,142.1	2,982.0	38,770.2	152.7	191.9	31	-	-
C2 - Small Business Energy Solutions	3.07	3.07	2.78	3,181.8	3,181.8	4,973.8	1,036.1	752.3	2,588.8	34,557.9	326.6	252.5	210	-	-
C3 - Municipal Energy Solutions	1.77	1.14	1.27	289.4	185.9	396.9	163.3	149.7	161.8	2,129.1	15.7	18.3	15	126.8	3,170.4
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	14.0	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	46.4	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.33</b>	<b>2.28</b>	<b>1.87</b>	<b>5,253.3</b>	<b>5,149.8</b>	<b>8,038.3</b>	<b>2,256.0</b>	<b>2,044.1</b>	<b>5,732.5</b>	<b>75,457.3</b>	<b>494.9</b>	<b>462.8</b>	<b>256</b>	<b>126.8</b>	<b>3,170.4</b>
C6e - Smart Start	-	-	-	-	-	-	5.4	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.42</b>	<b>1.15</b>	<b>2.32</b>	<b>16,976.5</b>	<b>8,067.7</b>	<b>21,959.0</b>	<b>7,004.4</b>	<b>2,455.7</b>	<b>9,144.0</b>	<b>106,807.1</b>	<b>1,174.8</b>	<b>892.7</b>	<b>52,581</b>	<b>12,618.4</b>	<b>280,318.5</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars.

<b>Annual kWh Savings</b>	9,144,021	71.2%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	106,807,115	56.5%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>3,698,097</u>	<u>28.8%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>82,153,236</u>	<u>43.5%</u>	
	<b>12,842,118</b>	100.0%			<b>188,960,351</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.20%	<b>Spending per Customer</b>	Low-Income	\$	577.99
			Residential	\$	48.37
			C&I	\$	55.84

Program Cost-Effectiveness - 2022 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.41	0.10	1.46	1,956.0	134.0	2,023.4	1,389.8	-	111.9	1,644.9	27.4	6.7	102	2,119.4	51,766.7
A1 - Energy Star Homes	7.01	0.76	6.77	4,604.6	502.2	5,299.7	657.1	126.0	313.7	7,779.9	83.7	2.6	100	4,919.1	121,187.6
A2 - Home Performance with Energy Star	2.64	0.21	2.49	3,209.3	258.8	3,652.2	1,215.9	249.1	204.2	3,475.0	63.1	2.4	174	5,408.7	107,368.8
A3 - Energy Star Products	1.89	1.43	2.30	2,155.5	1,623.1	2,963.8	1,137.7	148.2	1,646.9	14,372.3	264.8	257.3	28,368	424.2	5,939.4
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	48.5	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.68</b>	<b>0.57</b>	<b>2.80</b>	<b>11,925.4</b>	<b>2,518.1</b>	<b>13,939.1</b>	<b>4,449.0</b>	<b>523.3</b>	<b>2,276.7</b>	<b>27,272.2</b>	<b>439.0</b>	<b>269.0</b>	<b>28,744</b>	<b>12,871.5</b>	<b>286,262.5</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.77	1.77	1.21	1,826.9	1,826.9	2,725.9	1,035.0	1,220.6	2,991.3	38,891.5	153.1	192.5	31	-	-
C2 - Small Business Energy Solutions	3.18	3.18	2.78	3,838.8	3,838.8	5,929.4	1,208.3	922.9	2,970.9	39,647.1	392.5	319.5	240	-	-
C3 - Municipal Energy Solutions	1.73	1.06	1.25	274.4	167.2	371.8	158.2	140.2	143.1	1,882.9	13.7	16.0	15	126.8	3,170.4
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	48.5	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.42</b>	<b>2.38</b>	<b>1.91</b>	<b>5,940.1</b>	<b>5,833.0</b>	<b>9,027.1</b>	<b>2,449.9</b>	<b>2,283.7</b>	<b>6,105.3</b>	<b>80,421.5</b>	<b>559.3</b>	<b>528.0</b>	<b>286</b>	<b>126.8</b>	<b>3,170.4</b>
C6e - Smart Start	-	-	-	-	-	-	5.2	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.59</b>	<b>1.21</b>	<b>2.36</b>	<b>17,865.5</b>	<b>8,351.1</b>	<b>22,966.3</b>	<b>6,904.2</b>	<b>2,807.0</b>	<b>8,382.0</b>	<b>107,693.7</b>	<b>998.3</b>	<b>797.0</b>	<b>29,030</b>	<b>12,998.3</b>	<b>289,432.9</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars.

<b>Annual kWh Savings</b>	8,382,009	68.8%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	107,693,705	55.9%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>3,809,428</u>	<u>31.2%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>84,824,415</u>	<u>44.1%</u>	
	<b>12,191,438</b>	100.0%			<b>192,518,120</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.10%	<b>Spending per Customer</b>	Low-Income	\$	573.33
			Residential	\$	44.28
			C&I	\$	60.64

Program Cost-Effectiveness - 2023 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021)\$ <sup>2</sup>	Customer Costs (\$000 - 2021)\$ <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.62	0.15	1.70	2,163.9	195.4	2,263.1	1,332.0	-	154.3	2,390.2	40.5	7.0	102	2,225.4	54,355.0
A1 - Energy Star Homes	7.37	0.80	7.12	4,752.5	517.3	5,462.7	644.8	122.1	313.7	7,779.9	83.7	2.6	100	4,919.1	121,187.6
A2 - Home Performance with Energy Star	2.62	0.21	2.46	3,464.7	279.1	3,938.7	1,323.5	278.7	213.0	3,641.3	65.7	2.6	183	5,632.0	112,088.3
A3 - Energy Star Products	2.26	1.66	2.36	2,034.1	1,489.7	2,759.1	898.6	270.7	1,134.7	12,806.4	153.6	187.3	8,811	424.2	5,939.4
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	5.8	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	18.3	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.94</b>	<b>0.59</b>	<b>2.95</b>	<b>12,415.2</b>	<b>2,481.5</b>	<b>14,423.5</b>	<b>4,223.0</b>	<b>671.5</b>	<b>1,815.7</b>	<b>26,617.8</b>	<b>343.5</b>	<b>199.5</b>	<b>9,197</b>	<b>13,200.7</b>	<b>293,570.4</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.96	1.96	1.33	1,977.5	1,977.5	2,949.7	1,008.0	1,203.3	3,114.7	40,488.3	156.0	196.1	31	-	-
C2 - Small Business Energy Solutions	3.27	3.27	2.86	3,611.0	3,611.0	5,596.7	1,103.9	850.7	2,817.4	37,377.8	356.9	274.8	205	-	-
C3 - Municipal Energy Solutions	1.71	0.99	1.23	261.9	151.3	350.4	153.2	130.9	126.3	1,662.3	12.0	13.9	14	126.8	3,170.4
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	13.5	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	22.7	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.54</b>	<b>2.49</b>	<b>1.98</b>	<b>5,850.3</b>	<b>5,739.7</b>	<b>8,896.8</b>	<b>2,301.3</b>	<b>2,184.9</b>	<b>6,058.4</b>	<b>79,528.3</b>	<b>524.9</b>	<b>484.7</b>	<b>250</b>	<b>126.8</b>	<b>3,170.4</b>
C6e - Smart Start	-	-	-	-	-	-	4.7	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.80</b>	<b>1.26</b>	<b>2.48</b>	<b>18,265.5</b>	<b>8,221.2</b>	<b>23,320.3</b>	<b>6,528.9</b>	<b>2,856.4</b>	<b>7,874.0</b>	<b>106,146.1</b>	<b>868.4</b>	<b>684.2</b>	<b>9,447</b>	<b>13,327.5</b>	<b>296,740.8</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars.

<b>Annual kWh Savings</b>	7,874,009	66.8%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	106,146,129	55.0%	<b>kWh &lt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	3,905,912	33.2%		<b>Lifetime MMBTU Savings (in kWh)</b>	86,966,155	45.0%	
	<b>11,779,921</b>	100.0%			<b>193,112,284</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.03%	<b>Spending per Customer</b>	Low-Income	\$	549.50
			Residential	\$	41.85
			C&I	\$	56.96

**Program Cost-Effectiveness - 2021-2023 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.43	0.12	1.48	5,877.9	489.4	6,121.9	4,122.8	-	400.1	5,917.3	96.2	24.4	294	6,297.0	153,268.8
A1 - Energy Star Homes	7.00	0.76	6.76	13,808.4	1,508.3	15,893.2	1,972.0	378.2	941.2	23,339.7	251.2	7.8	301	14,757.3	363,562.8
A2 - Home Performance with Energy Star	2.63	0.21	2.49	9,639.7	779.1	10,969.7	3,661.5	750.5	613.2	10,433.1	189.3	7.3	523	16,236.8	322,331.0
A3 - Energy Star Products	1.91	1.45	2.32	6,737.8	5,140.7	9,298.5	3,533.6	477.7	5,549.4	45,549.7	925.7	859.0	89,148	1,272.7	17,818.2
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	11.8	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	113.2	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.69</b>	<b>0.59</b>	<b>2.81</b>	<b>36,063.7</b>	<b>7,917.6</b>	<b>42,283.4</b>	<b>13,414.9</b>	<b>1,606.4</b>	<b>7,503.9</b>	<b>85,239.9</b>	<b>1,462.4</b>	<b>898.5</b>	<b>90,266</b>	<b>38,563.8</b>	<b>856,980.9</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.84	1.84	1.26	5,586.4	5,586.4	8,343.1	3,039.1	3,566.0	9,087.9	118,150.0	461.7	580.5	93	-	-
C2 - Small Business Energy Solutions	3.18	3.18	2.81	10,631.6	10,631.6	16,499.9	3,348.3	2,525.9	8,377.1	111,582.7	1,076.0	846.8	655	-	-
C3 - Municipal Energy Solutions	1.74	1.06	1.25	825.7	504.4	1,119.2	474.7	420.8	431.1	5,674.3	41.4	48.2	44	380.5	9,511.3
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	27.5	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	117.6	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.43</b>	<b>2.39</b>	<b>1.92</b>	<b>17,043.7</b>	<b>16,722.4</b>	<b>25,962.2</b>	<b>7,007.2</b>	<b>6,512.7</b>	<b>17,896.2</b>	<b>235,407.1</b>	<b>1,579.1</b>	<b>1,475.5</b>	<b>792</b>	<b>380.5</b>	<b>9,511.3</b>
C6e - Smart Start	-	-	-	-	-	-	15.4	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.60</b>	<b>1.21</b>	<b>2.39</b>	<b>53,107.4</b>	<b>24,640.0</b>	<b>68,245.6</b>	<b>20,437.5</b>	<b>8,119.2</b>	<b>25,400.0</b>	<b>320,646.9</b>	<b>3,041.6</b>	<b>2,374.0</b>	<b>91,058</b>	<b>38,944.3</b>	<b>866,492.2</b>

**Notes:**

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars.

<b>Annual kWh Savings</b>	25,400,039	69.0%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	320,646,949	55.8%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>11,413,438</u>	31.0%		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>253,943,806</u>	44.2%	
	<b>36,813,477</b>	100.0%			<b>574,590,755</b>	100.0%	

<b>Cumulative Savings as a % of 2019 Sales</b>	3.32%	<b>Spending per Customer</b>	Low-Income	\$	1,700.82
			Residential	\$	134.50
			C&I	\$	173.43

Present Value Benefits - 2021 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)											Non-Resource Benefits (\$000)			Environmental Benefits (\$000)			
	Granite State Test	Utility Cost Test	Secondary Granite State Test	CAPACITY					ENERGY				Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits		Total Non-Resource Benefits		
				Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak	Summer Peak	Summer Off Peak	Electric DRIPE	Total Electric Benefit						Other Fuels	Water Benefit
<b>Residential Programs</b>																					
B1 - Home Energy Assistance	\$ 1,758	\$ 160	\$ 1,835	\$ 8	\$ -	\$ 9	\$ 8	\$ -	\$ 53	\$ 58	\$ 8	\$ 8	\$ 7	\$ 160	\$ 990	\$ 4	\$ 1,154	\$ 72	\$ 531	\$ 604	\$ 78
A1 - Energy Star Homes	\$ 4,451	\$ 489	\$ 5,131	\$ 5	\$ -	\$ 5	\$ 4	\$ -	\$ 208	\$ 243	\$ 3	\$ 3	\$ 18	\$ 489	\$ 3,750	\$ 7	\$ 4,246	\$ 205	\$ 424	\$ 629	\$ 256
A2 - Home Performance with Energy Star	\$ 2,966	\$ 241	\$ 3,379	\$ 0	\$ -	\$ 0	\$ 0	\$ -	\$ 105	\$ 124	\$ 0	\$ 0	\$ 11	\$ 241	\$ 2,567	\$ -	\$ 2,808	\$ 158	\$ 281	\$ 439	\$ 132
A3 - Energy Star Products	\$ 2,548	\$ 2,028	\$ 3,576	\$ 215	\$ -	\$ 260	\$ 225	\$ -	\$ 449	\$ 400	\$ 210	\$ 162	\$ 107	\$ 2,028	\$ 108	\$ 405	\$ 2,540	\$ 8	\$ 214	\$ 221	\$ 814
A6b - Res ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Residential</b>	<b>\$ 11,723</b>	<b>\$ 2,918</b>	<b>\$ 13,921</b>	<b>\$ 228</b>	<b>\$ -</b>	<b>\$ 274</b>	<b>\$ 238</b>	<b>\$ -</b>	<b>\$ 815</b>	<b>\$ 825</b>	<b>\$ 222</b>	<b>\$ 172</b>	<b>\$ 144</b>	<b>\$ 2,918</b>	<b>\$ 7,414</b>	<b>\$ 416</b>	<b>\$ 10,748</b>	<b>\$ 444</b>	<b>\$ 1,449</b>	<b>\$ 1,893</b>	<b>\$ 1,279</b>
<b>Commercial/Industrial Programs</b>																					
C1 - Large Business Energy Solutions	\$ 1,782	\$ 1,782	\$ 2,668	\$ 203	\$ -	\$ 226	\$ 196	\$ -	\$ 365	\$ 203	\$ 329	\$ 157	\$ 102	\$ 1,782	\$ -	\$ -	\$ 1,782	\$ -	\$ 178	\$ 178	\$ 707
C2 - Small Business Energy Solutions	\$ 3,182	\$ 3,182	\$ 4,974	\$ 272	\$ -	\$ 302	\$ 262	\$ -	\$ 721	\$ 508	\$ 587	\$ 379	\$ 150	\$ 3,182	\$ -	\$ -	\$ 3,182	\$ -	\$ 318	\$ 318	\$ 1,474
C3 - Municipal Energy Solutions	\$ 289	\$ 186	\$ 397	\$ 19	\$ -	\$ 22	\$ 19	\$ -	\$ 39	\$ 24	\$ 35	\$ 19	\$ 9	\$ 186	\$ 98	\$ -	\$ 284	\$ 5	\$ 28	\$ 34	\$ 79
C6b - C&I ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Commercial &amp; Industrial</b>	<b>\$ 5,253</b>	<b>\$ 5,150</b>	<b>\$ 8,038</b>	<b>\$ 494</b>	<b>\$ -</b>	<b>\$ 550</b>	<b>\$ 477</b>	<b>\$ -</b>	<b>\$ 1,126</b>	<b>\$ 735</b>	<b>\$ 951</b>	<b>\$ 555</b>	<b>\$ 261</b>	<b>\$ 5,150</b>	<b>\$ 98</b>	<b>\$ -</b>	<b>\$ 5,248</b>	<b>\$ 5</b>	<b>\$ 525</b>	<b>\$ 530</b>	<b>\$ 2,260</b>
C6e - Smart Start	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total</b>	<b>\$ 16,976</b>	<b>\$ 8,068</b>	<b>\$ 21,959</b>	<b>\$ 722</b>	<b>\$ -</b>	<b>\$ 824</b>	<b>\$ 714</b>	<b>\$ -</b>	<b>\$ 1,940</b>	<b>\$ 1,561</b>	<b>\$ 1,174</b>	<b>\$ 727</b>	<b>\$ 405</b>	<b>\$ 8,068</b>	<b>\$ 7,512</b>	<b>\$ 416</b>	<b>\$ 15,996</b>	<b>\$ 449</b>	<b>\$ 1,974</b>	<b>\$ 2,423</b>	<b>\$ 3,540</b>







Portfolio Planned Versus Actual Performance - 2021										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	106,807,115	69,424,625		-	1.925%	-	\$ 134,730	\$ 168,412	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	9,144,021	5,943,614		-	0.550%	-	\$ 38,494	\$ 48,118	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	893	580		-	0.660%	-	\$ 46,193	\$ 57,741	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	1,175	764		-	0.440%	-	\$ 30,795	\$ 38,494	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	-	-		-	0.000%	-	\$ -	\$ -	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 15,996,263			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 6,998,953			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 8,997,310	\$ 5,848,252	\$ -	-	1.925%	-	\$ 134,730	\$ 168,412	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 384,942	\$ 481,178	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 16,976,465		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 384,942	\$ -	from row 9 above
12 Total Utility Costs	\$ 6,998,953	\$ -	from row 7 above
13 Portfolio GST BCR	2.30	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

Portfolio Planned Versus Actual Performance - 2022										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of			Source
					Coefficient	Coefficient	Planned PI	Planned PI	Actual PI	
1 Lifetime kWh Savings	107,693,705	70,000,908		-	1.925%	-	\$ 132,805	\$ 166,006	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	8,382,009	5,448,306		-	0.550%	-	\$ 37,944	\$ 47,430	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	797	518		-	0.660%	-	\$ 45,533	\$ 56,916	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	998	649		-	0.440%	-	\$ 30,355	\$ 37,944	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	-	-		-	0.000%	-	\$ -	\$ -	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 16,752,375			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 6,898,936			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 9,853,439	\$ 6,404,735	\$ -	-	1.925%	-	\$ 132,805	\$ 166,006	\$ -	Line 5 minus line 6
9 Total				-	5.500%	-	\$ 379,441	\$ 474,302	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 17,865,479		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 379,441	\$ -	from row 9 above
12 Total Utility Costs	\$ 6,898,936	\$ -	from row 7 above
13 Portfolio GST BCR	2.45	-	row 10 divided by rows 11+12

Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2022\$) is \$391,773.31.

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

Portfolio Planned Versus Actual Performance - 2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of			Source
					Coefficient	Coefficient	Planned PI	Planned PI	Actual PI	
1 Lifetime kWh Savings	106,146,129	68,994,984		-	1.925%	-	\$ 125,592	\$ 156,990	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	7,874,009	5,118,106		-	0.550%	-	\$ 35,883	\$ 44,854	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	684	445		-	0.660%	-	\$ 43,060	\$ 53,825	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	868	564		-	0.440%	-	\$ 28,707	\$ 35,883	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	-	-		-	0.000%	-	\$ -	\$ -	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 17,055,460			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 6,524,240			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 10,531,219	\$ 6,845,293	\$ -	-	1.925%	-	\$ 125,592	\$ 156,990	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 358,833	\$ 448,542	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 18,265,473		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 358,833	\$ -	from row 9 above
12 Total Utility Costs	\$ 6,524,240	\$ -	from row 7 above
13 Portfolio GST BCR	2.65	-	row 10 divided by rows 11+12

Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2023\$) is \$382,536.39.

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

Portfolio Planned Versus Actual Performance - 2021-2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design	Actual	125% of		Actual PI	Source
					Coefficient	Coefficient	Planned PI	Planned PI		
1 Lifetime kWh Savings	320,646,949	208,420,517		-	1.925%	-	\$ 393,126	\$ 491,407	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	25,400,039	16,510,026		-	0.550%	-	\$ 112,322	\$ 140,402	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	2,374	1,543		-	0.660%	-	\$ 134,786	\$ 168,483	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	3,042	1,977		-	0.440%	-	\$ 89,857	\$ 112,322	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	-	-		-	0.000%	-	\$ -	\$ -	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 49,804,098			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1,2</sup>	\$ 20,422,129			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 29,381,969	\$ 19,098,280	\$ -	-	1.925%	-	\$ 393,126	\$ 491,407	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 1,123,217	\$ 1,404,021	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 53,107,416		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 1,123,217	\$ -	from row 9 above
12 Total Utility Costs	\$ 20,422,129	\$ -	from row 7 above
13 Portfolio GST BCR	2.46	-	row 10 divided by rows 11+12

*Costs, Benefits, and PI Expressed in 2021 Dollars. Three-year nominal PI is \$1,159,252.11.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

<sup>2</sup> Net of Smart Start

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
B1a - HEA (Weatherization)	Air Sealing, Cord Wood	E21B1a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Electric	E21B1a002	83	94	99	12.4	14.1	14.8	186.7	211.2	221.7	4.0	4.5	4.7	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Gas	E21B1a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Kerosene	E21B1a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Oil	E21B1a005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Propane	E21B1a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Wood Pellets	E21B1a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Electric	E21B1a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Gas	E21B1a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Kerosene	E21B1a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Oil	E21B1a012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Propane	E21B1a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Electric	E21B1a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Gas	E21B1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Kerosene	E21B1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Oil	E21B1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Propane	E21B1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Cord Wood	E21B1a022	90	102	107	-	-	-	-	-	-	-	-	-	-	-	-	367.2	415.2	436.0	9,179.6	10,381.2	10,900.2
B1a - HEA (Weatherization)	Insulation, Electric	E21B1a023	84	95	100	31.3	35.3	37.1	781.4	883.7	927.9	9.9	11.2	11.8	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Gas	E21B1a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Kerosene	E21B1a025	90	102	107	-	-	-	-	-	-	-	-	-	-	-	-	606.6	686.0	720.3	15,164.0	17,148.9	18,006.3
B1a - HEA (Weatherization)	Insulation, Oil	E21B1a026	90	102	107	-	-	-	-	-	-	-	-	-	-	-	-	364.2	411.9	432.5	9,106.2	10,298.2	10,813.1
B1a - HEA (Weatherization)	Insulation, Propane	E21B1a027	90	102	107	-	-	-	-	-	-	-	-	-	-	-	-	188.9	213.6	224.3	4,722.0	5,340.1	5,607.1
B1a - HEA (Weatherization)	Insulation, Wood Pellets	E21B1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Electric	E21B1a030	69	78	82	11.8	13.3	14.0	82.5	93.3	98.0	2.3	2.6	2.8	0.9	1.0	1.1	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Gas	E21B1a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Kerosene	E21B1a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Oil	E21B1a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Propane	E21B1a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Electric	E21B1a037	27	30	32	3.3	3.8	4.0	50.0	56.5	59.3	0.7	0.7	0.8	0.3	0.3	0.3	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Gas	E21B1a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Kerosene	E21B1a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Oil	E21B1a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Propane	E21B1a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	DHW Heat Pump Water Heater	E21B1a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, General Service Lamps	E21B1a044	479	542	569	15.4	17.4	18.3	30.8	34.8	36.5	3.3	3.8	3.9	2.1	2.4	2.5	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Linear	E21B1a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Other Specialty	E21B1a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Reflector	E21B1a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Fixture	E21B1a048	23	26	28	0.8	0.9	0.9	1.6	1.8	1.9	0.2	0.2	0.2	0.1	0.1	0.1	-	-	-	-	-	-
B1a - HEA (Weatherization)	Refrigerator	E21B1a049	83	32	34	52.0	20.3	21.3	624.2	243.0	255.2	5.9	2.3	2.4	7.3	2.8	3.0	-	-	-	-	-	-
B1a - HEA (Weatherization)	Freezer	E21B1a050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Clothes Washer	E21B1a051	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Clothes Dryer	E21B1a052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Dehumidifier	E21B1a053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Room Air Conditioner	E21B1a054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Triple Pane Window	E21B1a055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Visual Audit	E21B1a056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Baseload Audit - SF	E21B1a057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Baseload Audit - MF	E21B1a058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Income Kits	E21B1a059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Boiler Replacement, Gas	E21B1b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Boiler Replacement, Kerosene	E21B1b002	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	8.6	8.7	9.1	214.6	217.6	228.5
B1b - HEA (HVAC Systems)	Boiler Replacement, Oil	E21B1b003	6	10	10	0.4	0.7	0.7	10.3	16.9	17.7	0.1	0.2	0.2	-	-	-	85.3	140.2	147.2	2,133.1	3,505.2	3,680.4
B1b - HEA (HVAC Systems)	Boiler Replacement, Propane	E21B1b004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Furnace Replacement, Gas	E21B1b005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Furnace Replacement, Kerosene	E21B1b006	7	6	6	0.6	0.4	0.5	11.8	9.0	9.4	0.2	0.1	0.1	-	-	-	63.3	48.4	50.8	1,265.1	967.4	1,015.7
B1b - HEA (HVAC Systems)	Furnace Replacement, Oil	E21B1b007	15	10	11	2.3	1.6	1.7	45.1	31.7	33.3	0.7	0.5	0.5	-	-	-	223.2	157.1	164.9	4,464.7	3,141.1	3,298.2
B1b - HEA (HVAC Systems)	Furnace Replacement, Propane	E21B1b008	3	3	3	0.5	0.4	0.4	9.0	7.7	8.1	0.1	0.1	0.1	-	-	-	44.9	38.4	40.3	897.8	767.1	805.4
B1b - HEA (HVAC Systems)	Programmable Thermostat, Electric	E21B1b009	44	49	52	3.3	3.7	3.9	49.0	55.4	58.1	1.0	1.2	1.2	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Programmable Thermostat, Gas	E21B1b010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Programmable Thermostat, Kerosene	E21B1b011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Programmable Thermostat, Oil	E21B1b012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Programmable Thermostat, Propane	E21B1b013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Programmable Thermostat, Wood Pellets	E21B1b014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1b - HEA (HVAC Systems)	Wifi Thermostat, Electric	E21B1b015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
B1b - HEA (HVAC Systems)	Wifi Thermostat, Gas	E21B1b016	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Kerosene	E21B1b017	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Oil	E21B1b018	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Propane	E21B1b019	-	-	-																		
B1b - HEA (HVAC Systems)	Wifi Thermostat, Wood Pellets	E21B1b020	-	-	-																		
B1b - HEA (HVAC Systems)	Mini Split HP (cooling)	E21B1b021	-	-	-																		
B1b - HEA (HVAC Systems)	Mini Split HP (heating)	E21B1b022	-	-	8			36.8			663.0			11.7			-						
<b>Home Energy Assistance Subtotal</b>						<b>134.0</b>	<b>111.9</b>	<b>154.3</b>	<b>1,882.2</b>	<b>1,644.9</b>	<b>2,390.2</b>	<b>28.4</b>	<b>27.4</b>	<b>40.5</b>	<b>10.7</b>	<b>6.7</b>	<b>7.0</b>	<b>1,952.2</b>	<b>2,119.4</b>	<b>2,225.4</b>	<b>47,147.1</b>	<b>51,766.7</b>	<b>54,355.0</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A1a - ES Homes	Cooling, Electric, SF	E21A1a001	23	23	23	3.5	3.5	3.5	86.3	86.3	86.3	-	-	-	1.9	1.9	1.9	-	-	-	-	-	-
A1a - ES Homes	Heating, Electric, SF	E21A1a002	22	22	22	261.6	261.6	261.6	6,540.5	6,540.5	6,540.5	83.1	83.1	83.1	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Gas, SF	E21A1a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Oil, SF	E21A1a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Propane, SF	E21A1a005	78	78	78	43.6	43.6	43.6	1,090.7	1,090.7	1,090.7	-	-	-	-	-	-	4,740.9	4,740.9	4,740.9	118,522.4	118,522.4	118,522.4
A1a - ES Homes	Heating, Wood Pellets, SF	E21A1a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Electric, SF	E21A1a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Gas, SF	E21A1a008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Oil, SF	E21A1a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Propane, SF	E21A1a010	39	39	39	-	-	-	-	-	-	-	-	-	-	-	-	170.1	170.1	170.1	2,551.6	2,551.6	2,551.6
A1a - ES Homes	Hot Water, Wood Pellets, SF	E21A1a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Cooling, Electric, MF	E21A1a012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Electric, MF	E21A1a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Gas, MF	E21A1a014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Oil, MF	E21A1a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Propane, MF	E21A1a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Wood Pellets, MF	E21A1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Electric, MF	E21A1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Gas, MF	E21A1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Oil, MF	E21A1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Propane, MF	E21A1a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Wood Pellets, MF	E21A1a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	LED Bulb	E21A1a023	47	47	47	0.3	0.3	0.3	0.9	0.9	0.9	0.1	0.1	0.1	0.0	0.0	0.0	-	-	-	-	-	-
A1a - ES Homes	LED Fixture	E21A1a024	12	12	12	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
A1a - ES Homes	Refrigerator	E21A1a025	49	49	49	2.0	2.0	2.0	23.9	23.9	23.9	0.2	0.2	0.2	0.3	0.3	0.3	-	-	-	-	-	-
A1a - ES Homes	Clothes Washer	E21A1a026	30	30	30	2.7	2.7	2.7	37.4	37.4	37.4	0.4	0.4	0.4	0.4	0.4	0.4	8.1	8.1	8.1	113.6	113.6	113.6
A1a - ES Homes	Clothes Dryer	E21A1a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	HERS - Lighting and Appliances	E21A1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Residential New Construction Code Compliance	E21A1a029	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>ES Homes Subtotal</b>						<b>313.7</b>	<b>313.7</b>	<b>313.7</b>	<b>7,779.9</b>	<b>7,779.9</b>	<b>7,779.9</b>	<b>83.7</b>	<b>83.7</b>	<b>83.7</b>	<b>2.6</b>	<b>2.6</b>	<b>2.6</b>	<b>4,919.1</b>	<b>4,919.1</b>	<b>4,919.1</b>	<b>121,187.6</b>	<b>121,187.6</b>	<b>121,187.6</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A2a - HPwES (Weatheriza	Air Sealing, Cord Wood	E21A2a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Air Sealing, Electric	E21A2a002	161	169	177	59.4	62.4	65.5	891.0	935.5	982.3	18.9	19.8	20.8	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Air Sealing, Gas	E21A2a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Air Sealing, Kerosene	E21A2a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Air Sealing, Oil	E21A2a005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Air Sealing, Propane	E21A2a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Air Sealing, Wood Pellets	E21A2a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Faucet Aerator, Electric	E21A2a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Faucet Aerator, Gas	E21A2a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Faucet Aerator, Kerosene	E21A2a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Faucet Aerator, Oil	E21A2a012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Faucet Aerator, Propane	E21A2a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Hand Held Showerhead, Electric	E21A2a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Hand Held Showerhead, Gas	E21A2a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Hand Held Showerhead, Kerosene	E21A2a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Hand Held Showerhead, Oil	E21A2a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Hand Held Showerhead, Propane	E21A2a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Insulation, Cord Wood	E21A2a022	166	174	183	-	-	-	-	-	-	-	-	-	-	-	-	372.7	391.3	410.9	7,961.1	8,359.1	8,777.1
A2a - HPwES (Weatheriza	Insulation, Electric	E21A2a023	159	167	175	89.7	94.1	98.9	2,241.5	2,353.6	2,471.3	28.5	29.9	31.4	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Insulation, Gas	E21A2a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Insulation, Kerosene	E21A2a025	166	174	183	-	-	-	-	-	-	-	-	-	-	-	-	14.5	15.2	15.9	323.7	339.9	356.9
A2a - HPwES (Weatheriza	Insulation, Oil	E21A2a026	166	174	183	-	-	-	-	-	-	-	-	-	-	-	-	2,516.1	2,641.9	2,774.0	53,039.3	55,691.3	58,475.9
A2a - HPwES (Weatheriza	Insulation, Propane	E21A2a027	166	174	183	-	-	-	-	-	-	-	-	-	-	-	-	1,349.0	1,416.5	1,487.3	28,572.5	30,001.1	31,501.2
A2a - HPwES (Weatheriza	Insulation, Wood Pellets	E21A2a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Low Flow Showerhead, Electric	E21A2a030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Low Flow Showerhead, Gas	E21A2a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Low Flow Showerhead, Kerosene	E21A2a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Low Flow Showerhead, Oil	E21A2a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Low Flow Showerhead, Propane	E21A2a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Pipe Insulation - Hot Water, Electric	E21A2a037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Pipe Insulation - Hot Water, Gas	E21A2a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Pipe Insulation - Hot Water, Kerosene	E21A2a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Pipe Insulation - Hot Water, Oil	E21A2a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Pipe Insulation - Hot Water, Propane	E21A2a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	DHW Heat Pump Water Heater	E21A2a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	LED Bulb, General Service Lamps	E21A2a044	479	503	528	16.7	17.6	18.5	33.5	35.2	36.9	3.6	3.8	4.0	2.3	2.4	2.6	-	-	-	-	-	
A2a - HPwES (Weatheriza	LED Bulb, Linear	E21A2a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	LED Bulb, Other Specialty	E21A2a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	LED Bulb, Reflector	E21A2a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	LED Fixture	E21A2a048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Refrigerator	E21A2a049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Freezer	E21A2a053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Clothes Washer	E21A2a054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Clothes Dryer	E21A2a055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Dehumidifier	E21A2a056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Room Air Conditioner	E21A2a057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Triple Pane Window	E21A2a058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2a - HPwES (Weatheriza	Visual Audit Oil Savings	E21A2a050	42	42	42	-	-	-	-	-	-	-	-	-	-	-	-	471.9	471.9	471.9	6,488.6	6,488.6	6,488.6
A2a - HPwES (Weatheriza	Visual Audit Propane Savings	E21A2a051	42	42	42	-	-	-	-	-	-	-	-	-	-	-	-	471.9	471.9	471.9	6,488.6	6,488.6	6,488.6
A2a - HPwES (Weatheriza	Visual Audit Electric Savings	E21A2a052	91	91	91	30.2	30.2	30.2	150.8	150.8	150.8	9.6	9.6	9.6	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Boiler Replacement, Gas	E21A2b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Boiler Replacement, Kerosene	E21A2b002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Boiler Replacement, Oil	E21A2b003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Boiler Replacement, Propane	E21A2b004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Furnace Replacement, Gas	E21A2b005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Furnace Replacement, Kerosene	E21A2b006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Furnace Replacement, Oil	E21A2b007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Furnace Replacement, Propane	E21A2b008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Programmable Thermostat, Electric	E21A2b009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Programmable Thermostat, Gas	E21A2b010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Programmable Thermostat, Kerosene	E21A2b011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Programmable Thermostat, Oil	E21A2b012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Programmable Thermostat, Propane	E21A2b013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Programmable Thermostat, Wood Pellets	E21A2b014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Wifi Thermostat, Electric	E21A2b015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC Syst	Wifi Thermostat, Gas	E21A2b016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A2b - HPwES (HVAC Syst	Wifi Thermostat, Kerosene	E21A2b017	-	-	-																		
A2b - HPwES (HVAC Syst	Wifi Thermostat, Oil	E21A2b018	-	-	-																		
A2b - HPwES (HVAC Syst	Wifi Thermostat, Propane	E21A2b019	-	-	-																		
A2b - HPwES (HVAC Syst	Wifi Thermostat, Wood Pellets	E21A2b020	-	-	-																		
<b>Home Performance with Energy Star Subtotal</b>						<b>196.0</b>	<b>204.2</b>	<b>213.0</b>	<b>3,316.8</b>	<b>3,475.0</b>	<b>3,641.3</b>	<b>60.5</b>	<b>63.1</b>	<b>65.7</b>	<b>2.3</b>	<b>2.4</b>	<b>2.6</b>	<b>5,196.1</b>	<b>5,408.7</b>	<b>5,632.0</b>	<b>102,873.9</b>	<b>107,368.8</b>	<b>112,088.3</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A3a - ES Lighting	LED Bulb, General Service Lamps	E21A3a001	95,948	47,974	-	820.0	285.8	-	2,460.1	857.3	-	177.0	61.7	-	114.2	39.8	-	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Linear	E21A3a002	15,534	7,767	914	43.4	15.1	1.0	433.8	151.2	9.0	9.4	3.3	0.2	6.0	2.1	0.1	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Other Specialty	E21A3a003	27,414	13,707	9,138	262.6	91.5	34.5	787.8	274.5	69.0	56.7	19.8	7.4	36.6	12.7	4.8	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Reflector	E21A3a004	31,983	15,991	-	339.0	118.1	-	678.1	236.3	-	73.2	25.5	-	47.2	16.5	-	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, General Service Lamps (Hard to Reach)	E21A3a005	5,050	2,525	1,683	69.3	28.1	14.4	208.0	84.4	28.8	15.0	6.1	3.1	9.7	3.9	2.0	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Linear (Hard to Reach)	E21A3a006	902	451	301	4.0	1.6	0.8	40.4	16.4	7.6	0.9	0.4	0.2	0.6	0.2	0.1	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Other Specialty (Hard to Reach)	E21A3a007	1,443	721	481	22.2	9.0	4.6	66.6	27.0	9.2	4.8	1.9	1.0	3.1	1.3	0.6	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Reflector (Hard to Reach)	E21A3a008	2,525	1,262	842	43.0	17.4	8.9	86.0	34.9	8.9	9.3	3.8	1.9	6.0	2.4	1.2	-	-	-	-	-	-
A3a - ES Lighting	LED Fixture	E21A3a009	6,825	3,413	2,275	54.1	18.9	7.1	162.3	56.6	14.2	11.7	4.1	1.5	7.5	2.6	1.0	-	-	-	-	-	-
A3a - ES Lighting	LED Fixture (Hard to Reach)	E21A3a010	359	180	120	4.6	1.9	0.9	13.7	5.6	1.9	1.0	0.4	0.2	0.6	0.3	0.1	-	-	-	-	-	-
A3b - ES Appliances	Advanced Power Strip, Tier I	E21A3b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Advanced Power Strip, Tier II	E21A3b002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (cooling)	E21A3b003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (heating)	E21A3b004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Mini Split HP - Lost Opportunity (cooling)	E21A3b005	400	300	300	41.2	30.9	30.9	741.1	555.8	555.8	-	-	-	22.7	17.0	17.0	-	-	-	-	-	-
A3c - ES HVAC Systems	Mini Split HP - Lost Opportunity (heating)	E21A3b006	400	300	300	131.3	98.5	98.5	2,363.8	1,772.8	1,772.8	41.7	31.3	31.3	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 50 gal - Downstream	E21A3b007	150	150	150	144.2	144.2	144.2	1,874.0	1,874.0	1,874.0	23.7	23.7	23.7	13.1	13.1	13.1	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 80 gal - Downstream	E21A3b008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Heat Pump Swimming Pool Heater	E21A3b009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	ES Clothes Dryers	E21A3b010	682	682	682	109.4	109.4	109.4	1,312.7	1,312.7	1,312.7	18.6	18.6	18.6	14.4	14.4	14.4	-	-	-	-	-	-
A3b - ES Appliances	Dryer Heat Pump	E21A3b011	45	45	45	18.9	18.9	18.9	227.4	227.4	227.4	3.2	3.2	3.2	2.5	2.5	2.5	-	-	-	-	-	-
A3b - ES Appliances	Dryer Hybrid	E21A3b012	23	23	23	4.9	4.9	4.9	58.9	58.9	58.9	0.8	0.8	0.8	0.6	0.6	0.6	-	-	-	-	-	-
A3c - ES HVAC Systems	ECM Motors for FHA Furnace Fans	E21A3b014	3	3	3	0.5	0.5	0.5	7.6	7.6	7.6	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	ES AC (central) 3 ton	E21A3b015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Room Air Conditioner	E21A3b016	455	455	455	7.3	7.3	7.3	58.2	58.2	58.2	-	-	-	3.8	3.8	3.8	-	-	-	-	-	-
A3b - ES Appliances	ES Clothes Washers	E21A3b017	682	682	682	60.5	60.5	60.5	846.6	846.6	846.6	8.5	8.5	8.5	8.0	8.0	8.0	183.5	183.5	183.5	2,568.4	2,568.4	2,568.4
A3b - ES Appliances	Washer Tier CEE Tier 2+	E21A3b018	546	546	546	85.1	85.1	85.1	1,191.7	1,191.7	1,191.7	12.0	12.0	12.0	11.3	11.3	11.3	240.8	240.8	240.8	3,371.0	3,371.0	3,371.0
A3b - ES Appliances	ES Dehumidifier	E21A3b019	546	546	546	78.9	78.9	78.9	946.8	946.8	946.8	3.2	3.2	3.2	15.1	15.1	15.1	-	-	-	-	-	-
A3b - ES Appliances	ES Dishwasher	E21A3b020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	ES Freezers	E21A3b021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Refrigerator	E21A3b022	591	591	591	24.2	24.2	24.2	290.8	290.8	290.8	2.8	2.8	2.8	3.4	3.4	3.4	-	-	-	-	-	-
A3b - ES Appliances	Refrigerator CEE Tier 2+	E21A3b023	227	227	227	21.9	21.9	21.9	262.6	262.6	262.6	2.5	2.5	2.5	3.1	3.1	3.1	-	-	-	-	-	-
A3b - ES Appliances	ES Pool Pumps (Variable Speed)	E21A3b024	68	65	68	72.2	69.3	72.2	722.2	692.5	722.2	-	-	-	41.7	40.0	41.7	-	-	-	-	-	-
A3b - ES Appliances	Room Air Purifier	E21A3b025	227	227	227	88.6	88.6	88.6	797.8	797.8	797.8	10.1	10.1	10.1	10.1	10.1	10.1	-	-	-	-	-	-
A3c - ES HVAC Systems	Wifi Thermostat (Heating & Cooling)	E21A3b026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Primary Refrigerator Recycling	E21A3b027	91	91	91	44.7	44.7	44.7	357.9	357.9	357.9	5.1	5.1	5.1	6.3	6.3	6.3	-	-	-	-	-	-
A3b - ES Appliances	Secondary Refrigerator Recycling	E21A3b028	227	227	227	171.4	171.4	171.4	1,371.1	1,371.1	1,371.1	16.1	16.1	16.1	26.8	26.8	26.8	-	-	-	-	-	-
A3b - ES Appliances	Secondary Freezer Recycling	E21A3b029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Room Air Conditioner Recycling	E21A3b030	7	7	7	0.1	0.1	0.1	0.6	0.6	0.6	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-
A3c - ES HVAC Systems	Ductless Mini-split Heat Pump - Retrofit Resistance	E21A3b031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Ductless Mini-split Heat Pump - Retrofit HP	E21A3b032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air-source Heat Pump - Retrofit HP	E21A3b033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air-source Heat Pump - Retrofit Resistance	E21A3b034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 50 gal - Midstream	E21A3b035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 80 gal - Midstream	E21A3b036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>ES Products Subtotal</b>						<b>2,767.8</b>	<b>1,646.9</b>	<b>1,134.7</b>	<b>18,370.9</b>	<b>14,372.3</b>	<b>12,806.4</b>	<b>507.3</b>	<b>264.8</b>	<b>153.6</b>	<b>414.4</b>	<b>257.3</b>	<b>187.3</b>	<b>424.2</b>	<b>424.2</b>	<b>424.2</b>	<b>5,939.4</b>	<b>5,939.4</b>	<b>5,939.4</b>

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1a - LCI Retrofit	Custom Large Compressed Air Retro	E21C1a001	-	-	-																		
C1a - LCI Retrofit	Custom Large Hot Water Retro	E21C1a002	-	-	-																		
C1a - LCI Retrofit	Custom Large HVAC Retro	E21C1a003	-	-	-																		
C1a - LCI Retrofit	Custom Large Lighting Retro - Interior	E21C1a004	14	14	14	1,198.2	1,202.0	1,224.1	15,576.9	15,625.6	15,913.2	146.3	146.8	149.5	191.9	192.5	196.1	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Exterior	E21C1a047	2	2	2	31.5	31.6	32.2	409.8	411.1	418.7	6.3	6.3	6.4	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Custom Large Lighting Retro - Controls	E21C1a048	0	0	0	1.4	1.4	1.4	12.4	12.4	12.7	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	
C1a - LCI Retrofit	Custom Large Motors Retro	E21C1a005	-	-	-																		
C1a - LCI Retrofit	Custom Large Process Retro	E21C1a006	-	-	-																		
C1a - LCI Retrofit	Custom Large Refrigeration Retro	E21C1a007	5	5	5	338.8	339.9	346.1	4,404.7	4,418.5	4,499.8	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Custom Large Other Retro	E21C1a008	9	9	9	1,371.9	1,376.2	1,401.5	17,835.0	17,890.8	18,220.1	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Daylight Dimming	E21C1a009	-	-	-																		
C1a - LCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C1a010	-	-	-																		
C1a - LCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C1a011	-	-	-																		
C1a - LCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C1a012	-	-	-																		
C1a - LCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C1a013	-	-	-																		
C1a - LCI Retrofit	Lighting Occupancy Sensors	E21C1a014	-	-	-																		
C1a - LCI Retrofit	Boiler Reset Controls, Electric	E21C1a015	-	-	-																		
C1a - LCI Retrofit	Case Motor Replacement	E21C1a016	-	-	-																		
C1a - LCI Retrofit	Cooler Night Cover	E21C1a017	-	-	-																		
C1a - LCI Retrofit	Demand Control Ventilation	E21C1a018	-	-	-																		
C1a - LCI Retrofit	Door Heater Controls	E21C1a019	-	-	-																		
C1a - LCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C1a020	-	-	-																		
C1a - LCI Retrofit	Duct Sealing, Electric	E21C1a021	-	-	-																		
C1a - LCI Retrofit	Ductless Mini Split Heat Pump	E21C1a022	-	-	-																		
C1a - LCI Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C1a023	-	-	-																		
C1a - LCI Retrofit	Electronic Defrost Control	E21C1a024	-	-	-																		
C1a - LCI Retrofit	Energy Management System, Electric	E21C1a025	-	-	-																		
C1a - LCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C1a026	-	-	-																		
C1a - LCI Retrofit	Evaporator Fan Control	E21C1a027	-	-	-																		
C1a - LCI Retrofit	Faucet Aerator, Electric	E21C1a028	-	-	-																		
C1a - LCI Retrofit	Hotel Occupancy Sensor	E21C1a031	-	-	-																		
C1a - LCI Retrofit	Low Pressure Drop Filter	E21C1a032	-	-	-																		
C1a - LCI Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C1a033	-	-	-																		
C1a - LCI Retrofit	Low-Flow Showerhead, Electric	E21C1a034	-	-	-																		
C1a - LCI Retrofit	Motors, Open Drip	E21C1a035	-	-	-																		
C1a - LCI Retrofit	Motors, Totally Enclosed Fan Cooled	E21C1a036	-	-	-																		
C1a - LCI Retrofit	Novelty Cooler Shutoff	E21C1a037	-	-	-																		
C1a - LCI Retrofit	Pipe Wrap - Heating, Electric	E21C1a038	-	-	-																		
C1a - LCI Retrofit	Pipe Wrap - Hot Water, Electric	E21C1a039	-	-	-																		
C1a - LCI Retrofit	Pre Rinse Spray Valve, Electric	E21C1a040	-	-	-																		
C1a - LCI Retrofit	Programmable Thermostat, Electric	E21C1a041	-	-	-																		
C1a - LCI Retrofit	Steam Trap, Electric	E21C1a042	-	-	-																		
C1a - LCI Retrofit	Variable Frequency Drive	E21C1a043	0	0	1	35.1	35.2	107.6	456.3	457.7	1,398.4	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Variable Frequency Drive with Motor	E21C1a044	-	-	-																		
C1a - LCI Retrofit	Vending Miser	E21C1a045	-	-	-																		
C1a - LCI Retrofit	Zero Loss Condensate Drain	E21C1a046	-	-	-																		
C1a - LCI Retrofit	Large Retrocommissioning	E21C1a049	-	-	-																		
C1b - LCI New Equipment	Custom Large Compressed Air New	E21C1b001	-	-	-																		
C1b - LCI New Equipment	Custom Large Hot Water New	E21C1b002	-	-	-																		
C1b - LCI New Equipment	Custom Large HVAC New	E21C1b003	1	1	0	5.0	5.0	1.7	75.2	75.4	25.6	-	-	-	-	-	-	-	-	-	-	-	
C1b - LCI New Equipment	Custom Large Lighting New - Interior	E21C1b004	-	-	-																		
C1b - LCI New Equipment	Custom Large Lighting New - Exterior	E21C1b054	-	-	-																		
C1b - LCI New Equipment	Custom Large Lighting New - Controls	E21C1b055	-	-	-																		
C1b - LCI New Equipment	Custom Large Motors New	E21C1b005	-	-	-																		
C1b - LCI New Equipment	Custom Large Process New	E21C1b006	-	-	-																		
C1b - LCI New Equipment	Custom Large Refrigeration New	E21C1b007	-	-	-																		
C1b - LCI New Equipment	Custom Large Other New	E21C1b008	-	-	-																		
C1b - LCI New Equipment	Custom Large Comprehensive Design	E21C1b056	-	-	-																		
C1b - LCI New Equipment	Daylight Dimming	E21C1b009	-	-	-																		
C1b - LCI New Equipment	Lighting Occupancy Sensors	E21C1b014	-	-	-																		
C1b - LCI New Equipment	Advanced Power Strip	E21C1b015	-	-	-																		
C1b - LCI New Equipment	Air Compressor	E21C1b016	-	-	-																		
C1b - LCI New Equipment	Air Nozzle	E21C1b017	-	-	-																		
C1b - LCI New Equipment	Circulator Pump	E21C1b018	-	-	-																		
C1b - LCI New Equipment	Combination Oven, Electric	E21C1b019	-	-	-																		
C1b - LCI New Equipment	Compressor Storage	E21C1b020	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1b - LCI New Equipment	Convection Oven, Electric	E21C1b021	-	-	-																		
C1b - LCI New Equipment	Dishwasher - High Temp Door Type	E21C1b022	-	-	-																		
C1b - LCI New Equipment	Dishwasher - High Temp Multi Tank Conveyor	E21C1b023	-	-	-																		
C1b - LCI New Equipment	Dishwasher - High Temp Pot, Pan, Utensil	E21C1b024	-	-	-																		
C1b - LCI New Equipment	Dishwasher - High Temp Single Tank Conveyor	E21C1b025	-	-	-																		
C1b - LCI New Equipment	Dishwasher - High Temp Under Counter	E21C1b026	-	-	-																		
C1b - LCI New Equipment	Dishwasher - Low Temp Door Type	E21C1b027	-	-	-																		
C1b - LCI New Equipment	Dishwasher - Low Temp Multi Tank Conveyor	E21C1b028	-	-	-																		
C1b - LCI New Equipment	Dishwasher - Low Temp Single Tank Conveyor	E21C1b029	-	-	-																		
C1b - LCI New Equipment	Dishwasher - Low Temp Under Counter	E21C1b030	-	-	-																		
C1b - LCI New Equipment	Faucet Aerator, Electric	E21C1b031	-	-	-																		
C1b - LCI New Equipment	Fryer Large Vat, Electric	E21C1b032	-	-	-																		
C1b - LCI New Equipment	Fryer Standard Vat, Electric	E21C1b033	-	-	-																		
C1b - LCI New Equipment	Griddle, Electric	E21C1b034	-	-	-																		
C1b - LCI New Equipment	Ground Source Heat Pump	E21C1b035	-	-	-																		
C1b - LCI New Equipment	Hot Food Holding Cabinet 3/4 Size	E21C1b036	-	-	-																		
C1b - LCI New Equipment	Hot Food Holding Cabinet Full Size	E21C1b037	-	-	-																		
C1b - LCI New Equipment	Hot Food Holding Cabinet Half Size	E21C1b038	-	-	-																		
C1b - LCI New Equipment	Ice Machine - Ice Making Head	E21C1b039	-	-	-																		
C1b - LCI New Equipment	Ice Machine - Remote Cond./Split Unit - Batch	E21C1b040	-	-	-																		
C1b - LCI New Equipment	Ice Machine - Remote Cond./Split Unit - Continuous	E21C1b041	-	-	-																		
C1b - LCI New Equipment	Ice Machine - Self Contained	E21C1b042	-	-	-																		
C1b - LCI New Equipment	Low Pressure Drop Filter	E21C1b043	-	-	-																		
C1b - LCI New Equipment	Low-Flow Showerhead With Thermostatic Valve, Electric	E21C1b044	-	-	-																		
C1b - LCI New Equipment	Low-Flow Showerhead, Electric	E21C1b045	-	-	-																		
C1b - LCI New Equipment	Pre Rinse Spray Valve, Electric	E21C1b046	-	-	-																		
C1b - LCI New Equipment	Refrigerated Air Dryer	E21C1b047	-	-	-																		
C1b - LCI New Equipment	Steam Cooker, Electric	E21C1b048	-	-	-																		
C1b - LCI New Equipment	Unitary Air Conditioner	E21C1b049	-	-	-																		
C1b - LCI New Equipment	Water Source Heat Pump	E21C1b050	-	-	-																		
C1b - LCI New Equipment	Zero Loss Condensate Drain	E21C1b051	-	-	-																		
C1b - LCI New Equipment	High Efficiency Chiller - FL	E21C1b052	-	-	-																		
C1b - LCI New Equipment	High Efficiency Chiller - IPLV	E21C1b053	-	-	-																		
C1b - LCI New Equipment	C&I Large New Construction Code Compliance	E21C1b057	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1c - LCI Midstream	Midstream Circulator Pump	E21C1c001	-	-	-																		
C1c - LCI Midstream	Midstream Demand Control Ventilation	E21C1c002	-	-	-																		
C1c - LCI Midstream	Midstream DMSHP Systems	E21C1c003	-	-	-																		
C1c - LCI Midstream	Midstream Dual Enthalpy Economizer Controls	E21C1c004	-	-	-																		
C1c - LCI Midstream	Midstream ECM Fan Motors	E21C1c005	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Systems	E21C1c006	-	-	-																		
C1c - LCI Midstream	Midstream Unitary Air Conditioners	E21C1c007	-	-	-																		
C1c - LCI Midstream	Midstream VRF	E21C1c008	-	-	-																		
C1c - LCI Midstream	Midstream Water Source Heat Pump Systems	E21C1c009	-	-	-																		
C1c - LCI Midstream	Midstream LED Downlight	E21C1c010	-	-	-																		
C1c - LCI Midstream	Midstream LED Exterior	E21C1c011	-	-	-																		
C1c - LCI Midstream	Midstream LED High Bay/Low Bay	E21C1c012	-	-	-																		
C1c - LCI Midstream	Midstream LED Linear Fixture	E21C1c013	-	-	-																		
C1c - LCI Midstream	Midstream LED Linear Fixture with Controls	E21C1c014	-	-	-																		
C1c - LCI Midstream	Midstream LED Linear Lamp	E21C1c015	-	-	-																		
C1c - LCI Midstream	Midstream LED Screw In	E21C1c016	-	-	-																		
C1c - LCI Midstream	Midstream LED Stairwell Kit	E21C1c017	-	-	-																		
C1c - LCI Midstream	Midstream Combination Oven, Electric	E21C1c018	-	-	-																		
C1c - LCI Midstream	Midstream Convection Oven, Electric	E21C1c019	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - High Temp Door Type	E21C1c020	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - High Temp Multi Tank Conveyor	E21C1c021	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - High Temp Pot, Pan, Utensil	E21C1c022	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - High Temp Single Tank Conveyor	E21C1c023	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - High Temp Under Counter	E21C1c024	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Door Type	E21C1c025	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Multi Tank Conveyor	E21C1c026	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Single Tank Conveyor	E21C1c027	-	-	-																		
C1c - LCI Midstream	Midstream Dishwasher - Low Temp Under Counter	E21C1c028	-	-	-																		
C1c - LCI Midstream	Midstream Freezer - Solid Door	E21C1c029	-	-	-																		
C1c - LCI Midstream	Midstream Freezer -Glass Door	E21C1c030	-	-	-																		
C1c - LCI Midstream	Midstream Fryer Large Vat, Electric	E21C1c031	-	-	-																		
C1c - LCI Midstream	Midstream Fryer Standard Vat, Electric	E21C1c032	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1c - LCI Midstream	Midstream Griddle, Electric	E21C1c033	-	-	-																		
C1c - LCI Midstream	Midstream Hot Food Holding Cabinet 3/4 Size	E21C1c034	-	-	-																		
C1c - LCI Midstream	Midstream Hot Food Holding Cabinet Full Size	E21C1c035	-	-	-																		
C1c - LCI Midstream	Midstream Hot Food Holding Cabinet Half Size	E21C1c036	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Ice Making Head	E21C1c037	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Batch	E21C1c038	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Contin	E21C1c039	-	-	-																		
C1c - LCI Midstream	Midstream Ice Machine Self Contained	E21C1c040	-	-	-																		
C1c - LCI Midstream	Midstream Refrigerator - Glass Door	E21C1c041	-	-	-																		
C1c - LCI Midstream	Midstream Refrigerator - Solid Door	E21C1c042	-	-	-																		
C1c - LCI Midstream	Midstream Steam Cooker, Electric	E21C1c043	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Water Heater, 120 gallons	E21C1c044	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Water Heater, 50 gallons	E21C1c045	-	-	-																		
C1c - LCI Midstream	Midstream Heat Pump Water Heater, 80 gallons	E21C1c046	-	-	-																		
C1d - LCI Direct Install	Custom Large Compressed Air Direct Install	E21C1d001	-	-	-																		
C1d - LCI Direct Install	Custom Large Hot Water Direct Install	E21C1d002	-	-	-																		
C1d - LCI Direct Install	Custom Large HVAC Direct Install	E21C1d003	-	-	-																		
C1d - LCI Direct Install	Custom Large Lighting Direct Install - Interior	E21C1d004	-	-	-																		
C1d - LCI Direct Install	Custom Large Lighting Direct Install - Exterior	E21C1d005	-	-	-																		
C1d - LCI Direct Install	Custom Large Lighting Direct Install - Controls	E21C1d006	-	-	-																		
C1d - LCI Direct Install	Custom Large Motors Direct Install	E21C1d007	-	-	-																		
C1d - LCI Direct Install	Custom Large Process Direct Install	E21C1d008	-	-	-																		
C1d - LCI Direct Install	Custom Large Refrigeration Direct Install	E21C1d009	-	-	-																		
C1d - LCI Direct Install	Custom Large Other Direct Install	E21C1d010	-	-	-																		
C1d - LCI Direct Install	Daylight Dimming	E21C1d011	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Exterior w/ Controls	E21C1d012	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Exterior w/o Controls	E21C1d013	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Interior w/ Controls	E21C1d014	-	-	-																		
C1d - LCI Direct Install	Lighting Fixture - Interior w/o Controls	E21C1d015	-	-	-																		
C1d - LCI Direct Install	Lighting Occupancy Sensors	E21C1d016	-	-	-																		
C1d - LCI Direct Install	Boiler Reset Controls, Electric	E21C1d017	-	-	-																		
C1d - LCI Direct Install	Case Motor Replacement	E21C1d018	-	-	-																		
C1d - LCI Direct Install	Cooler Night Cover	E21C1d019	-	-	-																		
C1d - LCI Direct Install	Demand Control Ventilation	E21C1d020	-	-	-																		
C1d - LCI Direct Install	Door Heater Controls	E21C1d021	-	-	-																		
C1d - LCI Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C1d022	-	-	-																		
C1d - LCI Direct Install	Duct Sealing, Electric	E21C1d023	-	-	-																		
C1d - LCI Direct Install	Ductless Mini Split Heat Pump	E21C1d024	-	-	-																		
C1d - LCI Direct Install	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C1d025	-	-	-																		
C1d - LCI Direct Install	Electronic Defrost Control	E21C1d026	-	-	-																		
C1d - LCI Direct Install	Energy Management System, Electric	E21C1d027	-	-	-																		
C1d - LCI Direct Install	Energy Star Wifi Thermostat, Electric	E21C1d028	-	-	-																		
C1d - LCI Direct Install	Evaporator Fan Control	E21C1d029	-	-	-																		
C1d - LCI Direct Install	Faucet Aerator, Electric	E21C1d030	-	-	-																		
C1d - LCI Direct Install	Hotel Occupancy Sensor	E21C1d031	-	-	-																		
C1d - LCI Direct Install	Low Pressure Drop Filter	E21C1d032	-	-	-																		
C1d - LCI Direct Install	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C1d033	-	-	-																		
C1d - LCI Direct Install	Low-Flow Showerhead, Electric	E21C1d034	-	-	-																		
C1d - LCI Direct Install	Motors, Open Drip	E21C1d035	-	-	-																		
C1d - LCI Direct Install	Motors, Totally Enclosed Fan Cooled	E21C1d036	-	-	-																		
C1d - LCI Direct Install	Novelty Cooler Shutoff	E21C1d037	-	-	-																		
C1d - LCI Direct Install	Pipe Wrap - Heating, Electric	E21C1d038	-	-	-																		
C1d - LCI Direct Install	Pipe Wrap - Hot Water, Electric	E21C1d039	-	-	-																		
C1d - LCI Direct Install	Pre Rinse Spray Valve, Electric	E21C1d040	-	-	-																		
C1d - LCI Direct Install	Programmable Thermostat, Electric	E21C1d041	-	-	-																		
C1d - LCI Direct Install	Steam Trap, Electric	E21C1d042	-	-	-																		
C1d - LCI Direct Install	Variable Frequency Drive	E21C1d043	-	-	-																		
C1d - LCI Direct Install	Variable Frequency Drive with Motor	E21C1d044	-	-	-																		
C1d - LCI Direct Install	Vending Miser	E21C1d045	-	-	-																		
C1d - LCI Direct Install	Zero Loss Condensate Drain	E21C1d046	-	-	-																		
<b>Large Business Energy Solutions Subtotal</b>						<b>2,982.0</b>	<b>2,991.3</b>	<b>3,114.7</b>	<b>38,770.2</b>	<b>38,891.5</b>	<b>40,488.3</b>	<b>152.7</b>	<b>153.1</b>	<b>156.0</b>	<b>191.9</b>	<b>192.5</b>	<b>196.1</b>	-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2a - SCI Retrofit	Custom Small Compressed Air Retro	E21C2a001	-	-	-																		
C2a - SCI Retrofit	Custom Small Hot Water Retro	E21C2a002	-	-	-																		
C2a - SCI Retrofit	Custom Small HVAC Retro	E21C2a003	-	-	-																		
C2a - SCI Retrofit	Custom Small Lighting Retro - Interior	E21C2a004	105	122	119	1,495.0	1,730.3	1,685.4	19,435.0	22,493.4	21,909.6	171.1	198.0	192.9	224.4	259.7	253.0	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Lighting Retro - Exterior	E21C2a047	38	44	44	541.5	614.2	617.0	7,039.0	7,984.2	8,021.1	105.4	119.6	120.2	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Lighting Retro - Controls	E21C2a048	-	-	-																		
C2a - SCI Retrofit	Custom Small Motors Retro	E21C2a005	-	-	-																		
C2a - SCI Retrofit	Custom Small Process Retro	E21C2a006	-	-	-																		
C2a - SCI Retrofit	Custom Small Refrigeration Retro	E21C2a007	6	7	8	100.4	113.9	139.3	1,305.5	1,480.8	1,811.3	-	11.3	-	-	10.3	-	-	-	-	-	-	
C2a - SCI Retrofit	Custom Small Other Retro	E21C2a008	-	-	-																		
C2a - SCI Retrofit	Daylight Dimming	E21C2a009	-	-	-																		
C2a - SCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C2a010	-	-	-																		
C2a - SCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C2a011	-	-	-																		
C2a - SCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C2a012	-	-	-																		
C2a - SCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C2a013	-	-	-																		
C2a - SCI Retrofit	Lighting Occupancy Sensors	E21C2a014	-	-	-																		
C2a - SCI Retrofit	Boiler Reset Controls, Electric	E21C2a015	-	-	-																		
C2a - SCI Retrofit	Case Motor Replacement	E21C2a016	-	-	-																		
C2a - SCI Retrofit	Cooler Night Cover	E21C2a017	-	-	-																		
C2a - SCI Retrofit	Demand Control Ventilation	E21C2a018	-	-	-																		
C2a - SCI Retrofit	Door Heater Controls	E21C2a019	-	-	-																		
C2a - SCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C2a020	-	-	-																		
C2a - SCI Retrofit	Duct Sealing, Electric	E21C2a021	-	-	-																		
C2a - SCI Retrofit	Ductless Mini Split Heat Pump	E21C2a022	-	-	-																		
C2a - SCI Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C2a023	-	-	-																		
C2a - SCI Retrofit	Electronic Defrost Control	E21C2a024	-	-	-																		
C2a - SCI Retrofit	Energy Management System, Electric	E21C2a025	-	-	-																		
C2a - SCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C2a026	-	-	-																		
C2a - SCI Retrofit	Evaporator Fan Control	E21C2a027	-	-	-																		
C2a - SCI Retrofit	Faucet Aerator, Electric	E21C2a028	-	-	-																		
C2a - SCI Retrofit	Hotel Occupancy Sensor	E21C2a031	-	-	-																		
C2a - SCI Retrofit	Low Pressure Drop Filter	E21C2a032	-	-	-																		
C2a - SCI Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C2a033	-	-	-																		
C2a - SCI Retrofit	Low-Flow Showerhead, Electric	E21C2a034	-	-	-																		
C2a - SCI Retrofit	Motors, Open Drip	E21C2a035	-	-	-																		
C2a - SCI Retrofit	Motors, Totally Enclosed Fan Cooled	E21C2a036	-	-	-																		
C2a - SCI Retrofit	Novelty Cooler Shutoff	E21C2a037	-	-	-																		
C2a - SCI Retrofit	Pipe Wrap - Heating, Electric	E21C2a038	-	-	-																		
C2a - SCI Retrofit	Pipe Wrap - Hot Water, Electric	E21C2a039	-	-	-																		
C2a - SCI Retrofit	Pre Rinse Spray Valve, Electric	E21C2a040	-	-	-																		
C2a - SCI Retrofit	Programmable Thermostat, Electric	E21C2a041	-	-	-																		
C2a - SCI Retrofit	Steam Trap, Electric	E21C2a042	-	-	-																		
C2a - SCI Retrofit	Variable Frequency Drive	E21C2a043	1	1	3	32.6	37.0	76.4	489.6	555.3	1,146.6	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Variable Frequency Drive with Motor	E21C2a044	-	-	-																		
C2a - SCI Retrofit	Vending Miser	E21C2a045	-	-	-																		
C2a - SCI Retrofit	Zero Loss Condensate Drain	E21C2a046	-	-	-																		
C2a - SCI Retrofit	Small Retrocommissioning	E21C2a049	-	-	-																		
C2b - SCI New Equipment	Custom Small Compressed Air New	E21C2b001	-	-	-																		
C2b - SCI New Equipment	Custom Small Hot Water New	E21C2b002	-	-	-																		
C2b - SCI New Equipment	Custom Small HVAC New	E21C2b003	31	35	8	100.4	113.9	26.8	1,506.3	1,708.6	401.8	-	6.8	-	-	17.6	-	-	-	-	-	-	
C2b - SCI New Equipment	Custom Small Lighting New - Interior	E21C2b004	15	17	12	175.7	199.3	136.2	2,636.1	2,990.0	2,043.7	21.4	24.3	16.6	28.1	31.9	21.8	-	-	-	-	-	-
C2b - SCI New Equipment	Custom Small Lighting New - Exterior	E21C2b054	12	14	12	143.1	162.3	136.2	2,146.5	2,434.7	2,043.7	28.6	32.5	27.2	-	-	-	-	-	-	-	-	-
C2b - SCI New Equipment	Custom Small Lighting New - Controls	E21C2b055	-	-	-																		
C2b - SCI New Equipment	Custom Small Motors New	E21C2b005	-	-	-																		
C2b - SCI New Equipment	Custom Small Process New	E21C2b006	-	-	-																		
C2b - SCI New Equipment	Custom Small Refrigeration New	E21C2b007	-	-	-																		
C2b - SCI New Equipment	Custom Small Other New	E21C2b008	-	-	-																		
C2b - SCI New Equipment	Custom Small Comprehensive Design	E21C2b056	-	-	-																		
C2b - SCI New Equipment	Daylight Dimming	E21C2b009	-	-	-																		
C2b - SCI New Equipment	Lighting Occupancy Sensors	E21C2b014	-	-	-																		
C2b - SCI New Equipment	Advanced Power Strip	E21C2b015	-	-	-																		
C2b - SCI New Equipment	Air Compressor	E21C2b016	-	-	-																		
C2b - SCI New Equipment	Air Nozzle	E21C2b017	-	-	-																		
C2b - SCI New Equipment	Circulator Pump	E21C2b018	-	-	-																		
C2b - SCI New Equipment	Combination Oven, Electric	E21C2b019	-	-	-																		
C2b - SCI New Equipment	Compressor Storage	E21C2b020	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2b - SCI New Equipment	Convection Oven, Electric	E21C2b021	-	-	-																		
C2b - SCI New Equipment	Dishwasher - High Temp Door Type	E21C2b022	-	-	-																		
C2b - SCI New Equipment	Dishwasher - High Temp Multi Tank Conveyor	E21C2b023	-	-	-																		
C2b - SCI New Equipment	Dishwasher - High Temp Pot, Pan, Utensil	E21C2b024	-	-	-																		
C2b - SCI New Equipment	Dishwasher - High Temp Single Tank Conveyor	E21C2b025	-	-	-																		
C2b - SCI New Equipment	Dishwasher - High Temp Under Counter	E21C2b026	-	-	-																		
C2b - SCI New Equipment	Dishwasher - Low Temp Door Type	E21C2b027	-	-	-																		
C2b - SCI New Equipment	Dishwasher - Low Temp Multi Tank Conveyor	E21C2b028	-	-	-																		
C2b - SCI New Equipment	Dishwasher - Low Temp Single Tank Conveyor	E21C2b029	-	-	-																		
C2b - SCI New Equipment	Dishwasher - Low Temp Under Counter	E21C2b030	-	-	-																		
C2b - SCI New Equipment	Faucet Aerator, Electric	E21C2b031	-	-	-																		
C2b - SCI New Equipment	Fryer Large Vat, Electric	E21C2b032	-	-	-																		
C2b - SCI New Equipment	Fryer Standard Vat, Electric	E21C2b033	-	-	-																		
C2b - SCI New Equipment	Griddle, Electric	E21C2b034	-	-	-																		
C2b - SCI New Equipment	Ground Source Heat Pump	E21C2b035	-	-	-																		
C2b - SCI New Equipment	Hot Food Holding Cabinet 3/4 Size	E21C2b036	-	-	-																		
C2b - SCI New Equipment	Hot Food Holding Cabinet Full Size	E21C2b037	-	-	-																		
C2b - SCI New Equipment	Hot Food Holding Cabinet Half Size	E21C2b038	-	-	-																		
C2b - SCI New Equipment	Ice Machine - Ice Making Head	E21C2b039	-	-	-																		
C2b - SCI New Equipment	Ice Machine - Remote Cond./Split Unit - Batch	E21C2b040	-	-	-																		
C2b - SCI New Equipment	Ice Machine - Remote Cond./Split Unit - Continuous	E21C2b041	-	-	-																		
C2b - SCI New Equipment	Ice Machine - Self Contained	E21C2b042	-	-	-																		
C2b - SCI New Equipment	Low Pressure Drop Filter	E21C2b043	-	-	-																		
C2b - SCI New Equipment	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C2b044	-	-	-																		
C2b - SCI New Equipment	Low-Flow Showerhead, Electric	E21C2b045	-	-	-																		
C2b - SCI New Equipment	Pre Rinse Spray Valve, Electric	E21C2b046	-	-	-																		
C2b - SCI New Equipment	Refrigerated Air Dryer	E21C2b047	-	-	-																		
C2b - SCI New Equipment	Steam Cooker, Electric	E21C2b048	-	-	-																		
C2b - SCI New Equipment	Unitary Air Conditioner	E21C2b049	-	-	-																		
C2b - SCI New Equipment	Water Source Heat Pump	E21C2b050	-	-	-																		
C2b - SCI New Equipment	Zero Loss Condensate Drain	E21C2b051	-	-	-																		
C2b - SCI New Equipment	High Efficiency Chiller - FL	E21C2b052	-	-	-																		
C2b - SCI New Equipment	High Efficiency Chiller - IPLV	E21C2b053	-	-	-																		
C2b - SCI New Equipment	C&I Small New Construction Code Compliance	E21C2b057	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2c - SCI Midstream	Midstream Circulator Pump	E21C2c001	-	-	-																		
C2c - SCI Midstream	Midstream Demand Control Ventilation	E21C2c002	-	-	-																		
C2c - SCI Midstream	Midstream DMSHP Systems	E21C2c003	-	-	-																		
C2c - SCI Midstream	Midstream Dual Enthalpy Economizer Controls	E21C2c004	-	-	-																		
C2c - SCI Midstream	Midstream ECM Fan Motors	E21C2c005	-	-	-																		
C2c - SCI Midstream	Midstream Heat Pump Systems	E21C2c006	-	-	-																		
C2c - SCI Midstream	Midstream Unitary Air Conditioners	E21C2c007	-	-	-																		
C2c - SCI Midstream	Midstream VRF	E21C2c008	-	-	-																		
C2c - SCI Midstream	Midstream Water Source Heat Pump Systems	E21C2c009	-	-	-																		
C2c - SCI Midstream	Midstream LED Downlight	E21C2c010	-	-	-																		
C2c - SCI Midstream	Midstream LED Exterior	E21C2c011	-	-	-																		
C2c - SCI Midstream	Midstream LED High Bay/Low Bay	E21C2c012	-	-	-																		
C2c - SCI Midstream	Midstream LED Linear Fixture	E21C2c013	-	-	-																		
C2c - SCI Midstream	Midstream LED Linear Fixture with Controls	E21C2c014	-	-	-																		
C2c - SCI Midstream	Midstream LED Linear Lamp	E21C2c015	-	-	-																		
C2c - SCI Midstream	Midstream LED Screw In	E21C2c016	-	-	-																		
C2c - SCI Midstream	Midstream LED Stairwell Kit	E21C2c017	-	-	-																		
C2c - SCI Midstream	Midstream Combination Oven, Electric	E21C2c018	-	-	-																		
C2c - SCI Midstream	Midstream Convection Oven, Electric	E21C2c019	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - High Temp Door Type	E21C2c020	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - High Temp Multi Tank Conveyor	E21C2c021	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - High Temp Pot, Pan, Utensil	E21C2c022	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - High Temp Single Tank Conveyor	E21C2c023	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - High Temp Under Counter	E21C2c024	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Door Type	E21C2c025	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Multi Tank Conveyor	E21C2c026	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Single Tank Conveyor	E21C2c027	-	-	-																		
C2c - SCI Midstream	Midstream Dishwasher - Low Temp Under Counter	E21C2c028	-	-	-																		
C2c - SCI Midstream	Midstream Freezer - Solid Door	E21C2c029	-	-	-																		
C2c - SCI Midstream	Midstream Freezer -Glass Door	E21C2c030	-	-	-																		
C2c - SCI Midstream	Midstream Fryer Large Vat, Electric	E21C2c031	-	-	-																		
C2c - SCI Midstream	Midstream Fryer Standard Vat, Electric	E21C2c032	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2c - SCI Midstream	Midstream Griddle, Electric	E21C2c033	-	-	-																		
C2c - SCI Midstream	Midstream Hot Food Holding Cabinet 3/4 Size	E21C2c034	-	-	-																		
C2c - SCI Midstream	Midstream Hot Food Holding Cabinet Full Size	E21C2c035	-	-	-																		
C2c - SCI Midstream	Midstream Hot Food Holding Cabinet Half Size	E21C2c036	-	-	-																		
C2c - SCI Midstream	Midstream Ice Machine Ice Making Head	E21C2c037	-	-	-																		
C2c - SCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Batch	E21C2c038	-	-	-																		
C2c - SCI Midstream	Midstream Ice Machine Remote Cond/Split Unit Contin	E21C2c039	-	-	-																		
C2c - SCI Midstream	Midstream Ice Machine Self Contained	E21C2c040	-	-	-																		
C2c - SCI Midstream	Midstream Refrigerator - Glass Door	E21C2c041	-	-	-																		
C2c - SCI Midstream	Midstream Refrigerator - Solid Door	E21C2c042	-	-	-																		
C2c - SCI Midstream	Midstream Steam Cooker, Electric	E21C2c043	-	-	-																		
C2c - SCI Midstream	Midstream Heat Pump Water Heater, 120 gallons	E21C2c044	-	-	-																		
C2c - SCI Midstream	Midstream Heat Pump Water Heater, 50 gallons	E21C2c045	-	-	-																		
C2c - SCI Midstream	Midstream Heat Pump Water Heater, 80 gallons	E21C2c046	-	-	-																		
C2d - SCI Direct Install	Custom Small Compressed Air Direct Install	E21C2d001	-	-	-																		
C2d - SCI Direct Install	Custom Small Hot Water Direct Install	E21C2d002	-	-	-																		
C2d - SCI Direct Install	Custom Small HVAC Direct Install	E21C2d003	-	-	-																		
C2d - SCI Direct Install	Custom Small Lighting Direct Install - Interior	E21C2d004	-	-	-																		
C2d - SCI Direct Install	Custom Small Lighting Direct Install - Exterior	E21C2d005	-	-	-																		
C2d - SCI Direct Install	Custom Small Lighting Direct Install - Controls	E21C2d006	-	-	-																		
C2d - SCI Direct Install	Custom Small Motors Direct Install	E21C2d007	-	-	-																		
C2d - SCI Direct Install	Custom Small Process Direct Install	E21C2d008	-	-	-																		
C2d - SCI Direct Install	Custom Small Refrigeration Direct Install	E21C2d009	-	-	-																		
C2d - SCI Direct Install	Custom Small Other Direct Install	E21C2d010	-	-	-																		
C2d - SCI Direct Install	Daylight Dimming	E21C2d011	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Exterior w/ Controls	E21C2d012	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Exterior w/o Controls	E21C2d013	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Interior w/ Controls	E21C2d014	-	-	-																		
C2d - SCI Direct Install	Lighting Fixture - Interior w/o Controls	E21C2d015	-	-	-																		
C2d - SCI Direct Install	Lighting Occupancy Sensors	E21C2d016	-	-	-																		
C2d - SCI Direct Install	Boiler Reset Controls, Electric	E21C2d017	-	-	-																		
C2d - SCI Direct Install	Case Motor Replacement	E21C2d018	-	-	-																		
C2d - SCI Direct Install	Cooler Night Cover	E21C2d019	-	-	-																		
C2d - SCI Direct Install	Demand Control Ventilation	E21C2d020	-	-	-																		
C2d - SCI Direct Install	Door Heater Controls	E21C2d021	-	-	-																		
C2d - SCI Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C2d022	-	-	-																		
C2d - SCI Direct Install	Duct Sealing, Electric	E21C2d023	-	-	-																		
C2d - SCI Direct Install	Ductless Mini Split Heat Pump	E21C2d024	-	-	-																		
C2d - SCI Direct Install	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C2d025	-	-	-																		
C2d - SCI Direct Install	Electronic Defrost Control	E21C2d026	-	-	-																		
C2d - SCI Direct Install	Energy Management System, Electric	E21C2d027	-	-	-																		
C2d - SCI Direct Install	Energy Star Wifi Thermostat, Electric	E21C2d028	-	-	-																		
C2d - SCI Direct Install	Evaporator Fan Control	E21C2d029	-	-	-																		
C2d - SCI Direct Install	Faucet Aerator, Electric	E21C2d030	-	-	-																		
C2d - SCI Direct Install	Hotel Occupancy Sensor	E21C2d031	-	-	-																		
C2d - SCI Direct Install	Low Pressure Drop Filter	E21C2d032	-	-	-																		
C2d - SCI Direct Install	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C2d033	-	-	-																		
C2d - SCI Direct Install	Low-Flow Showerhead, Electric	E21C2d034	-	-	-																		
C2d - SCI Direct Install	Motors, Open Drip	E21C2d035	-	-	-																		
C2d - SCI Direct Install	Motors, Totally Enclosed Fan Cooled	E21C2d036	-	-	-																		
C2d - SCI Direct Install	Novelty Cooler Shutoff	E21C2d037	-	-	-																		
C2d - SCI Direct Install	Pipe Wrap - Heating, Electric	E21C2d038	-	-	-																		
C2d - SCI Direct Install	Pipe Wrap - Hot Water, Electric	E21C2d039	-	-	-																		
C2d - SCI Direct Install	Pre Rinse Spray Valve, Electric	E21C2d040	-	-	-																		
C2d - SCI Direct Install	Programmable Thermostat, Electric	E21C2d041	-	-	-																		
C2d - SCI Direct Install	Steam Trap, Electric	E21C2d042	-	-	-																		
C2d - SCI Direct Install	Variable Frequency Drive	E21C2d043	-	-	-																		
C2d - SCI Direct Install	Variable Frequency Drive with Motor	E21C2d044	-	-	-																		
C2d - SCI Direct Install	Vending Miser	E21C2d045	-	-	-																		
C2d - SCI Direct Install	Zero Loss Condensate Drain	E21C2d046	-	-	-																		
<b>Small Business Energy Solutions Subtotal</b>						<b>2,588.8</b>	<b>2,970.9</b>	<b>2,817.4</b>	<b>34,557.9</b>	<b>39,647.1</b>	<b>37,377.8</b>	<b>326.6</b>	<b>392.5</b>	<b>356.9</b>	<b>252.5</b>	<b>319.5</b>	<b>274.8</b>	-	-	-	-	-	-

