



## **Cape Light Compact JPE**

### **Term Report on Energy Efficiency Activities for 2016–2018**

**Submitted to the  
Massachusetts Department of Public Utilities  
and the Massachusetts Department of Energy Resources  
August 1, 2019**

**Cape Light Compact JPE**

**D.P.U. 19-96**

**2016–2018 Energy Efficiency Term Report**

# TABLE OF CONTENTS

Table of Contents

Introduction

Part One – Data Tables

Part Two – Narrative

1. Core Initiative Variances & Cost-Effectiveness
  - A. Residential Programs
  - B. Low-Income Programs
  - C. Commercial and Industrial Programs
2. Low-Income Cost Allocation
3. Minimization of Administrative Costs
4. Competitive Procurement
5. Benefit-Cost Ratio Screening Tool
6. Statewide Technical Reference Manual/Library
7. Statewide Evaluation Studies Summary
  - A. Previously Submitted Evaluation Studies Incorporated by Reference
  - B. Annual Summary for Year Three (2018)
  - C. Summary of the Studies with the Most Significant Effects
  - D. Evaluation Studies Recommendations Table
8. Three-Year Costs
  - A. Invoice Summary Table
  - B. Sponsorships and Subscriptions
9. Performance Incentive Models
10. Active Demand Demonstration Summary

Appendix A Benefit-Cost Ratio Screening Tool

Appendix B Technical Reference Manual – 2018 Report Version

Appendix C Statewide Evaluation Studies Summary

Appendix D Evaluation Studies

Appendix E Summary of Evaluation Study Recommendations

Appendix F Invoice Summary Tables

Appendix G Sponsorships and Subscriptions

1. Introduction
2. Description of 2016–2018 Three-Year Sponsorships and Subscriptions

Appendix H Performance Incentive Models

Appendix I Active Demand Demonstration Summary

A. Statewide Summary

B. Meetings and Presentations

C. PA-Specific Summary of Demand Reduction Demonstration Projects and Proposals

Appendix CLC-1 Cape Light Compact Town Activity Reports

Appendix CLC-2 Cape Light Compact Energy Education Outreach Activities

## INTRODUCTION

The Cape Light Compact JPE (“Compact”) is pleased with the results of its 2016–2018 Three-Year Energy Efficiency Plan (“2016–2018 Three-Year Plan”), the third of such plans envisioned by the Green Communities Act (“GCA”) and approved by the Department of Public Utilities (“Department” or “DPU”). The Compact and the other Massachusetts Energy Efficiency Program Administrators (the “Program Administrators” or “PAs”) diligently implemented their respective plans over the past three years. Program Year 2018 continued to build on the nationally acclaimed accomplishments of the 2016 and 2017 plan-years and the two prior Three-Year Plans. Over the course of three years, the Compact’s programs showed remarkable success with respect to achievement of real benefits for the environment and the economy in the Commonwealth of Massachusetts. The Compact maintained a cost-effective portfolio throughout the three-year term, complying with the directives of the GCA in ensuring that it makes available all cost-effective energy efficiency opportunities.

The Compact’s successful energy efficiency programs implementation in 2016 and 2017 is described in the Compact’s 2016 Energy Efficiency Plan-Year Report (“2016 Plan-Year Report”) (D.P.U. 17-100) and the Compact’s 2017 Energy Efficiency Plan-Year Report (“2017 Plan-Year Report”) (D.P.U. 18-51), respectively. For 2018, the Compact enjoyed the following notable awards and accomplishments:

- 2018 ENERGY STAR Certified Homes Market Leader Award
- 2018 Advanced Rooftop Unit (“RTU”) Campaign Award for Commercial and Industrial HVAC program
- Orleans Energy Savers: In celebration of Earth Day 2018, the Compact and the Orleans Chamber of Commerce partnered to help small businesses and non-profits become more energy and fuel efficient. The initiative provided turn-key energy efficiency and fuel savings services to small businesses and non-profits in the Chamber’s membership.

The results for all three years of the 2016–2018 Three-Year Plan, presented in this 2016–2018 Term Report (“Term Report”), indicate that the Compact continues to offer successful energy efficiency programs. Over the three-year term, the Compact has achieved:

- cost-effective programs with a benefit-cost ratio (“BCR”) of 2.24;
- net benefits of \$166 million (2016\$);
- annual energy savings of 157 GWh;
- lifetime energy savings of 1,403 GWh;
- total benefits of \$300 million (2016\$); and
- program costs of \$105 million (\$ nominal).