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3a - Muni Retrofit	Custom Muni Compressed Air Retro	E21C3a001	-	-	-																		
C3a - Muni Retrofit	Custom Muni Hot Water Retro	E21C3a002	-	-	-																		
C3a - Muni Retrofit	Custom Muni HVAC Retro	E21C3a003	-	-	-																		
C3a - Muni Retrofit	Custom Muni Lighting Retro - Interior	E21C3a004	8	8	8	114.4	99.7	86.7	1,486.6	1,295.9	1,127.5	14.0	12.2	10.6	18.3	15.9	13.9	-	-	-	-	-	
C3a - Muni Retrofit	Custom Muni Lighting Retro - Exterior	E21C3a0091	2	2	1	8.4	7.7	6.9	109.5	99.7	90.1	1.7	1.5	1.4	-	-	-	-	-	-	-	-	
C3a - Muni Retrofit	Custom Muni Lighting Retro - Controls	E21C3a092	1	1	1	2.9	2.5	2.2	26.2	22.9	19.9	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	
C3a - Muni Retrofit	Custom Muni Motors Retro	E21C3a005	-	-	-																		
C3a - Muni Retrofit	Custom Muni Process Retro	E21C3a006	-	-	-																		
C3a - Muni Retrofit	Custom Muni Refrigeration Retro	E21C3a007	-	-	-																		
C3a - Muni Retrofit	Custom Muni Other Retro	E21C3a008	-	-	-																		
C3a - Muni Retrofit	Daylight Dimming	E21C3a009	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Exterior w/ Controls	E21C3a010	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Exterior w/o Controls	E21C3a011	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Interior w/ Controls	E21C3a012	-	-	-																		
C3a - Muni Retrofit	Lighting Fixture - Interior w/o Controls	E21C3a013	-	-	-																		
C3a - Muni Retrofit	Lighting Occupancy Sensors	E21C3a014	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Electric	E21C3a015	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Gas	E21C3a016	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Oil	E21C3a017	-	-	-																		
C3a - Muni Retrofit	Air Sealing, Propane	E21C3a018	-	-	-																		
C3a - Muni Retrofit	Boiler Reset Controls, Gas	E21C3a019	-	-	-																		
C3a - Muni Retrofit	Boiler Reset Controls, Oil	E21C3a020	-	-	-																		
C3a - Muni Retrofit	Boiler Reset Controls, Propane	E21C3a021	-	-	-																		
C3a - Muni Retrofit	Case Motor Replacement	E21C3a022	-	-	-																		
C3a - Muni Retrofit	Cooler Night Cover	E21C3a023	-	-	-																		
C3a - Muni Retrofit	Demand Control Ventilation	E21C3a024	-	-	-																		
C3a - Muni Retrofit	Door Heater Controls	E21C3a025	-	-	-																		
C3a - Muni Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C3a026	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Electric	E21C3a027	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Gas	E21C3a028	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Oil	E21C3a029	-	-	-																		
C3a - Muni Retrofit	Duct Insulation, Propane	E21C3a030	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Electric	E21C3a031	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Gas	E21C3a032	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Oil	E21C3a033	-	-	-																		
C3a - Muni Retrofit	Duct Sealing, Propane	E21C3a034	-	-	-																		
C3a - Muni Retrofit	Ductless Mini Split Heat Pump	E21C3a035	-	-	-																		
C3a - Muni Retrofit	ECM Evaporator Fan Motors for Walk-in Cooler/Freeze	E21C3a036	-	-	-																		
C3a - Muni Retrofit	Electronic Defrost Control	E21C3a037	-	-	-																		
C3a - Muni Retrofit	Energy Management System, Electric	E21C3a038	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Electric	E21C3a039	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Gas	E21C3a040	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Oil	E21C3a041	-	-	-																		
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Propane	E21C3a042	-	-	-																		
C3a - Muni Retrofit	Evaporator Fan Control	E21C3a043	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Electric	E21C3a044	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Gas	E21C3a045	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Oil	E21C3a046	-	-	-																		
C3a - Muni Retrofit	Faucet Aerator, Propane	E21C3a047	-	-	-																		
C3a - Muni Retrofit	Hotel Occupancy Sensor	E21C3a050	-	-	-																		
C3a - Muni Retrofit	Insulation, Electric	E21C3a051	-	-	-																		
C3a - Muni Retrofit	Insulation, Gas	E21C3a052	-	-	-																		
C3a - Muni Retrofit	Insulation, Oil	E21C3a053	-	-	-																		
C3a - Muni Retrofit	Insulation, Propane	E21C3a054	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	126.8	126.8	126.8	3,170.4	3,170.4	3,170.4
C3a - Muni Retrofit	Low Pressure Drop Filter	E21C3a055	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C3a056	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Gas	E21C3a057	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Oil	E21C3a058	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic Valve, Propa	E21C3a059	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Electric	E21C3a060	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Gas	E21C3a061	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Oil	E21C3a062	-	-	-																		
C3a - Muni Retrofit	Low-Flow Showerhead, Propane	E21C3a063	-	-	-																		
C3a - Muni Retrofit	Motors, Open Drip	E21C3a064	-	-	-																		
C3a - Muni Retrofit	Motors, Totally Enclosed Fan Cooled	E21C3a065	-	-	-																		
C3a - Muni Retrofit	Novelty Cooler Shutoff	E21C3a066	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3a - Muni Retrofit	Pipe Wrap - Heating, Electric	E21C3a067	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Heating, Gas	E21C3a068	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Heating, Oil	E21C3a069	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Heating, Propane	E21C3a070	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Electric	E21C3a071	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Gas	E21C3a072	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Oil	E21C3a073	-	-	-																		
C3a - Muni Retrofit	Pipe Wrap - Hot Water, Propane	E21C3a074	-	-	-																		
C3a - Muni Retrofit	Pre Rinse Spray Valve, Electric	E21C3a075	-	-	-																		
C3a - Muni Retrofit	Pre Rinse Spray Valve, Gas	E21C3a076	-	-	-																		
C3a - Muni Retrofit	Pre Rinse Spray Valve, Oil	E21C3a077	-	-	-																		
C3a - Muni Retrofit	Pre Rinse Spray Valve, Propane	E21C3a078	-	-	-																		
C3a - Muni Retrofit	Programmable Thermostat, Electric	E21C3a079	-	-	-																		
C3a - Muni Retrofit	Programmable Thermostat, Gas	E21C3a080	-	-	-																		
C3a - Muni Retrofit	Programmable Thermostat, Oil	E21C3a081	-	-	-																		
C3a - Muni Retrofit	Programmable Thermostat, Propane	E21C3a082	-	-	-																		
C3a - Muni Retrofit	Steam Trap, Electric	E21C3a083	-	-	-																		
C3a - Muni Retrofit	Steam Trap, Gas	E21C3a084	-	-	-																		
C3a - Muni Retrofit	Steam Trap, Oil	E21C3a085	-	-	-																		
C3a - Muni Retrofit	Steam Trap, Propane	E21C3a086	-	-	-																		
C3a - Muni Retrofit	Variable Frequency Drive	E21C3a087	1	1	1	17.2	16.5	15.8	224.2	214.8	204.9	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Variable Frequency Drive with Motor	E21C3a088	-	-	-																		
C3a - Muni Retrofit	Vending Miser	E21C3a089	-	-	-																		
C3a - Muni Retrofit	Zero Loss Condensate Drain	E21C3a090	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Compressed Air New	E21C3b001	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Hot Water New	E21C3b002	-	-	-																		
C3b - Muni New Equipmen	Custom Muni HVAC New	E21C3b003	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Lighting New - Interior	E21C3b004	1	1	1	12.9	11.3	9.8	194.1	169.2	147.2	-	-	-	-	-	-	-	-	-	-	-	-
C3b - Muni New Equipmen	Custom Muni Lighting New - Exterior	E21C3b005	1	1	1	5.9	5.4	4.9	88.5	80.5	72.8	-	-	-	-	-	-	-	-	-	-	-	-
C3b - Muni New Equipmen	Custom Muni Lighting New - Controls	E21C3b006	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Motors New	E21C3b007	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Process New	E21C3b008	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Refrigeration New	E21C3b009	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Other New	E21C3b010	-	-	-																		
C3b - Muni New Equipmen	Custom Muni Comprehensive Design	E21C3b011	-	-	-																		
C3b - Muni New Equipmen	Daylight Dimming	E21C3b012	-	-	-																		
C3b - Muni New Equipmen	Lighting Occupancy Sensors	E21C3b013	-	-	-																		
C3b - Muni New Equipmen	Advanced Power Strip	E21C3b014	-	-	-																		
C3b - Muni New Equipmen	Air Compressor	E21C3b015	-	-	-																		
C3b - Muni New Equipmen	Air Nozzle	E21C3b016	-	-	-																		
C3b - Muni New Equipmen	Boiler 1000 to 1700 MBH 90 AFUE, Oil	E21C3b017	-	-	-																		
C3b - Muni New Equipmen	Boiler 1000 to 1700 MBH 90 AFUE, Propane	E21C3b018	-	-	-																		
C3b - Muni New Equipmen	Boiler 1701 to 2000 MBH 85 AFUE, Oil	E21C3b019	-	-	-																		
C3b - Muni New Equipmen	Boiler 1701 to 2000 MBH 90 AFUE, Propane	E21C3b020	-	-	-																		
C3b - Muni New Equipmen	Boiler 301 to 499 MBH 85 AFUE, Oil	E21C3b021	-	-	-																		
C3b - Muni New Equipmen	Boiler 301 to 499 MBH 90 AFUE, Propane	E21C3b022	-	-	-																		
C3b - Muni New Equipmen	Boiler 301 to 499 MBH 85 AFUE, Oil	E21C3b023	-	-	-																		
C3b - Muni New Equipmen	Boiler 301 to 499 MBH 90 AFUE, Propane	E21C3b024	-	-	-																		
C3b - Muni New Equipmen	Boiler 500 to 999 MBH 85 AFUE, Oil	E21C3b025	-	-	-																		
C3b - Muni New Equipmen	Boiler 500 to 999 MBH 90 AFUE, Propane	E21C3b026	-	-	-																		
C3b - Muni New Equipmen	Boiler to 300 MBH 85 AFUE, Oil	E21C3b027	-	-	-																		
C3b - Muni New Equipmen	Boiler to 300 MBH 87 AFUE, Oil	E21C3b028	-	-	-																		
C3b - Muni New Equipmen	Boiler to 300 MBH 90 AFUE, Propane	E21C3b029	-	-	-																		
C3b - Muni New Equipmen	Boiler to 300 MBH 95 AFUE, Propane	E21C3b030	-	-	-																		
C3b - Muni New Equipmen	Circulator Pump	E21C3b031	-	-	-																		
C3b - Muni New Equipmen	Combination Oven, Electric	E21C3b032	-	-	-																		
C3b - Muni New Equipmen	Compressor Storage	E21C3b033	-	-	-																		
C3b - Muni New Equipmen	Condensing Unit Heater up to 300 MBH, Oil	E21C3b034	-	-	-																		
C3b - Muni New Equipmen	Condensing Unit Heater up to 300 MBH, Propane	E21C3b035	-	-	-																		
C3b - Muni New Equipmen	Convection Oven, Electric	E21C3b036	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - High Temp Door Type	E21C3b037	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - High Temp Multi Tank Conveyor	E21C3b038	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - High Temp Pot, Pan, Utensil	E21C3b039	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - High Temp Single Tank Conveyor	E21C3b040	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - High Temp Under Counter	E21C3b041	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - Low Temp Door Type	E21C3b042	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - Low Temp Multi Tank Conveyor	E21C3b043	-	-	-																		
C3b - Muni New Equipmen	Dishwasher - Low Temp Single Tank Conveyor	E21C3b044	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3b - Muni New Equipmen	Dishwasher - Low Temp Under Counter	E21C3b044	-	-	-																		
C3b - Muni New Equipmen	Faucet Aerator, Electric	E21C3b045	-	-	-																		
C3b - Muni New Equipmen	Faucet Aerator, Gas	E21C3b046	-	-	-																		
C3b - Muni New Equipmen	Faucet Aerator, Oil	E21C3b047	-	-	-																		
C3b - Muni New Equipmen	Faucet Aerator, Propane	E21C3b048	-	-	-																		
C3b - Muni New Equipmen	Fryer Large Vat, Electric	E21C3b049	-	-	-																		
C3b - Muni New Equipmen	Fryer Standard Vat, Electric	E21C3b050	-	-	-																		
C3b - Muni New Equipmen	Furnace w/ ECM 85 AFUE up to 150 MBH, Oil	E21C3b051	-	-	-																		
C3b - Muni New Equipmen	Furnace w/ ECM 87 AFUE up to 150 MBH, Oil	E21C3b052	-	-	-																		
C3b - Muni New Equipmen	Furnace w/ ECM 95 AFUE up to 150 MBH, Propane	E21C3b053	-	-	-																		
C3b - Muni New Equipmen	Furnace w/ ECM 97 AFUE up to 150 MBH, Propane	E21C3b054	-	-	-																		
C3b - Muni New Equipmen	Griddle, Electric	E21C3b055	-	-	-																		
C3b - Muni New Equipmen	Ground Source Heat Pump	E21C3b056	-	-	-																		
C3b - Muni New Equipmen	Hot Food Holding Cabinet 3/4 Size	E21C3b057	-	-	-																		
C3b - Muni New Equipmen	Hot Food Holding Cabinet Full Size	E21C3b058	-	-	-																		
C3b - Muni New Equipmen	Hot Food Holding Cabinet Half Size	E21C3b059	-	-	-																		
C3b - Muni New Equipmen	Ice Machine - Ice Making Head	E21C3b060	-	-	-																		
C3b - Muni New Equipmen	Ice Machine - Remote Cond./Split Unit - Batch	E21C3b061	-	-	-																		
C3b - Muni New Equipmen	Ice Machine - Remote Cond./Split Unit - Continuous	E21C3b062	-	-	-																		
C3b - Muni New Equipmen	Ice Machine - Self Contained	E21C3b063	-	-	-																		
C3b - Muni New Equipmen	Infrared Heater	E21C3b064	-	-	-																		
C3b - Muni New Equipmen	Low Pressure Drop Filter	E21C3b065	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead With Thermostatic Valve, Electr	E21C3b066	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead With Thermostatic Valve, Gas	E21C3b067	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead With Thermostatic Valve, Oil	E21C3b068	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead With Thermostatic Valve, Propa	E21C3b069	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead, Electric	E21C3b070	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead, Gas	E21C3b071	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead, Oil	E21C3b072	-	-	-																		
C3b - Muni New Equipmen	Low-Flow Showerhead, Propane	E21C3b073	-	-	-																		
C3b - Muni New Equipmen	Pre Rinse Spray Valve, Electric	E21C3b074	-	-	-																		
C3b - Muni New Equipmen	Pre Rinse Spray Valve, Gas	E21C3b075	-	-	-																		
C3b - Muni New Equipmen	Pre Rinse Spray Valve, Oil	E21C3b076	-	-	-																		
C3b - Muni New Equipmen	Pre Rinse Spray Valve, Propane	E21C3b077	-	-	-																		
C3b - Muni New Equipmen	Refrigerated Air Dryer	E21C3b078	-	-	-																		
C3b - Muni New Equipmen	Steam Cooker, Electric	E21C3b079	-	-	-																		
C3b - Muni New Equipmen	Unitary Air Conditioner	E21C3b080	-	-	-																		
C3b - Muni New Equipmen	Water Source Heat Pump	E21C3b081	-	-	-																		
C3b - Muni New Equipmen	Zero Loss Condensate Drain	E21C3b082	-	-	-																		
C3b - Muni New Equipmen	High Efficiency Chiller - FL	E21C3b083	-	-	-																		
C3b - Muni New Equipmen	High Efficiency Chiller - IPLV	E21C3b084	-	-	-																		
C3d - Muni Direct Install	Custom Muni Compressed Air Direct Install	E21C3d001	-	-	-																		
C3d - Muni Direct Install	Custom Muni Hot Water Direct Install	E21C3d002	-	-	-																		
C3d - Muni Direct Install	Custom Muni HVAC Direct Install	E21C3d003	-	-	-																		
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Interior	E21C3d004	-	-	-																		
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Exterior	E21C3d005	-	-	-																		
C3d - Muni Direct Install	Custom Muni Lighting Direct Install - Controls	E21C3d006	-	-	-																		
C3d - Muni Direct Install	Custom Muni Motors Direct Install	E21C3d007	-	-	-																		
C3d - Muni Direct Install	Custom Muni Process Direct Install	E21C3d008	-	-	-																		
C3d - Muni Direct Install	Custom Muni Refrigeration Direct Install	E21C3d009	-	-	-																		
C3d - Muni Direct Install	Custom Muni Other Direct Install	E21C3d010	-	-	-																		
C3d - Muni Direct Install	Daylight Dimming	E21C3d011	-	-	-																		
C3d - Muni Direct Install	Lighting Fixture - Exterior w/ Controls	E21C3d012	-	-	-																		
C3d - Muni Direct Install	Lighting Fixture - Exterior w/o Controls	E21C3d013	-	-	-																		
C3d - Muni Direct Install	Lighting Fixture - Interior w/ Controls	E21C3d014	-	-	-																		
C3d - Muni Direct Install	Lighting Fixture - Interior w/o Controls	E21C3d015	-	-	-																		
C3d - Muni Direct Install	Lighting Occupancy Sensors	E21C3d016	-	-	-																		
C3d - Muni Direct Install	Air Sealing, Electric	E21C3d017	-	-	-																		
C3d - Muni Direct Install	Air Sealing, Gas	E21C3d018	-	-	-																		
C3d - Muni Direct Install	Air Sealing, Oil	E21C3d019	-	-	-																		
C3d - Muni Direct Install	Air Sealing, Propane	E21C3d020	-	-	-																		
C3d - Muni Direct Install	Boiler Reset Controls, Gas	E21C3d021	-	-	-																		
C3d - Muni Direct Install	Boiler Reset Controls, Oil	E21C3d022	-	-	-																		
C3d - Muni Direct Install	Boiler Reset Controls, Propane	E21C3d023	-	-	-																		
C3d - Muni Direct Install	Case Motor Replacement	E21C3d024	-	-	-																		
C3d - Muni Direct Install	Cooler Night Cover	E21C3d025	-	-	-																		

Subprogram	Measure	Measure ID	Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
			2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3d - Muni Direct Install	Demand Control Ventilation	E21C3d026	-	-	-																		
C3d - Muni Direct Install	Door Heater Controls	E21C3d027	-	-	-																		
C3d - Muni Direct Install	Dual Enthalpy Economizer Controls (DEEC)	E21C3d028	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Electric	E21C3d029	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Gas	E21C3d030	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Oil	E21C3d031	-	-	-																		
C3d - Muni Direct Install	Duct Insulation, Propane	E21C3d032	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Electric	E21C3d033	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Gas	E21C3d034	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Oil	E21C3d035	-	-	-																		
C3d - Muni Direct Install	Duct Sealing, Propane	E21C3d036	-	-	-																		
C3d - Muni Direct Install	Ductless Mini Split Heat Pump	E21C3d037	-	-	-																		
C3d - Muni Direct Install	ECM Evaporator Fan Motors for Walk-in Cooler/Freezer	E21C3d038	-	-	-																		
C3d - Muni Direct Install	Electronic Defrost Control	E21C3d039	-	-	-																		
C3d - Muni Direct Install	Energy Management System, Electric	E21C3d040	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Electric	E21C3d041	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Gas	E21C3d042	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Oil	E21C3d043	-	-	-																		
C3d - Muni Direct Install	Energy Star Wifi Thermostat, Propane	E21C3d044	-	-	-																		
C3d - Muni Direct Install	Evaporator Fan Control	E21C3d045	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Electric	E21C3d046	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Gas	E21C3d047	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Oil	E21C3d048	-	-	-																		
C3d - Muni Direct Install	Faucet Aerator, Propane	E21C3d049	-	-	-																		
C3d - Muni Direct Install	Hotel Occupancy Sensor	E21C3d050	-	-	-																		
C3d - Muni Direct Install	Insulation, Electric	E21C3d051	-	-	-																		
C3d - Muni Direct Install	Insulation, Gas	E21C3d052	-	-	-																		
C3d - Muni Direct Install	Insulation, Oil	E21C3d053	-	-	-																		
C3d - Muni Direct Install	Insulation, Propane	E21C3d054	-	-	-																		
C3d - Muni Direct Install	Low Pressure Drop Filter	E21C3d055	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Electric	E21C3d056	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Gas	E21C3d057	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Oil	E21C3d058	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead With Thermostatic Valve, Propane	E21C3d059	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Electric	E21C3d060	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Gas	E21C3d061	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Oil	E21C3d062	-	-	-																		
C3d - Muni Direct Install	Low-Flow Showerhead, Propane	E21C3d063	-	-	-																		
C3d - Muni Direct Install	Motors, Open Drip	E21C3d064	-	-	-																		
C3d - Muni Direct Install	Motors, Totally Enclosed Fan Cooled	E21C3d065	-	-	-																		
C3d - Muni Direct Install	Novelty Cooler Shutoff	E21C3d066	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Electric	E21C3d067	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Gas	E21C3d068	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Oil	E21C3d069	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Heating, Propane	E21C3d070	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Electric	E21C3d071	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Gas	E21C3d072	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Oil	E21C3d073	-	-	-																		
C3d - Muni Direct Install	Pipe Wrap - Hot Water, Propane	E21C3d074	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Electric	E21C3d075	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Gas	E21C3d076	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Oil	E21C3d077	-	-	-																		
C3d - Muni Direct Install	Pre Rinse Spray Valve, Propane	E21C3d078	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Electric	E21C3d079	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Gas	E21C3d080	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Oil	E21C3d081	-	-	-																		
C3d - Muni Direct Install	Programmable Thermostat, Propane	E21C3d082	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Electric	E21C3d083	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Gas	E21C3d084	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Oil	E21C3d085	-	-	-																		
C3d - Muni Direct Install	Steam Trap, Propane	E21C3d086	-	-	-																		
C3d - Muni Direct Install	Variable Frequency Drive	E21C3d087	-	-	-																		
C3d - Muni Direct Install	Variable Frequency Drive with Motor	E21C3d088	-	-	-																		
C3d - Muni Direct Install	Vending Miser	E21C3d089	-	-	-																		
C3d - Muni Direct Install	Zero Loss Condensate Drain	E21C3d090	-	-	-																		
<b>Municipal Energy Solutions Subtotal</b>						<b>161.8</b>	<b>143.1</b>	<b>126.3</b>	<b>2,129.1</b>	<b>1,882.9</b>	<b>1,662.3</b>	<b>15.7</b>	<b>13.7</b>	<b>12.0</b>	<b>18.3</b>	<b>16.0</b>	<b>13.9</b>	<b>126.8</b>	<b>126.8</b>	<b>126.8</b>	<b>3,170.4</b>	<b>3,170.4</b>	<b>3,170.4</b>

**2021-2023 System Benefits Charge ("SBC") Calculation**  
 (\$ in 000's)

Year	Member Sector	EE Total Budget	RGGI Revenues	FCM Revenues	Carryforward with Interest	SBC Requirement	Forecasted Distribution (MWH)	SBC Rate EE Portion (cents/kWh)	SBC Rate EAP Portion (cents/kWh)	Total SBC Rate (cents/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. G	Col. I	Col. J	Col. K	Col. L	Col. N
2021	Residential	\$ 4,407	\$ 34.61	\$ 30.00	\$ 407.83	\$ 3,935	469,460	0.838	0.150	0.988
2021	C&I	\$ 2,982	\$ 172.87	\$ 70.00	\$ 28.16	\$ 2,711	299,137	0.906	0.150	1.056
2021	Total	\$ 7,389	\$ 207.49	\$ 100.00	\$ 435.98	\$ 6,646	768,597	0.865	0.150	1.015
2022	Residential	\$ 4,165	\$ 34.61	\$ 30.00	\$ -	\$ 4,100	469,460	0.873	0.150	1.023
2022	C&I	\$ 3,343	\$ 172.87	\$ 70.00	\$ -	\$ 3,100	299,137	1.036	0.150	1.186
2022	Total	\$ 7,508	\$ 207.49	\$ 100.00	\$ -	\$ 7,201	768,597	0.937	0.150	1.087
2023	Residential	\$ 4,071	\$ 34.61	\$ 30.00	\$ -	\$ 4,006	469,460	0.853	0.150	1.003
2023	C&I	\$ 3,248	\$ 172.87	\$ 70.00	\$ -	\$ 3,005	299,137	1.005	0.150	1.155
2023	Total	\$ 7,319	\$ 207.49	\$ 100.00	\$ -	\$ 7,012	768,597	0.912	0.150	1.062

- Col. A: Effective year (January 1 - December 31)
- Col. B: Member Sector
- Col. C: Company Forecast
- Col. D: Company Forecast
- Col. E: Company Forecast
- Col. F: Company Forecast
- Col. G: Page 2, Line 9 Col. N + Line 11 Col. O
- Col. H: Page 2, Line 13, Col. O
- Col. I: Col. C - Col. D - Col. E - Col. F + Col. G - Col. H
- Col. J: Company Forecast
- Col. K: (Col. I / Col. J) x 100
- Col. L: EAP Portion of SBC Rate
- Col. M: Page 3, Col. G
- Col. N: Col. J + Col. K

**New Hampshire Electric Cooperative, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Residential)**  
**January 1, 2021 to December 31, 2021**

(\$ in 000's)

Line	Description	Carrover 12/31/2020	Actual Jan 2021	Actual Feb 2021	Actual Mar 2021	Actual Apr 2021	Actual May 2021	Actual Jun 2021	Actual Jul 2021	Actual Aug 2021	Actual Sep 2021	Actual Oct 2021	Actual Nov 2021	Actual Dec 2021	2021 Total
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	SBC Revenues		408	428	361	315	275	271	298	376	316	244	283	360	3,935
2	RGGI Revenues		-	-	9	-	-	9	-	-	9	-	-	9	35
3	FCM Revenues		3	3	3	3	3	3	3	3	3	3	3	3	30
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-
5	Total Revenues		411	430	372	317	278	282	301	378	327	247	285	371	3,999
6	Program Expenses		367	367	367	367	367	367	367	367	367	367	367	367	4,407
7	Total Program Expenses		367	367	367	367	367	367	367	367	367	367	367	367	4,407
8	Current Month (Over)/Under Recovery		(43)	(63)	(5)	50	89	85	67	(11)	40	120	82	(4)	
9	Cumulative (Over)/Under Recovery	(408)	(451)	(514)	(519)	(469)	(379)	(294)	(228)	(239)	(199)	(78)	4	(0)	
10	Interest @ Prime Rate	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	Interest on Deferral Balance		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(0)	(0)	0	(10)
12	Monthly Sales (MWh)		48,689	51,055	43,056	37,537	32,849	32,312	35,586	44,817	37,720	29,172	33,712	42,955	469,460
13	EE SBC Rate		0.838	0.838	0.838	0.838	0.838	0.838	0.838	0.838	0.838	0.838	0.838	0.838	

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**New Hampshire Electric Cooperative, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Commercial)**  
**January 1, 2021 to December 31, 2021**

Line	Description	(\$ in 000's)														
		Carrover 12/31/20	Actual Jan 2021	Actual Feb 2021	Actual Mar 2021	Actual Apr 2021	Actual May 2021	Actual Jun 2021	Actual Jul 2021	Actual Aug 2021	Actual Sep 2021	Actual Oct 2021	Actual Nov 2021	Actual Dec 2021	2021 Total	
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	SBC Revenues		301	267	217	202	185	203	221	252	232	180	187	263	2,711	
2	RGGI Revenues		-	-	43	-	-	43	-	-	43	-	-	43	173	
3	FCM Revenues		6	6	6	6	6	6	6	6	6	6	6	6	70	
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Total Revenues		307	273	266	208	190	252	227	257	281	186	193	312	2,954	
6	Program Expenses		249	249	249	249	249	249	249	249	249	249	249	249	2,734	
7	Total Program Expenses		249	249	249	249	249	249	249	249	249	249	249	249	2,734	
8	Current Month (Over)/Under Recovery		(59)	(25)	(18)	40	58	(3)	21	(9)	(33)	62	56	(64)		
9	Cumulative (Over)/Under Recovery	(28)	(87)	(111)	(129)	(89)	(31)	(34)	(13)	(22)	(54)	8	64	(0)		
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%		
11	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0	0		
12	Monthly Sales (MWh)		33,245	29,485	23,981	22,337	20,367	22,351	24,439	27,757	25,605	19,902	20,641	29,026	299,137	
13	EE SBC Rate		0.906	0.906	0.906	0.906	0.906	0.906	0.906	0.906	0.906	0.906	0.906	0.906		

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**New Hampshire Electric Cooperative, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation**  
**January 1, 2022 to December 31, 2022 (Residential)**

Line	Description	(\$ in 000's)														2021 Total
		Carrover 12/31/20	Actual Jan 2021	Actual Feb 2021	Actual Mar 2021	Actual Apr 2021	Actual May 2021	Actual Jun 2021	Actual Jul 2021	Actual Aug 2021	Actual Sep 2021	Actual Oct 2021	Actual Nov 2021	Actual Dec 2021		
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	SBC Revenues		425	446	376	328	287	282	311	391	329	255	294	375	4,100	
2	RGGI Revenues		-	-	9	-	-	9	-	-	9	-	-	9	35	
3	FCM Revenues		3	3	3	3	3	3	3	3	3	3	3	3	30	
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Total Revenues		428	448	387	330	289	293	313	394	341	257	297	386	4,165	
6	Program Expenses		347	347	347	347	347	347	347	347	347	347	347	347	4,165	
7	Total Program Expenses		347	347	347	347	347	347	347	347	347	347	347	347	4,165	
8	Current Month (Over)/Under Recovery		(81)	(101)	(40)	17	58	54	34	(47)	6	90	50	(39)		
9	Cumulative (Over)/Under Recovery		(81)	(182)	(222)	(205)	(148)	(94)	(60)	(107)	(101)	(11)	39	(0)		
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%		
11	Interest on Deferral Balance		(0)	(0)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	0	0		
12	Monthly Sales (MWh)		48,689	51,055	43,056	37,537	32,849	32,312	35,586	44,817	37,720	29,172	33,712	42,955	469,460	
13	EE SBC Rate		0.873	0.873	0.873	0.873	0.873	0.873	0.873	0.873	0.873	0.873	0.873	0.873		

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**New Hampshire Electric Cooperative, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Commercial)**  
**January 1, 2022 to December 31, 2022**

Line	Description	(\$ in 000's)														
		Carover 12/31/20	Actual Jan 2021	Actual Feb 2021	Actual Mar 2021	Actual Apr 2021	Actual May 2021	Actual Jun 2021	Actual Jul 2021	Actual Aug 2021	Actual Sep 2021	Actual Oct 2021	Actual Nov 2021	Actual Dec 2021	2021 Total	
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	SBC Revenues		345	306	249	231	211	232	253	288	265	206	214	301	3100	
2	RGGI Revenues		0	0	43	0	0	43	0	43	0	43	0	43	173	
3	FCM Revenues		6	6	6	6	6	6	6	6	6	6	6	6	70	
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Total Revenues		350	311	298	237	217	281	259	293	314	212	220	350	3343	
6	Program Expenses		279	279	279	279	279	279	279	279	279	279	279	279	3,343	
7	Total Program Expenses		279	279	279	279	279	279	279	279	279	279	279	279	3,343	
8	Current Month (Over)/Under Recovery		(72)	(33)	(19)	41	62	(2)	19	(15)	(36)	66	59	(71)		
9	Cumulative (Over)/Under Recovery		(72)	(105)	(124)	(82)	(21)	(23)	(3)	(18)	(54)	12	71	(0)		
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%		
11	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0	0		
12	Monthly Sales (MWh)		33,245	29,485	23,981	22,337	20,367	22,351	24,439	27,757	25,605	19,902	20,641	29,026	299,137	
13	EE SBC Rate		1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036	1.036		

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**New Hampshire Electric Cooperative, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Residential)**  
**January 1, 2023 to December 31, 2023**

Line	Description	(\$ in 000's)														
		Carrover 12/31/20	Actual Jan 2021	Actual Feb 2021	Actual Mar 2021	Actual Apr 2021	Actual May 2021	Actual Jun 2021	Actual Jul 2021	Actual Aug 2021	Actual Sep 2021	Actual Oct 2021	Actual Nov 2021	Actual Dec 2021	2021 Total	
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	SBC Revenues			416	436	367	320	280	276	304	382	322	249	288	367	4006
2	RGGI Revenues			-	-	9	-	-	9	-	-	9	-	-	9	35
3	FCM Revenues			3	3	3	3	3	3	3	3	3	3	3	3	30
4	Other Revenues			-	-	-	-	-	-	-	-	-	-	-	-	-
5	Total Revenues			418	438	379	323	283	287	306	385	333	251	290	378	4071
6	Program Expenses			339	339	339	339	339	339	339	339	339	339	339	339	4,071
7	Total Program Expenses			339	339	339	339	339	339	339	339	339	339	339	339	4,071
8	Current Month (Over)/Under Recovery			(79)	(99)	(39)	16	56	52	33	(46)	6	88	49	(38)	
9	Cumulative (Over)/Under Recovery			(79)	(178)	(217)	(201)	(144)	(92)	(59)	(105)	(98)	(11)	38	0	
10	Interest @ Prime Rate			0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	
11	Interest on Deferral Balance			(0)	(0)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	0	0	
12	Monthly Sales (MWh)			48,689	51,055	43,056	37,537	32,849	32,312	35,586	44,817	37,720	29,172	33,712	42,955	
13	EE SBC Rate			0.853	0.853	0.853	0.853	0.853	0.853	0.853	0.853	0.853	0.853	0.853	0.853	

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**New Hampshire Electric Cooperative, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation (Commercial)**  
 January 1, 2023 to December 31, 2023

Line	Description	(\$ in 000's)														
		Carrover 12/31/20	Actual Jan 2021	Actual Feb 2021	Actual Mar 2021	Actual Apr 2021	Actual May 2021	Actual Jun 2021	Actual Jul 2021	Actual Aug 2021	Actual Sep 2021	Actual Oct 2021	Actual Nov 2021	Actual Dec 2021	2021 Total	
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O	
1	SBC Revenues		334	296	241	224	205	225	246	279	257	200	207	292	3005	
2	RGGI Revenues		0	0	43	0	0	43	0	43	0	43	0	43	173	
3	FCM Revenues		6	6	6	6	6	6	6	6	6	6	6	6	70	
4	Other Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Total Revenues		340	302	290	230	210	274	251	285	306	206	213	341	3248	
6	Program Expenses		271	271	271	271	271	271	271	271	271	271	271	271	3,248	
7	Total Program Expenses		271	271	271	271	271	271	271	271	271	271	271	271	3,248	
8	Current Month (Over)/Under Recovery		(69)	(31)	(19)	40	60	(3)	19	(14)	(36)	65	57	(70)		
9	Cumulative (Over)/Under Recovery		(69)	(101)	(120)	(79)	(19)	(22)	(3)	(17)	(52)	13	70	(0)		
10	Interest @ Prime Rate		0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%	0.2708%		
11	Interest on Deferral Balance		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0	0		
12	Monthly Sales (MWh)		33,245	29,485	23,981	22,337	20,367	22,351	24,439	27,757	25,605	19,902	20,641	29,026		
13	EE SBC Rate		1.005	1.005	1.005	1.005	1.005	1.005	1.005	1.005	1.005	1.005	1.005	1.005		

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**Bill Impacts of Changes in System Benefits Charge - New Hampshire Electric Cooperative, Inc.**

	<u>Current Rates*</u>		<u>2021</u>	<u>2022</u>	<u>2023</u>
EE Portion of System Benefits Charge (\$/kWh)	\$	0.00528	N/A		
Proposed Residential EE Portion of System Benefits Charge (\$/kWh)	N/A		\$ 0.00838	0.0087343	0.008534
Proposed Commercial EE Portion of System Benefits Charge (\$/kWh)	N/A		\$ 0.00906	0.0103636	0.010046
<u>Bill per month, including NHEC default energy service</u>					
Residential Rate Basic (625 kWh/month)	\$	117.01	\$ 118.95	\$ 119.17	\$ 119.04
Commercial B3, three phase service (<50 kW, 10,000 kWh/month)	\$	1,649.14	\$ 1,686.97	\$ 1,699.98	\$ 1,696.80
<u>Change from previous rate level - \$ per month</u>					
Residential Rate Basic (625 kWh/month)			\$ 1.94	\$ 0.22	\$ (0.13)
Commercial B3, three phase service (<50 kW, 10,000 kWh/month)			\$ 37.83	\$ 13.01	\$ (3.18)
<u>Change from previous rate level - %</u>					
Residential Rate Basic (625 kWh/month)			1.7%	0.19%	-0.11%
Commercial B3, three phase service (<50 kW, 10,000 kWh/month)			2.3%	0.77%	-0.19%

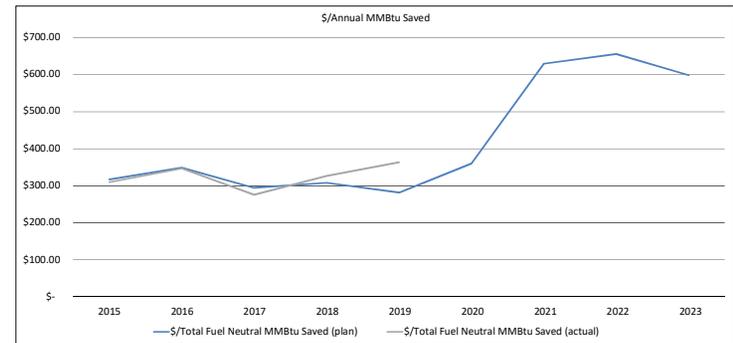
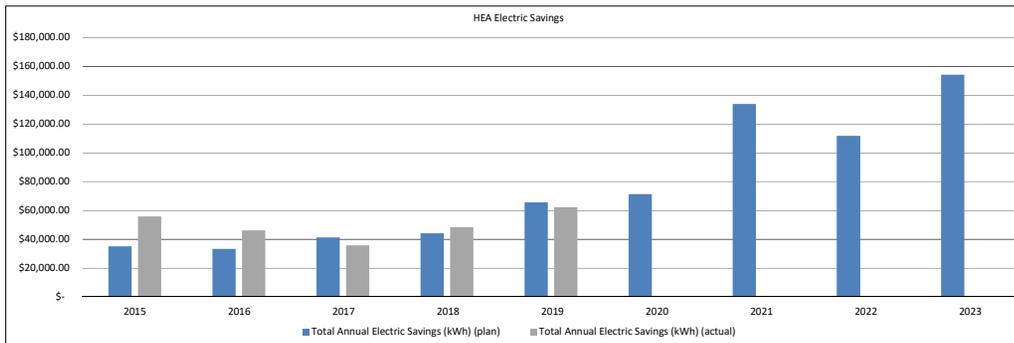
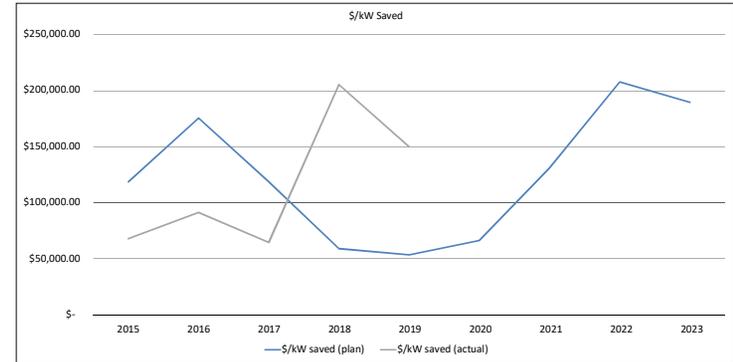
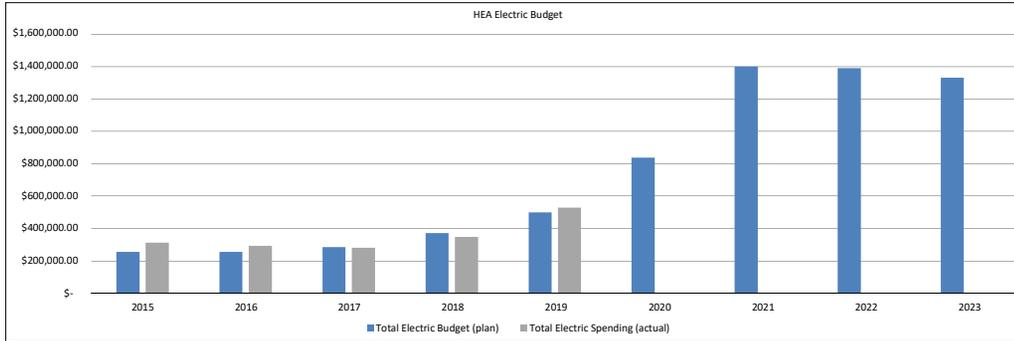
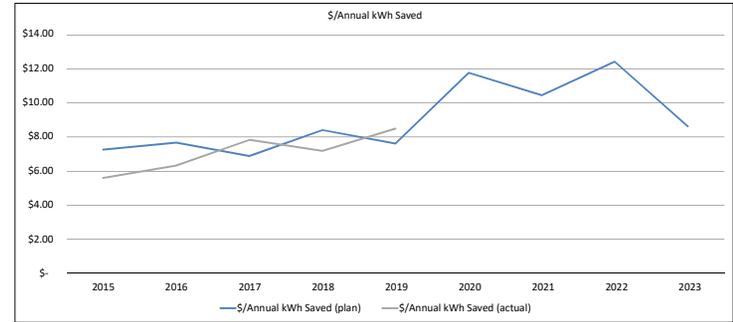
\* Stated at NHEC's rate levels approved March 31,2020

Home Energy Assistance

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 254,857.00	\$ 255,703.00	\$ 284,308.00	\$ 371,084.55	\$ 499,415.73	\$ 838,773.00	\$ 1,401,044.44	\$ 1,389,759.92	\$ 1,331,991.65
	Total Annual Electric Savings (kWh) (plan)	\$ 35,100.20	\$ 33,320.82	\$ 41,277.05	\$ 44,118.52	\$ 65,569.58	\$ 71,262.75	\$ 133,985.40	\$ 111,856.22	\$ 154,282.45
	\$/Annual kWh Saved (plan)	\$ 7.26	\$ 7.67	\$ 6.89	\$ 8.41	\$ 7.62	\$ 11.77	\$ 10.46	\$ 12.42	\$ 8.63
2)	Total Electric Budget	\$ 254,857.00	\$ 255,703.00	\$ 284,308.00	\$ 371,084.55	\$ 499,415.73	\$ 838,773.00	\$ 1,401,044.44	\$ 1,389,759.92	\$ 1,331,991.65
	Total kW saved	\$ 2.15	\$ 1.45	\$ 2.39	\$ 6.28	\$ 9.34	\$ 12.64	\$ 10.69	\$ 6.68	\$ 7.02
	\$/kW saved (plan)	\$ 118,803.99	\$ 175,764.94	\$ 118,738.52	\$ 59,056.07	\$ 53,477.66	\$ 66,382.70	\$ 131,084.30	\$ 207,953.92	\$ 189,818.94
3)	Total Electric Budget	\$ 254,857.00	\$ 255,703.00	\$ 284,308.00	\$ 371,084.55	\$ 499,415.73	\$ 838,773.00	\$ 1,401,044.44	\$ 1,389,759.92	\$ 1,331,991.65
	Total Fuel Neutral MMBtu Saved	\$ 803.73	\$ 732.78	\$ 965.66	\$ 1,204.43	\$ 1,773.71	\$ 2,329.89	\$ 2,225.39	\$ 2,119.42	\$ 2,225.39
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 317.09	\$ 348.95	\$ 294.42	\$ 308.10	\$ 281.57	\$ 360.00	\$ 629.57	\$ 655.73	\$ 598.54

Actuals		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Spending (actual)	\$ 313,005.00	\$ 292,376.00	\$ 280,148.40	\$ 348,316.37	\$ 529,829.57				
	Total Annual Electric Savings (kWh) (actu)	\$ 55,900.00	\$ 46,200.00	\$ 35,764.57	\$ 48,480.85	\$ 62,388.23				
	\$/Annual kWh Saved (actual)	\$ 5.60	\$ 6.33	\$ 7.83	\$ 7.18	\$ 8.49				
2)	Total Electric Spending	\$ 313,005.00	\$ 292,376.00	\$ 280,148.40	\$ 348,316.37	\$ 529,829.57				
	Total kW saved	\$ 4.60	\$ 3.20	\$ 4.33	\$ 1.69	\$ 3.53				
	\$/kW saved (actual)	\$ 68,044.57	\$ 91,367.50	\$ 64,654.44	\$ 205,508.97	\$ 150,172.66				
3)	Total Electric Spending	\$ 313,005.00	\$ 292,376.00	\$ 280,148.40	\$ 348,316.37	\$ 529,829.57				
	Total Fuel Neutral MMBtu Saved	\$ 1,010.08	\$ 842.90	\$ 1,015.69	\$ 1,067.33	\$ 1,456.82				
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 309.88	\$ 346.87	\$ 275.82	\$ 326.34	\$ 363.69				

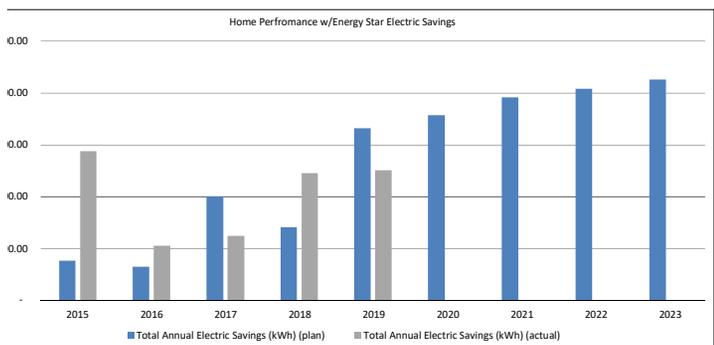
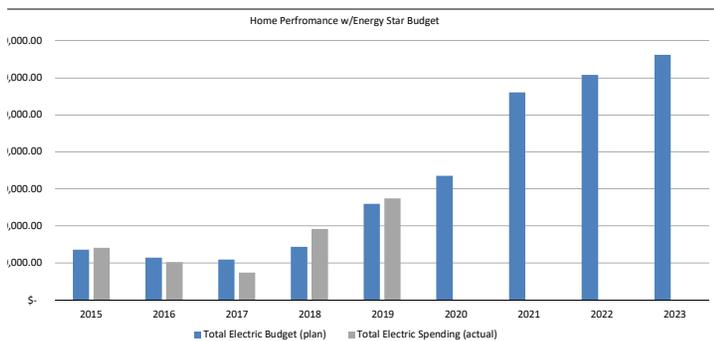
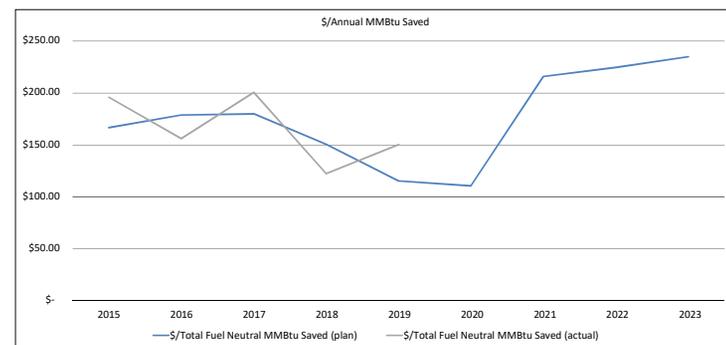
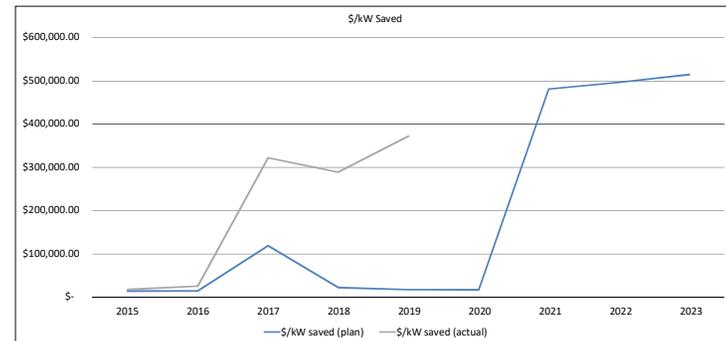
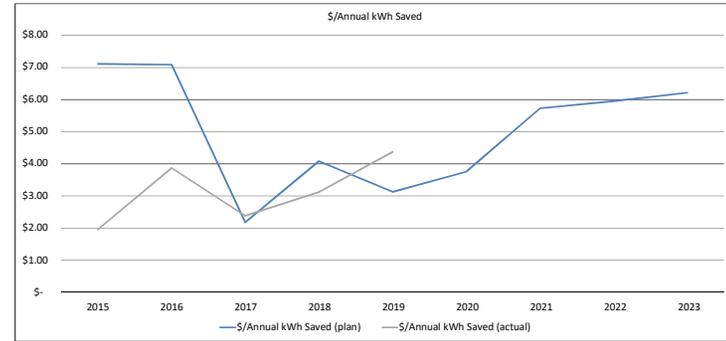


Home Performance w/Energy Star

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Electric Budget (plan)	\$ 272,233.00	\$ 229,205.00	\$ 218,456.00	\$ 287,669.67	\$ 519,510.90	\$ 670,225.00	\$ 1,122,087	\$ 1,215,888	\$ 1,323,499
Total Annual Electric Savings (kWh) (plan)	\$ 38,271.72	\$ 32,355.03	\$ 100,197.78	\$ 70,460.53	\$ 166,032.86	\$ 178,487.22	\$ 195,956	\$ 204,246	\$ 212,950
\$/Annual kWh Saved (plan)	\$ 7.11	\$ 7.08	\$ 2.18	\$ 4.08	\$ 3.13	\$ 3.76	\$ 5.73	\$ 5.95	\$ 6.22
Total Electric Budget	\$ 272,233.00	\$ 229,205.00	\$ 218,456.00	\$ 287,669.67	\$ 519,510.90	\$ 670,225.00	\$ 1,122,087	\$ 1,215,888	\$ 1,323,499
Total kW saved	19.43	16.31	1.84	12.99	30.65	39.67	2.33	2.45	2.57
\$/kW saved (plan)	\$ 14,008.04	\$ 14,051.07	\$ 118,668.66	\$ 22,145.49	\$ 16,952.03	\$ 16,893.39	\$ 481,399	\$ 496,802	\$ 515,020
Total Electric Budget	\$ 272,233.00	\$ 229,205.00	\$ 218,456.00	\$ 287,669.67	\$ 519,510.90	\$ 670,225.00	\$ 1,122,087	\$ 1,215,888	\$ 1,323,499
Total Fuel Neutral MMBtu Saved	1,633.55	1,281.68	1,214.38	1,912.43	4,506.44	6,066.04	5,196	5,409	5,632
\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 166.65	\$ 178.83	\$ 179.89	\$ 150.42	\$ 115.28	\$ 110.49	\$ 216	\$ 225	\$ 235

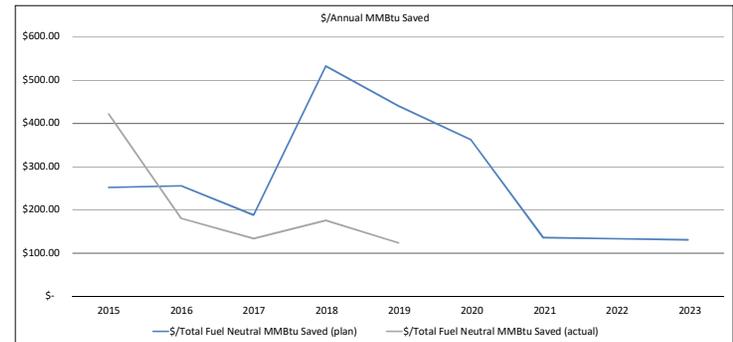
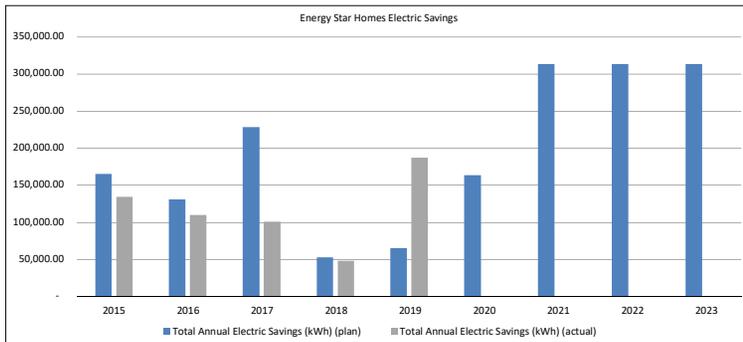
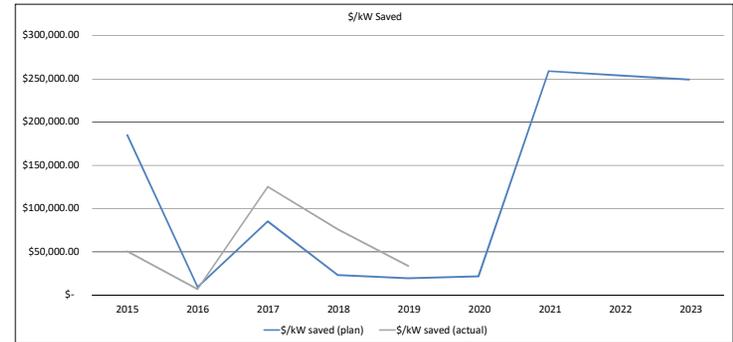
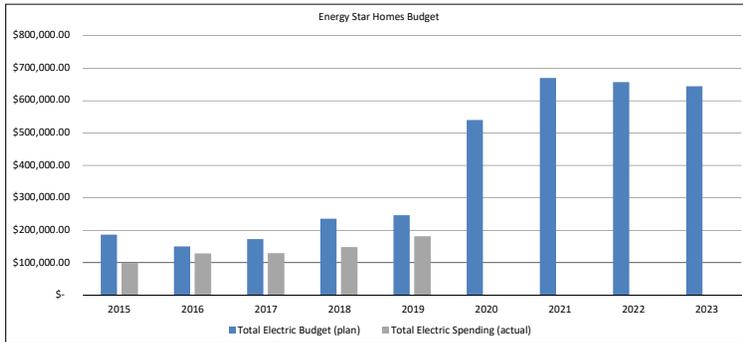
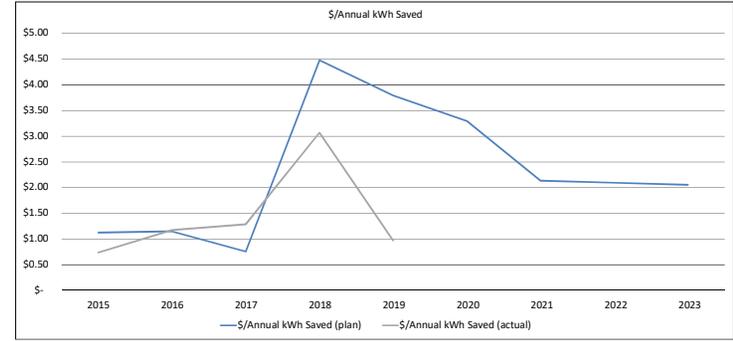
  

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Electric Spending (actual)	\$ 281,645.00	\$ 204,480.00	\$ 148,636.84	\$ 383,006.41	\$ 548,206.97				
Total Annual Electric Savings (kWh) (actu)	\$ 144,000.00	\$ 52,805.00	\$ 62,273.93	\$ 122,706.43	\$ 125,325.72				
\$/Annual kWh Saved (actual)	\$ 1.96	\$ 3.87	\$ 2.39	\$ 3.12	\$ 4.37				
Total Electric Spending	\$ 281,645.00	\$ 204,480.00	\$ 148,636.84	\$ 383,006.41	\$ 548,206.97				
Total kW saved	15.90	8.10	0.46	1.33	1.47				
\$/kW saved (actual)	\$ 17,713.52	\$ 25,244.44	\$ 322,270.51	\$ 288,998.22	\$ 372,381.72				
Total Electric Spending	\$ 281,645.00	\$ 204,480.00	\$ 148,636.84	\$ 383,006.41	\$ 548,206.97				
Total Fuel Neutral MMBtu Saved	1,437.92	1,310.31	741.02	3,132.17	3,646.40				
\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 195.87	\$ 156.05	\$ 200.58	\$ 122.28	\$ 150.34				



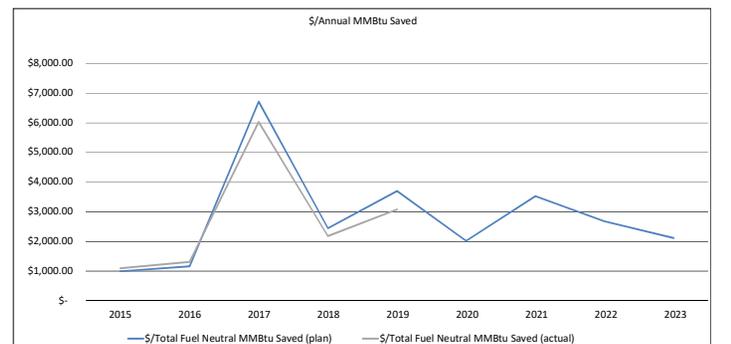
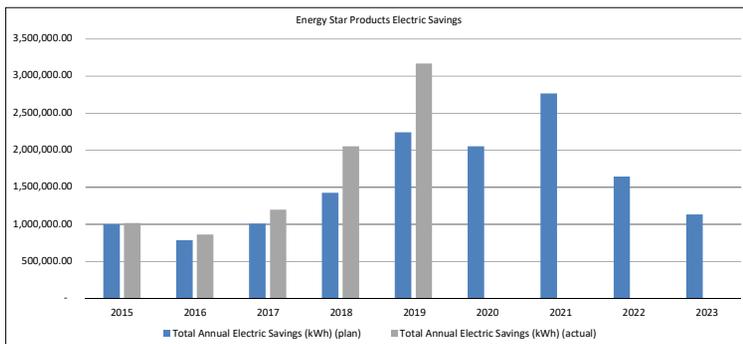
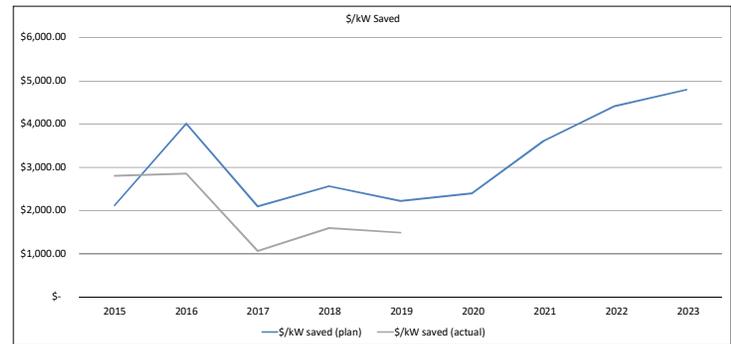
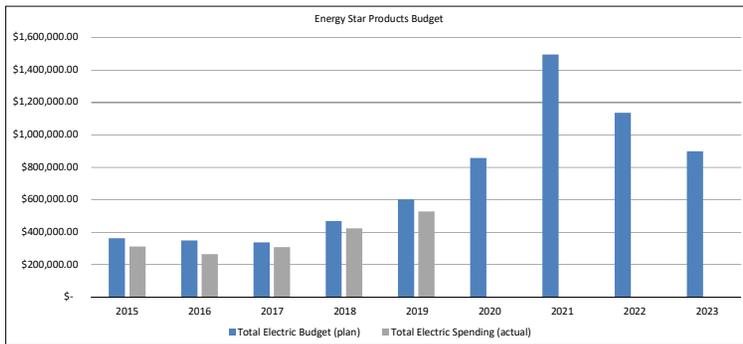
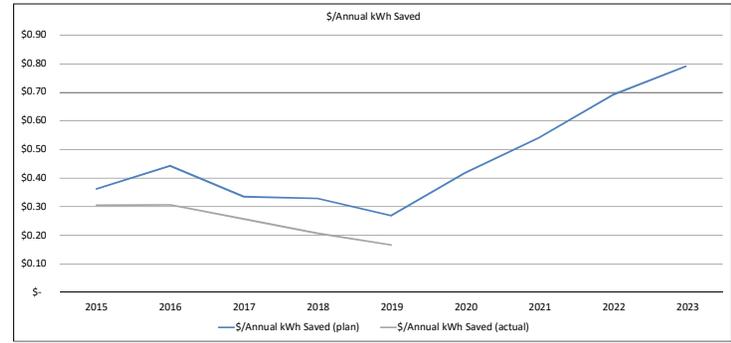
Energy Star Homes

		2015	2016	2017	2018	2019	2020	2021	2022	2023	
1) Planned	Total Electric Budget (plan)	\$ 186,042.00	\$ 150,426.00	\$ 172,764.00	\$ 235,909.21	\$ 246,674.96	\$ 540,544.00	\$ 670,122	\$ 657,117	\$ 644,777	
	Total Annual Electric Savings (kWh) (plan)	\$ 165,241.44	\$ 130,931.27	\$ 228,636.03	\$ 52,681.05	\$ 65,009.21	\$ 163,862.33	\$ 313,729	\$ 313,729	\$ 313,729	
	\$/Annual kWh Saved (plan)	\$ 1.13	\$ 1.15	\$ 0.76	\$ 4.48	\$ 3.79	\$ 3.30	\$ 2.14	\$ 2.09	\$ 2.06	
2)	Total Electric Budget	\$ 186,042.00	\$ 150,426.00	\$ 172,764.00	\$ 235,909.21	\$ 246,674.96	\$ 540,544.00	\$ 670,122	\$ 657,117	\$ 644,777	
	Total kW saved	1.01	16.55	2.03	10.22	12.76	25.02	2.59	2.59	2.59	
	\$/kW saved (plan)	\$ 185,056.05	\$ 9,089.54	\$ 85,266.64	\$ 23,075.53	\$ 19,333.56	\$ 21,603.62	\$ 259,058	\$ 254,030	\$ 249,260	
3)	Total Electric Budget	\$ 186,042.00	\$ 150,426.00	\$ 172,764.00	\$ 235,909.21	\$ 246,674.96	\$ 540,544.00	\$ 670,122	\$ 657,117	\$ 644,777	
	Total Fuel Neutral MMBtu Saved	737.56	587.75	916.77	442.43	559.33	1,490.73	4,919	4,919	4,919	
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 252.24	\$ 255.94	\$ 188.45	\$ 533.21	\$ 441.02	\$ 362.60	\$ 136	\$ 134	\$ 131	
<b>Actuals</b>											
1)	Total Electric Spending (actual)	\$ 99,069.00	\$ 129,039.00	\$ 129,650.82	\$ 147,672.12	\$ 181,874.58					
	Total Annual Electric Savings (kWh) (actu.)	\$ 134,300.00	\$ 109,900.00	\$ 100,710.35	\$ 48,129.32	\$ 187,159.38					
	\$/Annual kWh Saved (actual)	\$ 0.74	\$ 1.17	\$ 1.29	\$ 3.07	\$ 0.97					
2)	Total Electric Spending	\$ 99,069.00	\$ 129,039.00	\$ 129,650.82	\$ 147,672.12	\$ 181,874.58					
	Total kW saved	1.96	18.80	1.03	1.94	5.41					
	\$/kW saved (actual)	\$ 50,501.18	\$ 6,863.78	\$ 125,444.95	\$ 76,096.52	\$ 33,647.03					
3)	Total Electric Spending	\$ 99,069.00	\$ 129,039.00	\$ 129,650.82	\$ 147,672.12	\$ 181,874.58					
	Total Fuel Neutral MMBtu Saved	234.69	713.60	966.41	839.99	1,464.62					
	\$/Total Fuel Neutral MMBtu Saved (actu.)	\$ 422.13	\$ 180.83	\$ 134.16	\$ 175.80	\$ 124.18					



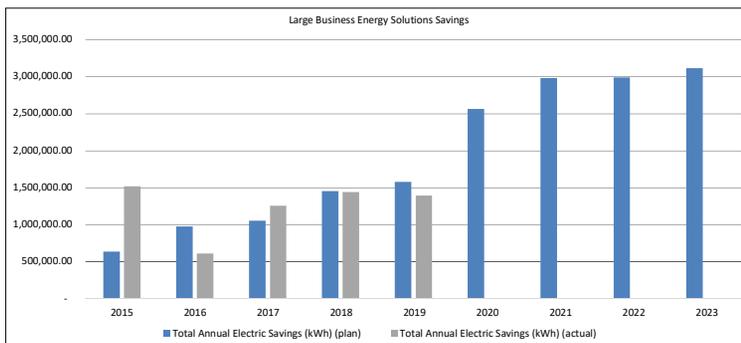
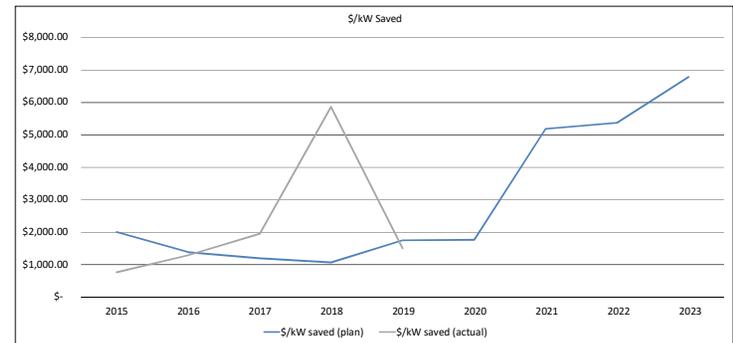
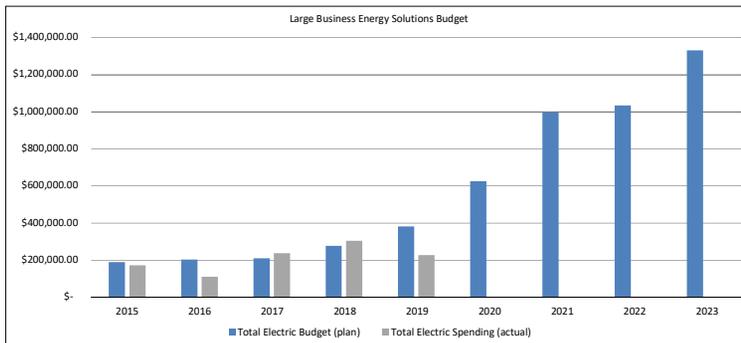
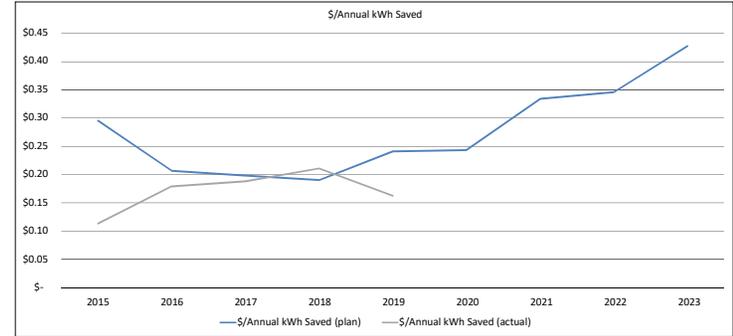
Energy Star Products

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 362,250.00	\$ 349,270.00	\$ 338,248.00	\$ 469,558.56	\$ 602,894.51	\$ 858,424.35	\$ 1,497,232	\$ 1,137,730	\$ 898,630
	Total Annual Electric Savings (kWh) (plan)	\$ 999,269.23	\$ 787,893.83	\$ 1,008,685.09	\$ 1,426,971.51	\$ 2,244,494.09	\$ 2,052,977.25	\$ 2,767,818	\$ 1,646,896	\$ 1,134,690
	\$/Annual kWh Saved (plan)	\$ 0.36	\$ 0.44	\$ 0.34	\$ 0.33	\$ 0.27	\$ 0.42	\$ 0.54	\$ 0.69	\$ 0.79
2)	Total Electric Budget	\$ 362,250.00	\$ 349,270.00	\$ 338,248.00	\$ 469,558.56	\$ 602,894.51	\$ 858,424.35	\$ 1,497,232	\$ 1,137,730	\$ 898,630
	Total kW saved	170.49	86.98	161.13	182.83	270.89	357.45	414.37	257.31	187.28
	\$/kW saved (plan)	\$ 2,124.74	\$ 4,015.30	\$ 2,099.27	\$ 2,568.30	\$ 2,225.57	\$ 2,401.54	\$ 3,613	\$ 4,422	\$ 4,798
3)	Total Electric Budget	\$ 362,250.00	\$ 349,270.00	\$ 338,248.00	\$ 469,558.56	\$ 602,894.51	\$ 858,424.35	\$ 1,497,232	\$ 1,137,730	\$ 898,630
	Total Fuel Neutral MMBtu Saved	364.14	300.17	50.35	191.64	162.77	424.34	424	424	424
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 994.82	\$ 1,163.59	\$ 6,717.37	\$ 2,450.24	\$ 3,703.93	\$ 2,022.95	\$ 3,529	\$ 2,682	\$ 2,118
Actuals		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Spending (actual)	\$ 310,934.00	\$ 264,733.00	\$ 308,155.35	\$ 425,054.56	\$ 527,215.81				
	Total Annual Electric Savings (kWh) (actu.)	\$ 1,018,400.00	\$ 863,500.00	\$ 1,199,911.22	\$ 2,052,977.25	\$ 3,172,843.69				
	\$/Annual kWh Saved (actual)	\$ 0.31	\$ 0.31	\$ 0.26	\$ 0.21	\$ 0.17				
2)	Total Electric Spending	\$ 310,934.00	\$ 264,733.00	\$ 308,155.35	\$ 425,054.56	\$ 527,215.81				
	Total kW saved	110.80	92.60	289.14	265.97	353.37				
	\$/kW saved (actual)	\$ 2,806.26	\$ 2,858.89	\$ 1,065.76	\$ 1,598.11	\$ 1,491.95				
3)	Total Electric Spending	\$ 310,934.00	\$ 264,733.00	\$ 308,155.35	\$ 425,054.56	\$ 527,215.81				
	Total Fuel Neutral MMBtu Saved	283.50	201.40	51.06	194.68	171.096				
	\$/Total Fuel Neutral MMBtu Saved (actu.)	\$ 1,096.77	\$ 1,314.46	\$ 6,035.52	\$ 2,183.39	\$ 3,081.40				



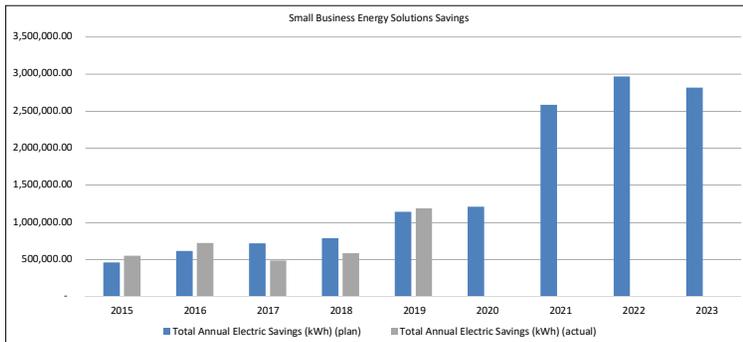
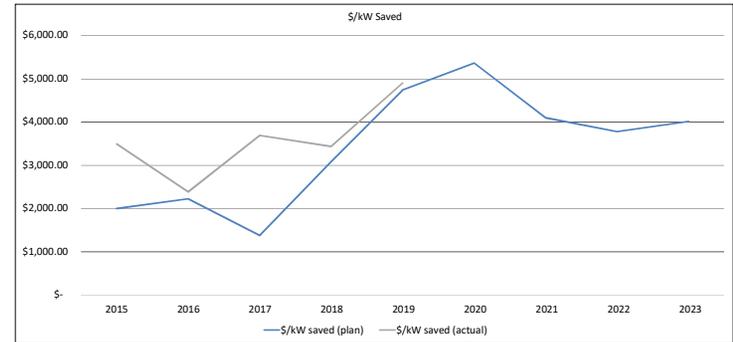
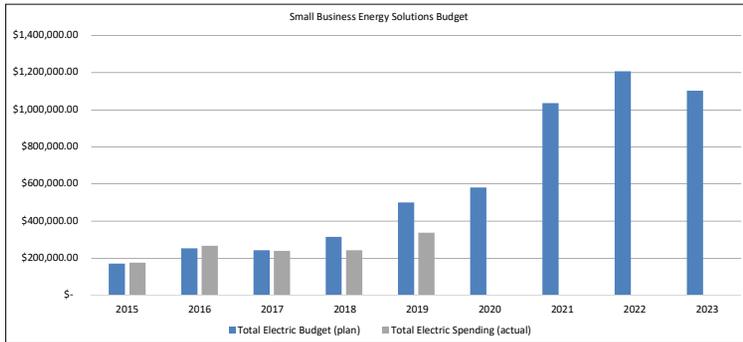
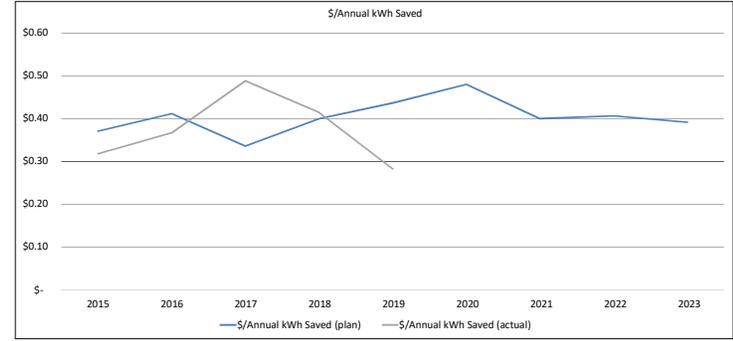
Large Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 188,981.00	\$ 202,403.00	\$ 209,679.00	\$ 277,067.46	\$ 381,523.59	\$ 624,576.00	\$ 996,188.04	\$ 1,034,978.57	\$ 1,331,991.65
	Total Annual Electric Savings (kWh) (plan)	\$ 639,637.22	\$ 978,279.40	\$ 1,056,642.38	\$ 1,456,171.75	\$ 1,581,541.99	\$ 2,564,148.19	\$ 2,981,976.04	\$ 2,991,305.70	\$ 3,114,657.18
	\$/Annual kWh Saved (plan)	\$ 0.30	\$ 0.21	\$ 0.20	\$ 0.19	\$ 0.24	\$ 0.24	\$ 0.33	\$ 0.35	\$ 0.43
2)	Total Electric Budget	\$ 188,981.00	\$ 202,403.00	\$ 209,679.00	\$ 277,067.46	\$ 381,523.59	\$ 624,576.00	\$ 996,188.04	\$ 1,034,978.57	\$ 1,331,991.65
	Total kW saved	94.11	146.13	175.61	259.47	218.04	353.51	191.93	192.53	196.07
	\$/kW saved (plan)	\$ 2,008.02	\$ 1,385.12	\$ 1,194.04	\$ 1,067.80	\$ 1,749.79	\$ 1,766.80	\$ 5,190	\$ 5,376	\$ 6,793
3)	Total Electric Budget	\$ 188,981.00	\$ 202,403.00	\$ 209,679.00	\$ 277,067.46	\$ 381,523.59	\$ 624,576.00	\$ 996,188.04	\$ 1,034,978.57	\$ 1,331,991.65
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-	-	-	-	-
	\$/Total Fuel Neutral MMBtu Saved (plan)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Actuals		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Spending (actual)	\$ 172,179.00	\$ 109,309.00	\$ 236,808.93	\$ 304,536.17	\$ 226,077.07				
	Total Annual Electric Savings (kWh) (actu.)	\$ 1,519,000.00	\$ 609,900.00	\$ 1,258,258.52	\$ 1,442,732.56	\$ 1,399,199.13				
	\$/Annual kWh Saved (actual)	\$ 0.11	\$ 0.18	\$ 0.19	\$ 0.21	\$ 0.16				
2)	Total Electric Spending	\$ 172,179.00	\$ 109,309.00	\$ 236,808.93	\$ 304,536.17	\$ 226,077.07				
	Total kW saved	225.50	84.90	121.28	51.89	149.97				
	\$/kW saved (actual)	\$ 763.54	\$ 1,287.50	\$ 1,952.66	\$ 5,868.41	\$ 1,507.53				
3)	Total Electric Spending	\$ 172,179.00	\$ 109,309.00	\$ 236,808.93	\$ 304,536.17	\$ 226,077.07				
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-				
	\$/Total Fuel Neutral MMBtu Saved (actu.)	-	-	-	-	-				



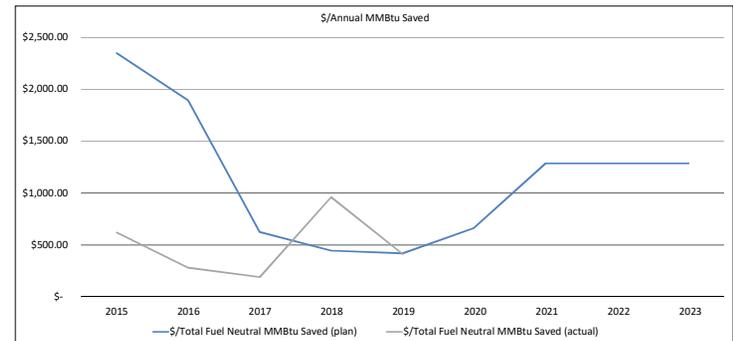
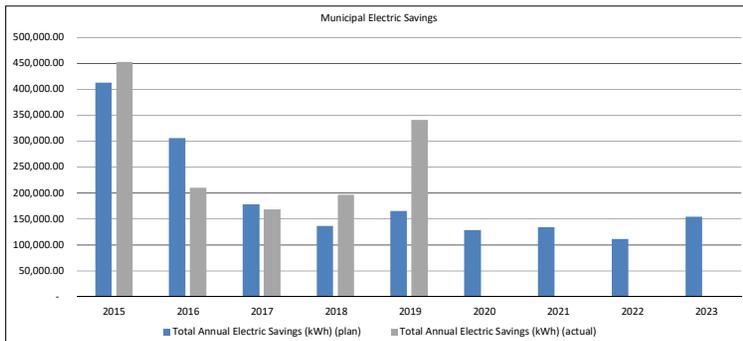
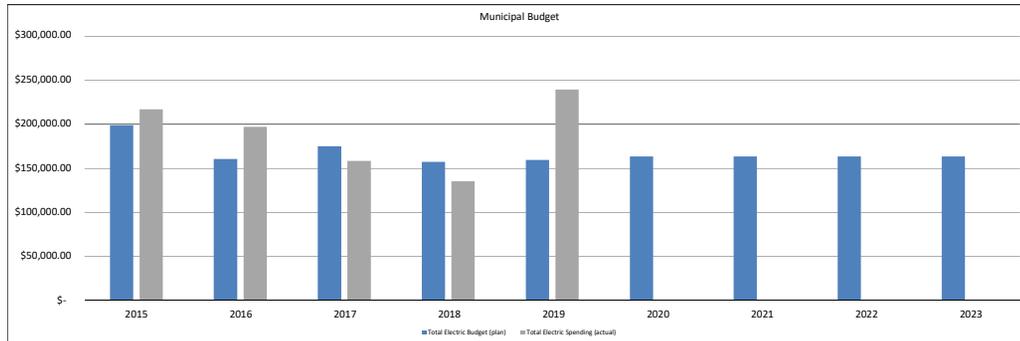
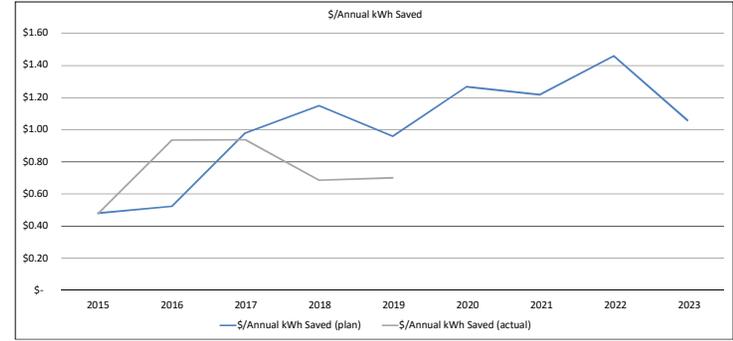
Small Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 170,507.00	\$ 253,038.00	\$ 241,342.00	\$ 314,465.22	\$ 499,966.58	\$ 581,067.00	\$ 1,036,092	\$ 1,208,256	\$ 1,103,905
	Total Annual Electric Savings (kWh) (plan)	\$ 459,727.00	\$ 614,054.23	\$ 718,002.42	\$ 786,162.50	\$ 1,144,703.92	\$ 1,209,604.03	\$ 2,588,778	\$ 2,970,915	\$ 2,817,409
	\$/Annual kWh Saved (plan)	\$ 0.37	\$ 0.41	\$ 0.34	\$ 0.40	\$ 0.44	\$ 0.48	\$ 0.40	\$ 0.41	\$ 0.39
2)	Total Electric Budget	\$ 170,507.00	\$ 253,038.00	\$ 241,342.00	\$ 314,465.22	\$ 499,966.58	\$ 581,067.00	\$ 1,036,092	\$ 1,208,256	\$ 1,103,905
	Total kW saved	85.06	113.62	175.08	101.83	105.30	108.23	252.51	319.49	274.76
	\$/kW saved (plan)	\$ 2,004.49	\$ 2,227.11	\$ 1,378.49	\$ 3,088.21	\$ 4,748.00	\$ 5,368.82	\$ 4,103	\$ 3,782	\$ 4,018
3)	Total Electric Budget	\$ 170,507.00	\$ 253,038.00	\$ 241,342.00	\$ 314,465.22	\$ 499,966.58	\$ 581,067.00	\$ 1,036,092	\$ 1,208,256	\$ 1,103,905
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-	-	-	-	-
	\$/Total Fuel Neutral MMBtu Saved (plan)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Actuals		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Spending (actual)	\$ 175,186.00	\$ 265,112.00	\$ 238,151.99	\$ 241,447.38	\$ 336,499.89				
	Total Annual Electric Savings (kWh) (actu.)	\$ 550,600.00	\$ 721,700.00	\$ 487,246.98	\$ 582,120.00	\$ 1,189,122.82				
	\$/Annual kWh Saved (actual)	\$ 0.32	\$ 0.37	\$ 0.49	\$ 0.41	\$ 0.28				
2)	Total Electric Spending	\$ 175,186.00	\$ 265,112.00	\$ 238,151.99	\$ 241,447.38	\$ 336,499.89				
	Total kW saved	50.10	111.00	64.46	70.22	68.57				
	\$/kW saved (actual)	\$ 3,496.73	\$ 2,388.40	\$ 3,694.33	\$ 3,438.44	\$ 4,907.32				
3)	Total Electric Spending	\$ 175,186.00	\$ 265,112.00	\$ 238,151.99	\$ 241,447.38	\$ 336,499.89				
	Total Fuel Neutral MMBtu Saved	-	-	-	-	-				
	\$/Total Fuel Neutral MMBtu Saved (actu)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!				



Municipal

		2015	2016	2017	2018	2019	2020	2021	2022	2023	
1) Planned	Total Electric Budget (plan)	\$ 198,828.00	\$ 160,393.00	\$ 174,968.00	\$ 157,518.81	\$ 159,402.78	\$ 163,318.00	\$ 163,318	\$ 163,318	\$ 163,318	
	Total Annual Electric Savings (kWh) (plan)	\$ 413,076.33	\$ 306,456.75	\$ 178,641.98	\$ 137,004.63	\$ 166,023.21	\$ 128,772.82	\$ 133,985	\$ 111,856	\$ 154,282	
	\$/Annual kWh Saved (plan)	\$ 0.48	\$ 0.52	\$ 0.98	\$ 1.15	\$ 0.96	\$ 1.27	\$ 1.22	\$ 1.46	\$ 1.06	
2) Total Electric Budget	Total Electric Budget	\$ 198,828.00	\$ 160,393.00	\$ 174,968.00	\$ 157,518.81	\$ 159,402.78	\$ 163,318.00	\$ 163,318	\$ 163,318	\$ 163,318	
	Total kW saved	44.77	29.96	25.80	24.38	19.17	13.10	18.34	15.99	13.91	
	\$/kW saved (plan)	\$ 4,441.47	\$ 5,353.27	\$ 6,781.68	\$ 6,461.52	\$ 8,315.74	\$ 12,467.50	\$ 8,905	\$ 10,215	\$ 11,741	
3) Total Electric Budget	Total Electric Budget	\$ 198,828.00	\$ 160,393.00	\$ 174,968.00	\$ 157,518.81	\$ 159,402.78	\$ 163,318.00	\$ 163,318	\$ 163,318	\$ 163,318	
	Total Fuel Neutral MMBtu Saved	84.60	84.60	280.03	353.15	379.89	245.77	127	127	127	
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 2,350.21	\$ 1,895.90	\$ 624.81	\$ 446.04	\$ 419.60	\$ 664.51	\$ 1,288	\$ 1,288	\$ 1,288	
<b>Actuals</b>											
1) Total Electric Spending (actual)	Total Electric Spending (actual)	\$ 217,200.00	\$ 197,081.00	\$ 158,370.45	\$ 135,104.98	\$ 239,397.86					
	Total Annual Electric Savings (kWh) (act.)	\$ 452,700.00	\$ 210,600.00	\$ 168,841.99	\$ 196,823.00	\$ 341,480.29					
	\$/Annual kWh Saved (actual)	\$ 0.48	\$ 0.94	\$ 0.94	\$ 0.69	\$ 0.70					
2) Total Electric Spending	Total Electric Spending	\$ 217,200.00	\$ 197,081.00	\$ 158,370.45	\$ 135,104.98	\$ 239,397.86					
	Total kW saved	90.20	39.50	26.63	22.73	33.42					
	\$/kW saved (actual)	\$ 2,407.98	\$ 4,989.39	\$ 5,946.23	\$ 5,944.32	\$ 7,164.01					
3) Total Electric Spending	Total Electric Spending	\$ 217,200.00	\$ 197,081.00	\$ 158,370.45	\$ 135,104.98	\$ 239,397.86					
	Total Fuel Neutral MMBtu Saved	350.53	700.35	830.79	140.51	577.55					
	\$/Total Fuel Neutral MMBtu Saved (actu)	\$ 619.63	\$ 281.40	\$ 190.63	\$ 961.53	\$ 414.50					



Program Cost-Effectiveness - 2021 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.79	0.18	1.85	2,923.975	288.886	3,023.074	1,637.476	-	199.0	2,534.5	44.7	41.7	124	3,322.7	68,015.1
A1 - Energy Star Homes	3.23	0.26	4.00	1,397.207	113.426	2,132.946	432.655	101.125	64.6	1,464.8	16.7	2.5	120	1,654.0	39,310.0
A2 - Home Performance with Energy Star	1.80	0.29	2.27	918.942	150.477	1,410.927	510.435	110.976	74.1	1,252.6	24.2	19.3	54	1,379.0	27,622.0
A3 - Energy Star Products	2.30	1.55	3.66	3,480.545	2,339.764	5,923.622	1,513.474	106.436	3,332.3	19,705.6	655.5	549.5	61,666	2,371.6	35,182.4
A4 - Residential Behavior	1.01	1.01	1.96	201.145	201.145	389.145	198.183	-	1,749.0	1,749.0	377.6	243.5	22,700	-	-
A5 - Residential Active Demand Response	0.75	0.75	0.83	27.148	27.148	29.863	36.000	-	-	-	-	-	125	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	13.000	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	26.950	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	65.500	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.02</b>	<b>0.70</b>	<b>2.72</b>	<b>8,948.964</b>	<b>3,120.847</b>	<b>12,909.577</b>	<b>4,433.672</b>	<b>318.537</b>	<b>5,418.9</b>	<b>26,706.4</b>	<b>1,118.7</b>	<b>856.5</b>	<b>84,789</b>	<b>8,727.3</b>	<b>170,129.4</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	2.01	2.00	2.04	4,548.611	4,525.608	7,515.698	2,257.665	1,423.170	5,666.1	72,746.7	297.5	321.0	184	107.4	1,074.2
C2 - Small Business Energy Solutions	2.31	2.30	2.29	4,536.759	4,514.429	7,566.605	1,959.838	1,337.403	4,357.8	52,467.2	400.5	298.4	448	190.5	2,030.6
C3 - Municipal Energy Solutions	5.41	5.16	6.56	1,107.671	1,055.562	1,593.021	204.700	38.000	471.4	7,328.6	30.5	157.0	11	100.0	2,500.0
C5 - C&I Active Demand Response	3.20	3.20	3.52	442.871	442.871	487.027	138.250	-	-	-	-	-	19	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	19.000	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	57.500	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.29</b>	<b>2.27</b>	<b>2.31</b>	<b>10,635.913</b>	<b>10,538.471</b>	<b>17,162.351</b>	<b>4,636.953</b>	<b>2,798.573</b>	<b>10,495.4</b>	<b>132,542.4</b>	<b>728.5</b>	<b>776.5</b>	<b>662</b>	<b>397.9</b>	<b>5,604.7</b>
C6e - Smart Start	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.16</b>	<b>1.51</b>	<b>2.47</b>	<b>19,584.877</b>	<b>13,659.317</b>	<b>30,071.928</b>	<b>9,070.625</b>	<b>3,117.110</b>	<b>15,914.3</b>	<b>159,248.9</b>	<b>1,847.2</b>	<b>1,633.0</b>	<b>85,451</b>	<b>9,125.2</b>	<b>175,734.2</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs in 2021 Dollars

<b>Annual kWh Savings</b>	15,914,330	85.6%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	159,248,874	75.6%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>2,674,319</u>	<u>14.4%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>51,502,611</u>	<u>24.4%</u>	
	<b>18,588,649</b>	100.0%			<b>210,751,484</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.37%	<b>Spending per Customer</b>	Low-Income	\$	360.28
			Residential	\$	46.30
			C&I	\$	416.73

Present Value Benefits - 2021 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)											Non-Resource Benefits (\$000)			Environmental Benefits (\$000)			
				Electric					Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits	Total Non-Resource Benefits							
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak					Summer Peak	Summer Off Peak	Electric DRIPE		Total Electric Benefit	Other Fuels	Water Benefit
<b>Residential Programs</b>																					
B1 - Home Energy Assistance	\$ 2,924	\$ 289	\$ 3,023	\$ 41	\$ -	\$ 44	\$ 38	\$ -	\$ 49	\$ 49	\$ 31	\$ 26	\$ 11	\$ 289	\$ 1,780	\$ 7	\$ 2,076	\$ 117	\$ 731	\$ 848	\$ 99
A1 - Energy Star Homes	\$ 1,397	\$ 113	\$ 2,133	\$ 3	\$ -	\$ 3	\$ 3	\$ -	\$ 45	\$ 50	\$ 3	\$ 2	\$ 4	\$ 113	\$ 1,218	\$ -	\$ 1,331	\$ 66	\$ 679	\$ 745	\$ 57
A2 - Home Performance with Energy Star	\$ 919	\$ 150	\$ 1,411	\$ 22	\$ -	\$ 22	\$ 19	\$ -	\$ 28	\$ 31	\$ 14	\$ 11	\$ 4	\$ 150	\$ 718	\$ 3	\$ 871	\$ 48	\$ 443	\$ 491	\$ 49
A3 - Energy Star Products	\$ 3,481	\$ 2,340	\$ 5,924	\$ 270	\$ -	\$ 341	\$ 295	\$ -	\$ 459	\$ 417	\$ 246	\$ 186	\$ 126	\$ 2,340	\$ 722	\$ 371	\$ 3,432	\$ 48	\$ 1,561	\$ 1,610	\$ 882
A4 - Residential Behavior	\$ 201	\$ 201	\$ 389	\$ 13	\$ -	\$ 24	\$ 21	\$ -	\$ 49	\$ 40	\$ 23	\$ 15	\$ 16	\$ 201	\$ -	\$ -	\$ 201	\$ -	\$ 103	\$ 103	\$ 85
A5 - Residential Active Demand Response	\$ 27	\$ 27	\$ 30	\$ 1	\$ -	\$ 12	\$ 11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3	\$ 27	\$ -	\$ -	\$ 27	\$ -	\$ 3	\$ 3	\$ -
A6b - Res ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A6c - Res Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Residential</b>	<b>\$ 8,949</b>	<b>\$ 3,121</b>	<b>\$ 12,910</b>	<b>\$ 351</b>	<b>\$ -</b>	<b>\$ 447</b>	<b>\$ 387</b>	<b>\$ -</b>	<b>\$ 629</b>	<b>\$ 586</b>	<b>\$ 317</b>	<b>\$ 241</b>	<b>\$ 164</b>	<b>\$ 3,121</b>	<b>\$ 4,438</b>	<b>\$ 380</b>	<b>\$ 7,940</b>	<b>\$ 278</b>	<b>\$ 3,520</b>	<b>\$ 3,798</b>	<b>\$ 1,172</b>
<b>Commercial/Industrial Programs</b>																					
C1 - Large Business Energy Solutions	\$ 4,549	\$ 4,526	\$ 7,516	\$ 327	\$ -	\$ 369	\$ 319	\$ -	\$ 880	\$ 668	\$ 1,001	\$ 704	\$ 258	\$ 4,526	\$ 9	\$ 13	\$ 4,548	\$ 1	\$ 771	\$ 772	\$ 2,196
C2 - Small Business Energy Solutions	\$ 4,537	\$ 4,514	\$ 7,567	\$ 285	\$ -	\$ 326	\$ 282	\$ -	\$ 1,089	\$ 785	\$ 928	\$ 564	\$ 256	\$ 4,514	\$ 14	\$ 6	\$ 4,535	\$ 2	\$ 770	\$ 772	\$ 2,260
C3 - Municipal Energy Solutions	\$ 1,108	\$ 1,056	\$ 1,593	\$ 191	\$ -	\$ 206	\$ 178	\$ -	\$ 84	\$ 44	\$ 204	\$ 121	\$ 27	\$ 1,056	\$ 47	\$ -	\$ 1,103	\$ 5	\$ 187	\$ 192	\$ 298
C5 - C&I Active Demand Response	\$ 443	\$ 443	\$ 487	\$ 30	\$ -	\$ 187	\$ 162	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 64	\$ 443	\$ -	\$ -	\$ 443	\$ -	\$ 44	\$ 44	\$ (0)
C6b - C&I ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Commercial &amp; Industrial</b>	<b>\$ 10,636</b>	<b>\$ 10,538</b>	<b>\$ 17,162</b>	<b>\$ 832</b>	<b>\$ -</b>	<b>\$ 1,087</b>	<b>\$ 942</b>	<b>\$ -</b>	<b>\$ 2,053</b>	<b>\$ 1,497</b>	<b>\$ 2,134</b>	<b>\$ 1,388</b>	<b>\$ 605</b>	<b>\$ 10,538</b>	<b>\$ 70</b>	<b>\$ 19</b>	<b>\$ 10,628</b>	<b>\$ 8</b>	<b>\$ 1,772</b>	<b>\$ 1,781</b>	<b>\$ 4,754</b>
<b>Total</b>	<b>\$ 19,585</b>	<b>\$ 13,659</b>	<b>\$ 30,072</b>	<b>\$ 1,183</b>	<b>\$ -</b>	<b>\$ 1,534</b>	<b>\$ 1,329</b>	<b>\$ -</b>	<b>\$ 2,682</b>	<b>\$ 2,083</b>	<b>\$ 2,451</b>	<b>\$ 1,629</b>	<b>\$ 769</b>	<b>\$ 13,659</b>	<b>\$ 4,509</b>	<b>\$ 399</b>	<b>\$ 18,567</b>	<b>\$ 286</b>	<b>\$ 5,293</b>	<b>\$ 5,579</b>	<b>\$ 5,926</b>

Portfolio Planned Versus Actual Performance - 2021										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime kWh Savings	159,248,874	103,511,768		-	1.925%	-	\$ 174,610	\$ 218,262	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	15,914,330	10,344,314		-	0.550%	-	\$ 49,888	\$ 62,361	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	1,633	1,061		-	0.495%	-	\$ 44,900	\$ 56,124	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	1,847	1,201		-	0.330%	-	\$ 29,933	\$ 37,416	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	2,025	1,316		-	0.275%	-	\$ 24,944	\$ 31,180	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 18,567,423			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 9,070,625			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 9,496,798	\$ 6,172,919	\$ -	-	1.925%	-	\$ 174,610	\$ 218,262	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 498,884	\$ 623,605	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 19,584,877		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 498,884	\$ -	from row 8 above
12 Total Utility Costs	\$ 9,070,625	\$ -	from row 6 above
13 Portfolio GST BCR	2.05	-	row 9 divided by rows 10+11

*Costs, Benefits, and PI Expressed in 2021 Dollars.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

**Program Cost-Effectiveness - 2022 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.04	0.15	2.09	4,069.1	291.3	4,166.1	1,991.2	-	280.5	2,533.0	55.8	47.8	168	4,584.4	94,137.5
A1 - Energy Star Homes	3.21	0.29	3.85	1,248.1	112.9	1,910.0	388.6	106.9	72.2	1,659.6	15.3	1.1	25	1,432.5	33,562.5
A2 - Home Performance with Energy Star	2.20	0.30	2.77	1,351.5	181.7	2,060.6	614.1	130.8	75.0	1,480.2	19.1	16.9	65	1,925.0	39,618.8
A3 - Energy Star Products	2.82	1.77	4.02	3,944.9	2,471.8	6,566.2	1,397.6	235.3	2,472.1	19,877.1	454.4	455.1	42,495	2,964.5	43,978.0
A4 - Residential Behavior	1.31	1.31	2.55	236.0	236.0	459.6	180.0	-	2,087.0	2,087.0	450.5	290.6	22,700	-	-
A5 - Residential Active Demand Response	1.02	1.02	1.12	41,580	41,580	45,738	40.9	-	-	-	-	-	188	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	23.7	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	31.6	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	67.9	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.30</b>	<b>0.70</b>	<b>2.92</b>	<b>10,891.2</b>	<b>3,335.2</b>	<b>15,208.3</b>	<b>4,735.7</b>	<b>473.0</b>	<b>4,986.8</b>	<b>27,636.9</b>	<b>995.2</b>	<b>811.4</b>	<b>65,641</b>	<b>10,906.4</b>	<b>211,296.8</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.84	1.83	1.88	5,491.6	5,466.5	9,142.2	2,983.9	1,889.0	7,421.4	96,979.1	296.4	315.1	170	123.9	1,239.4
C2 - Small Business Energy Solutions	1.85	1.84	2.23	4,151.8	4,131.0	7,119.6	2,248.2	942.6	4,431.7	51,975.7	223.7	145.4	356	83.2	1,538.0
C3 - Municipal Energy Solutions	5.30	4.75	5.87	1,039.6	931.4	1,458.2	196.1	52.3	310.0	6,310.0	-	111.2	11	200.0	5,000.0
C5 - C&I Active Demand Response	3.32	3.32	3.65	541,267	541,267	595,261	163.1	-	-	-	-	-	23	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	20.3	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	69.1	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>1.98</b>	<b>1.95</b>	<b>2.14</b>	<b>11,224.4</b>	<b>11,070.1</b>	<b>18,315.3</b>	<b>5,680.7</b>	<b>2,884.0</b>	<b>12,163.0</b>	<b>155,264.7</b>	<b>520.1</b>	<b>571.7</b>	<b>561</b>	<b>407.1</b>	<b>7,777.4</b>
<b>Total</b>	<b>2.12</b>	<b>1.38</b>	<b>2.43</b>	<b>22,115.5</b>	<b>14,405.3</b>	<b>33,523.6</b>	<b>10,416.4</b>	<b>3,357.0</b>	<b>17,149.8</b>	<b>182,901.6</b>	<b>1,515.3</b>	<b>1,383.2</b>	<b>66,202</b>	<b>11,313.5</b>	<b>219,074.2</b>

**Notes:**

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs and Performance Incentive tabs.

<b>Annual kWh Savings</b>	17,149,843	83.8%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	182,901,629	74.0%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>3,315,669</u>	<u>16.2%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>64,204,312</u>	<u>26.0%</u>	
	<b>20,465,513</b>	100.0%			<b>247,105,941</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.48%
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<b>Spending per Customer</b>	Low-Income	\$	438.10
	Residential	\$	45.45
	C&I	\$	510.54



Portfolio Planned Versus Actual Performance - 2022										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime kWh Savings	182,901,629	118,886,059		-	1.925%	-	\$ 200,516	\$ 250,645	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	17,149,843	11,147,398		-	0.550%	-	\$ 57,290	\$ 71,613	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	1,383	899		-	0.495%	-	\$ 51,561	\$ 64,452	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	1,515	985		-	0.330%	-	\$ 34,374	\$ 42,968	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	2,488	1,617		-	0.275%	-	\$ 28,326	\$ 35,407	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 20,716,751			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 10,416,433			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 10,300,318	\$ 6,695,207	\$ -	-	1.925%	-	\$ 200,516	\$ 250,645	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 572,585	\$ 715,731	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 22,115,506		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 572,585	\$ -	from row 8 above
12 Total Utility Costs	\$ 10,416,433	\$ -	from row 6 above
13 Portfolio GST BCR	2.01	-	row 9 divided by rows 10+11

*Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2022\$) is \$591,523.20.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

**Program Cost-Effectiveness - 2023 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.37	0.16	2.42	5,433.8	365.5	5,550.0	2,293.5	-	371.3	2,976.4	75.4	61.6	190	5,553.9	112,546.6
A1 - Energy Star Homes	2.64	0.34	3.34	1,039.0	135.0	1,678.7	392.9	110.2	80.8	1,868.8	16.9	1.2	31	1,133.5	25,877.5
A2 - Home Performance with Energy Star	2.38	0.31	2.71	1,679.1	219.6	2,325.8	706.3	151.2	80.6	1,748.6	16.4	15.8	77	2,342.7	47,837.4
A3 - Energy Star Products	3.54	2.12	3.39	4,535.4	2,713.7	5,821.3	1,281.0	436.7	2,042.1	20,886.7	346.3	417.4	18,312	3,557.4	52,773.6
A4 - Residential Behavior	1.74	1.74	2.63	308.2	308.2	464.3	176.9	-	3,116.0	3,116.0	377.6	243.5	22,700	-	-
A5 - Residential Active Demand Response	1.23	1.23	1.36	56.483	56.483	62.131	45.8	-	-	-	-	-	250	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	15.0	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	30.7	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	71.3	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.60</b>	<b>0.76</b>	<b>2.78</b>	<b>13,051.9</b>	<b>3,798.4</b>	<b>15,902.3</b>	<b>5,013.5</b>	<b>698.1</b>	<b>5,690.8</b>	<b>30,596.5</b>	<b>832.6</b>	<b>739.6</b>	<b>41,559</b>	<b>12,587.5</b>	<b>239,035.1</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.79	1.79	1.78	7,063.4	7,030.1	11,264.1	3,937.7	2,377.7	9,898.3	127,492.4	306.5	353.6	170	165.3	1,652.6
C2 - Small Business Energy Solutions	1.73	1.72	2.40	4,317.9	4,286.6	7,184.9	2,496.2	497.5	4,446.4	54,219.7	171.2	111.3	356	133.6	2,294.0
C3 - Municipal Energy Solutions	5.63	5.05	5.84	1,088.8	976.6	1,314.0	193.2	31.9	280.0	5,800.0	-	123.8	11	200.0	5,000.0
C5 - C&I Active Demand Response	3.95	3.95	4.34	641.918	641.918	705.975	162.7	-	-	-	-	-	27	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	22.5	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	79.7	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>1.90</b>	<b>1.88</b>	<b>2.09</b>	<b>13,112.0</b>	<b>12,935.2</b>	<b>20,468.9</b>	<b>6,892.1</b>	<b>2,907.0</b>	<b>14,624.7</b>	<b>187,512.2</b>	<b>477.7</b>	<b>588.6</b>	<b>565</b>	<b>498.9</b>	<b>8,946.6</b>
<b>Total</b>	<b>2.20</b>	<b>1.41</b>	<b>2.34</b>	<b>26,163.9</b>	<b>16,733.6</b>	<b>36,371.2</b>	<b>11,905.6</b>	<b>3,605.1</b>	<b>20,315.5</b>	<b>218,108.7</b>	<b>1,310.3</b>	<b>1,328.2</b>	<b>42,124</b>	<b>13,086.4</b>	<b>247,981.6</b>

**Notes:**

- (1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.
- (2) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs and Performance Incentive tabs.