**PART ONE – DATA TABLES**

# **Energy Efficiency Term Report Data Tables**

## **Overview**

*Cape Light Compact*

August 1, 2019

Cape Light Compact JPE  
D.P.U. 19-96  
2016-2018 Energy Efficiency Term Report  
August 1, 2019  
Part One, Page 1 of 33

## **DATA OVERVIEW**

The following data tables provide a summary of the Program Administrator's benefits, costs, savings, and cost-effectiveness for 2016 through 2018. The planned values are consistent with each Program Administrator's 2016-2018 Three-Year Plan. The preliminary and evaluated values are consistent with each Program Administrator's 2016-2018 Term Report.

## **USING THE DATA TABLES**

These Term Report data tables are in a pivot table format with set outputs based on the Department's direction in D.P.U. 11-120-B (June 2, 2016). Users can manipulate the data by using either the raw data included on the Master Data tab, or the Slicers shown on the Selections tab. The Slicers will update the comparisons between years and between reporting periods (planned, preliminary, or evaluated) on all tables except the Variance tables. The Variance tables are fixed for the three years in total, and the reporting period is consistent with the Department's direction.

## **CORRECTIONS TO 2016 AND 2017 DATA**

In performing a complete data review for this Term Report, the Program Administrators have updated certain limited data from previous years to correct errors. The data tables filed in this Term Report represent the final values for all three years. Additionally, updated Benefit-Cost Screening models for previous years that correspond to the final data tables are included at Appendix A.

## **SUPPORTING INFORMATION**

The data included in these tables is based on other supporting models. The primary supporting models used by the Program Administrators in the preparation of this 2016-2018 Term Report are the Benefit-Cost Screening model and the Performance Incentive model. These exhibits should be referenced when looking for more detailed analyses, such as measure-level savings. High-level summaries for each of these models are provided below.

### **Benefit-Cost Screening Models**

The Benefit-Cost Screening model provides measure level savings and benefits. This model uses the avoided cost values from the 2015 Avoided Energy Supply Cost study prepared by Tabors Caramanis Rudkevich.

### **Performance Incentive Model**

The Performance Incentive model filed as part of the Joint Statewide Three-Year Plan provides support for the performance incentive dollars proposed for collection by the Program Administrator. Final performance incentive amounts are based on the three-year term costs and benefits. Note that performance incentives are not applicable to the Cape Light Compact.

### **EM&V Activities**

The Evaluation, Monitoring & Verification ("EM&V") Section of the Joint Statewide Three-Year Plan describes in detail the EM&V activities planned for the term. The EMV section of each Program Administrator's Term Report summarizes the evaluation results completed in 2018. The Technical Reference Manual ("TRM") has been updated to account for recent evaluation results.

**Reference Material**  
**2016-2018 Term-Year Report**

Cape Light Compact  
 August 1, 2019

The PA-specific information below is referenced throughout the data tables.

**Current Filing Detail**

Distribution Fuel	Electric
Program Administrator	Cape Light Compact
Date of Filing	August 1, 2019

**Plan Term Filings**

Filings	Filing Date	DPU Docket
2016 Plan	December 21, 2015	D.P.U. 15-166
2017 Plan	December 21, 2015	D.P.U. 15-166
2018 Plan	December 21, 2015	D.P.U. 15-166
2016 Preliminary & Evaluated	May 1, 2017	D.P.U. 17-100
2017 Preliminary & Evaluated	June 8, 2018	D.P.U. 18-51
2018 Preliminary & Evaluated	August 1, 2019	D.P.U. 19-96

**Nominal Discount Rates**

2017 Nominal Discount Rate	2.54%
2018 Nominal Discount Rate	2.54%

**Plan Years**

Plan Year 1	2016
Plan Year 2	2017
Plan Year 3	2018

**GHG Emissions Reduction Factors (Short Tons)**

GHG per:	NOX	SO2	CO2
Electricity (MWh)	0.00016	0.00004	0.49400
Gas (Therm)			0.00585
Oil (MMBTU)			0.08069
Propane (MMBTU)			0.06959
Source:	File named "3-year plan EFs 8-9-18.xlsx"		



**Selections for Data Displayed in Tables**

**2016-2018 Term-Year Report**

Cape Light Compact  
August 1, 2019

Use the options in the boxes below to select the data shown and compared in the Term Report data tables.