<b>Annual kWh Savings</b>	20,315,482	84.1%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	218,108,688	75.0%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	<u>3,835,241</u>	<u>15.9%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>72,676,248</u>	<u>25.0%</u>	
	<b>24,150,723</b>	100.0%			<b>290,784,937</b>	100.0%	

<b>Annual Savings as a % of 2019 Sales</b>	1.75%	<b>Spending per Cus</b>	1.75% Low-Income	\$ 504.62
			Residential	\$ 45.04
			C&I	\$ 619.40

Present Value Benefits - 2023 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)											Non-Resource Benefits (\$000)			Environmental Benefits (\$000)			
				Electric					Non-Electric			Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits	Total Non-Resource Benefits						
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak	Summer Peak					Summer Off Peak	Electric DRIPE		Total Electric Benefit	Other Fuels	Water Benefit
<b>Residential Programs</b>																					
B1 - Home Energy Assistance	\$ 5,434	\$ 365	\$ 5,550	\$ 57	\$ -	\$ 56	\$ 48	\$ -	\$ 62	\$ 57	\$ 41	\$ 32	\$ 13	\$ 365	\$ 3,169	\$ 10	\$ 3,545	\$ 224	\$ 1,665	\$ 1,889	\$ 116
A1 - Energy Star Homes	\$ 1,039	\$ 135	\$ 1,679	\$ 3	\$ -	\$ 2	\$ 2	\$ -	\$ 54	\$ 62	\$ 4	\$ 3	\$ 5	\$ 135	\$ 854	\$ -	\$ 989	\$ 50	\$ 573	\$ 623	\$ 66
A2 - Home Performance with Energy Star	\$ 1,679	\$ 220	\$ 2,326	\$ 33	\$ -	\$ 31	\$ 27	\$ -	\$ 41	\$ 45	\$ 22	\$ 16	\$ 5	\$ 220	\$ 1,362	\$ 1	\$ 1,583	\$ 96	\$ 578	\$ 674	\$ 69
A3 - Energy Star Products	\$ 4,535	\$ 2,714	\$ 5,821	\$ 397	\$ -	\$ 412	\$ 357	\$ -	\$ 477	\$ 456	\$ 274	\$ 219	\$ 121	\$ 2,714	\$ 1,160	\$ 576	\$ 4,450	\$ 85	\$ 361	\$ 446	\$ 925
A4 - Residential Behavior	\$ 308	\$ 308	\$ 464	\$ 15	\$ -	\$ 25	\$ 22	\$ -	\$ 89	\$ 70	\$ 38	\$ 24	\$ 25	\$ 308	\$ -	\$ -	\$ 308	\$ -	\$ -	\$ -	\$ 156
A5 - Residential Active Demand Response	\$ 56	\$ 56	\$ 62	\$ 3	\$ -	\$ 26	\$ 22	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6	\$ 56	\$ -	\$ -	\$ 56	\$ -	\$ 6	\$ 6	\$ -
A6b - Res ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A6c - Res Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Residential</b>	<b>\$ 13,052</b>	<b>\$ 3,798</b>	<b>\$ 15,902</b>	<b>\$ 509</b>	<b>\$ -</b>	<b>\$ 552</b>	<b>\$ 478</b>	<b>\$ -</b>	<b>\$ 722</b>	<b>\$ 690</b>	<b>\$ 379</b>	<b>\$ 294</b>	<b>\$ 174</b>	<b>\$ 3,798</b>	<b>\$ 6,545</b>	<b>\$ 588</b>	<b>\$ 10,931</b>	<b>\$ 456</b>	<b>\$ 3,182</b>	<b>\$ 3,638</b>	<b>\$ 1,333</b>
<b>Commercial/Industrial Programs</b>																					
C1 - Large Business Energy Solutions	\$ 7,063	\$ 7,030	\$ 11,264	\$ 420	\$ -	\$ 427	\$ 370	\$ -	\$ 1,367	\$ 1,054	\$ 1,710	\$ 1,249	\$ 433	\$ 7,030	\$ 15	\$ 17	\$ 7,061	\$ 2	\$ 695	\$ 697	\$ 3,506
C2 - Small Business Energy Solutions	\$ 4,318	\$ 4,287	\$ 7,185	\$ 124	\$ -	\$ 128	\$ 111	\$ -	\$ 1,195	\$ 856	\$ 998	\$ 606	\$ 268	\$ 4,287	\$ 0	\$ 28	\$ 4,315	\$ 3	\$ 498	\$ 501	\$ 2,369
C3 - Municipal Energy Solutions	\$ 1,089	\$ 977	\$ 1,314	\$ 203	\$ -	\$ 194	\$ 168	\$ -	\$ 37	\$ 18	\$ 215	\$ 125	\$ 16	\$ 977	\$ 100	\$ -	\$ 1,077	\$ 12	\$ -	\$ 12	\$ 225
C5 - C&I Active Demand Response	\$ 642	\$ 642	\$ 706	\$ 41	\$ -	\$ 276	\$ 239	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 86	\$ 642	\$ -	\$ -	\$ 642	\$ -	\$ 64	\$ 64	\$ (0)
C6b - C&I ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Commercial &amp; Industrial</b>	<b>\$ 13,112</b>	<b>\$ 12,935</b>	<b>\$ 20,469</b>	<b>\$ 789</b>	<b>\$ -</b>	<b>\$ 1,024</b>	<b>\$ 887</b>	<b>\$ -</b>	<b>\$ 2,599</b>	<b>\$ 1,928</b>	<b>\$ 2,924</b>	<b>\$ 1,981</b>	<b>\$ 803</b>	<b>\$ 12,935</b>	<b>\$ 115</b>	<b>\$ 45</b>	<b>\$ 13,095</b>	<b>\$ 17</b>	<b>\$ 1,257</b>	<b>\$ 1,274</b>	<b>\$ 6,100</b>
<b>Total</b>	<b>\$ 26,164</b>	<b>\$ 16,734</b>	<b>\$ 36,371</b>	<b>\$ 1,297</b>	<b>\$ -</b>	<b>\$ 1,576</b>	<b>\$ 1,365</b>	<b>\$ -</b>	<b>\$ 3,321</b>	<b>\$ 2,618</b>	<b>\$ 3,302</b>	<b>\$ 2,276</b>	<b>\$ 977</b>	<b>\$ 16,733</b>	<b>\$ 6,660</b>	<b>\$ 633</b>	<b>\$ 24,027</b>	<b>\$ 472</b>	<b>\$ 4,440</b>	<b>\$ 4,912</b>	<b>\$ 7,433</b>

Portfolio Planned Versus Actual Performance - 2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime kWh Savings	218,108,688	141,770,647		-	1.925%	-	\$ 229,182	\$ 286,477	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	20,315,482	13,205,063		-	0.550%	-	\$ 65,481	\$ 81,851	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	1,328	863		-	0.495%	-	\$ 58,932	\$ 73,666	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	1,310	852		-	0.330%	-	\$ 39,288	\$ 49,110	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	2,950	1,918		-	0.275%	-	\$ 33,333	\$ 41,666	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 24,026,617			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 11,905,554			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 12,121,063	\$ 7,878,691	\$ -	-	1.925%	-	\$ 229,182	\$ 286,477	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 655,398	\$ 819,248	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 26,163,878		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 655,398	\$ -	from row 8 above
12 Total Utility Costs	\$ 11,905,554	\$ -	from row 6 above
13 Portfolio GST BCR	2.08	-	row 9 divided by rows 10+11

*Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2023\$) is \$698,059.45.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

**Program Cost-Effectiveness - 2021-2023 PLAN**

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	2.10	0.16	2.15	12,426.8	945.6	12,739.2	5,922.2	-	850.8	8,043.9	176.0	151.1	482	13,461.0	274,699.2
A1 - Energy Star Homes	3.03	0.30	3.73	3,684.4	361.4	5,721.7	1,214.2	318.3	217.5	4,993.2	49.0	4.8	176	4,220.0	98,750.0
A2 - Home Performance with Energy Star	2.16	0.30	2.61	3,949.5	551.7	5,797.4	1,830.8	393.0	229.7	4,481.4	59.8	52.0	196	5,646.7	115,078.2
A3 - Energy Star Products	2.85	1.80	3.68	11,960.8	7,525.2	18,311.2	4,192.1	778.4	7,846.5	60,469.3	1,456.2	1,421.9	122,473	8,893.5	131,933.9
A4 - Residential Behavior	1.34	1.34	2.37	745.3	745.3	1,313.0	555.1	-	6,952.0	6,952.0	1,205.7	777.7	22,700	-	-
A5 - Residential Active Demand Response	1.02	1.02	1.12	125.2	125.2	137.7	122.7	-	-	-	-	-	563	-	-
A6b - Res ISO Forward Capacity Market Expenses	-	-	-	-	-	-	51.7	-	-	-	-	-	-	-	-
A6c - Res Education	-	-	-	-	-	-	89.2	-	-	-	-	-	-	-	-
A6d - Energy Optimization Pilot	-	-	-	-	-	-	204.7	-	-	-	-	-	-	-	-
<b>Sub-Total Residential</b>	<b>2.32</b>	<b>0.72</b>	<b>2.81</b>	<b>32,892.0</b>	<b>10,254.5</b>	<b>44,020.2</b>	<b>14,182.9</b>	<b>1,489.7</b>	<b>16,096.6</b>	<b>84,939.8</b>	<b>2,946.5</b>	<b>2,407.5</b>	<b>146,589</b>	<b>32,221.2</b>	<b>620,461.3</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	1.86	1.85	1.88	17,103.6	17,022.1	27,922.0	9,179.2	5,689.9	22,985.8	297,218.2	900.4	989.7	524	396.6	3,966.2
C2 - Small Business Energy Solutions	1.94	1.93	2.31	13,006.5	12,932.0	21,871.1	6,704.3	2,777.5	13,235.9	158,662.6	795.4	555.1	1,161	407.3	5,862.6
C3 - Municipal Energy Solutions	5.45	4.99	6.09	3,236.1	2,963.5	4,365.2	594.1	122.2	1,061.4	19,438.6	30.5	392.0	33	500.0	12,500.0
C5 - C&I Active Demand Response	3.50	3.50	3.85	1,626.1	1,626.1	1,788.3	464.0	-	-	-	-	-	69	-	-
C6b - C&I ISO Forward Capacity Market Expenses	-	-	-	-	-	-	61.9	-	-	-	-	-	-	-	-
C6c - C&I Education	-	-	-	-	-	-	206.3	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>2.03</b>	<b>2.01</b>	<b>2.17</b>	<b>34,972.2</b>	<b>34,543.7</b>	<b>55,946.6</b>	<b>17,209.8</b>	<b>8,589.6</b>	<b>37,283.1</b>	<b>475,319.4</b>	<b>1,726.3</b>	<b>1,936.8</b>	<b>1,787</b>	<b>1,303.9</b>	<b>22,328.8</b>
<b>Total</b>	<b>2.16</b>	<b>1.43</b>	<b>2.41</b>	<b>67,864.3</b>	<b>44,798.2</b>	<b>99,966.7</b>	<b>31,392.6</b>	<b>10,079.2</b>	<b>53,379.7</b>	<b>560,259.2</b>	<b>4,672.8</b>	<b>4,344.4</b>	<b>148,376</b>	<b>33,525.1</b>	<b>642,790.0</b>

**Notes:**

- (1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.
- (2) Utility and Customer Costs in 2021 Dollars and will not equal the nominal costs presented in the Costs and Performance Incentive tabs.

<b>Annual kWh Savings</b>	53,379,655	84.5%	<b>kWh &gt; 55%</b>	<b>Lifetime kWh Savings</b>	560,259,191	74.8%	<b>kWh &gt; 55%</b>
<b>Annual MMBTU Savings (in kWh)</b>	9,825,230	15.5%		<b>Lifetime MMBTU Savings (in kWh)</b>	188,383,170	25.2%	
	<b>63,204,885</b>	100.0%			<b>748,642,362</b>	100.0%	
<b>Cumulative Savings as a % of 2019 Sales</b>	4.59%			<b>Spending per Cus</b>	1.75% Low-Income	\$ 1,303.01	
					Residential	\$ 136.79	
					C&I	\$ 1,546.67	

Present Value Benefits - 2021-2023 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)											Non-Resource Benefits (\$000)			Environmental Benefits (\$000)			
				Electric					Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits	Total Non-Resource Benefits							
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak					Summer Peak	Summer Off Peak	Electric DRIPE		Total Electric Benefit	Other Fuels	Water Benefit
<b>Residential Programs</b>																					
B1 - Home Energy Assistance	\$ 12,427	\$ 946	\$ 12,739	\$ 141	\$ -	\$ 144	\$ 125	\$ -	\$ 161	\$ 152	\$ 105	\$ 84	\$ 35	\$ 946	\$ 7,534	\$ 26	\$ 8,505	\$ 515	\$ 3,407	\$ 3,922	\$ 312
A1 - Energy Star Homes	\$ 3,684	\$ 361	\$ 5,722	\$ 8	\$ -	\$ 8	\$ 7	\$ -	\$ 144	\$ 166	\$ 8	\$ 6	\$ 13	\$ 361	\$ 3,147	\$ -	\$ 3,508	\$ 176	\$ 1,858	\$ 2,034	\$ 179
A2 - Home Performance with Energy Star	\$ 3,950	\$ 552	\$ 5,797	\$ 83	\$ -	\$ 79	\$ 69	\$ -	\$ 101	\$ 113	\$ 54	\$ 40	\$ 13	\$ 552	\$ 3,175	\$ 5	\$ 3,732	\$ 217	\$ 1,672	\$ 1,889	\$ 176
A3 - Energy Star Products	\$ 11,961	\$ 7,525	\$ 18,311	\$ 994	\$ -	\$ 1,125	\$ 974	\$ -	\$ 1,391	\$ 1,298	\$ 773	\$ 603	\$ 366	\$ 7,525	\$ 2,818	\$ 1,418	\$ 11,761	\$ 199	\$ 3,660	\$ 3,859	\$ 2,690
A4 - Residential Behavior	\$ 745	\$ 745	\$ 1,313	\$ 44	\$ -	\$ 78	\$ 68	\$ -	\$ 195	\$ 156	\$ 87	\$ 57	\$ 61	\$ 745	\$ -	\$ -	\$ 745	\$ -	\$ 223	\$ 223	\$ 345
A5 - Residential Active Demand Response	\$ 125	\$ 125	\$ 138	\$ 6	\$ -	\$ 57	\$ 49	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 13	\$ 125	\$ -	\$ -	\$ 125	\$ -	\$ 13	\$ 13	\$ -
A6b - Res ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A6c - Res Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Residential	\$ 32,892	\$ 10,254	\$ 44,020	\$ 1,276	\$ -	\$ 1,490	\$ 1,291	\$ -	\$ 1,993	\$ 1,884	\$ 1,027	\$ 791	\$ 501	\$ 10,254	\$ 16,674	\$ 1,449	\$ 28,378	\$ 1,107	\$ 10,833	\$ 11,940	\$ 3,702
<b>Commercial/Industrial Programs</b>																					
C1 - Large Business Energy Solutions	\$ 17,104	\$ 17,022	\$ 27,922	\$ 1,093	\$ -	\$ 1,166	\$ 1,010	\$ -	\$ 3,311	\$ 2,540	\$ 4,001	\$ 2,886	\$ 1,016	\$ 17,022	\$ 35	\$ 43	\$ 17,099	\$ 4	\$ 2,397	\$ 2,401	\$ 8,421
C2 - Small Business Energy Solutions	\$ 13,007	\$ 12,932	\$ 21,871	\$ 559	\$ -	\$ 616	\$ 533	\$ -	\$ 3,404	\$ 2,446	\$ 2,854	\$ 1,734	\$ 786	\$ 12,932	\$ 14	\$ 53	\$ 12,999	\$ 7	\$ 1,970	\$ 1,977	\$ 6,895
C3 - Municipal Energy Solutions	\$ 3,236	\$ 2,963	\$ 4,365	\$ 571	\$ -	\$ 575	\$ 498	\$ -	\$ 160	\$ 80	\$ 641	\$ 377	\$ 61	\$ 2,963	\$ 245	\$ -	\$ 3,208	\$ 28	\$ 362	\$ 390	\$ 767
C5 - C&I Active Demand Response	\$ 1,626	\$ 1,626	\$ 1,788	\$ 106	\$ -	\$ 693	\$ 601	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 225	\$ 1,626	\$ -	\$ -	\$ 1,626	\$ -	\$ 163	\$ 163	\$ (0)
C6b - C&I ISO Forward Capacity Market Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Commercial & Industrial	\$ 34,972	\$ 34,544	\$ 55,947	\$ 2,329	\$ -	\$ 3,050	\$ 2,642	\$ -	\$ 6,875	\$ 5,066	\$ 7,497	\$ 4,997	\$ 2,088	\$ 34,543	\$ 294	\$ 96	\$ 34,933	\$ 39	\$ 4,892	\$ 4,931	\$ 16,082
<b>Total</b>	\$ 67,864	\$ 44,798	\$ 99,967	\$ 3,606	\$ -	\$ 4,540	\$ 3,933	\$ -	\$ 8,867	\$ 6,950	\$ 8,524	\$ 5,788	\$ 2,589	\$ 44,798	\$ 16,968	\$ 1,545	\$ 63,311	\$ 1,146	\$ 15,725	\$ 16,871	\$ 19,785

Portfolio Planned Versus Actual Performance - 2021-2023										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime kWh Savings	560,259,191	364,168,474		-	1.925%	-	\$ 604,308	\$ 755,385	\$ -	Planned and Actual from Cost Eff Tab
2 Annual kWh Savings	53,379,655	34,696,776		-	0.550%	-	\$ 172,659	\$ 215,824	\$ -	Planned and Actual from Cost Eff Tab
3 Summer Peak Demand kW	4,344	2,824		-	0.495%	-	\$ 155,393	\$ 194,242	\$ -	Planned and Actual from Cost Eff Tab
4 Winter Peak Demand kW	4,673	3,037		-	0.330%	-	\$ 103,596	\$ 129,495	\$ -	Planned and Actual from Cost Eff Tab
5 Active Demand kW	7,285	4,735		-	0.275%	-	\$ 87,775	\$ 109,719	\$ -	Planned and Actual from ADR Cost Eff Tab
6 Total Resource Benefits	\$ 63,310,791			-						Planned and Actual from Benefits Tab
7 Total Utility Costs <sup>1</sup>	\$ 31,392,612			-						Planned and Actual from Cost Eff Tab
8 Net Benefits	\$ 31,918,179	\$ 20,746,817	\$ -	-	1.925%	-	\$ 604,308	\$ 755,385	\$ -	Line 5 minus line 6
9 Total					5.500%	-	\$ 1,728,039	\$ 2,160,049	\$ -	

	Granite State Test		Source
	Planned	Actual	
10 Total Benefits	\$ 67,864,261		Planned and Actual from Cost Eff Tab
11 Performance Incentive	\$ 1,728,039	\$ -	from row 8 above
12 Total Utility Costs	\$ 31,392,612	\$ -	from row 6 above
13 Portfolio GST BCR	2.05	-	row 9 divided by rows 10+11

*Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2023\$) is \$1,420,443.51.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Home Energy Assistance			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
B1a - HEA (Weatherization)	Air Sealing, Electric	E21B1a002	4	4	5	3.6	4.0	4.4	54.6	60.1	66.1	1.2	1.3	1.4	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Gas	E21B1a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Air Sealing, Kerosene	E21B1a004	20	24	30	1.8	2.2	2.7	27.3	32.8	41.0	-	-	-	-	-	-	145.6	174.7	218.4	2,184.0	2,620.8	3,276.0
B1a - HEA (Weatherization)	Air Sealing, Oil	E21B1a005	40	50	55	3.6	4.6	5.0	54.6	68.3	75.1	-	-	-	-	-	-	364.0	455.0	500.5	5,460.0	6,825.0	7,507.5
B1a - HEA (Weatherization)	Air Sealing, Propane	E21B1a006	60	90	100	5.5	8.2	9.1	81.9	122.9	136.5	-	-	-	-	-	-	546.0	819.0	910.0	8,190.0	12,285.0	13,650.0
B1a - HEA (Weatherization)	Air Sealing, Wood Pellets	E21B1a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Electric	E21B1a009	30	45	60	1.3	1.9	2.6	9.0	13.4	17.9	0.3	0.4	0.5	0.1	0.1	0.2	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Gas	E21B1a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Kerosene	E21B1a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Faucet Aerator, Oil	E21B1a012	50	60	80	-	-	-	-	-	-	-	-	-	-	-	-	7.1	8.5	11.4	49.7	59.6	79.5
B1a - HEA (Weatherization)	Faucet Aerator, Propane	E21B1a013	65	50	55	-	-	-	-	-	-	-	-	-	-	-	-	9.2	7.1	7.8	64.6	49.7	54.7
B1a - HEA (Weatherization)	Hand Held Showerhead, Electric	E21B1a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Gas	E21B1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Kerosene	E21B1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Oil	E21B1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Hand Held Showerhead, Propane	E21B1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Electric	E21B1a023	4	4	5	9.1	10.0	11.0	227.5	250.3	275.3	2.9	3.2	3.5	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Gas	E21B1a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Insulation, Kerosene	E21B1a025	20	24	30	2.7	3.3	4.1	68.3	81.9	102.4	-	-	-	1.5	1.8	2.3	218.4	262.1	327.6	5,460.0	6,552.0	8,190.0
B1a - HEA (Weatherization)	Insulation, Oil	E21B1a026	40	50	55	5.5	6.8	7.5	136.5	170.6	187.7	-	-	-	3.0	3.8	4.1	546.0	682.5	750.8	13,650.0	17,062.5	18,768.8
B1a - HEA (Weatherization)	Insulation, Propane	E21B1a027	60	90	100	8.2	12.3	13.7	204.8	307.1	341.3	-	-	-	4.5	6.8	7.5	819.0	1,228.5	1,365.0	20,475.0	30,712.5	34,125.0
B1a - HEA (Weatherization)	Insulation, Wood Pellets	E21B1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Electric	E21B1a030	3	4	-	0.4	0.5	-	2.8	3.7	-	0.1	0.1	-	0.0	0.0	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Gas	E21B1a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Kerosene	E21B1a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Flow Showerhead, Oil	E21B1a033	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	2.9	3.5	4.6	20.2	24.2	32.3
B1a - HEA (Weatherization)	Low Flow Showerhead, Propane	E21B1a034	8	10	12	-	-	-	-	-	-	-	-	-	-	-	-	4.6	5.8	6.9	32.3	40.3	48.4
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Electric	E21B1a037	15	16	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Gas	E21B1a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Kerosene	E21B1a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Oil	E21B1a040	20	25	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Pipe Insulation - Hot Water, Propane	E21B1a041	30	45	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	DHW Heat Pump Water Heater	E21B1a043	5	8	10	8.3	13.2	16.5	107.5	172.1	215.1	1.1	1.7	2.2	0.4	0.7	0.8	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, General Service Lamps	E21B1a044	870	505	253	27.9	16.2	8.1	55.9	32.5	16.2	20.1	11.7	5.8	13.0	7.5	3.8	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Linear	E21B1a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Other Specialty	E21B1a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Bulb, Reflector	E21B1a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	LED Fixture	E21B1a048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Refrigerator	E21B1a049	150	75	75	106.5	53.2	53.2	1,277.6	638.8	638.8	12.2	6.1	6.1	14.9	7.5	7.5	-	-	-	-	-	-
B1a - HEA (Weatherization)	Freezer	E21B1a050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Clothes Washer	E21B1a051	10	11	15	0.8	0.9	1.2	8.9	9.8	13.4	0.1	0.1	0.2	0.1	0.1	0.2	2.4	2.7	3.7	26.9	29.6	40.4
B1a - HEA (Weatherization)	Clothes Dryer	E21B1a052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Dehumidifier	E21B1a053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Room Air Conditioner	E21B1a054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Triple Pane Window	E21B1a055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Visual Audit	E21B1a056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Baseload Audit - SF	E21B1a057	50	75	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Baseload Audit - MF	E21B1a058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a - HEA (Weatherization)	Low Income Kits	E21B1a059	-	1,500	2,500	-	123.3	205.4	-	246.5	410.9	-	26.6	44.3	-	17.2	28.6	-	-	-	-	-	-



ES Homes			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A1a - ES Homes	Cooling, Electric, SF	E21A1a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Electric, SF	E21A1a002	2	3	4	4.0	5.7	7.2	100.0	142.5	180.0	1.1	1.5	2.2	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Gas, SF	E21A1a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Oil, SF	E21A1a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Propane, SF	E21A1a005	18	22	27	-	-	-	-	-	-	-	-	-	-	-	-	450.0	412.5	337.5	11,250.0	10,312.5	8,437.5
A1a - ES Homes	Heating, Wood Pellets, SF	E21A1a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Electric, SF	E21A1a007	50	-	-	12.5	-	-	187.5	-	-	2.5	-	-	0.9	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Gas, SF	E21A1a008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Oil, SF	E21A1a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Propane, SF	E21A1a010	18	22	27	-	5.5	5.4	-	82.5	81.0	-	-	-	-	-	-	54.0	66.0	81.0	810.0	990.0	1,215.0
A1a - ES Homes	Hot Water, Wood Pellets, SF	E21A1a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Cooling, Electric, MF	E21A1a012	25	28	30	1.6	1.8	2.0	40.6	45.5	48.8	-	-	-	0.9	1.0	1.1	-	-	-	-	-	-
A1a - ES Homes	Heating, Electric, MF	E21A1a013	25	28	30	45.0	50.4	54.0	1,125.0	1,260.0	1,350.0	12.2	13.7	14.7	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Gas, MF	E21A1a014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Oil, MF	E21A1a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Heating, Propane, MF	E21A1a016	50	53	55	-	-	-	-	-	-	-	-	-	-	-	-	1,000.0	795.0	550.0	25,000.0	19,875.0	13,750.0
A1a - ES Homes	Heating, Wood Pellets, MF	E21A1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Electric, MF	E21A1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Gas, MF	E21A1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Oil, MF	E21A1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Hot Water, Propane, MF	E21A1a021	50	53	55	-	8.0	5.5	-	119.3	82.5	-	-	-	-	-	-	150.0	159.0	165.0	2,250.0	2,385.0	2,475.0
A1a - ES Homes	Hot Water, Wood Pellets, MF	E21A1a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	LED Bulb	E21A1a023	75	-	-	0.5	-	-	1.4	-	-	0.6	-	-	0.4	-	-	-	-	-	-	-	-
A1a - ES Homes	LED Fixture	E21A1a024	25	-	-	0.1	-	-	0.4	-	-	0.2	-	-	0.1	-	-	-	-	-	-	-	-
A1a - ES Homes	Refrigerator	E21A1a025	20	20	23	0.8	0.8	0.9	9.8	9.8	11.3	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-
A1a - ES Homes	Clothes Washer	E21A1a026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Clothes Dryer	E21A1a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	HERS - Lighting and Appliances	E21A1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1a - ES Homes	Residential New Construction Code Compli	E21A1a029	1	1	1	-	-	5.8	-	-	115.2	-	-	-	-	-	-	-	-	-	-	-	-
<b>ES Homes Subtotal</b>						<b>64.6</b>	<b>72.2</b>	<b>80.8</b>	<b>1,464.8</b>	<b>1,659.6</b>	<b>1,868.8</b>	<b>16.7</b>	<b>15.3</b>	<b>16.9</b>	<b>2.5</b>	<b>1.1</b>	<b>1.2</b>	<b>1,654.0</b>	<b>1,432.5</b>	<b>1,133.5</b>	<b>39,310.0</b>	<b>33,562.5</b>	<b>25,877.5</b>

Home Performance with Energy Star			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A2a - HPwES (Weatherizat	Air Sealing, Electric	E21A2a002	6	7	9	11.9	14.3	17.1	178.2	213.8	256.6	3.8	4.5	5.4	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Air Sealing, Gas	E21A2a003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Air Sealing, Kerosene	E21A2a004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Air Sealing, Oil	E21A2a005	30	36	43	3.2	3.8	4.6	47.5	57.0	68.4	-	-	-	1.7	2.1	2.5	297.0	356.4	427.7	4,455.0	5,346.0	6,415.2
A2a - HPwES (Weatherizat	Air Sealing, Propane	E21A2a006	18	22	25	1.9	2.3	2.6	28.5	34.8	39.6	-	-	-	1.0	1.3	1.5	178.2	217.8	247.5	2,673.0	3,267.0	3,712.5
A2a - HPwES (Weatherizat	Air Sealing, Wood Pellets	E21A2a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Faucet Aerator, Electric	E21A2a009	10	12	15	0.5	0.6	0.7	3.2	3.9	4.9	0.1	0.1	0.1	0.0	0.0	0.1	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Faucet Aerator, Gas	E21A2a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Faucet Aerator, Kerosene	E21A2a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Faucet Aerator, Oil	E21A2a012	40	8	10	-	-	-	-	-	-	-	-	-	-	-	-	6.2	1.2	1.5	43.2	8.6	10.8
A2a - HPwES (Weatherizat	Faucet Aerator, Propane	E21A2a013	25	14	18	-	-	-	-	-	-	-	-	-	-	-	-	3.9	2.2	2.8	27.0	15.1	19.5
A2a - HPwES (Weatherizat	Hand Held Showerhead, Electric	E21A2a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Hand Held Showerhead, Gas	E21A2a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Hand Held Showerhead, Kerosene	E21A2a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Hand Held Showerhead, Oil	E21A2a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Hand Held Showerhead, Propane	E21A2a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Insulation, Electric	E21A2a023	6	7	9	23.8	28.5	34.2	594.0	712.8	855.4	7.5	9.1	10.9	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Insulation, Gas	E21A2a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Insulation, Kerosene	E21A2a025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Insulation, Oil	E21A2a026	30	36	43	8.9	10.7	12.8	222.8	267.3	320.8	-	-	-	4.9	5.9	7.1	415.8	499.0	598.8	10,395.0	12,474.0	14,968.8
A2a - HPwES (Weatherizat	Insulation, Propane	E21A2a027	18	22	25	5.3	6.5	7.4	133.7	163.4	185.6	-	-	-	2.9	3.6	4.1	249.5	304.9	346.5	6,237.0	7,623.0	8,662.5
A2a - HPwES (Weatherizat	Insulation, Wood Pellets	E21A2a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Low Flow Showerhead, Electric	E21A2a030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Low Flow Showerhead, Gas	E21A2a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Low Flow Showerhead, Kerosene	E21A2a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Low Flow Showerhead, Oil	E21A2a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Low Flow Showerhead, Propane	E21A2a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Pipe Insulation - Hot Water, Electric	E21A2a037	3	4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Pipe Insulation - Hot Water, Gas	E21A2a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Pipe Insulation - Hot Water, Kerosene	E21A2a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Pipe Insulation - Hot Water, Oil	E21A2a040	20	30	40	-	-	-	-	-	-	-	-	-	-	-	-	4.0	5.9	7.9	59.4	89.1	118.8
A2a - HPwES (Weatherizat	Pipe Insulation - Hot Water, Propane	E21A2a041	12	15	25	-	-	-	-	-	-	-	-	-	-	-	-	2.4	3.0	5.0	35.6	44.6	74.3
A2a - HPwES (Weatherizat	DHW Heat Pump Water Heater	E21A2a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	LED Bulb, General Service Lamps	E21A2a044	432	216	-	15.1	7.5	-	30.2	15.1	-	10.9	5.4	-	7.0	3.5	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	LED Bulb, Linear	E21A2a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	LED Bulb, Other Specialty	E21A2a046	30	-	-	1.5	-	-	3.0	-	-	1.3	-	0.8	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	LED Bulb, Reflector	E21A2a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	LED Fixture	E21A2a048	40	-	-	1.5	-	-	3.0	-	-	0.7	-	0.4	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Refrigerator	E21A2a049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Freezer	E21A2a053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Clothes Washer	E21A2a054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Clothes Dryer	E21A2a055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Dehumidifier	E21A2a056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Room Air Conditioner	E21A2a057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Triple Pane Window	E21A2a058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Visual Audit Oil Savings	E21A2a050	40	60	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Visual Audit Propane Savings	E21A2a051	25	35	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2a - HPwES (Weatherizat	Visual Audit Electric Savings	E21A2a052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A2b - HPwES (HVAC System)	Boiler Replacement, Gas	E21A2b001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Boiler Replacement, Kerosene	E21A2b002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Boiler Replacement, Oil	E21A2b003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Boiler Replacement, Propane	E21A2b004	2	15	18	-	-	-	-	-	-	-	-	-	-	-	-	36.4	273.2	327.9	910.8	6,831.0	8,197.2
A2b - HPwES (HVAC System)	Furnace Replacement, Gas	E21A2b005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Furnace Replacement, Kerosene	E21A2b006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Furnace Replacement, Oil	E21A2b007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Furnace Replacement, Propane	E21A2b008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Programmable Thermostat, Electric	E21A2b009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Programmable Thermostat, Gas	E21A2b010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Programmable Thermostat, Kerosene	E21A2b011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Programmable Thermostat, Oil	E21A2b012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Programmable Thermostat, Propane	E21A2b013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Programmable Thermostat, Wood Pellets	E21A2b014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Wifi Thermostat, Electric	E21A2b015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Wifi Thermostat, Gas	E21A2b016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Wifi Thermostat, Kerosene	E21A2b017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2b - HPwES (HVAC System)	Wifi Thermostat, Oil	E21A2b018	20	30	40	0.4	0.5	0.7	5.3	8.0	10.7	-	-	-	0.2	0.3	0.4	116.8	175.2	233.6	1,752.3	2,628.5	3,504.6
A2b - HPwES (HVAC System)	Wifi Thermostat, Propane	E21A2b019	12	15	25	0.2	0.3	0.4	3.2	4.0	6.7	-	-	-	0.1	0.1	0.2	68.9	86.1	143.6	1,033.6	1,292.0	2,153.3
A2b - HPwES (HVAC System)	Wifi Thermostat, Wood Pellets	E21A2b020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Home Performance with Energy Star Subtotal</b>						<b>74.1</b>	<b>75.0</b>	<b>80.6</b>	<b>1,252.6</b>	<b>1,480.2</b>	<b>1,748.6</b>	<b>24.2</b>	<b>19.1</b>	<b>16.4</b>	<b>19.3</b>	<b>16.9</b>	<b>15.8</b>	<b>1,379.0</b>	<b>1,925.0</b>	<b>2,342.7</b>	<b>27,622.0</b>	<b>39,618.8</b>	<b>47,837.4</b>

ES Products			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A3a - ES Lighting	LED Bulb, General Service Lamps	E21A3a001	110,000	80,000	-	940.1	476.5		2,820.4	1,429.6		203.0	102.9		130.9	66.4		-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Linear	E21A3a002	1,000	500	250	2.8	1.0	0.3	27.9	9.7	2.5	0.6	0.2	0.1	0.4	0.1	0.0	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Other Specialty	E21A3a003	36,000	20,000	10,000	344.9	133.5	37.7	1,034.6	400.6	75.5	74.4	28.8	8.1	48.0	18.6	5.3	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Reflector	E21A3a004	40,000	10,000	-	424.0	73.9		848.0	147.8		91.5	15.9		59.0	10.3		-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, General Service Lamps (Hard to Reach)	E21A3a005	12,000	8,000	5,000	164.7	89.1	42.7	494.2	267.3	85.5	35.6	19.2	9.2	22.9	12.4	6.0	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Linear (Hard to Reach)	E21A3a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Other Specialty (Hard to Reach)	E21A3a007	4,800	6,000	8,000	73.8	74.9	76.6	221.5	224.7	153.3	15.9	16.2	16.5	10.3	10.4	10.7	-	-	-	-	-	-
A3a - ES Lighting	LED Bulb, Reflector (Hard to Reach)	E21A3a008	2,400	3,000	3,500	40.9	41.4	37.1	81.7	82.9	37.1	8.8	8.9	8.0	5.7	5.8	5.2	-	-	-	-	-	-
A3a - ES Lighting	LED Fixture	E21A3a009	12,000	6,000	4,000	95.1	33.2	12.5	285.4	99.5	25.0	20.5	7.2	2.7	13.2	4.6	1.7	-	-	-	-	-	-
A3a - ES Lighting	LED Fixture (Hard to Reach)	E21A3a010	2,400	4,000	4,000	30.6	41.3	31.7	91.7	124.0	63.4	6.6	8.9	6.8	4.3	5.8	4.4	-	-	-	-	-	-
A3b - ES Appliances	Advanced Power Strip, Tier I	E21A3b001	250	313	375	19.9	24.9	29.9	99.6	124.5	149.4	1.6	2.0	2.4	1.1	1.4	1.6	-	-	-	-	-	-
A3b - ES Appliances	Advanced Power Strip, Tier II	E21A3b002	250	313	375	29.6	37.0	44.4	148.1	185.1	222.1	2.6	3.3	4.0	1.8	2.2	2.7	-	-	-	-	-	-
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (cooling)	E21A3b003	4	5	6	0.9	1.1	1.3	15.8	19.8	23.8	-	-	-	0.5	0.6	0.7	-	-	-	-	-	-
A3c - ES HVAC Systems	Air Source Heat Pump - Lost Opportunity (heating)	E21A3b004	4	5	6	8.3	10.4	12.5	150.3	187.8	225.4	2.7	3.3	4.0	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Mini Split HP - Lost Opportunity (cooling)	E21A3b005	325	406	488	33.5	41.8	50.2	602.1	752.7	903.2	-	-	-	29.0	36.2	43.5	-	-	-	-	-	-
A3c - ES HVAC Systems	Mini Split HP- Lost Opportunity (heating)	E21A3b006	325	406	488	106.7	133.4	160.0	1,920.6	2,400.7	2,880.8	89.6	112.0	134.4	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 50 gal	E21A3b007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	DHW Heat Pump Water Heater 80 gal	E21A3b008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Heat Pump Swimming Pool Heater	E21A3b009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	ES Clothes Dryers	E21A3b010	600	750	900	96.2	120.3	144.4	1,154.9	1,443.6	1,732.3	16.4	20.5	24.6	12.6	15.8	18.9	-	-	-	-	-	-
A3b - ES Appliances	Dryer Heat Pump	E21A3b011	10	13	15	4.2	5.3	6.3	50.5	63.2	75.8	0.7	0.9	1.1	0.6	0.7	0.8	-	-	-	-	-	-
A3b - ES Appliances	Dryer Hybrid	E21A3b012	35	44	53	7.5	9.3	11.2	89.6	112.0	134.4	1.3	1.6	1.9	1.0	1.2	1.5	-	-	-	-	-	-
A3c - ES HVAC Systems	ECM Motor for FWH Circulating Pump - Mid	E21A3b013	50	63	75	2.3	2.9	3.5	42.2	52.8	63.3	0.4	0.6	0.7	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	ECM Motors for FHA Furnace Fans	E21A3b014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	ES AC (central) 3 ton	E21A3b015	8	10	12	1.6	2.0	2.4	22.4	28.0	33.6	-	-	-	1.4	1.8	2.2	-	-	-	-	-	-
A3c - ES HVAC Systems	Room Air Conditioner	E21A3b016	500	750	900	8.0	12.0	14.4	64.0	96.0	115.2	-	-	-	15.6	23.4	28.0	-	-	-	-	-	-
A3b - ES Appliances	ES Clothes Washers	E21A3b017	800	1,000	1,200	70.9	88.7	106.4	993.1	1,241.4	1,489.7	10.0	12.5	14.9	9.4	11.8	14.1	215.2	269.0	322.8	3,012.8	3,766.0	4,519.2
A3b - ES Appliances	Washer Tier CEE Tier 2+	E21A3b018	400	500	600	62.4	78.0	93.5	873.0	1,091.3	1,309.6	8.8	10.9	13.1	8.3	10.3	12.4	176.4	220.5	264.6	2,469.6	3,087.0	3,704.4
A3b - ES Appliances	ES Dehumidifier	E21A3b019	500	625	750	72.3	90.3	108.4	867.0	1,083.8	1,300.5	2.9	3.6	4.4	13.9	17.3	20.8	-	-	-	-	-	-
A3b - ES Appliances	ES Dishwasher	E21A3b020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	ES Freezers	E21A3b021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	Refrigerator	E21A3b022	1,000	1,100	1,200	41.0	45.1	49.2	492.0	541.2	590.4	4.7	5.2	5.6	5.7	6.3	6.9	-	-	-	-	-	-
A3b - ES Appliances	Refrigerator CEE Tier 2+	E21A3b023	300	375	450	28.9	36.2	43.4	347.0	433.8	520.6	3.3	4.1	5.0	4.1	5.1	6.1	-	-	-	-	-	-
A3b - ES Appliances	ES Pool Pumps (Variable Speed)	E21A3b024	150	188	225	159.3	199.1	239.0	1,593.0	1,991.3	2,389.5	-	-	-	92.1	115.1	138.1	-	-	-	-	-	-
A3b - ES Appliances	Room Air Purifier	E21A3b025	800	1,000	1,200	312.4	390.5	468.6	2,811.6	3,514.5	4,217.4	35.7	44.6	53.5	35.7	44.6	53.5	-	-	-	-	-	-
A3c - ES HVAC Systems	Wifi Thermostat (Heating & Cooling)	E21A3b026	300	375	450	7.5	9.3	11.2	111.9	139.8	167.8	-	-	-	4.1	5.1	6.2	1,980.0	2,475.0	2,970.0	29,700.0	37,125.0	44,550.0
A3b - ES Appliances	Primary Refrigerator Recycling	E21A3b027	150	188	225	73.7	92.2	110.6	589.9	737.4	884.9	8.4	10.5	12.6	10.3	12.9	15.5	-	-	-	-	-	-
A3b - ES Appliances	Secondary Refrigerator Recycling	E21A3b028	10	13	15	7.6	9.4	11.3	60.4	75.5	90.6	0.7	0.9	1.1	1.2	1.5	1.8	-	-	-	-	-	-
A3b - ES Appliances	Secondary Freezer Recycling	E21A3b029	25	31	38	16.5	20.6	24.7	131.6	164.5	197.4	1.6	2.0	2.4	2.2	2.7	3.3	-	-	-	-	-	-
A3b - ES Appliances	Room Air Conditioner Recycling	E21A3b030	45	56	68	0.7	0.9	1.1	3.6	4.6	5.5	-	-	-	0.4	0.5	0.6	-	-	-	-	-	-
A3c - ES HVAC Systems	Ductless Mini-split Heat Pump - Retrofit Res	E21A3b031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Ductless Mini-split Heat Pump - Retrofit HP	E21A3b032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air-source Heat Pump - Retrofit HP	E21A3b033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3c - ES HVAC Systems	Air-source Heat Pump - Retrofit Resistance	E21A3b034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3b - ES Appliances	DHW Heat Pump Water Heater 50 gal - Mid	E21A3b035	50	63	75	37.0	46.6	55.5	481.0	606.0	721.5	6.1	7.7	9.1	3.4	4.2	5.0	-	-	-	-	-	-
A3b - ES Appliances	DHW Heat Pump Water Heater 80 gal - Mid	E21A3b036	15	-	-	6.5	-	-	84.8	-	-	1.1	-	-	0.6	-	-	-	-	-	-	-	-

Residential Behavior			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
A4a - Residential Behavior	Home Energy Reports	E21A4a001	22,700	22,700	22,700	1,749.0	2,087.0	3,116.0	1,749.0	2,087.0	3,116.0	377.6	450.5	377.6	243.5	290.6	243.5	-	-	-	-	-	-

Large Business Energy Solutions			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C1a - LCI Retrofit	Custom Large Compressed Air Retro	E21C1a001	3	4	5	228.3	289.2	342.5	2,968.5	3,760.0	4,452.7	37.3	49.8	62.2	44.6	59.4	74.3	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Hot Water Retro	E21C1a002	5	6	8	266.4	303.7	383.6	2,664.0	3,037.0	3,836.2	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large HVAC Retro	E21C1a003	1	2	3	69.9	132.9	799.2	1,049.0	1,993.0	7,992.0	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Interior	E21C1a004	15	18	20	399.6	455.5	479.5	3,996.0	4,555.4	4,795.2	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Exterior	E21C1a047	8	8	8	213.1	202.5	191.8	2,131.2	2,024.6	1,918.1	42.7	40.5	42.7	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Lighting Retro - Controls	E21C1a048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Motors Retro	E21C1a005	3	4	6	214.1	271.2	385.3	2,782.9	3,525.0	5,009.3	35.7	47.6	71.4	35.7	47.6	71.4	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Process Retro	E21C1a006	5	6	9	555.0	632.7	899.1	7,215.0	8,225.1	11,688.3	5.6	6.7	10.0	45.4	54.4	81.7	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Refrigeration Retro	E21C1a007	4	5	8	399.6	474.5	719.3	5,194.8	6,168.8	9,350.6	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Custom Large Other Retro	E21C1a008	15	25	37	1,498.5	2,372.6	3,326.7	19,480.5	30,844.1	43,246.7	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Daylight Dimming	E21C1a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C1a010	15	25	15	66.2	110.3	66.2	926.5	1,544.1	926.5	13.2	22.1	13.2	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C1a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C1a012	2,000	1,500	1,200	894.7	671.1	536.8	10,736.8	8,052.6	6,442.1	109.2	81.9	65.5	143.2	107.4	85.9	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C1a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Lighting Occupancy Sensors	E21C1a014	200	1,000	1,200	31.4	156.9	188.3	282.5	1,412.5	1,695.0	0.4	2.0	2.4	0.5	2.4	2.8	-	-	-	-	-	-
C1a - LCI Retrofit	Boiler Reset Controls, Electric	E21C1a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Case Motor Replacement	E21C1a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Cooler Night Cover	E21C1a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Demand Control Ventilation	E21C1a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Door Heater Controls	E21C1a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C1a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Duct Sealing, Electric	E21C1a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Ductless Mini Split Heat Pump	E21C1a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	ECM Evaporator Fan Motors for Walk-in Co	E21C1a023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Electronic Defrost Control	E21C1a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Energy Management System, Electric	E21C1a025	2	3	4	79.5	87.4	122.4	1,033.1	1,136.4	1,590.9	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C1a026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Evaporator Fan Control	E21C1a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Faucet Aerator, Electric	E21C1a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Hotel Occupancy Sensor	E21C1a031	65	75	100	28.4	32.8	43.8	284.4	328.2	437.6	-	-	-	-	-	-	107.4	123.9	165.3	1,074.2	1,239.4	1,652.6
C1a - LCI Retrofit	Low Pressure Drop Filter	E21C1a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Low-Flow Showerhead With Thermostatic V	E21C1a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Low-Flow Showerhead, Electric	E21C1a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Motors, Open Drip	E21C1a035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Motors, Totally Enclosed Fan Cooled	E21C1a036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Novelty Cooler Shutoff	E21C1a037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Pipe Wrap - Heating, Electric	E21C1a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Pipe Wrap - Hot Water, Electric	E21C1a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Pre Rinse Spray Valve, Electric	E21C1a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Programmable Thermostat, Electric	E21C1a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Steam Trap, Electric	E21C1a042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Variable Frequency Drive	E21C1a043	5	8	10	0.5	0.8	1.0	7.5	12.0	15.0	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Variable Frequency Drive with Motor	E21C1a044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Vending Miser	E21C1a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1a - LCI Retrofit	Zero Loss Condensate Drain	E21C1a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Small Business Energy Solutions			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C2a - SCI Retrofit	Custom Small Compressed Air Retro	E21C2a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Hot Water Retro	E21C2a002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small HVAC Retro	E21C2a003	5	8	13	75.0	114.0	175.5	1,875.0	2,850.0	4,387.5	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Lighting Retro - Interior	E21C2a004	25	70	75	476.2	1,266.7	1,071.4	4,761.9	12,666.7	10,714.3	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Lighting Retro - Exterior	E21C2a047	15	15	10	400.0	380.0	200.0	3,600.0	3,420.0	1,800.0	80.0	76.0	53.3	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Lighting Retro - Controls	E21C2a048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Motors Retro	E21C2a005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Process Retro	E21C2a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Refrigeration Retro	E21C2a007	12	15	25	48.0	57.0	90.0	576.0	684.0	1,080.0	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Custom Small Other Retro	E21C2a008	25	35	50	714.3	950.0	1,285.7	9,285.7	11,400.0	15,428.6	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Daylight Dimming	E21C2a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Lighting Fixture - Exterior w/ Controls	E21C2a010	100	5	5	20.3	1.0	1.0	283.7	14.2	14.2	4.1	0.2	0.2	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Lighting Fixture - Exterior w/o Controls	E21C2a011	200	4	4	201.6	4.0	4.0	2,822.4	56.4	56.4	40.3	0.8	0.8	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Lighting Fixture - Interior w/ Controls	E21C2a012	3,500	75	75	630.0	13.5	13.5	7,560.0	162.0	162.0	76.9	1.6	1.6	100.8	2.2	2.2	-	-	-	-	-	-
C2a - SCI Retrofit	Lighting Fixture - Interior w/o Controls	E21C2a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Lighting Occupancy Sensors	E21C2a014	500	-	-	78.5	-	-	706.3	-	-	1.0	-	-	1.2	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Boiler Reset Controls, Electric	E21C2a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Case Motor Replacement	E21C2a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Cooler Night Cover	E21C2a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Demand Control Ventilation	E21C2a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Door Heater Controls	E21C2a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C2a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Duct Sealing, Electric	E21C2a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Ductless Mini Split Heat Pump	E21C2a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	ECM Evaporator Fan Motors for Walk-in Co	E21C2a023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Electronic Defrost Control	E21C2a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Energy Management System, Electric	E21C2a025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Energy Star Wifi Thermostat, Electric	E21C2a026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Evaporator Fan Control	E21C2a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Faucet Aerator, Electric	E21C2a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Hotel Occupancy Sensor	E21C2a031	100	-	-	43.8	-	-	438.0	-	-	-	-	-	-	-	-	165.3	-	-	1,652.6	-	-
C2a - SCI Retrofit	Low Pressure Drop Filter	E21C2a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Low-Flow Showerhead With Thermostatic V	E21C2a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Low-Flow Showerhead, Electric	E21C2a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Motors, Open Drip	E21C2a035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Motors, Totally Enclosed Fan Cooled	E21C2a036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Novelty Cooler Shutoff	E21C2a037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Pipe Wrap - Heating, Electric	E21C2a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Pipe Wrap - Hot Water, Electric	E21C2a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Pre Rinse Spray Valve, Electric	E21C2a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Programmable Thermostat, Electric	E21C2a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Steam Trap, Electric	E21C2a042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Variable Frequency Drive	E21C2a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Variable Frequency Drive with Motor	E21C2a044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Vending Miser	E21C2a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2a - SCI Retrofit	Zero Loss Condensate Drain	E21C2a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Municipal Energy Solutions			Quantity			Net Annual MWh Savings			Net Lifetime MWh Savings			Annual Net Winter kW			Annual Net Summer kW			Total Net Annual MMBTU			Total Net Lifetime MMBTU		
Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
C3a - Muni Retrofit	Custom Muni Compressed Air Retro	E21C3a001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Hot Water Retro	E21C3a002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni HVAC Retro	E21C3a003	2	4	4	100.0	190.0	180.0	2,500.0	4,750.0	4,500.0	-	-	-	22.5	45.0	45.0	100.0	200.0	200.0	2,500.0	5,000.0	5,000.0
C3a - Muni Retrofit	Custom Muni Lighting Retro - Interior	E21C3a004	3	-	-	200.0	-	-	2,600.0	-	-	30.5	-	-	40.0	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Lighting Retro - Exterior	E21C3a091	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Lighting Retro - Controls	E21C3a092	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Motors Retro	E21C3a005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Process Retro	E21C3a006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Refrigeration Retro	E21C3a007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Custom Muni Other Retro	E21C3a008	6	6	5	171.4	120.0	100.0	2,228.6	1,560.0	1,300.0	-	-	-	94.5	66.2	78.8	-	-	-	-	-	-
C3a - Muni Retrofit	Daylight Dimming	E21C3a009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Lighting Fixture - Exterior w/ Controls	E21C3a010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Lighting Fixture - Exterior w/o Controls	E21C3a011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Lighting Fixture - Interior w/ Controls	E21C3a012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Lighting Fixture - Interior w/o Controls	E21C3a013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Lighting Occupancy Sensors	E21C3a014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Air Sealing, Electric	E21C3a015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Air Sealing, Gas	E21C3a016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Air Sealing, Oil	E21C3a017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Air Sealing, Propane	E21C3a018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Boiler Reset Controls, Gas	E21C3a019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Boiler Reset Controls, Oil	E21C3a020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Boiler Reset Controls, Propane	E21C3a021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Case Motor Replacement	E21C3a022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Cooler Night Cover	E21C3a023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Demand Control Ventilation	E21C3a024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Door Heater Controls	E21C3a025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Dual Enthalpy Economizer Controls (DEEC)	E21C3a026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Insulation, Electric	E21C3a027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Insulation, Gas	E21C3a028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Insulation, Oil	E21C3a029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Insulation, Propane	E21C3a030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Sealing, Electric	E21C3a031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Sealing, Gas	E21C3a032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Sealing, Oil	E21C3a033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Duct Sealing, Propane	E21C3a034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Ductless Mini Split Heat Pump	E21C3a035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	ECM Evaporator Fan Motors for Walk-in Co	E21C3a036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Electronic Defrost Control	E21C3a037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Energy Management System, Electric	E21C3a038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Electric	E21C3a039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Gas	E21C3a040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Oil	E21C3a041	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Energy Star Wifi Thermostat, Propane	E21C3a042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Evaporator Fan Control	E21C3a043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Faucet Aerator, Electric	E21C3a044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Faucet Aerator, Gas	E21C3a045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Faucet Aerator, Oil	E21C3a046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Faucet Aerator, Propane	E21C3a047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Hotel Occupancy Sensor	E21C3a050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Insulation, Electric	E21C3a051	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Insulation, Gas	E21C3a052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Insulation, Oil	E21C3a053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Insulation, Propane	E21C3a054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low Pressure Drop Filter	E21C3a055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic V	E21C3a056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic V	E21C3a057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic V	E21C3a058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead With Thermostatic V	E21C3a059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead, Electric	E21C3a060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead, Gas	E21C3a061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3a - Muni Retrofit	Low-Flow Showerhead, Oil	E21C3a062	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







**Unitil Energy System, Inc.  
System Benefits Charge ("SBC") Calculation**

Unitil Energy Systems, Inc.  
NHPUC Docket No. DE 20-092  
Attachment H3 - (2021 - 2023 Plan)  
Page 1 of 11

Residential Sector (includes Low-Income Residential)												
Year	EE Total Budget	RGGI Revenues	FCM Revenues	Other Revenues	Prior Year Deferral with Interest	Current Year Interest	SBC Requirement	Forecasted Distribution (kWh)	SBC Rate EE Portion (\$/kWh)	SBC Rate EAP Portion (\$/kWh)	SBC Rate LBR Portion (\$/kWh)	(Jan 1, 21 & 22 & 23) Total SBC Rate (\$/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M
2021	\$ 4,677,524	\$ 56,687	\$ 168,524	\$ 963,228	\$ (465,753)	\$ (14,347)	\$ 3,008,984	489,122,763	\$0.00615	\$0.00150	\$0.00120	\$0.00885
2022	\$ 5,158,548	\$ 54,463	\$ 140,137	\$ 1,239,115	\$ 879	\$ -	\$ 3,725,713	482,005,817	\$0.00773	\$0.00150	\$0.00145	\$0.01068
2023	\$ 5,344,652	\$ 52,238	\$ 133,129	\$ 1,488,459	\$ -	\$ -	\$ 3,670,826	478,409,950	\$0.00767	\$0.00150	\$0.00186	\$0.01103

Commercial & Industrial (C&I) Sector												
Year	EE Total Budget	RGGI Revenues	FCM Revenues	Other Revenues	Prior Year Deferral with Interest	Current Year Interest	SBC Requirement	Forecasted Distribution (kWh)	SBC Rate EE Portion (\$/kWh)	SBC Rate EAP Portion (\$/kWh)	SBC Rate LBR Portion (\$/kWh)	Total SBC Rate (\$/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M
2021	\$ 4,891,985	\$ 228,000	\$ 393,222	\$ (963,228)	\$ 122,445	\$ (11,204)	\$ 5,345,233	616,422,193	\$0.00867	\$0.00150	\$0.00129	\$0.01146
2022	\$ 6,187,942	\$ 228,000	\$ 326,985	\$ (1,239,115)	\$ 852	\$ -	\$ 6,872,924	642,314,405	\$0.01070	\$0.00150	\$0.00121	\$0.01341
2023	\$ 7,751,441	\$ 228,000	\$ 310,634	\$ (1,488,459)	\$ -	\$ -	\$ 8,701,266	652,689,123	\$0.01333	\$0.00150	\$0.00130	\$0.01613

- Col. A: Effective year
- Col. B: Company Forecast
- Col. C: Company Forecast
- Col. D: Company Forecast
- Col. E: Company Forecast, C&I Funding for Low-Income Program
- Col. F: Page 2, Line 15
- Col. G: Page 3, Line 14
- Col. H: Col. B - Col. C - Col. D - Col. E + Col. F + Col. G
- Col. I: Company Forecast
- Col. J: Col. H / Col. I
- Col. K: EAP Portion of SBC Rate
- Col. L: Page 4, Col. G
- Col. M: Col. J + Col. K + Col. L

**Unitil Energy Systems, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation**  
**January 1, 2020 to December 31, 2020**

	Jan-20 Recast	Feb-20 Recast	Mar-20 Recast	Apr-20 Recast	May-20 Recast	Jun-20 Recast	Jul-20 Estimate	Aug-20 Estimate	Sep-20 Estimate	Oct-20 Estimate	Nov-20 Estimate	Dec-20 Estimate	Total
1 Beginning Balance -- (Over)/Under Recovery	\$ (1,154,187)	\$ (1,583,066)	\$ (1,788,235)	\$ (1,888,553)	\$ (2,113,676)	\$ (2,316,469)	\$ (2,565,452)	\$ (2,265,308)	\$ (1,979,172)	\$ (1,723,117)	\$ (1,234,261)	\$ (805,341)	
<b>2 Total Costs</b>	<b>183,721</b>	<b>396,761</b>	<b>490,271</b>	<b>280,126</b>	<b>356,701</b>	<b>336,778</b>	<b>867,844</b>	<b>897,534</b>	<b>934,545</b>	<b>947,018</b>	<b>976,709</b>	<b>1,023,616</b>	<b>7,691,624</b>
<b>Revenues</b>													
3 Class Sales (Residential inc. LI) -- kWh	47,877,662	43,447,320	41,788,394	36,919,734	34,845,155	43,074,211	42,464,449	49,044,653	47,171,852	31,371,125	34,379,732	44,937,859	497,322,147
Class Sales (C&I) -- kWh	57,648,909	57,361,500	56,685,607	45,265,444	44,359,715	53,888,841	53,039,214	54,887,862	56,213,703	43,874,345	44,670,644	50,365,956	618,261,740
Total Class Sales - kWh	105,526,571	100,808,820	98,474,001	82,185,178	79,204,870	96,963,052	95,503,664	103,932,515	103,385,555	75,245,470	79,050,376	95,303,816	1,115,583,887
4 Charge -- \$/kWh	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528	\$ 0.00528
5 Energy Efficiency Revenues	\$ 473,467	\$ 532,633	\$ 520,570	\$ 434,496	\$ 418,791	\$ 512,651	\$ 504,259	\$ 548,764	\$ 545,876	\$ 397,296	\$ 417,386	\$ 503,204	\$ 5,809,393
6 Forward Capacity Market Revenue	\$ 62,522	\$ 62,965	\$ 62,639	\$ 62,926	\$ 62,996	\$ 63,624	\$ 56,801	\$ 56,801	\$ 56,801	\$ 56,801	\$ 56,801	\$ 56,801	\$ 718,476
7 RGGI Funding	\$ 71,223	\$ -	\$ -	\$ -	\$ -	\$ 68,813	\$ -	\$ -	\$ 70,889	\$ -	\$ 70,889	\$ -	\$ 281,815
8 Other Revenues	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>9 Total Revenues</b>	<b>\$ 607,212</b>	<b>\$ 595,598</b>	<b>\$ 583,209</b>	<b>\$ 497,422</b>	<b>\$ 550,601</b>	<b>\$ 576,275</b>	<b>\$ 561,060</b>	<b>\$ 605,564</b>	<b>\$ 673,565</b>	<b>\$ 454,097</b>	<b>\$ 545,076</b>	<b>\$ 560,005</b>	<b>\$ 6,809,684</b>
10 (Over)/Under Recovery (excluding interest)	\$ (1,577,677)	\$ (1,781,903)	\$ (1,881,172)	\$ (2,105,849)	\$ (2,307,576)	\$ (2,555,967)	\$ (2,258,668)	\$ (1,973,338)	\$ (1,718,192)	\$ (1,230,196)	\$ (802,628)	\$ (341,730)	
<b>Interest Calculation</b>													
11 Average Monthly Balance	\$ (1,365,932)	\$ (1,682,484)	\$ (1,834,703)	\$ (1,997,201)	\$ (2,210,626)	\$ (2,436,218)	\$ (2,412,060)	\$ (2,119,323)	\$ (1,848,682)	\$ (1,476,656)	\$ (1,018,444)	\$ (573,535)	
12 Interest Rate	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
13 Days per Month	31	29	31	30	31	30	31	31	30	31	30	31	366
14 Computed Interest	\$ (5,388)	\$ (6,331)	\$ (7,381)	\$ (7,827)	\$ (8,894)	\$ (9,485)	\$ (6,640)	\$ (5,834)	\$ (4,925)	\$ (4,065)	\$ (2,713)	\$ (1,579)	\$ (71,062)
<b>15 Ending Balance</b>	<b>\$ (1,583,066)</b>	<b>\$ (1,788,235)</b>	<b>\$ (1,888,553)</b>	<b>\$ (2,113,676)</b>	<b>\$ (2,316,469)</b>	<b>\$ (2,565,452)</b>	<b>\$ (2,265,308)</b>	<b>\$ (1,979,172)</b>	<b>\$ (1,723,117)</b>	<b>\$ (1,234,261)</b>	<b>\$ (805,341)</b>	<b>\$ (343,309)</b>	

Line 1: Prior period ending balance.  
 Line 2: Page 1, Col. B  
 Line 3: Company Forecast  
 Line 4: Page 1, Col. J  
 Line 5: Line 3 \* Line 4  
 Line 6: Page 1, Col. D  
 Line 7: Page 1, Col. C  
 Line 8: Page 1, Col. E.  
 Line 9: Sum of Lines 5 through 8  
 Line 10: Line 1 + Line 2 - Line 9  
 Line 11: (Line 1 + Line 10)/2  
 Line 12: Prime Rate  
 Line 14: Line 11 \* ((Line 12/# days per year) \* Line 13). March includes interest adjustments for 2017 performance incentive true-ups.  
 Line 15: Line 10 + Line 14

**Unitil Energy Systems, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation**  
**Residential Sector**  
**January 1, 2021 to December 31, 2021**

Unitil Energy Systems, Inc.  
NHPUC Docket No. DE 20-092  
Attachment H3 - (2021 - 2023 Plan)  
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	Jan-21 Estimate	Feb-21 Estimate	Mar-21 Estimate	Apr-21 Estimate	May-21 Estimate	Jun-21 Estimate	Jul-21 Estimate	Aug-21 Estimate	Sep-21 Estimate	Oct-21 Estimate	Nov-21 Estimate	Dec-21 Estimate	Total
1 Beginning Balance -- (Over)/Under Recovery	\$ (465,753)	\$ (604,706)	\$ (777,581)	\$ (826,429)	\$ (543,931)	\$ (595,652)	\$ (462,215)	\$ (137,870)	\$ (315,128)	\$ (324,439)	\$ (239,023)	\$ (269,826)	
<b>2 Total Residential Costs</b>	<b>240,657</b>	<b>196,590</b>	<b>335,529</b>	<b>593,195</b>	<b>240,657</b>	<b>467,731</b>	<b>681,329</b>	<b>240,657</b>	<b>379,596</b>	<b>372,859</b>	<b>284,724</b>	<b>644,000</b>	\$ 4,677,524
<b>Revenues</b>													
3 Class Sales (inc. LI) -- kWh	46,825,059	44,889,222	43,716,625	35,837,589	32,970,684	36,652,577	41,682,485	50,446,340	44,344,475	32,263,800	34,593,108	44,900,799	489,122,763
4 Charge -- \$/kWh	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	\$ 0.00615	
5 Energy Efficiency Revenues	\$ 287,974	\$ 276,069	\$ 268,857	\$ 220,401	\$ 202,770	\$ 225,413	\$ 256,347	\$ 310,245	\$ 272,719	\$ 198,422	\$ 212,748	\$ 276,140	\$ 3,008,105
6 Forward Capacity Market Revenue	\$ 14,401	\$ 14,401	\$ 14,401	\$ 14,401	\$ 14,401	\$ 13,788	\$ 13,788	\$ 13,788	\$ 13,788	\$ 13,788	\$ 13,788	\$ 13,788	\$ 168,524
7 RGGI Funding	\$ -	\$ -	\$ 14,172	\$ -	\$ -	\$ 14,172	\$ -	\$ -	\$ 14,172	\$ -	\$ 14,172	\$ -	\$ 56,687
8 Other Revenues	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9 Low-Income Funding From C&I Sector	\$ 75,759	\$ 77,274	\$ 84,736	\$ 74,067	\$ 73,636	\$ 79,509	\$ 86,022	\$ 93,258	\$ 87,375	\$ 74,456	\$ 74,140	\$ 82,996	\$ 963,228
<b>10 Total Revenues</b>	<b>\$ 378,134</b>	<b>\$ 367,744</b>	<b>\$ 382,166</b>	<b>\$ 308,869</b>	<b>\$ 290,807</b>	<b>\$ 332,883</b>	<b>\$ 356,157</b>	<b>\$ 417,291</b>	<b>\$ 388,054</b>	<b>\$ 286,667</b>	<b>\$ 314,848</b>	<b>\$ 372,924</b>	<b>\$ 4,196,544</b>
11 (Over)/Under Recovery (excluding interest)	\$ (603,231)	\$ (775,860)	\$ (824,218)	\$ (542,103)	\$ (594,081)	\$ (460,804)	\$ (137,043)	\$ (314,504)	\$ (323,586)	\$ (238,247)	\$ (269,147)	\$ 1,250	
<b>Interest Calculation</b>													
12 Average Monthly Balance	\$ (534,492)	\$ (690,283)	\$ (800,900)	\$ (684,266)	\$ (569,006)	\$ (528,228)	\$ (299,629)	\$ (226,187)	\$ (319,357)	\$ (281,343)	\$ (254,085)	\$ (134,288)	
13 Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	
14 Days per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
15 Computed Interest	\$ (1,475)	\$ (1,721)	\$ (2,211)	\$ (1,828)	\$ (1,571)	\$ (1,411)	\$ (827)	\$ (624)	\$ (853)	\$ (777)	\$ (679)	\$ (371)	\$ (14,347)
<b>16 Ending Balance</b>	<b>\$ (604,706)</b>	<b>\$ (777,581)</b>	<b>\$ (826,429)</b>	<b>\$ (543,931)</b>	<b>\$ (595,652)</b>	<b>\$ (462,215)</b>	<b>\$ (137,870)</b>	<b>\$ (315,128)</b>	<b>\$ (324,439)</b>	<b>\$ (239,023)</b>	<b>\$ (269,826)</b>	<b>\$ 879</b>	

Line 1: Prior period ending balance  
Line 2: Page 1, Col. B, Company budget  
Line 3: Company Forecast  
Line 4: Page 1, Col. J  
Line 5: Line 3 \* Line 4  
Line 6: Page 1, Col. D  
Line 7: Page 1, Col. C  
Line 8: Page 1, Col. E  
Line 9: Page 3a, C&I Funding, Line 12  
Line 10: Sum of Lines 5 - 9  
Line 11: Line 1 + Line 2 - Line 10  
Line 12: (Line 1 + Line 11)/2  
Line 13: Prime Rate  
Line 15: Line 12 \* ((Line 13/# days per year) \* Line 14)  
Line 16: Line 11 + Line 15

**Unitil Energy Systems, Inc.**  
**Energy Efficiency Expense & SBC Revenue Reconciliation**  
**Commercial & Industrial (C&I) Sector**  
**January 1, 2021 to December 31, 2021**

Unitil Energy Systems, Inc.  
NHPUC Docket No. DE 20-092  
Attachment H3 - (2021 - 2023 Plan)  
Page 3a of 11

	Jan-21 Estimate	Feb-21 Estimate	Mar-21 Estimate	Apr-21 Estimate	May-21 Estimate	Jun-21 Estimate	Jul-21 Estimate	Aug-21 Estimate	Sep-21 Estimate	Oct-21 Estimate	Nov-21 Estimate	Dec-21 Estimate	Total
1 Beginning Balance -- (Over)/Under Recovery	\$ 122,445	\$ (97,070)	\$ (232,330)	\$ (444,679)	\$ (520,434)	\$ (502,766)	\$ (461,292)	\$ (498,440)	\$ (431,076)	\$ (287,669)	\$ (317,519)	\$ (403,058)	
<b>2 Total C&amp;I Costs</b>	<b>158,636</b>	<b>250,225</b>	<b>264,600</b>	<b>296,020</b>	<b>387,609</b>	<b>493,573</b>	<b>387,609</b>	<b>524,993</b>	<b>630,957</b>	<b>341,814</b>	<b>341,814</b>	<b>814,135</b>	<b>\$ 4,891,985</b>
<b>Revenues</b>													
3 Class Sales C&I kWh	47,826,525	48,805,207	53,583,677	46,759,599	46,468,649	50,221,509	54,412,029	59,025,743	55,255,824	46,990,413	46,794,308	52,460,383	608,603,868
4 Outdoor Lighting kWh	655,812	646,441	643,518	639,643	655,263	660,735	638,027	655,115	660,391	658,236	652,060	653,084	7,818,326
5 Total Sales	48,482,338	49,451,648	54,227,195	47,399,243	47,123,912	50,882,244	55,050,056	59,680,858	55,916,215	47,648,649	47,446,368	53,113,467	616,422,193
6 Charge -- \$/kWh	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867	\$ 0.00867
7 Energy Efficiency Revenues	\$ 420,342	\$ 428,746	\$ 470,150	\$ 410,951	\$ 408,564	\$ 441,149	\$ 477,284	\$ 517,433	\$ 484,794	\$ 413,114	\$ 411,360	\$ 460,494	\$ 5,344,380
8 Forward Capacity Market Revenue	\$ 33,603	\$ 33,603	\$ 33,603	\$ 33,603	\$ 33,603	\$ 32,172	\$ 32,172	\$ 32,172	\$ 32,172	\$ 32,172	\$ 32,172	\$ 32,172	\$ 393,222
9 RGGI Funding	\$ -	\$ -	\$ 57,000	\$ -	\$ -	\$ 57,000	\$ -	\$ -	\$ 57,000	\$ -	\$ 57,000	\$ -	\$ 228,000
10 Other Revenues	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
11 Total Revenues	\$ 453,945	\$ 462,349	\$ 560,753	\$ 444,554	\$ 442,167	\$ 530,322	\$ 509,456	\$ 549,605	\$ 573,966	\$ 445,286	\$ 500,532	\$ 492,666	\$ 5,965,602
12 Low-Income Funding	\$ (75,759)	\$ (77,274)	\$ (84,736)	\$ (74,067)	\$ (73,636)	\$ (79,509)	\$ (86,022)	\$ (93,258)	\$ (87,375)	\$ (74,456)	\$ (74,140)	\$ (82,996)	\$ (963,228)
13 Net Revenue	\$ 378,186	\$ 385,075	\$ 476,017	\$ 370,488	\$ 368,531	\$ 450,812	\$ 423,435	\$ 456,347	\$ 486,591	\$ 370,830	\$ 426,392	\$ 409,670	\$ 5,002,374
14 (Over)/Under Recovery (excluding interest)	\$ (97,105)	\$ (231,919)	\$ (443,746)	\$ (519,147)	\$ (501,356)	\$ (460,006)	\$ (497,117)	\$ (429,795)	\$ (286,710)	\$ (316,685)	\$ (402,096)	\$ 1,407	
<b>Interest Calculation</b>													
15 Average Monthly Balance	\$ 12,670	\$ (164,495)	\$ (338,038)	\$ (481,913)	\$ (510,895)	\$ (481,386)	\$ (479,205)	\$ (464,118)	\$ (358,893)	\$ (302,177)	\$ (359,808)	\$ (200,825)	
16 Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	
17 Days per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
18 Computed Interest	\$ 35	\$ (410)	\$ (933)	\$ (1,287)	\$ (1,410)	\$ (1,286)	\$ (1,323)	\$ (1,281)	\$ (959)	\$ (834)	\$ (961)	\$ (554)	\$ (11,204)
19 Ending Balance	\$ (97,070)	\$ (232,330)	\$ (444,679)	\$ (520,434)	\$ (502,766)	\$ (461,292)	\$ (498,440)	\$ (431,076)	\$ (287,669)	\$ (317,519)	\$ (403,058)	\$ 852	

Line 1: Prior period ending balance  
Line 2: Page 1, Col. B, Company budget  
Lines 3 & 4: Company Forecast  
Line 5: Line 3 + Line 4  
Line 6: Page 1, Col. J  
Line 7: Line 5 \* Line 6  
Line 8: Page 1, Col. D  
Line 9: Page 1, Col. C  
Line 11: Sum of Lines 5 through 8  
Line 12: LI funding allocation based on sales  
Line 13: Line 11- Line 12  
Line 14: Line 1 + Line 2 - Line 13  
Line 15: (Line 1 + Line 14)/2  
Line 16: Prime Rate  
Line 18: Line 15 \* ((Line 16/# days per year) \* Line 17))  
Line 19: Line 14 + Line 18

**Unitil Energy Systems, Inc.**  
**2021 System Benefits Charge Calculation (LBR Component)**

Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
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**Residential Sector**

Year	Forecasted LBR Revenue	Prior Year Deferral with Interest	Current Year Interest	Total LBR Revenue	Forecasted Distribution (kWh)	SBC Rate LBR Portion (\$/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G
2021	\$ 515,137	\$ 71,235	\$ 476	\$ 586,848	489,122,763	\$ 0.00120
2022	\$ 700,148	\$ (99)	\$ -	\$ 700,049	482,005,817	\$ 0.00145
2023	\$ 890,262	\$ -	\$ -	\$ 890,262	478,409,950	\$ 0.00186

**Commercial & Industrial Sector (C&I)**

Year	Forecasted LBR Revenue	Prior Year Deferral with Interest	Current Year Interest	Total LBR Revenue	Forecasted Distribution (kWh)	SBC Rate LBR Portion (\$/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G
2021	\$ 703,468	\$ 88,558	\$ 1,297	\$ 793,322	616,422,193	\$ 0.00129
2022	\$ 780,288	\$ (1,862)	\$ -	\$ 778,426	642,314,405	\$ 0.00121
2023	\$ 847,278	\$ -	\$ -	\$ 847,278	652,689,123	\$ 0.00130

Col. A: Effective year  
 Col. B: Page 5, Line 9, Col. P & Line 21, Col. P  
 Col. C: Page 7, Line 1, Col. B  
 Col. D: Page 7, Line 8, Col. O  
 Col. E: Col. B + Col. C + Col. D  
 Col. F: Company Forecast  
 Col. G: Col. E/Col. F

**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2020 to December 31, 2020**

Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Page 5 of 11

Line	Description	12/31/2019	Forecast	Forecast	2020											
			Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Annual Savings	
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O		
1	Monthly Savings Installation Assumption		6.70%	7.00%	7.30%	7.60%	7.90%	8.20%	8.50%	8.80%	9.10%	9.30%	9.60%	10.00%		
2	Residential Annualized kWh Savings (2020)		215,359	225,002	234,645	244,287	253,930	263,573	273,216	282,859	292,502	298,931	308,574	321,431	3,214,309	
3	C&I Annualized kWh Savings (2020)		719,221	751,425	783,629	815,833	848,037	880,241	912,445	944,649	976,853	998,322	1,030,526	1,073,464	10,734,644	
4	Total		934,580	976,427	1,018,274	1,060,120	1,101,967	1,143,814	1,185,661	1,227,508	1,269,355	1,297,253	1,339,099	1,394,895	13,948,953	
5	C&I Annualized kW Savings (2020)		92	92	92	92	92	92	92	92	92	92	92	92	1,101	
																<b>Cumulative</b>
			Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20		<b>LBR Savings</b>
6	Monthly Residential kWh Savings		17,947	18,750	19,554	20,357	21,161	21,964	22,768	23,572	24,375	24,911	25,714	26,786		
7	Cumulative Residential kWh Savings	709,903	727,849	746,599	766,153	786,510	807,671	829,636	852,404	875,975	900,351	925,261	950,976	977,762	10,147,148	
8	Average Residential Distribution Rate		0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558		
9	Lost Residential Revenue		\$ 25,897	\$ 26,564	\$ 27,260	\$ 27,984	\$ 28,737	\$ 29,518	\$ 30,329	\$ 31,167	\$ 32,034	\$ 32,921	\$ 33,836	\$ 34,789	\$ 361,036	
10	Monthly C&I kWh Savings (2017 & 2018)	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418		
11	Average C&I Distribution Rate		0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217		
12	Lost C&I Revenue		\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 408,978	
13	Monthly C&I kWh Savings (2020)		59,935	62,619	65,302	67,986	70,670	73,353	76,037	78,721	81,404	83,193	85,877	89,455		
14	Cumulative C&I kWh Savings (2019 & 2020)	534,180	594,115	656,733	722,036	790,022	860,692	934,045	1,010,082	1,088,803	1,170,207	1,253,401	1,339,278	1,428,733		
15	Average C&I Distribution Rate (kWh)		0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024		
16	Lost C&I Revenue		\$ 143	\$ 158	\$ 173	\$ 190	\$ 207	\$ 224	\$ 242	\$ 261	\$ 281	\$ 301	\$ 321	\$ 343	\$ 2,844	
17	Monthly C&I kW Savings (2020)		46	46	46	46	46	46	46	46	46	46	46	46		
18	Cumulative C&I Savings (2019 & 2020)	1,140	1,186	1,278	1,370	1,462	1,553	1,645	1,737	1,829	1,921	2,012	2,104	2,196		
19	Average C&I Demand Rate		\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16		
20	Lost C&I Demand Revenue		\$ 10,867	\$ 11,708	\$ 12,549	\$ 13,389	\$ 14,230	\$ 15,071	\$ 15,911	\$ 16,752	\$ 17,593	\$ 18,433	\$ 19,274	\$ 20,115	\$ 185,892	
21	<b>Total Lost Revenue</b>		<b>\$ 70,988</b>	<b>\$ 72,511</b>	<b>\$ 74,063</b>	<b>\$ 75,644</b>	<b>\$ 77,255</b>	<b>\$ 78,895</b>	<b>\$ 80,564</b>	<b>\$ 82,262</b>	<b>\$ 83,990</b>	<b>\$ 85,737</b>	<b>\$ 87,513</b>	<b>\$ 89,328</b>	<b>958,749</b>	

**Notes**

- Line 1: Company Estimate
- Line 2: Estimated Savings per DE 17-136
- Line 3: Estimated Savings per DE 17-136
- Line 4: Line 2 + Line 3
- Line 5: Estimated Savings per DE 17-136
- Line 6: Line 2 / 12
- Line 7: Prior Month Line 7 + Current Month Line 6. 2019 Cumulative savings shown in Col. N from 2019 Annual Report.
- Line 8: Page 8, Line 1, Col. 5
- Line 9: Line 7 x Line 8
- Line 10: Prior Month Line 10. 12/31/18 Cumulative savings shown in Col. N from 2019 Annual Report.
- Line 11: Page 8, line 2, column (b)
- Line 12: Line 10 x Line 11
- Line 13: Line 3/12
- Line 14: Prior month Line 14 + current month Line 12. 2019 Cumulative savings shown in Col. N from 2019 Annual Report
- Line 15: Page 8 Line 4, Column (a)
- Line 16: Line 14 x Line 15
- Line 17: Line 5 / 2
- Line 18: Prior month Lines 18 + Current month Line 17. 2019 Cumulative savings shown in Col. N from 2019 Annual Report
- Line 19: Page 8 Line 4 Column 6
- Line 20: Line 18 x Line 19
- Line 21: Line 9 + Line 12 + Line 16 + Line 20

**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2020 to December 31, 2020**  
**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2021 to December 31, 2021**

Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
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Line	Description	12/31/2020	Forecast Jan-21	Forecast Feb-21	Forecast Mar-21	Forecast Apr-21	Forecast May-21	Forecast Jun-21	Forecast Jul-21	Forecast Aug-21	Forecast Sep-21	Forecast Oct-21	Forecast Nov-21	Forecast Dec-21	2021 Annual Savings
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Monthly Savings Installation Assumption		6.70%	7.00%	7.30%	7.60%	7.90%	8.20%	8.50%	8.80%	9.10%	9.30%	9.60%	10.00%	
2	Residential Annualized kWh Savings (2021)		363,069	379,326	395,583	411,839	428,096	444,353	460,610	476,867	493,123	503,961	520,218	541,894	5,418,938
3	C&I Annualized kWh Savings (2021)		703,191	734,677	766,164	797,650	829,136	860,622	892,108	923,594	955,081	976,071	1,007,558	1,049,539	10,495,391
4	Total		1,066,260	1,114,003	1,161,746	1,209,489	1,257,232	1,304,975	1,352,718	1,400,461	1,448,204	1,480,033	1,527,776	1,591,433	15,914,330
5	C&I Annualized kW Savings (2021)		65	65	65	65	65	65	65	65	65	65	65	65	776
			12 Jan-21	11 Feb-21	10 Mar-21	9 Apr-21	8 May-21	7 Jun-21	6 Jul-21	5 Aug-21	4 Sep-21	3 Oct-21	2 Nov-21	1 Dec-21	Cumulative LBR Savings
6	Monthly Residential kWh Savings		30,256	31,610	32,965	34,320	35,675	37,029	38,384	39,739	41,094	41,997	43,352	45,158	
7	Cumulative Residential kWh Savings	977,762	1,008,018	1,039,628	1,072,593	1,106,913	1,142,588	1,179,617	1,218,001	1,257,740	1,298,834	1,340,831	1,384,182	1,429,340	14,478,286
8	Average Residential Distribution Rate		0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	
9	Lost Residential Revenue		\$ 35,865	\$ 36,990	\$ 38,163	\$ 39,384	\$ 40,653	\$ 41,971	\$ 43,336	\$ 44,750	\$ 46,213	\$ 47,707	\$ 49,249	\$ 50,856	\$ 515,137
10	Monthly C&I kWh Savings (2017 & 2018)	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	
11	Average C&I Distribution Rate		0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	
12	Lost C&I Revenue		\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 408,978
13	Monthly C&I kWh Savings (2021)		58,599	61,223	63,847	66,471	69,095	71,719	74,342	76,966	79,590	81,339	83,963	87,462	
14	Cumulative C&I kWh Savings (2019 to present)	1,428,733	1,487,332	1,548,556	1,612,403	1,678,873	1,747,968	1,819,687	1,894,029	1,970,995	2,050,585	2,131,924	2,215,888	2,303,349	
15	Average C&I Distribution Rate (kWh)		0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	
16	Lost C&I Revenue		\$ 357	\$ 372	\$ 387	\$ 403	\$ 420	\$ 437	\$ 455	\$ 473	\$ 492	\$ 512	\$ 532	\$ 553	\$ 5,391
17	Monthly C&I kW Savings (2021)		32	32	32	32	32	32	32	32	32	32	32	32	
18	Cumulative C&I Savings (2019 to present)	2,242	2,274	2,339	2,404	2,468	2,533	2,598	2,662	2,727	2,792	2,857	2,921	2,986	
19	Average C&I Demand Rate		\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	
20	Lost C&I Demand Revenue		\$ 20,832	\$ 21,424	\$ 22,017	\$ 22,610	\$ 23,203	\$ 23,795	\$ 24,388	\$ 24,981	\$ 25,573	\$ 26,166	\$ 26,759	\$ 27,352	\$ 289,099
21	Total Lost C&I Revenue		\$ 55,270	\$ 55,877	\$ 56,486	\$ 57,094	\$ 57,704	\$ 58,313	\$ 58,924	\$ 59,535	\$ 60,147	\$ 60,759	\$ 61,372	\$ 61,986	\$ 703,468
22	<b>Total Lost Revenue</b>		<b>\$ 91,135</b>	<b>\$ 92,867</b>	<b>\$ 94,648</b>	<b>\$ 96,478</b>	<b>\$ 98,357</b>	<b>\$ 100,284</b>	<b>\$ 102,260</b>	<b>\$ 104,286</b>	<b>\$ 106,360</b>	<b>\$ 108,466</b>	<b>\$ 110,621</b>	<b>\$ 112,842</b>	<b>1,218,605</b>

**Notes**  
 Line 1: Company Estimate  
 Line 2: Estimated Savings per DE 20-092  
 Line 3: Estimated Savings per DE 20-092  
 Line 4: Line 2 + Line 3  
 Line 5: Estimated Savings per DE 20-092  
 Line 6: Line 2 / 12  
 Line 7: Prior Month Line 7 + Current Month Line 6. 2020 Cumulative savings from Page 5, Line 7, Col. N.  
 Line 8: Page 8, Line 1, Col. 5  
 Line 9: Line 7 x Line 8  
 Line 10: Prior Month Line 10. 12/31/18 Cumulative savings from Page 5, Line 10, Col. N.  
 Line 11: Page 8, line 2, column (b)  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3/12  
 Line 14: Prior month Line 14 + current month Line 12. 2020 Cumulative savings from Page 5, Line 10, Col. N.  
 Line 15: Page 8 Line 4, Column (a)  
 Line 16: Line 14 x Line 15  
 Line 17: Line 5 / 2  
 Line 18: Prior month Lines 18 + Current month Line 17. 2020 Cumulative savings from Page 5, Line 18, Col. N + Page 5, Line 17, Col. N  
 Line 19: Page 8 Line 4 Column 6  
 Line 20: Line 18 x Line 19  
 Line 21: Line 12 + Line 16 + Line 20  
 Line 22: Line 9 + Line 21

**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2020 to December 31, 2020**  
**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2022 to December 31, 2022**

Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Page 5b of 11

Line	Description	12/31/2021	Forecast Jan-22	Forecast Feb-22	Forecast Mar-22	Forecast Apr-22	Forecast May-22	Forecast Jun-22	Forecast Jul-22	Forecast Aug-22	Forecast Sep-22	Forecast Oct-22	Forecast Nov-22	Forecast Dec-22	2022 Annual Savings
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O
1	Monthly Savings Installation Assumption		6.70%	7.00%	7.30%	7.60%	7.90%	8.20%	8.50%	8.80%	9.10%	9.30%	9.60%	10.00%	
2	Residential Annualized Savings (2022)		334,093	349,053	364,012	378,972	393,931	408,890	423,850	438,809	453,769	463,742	478,701	498,647	4,986,468
3	C&I Annualized Savings (2022)		814,921	851,410	887,899	924,388	960,877	997,366	1,033,855	1,070,344	1,106,834	1,131,160	1,167,649	1,216,301	12,163,006
4	Total		1,149,015	1,200,463	1,251,912	1,303,360	1,354,808	1,406,257	1,457,705	1,509,154	1,560,602	1,594,901	1,646,349	1,714,947	17,149,473
5	C&I Annualized kW Savings (2022)		48	48	48	48	48	48	48	48	48	48	48	48	572
															<b>Cumulative LBR Savings</b>
6	Monthly Residential kWh Savings		27,841	29,088	30,334	31,581	32,828	34,074	35,321	36,567	37,814	38,645	39,892	41,554	
7	Cumulative Residential kWh Savings	1,429,340	1,457,181	1,486,269	1,516,603	1,548,184	1,581,012	1,615,086	1,650,407	1,686,974	1,724,788	1,763,433	1,803,325	1,844,879	19,678,142
8	Average Residential Distribution Rate		0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	
9	Lost Residential Revenue		\$ 51,847	\$ 52,881	\$ 53,961	\$ 55,084	\$ 56,252	\$ 57,465	\$ 58,721	\$ 60,023	\$ 61,368	\$ 62,743	\$ 64,162	\$ 65,641	\$ 700,148
10	Monthly C&I kWh Savings (2017 & 2018)	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	
11	Average C&I Distribution Rate		0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	
12	Lost C&I Revenue		\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 408,978
13	Monthly C&I kWh Savings (2022)		67,910	70,951	73,992	77,032	80,073	83,114	86,155	89,195	92,236	94,263	97,304	101,358	
14	Cumulative C&I kWh Savings (2019 to present)	2,303,349	2,371,259	2,442,210	2,516,202	2,593,234	2,673,307	2,756,421	2,842,576	2,931,771	3,024,007	3,118,271	3,215,575	3,316,933	
15	Average C&I Distribution Rate (kWh)		0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	
16	Lost C&I Revenue		\$ 569	\$ 586	\$ 604	\$ 622	\$ 642	\$ 662	\$ 682	\$ 704	\$ 726	\$ 748	\$ 772	\$ 796	\$ 8,112
17	Monthly C&I kW Savings (2022)		24	24	24	24	24	24	24	24	24	24	24	24	
18	Cumulative C&I kW Savings (2019 to present)	3,018	3,042	3,090	3,137	3,185	3,233	3,280	3,328	3,376	3,423	3,471	3,519	3,566	
19	Average C&I Demand Rate		\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	
20	Lost C&I Demand Revenue		\$ 27,866	\$ 28,303	\$ 28,739	\$ 29,175	\$ 29,612	\$ 30,048	\$ 30,485	\$ 30,921	\$ 31,358	\$ 31,794	\$ 32,230	\$ 32,667	\$ 363,198
21	Total Lost C&I Revenue		\$ 62,517	\$ 62,970	\$ 63,424	\$ 63,879	\$ 64,335	\$ 64,791	\$ 65,248	\$ 65,706	\$ 66,165	\$ 66,624	\$ 67,084	\$ 67,544	\$ 780,288
22	<b>Total Lost Revenue</b>		<b>\$ 114,363</b>	<b>\$ 115,852</b>	<b>\$ 117,385</b>	<b>\$ 118,964</b>	<b>\$ 120,587</b>	<b>\$ 122,256</b>	<b>\$ 123,970</b>	<b>\$ 125,729</b>	<b>\$ 127,533</b>	<b>\$ 129,367</b>	<b>\$ 131,246</b>	<b>\$ 133,185</b>	<b>1,480,436</b>

**Notes**  
 Line 1: Company Estimate  
 Line 2: Estimated Savings per DE 20-092  
 Line 3: Estimated Savings per DE 20-092  
 Line 4: Line 2 + Line 3  
 Line 5: Estimated Savings per DE 20-092  
 Line 6: Line 2 / 12  
 Line 7: Prior Month Line 7 + Current Month Line 6. 2021 Cumulative savings from Page 5a, Line 7, Col. N.  
 Line 8: Page 8, Line 1, Col. 5  
 Line 9: Line 7 x Line 8  
 Line 10: Prior Month Line 10. 12/31/18 Cumulative savings from Page 5a, Line 10, Col. N.  
 Line 11: Page 8, line 2, column (b)  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3/12  
 Line 14: Prior month Line 14 + current month Line 12. 2021 Cumulative savings from Page 5a, Line 10, Col. N.  
 Line 15: Page 8 Line 4, Column (a)  
 Line 16: Line 14 x Line 15  
 Line 17: Line 5 / 2  
 Line 18: Prior month Lines 18 + Current month Line 17. 2021 Cumulative savings from Page 5a, Line 18, Col. N + Page 5a, Line 17, Col. N  
 Line 19: Page 8 Line 4 Column 6  
 Line 20: Line 18 x Line 19  
 Line 21: Line 12 + Line 16 + Line 20  
 Line 22: Line 9 + Line 21

**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2020 to December 31, 2020**  
**Unitil Energy System, Inc.**  
**Estimated Monthly and Cumulative Savings (kWh& kW) and Lost Base Revenue**  
**January 1, 2023 to December 31, 2023**

Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Page 5c of 11

Line	Description	12/31/2022	Forecast	2023												
			Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Annual Savings	
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N	Col. O		
1	Monthly Savings Installation Assumption		6.70%	7.00%	7.30%	7.60%	7.90%	8.20%	8.50%	8.80%	9.10%	9.30%	9.60%	10.00%		
2	Residential Annualized Savings (2023)		381,284	398,356	415,429	432,501	449,574	466,646	483,718	500,791	517,863	529,245	546,317	569,081	5,690,806	
3	C&I Annualized Savings (2023)		979,853	1,023,727	1,067,601	1,111,475	1,155,349	1,199,223	1,243,097	1,286,972	1,330,846	1,360,095	1,403,969	1,462,468	14,624,676	
4	Total		1,361,137	1,422,084	1,483,030	1,543,977	1,604,923	1,665,870	1,726,816	1,787,762	1,848,709	1,889,340	1,950,286	2,031,548	20,315,482	
5	C&I Annualized kW Savings (2023)		49	49	49	49	49	49	49	49	49	49	49	49	589	
															<b>Cumulative</b>	
			Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	<b>LBR Savings</b>	
6	Monthly Residential kWh Savings		31,774	33,196	34,619	36,042	37,464	38,887	40,310	41,733	43,155	44,104	45,526	47,423		
7	Cumulative Residential kWh Savings	1,844,879	1,876,653	1,909,849	1,944,468	1,980,510	2,017,974	2,056,862	2,097,171	2,138,904	2,182,059	2,226,163	2,271,689	2,319,113	25,021,415	
8	Average Residential Distribution Rate		0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558	0.03558		
9	Lost Residential Revenue		\$ 66,771	\$ 67,952	\$ 69,184	\$ 70,467	\$ 71,800	\$ 73,183	\$ 74,617	\$ 76,102	\$ 77,638	\$ 79,207	\$ 80,827	\$ 82,514	\$ 890,262	
10	Monthly C&I kWh Savings (2017 & 2018)	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418	1,059,418		
11	Average C&I Distribution Rate		0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217	0.03217		
12	Lost C&I Revenue		\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 34,081	\$ 408,978	
13	Monthly C&I kWh Savings (2023)		81,654	85,311	88,967	92,623	96,279	99,935	103,591	107,248	110,904	113,341	116,997	121,872		
14	Cumulative C&I kWh Savings (2019 to present)	3,316,933	3,398,587	3,483,898	3,572,865	3,665,488	3,761,767	3,861,702	3,965,294	4,072,541	4,183,445	4,296,786	4,413,784	4,535,656		
15	Average C&I Distribution Rate (kWh)		0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024		
16	Lost C&I Revenue		\$ 816	\$ 836	\$ 857	\$ 880	\$ 903	\$ 927	\$ 952	\$ 977	\$ 1,004	\$ 1,031	\$ 1,059	\$ 1,089	\$ 11,331	
17	Monthly C&I kW Savings (2023)		25	25	25	25	25	25	25	25	25	25	25	25		
18	Cumulative C&I kW Savings (2019 to present)	3,590	3,615	3,664	3,713	3,762	3,811	3,860	3,909	3,958	4,007	4,056	4,105	4,154		
19	Average C&I Demand Rate		\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16	\$ 9.16		
20	Lost C&I Demand Revenue		\$ 33,110	\$ 33,559	\$ 34,008	\$ 34,458	\$ 34,907	\$ 35,356	\$ 35,805	\$ 36,255	\$ 36,704	\$ 37,153	\$ 37,603	\$ 38,052	\$ 426,969	
21	Total Lost C&I Revenue		\$ 68,007	\$ 68,477	\$ 68,947	\$ 69,419	\$ 69,891	\$ 70,364	\$ 70,839	\$ 71,314	\$ 71,790	\$ 72,266	\$ 72,743	\$ 73,222	\$ 847,278	
22	<b>Total Lost Revenue</b>		<b>\$ 134,778</b>	<b>\$ 136,429</b>	<b>\$ 138,131</b>	<b>\$ 139,885</b>	<b>\$ 141,691</b>	<b>\$ 143,548</b>	<b>\$ 145,456</b>	<b>\$ 147,416</b>	<b>\$ 149,427</b>	<b>\$ 151,473</b>	<b>\$ 153,570</b>	<b>\$ 155,736</b>	<b>1,737,540</b>	

**Notes**  
 Line 1: Company Estimate  
 Line 2: Estimated Savings per DE 20-092  
 Line 3: Estimated Savings per DE 20-092  
 Line 4: Line 2 + Line 3  
 Line 5: Estimated Savings per DE 20-092  
 Line 6: Line 2 / 12  
 Line 7: Prior Month Line 7 + Current Month Line 6. 2022 Cumulative savings from Page 5b, Line 7, Col. N.  
 Line 8: Page 8, Line 1, Col. 5  
 Line 9: Line 7 x Line 8  
 Line 10: Prior Month Line 10. 12/31/18 Cumulative savings from Page 5b, Line 10, Col. N.  
 Line 11: Page 8, line 2, column (b)  
 Line 12: Line 10 x Line 11  
 Line 13: Line 3/12  
 Line 14: Prior month Line 14 + current month Line 12. 2022 Cumulative savings from Page 5b, Line 10, Col. N.  
 Line 15: Page 8 Line 4, Column (a)  
 Line 16: Line 14 x Line 15  
 Line 17: Line 5 / 2  
 Line 18: Prior month Lines 18 + Current month Line 17. 2022 Cumulative savings from Page 5b, Line 18, Col. N + Page 5b, Line 17, Col. N  
 Line 19: Page 8 Line 4 Column 6  
 Line 20: Line 18 x Line 19  
 Line 21: Line 12 + Line 16 + Line 20  
 Line 22: Line 9 + Line 21

**Unitil Energy System, Inc.**  
**Lost Base Revenue Reconciliation**  
**January 1, 2020 to December 31, 2020**

Line	Description	Recast Jan-20	Recast Feb-20	Recast Mar-20	Recast Apr-20	Recast May-20	Recast Jun-20	Estimate Jul-20	Estimate Aug-20	Estimate Sep-20	Estimate Oct-20	Estimate Nov-20	Estimate Dec-20	2020 Total
Total		Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N
1	Beginning Balance	\$ 13,489	\$ 17,774	\$ 15,688	\$ 16,840	\$ 31,669	\$ 50,375	\$ 57,608	\$ 67,672	\$ 73,217	\$ 80,907	\$ 111,226	\$ 140,576	
2	Lost Revenues	\$ 70,988	\$ 72,511	\$ 74,063	\$ 75,644	\$ 77,255	\$ 78,895	\$ 80,564	\$ 82,262	\$ 83,990	\$ 85,737	\$ 87,513	\$ 89,328	\$ 958,749
<b>REVENUE</b>														
3	Revenue (\$)	\$ 66,767	\$ 74,660	\$ 72,976	\$ 60,910	\$ 58,713	\$ 71,871	\$ 70,673	\$ 76,910	\$ 76,505	\$ 55,682	\$ 58,497	\$ 70,525	\$ 814,689
4	Cumulative (Over)/Under Recovery	\$ 17,711	\$ 15,625	\$ 16,775	\$ 31,574	\$ 50,210	\$ 57,399	\$ 67,500	\$ 73,024	\$ 80,702	\$ 110,962	\$ 140,241	\$ 159,379	
<b>INTEREST</b>														
5	Average Monthly Balance	\$ 15,600	\$ 16,699	\$ 16,231	\$ 24,207	\$ 40,939	\$ 53,887	\$ 62,554	\$ 70,348	\$ 76,960	\$ 95,934	\$ 125,734	\$ 149,978	
6	Interest Rate	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
7	Days per Month	31	29	31	30	31	30	31	31	30	31	30	31	366
8	Computed Interest	\$ 63	\$ 63	\$ 65	\$ 94	\$ 165	\$ 210	\$ 172	\$ 194	\$ 205	\$ 264	\$ 335	\$ 413	\$ 2,242
9	Ending Balance (Over)/Under Recovery	\$ 17,774	\$ 15,688	\$ 16,840	\$ 31,669	\$ 50,375	\$ 57,608	\$ 67,672	\$ 73,217	\$ 80,907	\$ 111,226	\$ 140,576	\$ 159,792	
10	Class Sales (Residential inc. LI) -- kWh	47,877,662	43,447,320	41,788,394	36,919,734	34,845,155	43,074,211	42,464,449	49,044,653	47,171,852	31,371,125	34,379,732	44,937,859	497,322,147
11	Class Sales (C&I) -- kWh	57,648,909	57,361,500	56,685,607	45,265,444	44,359,715	53,888,841	53,039,214	54,887,862	56,213,703	43,874,345	44,670,644	50,365,956	618,261,740
12	Total Class Sales - kWh	105,526,571	100,808,820	98,474,001	82,185,178	79,204,870	96,963,052	95,503,664	103,932,515	103,385,555	75,245,470	79,050,376	95,303,816	1,115,583,887

Line 1: Prior period ending balance  
 Line 2: Page 5, Line 21  
 Line 3: Estimated revenue  
 Line 4: Line 1 + Line 2 - Line 3  
 Line 5: (Line 1 + Line 4)/2  
 Line 6: Prime Rate  
 Line 8: Line 7 \* ((Line 5/# days per year) \* Line 9)  
 Line 9: Line 4 + Line 8

**Unitil Energy System, Inc.**  
**Lost Base Revenue Reconciliation**  
**January 1, 2021 to December 31, 2021**

Line	Description	Estimate Jan-21	Estimate Feb-21	Estimate Mar-21	Estimate Apr-21	Estimate May-21	Estimate Jun-21	Estimate Jul-21	Estimate Aug-21	Estimate Sep-21	Estimate Oct-21	Estimate Nov-21	Estimate Dec-21	2021 Total
	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L	Col. M	Col. N
<b>Residential Sector</b>														
1	Beginning Balance	\$ 71,235	\$ 51,078	\$ 34,308	\$ 20,086	\$ 16,513	\$ 17,649	\$ 15,681	\$ 9,032	\$ (6,750)	\$ (13,778)	\$ (4,813)	\$ 2,922	
2	Lost Revenues	\$ 35,865	\$ 36,990	\$ 38,163	\$ 39,384	\$ 40,653	\$ 41,971	\$ 43,336	\$ 44,750	\$ 46,213	\$ 47,707	\$ 49,249	\$ 50,856	\$ 515,137
<b>REVENUE</b>														
3	Revenue (\$)	\$ 56,190	\$ 53,867	\$ 52,460	\$ 43,005	\$ 39,565	\$ 43,983	\$ 50,019	\$ 60,536	\$ 53,213	\$ 38,717	\$ 41,512	\$ 53,881	\$ 586,947
4	Cumulative (Over)/Under Recovery	\$ 50,910	\$ 34,201	\$ 20,011	\$ 16,464	\$ 17,602	\$ 15,636	\$ 8,998	\$ (6,753)	\$ (13,750)	\$ (4,788)	\$ 2,924	\$ (103)	
<b>INTEREST</b>														
5	Average Monthly Balance	\$ 61,072	\$ 42,640	\$ 27,159	\$ 18,275	\$ 17,057	\$ 16,643	\$ 12,340	\$ 1,140	\$ (10,250)	\$ (9,283)	\$ (945)	\$ 1,409	
6	Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
7	Days per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
8	Computed Interest	\$ 169	\$ 106	\$ 75	\$ 49	\$ 47	\$ 44	\$ 34	\$ 3	\$ (27)	\$ (26)	\$ (3)	\$ 4	\$ 476
9	<b>Ending Balance (Over)/Under Recovery</b>	\$ 51,078	\$ 34,308	\$ 20,086	\$ 16,513	\$ 17,649	\$ 15,681	\$ 9,032	\$ (6,750)	\$ (13,778)	\$ (4,813)	\$ 2,922	\$ (99)	
10	Class Sales (Residential inc. LI) -- kWh	46,825,059	44,889,222	43,716,625	35,837,589	32,970,684	36,652,577	41,682,485	50,446,340	44,344,475	32,263,800	34,593,108	44,900,799	489,122,763
<b>Commercial &amp; Industrial Sector (C&amp;I)</b>														
1	Beginning Balance	\$ 88,558	\$ 81,520	\$ 73,798	\$ 60,516	\$ 56,621	\$ 53,687	\$ 46,496	\$ 34,517	\$ 17,135	\$ 5,180	\$ 4,486	\$ 4,664	
2	Lost Revenues	\$ 55,270	\$ 55,877	\$ 56,486	\$ 57,094	\$ 57,704	\$ 58,313	\$ 58,924	\$ 59,535	\$ 60,147	\$ 60,759	\$ 61,372	\$ 61,986	\$ 703,468
<b>REVENUE</b>														
3	Revenue (\$)	\$ 62,542	\$ 63,793	\$ 69,953	\$ 61,145	\$ 60,790	\$ 65,638	\$ 71,015	\$ 76,988	\$ 72,132	\$ 61,467	\$ 61,206	\$ 68,516	\$ 795,185
4	Cumulative (Over)/Under Recovery	\$ 81,285	\$ 73,605	\$ 60,331	\$ 56,465	\$ 53,535	\$ 46,362	\$ 34,405	\$ 17,064	\$ 5,150	\$ 4,472	\$ 4,652	\$ (1,866)	
<b>INTEREST</b>														
5	Average Monthly Balance	\$ 84,922	\$ 77,562	\$ 67,064	\$ 58,490	\$ 55,078	\$ 50,024	\$ 40,451	\$ 25,790	\$ 11,143	\$ 4,826	\$ 4,569	\$ 1,399	
6	Interest Rate	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
7	Days per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
8	Computed Interest	\$ 234	\$ 193	\$ 185	\$ 156	\$ 152	\$ 134	\$ 112	\$ 71	\$ 30	\$ 13	\$ 12	\$ 4	\$ 1,297
9	<b>Ending Balance</b>	\$ 81,520	\$ 73,798	\$ 60,516	\$ 56,621	\$ 53,687	\$ 46,496	\$ 34,517	\$ 17,135	\$ 5,180	\$ 4,486	\$ 4,664	\$ (1,862)	
10	Class Sales (C&I) -- kWh	48,482,338	49,451,648	54,227,195	47,399,243	47,123,912	50,882,244	55,050,056	59,680,858	55,916,215	47,648,649	47,446,368	53,113,467	616,422,193

Line 1: Prior period ending balance allocated by sales %  
 Line 2: Page 5, Line 12  
 Line 3: Estimated revenue  
 Line 4: Line 1 + Line 2 - Line 3  
 Line 5: (Line 1 + Line 4)/2  
 Line 6: Prime Rate  
 Line 8: Line 7 \* ((Line 5/# days per year) \* Line 9)  
 Line 9: Line 4 + Line 8

**Unitil Energy Systems, Inc.**  
**Calculation of Forecasted Average Distribution Rate for Lost Revenue**  
**Based on Actual Billing Determinants for January - December 2019 and Distribution Rates effective May 1, 2019**

Rate Class	(1)	(2)	(3)	(4)	(5)	(6) = (1) / (4)	(7) = (2) / (5)	(8) = (3) / (5)
	Revenue*			Units		Average Distribution Rate	Average Distribution Rate	Average Distribution Rate
	Demand Charges	kWh Charges	Total Demand and kWh Charges	Delivery kW	Delivery kWh	\$/kW	\$/kWh <sup>(a)</sup>	\$/kWh <sup>(b)</sup>
1 Residential D	\$ -	\$ 17,218,197	\$ 17,218,197	-	483,929,101	N/A	N/A	\$ 0.03558
2 Regular General G2	\$ 13,817,475	\$ 162,786	\$ 13,980,261	1,316,550	342,782,066	10.50	\$ 0.00047	\$ 0.04078
3 Large General Service Rate G1	\$ 7,590,823	\$ -	\$ 7,590,823	1,021,630	327,838,600	7.43	\$ -	\$ 0.02315
4 Commercial and Industrial	\$ 21,408,298	\$ 162,786	\$ 21,571,084	2,338,180	670,620,666	\$ 9.16	\$ 0.00024	\$ 0.03217

Note: See page 10 for details.

\* Revenues include demand charges and kWh charges only.  
 Customer, meter and per luminaire charges are excluded.

(a) For 2019 & 2020 C&I Savings.

(b) For 2017 & 2018 C&I Savings (in 2020 calculation).

**Bill Impacts of Changes in System Benefits Charge - Unitil Energy Systems, Inc.**  
 Rates Proposed for Effect January 1, 2021, January 1, 2022 & January 1, 2023

	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
System Benefits Charge (\$/kWh) Residential	\$ 0.00752	\$ 0.00885	\$ 0.01068	\$ 0.01103
System Benefits Charge (\$/kWh) C&I	\$ 0.00752	\$ 0.01146	\$ 0.01341	\$ 0.01613
<u>Bill per month, including UES Default Service Charge</u>				
Residential Rate R (625 kWh/month)	\$ 109.78	\$ 110.61	\$ 111.75	\$ 111.97
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)	\$ 1,479.39	\$ 1,492.71	\$ 1,511.01	\$ 1,514.53
<u>Change from previous rate level - \$ per month</u>				
Residential Rate R (625 kWh/month)		\$ 0.83	\$ 1.14	\$ 0.22
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		\$ 13.32	\$ 18.30	\$ 3.52
<u>Change from previous rate level - %</u>				
Residential Rate R (625 kWh/month)		0.8%	1.0%	0.2%
General Service Rate G, three-phase service (40 kW, 10,000 kWh/month)		0.9%	1.2%	0.2%

**Unitil Energy Systems, Inc.**  
**Calculation of Distribution Revenue at the Rate Level Effective January 1, 2019 - December 31, 2019**  
**Based on Billing Determinants for the Twelve Months Ending December 31, 2018**

Unitil Energy Systems, Inc.  
 NHPUC Docket No. DE 20-092  
 Attachment H3 - (2021 - 2023 Plan)  
 Page 10 of 11

Rate Class	Customer Group		(a)	(b)	(c)				
			05/01/2019 Monthly Distribution Charge	Jan - Dec Billing Determinants	Customer/ Meter/ Luminaire	Demand	kWh	Total	
Residential Rate R	Standard Rate	Customer Charge	\$ 16.22	808,335	\$ 13,111,194				
		All kWh	\$ 0.03558	483,929,101			\$ 17,218,197	\$ 30,329,391	
<b>Total Rate R</b>		<b>Customers</b>		<b>808,335</b>					
		<b>Meters</b>		<b>n/a</b>					
		<b>KWH</b>		<b>483,929,101</b>					
		<b>Revenue</b>			<b>\$ 13,111,194</b>	<b>\$ -</b>	<b>\$ 17,218,197</b>	<b>\$ 30,329,391</b>	
General Rate G2	Standard Rate	Customer Charge	\$ 29.19	125,661	\$ 3,668,045				
		Demand charge (All KW)	\$ 10.51	1,316,550		\$ 13,836,941			
		All KWH	\$ -	337,338,818			\$ -		
		Transformer Ownership Credit, G2	\$ (0.50000)	38,931		\$ (19,466)		\$ 17,485,520	
	G2 - kWh Meter	Customer Charge	\$ 18.38	4,726	\$ 86,864				
		All KWH	\$ 0.00883	500,439		\$ 4,419	\$ 91,283		
QR Water Heating and/or Space Heat	Customer Charge	All KWH	\$ 9.73	3,107	\$ 30,231				
		All KWH	\$ 0.03204	4,942,809		\$ 158,368	\$ 188,599		
<b>Total Rate G2</b>		<b>Customers</b>		<b>133,494</b>					
		<b>Meters</b>		<b>n/a</b>					
		<b>Billing demand</b>		<b>1,316,550</b>					
		<b>KWH</b>		<b>342,782,066</b>					
		<b>Revenue</b>			<b>\$ 3,785,140</b>	<b>\$ 13,817,475</b>	<b>\$ 162,786</b>	<b>\$ 17,765,401</b>	
Large General Rate G1	Standard Rate	Customer Charge Secondary Voltage	\$ 162.18	1,582	\$ 256,569				
		Customer Charge Primary Voltage	\$ 86.49	394	\$ 34,077				
		All kVA	\$ 7.60	1,021,630		\$ 7,764,388			
		All KWH	\$ -	327,838,600			\$ -		
		Transformer Ownership Credit, G1	\$ (0.50000)	347,131		\$ (173,566)		\$ 7,881,468	
<b>Total Rate G1</b>		<b>Customers Secondary Voltage</b>		<b>1,582</b>					
		<b>Customers Primary Voltage</b>		<b>394</b>					
		<b>Meters</b>		<b>n/a</b>					
		<b>Billing demand</b>		<b>1,021,630</b>					
		<b>KWH</b>		<b>327,838,600</b>					
		<b>Revenue</b>			<b>\$ 290,646</b>	<b>\$ 7,590,823</b>	<b>\$ -</b>	<b>\$ 7,881,468</b>	

Outdoor Lighting Rate OL

100	Mercury Vapor Street	\$13.28	10,729	\$	142,484
175	Mercury Vapor Street	\$15.75	545	\$	8,586
250	Mercury Vapor Street	\$17.85	576	\$	10,284
400	Mercury Vapor Street	\$21.25	1,061	\$	22,551
1000	Mercury Vapor Street	\$42.19	16	\$	675
250	Mercury Vapor Flood	\$19.02	488	\$	9,281
400	Mercury Vapor Flood	\$22.75	736	\$	16,753
1000	Mercury Vapor Flood	\$37.70	112	\$	4,227
100	Mercury Vapor Power Bracket	\$13.41	2,848	\$	38,195
175	Mercury Vapor Power Bracket	\$14.87	401	\$	5,968
50	Sodium Vapor Street	\$13.52	28,508	\$	385,424
100	Sodium Vapor Street	\$15.22	850	\$	12,944
150	Sodium Vapor Street	\$15.28	2,885	\$	44,076
250	Sodium Vapor Street	\$19.14	9,178	\$	175,658
400	Sodium Vapor Street	\$24.13	1,920	\$	46,328
1000	Sodium Vapor Street	\$41.66	1,089	\$	45,368
150	Sodium Vapor Flood	\$17.61	1,881	\$	33,127
250	Sodium Vapor Flood	\$20.76	2,576	\$	53,485
400	Sodium Vapor Flood	\$23.58	3,246	\$	76,536
1000	Sodium Vapor Flood	\$42.03	1,747	\$	73,444
50	Sodium Vapor Power Bracket	\$12.51	942	\$	11,779
100	Sodium Vapor Power Bracket	\$14.04	589	\$	8,264
175	Metal Halide Street	\$19.91	9	\$	169
250	Metal Halide Street	\$21.65	-	\$	-
400	Metal Halide Street	\$22.45	-	\$	-
175	Metal Halide Flood	\$23.00	-	\$	-
250	Metal Halide Flood	\$24.83	-	\$	-
400	Metal Halide Flood	\$24.88	-	\$	-
1000	Metal Halide Flood	\$32.22	-	\$	-
175	Metal Halide Power Bracket	\$18.63	-	\$	-
250	Metal Halide Power Bracket	\$19.81	-	\$	-
400	Metal Halide Power Bracket	\$21.17	296	\$	6,269
42	LED Area Light Fixture	\$13.16	-	\$	-
57	LED Area Light Fixture	\$13.21	-	\$	-
25	LED Cobra Head Fixture	\$13.11	-	\$	-
88	LED Cobra Head Fixture	\$13.30	-	\$	-
108	LED Cobra Head Fixture	\$13.36	-	\$	-
193	LED Cobra Head Fixture	\$13.62	-	\$	-
123	LED Flood Light Fixture	\$13.41	-	\$	-
194	LED Flood Light Fixture	\$13.62	-	\$	-
297	LED Flood Light Fixture	\$13.93	-	\$	-

Total Rate OL

<b>Luminaires</b>			<b>73,228</b>		
<b>Customers</b>		n/a			
<b>Meters</b>		-			
<b>KWH</b>	\$ -	<b>7,942,212</b>			
<b>Revenue</b>				\$ <b>1,231,875</b>	\$ - \$ <b>1,231,875</b>

Total Retail

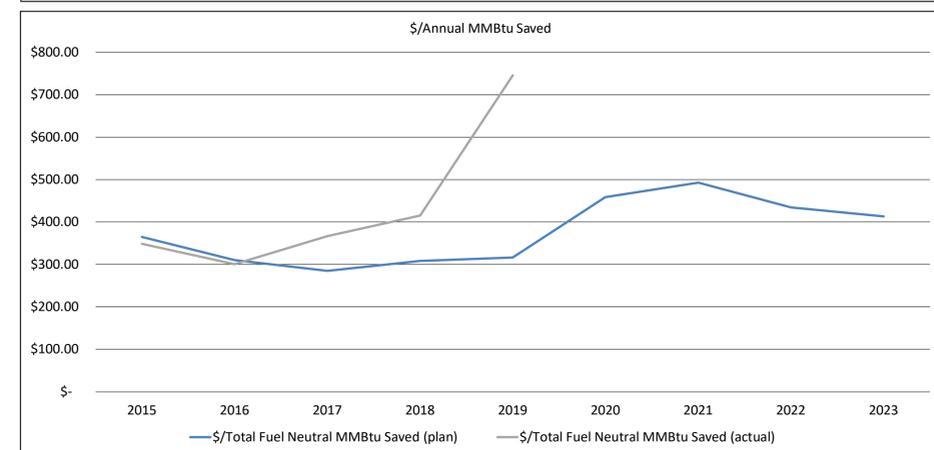
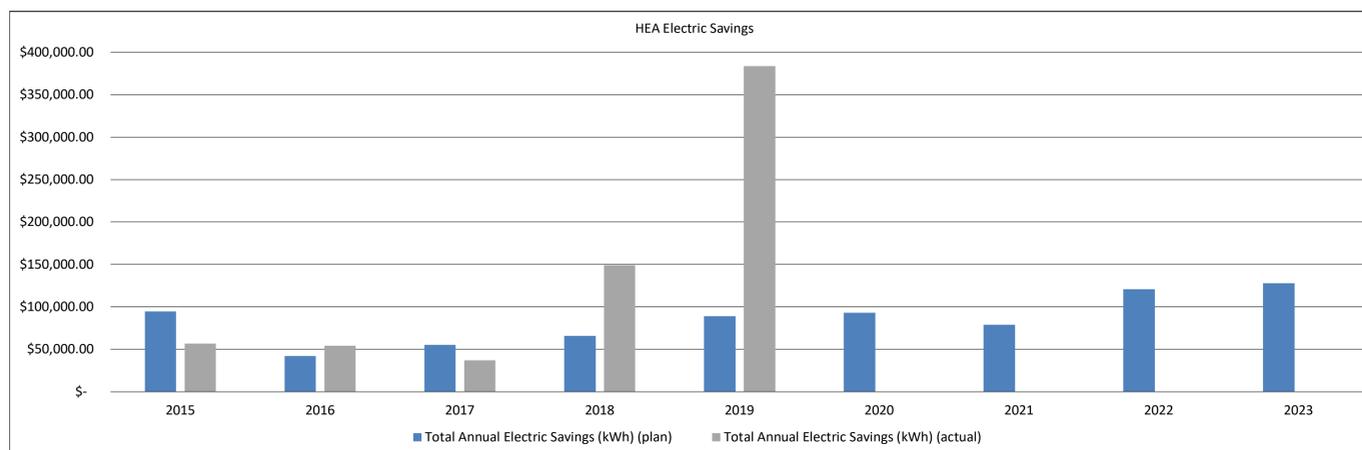
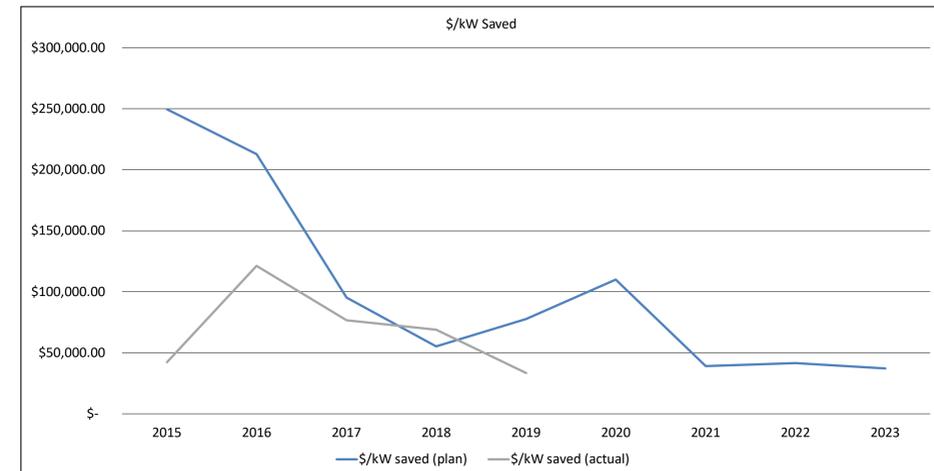
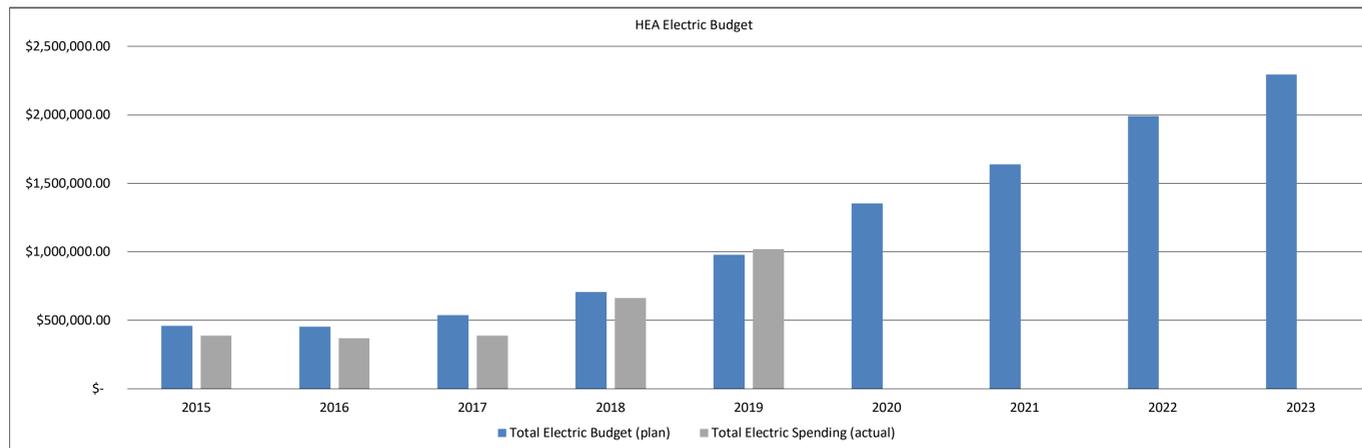
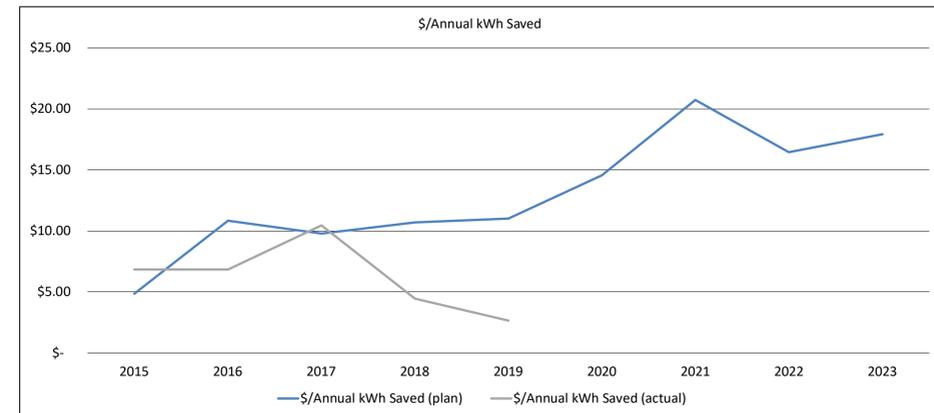
<b>Customers</b>		<b>943,411</b>			
<b>Meters</b>		n/a			
<b>Luminaires</b>		<b>73,228</b>			
<b>Billing Demand</b>		<b>2,338,180</b>			
<b>KWH</b>		<b>1,162,491,979</b>			
<b>Revenue</b>			\$ <b>17,186,979</b>	\$ <b>22,640,172</b>	\$ <b>17,380,984</b> \$ <b>57,208,135</b>

Home Energy Assistance

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 459,624.42	\$ 455,327.00	\$ 538,873.80	\$ 706,636.00	\$ 980,094.04	\$ 1,353,130.64	\$ 1,637,475.76	\$ 1,991,184.16	\$ 2,293,499.04
	Total Annual Electric Savings (kWh) (plan)	\$ 94,642.13	\$ 42,000.00	\$ 55,000.00	\$ 66,000.00	\$ 89,000.00	\$ 93,000.00	\$ 79,000.00	\$ 121,000.00	\$ 128,000.00
	\$/Annual kWh Saved (plan)	\$ 4.86	\$ 10.84	\$ 9.80	\$ 10.71	\$ 11.01	\$ 14.55	\$ 20.73	\$ 16.46	\$ 17.92
2)	Total Electric Budget	\$ 459,624.42	\$ 455,327.00	\$ 538,873.80	\$ 706,636.00	\$ 980,094.04	\$ 1,353,130.64	\$ 1,637,475.76	\$ 1,991,184.16	\$ 2,293,499.04
	Total kW saved	\$ 1.84	\$ 2.14	\$ 5.65	\$ 12.81	\$ 12.61	\$ 12.29	\$ 41.72	\$ 47.78	\$ 61.64
	\$/kW saved (plan)	\$ 249,518.52	\$ 212,854.29	\$ 95,350.21	\$ 55,141.71	\$ 77,735.31	\$ 110,144.78	\$ 39,248.59	\$ 41,676.02	\$ 37,210.50
3)	Total Electric Budget	\$ 459,624.42	\$ 455,327.00	\$ 538,873.80	\$ 706,636.00	\$ 980,094.04	\$ 1,353,130.64	\$ 1,637,475.76	\$ 1,991,184.16	\$ 2,293,499.04
	Total Fuel Neutral MMBtu Saved	\$ 1,261.63	\$ 1,465.79	\$ 1,892.00	\$ 2,293.60	\$ 3,102.63	\$ 2,948.24	\$ 3,322.67	\$ 4,584.40	\$ 5,553.93
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 364.31	\$ 310.64	\$ 284.82	\$ 308.09	\$ 315.89	\$ 458.96	\$ 492.82	\$ 434.34	\$ 412.95

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 389,541.09	\$ 369,329.15	\$ 388,231.12	\$ 662,392.08	\$ 1,020,067.22
	Total Annual Electric Savings (kWh) (actual)	\$ 56,811.45	\$ 54,123.54	\$ 37,139.55	\$ 149,020.93	\$ 383,834.11
	\$/Annual kWh Saved (actual)	\$ 6.86	\$ 6.82	\$ 10.45	\$ 4.44	\$ 2.66
2)	Total Electric Spending	\$ 389,541.09	\$ 369,329.15	\$ 388,231.12	\$ 662,392.08	\$ 1,020,067.22
	Total kW saved	\$ 9.19	\$ 3.05	\$ 5.07	\$ 9.62	\$ 30.50
	\$/kW saved (actual)	\$ 42,400.58	\$ 121,244.48	\$ 76,538.42	\$ 68,882.77	\$ 33,448.34
3)	Total Electric Spending	\$ 389,541.09	\$ 369,329.15	\$ 388,231.12	\$ 662,392.08	\$ 1,020,067.22
	Total Fuel Neutral MMBtu Saved	\$ 1,118.95	\$ 1,228.97	\$ 1,058.07	\$ 1,595.98	\$ 1,367.60
	\$/Total Fuel Neutral MMBtu Saved (actual)	\$ 348.13	\$ 300.52	\$ 366.92	\$ 415.04	\$ 745.88

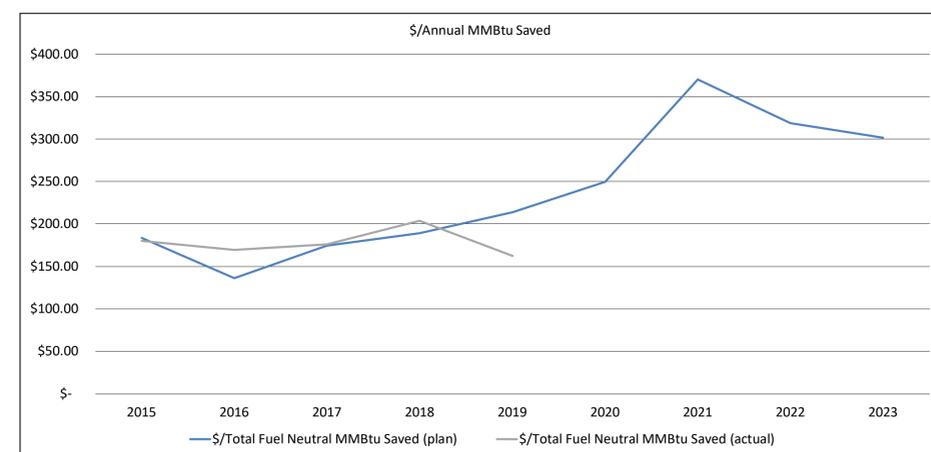
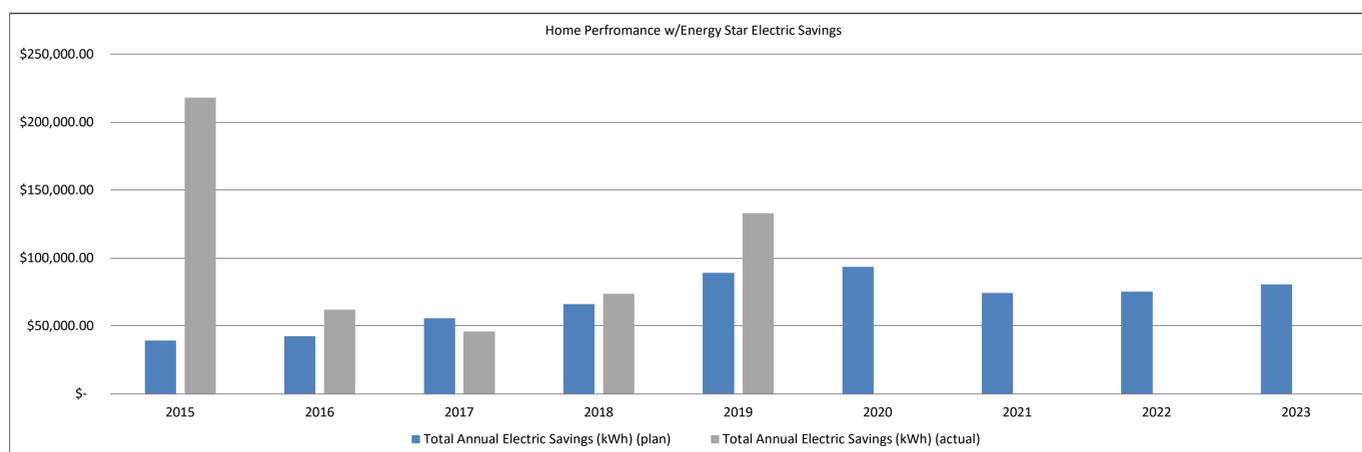
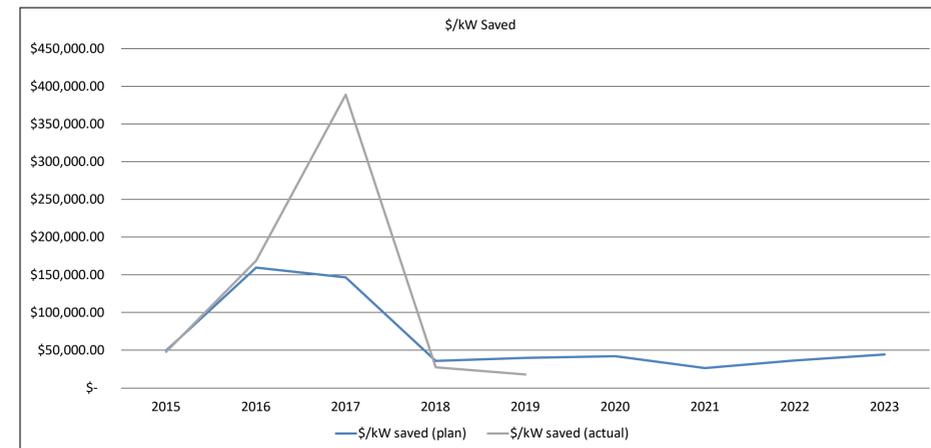
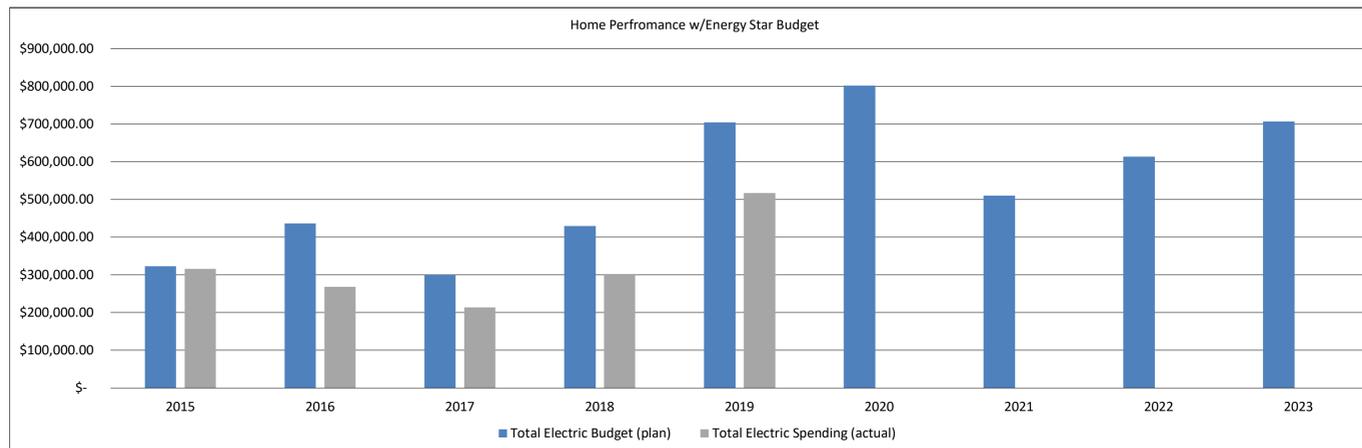
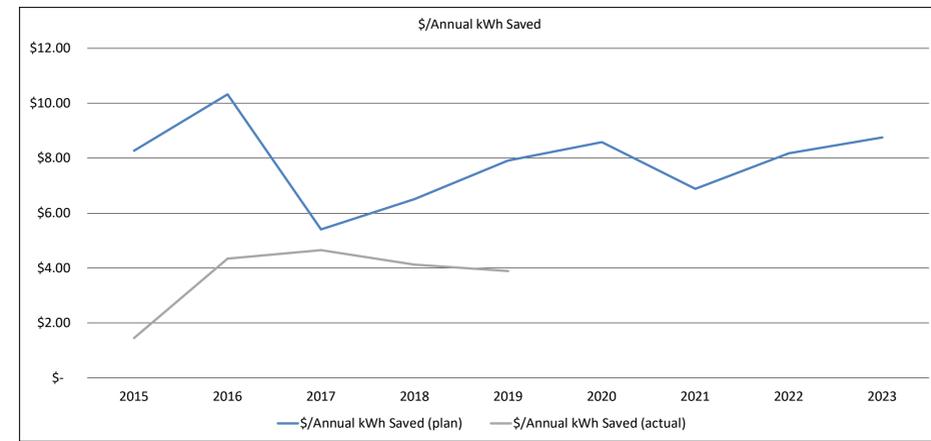


Home Performance w/Energy Star

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 322,989.57	\$ 436,630.68	\$ 299,999.99	\$ 429,999.86	\$ 704,299.65	\$ 801,804.38	\$ 510,435.00	\$ 614,062.95	\$ 706,308.88
	Total Annual Electric Savings (kWh) (plan)	\$ 39,052.59	\$ 42,288.52	\$ 55,484.65	\$ 66,052.08	\$ 89,008.00	\$ 93,440.33	\$ 74,079.95	\$ 75,025.98	\$ 80,633.14
	\$/Annual kWh Saved (plan)	\$ 8.27	\$ 10.33	\$ 5.41	\$ 6.51	\$ 7.91	\$ 8.58	\$ 6.89	\$ 8.18	\$ 8.76
2)	Total Electric Budget	\$ 322,989.57	\$ 436,630.68	\$ 299,999.99	\$ 429,999.86	\$ 704,299.65	\$ 801,804.38	\$ 510,435.00	\$ 614,062.95	\$ 706,308.88
	Total kW saved	\$ 6.53	\$ 2.73	\$ 2.05	\$ 11.94	\$ 17.60	\$ 19.01	\$ 19.27	\$ 16.87	\$ 15.83
	\$/kW saved (plan)	\$ 49,489.06	\$ 159,701.47	\$ 146,686.52	\$ 36,008.82	\$ 40,012.62	\$ 42,173.51	\$ 26,488.98	\$ 36,399.86	\$ 44,611.69
3)	Total Electric Budget	\$ 322,989.57	\$ 436,630.68	\$ 299,999.99	\$ 429,999.86	\$ 704,299.65	\$ 801,804.38	\$ 510,435.00	\$ 614,062.95	\$ 706,308.88
	Total Fuel Neutral MMBtu Saved	\$ 1,759.57	\$ 3,210.97	\$ 1,717.60	\$ 2,270.40	\$ 3,291.00	\$ 3,209.40	\$ 1,379.01	\$ 1,924.99	\$ 2,342.70
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 183.56	\$ 135.98	\$ 174.66	\$ 189.39	\$ 214.01	\$ 249.83	\$ 370.15	\$ 319.00	\$ 301.49

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 316,628.56	\$ 268,193.38	\$ 213,461.99	\$ 302,725.58	\$ 517,027.72
	Total Annual Electric Savings (kWh) (actual)	\$ 218,041.56	\$ 61,812.00	\$ 45,885.13	\$ 73,424.52	\$ 132,836.00
	\$/Annual kWh Saved (actual)	\$ 1.45	\$ 4.34	\$ 4.65	\$ 4.12	\$ 3.89
2)	Total Electric Spending	\$ 316,628.56	\$ 268,193.38	\$ 213,461.99	\$ 302,725.58	\$ 517,027.72
	Total kW saved	\$ 6.63	\$ 1.59	\$ 0.55	\$ 11.07	\$ 28.69
	\$/kW saved (actual)	\$ 47,749.41	\$ 168,737.76	\$ 389,003.51	\$ 27,348.88	\$ 18,020.38
3)	Total Electric Spending	\$ 316,628.56	\$ 268,193.38	\$ 213,461.99	\$ 302,725.58	\$ 517,027.72
	Total Fuel Neutral MMBtu Saved	\$ 1,757.81	\$ 1,583.90	\$ 1,212.18	\$ 1,486.46	\$ 3,179.20
	\$/Total Fuel Neutral MMBtu Saved (actual)	\$ 180.13	\$ 169.32	\$ 176.10	\$ 203.66	\$ 162.63

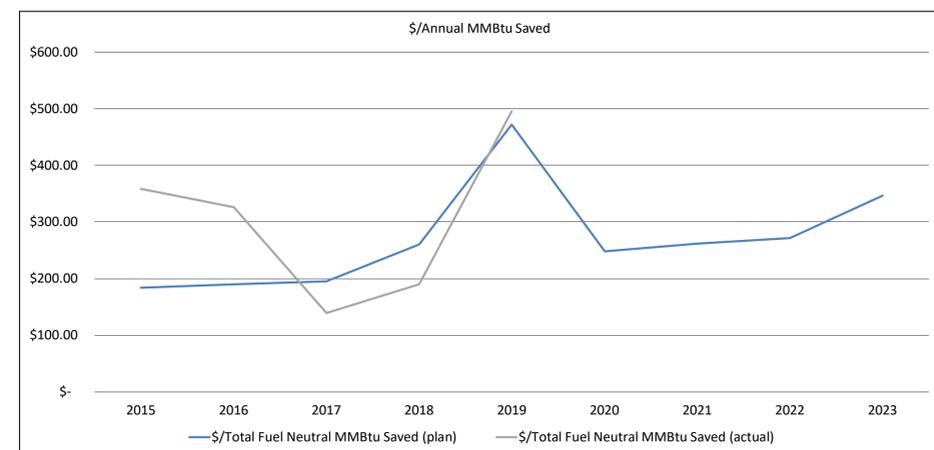
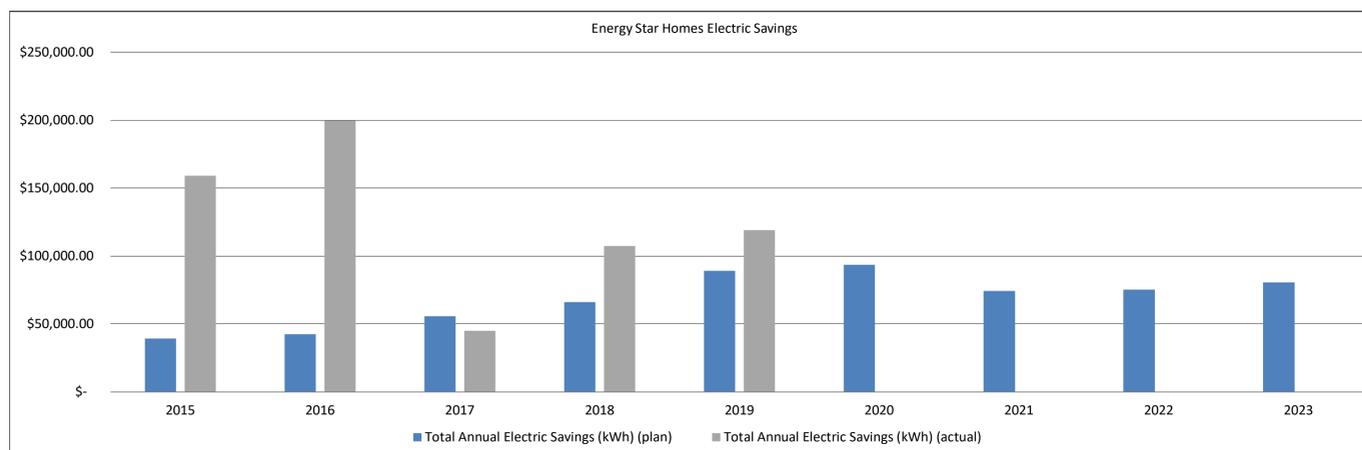
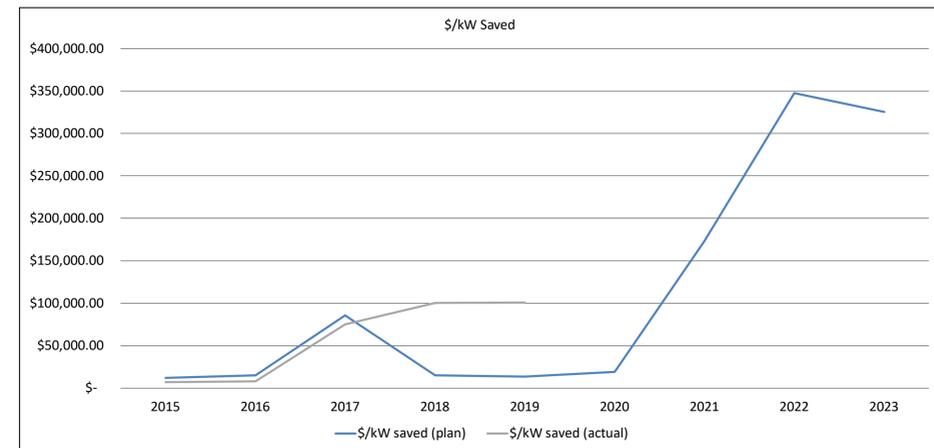
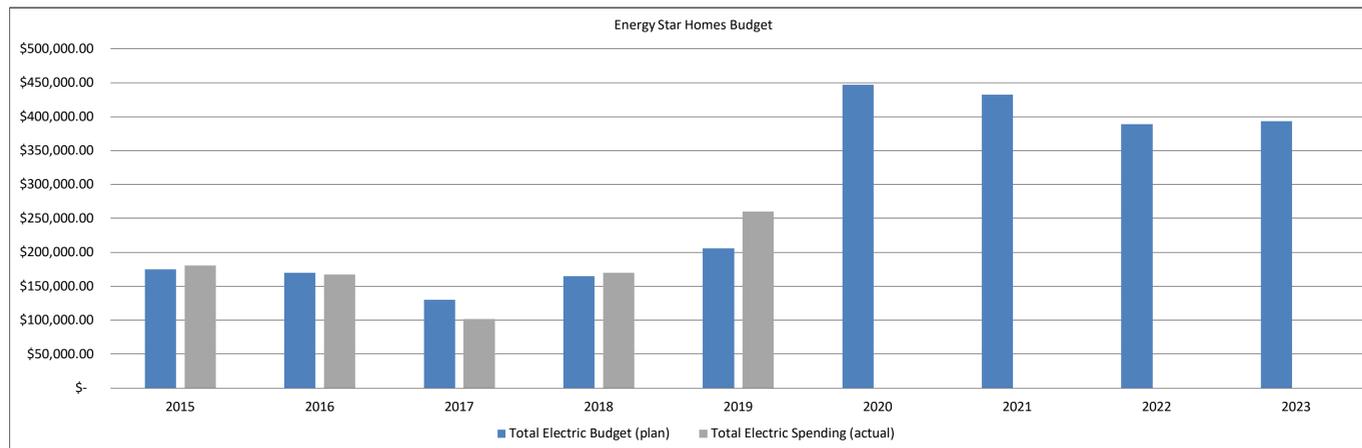
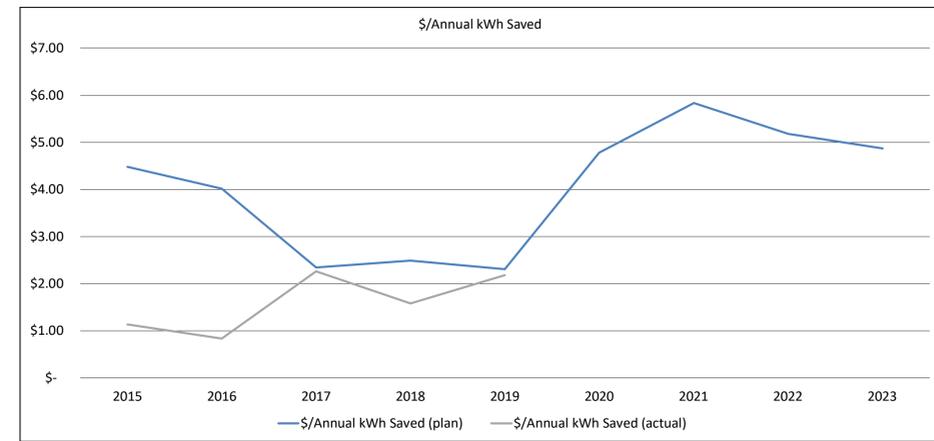


Energy Star Homes

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 175,000.00	\$ 170,000.00	\$ 130,000.28	\$ 164,703.66	\$ 205,783.48	\$ 446,820.72	\$ 432,654.50	\$ 388,625.67	\$ 392,937.05
	Total Annual Electric Savings (kWh) (plan)	\$ 39,052.59	\$ 42,288.52	\$ 55,484.65	\$ 66,052.08	\$ 89,008.00	\$ 93,440.33	\$ 74,079.95	\$ 75,025.98	\$ 80,633.14
	\$/Annual kWh Saved (plan)	\$ 4.48	\$ 4.02	\$ 2.34	\$ 2.49	\$ 2.31	\$ 4.78	\$ 5.84	\$ 5.18	\$ 4.87
2)	Total Electric Budget	\$ 175,000.00	\$ 170,000.00	\$ 130,000.28	\$ 164,703.66	\$ 205,783.48	\$ 446,820.72	\$ 432,654.50	\$ 388,625.67	\$ 392,937.05
	Total kW saved	\$ 14.34	\$ 11.26	\$ 1.51	\$ 11.06	\$ 15.11	\$ 23.71	\$ 2.50	\$ 1.12	\$ 1.21
	\$/kW saved (plan)	\$ 12,206.20	\$ 15,096.93	\$ 85,871.19	\$ 14,896.90	\$ 13,620.32	\$ 18,842.58	\$ 173,135.34	\$ 347,458.36	\$ 325,440.96
3)	Total Electric Budget	\$ 175,000.00	\$ 170,000.00	\$ 130,000.28	\$ 164,703.66	\$ 205,783.48	\$ 446,820.72	\$ 432,654.50	\$ 388,625.67	\$ 392,937.05
	Total Fuel Neutral MMBtu Saved	\$ 951.23	\$ 894.92	\$ 665.27	\$ 632.42	\$ 436.04	\$ 1,800.00	\$ 1,654.00	\$ 1,432.50	\$ 1,133.50
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 183.97	\$ 189.96	\$ 195.41	\$ 260.43	\$ 471.94	\$ 248.23	\$ 261.58	\$ 271.29	\$ 346.66

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 180,414.15	\$ 167,126.28	\$ 101,427.40	\$ 169,803.30	\$ 259,859.59
	Total Annual Electric Savings (kWh) (actual)	\$ 159,006.65	\$ 199,654.84	\$ 44,813.33	\$ 107,316.03	\$ 119,010.64
	\$/Annual kWh Saved (actual)	\$ 1.13	\$ 0.84	\$ 2.26	\$ 1.58	\$ 2.18
2)	Total Electric Spending	\$ 180,414.15	\$ 167,126.28	\$ 101,427.40	\$ 169,803.30	\$ 259,859.59
	Total kW saved	\$ 25.18	\$ 21.15	\$ 1.35	\$ 1.69	\$ 2.58
	\$/kW saved (actual)	\$ 7,166.00	\$ 7,901.61	\$ 75,145.19	\$ 100,446.47	\$ 100,759.00
3)	Total Electric Spending	\$ 180,414.15	\$ 167,126.28	\$ 101,427.40	\$ 169,803.30	\$ 259,859.59
	Total Fuel Neutral MMBtu Saved	\$ 503.05	\$ 512.40	\$ 728.51	\$ 893.50	\$ 523.90
	\$/Total Fuel Neutral MMBtu Saved (actual)	\$ 358.64	\$ 326.16	\$ 139.23	\$ 190.04	\$ 496.01

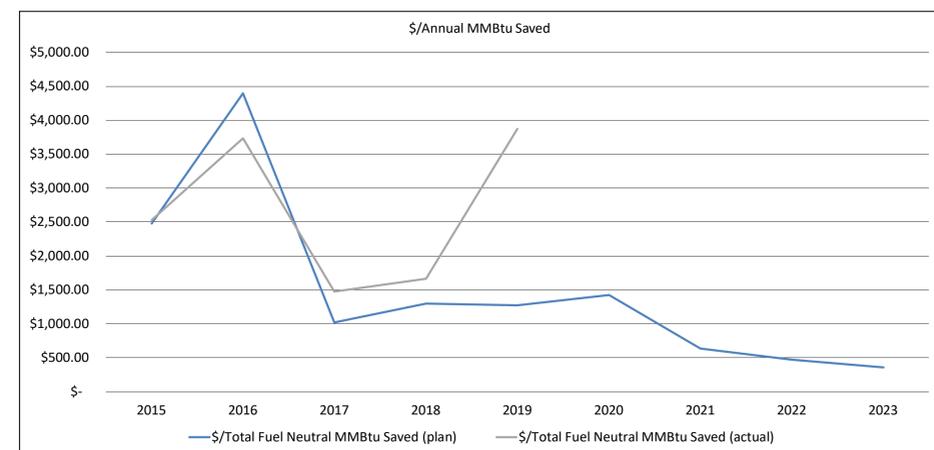
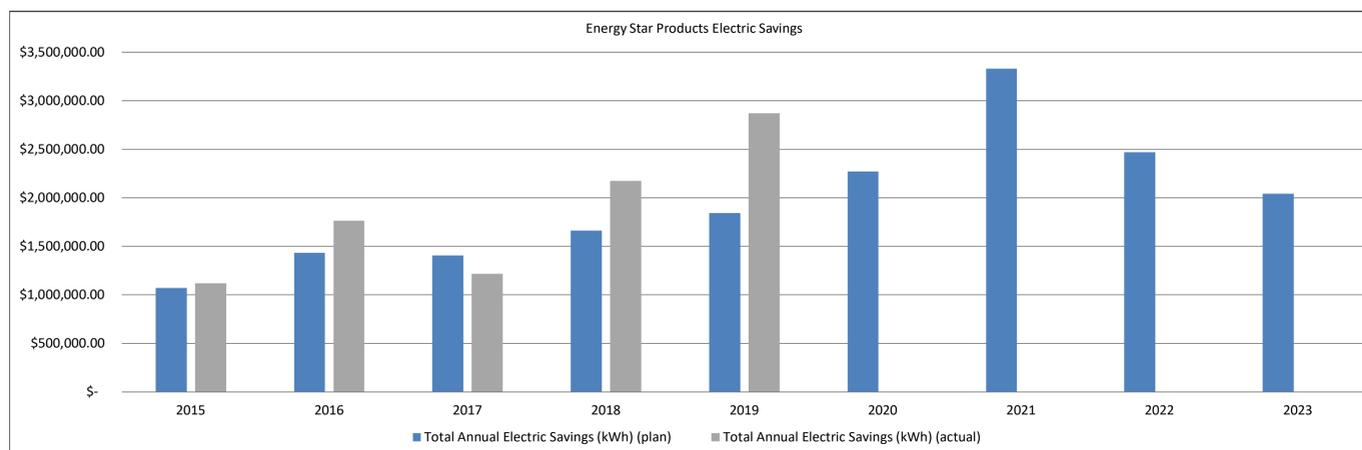
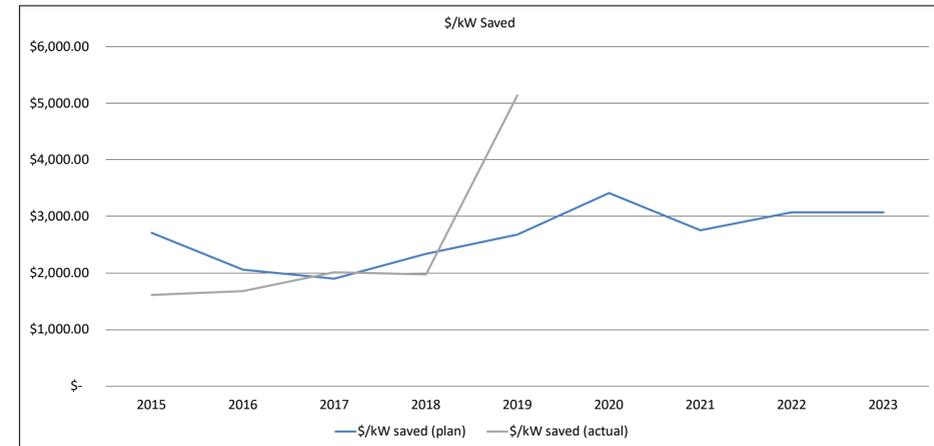
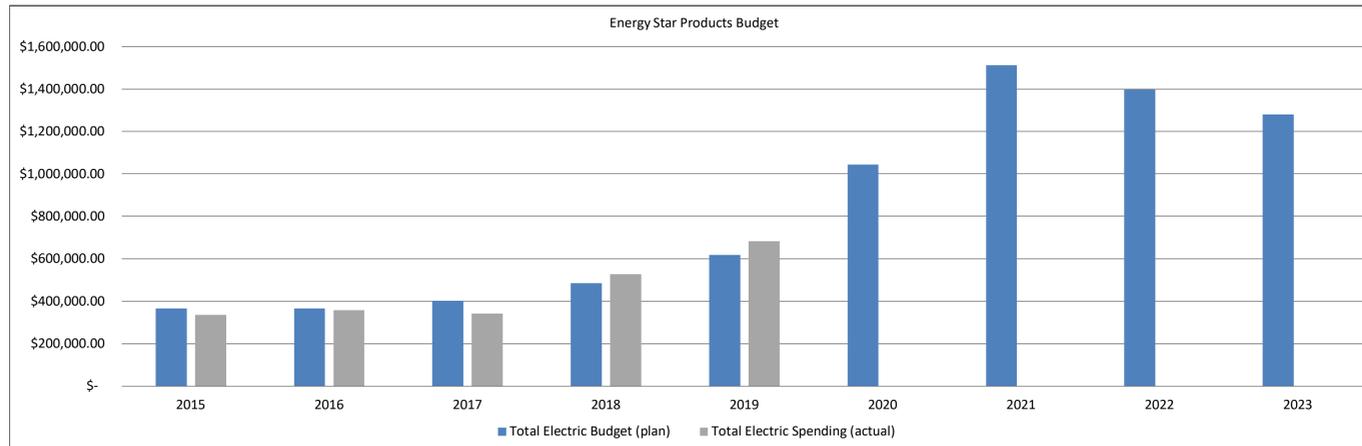
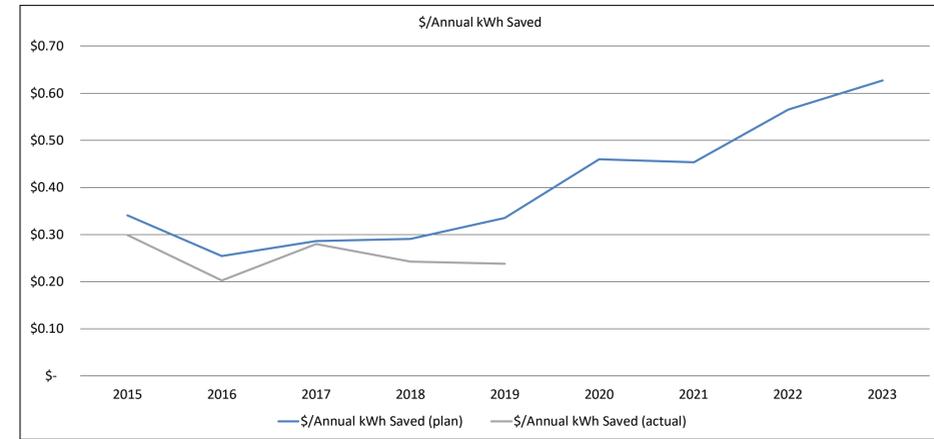


Energy Star Products

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 365,000.00	\$ 365,000.00	\$ 402,825.70	\$ 484,188.44	\$ 617,955.09	\$ 1,044,546.94	\$ 1,513,473.66	\$ 1,397,648.41	\$ 1,281,002.13
	Total Annual Electric Savings (kWh) (plan)	\$ 1,070,382.25	\$ 1,433,378.24	\$ 1,406,463.34	\$ 1,662,668.24	\$ 1,840,674.95	\$ 2,269,568.82	\$ 3,332,321.11	\$ 2,472,125.72	\$ 2,042,077.85
	\$/Annual kWh Saved (plan)	\$ 0.34	\$ 0.25	\$ 0.29	\$ 0.29	\$ 0.34	\$ 0.46	\$ 0.45	\$ 0.57	\$ 0.63
2)	Total Electric Budget	\$ 365,000.00	\$ 365,000.00	\$ 402,825.70	\$ 484,188.44	\$ 617,955.09	\$ 1,044,546.94	\$ 1,513,473.66	\$ 1,397,648.41	\$ 1,281,002.13
	Total kW saved	\$ 134.88	\$ 177.23	\$ 212.54	\$ 207.29	\$ 230.88	\$ 306.11	\$ 549.49	\$ 455.06	\$ 417.36
	\$/kW saved (plan)	\$ 2,706.16	\$ 2,059.49	\$ 1,895.31	\$ 2,335.76	\$ 2,676.48	\$ 3,412.34	\$ 2,754.35	\$ 3,071.36	\$ 3,069.33
3)	Total Electric Budget	\$ 365,000.00	\$ 365,000.00	\$ 402,825.70	\$ 484,188.44	\$ 617,955.09	\$ 1,044,546.94	\$ 1,513,473.66	\$ 1,397,648.41	\$ 1,281,002.13
	Total Fuel Neutral MMBtu Saved	\$ 147.48	\$ 82.97	\$ 394.63	\$ 373.88	\$ 485.14	\$ 733.65	\$ 2,371.60	\$ 2,964.50	\$ 3,557.40
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 2,474.94	\$ 4,399.03	\$ 1,020.76	\$ 1,295.04	\$ 1,273.77	\$ 1,423.77	\$ 638.17	\$ 471.46	\$ 360.10

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 334,785.82	\$ 358,236.26	\$ 340,904.97	\$ 528,286.52	\$ 683,754.61
	Total Annual Electric Savings (kWh) (actual)	\$ 1,120,563.80	\$ 1,764,104.40	\$ 1,216,379.86	\$ 2,172,620.76	\$ 2,874,060.02
	\$/Annual kWh Saved (actual)	\$ 0.30	\$ 0.20	\$ 0.28	\$ 0.24	\$ 0.24
2)	Total Electric Spending	\$ 334,785.82	\$ 358,236.26	\$ 340,904.97	\$ 528,286.52	\$ 683,754.61
	Total kW saved	\$ 208.01	\$ 212.96	\$ 169.71	\$ 267.59	\$ 132.96
	\$/kW saved (actual)	\$ 1,609.48	\$ 1,682.16	\$ 2,008.79	\$ 1,974.22	\$ 5,142.48
3)	Total Electric Spending	\$ 334,785.82	\$ 358,236.26	\$ 340,904.97	\$ 528,286.52	\$ 683,754.61
	Total Fuel Neutral MMBtu Saved	\$ 132.37	\$ 95.90	\$ 231.34	\$ 317.87	\$ 176.53
	\$/Total Fuel Neutral MMBtu Saved (actual)	\$ 2,529.16	\$ 3,735.48	\$ 1,473.64	\$ 1,661.96	\$ 3,873.33

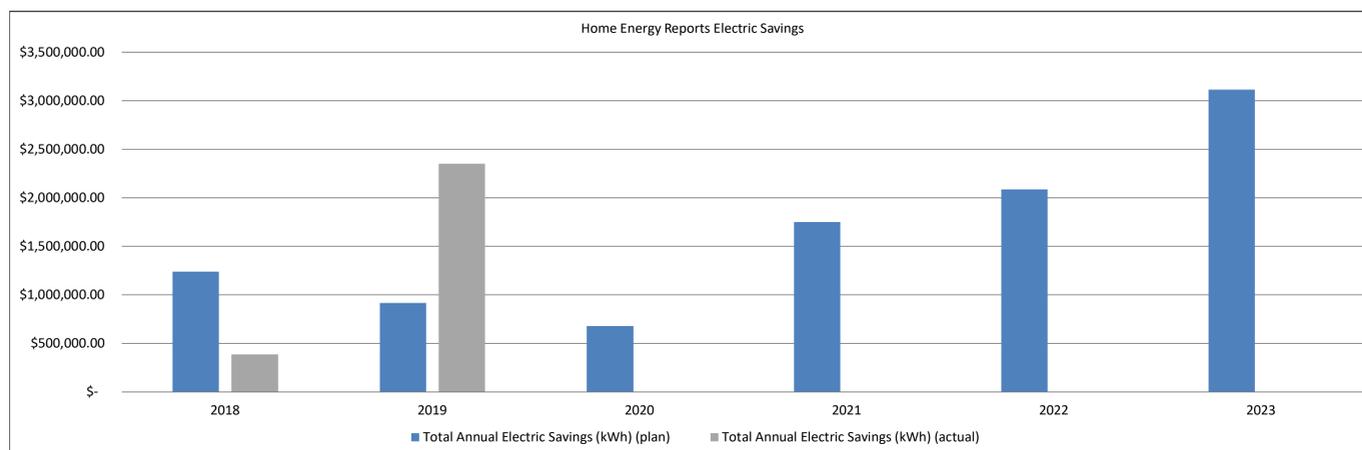
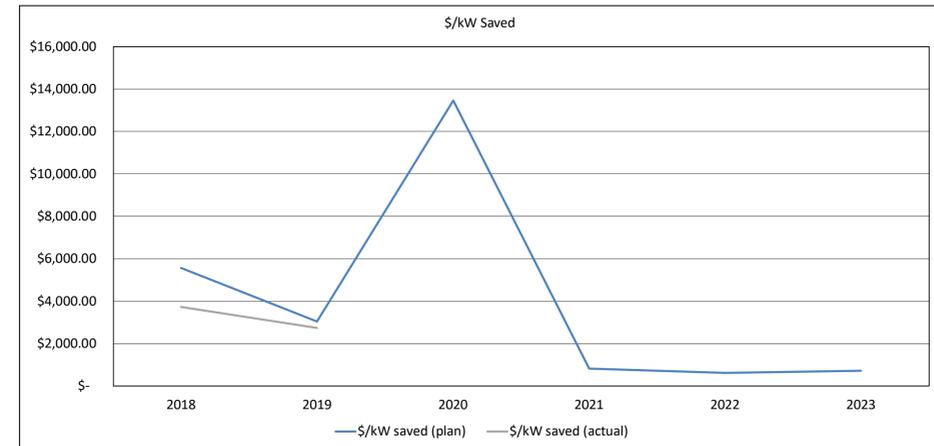
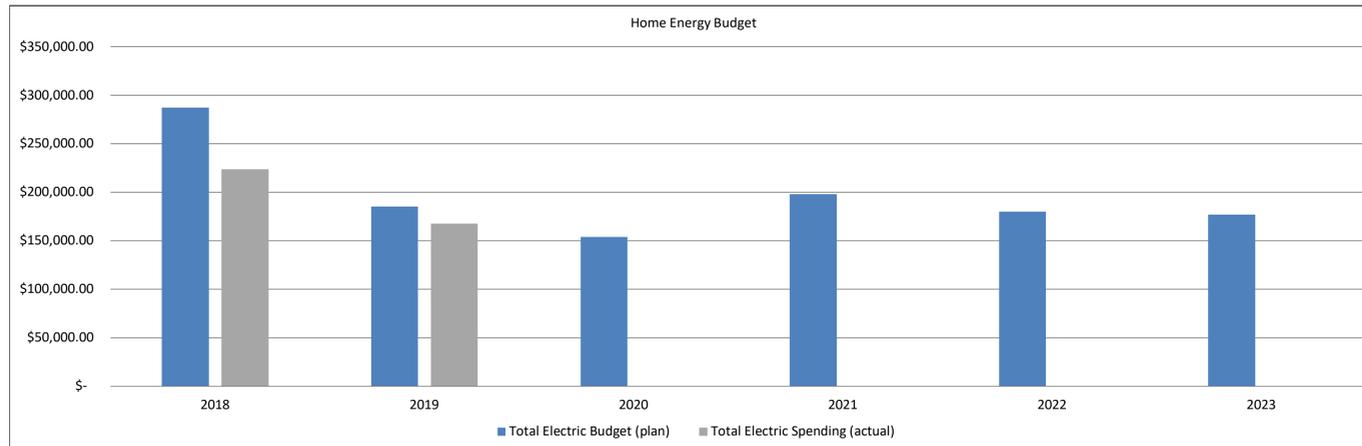
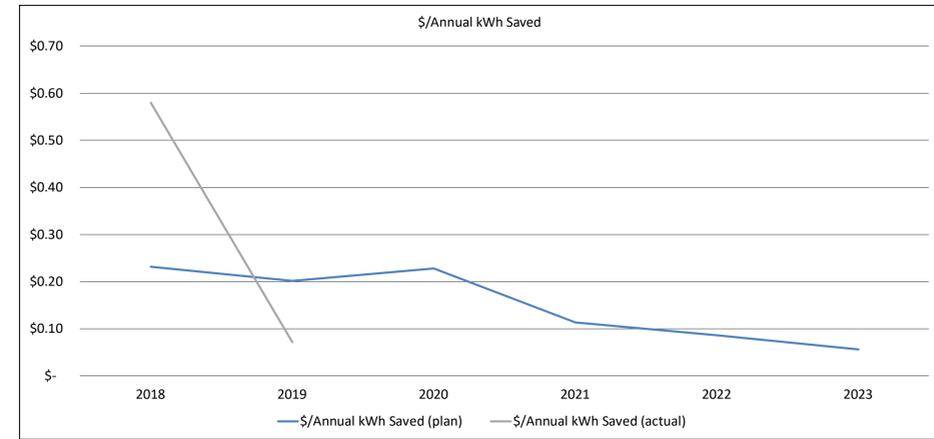


Home Energy Reports

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ -	\$ -	\$ -	\$ 286,984.00	\$ 184,985.00	\$ 153,784.00	\$ 198,183.00	\$ 180,048.43	\$ 176,866.84
	Total Annual Electric Savings (kWh) (plan)	\$ -	\$ -	\$ -	\$ 1,237,012.99	\$ 917,000.00	\$ 675,000.00	\$ 1,749,000.00	\$ 2,087,000.00	\$ 3,116,000.00
	\$/Annual kWh Saved (plan)				\$ 0.23	\$ 0.20	\$ 0.23	\$ 0.11	\$ 0.09	\$ 0.06
2)	Total Electric Budget	\$ -	\$ -	\$ -	\$ 286,984.00	\$ 184,985.00	\$ 153,784.00	\$ 198,183.00	\$ 180,048.43	\$ 176,866.84
	Total kW saved	\$ -	\$ -	\$ -	\$ 51.54	\$ 60.71	\$ 11.43	\$ 243.55	\$ 290.61	\$ 243.55
	\$/kW saved (plan)				\$ 5,567.94	\$ 3,046.80	\$ 13,459.85	\$ 813.74	\$ 619.55	\$ 726.21
3)	Total Electric Budget	\$ -	\$ -	\$ -	\$ 286,984.00	\$ 184,985.00	\$ 153,784.00	\$ 198,183.00	\$ 180,048.43	\$ 176,866.84
	Total Fuel Neutral MMBtu Saved	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/Total Fuel Neutral MMBtu Saved (plan)									

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)				\$ 223,784.50	\$ 167,701.02
	Total Annual Electric Savings (kWh) (actual)				\$ 385,562.00	\$ 2,350,149.00
	\$/Annual kWh Saved (actual)				\$ 0.58	\$ 0.07
2)	Total Electric Spending				\$ 223,784.50	\$ 167,701.02
	Total kW saved				\$ 60.15	\$ 61.26
	\$/kW saved (actual)				\$ 3,720.49	\$ 2,737.36
3)	Total Electric Spending				\$ 223,784.50	\$ 167,701.02
	Total Fuel Neutral MMBtu Saved				\$ -	\$ -
	\$/Total Fuel Neutral MMBtu Saved (actual)					

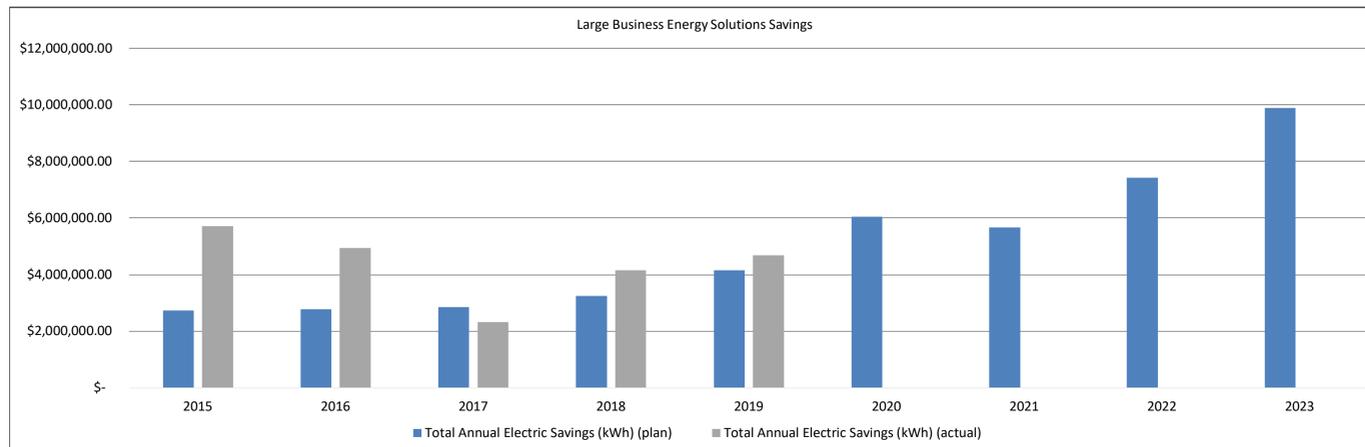
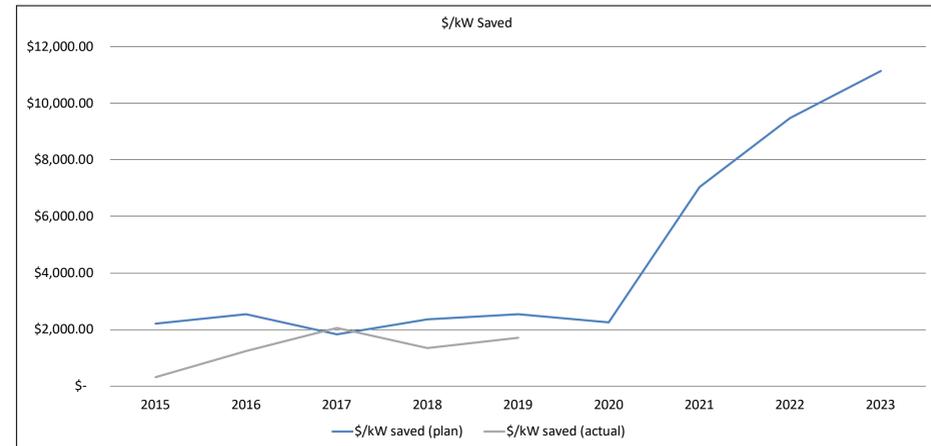
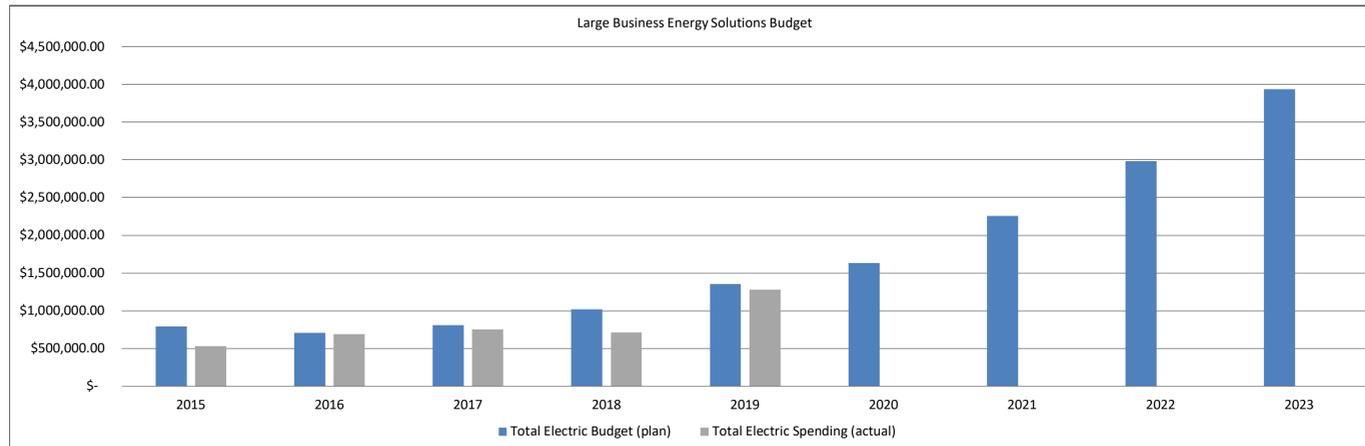
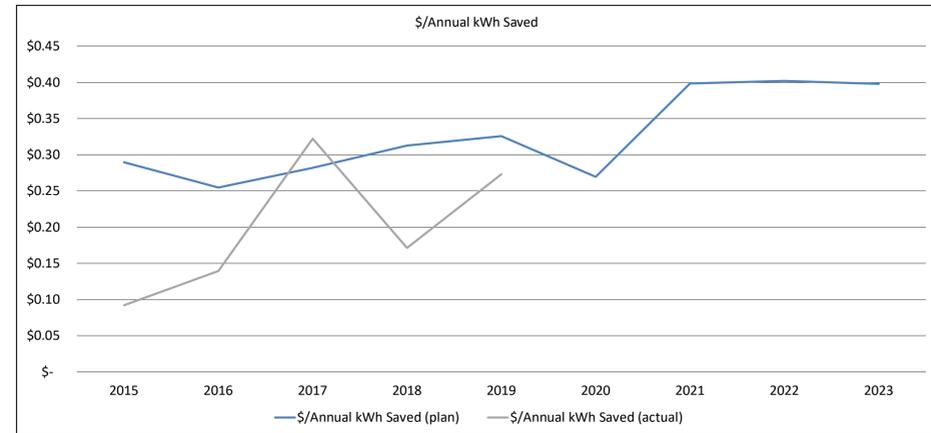


Large Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 792,417.96	\$ 708,103.97	\$ 804,855.80	\$ 1,018,000.00	\$ 1,353,124.06	\$ 1,632,099.26	\$ 2,257,664.54	\$ 2,983,879.88	\$ 3,937,680.07
	Total Annual Electric Savings (kWh) (plan)	\$ 2,733,709.43	\$ 2,778,532.48	\$ 2,851,063.83	\$ 3,251,317.98	\$ 4,148,221.09	\$ 6,050,964.32	\$ 5,666,115.45	\$ 7,421,355.59	\$ 9,898,315.77
	\$/Annual kWh Saved (plan)	\$ 0.29	\$ 0.25	\$ 0.28	\$ 0.31	\$ 0.33	\$ 0.27	\$ 0.40	\$ 0.40	\$ 0.40
2)	Total Electric Budget	\$ 792,417.96	\$ 708,103.97	\$ 804,855.80	\$ 1,018,000.00	\$ 1,353,124.06	\$ 1,632,099.26	\$ 2,257,664.54	\$ 2,983,879.88	\$ 3,937,680.07
	Total kW saved	\$ 360.05	\$ 279.38	\$ 439.10	\$ 432.43	\$ 532.63	\$ 725.53	\$ 321.03	\$ 315.13	\$ 353.55
	\$/kW saved (plan)	\$ 2,200.88	\$ 2,534.56	\$ 1,832.96	\$ 2,354.16	\$ 2,540.48	\$ 2,249.54	\$ 7,032.62	\$ 9,468.69	\$ 11,137.40
3)	Total Electric Budget	\$ 792,417.96	\$ 708,103.97	\$ 804,855.80	\$ 1,018,000.00	\$ 1,353,124.06	\$ 1,632,099.26	\$ 2,257,664.54	\$ 2,983,879.88	\$ 3,937,680.07
	Total Fuel Neutral MMBtu Saved	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 107.42	\$ 123.94	\$ 165.26
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21,017.70	\$ 24,074.60	\$ 23,827.56

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 527,212.31	\$ 688,316.04	\$ 748,208.39	\$ 711,153.65	\$ 1,280,014.05
	Total Annual Electric Savings (kWh) (actual)	\$ 5,704,791.08	\$ 4,938,617.74	\$ 2,319,910.78	\$ 4,152,747.70	\$ 4,682,916.54
	\$/Annual kWh Saved (actual)	\$ 0.09	\$ 0.14	\$ 0.32	\$ 0.17	\$ 0.27
2)	Total Electric Spending	\$ 527,212.31	\$ 688,316.04	\$ 748,208.39	\$ 711,153.65	\$ 1,280,014.05
	Total kW saved	\$ 1,660.17	\$ 554.89	\$ 362.79	\$ 532.27	\$ 748.70
	\$/kW saved (actual)	\$ 317.56	\$ 1,240.45	\$ 2,062.36	\$ 1,336.08	\$ 1,709.64
3)	Total Electric Spending	\$ 527,212.31	\$ 688,316.04	\$ 748,208.39	\$ 711,153.65	\$ 1,280,014.05
	Total Fuel Neutral MMBtu Saved	\$ 186.80	\$ 1,239.06	\$ -	\$ -	\$ -
	\$/Total Fuel Neutral MMBtu Saved (actual)	\$ 2,822.34	\$ 555.51	\$ -	\$ -	\$ -

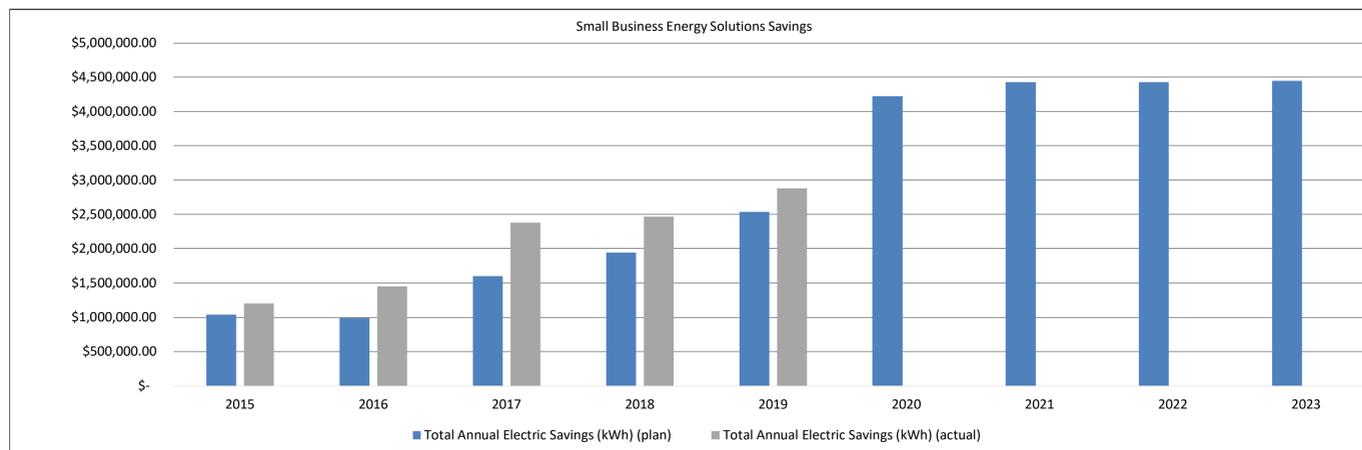
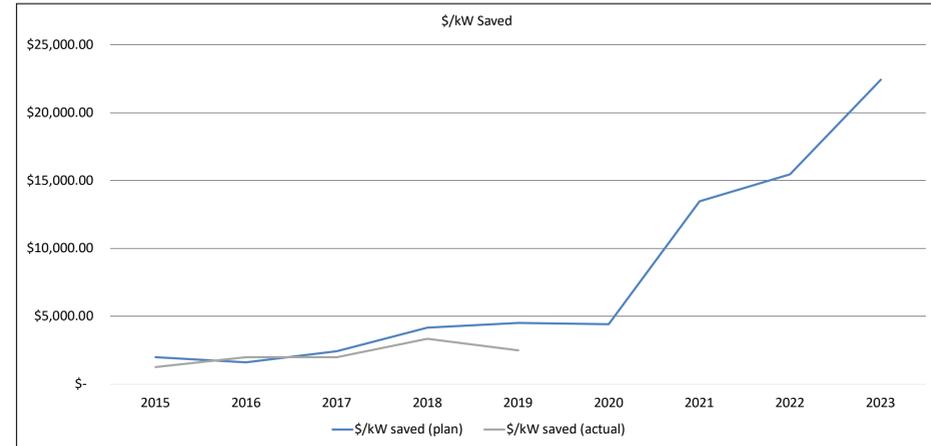
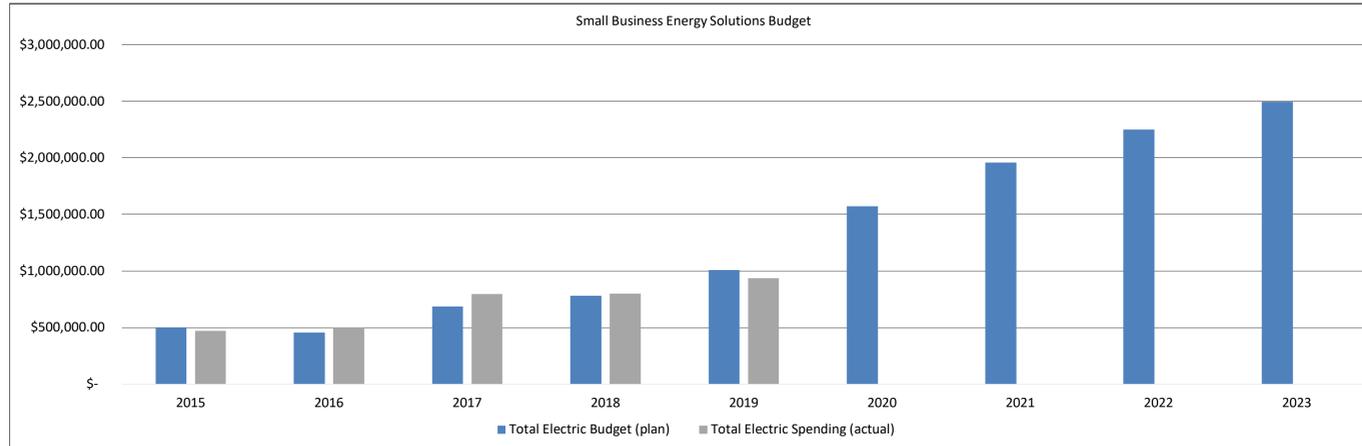
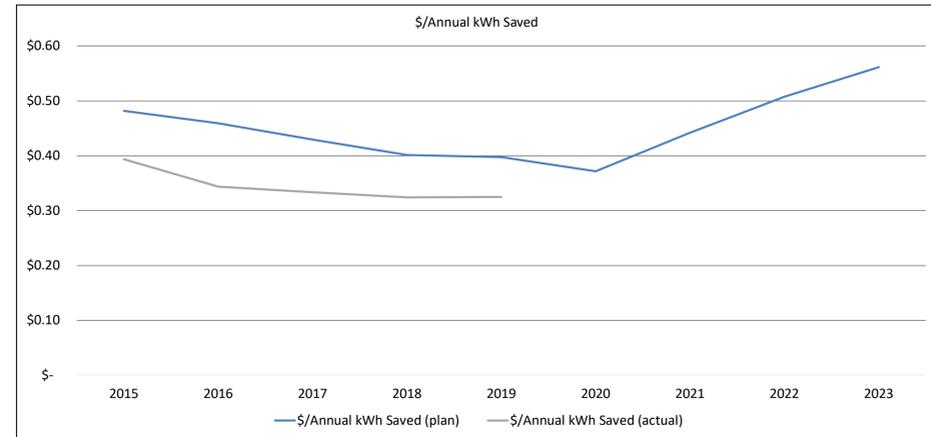


Small Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 500,000.00	\$ 455,000.50	\$ 686,088.31	\$ 779,755.65	\$ 1,008,202.87	\$ 1,570,429.81	\$ 1,959,838.23	\$ 2,248,248.82	\$ 2,496,226.90
	Total Annual Electric Savings (kWh) (plan)	\$ 1,037,376.46	\$ 990,500.00	\$ 1,597,407.41	\$ 1,941,463.22	\$ 2,535,529.86	\$ 4,224,432.59	\$ 4,431,650.02	\$ 4,431,650.02	\$ 4,446,360.53
	\$/Annual kWh Saved (plan)	\$ 0.48	\$ 0.46	\$ 0.43	\$ 0.40	\$ 0.40	\$ 0.37	\$ 0.44	\$ 0.51	\$ 0.56
2)	Total Electric Budget	\$ 500,000.00	\$ 455,000.50	\$ 686,088.31	\$ 779,755.65	\$ 1,008,202.87	\$ 1,570,429.81	\$ 1,959,838.23	\$ 2,248,248.82	\$ 2,496,226.90
	Total kW saved	\$ 250.94	\$ 284.84	\$ 282.22	\$ 187.90	\$ 224.44	\$ 356.84	\$ 145.43	\$ 145.43	\$ 111.27
	\$/kW saved (plan)	\$ 1,992.54	\$ 1,597.39	\$ 2,431.07	\$ 4,149.95	\$ 4,492.02	\$ 4,400.97	\$ 13,476.05	\$ 15,459.19	\$ 22,434.48
3)	Total Electric Budget	\$ 500,000.00	\$ 455,000.50	\$ 686,088.31	\$ 779,755.65	\$ 1,008,202.87	\$ 1,570,429.81	\$ 1,959,838.23	\$ 2,248,248.82	\$ 2,496,226.90
	Total Fuel Neutral MMBtu Saved	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 83.20	\$ 83.20	\$ 133.60
	\$/Total Fuel Neutral MMBtu Saved (plan)									

Actuals		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 471,603.35	\$ 499,144.45	\$ 794,502.64	\$ 799,496.85	\$ 935,895.34
	Total Annual Electric Savings (kWh) (actual)	\$ 1,198,433.94	\$ 1,451,929.00	\$ 2,381,724.69	\$ 2,469,440.00	\$ 2,879,216.42
	\$/Annual kWh Saved (actual)	\$ 0.39	\$ 0.34	\$ 0.33	\$ 0.32	\$ 0.33
2)	Total Electric Spending	\$ 471,603.35	\$ 499,144.45	\$ 794,502.64	\$ 799,496.85	\$ 935,895.34
	Total kW saved	\$ 379.92	\$ 253.82	\$ 398.49	\$ 238.83	\$ 377.59
	\$/kW saved (actual)	\$ 1,241.32	\$ 1,966.51	\$ 1,993.77	\$ 3,347.58	\$ 2,478.60
3)	Total Electric Spending	\$ 471,603.35	\$ 499,144.45	\$ 794,502.64	\$ 799,496.85	\$ 935,895.34
	Total Fuel Neutral MMBtu Saved	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/Total Fuel Neutral MMBtu Saved (actual)					

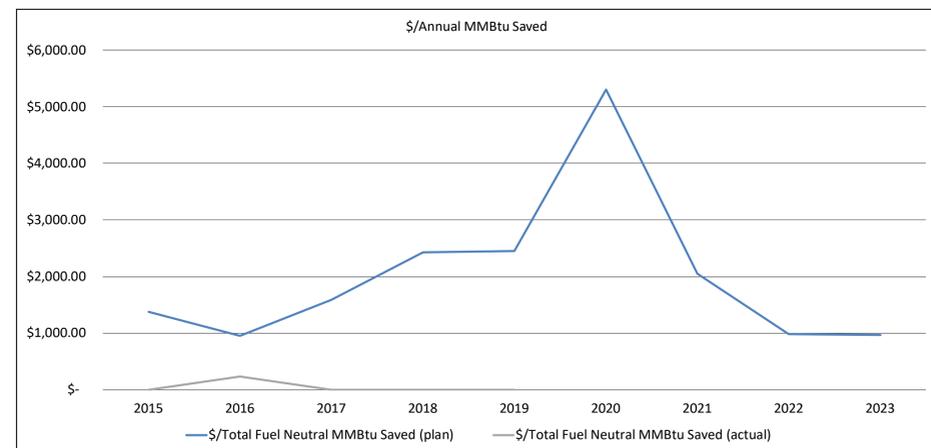
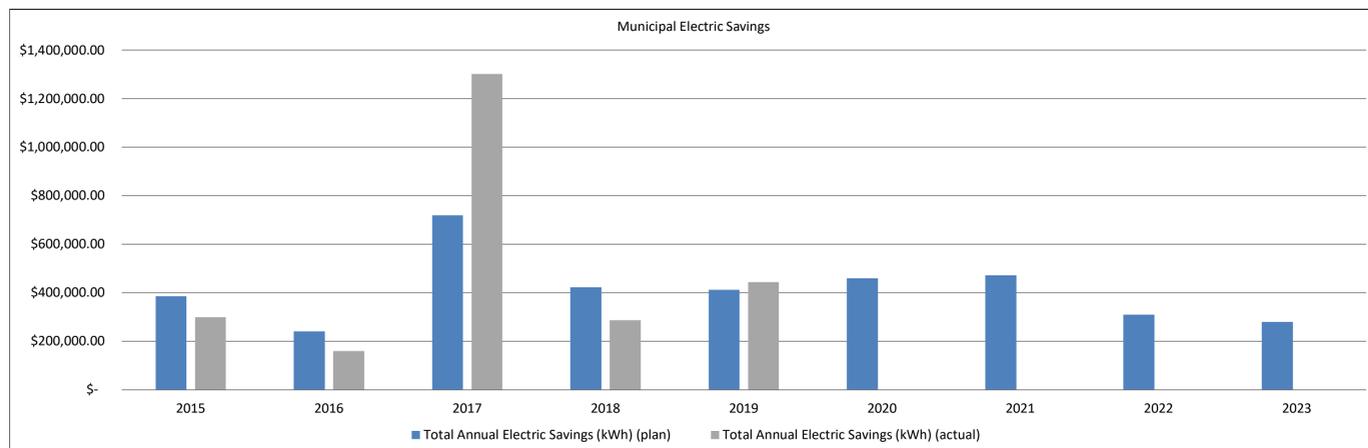
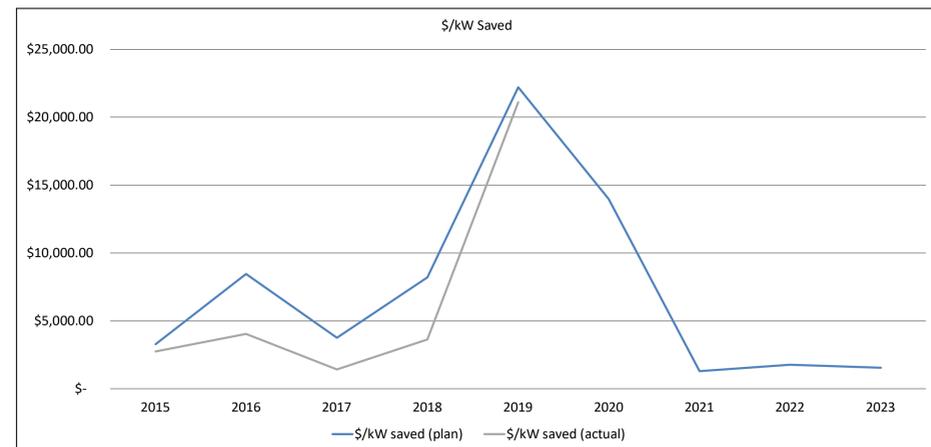
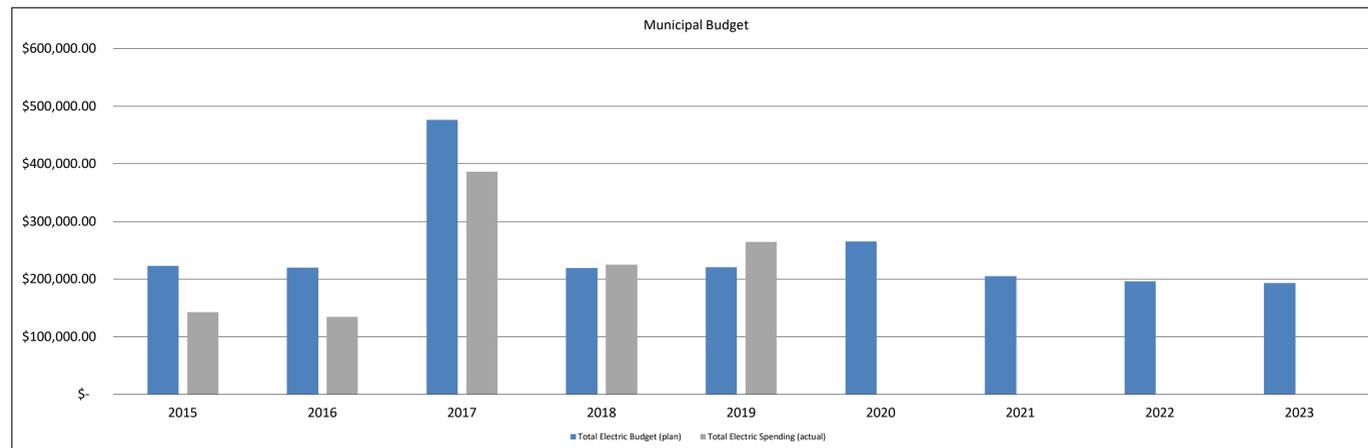
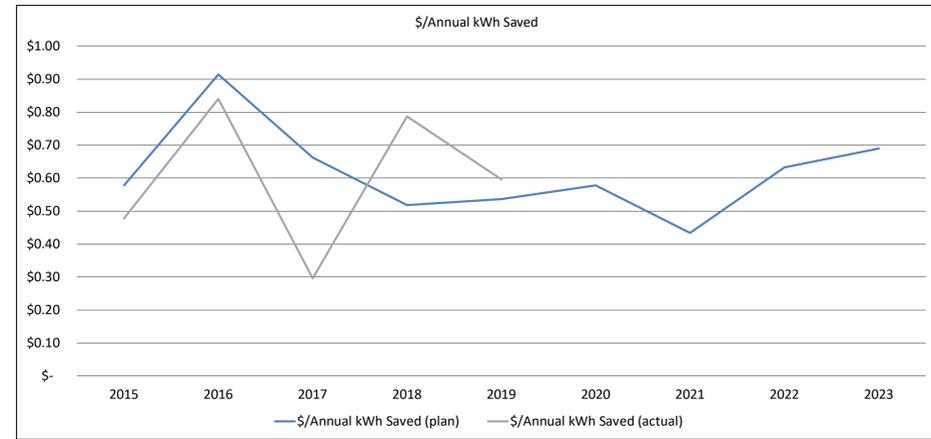


**Municipal**

<b>Planned</b>		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Electric Budget (plan)	\$ 222,573.69	\$ 219,875.76	\$ 476,528.53	\$ 218,878.38	\$ 220,642.18	\$ 265,229.65	\$ 204,700.00	\$ 196,125.91	\$ 193,235.58
	Total Annual Electric Savings (kWh) (plan)	\$ 385,143.71	\$ 240,506.33	\$ 718,947.37	\$ 422,166.66	\$ 411,529.39	\$ 459,247.22	\$ 471,428.57	\$ 310,000.00	\$ 280,000.00
	\$/Annual kWh Saved (plan)	\$ 0.58	\$ 0.91	\$ 0.66	\$ 0.52	\$ 0.54	\$ 0.58	\$ 0.43	\$ 0.63	\$ 0.69
2)	Total Electric Budget	\$ 222,573.69	\$ 219,875.76	\$ 476,528.53	\$ 218,878.38	\$ 220,642.18	\$ 265,229.65	\$ 204,700.00	\$ 196,125.91	\$ 193,235.58
	Total kW saved	\$ 67.76	\$ 26.00	\$ 126.85	\$ 26.69	\$ 9.93	\$ 18.98	\$ 157.03	\$ 111.17	\$ 123.78
	\$/kW saved (plan)	\$ 3,284.93	\$ 8,458.38	\$ 3,756.54	\$ 8,200.67	\$ 22,229.35	\$ 13,976.44	\$ 1,303.56	\$ 1,764.17	\$ 1,561.17
3)	Total Electric Budget	\$ 222,573.69	\$ 219,875.76	\$ 476,528.53	\$ 218,878.38	\$ 220,642.18	\$ 265,229.65	\$ 204,700.00	\$ 196,125.91	\$ 193,235.58
	Total Fuel Neutral MMBtu Saved	\$ 161.40	\$ 231.00	\$ 300.00	\$ 90.00	\$ 90.00	\$ 50.00	\$ 100.00	\$ 200.00	\$ 200.00
	\$/Total Fuel Neutral MMBtu Saved (plan)	\$ 1,379.02	\$ 951.84	\$ 1,588.43	\$ 2,431.98	\$ 2,451.58	\$ 5,304.59	\$ 2,047.00	\$ 980.63	\$ 966.18

<b>Actuals</b>		2015	2016	2017	2018	2019
1)	Total Electric Spending (actual)	\$ 142,709.48	\$ 134,368.59	\$ 386,763.00	\$ 224,879.42	\$ 264,183.17
	Total Annual Electric Savings (kWh) (actual)	\$ 298,503.00	\$ 159,791.00	\$ 1,303,245.00	\$ 285,855.00	\$ 443,486.44
	\$/Annual kWh Saved (actual)	\$ 0.48	\$ 0.84	\$ 0.30	\$ 0.79	\$ 0.60
2)	Total Electric Spending	\$ 142,709.48	\$ 134,368.59	\$ 386,763.00	\$ 224,879.42	\$ 264,183.17
	Total kW saved	\$ 51.68	\$ 33.15	\$ 269.98	\$ 61.96	\$ 12.51
	\$/kW saved (actual)	\$ 2,761.20	\$ 4,053.33	\$ 1,432.55	\$ 3,629.30	\$ 21,118.97
3)	Total Electric Spending	\$ 142,709.48	\$ 134,368.59	\$ 386,763.00	\$ 224,879.42	\$ 264,183.17
	Total Fuel Neutral MMBtu Saved	\$ -	\$ 579.10	\$ -	\$ -	\$ -
	\$/Total Fuel Neutral MMBtu Saved (actual)	\$ -	\$ 232.03	\$ -	\$ -	\$ -



Program Cost-Effectiveness - 2021 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.08	0.87	1.08	1,646.7	1,331.1	1,646.7	1,523.6	-	-	-	-	-	369	7,107.8	154,908.8
A1 - Energy Star Homes	1.07	0.91	0.80	1,110.3	945.0	1,364.9	1,039.3	673.4	-	-	-	-	98	4,465.7	111,641.9
A2 - Home Performance with Energy Star	1.70	1.47	1.90	2,055.1	1,775.5	2,546.4	1,205.8	133.5	6.4	142.3	-	3.5	768	11,064.2	200,161.9
A3 - Energy Star Products	1.92	1.66	1.33	1,869.2	1,620.5	2,330.7	975.8	780.0	24.7	407.9	8.3	(0.3)	1,623	11,065.6	187,594.4
A4 - Home Energy Reports	0.76	0.70	0.95	140.0	130.1	175.1	185.0	-	-	-	-	-	30,000	13,169.1	13,169.1
A6c - Res Education	-	-	-	-	-	-	60.2	-	-	-	-	-	-	-	-
A7 - Aerial Infrared Mapping	0.12	0.11	0.14	53.2	49.4	66.5	460.3	-	-	-	-	-	33,000	5,000.0	5,000.0
<b>Sub-Total Residential</b>	<b>1.26</b>	<b>1.07</b>	<b>1.16</b>	<b>6,874.6</b>	<b>5,851.6</b>	<b>8,130.3</b>	<b>5,449.9</b>	<b>1,586.9</b>	<b>31.0</b>	<b>550.1</b>	<b>8.3</b>	<b>3.2</b>	<b>98,858</b>	<b>51,872.2</b>	<b>672,476.1</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	4.55	4.00	2.56	8,278.6	7,277.5	9,874.1	1,818.5	2,037.6	-	-	-	-	207	76,164.6	913,272.3
C2 - Small Business Energy Solutions	2.63	2.08	1.83	4,296.2	3,400.6	5,051.8	1,633.1	1,121.5	9.5	152.2	1.9	1.7	1,080	25,848.9	453,388.5
C6c - C&I Education	-	-	-	-	-	-	60.6	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.58</b>	<b>3.04</b>	<b>2.24</b>	<b>12,574.7</b>	<b>10,678.2</b>	<b>14,925.8</b>	<b>3,512.3</b>	<b>3,159.1</b>	<b>9.5</b>	<b>152.2</b>	<b>1.9</b>	<b>1.7</b>	<b>1,287</b>	<b>102,013.5</b>	<b>1,366,660.8</b>
<b>Total</b>	<b>2.17</b>	<b>1.84</b>	<b>1.68</b>	<b>19,449.3</b>	<b>16,529.8</b>	<b>23,056.2</b>	<b>8,962.2</b>	<b>4,745.9</b>	<b>40.5</b>	<b>702.3</b>	<b>10.2</b>	<b>4.9</b>	<b>100,144</b>	<b>153,885.7</b>	<b>2,039,136.9</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	40,534	0.1%	<b>kWh &lt; 55%</b>	<b>Lifetime kWh Savings</b>	702,306	0.1%	<b>kWh &lt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	<u>45,099,455</u>	<u>99.9%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>597,612,058</u>	<u>99.9%</u>	
		<b>45,139,989</b>	100.0%			<b>598,314,364</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	0.88%							
				<b>Spending per Customer</b>	Low-Income	\$	283.40	
					Residential	\$	44.12	
					C&I	\$	240.27	

Present Value Benefits - 2021 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)											Non-Resource Benefits (\$000)			Environmental Benefits (\$000)					
				CAPACITY					ENERGY				Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits		Total Non-Resource Benefits				
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak	Summer Peak	Summer Off Peak	Electric DRIPE	Total Electric Benefit						Other Fuels	Water Benefit		
<b>Residential Programs</b>																							
B1 - Home Energy Assistance	\$ 1,647	\$ 1,331	\$ 1,647	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,331	\$ 8	\$ 1,340	\$ 212	\$ 95	\$ 307	\$ -
A1 - Energy Star Homes	\$ 1,110	\$ 945	\$ 1,365	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 945	\$ 3	\$ 948	\$ 162	\$ 255	\$ 417	\$ -
A2 - Home Performance with Energy Star	\$ 2,055	\$ 1,775	\$ 2,546	\$ 7	\$ -	\$ 7	\$ 6	\$ -	\$ 1	\$ 0	\$ 4	\$ 3	\$ 0	\$ 28	\$ 1,775	\$ 4	\$ 1,808	\$ 248	\$ 486	\$ 733	\$ 5	\$ -	
A3 - Energy Star Products	\$ 1,869	\$ 1,621	\$ 2,331	\$ (0)	\$ -	\$ (0)	\$ (0)	\$ -	\$ 14	\$ 17	\$ (1)	\$ (1)	\$ 2	\$ 29	\$ 1,621	\$ -	\$ 1,649	\$ 220	\$ 444	\$ 664	\$ 17	\$ -	
A4 - Home Energy Reports	\$ 140	\$ 130	\$ 175	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 130	\$ -	\$ 130	\$ 10	\$ 35	\$ 45	\$ -	\$ -	
A6c - Res Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A7 - Aerial Infrared Mapping	\$ 53	\$ 49	\$ 66	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 49	\$ -	\$ 49	\$ 4	\$ 13	\$ 17	\$ -	\$ -	
Sub-Total Residential	\$ 6,875	\$ 5,852	\$ 8,130	\$ 6	\$ -	\$ 6	\$ 5	\$ -	\$ 14	\$ 17	\$ 3	\$ 3	\$ 2	\$ 57	\$ 5,852	\$ 16	\$ 5,924	\$ 855	\$ 1,328	\$ 2,183	\$ 23	\$ -	
<b>Commercial/Industrial Programs</b>																							
C1 - Large Business Energy Solutions	\$ 8,279	\$ 7,278	\$ 9,874	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,278	\$ -	\$ 7,278	\$ 1,001	\$ 1,596	\$ 2,597	\$ -	\$ -	
C2 - Small Business Energy Solutions	\$ 4,296	\$ 3,401	\$ 5,052	\$ 2	\$ -	\$ 2	\$ 2	\$ -	\$ 4	\$ 4	\$ 1	\$ 1	\$ 1	\$ 17	\$ 3,401	\$ 320	\$ 3,737	\$ 559	\$ 749	\$ 1,308	\$ 6	\$ -	
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Commercial & Industrial	\$ 12,575	\$ 10,678	\$ 14,926	\$ 2	\$ -	\$ 2	\$ 2	\$ -	\$ 4	\$ 4	\$ 1	\$ 1	\$ 1	\$ 17	\$ 10,678	\$ 320	\$ 11,015	\$ 1,560	\$ 2,345	\$ 3,905	\$ 6	\$ -	
<b>Total</b>	\$ 19,449	\$ 16,530	\$ 23,056	\$ 8	\$ -	\$ 8	\$ 7	\$ -	\$ 18	\$ 21	\$ 5	\$ 4	\$ 2	\$ 74	\$ 16,530	\$ 336	\$ 16,939	\$ 2,415	\$ 3,673	\$ 6,088	\$ 29	\$ -	

Portfolio Planned Versus Actual Performance - 2021										
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source
1 Lifetime MMBtu Savings	2,039,137	1,325,439		-	2.475%	-	\$ 221,813	\$ 277,267	\$ -	Program Cost Effectiveness (Page 1 of 3)
2 Annual MMBtu Savings	153,886	100,026		-	1.100%	-	\$ 98,584	\$ 123,230	\$ -	Program Cost Effectiveness (Page 1 of 3)
3 Total Resource Benefits	\$ 16,939,053			-						Present Value Benefits (Page 2 of 3)
4 Total Utility Costs <sup>1</sup>	\$ 8,962,156			-						Program Cost Effectiveness (Page 1 of 3)
5 Net Benefits	\$ 7,976,897	\$ 5,184,983	\$ -	-	1.925%	-	\$ 172,522	\$ 215,652	\$ -	Line 5 minus line 6
6 Total					5.500%	-	\$ 492,919	\$ 616,148	\$ -	Sum of Rows 1, 2 & 5

	Granite State Test		Source
	Planned	Actual	
7 Total Benefits	\$ 19,449,324		Present Value Benefits (Page 2 of 3)
8 Performance Incentive	\$ 492,919	\$ -	Row 6
9 Total Utility Costs	\$ 8,962,156	\$ -	Row 4
10 Portfolio GST BCR	2.06	-	Row 7 Divided by Rows 8+9

*Costs, Benefits, and PI Expressed in 2021 Dollars.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Program Cost-Effectiveness - 2022 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.14	0.92	1.14	1,799.2	1,443.8	1,799.2	1,576.2	-	-	-	-	-	385	7,520.7	164,504.2
A1 - Energy Star Homes	1.24	1.05	0.97	1,406.2	1,186.4	1,725.9	1,131.8	646.4	-	-	-	-	116	5,488.1	137,202.3
A2 - Home Performance with Energy Star	1.81	1.56	2.02	2,296.2	1,969.7	2,841.1	1,266.2	142.3	6.9	153.0	-	3.8	802	12,031.8	217,262.4
A3 - Energy Star Products	2.05	1.76	1.41	2,085.2	1,792.8	2,597.3	1,017.6	819.3	28.4	471.1	9.5	(0.3)	1,743	11,961.2	203,036.5
A4 - Home Energy Reports	1.04	0.97	1.30	187.0	173.0	233.6	179.2	-	-	-	-	-	30,000	17,325.4	17,325.4
A6c - Res Education	-	-	-	-	-	-	65.1	-	-	-	-	-	-	-	-
A7 - Aerial Infrared Mapping	1.10	1.02	1.38	299.0	276.5	373.5	271.4	-	-	-	-	-	33,000	27,700.0	27,700.0
<b>Sub-Total Residential</b>	<b>1.47</b>	<b>1.24</b>	<b>1.35</b>	<b>8,072.8</b>	<b>6,842.1</b>	<b>9,570.6</b>	<b>5,507.5</b>	<b>1,608.0</b>	<b>35.3</b>	<b>624.1</b>	<b>9.5</b>	<b>3.5</b>	<b>66,046</b>	<b>82,027.3</b>	<b>767,030.8</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	4.87	4.24	2.76	9,399.3	8,188.0	11,194.4	1,930.9	2,123.4	-	-	-	-	218	81,402.1	1,005,446.2
C2 - Small Business Energy Solutions	2.74	2.16	1.92	4,836.3	3,820.0	5,684.2	1,768.0	1,191.0	9.7	155.6	2.0	1.7	1,127	28,289.5	498,466.6
C6c - C&I Education	-	-	-	-	-	-	65.2	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.78</b>	<b>3.19</b>	<b>2.38</b>	<b>14,235.6</b>	<b>12,008.0</b>	<b>16,878.6</b>	<b>3,764.1</b>	<b>3,314.4</b>	<b>9.7</b>	<b>155.6</b>	<b>2.0</b>	<b>1.7</b>	<b>1,345</b>	<b>109,691.6</b>	<b>1,503,912.8</b>
<b>Total</b>	<b>2.41</b>	<b>2.03</b>	<b>1.86</b>	<b>22,308.4</b>	<b>18,850.2</b>	<b>26,449.2</b>	<b>9,271.6</b>	<b>4,922.4</b>	<b>45.0</b>	<b>779.7</b>	<b>11.5</b>	<b>5.2</b>	<b>67,391</b>	<b>191,718.8</b>	<b>2,270,943.6</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	44,979	0.1%	<b>kWh &lt; 55%</b>	<b>Lifetime kWh Savings</b>	779,690	0.1%	<b>kWh &lt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	<u>56,187,246</u>	<u>99.9%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>665,547,887</u>	<u>99.9%</u>	
		<b>56,232,225</b>	100.0%			<b>666,327,577</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	1.09%			<b>Spending per Customer</b>	Low-Income	\$ 293.19		
					Residential	\$ 44.17		
					C&I	\$ 257.50		

Present Value Benefits - 2022 PLAN

	Total Benefits (\$000)			Resource Benefits (\$000)												Non-Resource Benefits (\$000)			Environmental Benefits (\$000)					
				CAPACITY						ENERGY				Non-Electric		Total Resource Benefits	Fossil Emissions	Other Non-Resource Benefits		Total Non-Resource Benefits				
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Summer Generation	Winter Generation	Transmission	Distribution	Reliability	Winter Peak	Winter Off Peak	Summer Peak	Summer Off Peak	Electric DRIPE	Total Electric Benefit	Other Fuels						Water Benefit			
<b>Residential Programs</b>																								
B1 - Home Energy Assistance	\$ 1,799	\$ 1,444	\$ 1,799	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,444	\$ 9	\$ 1,453	\$ 244	\$ 102	\$ 346	\$ -
A1 - Energy Star Homes	\$ 1,406	\$ 1,186	\$ 1,726	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,186	\$ 4	\$ 1,191	\$ 216	\$ 320	\$ 535	\$ -
A2 - Home Performance with Energy Star	\$ 2,296	\$ 1,970	\$ 2,841	\$ 8	\$ -	\$ 7	\$ 6	\$ -	\$ 1	\$ 0	\$ 5	\$ 4	\$ 0	\$ 31	\$ 1,970	\$ 4	\$ 2,005	\$ 291	\$ 539	\$ 830	\$ 6	\$ -	\$ 6	
A3 - Energy Star Products	\$ 2,085	\$ 1,793	\$ 2,597	\$ (1)	\$ -	\$ (1)	\$ (0)	\$ -	\$ 16	\$ 19	\$ (1)	\$ (1)	\$ 2	\$ 34	\$ 1,793	\$ -	\$ 1,827	\$ 258	\$ 492	\$ 750	\$ 20	\$ -	\$ -	
A4 - Home Energy Reports	\$ 187	\$ 173	\$ 234	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 173	\$ -	\$ 173	\$ 14	\$ 47	\$ 61	\$ -	\$ -	\$ -	
A6c - Res Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
A7 - Aerial Infrared Mapping	\$ 299	\$ 277	\$ 373	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 277	\$ -	\$ 277	\$ 22	\$ 74	\$ 97	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Residential</b>	<b>\$ 8,073</b>	<b>\$ 6,842</b>	<b>\$ 9,571</b>	<b>\$ 7</b>	<b>\$ -</b>	<b>\$ 7</b>	<b>\$ 6</b>	<b>\$ -</b>	<b>\$ 17</b>	<b>\$ 20</b>	<b>\$ 4</b>	<b>\$ 3</b>	<b>\$ 2</b>	<b>\$ 65</b>	<b>\$ 6,842</b>	<b>\$ 18</b>	<b>\$ 6,925</b>	<b>\$ 1,046</b>	<b>\$ 1,574</b>	<b>\$ 2,619</b>	<b>\$ 26</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Commercial/Industrial Programs</b>																								
C1 - Large Business Energy Solutions	\$ 9,399	\$ 8,188	\$ 11,194	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8,188	\$ -	\$ 8,188	\$ 1,211	\$ 1,795	\$ 3,006	\$ -	\$ -	\$ -	\$ -
C2 - Small Business Energy Solutions	\$ 4,836	\$ 3,820	\$ 5,684	\$ 2	\$ -	\$ 2	\$ 2	\$ -	\$ 4	\$ 4	\$ 1	\$ 1	\$ 1	\$ 17	\$ 3,820	\$ 332	\$ 4,169	\$ 667	\$ 841	\$ 1,509	\$ 7	\$ -	\$ -	\$ -
C6c - C&I Education	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total Commercial &amp; Industrial</b>	<b>\$ 14,236</b>	<b>\$ 12,008</b>	<b>\$ 16,879</b>	<b>\$ 2</b>	<b>\$ -</b>	<b>\$ 2</b>	<b>\$ 2</b>	<b>\$ -</b>	<b>\$ 4</b>	<b>\$ 4</b>	<b>\$ 1</b>	<b>\$ 1</b>	<b>\$ 1</b>	<b>\$ 17</b>	<b>\$ 12,008</b>	<b>\$ 332</b>	<b>\$ 12,357</b>	<b>\$ 1,878</b>	<b>\$ 2,636</b>	<b>\$ 4,515</b>	<b>\$ 7</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Total</b>	<b>\$ 22,308</b>	<b>\$ 18,850</b>	<b>\$ 26,449</b>	<b>\$ 9</b>	<b>\$ -</b>	<b>\$ 9</b>	<b>\$ 8</b>	<b>\$ -</b>	<b>\$ 21</b>	<b>\$ 24</b>	<b>\$ 5</b>	<b>\$ 4</b>	<b>\$ 3</b>	<b>\$ 83</b>	<b>\$ 18,850</b>	<b>\$ 349</b>	<b>\$ 19,283</b>	<b>\$ 2,924</b>	<b>\$ 4,210</b>	<b>\$ 7,134</b>	<b>\$ 32</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

Portfolio Planned Versus Actual Performance - 2022											
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source	
1 Lifetime MMBtu Savings	2,270,944	1,476,113		-	2.475%	-	\$ 229,472	\$ 286,840	\$ -	Program Cost Effectiveness (Page 1 of 3)	
2 Annual MMBtu Savings	191,719	124,617		-	1.100%	-	\$ 101,988	\$ 127,484	\$ -	Program Cost Effectiveness (Page 1 of 3)	
3 Total Resource Benefits	\$ 19,282,528			-						Present Value Benefits (Page 2 of 3)	
4 Total Utility Costs <sup>1</sup>	\$ 9,271,591			-						Program Cost Effectiveness (Page 1 of 3)	
5 Net Benefits	\$ 10,010,937	\$ 6,507,109	\$ -	-	1.925%	-	\$ 178,478	\$ 223,098	\$ -	Line 5 minus line 6	
6 Total					5.500%	-	\$ 509,938	\$ 637,422	\$ -	Sum of Rows 1, 2 & 5	

	Granite State Test		Source
	Planned	Actual	
7 Total Benefits	\$ 22,308,421		Present Value Benefits (Page 2 of 3)
8 Performance Incentive	\$ 509,938	\$ -	Row 6
9 Total Utility Costs	\$ 9,271,591	\$ -	Row 4
10 Portfolio GST BCR	2.28	-	Row 7 Divided by Rows 8+9

Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2022\$) is \$526,510.49.

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Program Cost-Effectiveness - 2023 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.20	0.95	1.20	2,018.8	1,606.6	2,018.8	1,683.1	-	-	-	-	-	410	8,138.1	179,184.7
A1 - Energy Star Homes	1.65	1.38	1.24	1,972.4	1,655.6	2,418.4	1,196.2	753.2	-	-	-	-	126	7,895.0	188,136.6
A2 - Home Performance with Energy Star	1.91	1.63	2.12	2,628.2	2,235.9	3,247.0	1,373.8	158.9	7.7	172.6	-	4.3	843	13,319.0	241,288.2
A3 - Energy Star Products	2.15	1.84	1.49	2,215.4	1,889.0	2,755.9	1,028.1	827.4	30.3	503.7	10.0	(0.3)	1,779	12,310.1	209,230.1
A4 - Home Energy Reports	1.81	1.67	2.26	313.9	289.1	391.8	173.5	-	-	-	-	-	30,000	28,410.0	28,410.0
A6c - Res Education	-	-	-	-	-	-	71.0	-	-	-	-	-	-	-	-
A7 - Aerial Infrared Mapping	1.16	1.07	1.45	306.0	281.9	382.0	262.9	-	-	-	-	-	33,000	27,700.0	27,700.0
<b>Sub-Total Residential</b>	<b>1.63</b>	<b>1.37</b>	<b>1.49</b>	<b>9,454.6</b>	<b>7,958.1</b>	<b>11,213.9</b>	<b>5,788.7</b>	<b>1,739.5</b>	<b>38.1</b>	<b>676.4</b>	<b>10.0</b>	<b>4.0</b>	<b>66,158</b>	<b>97,772.2</b>	<b>873,949.5</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	5.14	4.44	2.93	10,655.2	9,214.4	12,675.3	2,073.2	2,247.2	-	-	-	-	234	90,438.8	1,103,797.3
C2 - Small Business Energy Solutions	2.81	2.21	2.01	5,532.2	4,349.7	6,496.6	1,967.9	1,265.6	9.9	159.3	2.0	1.7	1,194	31,363.4	554,760.8
C6c - C&I Education	-	-	-	-	-	-	70.6	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.94</b>	<b>3.30</b>	<b>2.51</b>	<b>16,187.4</b>	<b>13,564.1</b>	<b>19,171.9</b>	<b>4,111.7</b>	<b>3,512.8</b>	<b>9.9</b>	<b>159.3</b>	<b>2.0</b>	<b>1.7</b>	<b>1,428</b>	<b>121,802.2</b>	<b>1,658,558.1</b>
<b>Total</b>	<b>2.59</b>	<b>2.17</b>	<b>2.01</b>	<b>25,642.0</b>	<b>21,522.2</b>	<b>30,385.8</b>	<b>9,900.4</b>	<b>5,252.3</b>	<b>48.0</b>	<b>835.7</b>	<b>12.0</b>	<b>5.7</b>	<b>67,586</b>	<b>219,574.4</b>	<b>2,532,507.6</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	47,972	0.1%	<b>kWh &lt; 55%</b>	<b>Lifetime kWh Savings</b>	835,732	0.1%	<b>kWh &lt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	<u>64,350,897</u>	<u>99.9%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>742,204,727</u>	<u>99.9%</u>	
		<b>64,398,869</b>	100.0%			<b>743,040,459</b>	100.0%	
<b>Annual Savings as a % of 2019 Sales</b>	1.25%							
		<b>Spending per Customer</b>		Low-Income	\$	313.07		
				Residential	\$	46.13		
				C&I	\$	281.28		



Portfolio Planned Versus Actual Performance - 2023											
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	Planned PI	125% of Planned PI	Actual PI	Source	
1 Lifetime MMBtu Savings	2,532,508	1,646,130		-	2.475%	-	\$ 245,035	\$ 306,294	\$ -	Program Cost Effectiveness (Page 1 of 3)	
2 Annual MMBtu Savings	219,574	142,723		-	1.100%	-	\$ 108,905	\$ 136,131	\$ -	Program Cost Effectiveness (Page 1 of 3)	
3 Total Resource Benefits	\$ 21,991,998			-						Present Value Benefits (Page 2 of 3)	
4 Total Utility Costs <sup>1</sup>	\$ 9,900,418			-						Program Cost Effectiveness (Page 1 of 3)	
5 Net Benefits	\$ 12,091,579	\$ 7,859,526	\$ -	-	1.925%	-	\$ 190,583	\$ 238,229	\$ -	Line 5 minus line 6	
6 Total					5.500%	-	\$ 544,523	\$ 680,654	\$ -	Sum of Rows 1, 2 & 5	

	Granite State Test		Source
	Planned	Actual	
7 Total Benefits	\$ 25,642,001		Present Value Benefits (Page 2 of 3)
8 Performance Incentive	\$ 544,523	\$ -	Row 6
9 Total Utility Costs	\$ 9,900,418	\$ -	Row 4
10 Portfolio GST BCR	2.45	-	Row 7 Divided by Rows 8+9

*Costs, Benefits, and PI Expressed in 2021 Dollars. Nominal PI (2023\$) is \$580,492.17.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.

Program Cost-Effectiveness - 2021-2023 PLAN

	Benefit/Cost Ratios			Benefits (\$000)			Utility Costs (\$000 - 2021\$) <sup>2</sup>	Customer Costs (\$000 - 2021\$) <sup>2</sup>	Annual MWh Savings	Lifetime MWh Savings	Winter kW Savings	Summer kW Savings	Number of Customers Served	Annual MMBTU Savings	Lifetime MMBTU Savings
	Granite State Test	Utility Cost Test	Secondary Granite State Test	Granite State Test	Utility Cost Test	Secondary Granite State Test <sup>1</sup>									
<b>Residential Programs</b>															
B1 - Home Energy Assistance	1.14	0.92	1.14	5,464.7	4,381.4	5,464.7	4,782.8	-	-	-	-	-	1,165	22,766.5	498,597.6
A1 - Energy Star Homes	1.33	1.12	1.01	4,489.0	3,787.1	5,509.2	3,367.3	2,072.9	-	-	-	-	340	17,848.8	436,980.8
A2 - Home Performance with Energy Star	1.81	1.56	2.02	6,979.5	5,981.0	8,634.5	3,845.8	434.7	21.0	467.9	-	11.6	2,412	36,414.9	658,712.5
A3 - Energy Star Products	2.04	1.75	1.41	6,169.8	5,302.3	7,684.0	3,021.5	2,426.8	83.4	1,382.7	27.8	(0.9)	5,144	35,336.9	599,860.9
A4 - Home Energy Reports	1.19	1.10	1.49	640.9	592.2	800.4	537.7	-	-	-	-	-	90,000	58,904.5	58,904.5
A6c - Res Education	-	-	-	-	-	-	196.3	-	-	-	-	-	-	-	-
A7 - Aerial Infrared Mapping	0.66	0.61	0.83	658.2	607.8	821.9	994.6	-	-	-	-	-	99,000	60,400.0	60,400.0
<b>Sub-Total Residential</b>	<b>1.46</b>	<b>1.23</b>	<b>1.33</b>	<b>24,402.0</b>	<b>20,651.8</b>	<b>28,914.8</b>	<b>16,746.1</b>	<b>4,934.4</b>	<b>104.4</b>	<b>1,850.6</b>	<b>27.8</b>	<b>10.7</b>	<b>198,061</b>	<b>231,671.7</b>	<b>2,313,456.3</b>
<b>Commercial, Industrial &amp; Municipal</b>															
C1 - Large Business Energy Solutions	4.87	4.24	2.76	28,333.0	24,679.9	33,743.8	5,822.7	6,408.1	-	-	-	-	659	248,005.5	3,022,515.8
C2 - Small Business Energy Solutions	2.73	2.16	1.93	14,664.7	11,570.4	17,232.6	5,369.1	3,578.1	29.1	467.1	5.9	5.0	3,401	85,501.7	1,506,615.8
C6c - C&I Education	-	-	-	-	-	-	196.4	-	-	-	-	-	-	-	-
<b>Sub-Total Commercial &amp; Industrial</b>	<b>3.78</b>	<b>3.18</b>	<b>2.38</b>	<b>42,997.7</b>	<b>36,250.3</b>	<b>50,976.4</b>	<b>11,388.1</b>	<b>9,986.3</b>	<b>29.1</b>	<b>467.1</b>	<b>5.9</b>	<b>5.0</b>	<b>4,060</b>	<b>333,507.3</b>	<b>4,529,131.7</b>
<b>Total</b>	<b>2.40</b>	<b>2.02</b>	<b>1.86</b>	<b>67,399.7</b>	<b>56,902.1</b>	<b>79,891.2</b>	<b>28,134.2</b>	<b>14,920.7</b>	<b>133.5</b>	<b>2,317.7</b>	<b>33.7</b>	<b>15.7</b>	<b>202,121</b>	<b>565,178.9</b>	<b>6,842,588.0</b>

Notes:

(1) For the Secondary Granite State Test a 10% NEI adder is applied to total benefits excluding water.

(2) Utility and Customer Costs Expressed in 2021 Dollars

	<b>Annual kWh Savings</b>	133,486	0.1%	<b>kWh &lt; 55%</b>	<b>Lifetime kWh Savings</b>	2,317,728	0.1%	<b>kWh &lt; 55%</b>
	<b>Annual MMBTU Savings (in kWh)</b>	<u>165,637,597</u>	<u>99.9%</u>		<b>Lifetime MMBTU Savings (in kWh)</b>	<u>2,005,364,672</u>	<u>99.9%</u>	
		<b>165,771,083</b>	100.0%			<b>2,007,682,399</b>	100.0%	
<b>Cumulative Savings as a % of 2019 Sales</b>	3.22%							
<b>Spending per Customer</b>	Low-Income	\$	889.66					
	Residential	\$	134.42					
	C&I	\$	779.05					



Portfolio Planned Versus Actual Performance - 2021-2023											
Portfolio	Planned	Threshold	Actual	% of Plan	Design Coefficient	Actual Coefficient	125% of		Actual PI	Source	
							Planned PI	Planned PI			
1 Lifetime MMBtu Savings	6,842,588	4,447,682		-	2.475%	-	\$ 696,321	\$ 870,401	\$ -	Program Cost Effectiveness (Page 1 of 3)	
2 Annual MMBtu Savings	565,179	367,366		-	1.100%	-	\$ 309,476	\$ 386,845	\$ -	Program Cost Effectiveness (Page 1 of 3)	
3 Total Resource Benefits	\$ 58,213,578			-						Present Value Benefits (Page 2 of 3)	
4 Total Utility Costs <sup>1</sup>	\$ 28,134,166			-						Program Cost Effectiveness (Page 1 of 3)	
5 Net Benefits	\$ 30,079,413	\$ 19,551,618	\$ -	-	1.925%	-	\$ 541,583	\$ 676,978	\$ -	Line 5 minus line 6	
6 Total					5.500%	-	\$ 1,547,379	\$ 1,934,224	\$ -	Sum of Rows 1, 2 & 5	

	Granite State Test		Source
	Planned	Actual	
7 Total Benefits	\$ 67,399,747		Present Value Benefits (Page 2 of 3)
8 Performance Incentive	\$ 1,547,379	\$ -	Row 6
9 Total Utility Costs	\$ 28,134,166	\$ -	Row 4
10 Portfolio GST BCR	2.27	-	Row 7 Divided by Rows 8+9

*Costs, Benefits, and PI Expressed in 2021 Dollars. Three-year nominal PI is \$1,599,921.24.*

<sup>1</sup> Note that in order to avoid a circular reference in the calculation of performance incentive, "Total Utility Costs" does not include the value of PI.





Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023		
Aza - HPwES (Weatherization)	Air Sealing, Gas	G21AZw001	56	60	68	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	0.6	0.6	0.7	8.5	9.1	10.3	-	-	-	0.3	0.4	0.4	787.9	847.5	956.2	12,101.8	13,016.3	14,886.3
Aza - HPwES (Weatherization)	Faucet Aerator, Gas	G21AZw002	1	1	1	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Hand Held Showerhead, Gas	G21AZw003	56	60	68	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Insulation, Gas	G21AZw004	118	127	143	23	23	100%	100%	100%	99%	99%	99%	100%	100%	100%	5.8	6.3	7.1	133.8	143.9	162.4	-	-	-	3.5	3.9	4.28318	4,614.2	5,295.0	98,536.8	105,987.3	119,581.9	
Aza - HPwES (Weatherization)	LED Bulb, General Service Lamps	G21AZw005	6	7	7	5	5	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	LED Bulb, Linear	G21AZw006	-	-	-	-	-	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	LED Bulb, Other Specialty	G21AZw007	1	1	1	5	5	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	LED Bulb, Reflector	G21AZw008	1	1	1	5	5	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	LED Fixture	G21AZw009	-	-	-	-	-	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Low Flow Showerhead, Gas	G21AZw010	2	3	3	7	7	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Pipe Insulation - Hot Water, Gas	G21AZw011	7	8	9	20	20	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Baseload Audit - Electric Savings	G21AZw012	650	675	700	5	5	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Baseload Audit - Thermal Savings	G21AZw013	650	675	700	12	12	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aza - HPwES (Weatherization)	Visual Audit kWh Savings	G21AZw014	-	-	-	1	1	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azb - HPwES (HVAC Systems)	Boiler Replacement, Gas	G21AZb001	-	-	-	25	25	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azb - HPwES (HVAC Systems)	Furnace Replacement, Gas	G21AZb002	-	-	-	20	20	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azb - HPwES (HVAC Systems)	Programmable Thermostat, Gas	G21AZb003	51	52	53	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azb - HPwES (HVAC Systems)	WiFi Thermostat, Gas	G21AZb004	1,000	1,100	1,200	15	15	100%	100%	100%	99%	99%	99%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Home Performance with Energy Star Subtotal</b>																	<b>6.4</b>	<b>6.9</b>	<b>7.7</b>	<b>142.3</b>	<b>153.1</b>	<b>172.7</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3.5</b>	<b>3.8</b>	<b>4.3</b>	<b>11,864.2</b>	<b>12,931.8</b>	<b>15,319.0</b>	<b>209,161.6</b>	<b>217,262.4</b>	<b>243,285.2</b>

Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023			
A3b - ES Appliances	Early Replacement Boiler, FHW (EE 80 AFUE 80%-90%)	G21A3B001	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Early Replacement Boiler, FHW - Retirement: 90 AFUE (85%-90%)	G21A3B002	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Early Replacement Boiler, Steam - EE: 82%+ AFUE	G21A3B003	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Early Replacement Boiler, Steam - Retirement: 82%+ AFUE	G21A3B004	-	-	-	10	10	10	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Boiler Reset Controls	G21A3B005	1	1	1	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Condensing Boiler -> 90% AFUE (Up to 300 MBH)	G21A3B006	15	18	21	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Condensing Boiler -> 90% AFUE (Up to 300 MBH)	G21A3B007	110	120	124	19	19	19	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Furnace 95+ AFUE (<150) w/ECM Motor	G21A3B008	100	115	111	17	17	17	100%	100%	100%	100%	100%	100%	100%	100%	100%	16.8	19.3	18.6	285.6	328.4	317.0	4.9	5.6	5.4	-	-	-	-	-	-			
A3b - ES Appliances	Furnace 97+ AFUE (<150) w/ECM Motor	G21A3B009	80	90	104	17	17	17	100%	100%	100%	100%	100%	100%	100%	100%	100%	13.4	15.1	17.5	228.5	257.0	297.0	3.8	4.4	5.1	-	-	-	-	-	-			
A3b - ES Appliances	Heat Recovery Ventilator (-133 kWh penalty)	G21A3B010	1	1	1	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Programmable Thermostat	G21A3B011	100	110	111	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Indirect Water Heater (attached to ES FHW Boiler, Combined eff rating ->85% (EF--R2))	G21A3B012	20	24	26	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Integrated Water Heater w/Condensing Boiler -> 90% AFUE	G21A3B013	5	7	8	19	19	19	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Integrated Water Heater w/Condensing Boiler -> 90% AFUE	G21A3B014	170	180	190	19	19	19	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Condensing Water Heater, UEF of .80+	G21A3B015	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	ES Storage Water Heater, Mod Draw UEF .64+, High Draw UEF .68+	G21A3B016	-	-	-	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Tankless On-Demand Water Heater, -> .82	G21A3B017	-	-	-	19	19	19	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	Tankless On-Demand Water Heater, UEF .87+	G21A3B018	130	140	135	19	19	19	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
A3b - ES Appliances	WiFi Thermostat (Heating Only)	G21A3B019	891	937	847	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	(5.6)	(6.0)	(5.8)	(106.2)	(114.4)	(110.3)	(8.5)	(8.6)	(8.5)	(8.3)	(8.3)	(8.3)	(8.3)	(8.3)	(8.3)			
A3b - ES Appliances	WiFi Thermostat (Heating & Cooling)	G21A3B020	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<b>ES Products Subtotal</b>																		<b>24.7</b>	<b>28.4</b>	<b>30.3</b>	<b>407.9</b>	<b>471.1</b>	<b>503.7</b>	<b>8.3</b>	<b>9.5</b>	<b>10.0</b>	<b>(0.3)</b>	<b>(0.3)</b>	<b>(0.3)</b>	<b>11,965.1</b>	<b>11,961.2</b>	<b>12,318.1</b>	<b>187,994.4</b>	<b>203,036.5</b>	<b>209,230.1</b>





Subprogram	Measure	Measure ID	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023			
C1a - LCI Retrofit	Custom Large Hot Water Retro	G21C1a001	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
C1a - LCI Retrofit	Custom Large HVAC Retro	G21C1a002	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
C1a - LCI Retrofit	Custom Large Other Retro	G21C1a003	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
C1a - LCI Retrofit	Custom Large Process Retro	G21C1a004	19	19	20	13	13	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
C1a - LCI Retrofit	Faucet Aerator, Gas	G21C1a005	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Low Flow Showerhead With Thermostatic Valve, Gas	G21C1a006	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Low Flow Showerhead, Gas	G21C1a007	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Pipe Wrap - Hot Water, Gas	G21C1a008	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Pre-Rinse Spray Valve, Gas	G21C1a009	-	-	-	8	8	8	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Boiler Reset Controls, Gas	G21C1a010	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Boiler Tune-Up, Gas	G21C1a011	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Energy Management System, Gas	G21C1a012	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Pipe Insulation - Heating, Gas	G21C1a013	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Steam Trap, Gas	G21C1a014	17	18	21	6	6	6	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	Programmable Thermostat, Gas	G21C1a015	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1a - LCI Retrofit	WiFi Thermostat (Heating & Cooling)	G21C1a016	-	-	-	15	15	15	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1b - LCI New Equipment and Construction	Custom Large Hot Water New	G21C1b001	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1b - LCI New Equipment and Construction	Custom Large HVAC New	G21C1b002	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Custom Large Other New	G21C1b003	8	10	11	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Custom Large Process New	G21C1b004	-	-	-	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Boiler 1701 to 2000 MBH 90 AFUE, Gas	G21C1b005	5	5	5	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Boiler 1000 to 1700 MBH 90 AFUE, Gas	G21C1b006	2	3	4	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Boiler 500 to 999 MBH 90 AFUE, Gas	G21C1b007	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Boiler 301 to 499 MBH 90 AFUE, Gas	G21C1b008	6	7	7	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Boiler 100 to 299 MBH 90 AFUE, Gas	G21C1b009	-	-	-	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Boiler to 300 MBH 85 AFUE, Gas	G21C1b010	2	2	2	25	25	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C1b - LCI New Equipment and Construction	Combo Condensing Boiler / Water Heater, Gas	G21C1b011	-	-	-	20	20	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Combo Furnace / Water Heater, Gas	G21C1b012	-	-	-	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Condensing Unit Heater, Gas	G21C1b013	-	-	-	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Furnace w/ ECM 95 AFUE, Gas	G21C1b014	-	-	-	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Furnace w/ ECM 87 AFUE, Gas	G21C1b015	-	-	-	18	18	18	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Infrared Heater, Gas	G21C1b016	19	19	20	17	17	17	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Faucet Aerator, Gas	G21C1b017	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Low Flow Showerhead With Thermostatic Valve, Gas	G21C1b018	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Low Flow Showerhead, Gas	G21C1b019	-	-	-	7	7	7	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Pre-Rinse Spray Valve, Gas	G21C1b020	-	-	-	8	8	8	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Combination Oven, Gas	G21C1b021	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Convection Oven, Gas	G21C1b022	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Conveyor Oven, Gas	G21C1b023	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Fryer, Gas	G21C1b024	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Griddle, Gas	G21C1b025	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Rack Oven, Gas	G21C1b026	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	Steam Cooker, Gas	G21C1b027	-	-	-	12	12	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1b - LCI New Equipment and Construction	CMI Large New Construction Code Compliance	G21Aa028	1	1	1	2																													



**Liberty Utilities (EnergyNorth Natural Gas) Corp.**  
**Energy Efficiency Programs**  
**For Residential Non-Heating and Heating Classes**  
**November 1, 2020 - October 31, 2021**  
**Energy Efficiency Charge**

Liberty Utilities Gas  
 NHPUC Docket No. 20 - 092  
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Month	Actual or Forecast	Beginning Balance (Over)/Under	Residential DSM Rate Per Therm	DSM Collections	Forecasted DSM Expenditures	Actual DSM Expenditures		Incentive	Ending Balance (Over)/Under	Average Balance (Over)/Under	Interest Monthly Federal Prime Rate	Interest @ Fed Reserve Bank Loan Rate	Ending Bal. Plus Interest (Over)/Under	Forecasted Residential Therm Sales	Residential Therm Sales	# of Days
						Residential	Low-Income									
May 20	Actual	(110,032)	(\$0.0640)	(308,762)	316,259	109,664	57,347	15,562	(236,221)	(173,126)	3.25%	(1,204)	(237,425)	4,066,455	4,824,165	31
June 20	Actual	(237,425)	(\$0.0640)	(140,008)	316,259	229,611	9,424	15,562	(122,836)	(180,131)	3.25%	(1,207)	(124,043)	1,969,131	2,187,747	30
July 20	Forecast	(124,043)	(\$0.0640)	(71,801)	316,259	0	0	0	120,415	(1,814)	3.25%	(5)	120,410	1,121,890	0	31
August 20	Forecast	120,410	(\$0.0640)	(69,431)	316,259	0	0	0	367,239	243,825	3.25%	673	367,912	1,084,856	0	31
September 20	Forecast	367,912	(\$0.0640)	(102,761)	316,259	0	0	0	581,411	474,661	3.25%	1,268	582,679	1,605,635	0	30
October 20	Forecast	582,679	(\$0.0640)	(181,622)	316,259	0	0	0	717,316	649,997	3.25%	1,794	719,110	2,837,843	0	31
November 20	Forecast	719,110	(\$0.0831)	(573,541)	316,259	0	0	0	461,828	590,469	3.25%	1,577	463,405	6,901,820	0	30
December 20	Forecast	463,405	(\$0.0831)	(835,401)	316,259	0	0	0	(55,736)	203,835	3.25%	563	(55,173)	10,052,958	0	31
January 21	Forecast	(55,173)	(\$0.0831)	(960,762)	398,237	0	0	0	(617,698)	(336,436)	3.25%	(929)	(618,627)	11,561,514	0	31
February 21	Forecast	(618,627)	(\$0.0831)	(750,240)	398,237	0	0	0	(970,630)	(794,628)	3.25%	(1,981)	(972,611)	9,028,156	0	28
March 21	Forecast	(972,611)	(\$0.0831)	(727,444)	398,237	0	0	0	(1,301,819)	(1,137,215)	3.25%	(3,139)	(1,304,958)	8,753,844	0	31
April 21	Forecast	(1,304,958)	(\$0.0831)	(432,798)	398,237	0	0	0	(1,339,519)	(1,322,238)	3.25%	(3,532)	(1,343,051)	5,208,158	0	30
May 21	Forecast	(1,343,051)	(\$0.0831)	(241,118)	398,237	0	0	0	(1,185,932)	(1,264,492)	3.25%	(3,490)	(1,189,423)	2,901,545	0	31
June 21	Forecast	(1,189,423)	(\$0.0831)	(109,497)	398,237	0	0	0	(900,683)	(1,045,053)	3.25%	(2,792)	(903,475)	1,317,656	0	30
July 21	Forecast	(903,475)	(\$0.0831)	(80,574)	398,237	0	0	0	(585,812)	(744,643)	3.25%	(2,055)	(587,867)	969,602	0	31
August 21	Forecast	(587,867)	(\$0.0831)	(82,771)	398,237	0	0	0	(272,401)	(430,134)	3.25%	(1,187)	(273,588)	996,041	0	31
September 21	Forecast	(273,588)	(\$0.0831)	(149,205)	398,237	0	0	0	(24,556)	(149,072)	3.25%	(398)	(24,955)	1,795,484	0	30
October 21	Forecast	(24,955)	(\$0.0831)	(370,009)	398,237	0	0	0	3,273	(10,841)	3.25%	(30)	3,243	4,452,576	0	31
November 21	Forecast	3,243	(\$0.0831)	(573,541)	398,237	0	0	0	(172,061)	(84,409)	3.25%	(225)	(172,287)	6,901,820	0	30
December 21	Forecast	(172,287)	(\$0.0831)	(835,401)	398,237	0	0	0	(609,451)	(390,869)	3.25%	(1,079)	(610,529)	10,052,958	0	31

<b>Estimated Residential Conservation Charge</b>	
<b>Effective November 1, 2020 - October 31, 2021</b>	
Beginning Balance	\$ 719,110
Program Budget Nov 2020-Oct 2021	<b>4,614,887</b>
Projected Interest	(17,532)
Projected Budget with Interest	\$ 5,316,465
<b>Total Charges</b>	<b>\$ 5,316,465</b>
<b>Projected Therm Sales</b>	<b>63,939,354</b>
<b>Residential Rate</b>	<b>\$0.0831</b>
<b>Total Charges with Interest</b>	<b>\$ 5,316,465</b>
<b>Projected Therm Sales</b>	<b>63,939,354</b>
<b>Residential Rate</b>	<b>\$0.0831</b>

Residential Non Heating Therm Sales	0%	<b>711,615</b>	<b>699,327</b>	0%
Residential Heating Therm Sales	34%	<b>63,227,739</b>	<b>63,382,533</b>	36%
C&I Therm Sales	66%	<b>121,652,799</b>	<b>112,542,801</b>	64%
<b>Total Therm Sales</b>	100%	<b>185,592,152</b>	<b>176,624,661</b>	100%
		<u>Budget</u>	<u>Budget</u>	
		<b>2020</b>	<b>2021</b>	
Low-Income Program Budget		\$ 1,676,441	\$ 1,523,570	
Other Refund		-	-	
<b>Total Shared Budget</b>		<b>\$ 1,676,441</b>	<b>\$ 1,523,570</b>	
Residential Program Budget		\$ 2,962,415	\$ 3,926,326	
Residential Program Incentive		\$ 255,137	\$ 299,744	
<b>Total Residential Program Budget</b>		<b>\$ 3,217,552</b>	<b>\$ 4,226,070</b>	
Commercial/Industrial Program Budget		\$ 4,083,759	\$ 3,512,260	
Commercial/Industrial Program Incentive		\$ 224,607	\$ 193,174	
<b>Total Commercial/Industrial Program Budget</b>		<b>\$ 4,308,366</b>	<b>\$ 3,705,434</b>	
<b>Total Program Budget</b>		<b>\$ 9,202,359</b>	<b>\$ 9,455,074</b>	
Shared Expenses Allocation to Residential		\$ 577,560	\$ 552,772	
Shared Expenses Allocation to C&I		1,098,881	970,798	
<b>Total Allocated Shared Expenses</b>		<b>\$ 1,676,441</b>	<b>\$ 1,523,570</b>	
Total Residential (including allocation of Shared Budget)		\$ 3,795,112	\$ 4,778,842	
Total C&I (including allocation of Shared Budget)		<u>5,407,247</u>	<u>4,676,232</u>	
<b>Total Budget</b>		<b>\$ 9,202,359</b>	<b>\$ 9,455,074</b>	

Liberty Utilities (EnergyNorth Natural Gas) Corp.  
 Energy Efficiency Programs  
 For Commercial/Industrial Classes  
 November 1, 2020 - October 31, 2021  
 Energy Efficiency Charge

Liberty Utilities Gas  
 NHPUC Docket No. 20 - 092  
 Attachment I3 - September 1, 2020  
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Month	Actual or Forecast	Beginning Balance (Over)/Under	DSM Rate Per Therm	DSM Collections	Forecasted DSM Expenditures	Actual DSM Expenditures		Incentive	Ending Balance (Over)/Under	Average Balance (Over)/Under	Interest Fed Reserve Prime Rate	Interest @ Fed Reserve Bank Loan Rate	Ending Bal. Plus Interest (Over)/Under	Forecasted Commercial/Industrial Therm Sales	Actual Commercial/Industrial Therm Sales	# of Days
						C&I	Low-Income									
May 20	Actual	(628,844)	(\$0.0426)	(349,588)	455,607	177,056	76,019	14,422	(710,935)	(669,889)	3.25%	(1,116)	(712,051)	8,443,740	8,205,951	31
June 20	Actual	(712,051)	(\$0.0426)	(216,372)	455,607	227,776	12,493	14,422	(673,733)	(692,892)	3.25%	(1,119)	(674,851)	5,816,016	5,079,339	30
July 20	Forecast	(674,851)	(\$0.0426)	(188,185)	455,607	0	0		(407,429)	(541,140)	3.25%	(1,494)	(408,923)	4,417,480	0	31
August 20	Forecast	(408,923)	(\$0.0426)	(183,699)	455,607	0	0		(137,015)	(272,969)	3.25%	(753)	(137,768)	4,312,181	0	31
September 20	Forecast	(137,768)	(\$0.0426)	(203,791)	455,607	0	0		114,047	(11,861)	3.25%	(32)	114,015	4,783,833	0	30
October 20	Forecast	114,015	(\$0.0426)	(270,127)	455,607	0	0		299,495	206,755	3.25%	571	300,066	6,340,998	0	31
November 20	Forecast	300,066	(\$0.0441)	(504,827)	455,607	0	0		250,846	275,456	3.25%	736	251,582	11,447,324	0	30
December 20	Forecast	251,582	(\$0.0441)	(678,482)	455,607	0	0		28,707	140,144	3.25%	387	29,094	15,385,075	0	31
January 21	Forecast	29,094	(\$0.0441)	(768,610)	389,686	0	0		(349,831)	(160,369)	3.25%	(443)	(350,273)	17,428,801	0	31
February 21	Forecast	(350,273)	(\$0.0441)	(659,265)	389,686	0	0		(619,852)	(485,063)	3.25%	(1,209)	(621,062)	14,949,322	0	28
March 21	Forecast	(621,062)	(\$0.0441)	(580,130)	389,686	0	0		(811,506)	(716,284)	3.25%	(1,977)	(813,483)	13,154,881	0	31
April 21	Forecast	(813,483)	(\$0.0441)	(399,341)	389,686	0	0		(823,138)	(818,311)	3.25%	(2,186)	(825,324)	9,055,353	0	30
May 21	Forecast	(825,324)	(\$0.0441)	(294,904)	389,686	0	0		(730,542)	(777,933)	3.25%	(2,147)	(732,689)	6,687,163	0	31
June 21	Forecast	(732,689)	(\$0.0441)	(213,144)	389,686	0	0		(556,148)	(644,419)	3.25%	(1,721)	(557,869)	4,833,207	0	30
July 21	Forecast	(557,869)	(\$0.0441)	(200,426)	389,686	0	0		(368,609)	(463,239)	3.25%	(1,279)	(369,887)	4,544,800	0	31
August 21	Forecast	(369,887)	(\$0.0441)	(208,090)	389,686	0	0		(188,291)	(279,089)	3.25%	(770)	(189,062)	4,718,593	0	31
September 21	Forecast	(189,062)	(\$0.0441)	(241,904)	389,686	0	0		(41,279)	(115,171)	3.25%	(308)	(41,587)	5,485,342	0	30
October 21	Forecast	(41,587)	(\$0.0441)	(350,395)	389,686	0	0		(2,296)	(21,942)	3.25%	(61)	(2,357)	7,945,466	0	31
November 21	Forecast	(2,357)	(\$0.0441)	(504,827)	389,686	0	0		(117,498)	(59,927)	3.25%	(160)	(117,658)	11,447,324	0	30
December 21	Forecast	(117,658)	(\$0.0441)	(678,482)	389,686	0	0		(406,454)	(262,056)	3.25%	(723)	(407,177)	15,385,075	0	31

Estimated C&I Conservation Charge November 1, 2020 - October 31, 2021	
Beginning Balance	300,066
Program Budget Nov 2020-Oct 2021	<b>4,808,073</b>
Projected Interest	(10,978)
Program Budget with Interest	5,097,161
<b>Total Charges</b>	<b>\$5,097,161</b>
Projected Therm Sales	<b>115,635,325</b>
C&I Rate	\$0.0441
Total Charges with Interest	<b>\$5,099,518</b>
Projected Therm Sales	<b>115,635,325</b>
<b>C&amp;I Rate</b>	<b>\$0.0441</b>

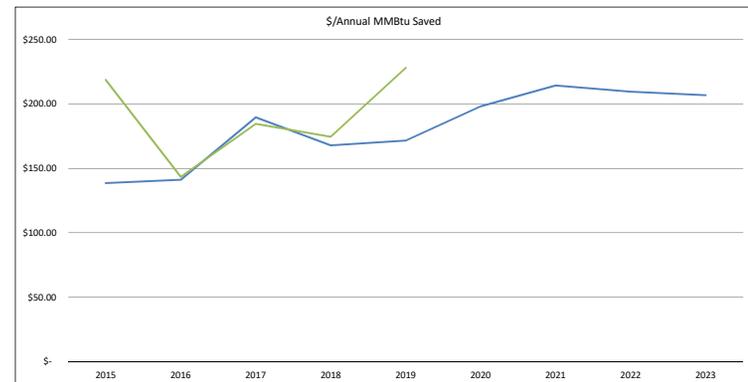
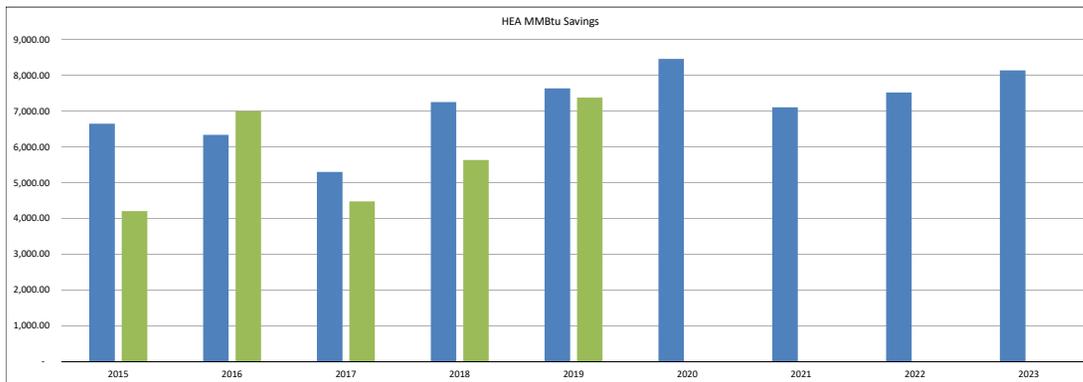
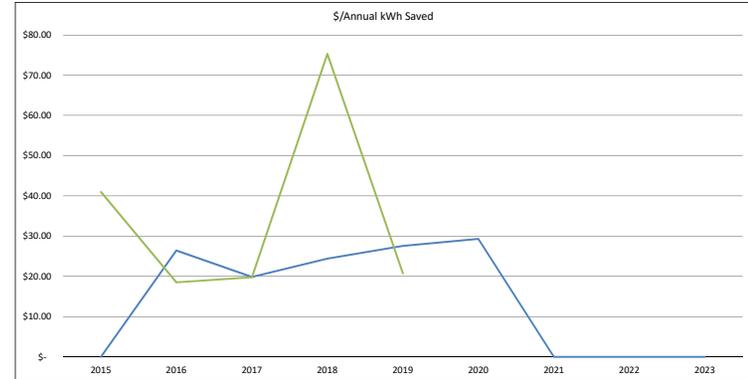
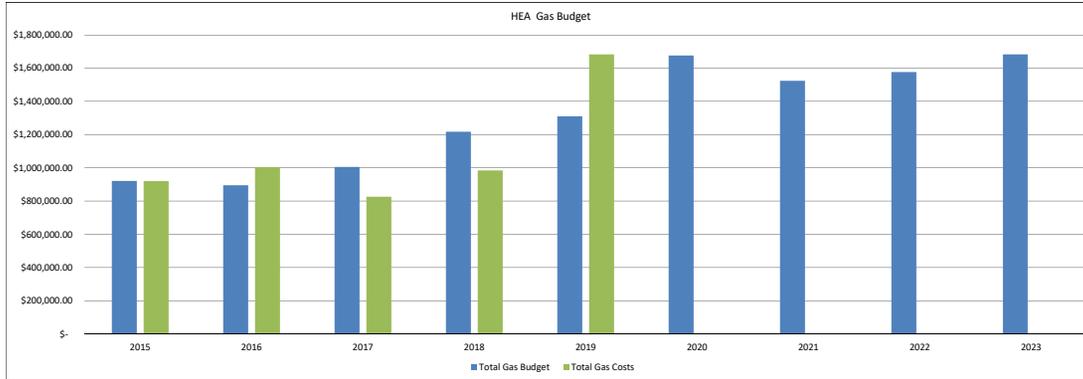
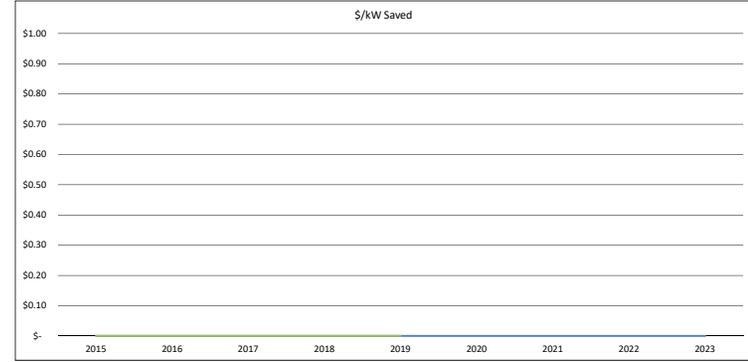
Liberty Utilities (EnergyNorth Natural Gas) Corp.  
**Energy Efficiency Programs**  
**For Residential and Commercial/Industrial Classes**  
**November 1, 2020 - October 31, 2021**  
**Energy Efficiency Charge**

Month	Actual or Forecast	Beginning Balance (Over)/Under	DSM Rate Per Therm	DSM Collections	Forecasted DSM Expenditures	Actual DSM Expenditures				Incentive	Ending Balance (Over)/Under	Average Balance (Over)/Under	Interest Plus Interest Prime Rate	Interest @ Fed Reserve Bank Loan Rate	Ending Bal. Plus Interest (Over)/Under	Forecasted Therm Sales	Actual Therm Sales	# of Days
						Residential	C&I	Low-Income	Total									
May 20	Actual	(738,875)	n/a	(658,351)	771,866	109,664	177,056	133,366	420,086	29,984	(947,156)	(843,016)	3.25%	(2,327)	(949,483)	12,333,808	12,290,578	31
June 20	Actual	(949,477)	n/a	(356,380)	771,866	229,611	227,776	21,917	479,305	29,984	(796,568)	(873,023)	3.25%	(2,332)	(798,901)	7,703,669	7,740,734	30
July 20	Forecast	(798,894)	n/a	(259,986)	771,866	0	0	0	0		(287,014)	(542,954)	3.25%	(1,499)	(288,512)	5,471,615	2,303,736	31
August 20	Forecast	(288,512)	n/a	(253,130)	771,866	0	0	0	0		230,224	(29,144)	3.25%	(80)	230,143	5,317,216	0	31
September 20	Forecast	230,143	n/a	(306,552)	771,866	0	0	0	0		695,458	462,801	3.25%	1,236	696,694	6,269,177	0	30
October 20	Forecast	696,694	n/a	(451,748)	771,866	0	0	0	0		1,016,811	856,753	3.25%	2,365	1,019,176	9,068,225	0	31
November 20	Forecast	1,019,176	n/a	(1,078,368)	771,866	0	0	0	0		712,674	865,925	3.25%	2,313	714,987	13,857,797	0	30
December 20	Forecast	714,987	n/a	(1,513,883)	771,866	0	0	0	0		(27,029)	343,979	3.25%	949	(26,080)	21,185,695	0	31
January 21	Forecast	(26,080)	n/a	(1,729,372)	787,923	0	0	0	0		(967,529)	(496,804)	3.25%	(1,371)	(968,900)	28,674,991	0	31
February 21	Forecast	(968,900)	n/a	(1,409,505)	787,923	0	0	0	0		(1,590,482)	(1,279,691)	3.25%	(3,190)	(1,593,673)	30,438,317	0	28
March 21	Forecast	(1,593,673)	n/a	(1,307,575)	787,923	0	0	0	0		(2,113,325)	(1,853,499)	3.25%	(5,116)	(2,118,441)	26,349,344	0	31
April 21	Forecast	(2,118,441)	n/a	(832,139)	787,923	0	0	0	0		(2,162,657)	(2,140,549)	3.25%	(5,718)	(2,168,375)	19,706,228	0	30
May 21	Forecast	(2,168,375)	n/a	(536,022)	787,923	0	0	0	0		(1,916,474)	(2,042,425)	3.25%	(5,638)	(1,922,112)	12,611,378	0	31
June 21	Forecast	(1,922,112)	n/a	(322,642)	787,923	0	0	0	0		(1,456,831)	(1,689,471)	3.25%	(4,513)	(1,461,344)	7,850,220	0	30
July 21	Forecast	(1,461,344)	n/a	(281,000)	787,923	0	0	0	0		(954,420)	(1,207,882)	3.25%	(3,334)	(957,755)	5,539,370	0	31
August 21	Forecast	(957,755)	n/a	(290,861)	787,923	0	0	0	0		(460,693)	(709,224)	3.25%	(1,958)	(462,650)	5,397,037	0	31
September 21	Forecast	(462,650)	n/a	(391,108)	787,923	0	0	0	0		(65,836)	(264,243)	3.25%	(706)	(66,542)	6,389,467	0	30
October 21	Forecast	(66,542)	n/a	(720,404)	787,923	0	0	0	0		977	(32,782)	3.25%	(90)	887	9,178,841	0	31
November 21	Forecast	887	n/a	(1,078,368)	787,923	0	0	0	0		(289,559)	(144,336)	3.25%	(386)	(289,944)	13,857,797	0	30
December 21	Forecast	(289,944)	n/a	(1,513,883)	787,923	0	0	0	0		(1,015,904)	(652,924)	3.25%	(1,802)	(1,017,707)	21,185,695	0	31

Residential (R-1 & R-3) and C & I Conservation Charge November 1, 2020 - October 31, 2021	
Beginning Balance	\$ 1,019,176
Program Budget Nov 2020-Oct 2021	\$ 9,422,960
Projected Interest	\$ (28,510)
Program Budget with Interest	\$ 10,413,627
<b>Total Charges</b>	<b>\$10,413,627</b>

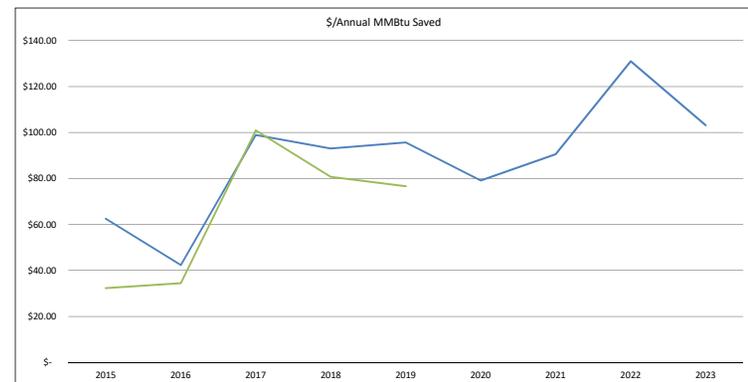
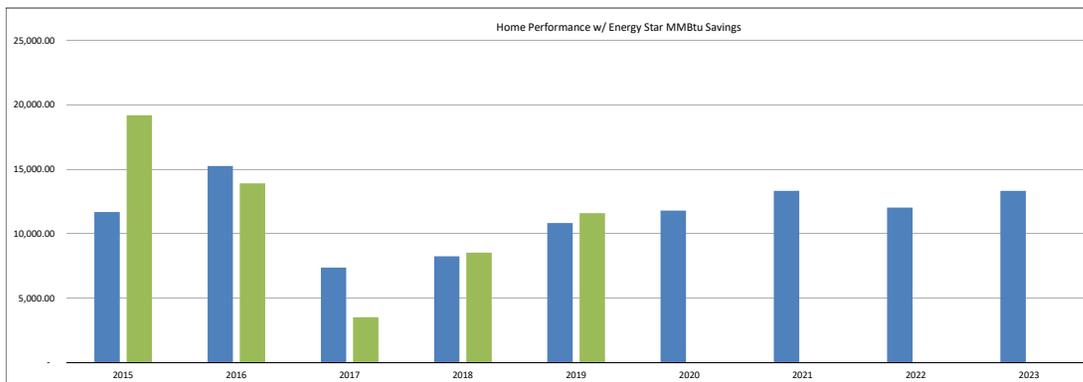
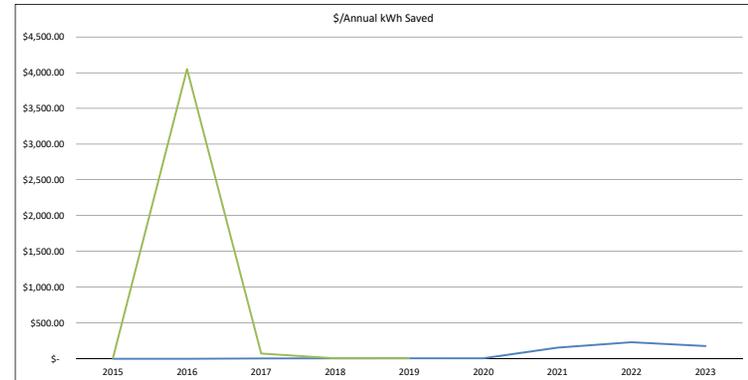
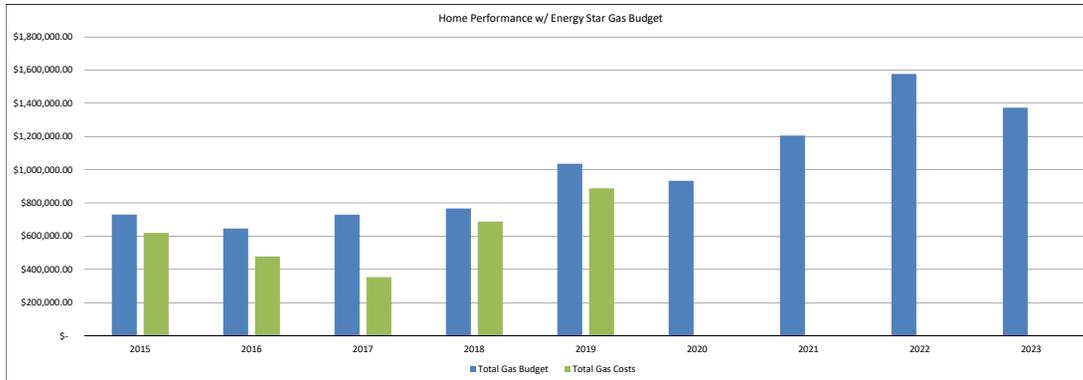
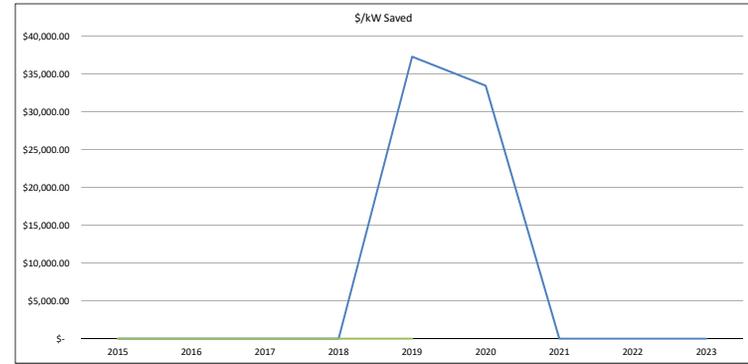
Home Energy Assistance

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Gas Budget	\$ 921,250.00	\$ 895,000.00	\$ 1,005,700.00	\$ 1,217,300.00	\$ 1,310,342.19	\$ 1,676,441.36	\$ 1,523,570.00	\$ 1,576,174.33	\$ 1,683,072.54
	Annual Electric Savings Plan (kWh)	\$ -	\$ 33,878.44	\$ 50,719.26	\$ 49,935.01	\$ 47,538.87	\$ 57,178.54	\$ -	\$ -	\$ -
	\$/Annual kWh Plan	\$ -	\$ 26.42	\$ 19.83	\$ 24.38	\$ 27.56	\$ 29.32	\$ -	\$ -	\$ -
2)	Total Gas Budget	\$ 921,250.00	\$ 895,000.00	\$ 1,005,700.00	\$ 1,217,300.00	\$ 1,310,342.19	\$ 1,676,441.36	\$ 1,523,570.00	\$ 1,576,174.33	\$ 1,683,072.54
	Total summer peak kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3)	Total Gas Budget	\$ 921,250.00	\$ 895,000.00	\$ 1,005,700.00	\$ 1,217,300.00	\$ 1,310,342.19	\$ 1,676,441.36	\$ 1,523,570.00	\$ 1,576,174.33	\$ 1,683,072.54
	Total Annual MMBtu Plan	6,650.66	6,338.51	5,302.03	7,252.46	7,636.96	8,460.12	7,107.75	7,520.70	8,138.08
	\$/Annual MMBtu Plan	\$ 138.52	\$ 141.20	\$ 189.68	\$ 167.85	\$ 171.58	\$ 198.16	\$ 214.35	\$ 209.58	\$ 206.81
<b>Home Energy Assistance</b>										
Actuals		2015	2016	2017	2018	2019				
1)	Total Gas Costs	\$ 919,750.53	\$ 1,003,642.21	\$ 826,371.23	\$ 984,076.99	\$ 1,683,151.63				
	Annual Electric Savings Actual (kWh)	22,452.20	54,303.44	41,805.90	13,069.01	81,247.30				
	\$/Annual kWh Actual	\$ 40.96	\$ 18.48	\$ 19.77	\$ 75.30	\$ 20.72				
2)	Total Gas Costs	\$ 919,750.53	\$ 1,003,642.21	\$ 826,371.23	\$ 984,076.99	\$ 1,683,151.63				
	Total summer peak kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
	\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3)	Total Gas Costs	\$ 919,750.53	\$ 1,003,642.21	\$ 826,371.23	\$ 984,076.99	\$ 1,683,151.63				
	Total Annual MMBtu Actual	4,206.13	6,997.88	4,476.14	5,636.02	7,377.76				
	\$/Annual MMBtu Actual	\$ 218.67	\$ 143.42	\$ 184.62	\$ 174.60	\$ 228.14				



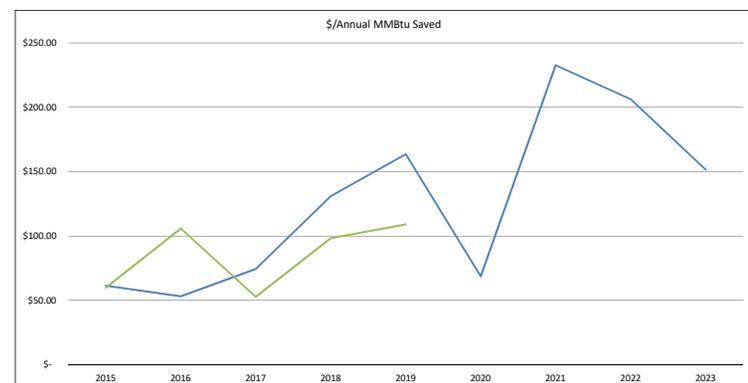
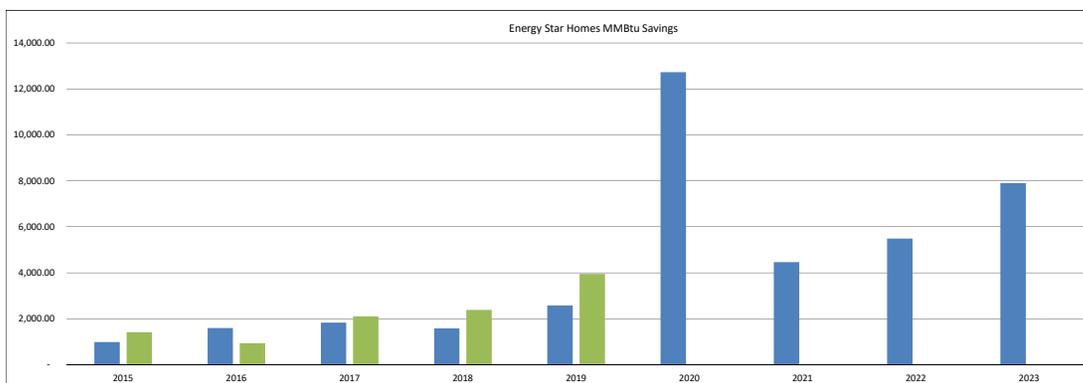
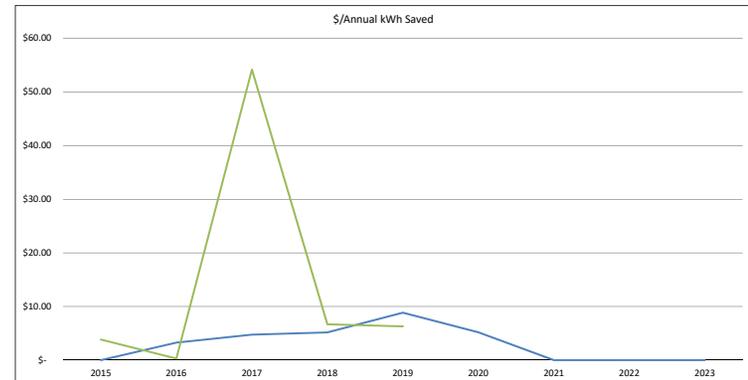
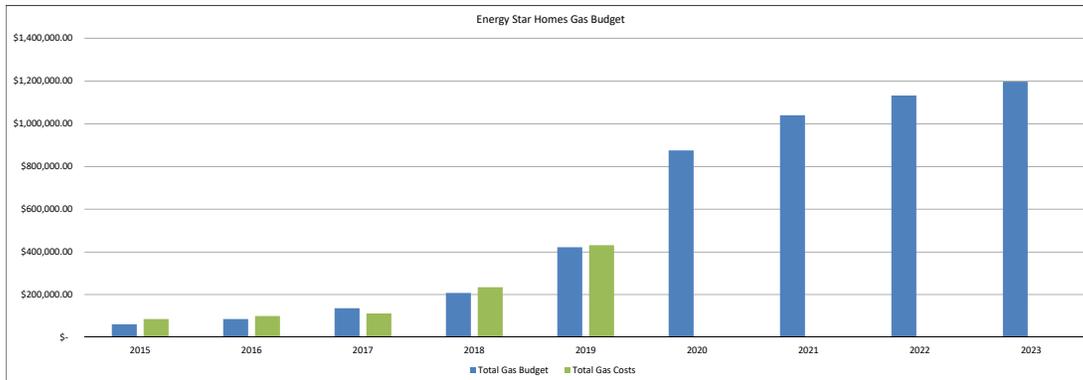
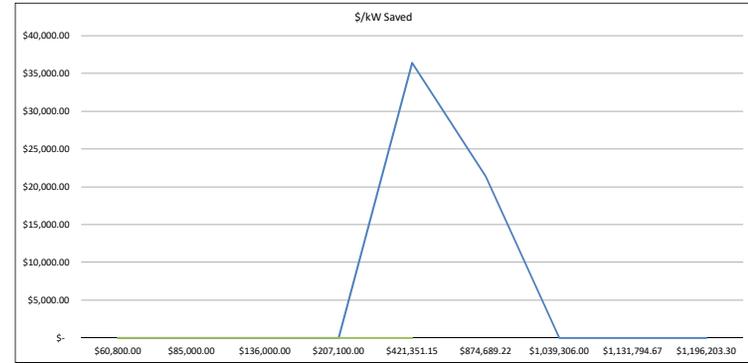
Home Performance w/Energy Star

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Gas Budget	\$ 730,157.00	\$ 645,815.00	\$ 729,200.00	\$ 767,160.00	\$ 1,035,751.28	\$ 933,161.78	\$ 1,205,798.00	\$ 1,576,174.33	\$ 1,373,780.23
	Annual Electric Savings Plan (kWh)	-	-	185,369.92	119,725.12	177,985.24	178,695.06	7,740.04	6,860.12	7,740.04
	\$/Annual kWh Plan	\$ -	\$ -	\$ 3.93	\$ 6.41	\$ 5.82	\$ 5.22	\$ 155.79	\$ 229.76	\$ 177.49
2)	Total Gas Budget	\$ 730,157.00	\$ 645,815.00	\$ 729,200.00	\$ 767,160.00	\$ 1,035,751.28	\$ 933,161.78	\$ 1,205,798.00	\$ 1,576,174.33	\$ 1,373,780.23
	Total summer peak kW Plan	-	-	-	-	27.77	27.88	-	-	-
	\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ 37,302.35	\$ 33,474.12	\$ -	\$ -	\$ -
3)	Total Gas Budget	\$ 730,157.00	\$ 645,815.00	\$ 729,200.00	\$ 767,160.00	\$ 1,035,751.28	\$ 933,161.78	\$ 1,205,798.00	\$ 1,576,174.33	\$ 1,373,780.23
	Total Annual MMBtu Plan	11,681.19	15,257.70	7,369.27	8,247.88	10,825.20	11,796.09	13,318.97	12,031.80	13,318.97
	\$/Annual MMBtu Plan	\$ 62.51	\$ 42.33	\$ 98.95	\$ 93.01	\$ 95.68	\$ 79.11	\$ 90.53	\$ 131.00	\$ 103.14
<b>Home Energy Assistance</b>										
Actuals		2015	2016	2017	2018	2019				
1)	Total Gas Costs	\$ 619,872.77	\$ 478,819.12	\$ 354,067.20	\$ 688,212.32	\$ 888,594.74				
	Annual Electric Savings Actual (kWh)	45,640.00	118.28	4,817.00	116,260.00	192,555.62				
	\$/Annual kWh Actual	\$ 13.58	\$ 4,048.30	\$ 73.50	\$ 5.92	\$ 4.61				
2)	Total Gas Costs	\$ 619,872.77	\$ 478,819.12	\$ 354,067.20	\$ 688,212.32	\$ 888,594.74				
	Total summer peak kW Actual	-	-	-	-	-				
	\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3)	Total Gas Costs	\$ 619,872.77	\$ 478,819.12	\$ 354,067.20	\$ 688,212.32	\$ 888,594.74				
	Total Annual MMBtu Actual	19,203.20	13,900.99	3,507.99	8,527.40	11,592.83				
	\$/Annual MMBtu Actual	\$ 32.28	\$ 34.44	\$ 100.93	\$ 80.71	\$ 76.65				



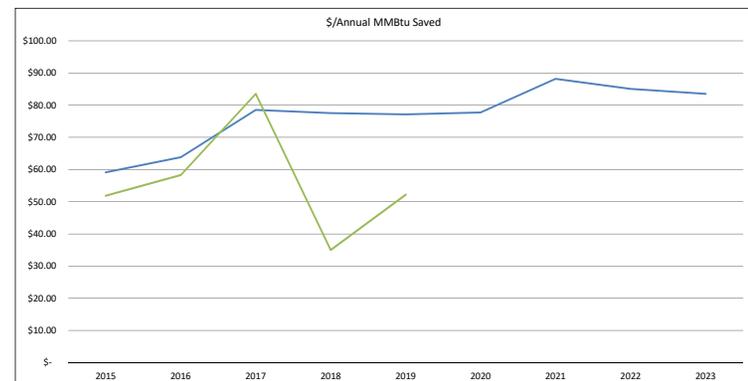
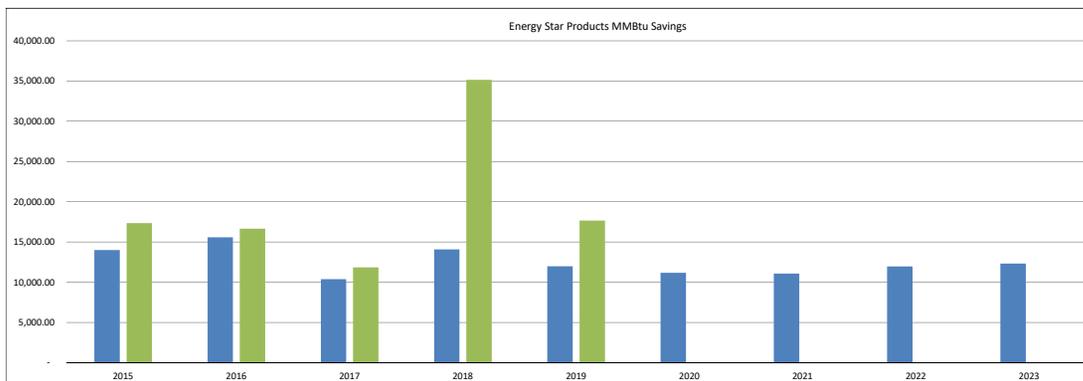
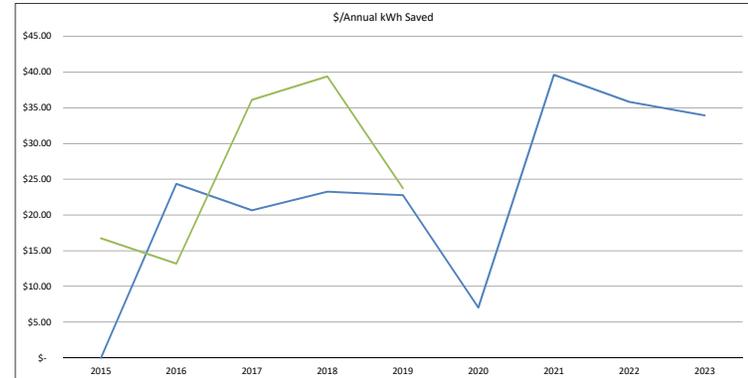
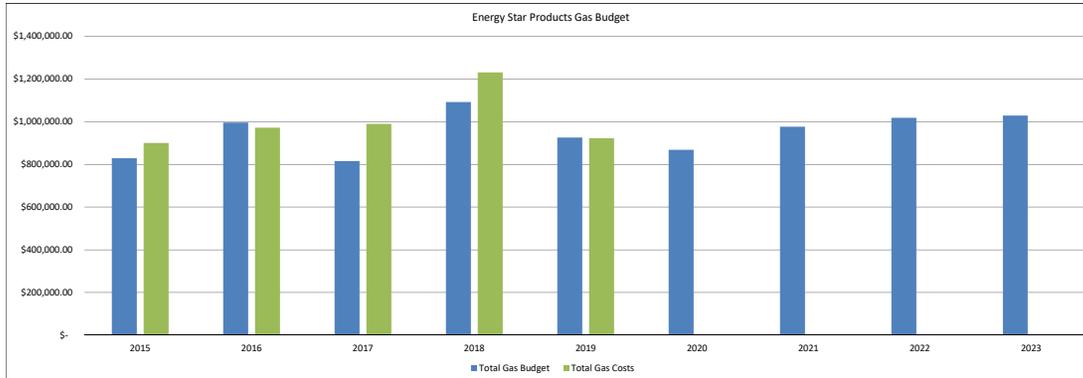
Energy Star Homes

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Gas Budget	\$ 60,800.00	\$ 85,000.00	\$ 136,000.00	\$ 207,100.00	\$ 421,351.15	\$ 874,689.22	\$ 1,039,306.00	\$ 1,131,794.67	\$ 1,196,203.30
	Annual Electric Savings Plan (kWh)	\$ -	\$ 26,098.44	\$ 28,722.49	\$ 40,277.27	\$ 47,700.96	\$ 168,486.15	\$ 5.19	\$ -	\$ -
	\$/Annual kWh Plan	\$ -	\$ 3.26	\$ 4.73	\$ 5.14	\$ 8.83	\$ 5.19	\$ -	\$ -	\$ -
2)	Total Gas Budget	\$ 60,800.00	\$ 85,000.00	\$ 136,000.00	\$ 207,100.00	\$ 421,351.15	\$ 874,689.22	\$ 1,039,306.00	\$ 1,131,794.67	\$ 1,196,203.30
	Total summer peak kW Plan	\$ -	\$ -	\$ -	\$ -	\$ 11.57	\$ 40.88	\$ -	\$ -	\$ -
	\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ 36,404.46	\$ 21,395.73	\$ -	\$ -	\$ -
3)	Total Gas Budget	\$ 60,800.00	\$ 85,000.00	\$ 136,000.00	\$ 207,100.00	\$ 421,351.15	\$ 874,689.22	\$ 1,039,306.00	\$ 1,131,794.67	\$ 1,196,203.30
	Total Annual MMBtu Plan	989.66	1,599.35	1,828.65	1,582.72	2,576.78	12,724.41	4,465.68	5,488.09	7,895.00
	\$/Annual MMBtu Plan	\$ 61.44	\$ 53.15	\$ 74.37	\$ 130.85	\$ 163.52	\$ 68.74	\$ 232.73	\$ 206.23	\$ 151.51
<b>Home Energy Assistance</b>										
Actuals		2015	2016	2017	2018	2019				
1)	Total Gas Costs	\$ 84,958.18	\$ 99,239.80	\$ 111,025.37	\$ 234,317.20	\$ 430,693.18				
	Annual Electric Savings Actual (kWh)	22,296.00	348,784.00	2,050.64	35,232.50	68,607.90				
	\$/Annual kWh Actual	\$ 3.81	\$ 0.28	\$ 54.14	\$ 6.65	\$ 6.28				
2)	Total Gas Costs	\$ 84,958.18	\$ 99,239.80	\$ 111,025.37	\$ 234,317.20	\$ 430,693.18				
	Total summer peak kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
	\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3)	Total Gas Costs	\$ 84,958.18	\$ 99,239.80	\$ 111,025.37	\$ 234,317.20	\$ 430,693.18				
	Total Annual MMBtu Actual	1,419.50	937.50	2,103.50	2,384.90	3,952.99				
	\$/Annual MMBtu Actual	\$ 59.85	\$ 105.86	\$ 52.78	\$ 98.25	\$ 108.95				



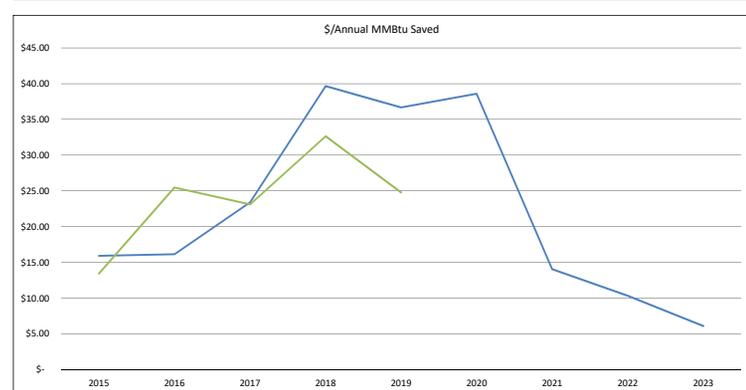
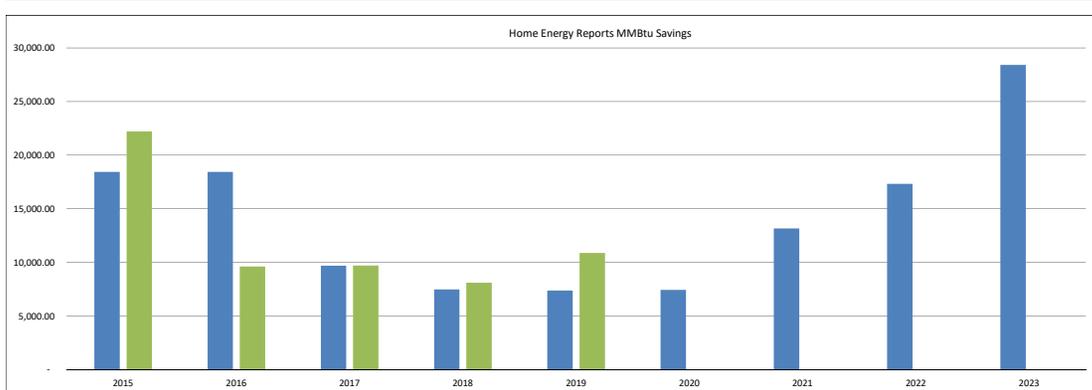
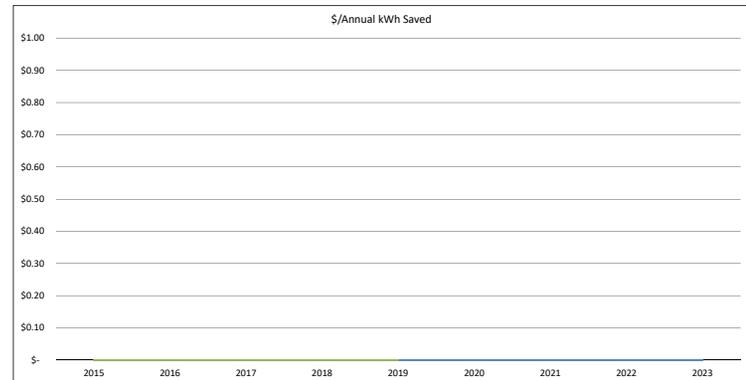
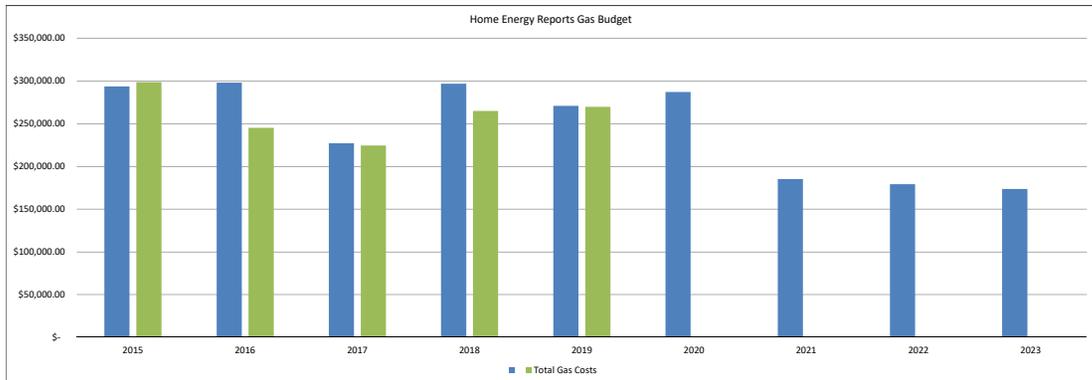
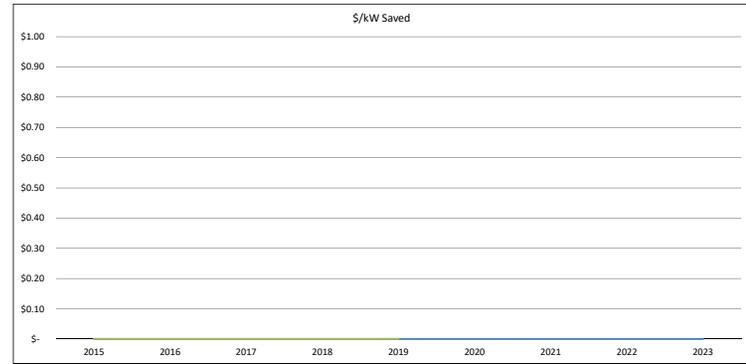
Energy Star Products

Planned	2015	2016	2017	2018	2019	2020	2021	2022	2023
1) Total Gas Budget	\$ 828,043.00	\$ 995,000.00	\$ 815,220.00	\$ 1,091,674.00	\$ 925,001.00	\$ 867,569.00	\$ 975,798.00	\$ 1,017,591.28	\$ 1,028,147.44
Annual Electric Savings Plan (kWh)	-	40,875.38	39,480.00	46,959.26	40,628.00	123,094.00	24,650.00	28,420.00	30,315.00
\$/Annual kWh Plan	\$ -	\$ 24.34	\$ 20.65	\$ 23.25	\$ 22.77	\$ 7.05	\$ 39.59	\$ 35.81	\$ 33.92
2) Total Gas Budget	\$ 828,043.00	\$ 995,000.00	\$ 815,220.00	\$ 1,091,674.00	\$ 925,001.00	\$ 867,569.00	\$ 975,798.00	\$ 1,017,591.28	\$ 1,028,147.44
Total summer peak kW Plan	-	-	-	-	-	-	(0.28)	(0.30)	(0.29)
\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3) Total Gas Budget	\$ 828,043.00	\$ 995,000.00	\$ 815,220.00	\$ 1,091,674.00	\$ 925,001.00	\$ 867,569.00	\$ 975,798.00	\$ 1,017,591.28	\$ 1,028,147.44
Total Annual MMBtu Plan	14,005.99	15,590.22	10,383.60	14,078.80	11,989.98	11,161.38	11,065.56	11,961.24	12,310.11
\$/Annual MMBtu Plan	\$ 59.12	\$ 63.82	\$ 78.51	\$ 77.54	\$ 77.15	\$ 77.73	\$ 88.18	\$ 85.07	\$ 83.52
<b>Home Energy Assistance</b>									
Actuals	2015	2016	2017	2018	2019				
1) Total Gas Costs	\$ 899,813.80	\$ 970,998.20	\$ 989,619.28	\$ 1,230,077.32	\$ 921,922.15				
Annual Electric Savings Actual (kWh)	53,802.80	73,636.72	27,419.00	31,248.00	38,843.00				
\$/Annual kWh Actual	\$ 16.72	\$ 13.19	\$ 36.09	\$ 39.36	\$ 23.73				
2) Total Gas Costs	\$ 899,813.80	\$ 970,998.20	\$ 989,619.28	\$ 1,230,077.32	\$ 921,922.15				
Total summer peak kW Actual	-	-	-	-	-				
\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3) Total Gas Costs	\$ 899,813.80	\$ 970,998.20	\$ 989,619.28	\$ 1,230,077.32	\$ 921,922.15				
Total Annual MMBtu Actual	17,351.10	16,657.70	11,845.70	35,151.30	17,650.50				
\$/Annual MMBtu Actual	\$ 51.86	\$ 58.29	\$ 83.54	\$ 34.99	\$ 52.23				



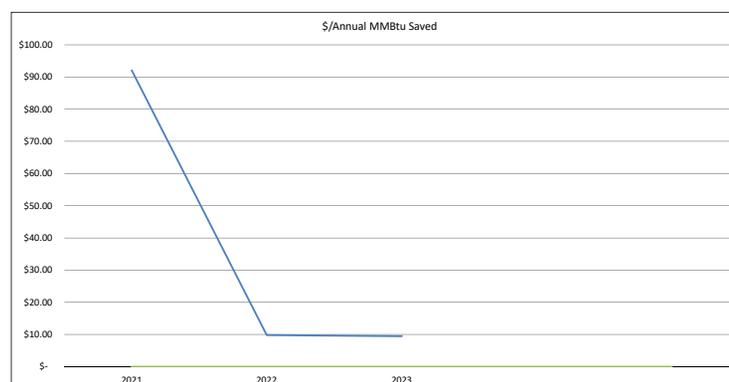
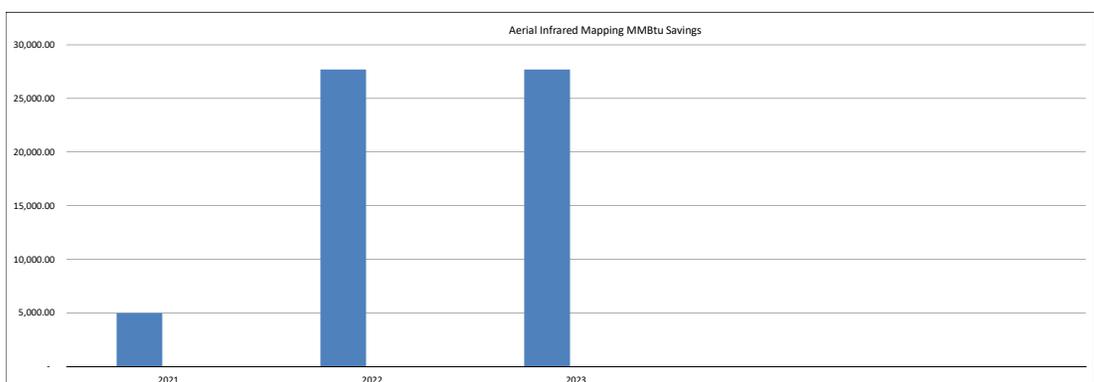
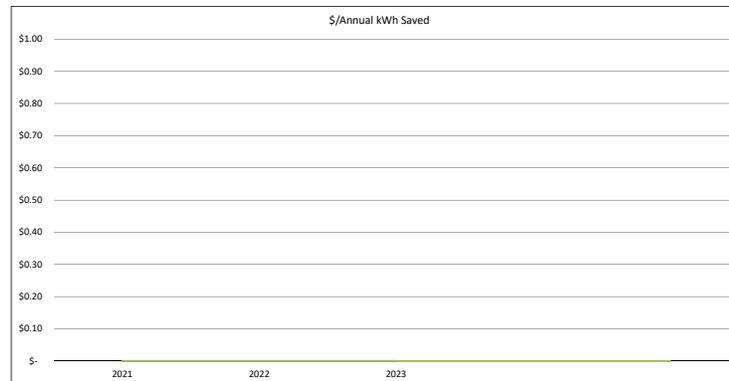
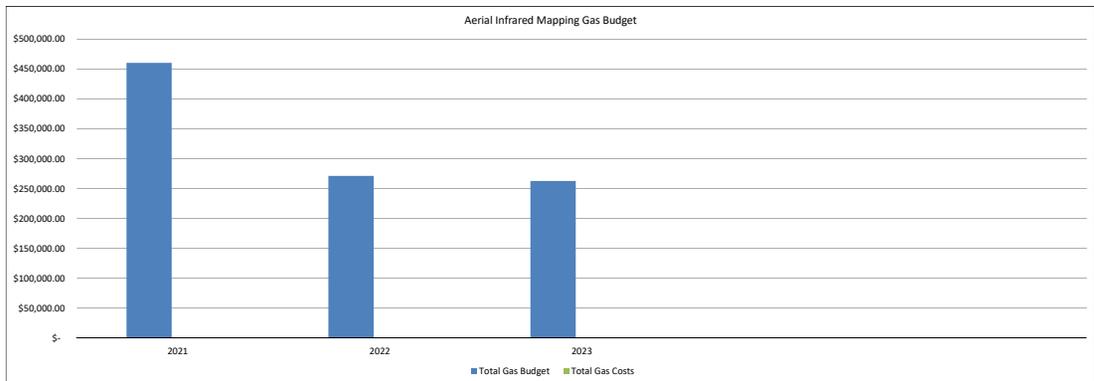
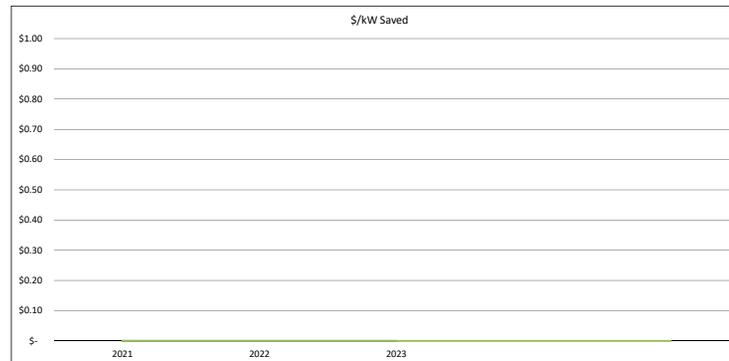
Home Energy Reports

<u>Planned</u>		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Gas Budget	\$ 293,550.00	\$ 298,000.00	\$ 227,000.00	\$ 296,600.00	\$ 270,764.00	\$ 286,994.54	\$ 185,000.00	\$ 179,176.76	\$ 173,536.81
	Annual Electric Savings Plan (kWh)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/Annual kWh Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2)	Total Gas Budget	\$ 293,550.00	\$ 298,000.00	\$ 227,000.00	\$ 296,600.00	\$ 270,764.00	\$ 286,994.54	\$ 185,000.00	\$ 179,176.76	\$ 173,536.81
	Total summer peak kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3)	Total Gas Budget	\$ 293,550.00	\$ 298,000.00	\$ 227,000.00	\$ 296,600.00	\$ 270,764.00	\$ 286,994.54	\$ 185,000.00	\$ 179,176.76	\$ 173,536.81
	Total Annual MMBtu Plan	\$ 18,440.10	\$ 18,440.10	\$ 9,700.00	\$ 7,480.00	\$ 7,384.00	\$ 7,438.20	\$ 13,169.10	\$ 17,325.42	\$ 28,410.00
	\$/Annual MMBtu Plan	\$ 15.92	\$ 16.16	\$ 23.40	\$ 39.65	\$ 36.67	\$ 38.58	\$ 14.05	\$ 10.34	\$ 6.11
<b>Home Energy Assistance</b>										
<u>Actuals</u>		2015	2016	2017	2018	2019				
1)	Total Gas Costs	\$ 298,541.76	\$ 245,049.37	\$ 224,349.60	\$ 264,913.58	\$ 269,754.70				
	Annual Electric Savings Actual (kWh)	\$ -	\$ -	\$ -	\$ -	\$ -				
	\$/Annual kWh Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
2)	Total Gas Costs	\$ 298,541.76	\$ 245,049.37	\$ 224,349.60	\$ 264,913.58	\$ 269,754.70				
	Total summer peak kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
	\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3)	Total Gas Costs	\$ 298,541.76	\$ 245,049.37	\$ 224,349.60	\$ 264,913.58	\$ 269,754.70				
	Total Annual MMBtu Actual	\$ 22,213.10	\$ 9,622.40	\$ 9,708.30	\$ 8,115.51	\$ 10,883.50				
	\$/Annual MMBtu Actual	\$ 13.44	\$ 25.47	\$ 23.11	\$ 32.64	\$ 24.79				



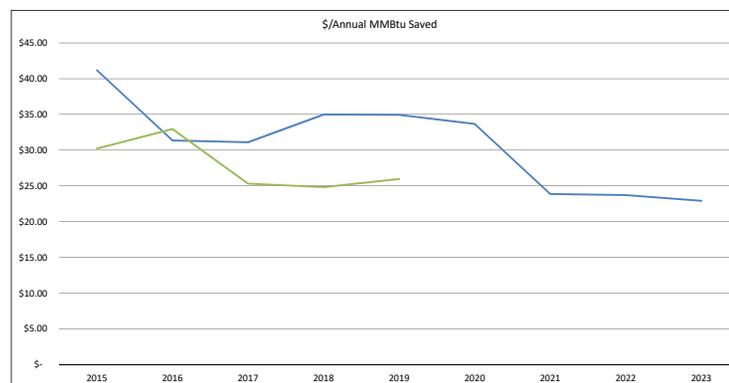
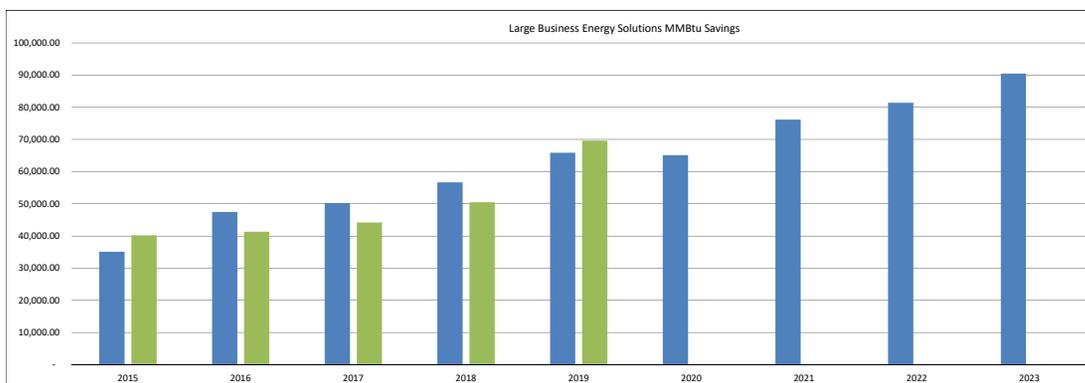
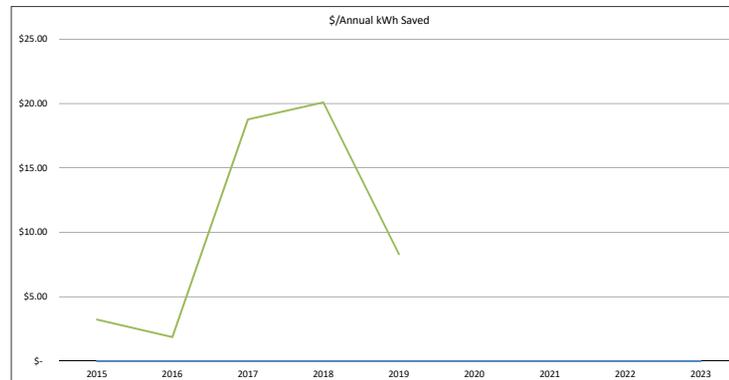
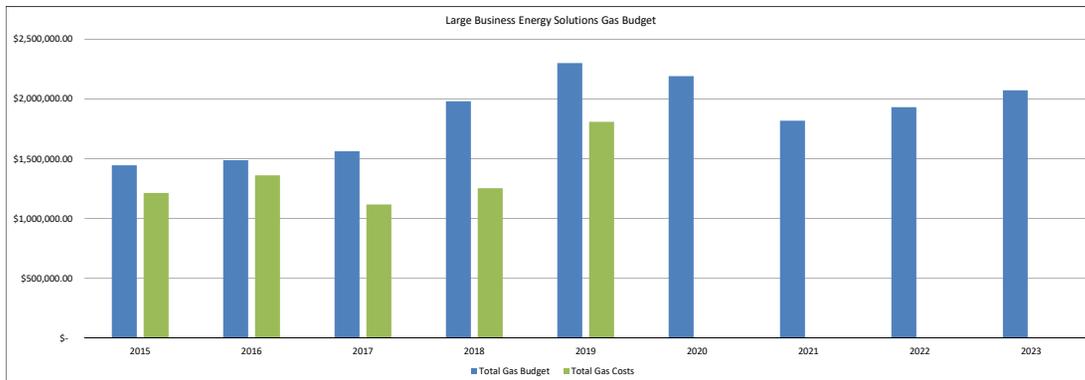
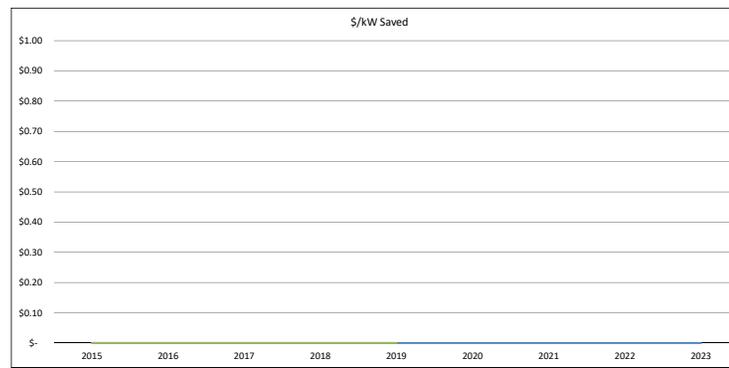
**Aerial Infrared Mapping**

<b>Planned</b>		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
1)	Total Gas Budget	n/a	n/a	n/a	n/a	n/a	n/a	\$ 460,250.00	\$ 271,428.57	\$ 262,884.81
	Annual Electric Savings Plan (kWh)	n/a	n/a	n/a	n/a	n/a	n/a	-	-	-
	\$/Annual kWh Plan	n/a	n/a	n/a	n/a	n/a	n/a	\$ -	\$ -	\$ -
2)	Total Gas Budget	n/a	n/a	n/a	n/a	n/a	n/a	\$ 460,250.00	\$ 271,428.57	\$ 262,884.81
	Total summer peak kW Plan	n/a	n/a	n/a	n/a	n/a	n/a	5.01	-	-
	\$/kW Plan	n/a	n/a	n/a	n/a	n/a	n/a	\$ -	\$ -	\$ -
3)	Total Gas Budget	n/a	n/a	n/a	n/a	n/a	n/a	\$ 460,250.00	\$ 271,428.57	\$ 262,884.81
	Total Annual MMBtu Plan	n/a	n/a	n/a	n/a	n/a	n/a	5,000.00	27,700.00	27,700.00
	\$/Annual MMBtu Plan	n/a	n/a	n/a	n/a	n/a	n/a	\$ 92.05	\$ 9.80	\$ 9.49
<b>Home Energy Assistance</b>										
<b>Actuals</b>		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>				
1)	Total Gas Costs	n/a	n/a	n/a	n/a	n/a				
	Annual Electric Savings Actual (kWh)	n/a	n/a	n/a	n/a	n/a				
	\$/Annual kWh Actual	n/a	n/a	n/a	n/a	n/a				
2)	Total Gas Costs	n/a	n/a	n/a	n/a	n/a				
	Total summer peak kW Actual	n/a	n/a	n/a	n/a	n/a				
	\$/kW Actual	n/a	n/a	n/a	n/a	n/a				
3)	Total Gas Costs	n/a	n/a	n/a	n/a	n/a				
	Total Annual MMBtu Actual	n/a	n/a	n/a	n/a	n/a				
	\$/Annual MMBtu Actual	n/a	n/a	n/a	n/a	n/a				



Large Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Gas Budget	\$ 1,445,300.00	\$ 1,488,000.00	\$ 1,563,100.00	\$ 1,981,418.00	\$ 2,300,303.00	\$ 2,190,676.00	\$ 1,818,540.00	\$ 1,930,920.10	\$ 2,073,193.60
	Annual Electric Savings Plan (kWh)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/Annual kWh Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2)	Total Gas Budget	\$ 1,445,300.00	\$ 1,488,000.00	\$ 1,563,100.00	\$ 1,981,418.00	\$ 2,300,303.00	\$ 2,190,676.00	\$ 1,818,540.00	\$ 1,930,920.10	\$ 2,073,193.60
	Total summer peak kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3)	Total Gas Budget	\$ 1,445,300.00	\$ 1,488,000.00	\$ 1,563,100.00	\$ 1,981,418.00	\$ 2,300,303.00	\$ 2,190,676.00	\$ 1,818,540.00	\$ 1,930,920.10	\$ 2,073,193.60
	Total Annual MMBtu Plan	\$ 35,112.28	\$ 47,470.90	\$ 50,253.00	\$ 56,640.57	\$ 65,862.90	\$ 65,052.48	\$ 76,164.60	\$ 81,402.11	\$ 90,438.81
	\$/Annual MMBtu Plan	\$ 41.16	\$ 31.35	\$ 31.10	\$ 34.98	\$ 34.93	\$ 33.68	\$ 23.88	\$ 23.72	\$ 22.92
<b>Home Energy Assistance</b>										
Actuals		2015	2016	2017	2018	2019				
1)	Total Gas Costs	\$ 1,213,707.03	\$ 1,362,062.88	\$ 1,118,669.97	\$ 1,253,657.27	\$ 1,808,918.19				
	Annual Electric Savings Actual (kWh)	\$ 376,025.00	\$ 730,766.77	\$ 59,599.14	\$ 62,399.00	\$ 217,971.00				
	\$/Annual kWh Actual	\$ 3.23	\$ 1.86	\$ 18.77	\$ 20.09	\$ 8.30				
2)	Total Gas Costs	\$ 1,213,707.03	\$ 1,362,062.88	\$ 1,118,669.97	\$ 1,253,657.27	\$ 1,808,918.19				
	Total summer peak kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
	\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3)	Total Gas Costs	\$ 1,213,707.03	\$ 1,362,062.88	\$ 1,118,669.97	\$ 1,253,657.27	\$ 1,808,918.19				
	Total Annual MMBtu Actual	\$ 40,175.50	\$ 41,329.60	\$ 44,189.10	\$ 50,500.29	\$ 69,643.09				
	\$/Annual MMBtu Actual	\$ 30.21	\$ 32.96	\$ 25.32	\$ 24.82	\$ 25.97				



Small Business Energy Solutions

Planned		2015	2016	2017	2018	2019	2020	2021	2022	2023
1)	Total Gas Budget	\$ 1,032,710.00	\$ 1,190,000.00	\$ 1,373,000.00	\$ 1,521,323.00	\$ 1,361,981.00	\$ 1,805,139.00	\$ 1,633,120.00	\$ 1,768,008.72	\$ 1,967,937.43
	Annual Electric Savings Plan (kWh)	-	2,352.00	1,344.00	-	-	-	9,506.44	9,699.30	9,917.02
	\$/Annual kWh Plan	\$ -	\$ 505.95	\$ 1,021.58	\$ -	\$ -	\$ -	\$ 171.79	\$ 182.28	\$ 198.44
2)	Total Gas Budget	\$ 1,032,710.00	\$ 1,190,000.00	\$ 1,373,000.00	\$ 1,521,323.00	\$ 1,361,981.00	\$ 1,805,139.00	\$ 1,633,120.00	\$ 1,768,008.72	\$ 1,967,937.43
	Total summer peak kW Plan	-	-	-	-	-	-	-	-	-
	\$/kW Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3)	Total Gas Budget	\$ 1,032,710.00	\$ 1,190,000.00	\$ 1,373,000.00	\$ 1,521,323.00	\$ 1,361,981.00	\$ 1,805,139.00	\$ 1,633,120.00	\$ 1,768,008.72	\$ 1,967,937.43
	Total Annual MMBtu Plan	\$ 19,194.68	\$ 17,647.10	\$ 38,717.41	\$ 34,789.57	\$ 31,804.20	\$ 30,789.02	\$ 25,848.88	\$ 28,289.47	\$ 31,363.40
	\$/Annual MMBtu Plan	\$ 53.80	\$ 67.43	\$ 35.46	\$ 43.73	\$ 42.82	\$ 58.63	\$ 63.18	\$ 62.50	\$ 62.75
<b>Home Energy Assistance</b>										
Actuals		2015	2016	2017	2018	2019				
1)	Total Gas Costs	\$ 1,129,097.52	\$ 795,988.77	\$ 852,560.30	\$ 1,226,552.32	\$ 1,389,859.77				
	Annual Electric Savings Actual (kWh)	316,732.00	17,924.79	90,646.55	66,362.00	31,344.00				
	\$/Annual kWh Actual	\$ 3.56	\$ 44.41	\$ 9.41	\$ 18.48	\$ 44.34				
2)	Total Gas Costs	\$ 1,129,097.52	\$ 795,988.77	\$ 852,560.30	\$ 1,226,552.32	\$ 1,389,859.77				
	Total summer peak kW Actual	-	-	-	-	-				
	\$/kW Actual	\$ -	\$ -	\$ -	\$ -	\$ -				
3)	Total Gas Costs	\$ 1,129,097.52	\$ 795,988.77	\$ 852,560.30	\$ 1,226,552.32	\$ 1,389,859.77				
	Total Annual MMBtu Actual	\$ 39,916.08	\$ 20,731.54	\$ 25,814.51	\$ 28,935.00	\$ 28,467.30				
	\$/Annual MMBtu Actual	\$ 28.29	\$ 38.40	\$ 33.03	\$ 42.39	\$ 48.82				