Year(s) Displayed	
Selected options should match each other.	
<b>Year, Master Data</b>	<b>Year, Master Sec...</b>
2016	2016
2017	2017
2018	2018

Distribution Fuel Type Displayed	
Selected options should match each other.	
<b>Distribution Fuel...</b>	<b>Distribution Fuel...</b>
Electric	Electric
Gas	Gas

Reporting Periods Compared	
<i>First Comparison</i>	<i>Second Comparison</i>
<b>Reporting Period</b>	<b>Reporting Period</b>
Evaluated	Evaluated
Planned	Planned
Preliminary	Preliminary

Program Administrator Displayed	
Selected options should match each other.	
<b>PA, Master Data</b>	<b>PA, Master Sector</b>
Cape Light Compact	Cape Light Compact
Eversource	Eversource
National Grid	National Grid
Statewide Electric	Statewide Electric
Unitil	Unitil
Berkshire	
CMA	
Liberty	
Statewide Gas	

**Notes**

- To select more than one option, press the Control button while clicking on the option.
- If no data is included for a PA on the Master tabs, then the PA's name and distribution company may not appear in the above boxes. For example, if this is a PA-specific filing, then the other PAs names may not appear in the boxes for selection.
- Because there are two data sets (Master Data and Master Sector) there are two sets of slicers for the year, distribution fuel, and PA. The selected options should match each other to ensure the tables reflect consistent data throughout the workbook.
- For Reporting Periods, the First Comparison should always be Planned, and the Second Comparison should be either Preliminary or Evaluated.

2016-2018 Significant Variances												
Program	Program Costs (\$)			Lifetime Electric Savings (MWh)			Total Resource Benefits (2016\$)			Total Benefits (2016\$)		
	Planned	Actual	Planned v. Actual (%)	Planned	Preliminary	Planned v. Preliminary (%)	Planned	Preliminary	Planned v. Preliminary (%)	Preliminary	Evaluated	Preliminary v. Evaluated (%)
<b>A - Residential</b>	<b>67,887,786</b>	<b>67,682,666</b>	<b>0%</b>	<b>610,325</b>	<b>1,137,277</b>	<b>86%</b>	<b>163,776,518</b>	<b>208,333,859</b>	<b>27%</b>	<b>242,493,234</b>	<b>188,917,016</b>	<b>-22%</b>
A1 - Residential Whole House	50,686,681	47,476,749	-6%	277,289	495,478	79%	127,852,837	141,965,146	11%	171,711,335	133,234,060	-22%
A1a - Residential New Construction	1,384,357	2,275,904	<b>64%</b>	35,606	167,398	370%	7,365,698	30,597,038	315%	31,848,771	10,099,948	<b>-68%</b>
A1b - Residential Multi-Family Retrofit	2,318,768	1,615,194	<b>-30%</b>	15,917	13,547	<b>-15%</b>	2,068,005	1,585,338	<b>-23%</b>	2,326,945	2,676,288	<b>15%</b>
A1c - Residential Home Energy Services - Measures	40,753,722	38,329,885	-6%	222,228	313,635	41%	117,712,580	109,590,773	-7%	137,342,200	120,273,004	<b>-12%</b>
A1d - Residential Home Energy Services - RCS	5,250,037	4,886,409	-7%	-	-	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	979,797	369,358	<b>-62%</b>	3,537	899	<b>-75%</b>	706,554	191,996	<b>-73%</b>	193,419	184,820	-4%
A2 - Residential Products	12,662,554	15,307,669	21%	333,037	641,800	93%	35,923,681	66,368,713	85%	70,781,899	55,682,956	-21%
A2a - Residential Heating & Cooling Equipment	5,792,237	4,804,978	<b>-17%</b>	61,699	59,290	-4%	7,634,442	7,361,295	-4%	7,829,690	7,680,556	-2%
A2b - Residential Consumer Products	1,114,585	1,767,601	<b>59%</b>	20,711	38,023	84%	3,001,049	5,866,683	95%	5,866,683	5,827,850	-1%
A2c - Residential Lighting	5,755,733	8,735,090	<b>52%</b>	250,627	544,486	117%	25,288,190	53,140,736	110%	57,085,527	42,174,550	<b>-26%</b>
A3 - Residential Hard-to-Measure	4,538,550	4,898,248	8%	-	-	-	-	-	-	-	-	-
<b>B - Low-Income</b>	<b>13,466,775</b>	<b>8,545,867</b>	<b>-37%</b>	<b>55,469</b>	<b>55,644</b>	<b>0%</b>	<b>27,842,660</b>	<b>12,367,160</b>	<b>-56%</b>	<b>15,406,713</b>	<b>17,487,252</b>	<b>14%</b>
B1 - Low-Income Whole House	13,145,672	8,301,186	-37%	55,469	55,644	0%	27,842,660	12,367,160	-56%	15,406,713	17,487,252	14%
B1a - Low-Income Single Family Retrofit	9,056,754	5,276,378	<b>-42%</b>	41,008	39,318	-4%	14,737,416	9,896,578	<b>-33%</b>	12,058,215	13,798,323	<b>14%</b>
B1b - Low-Income Multi-Family Retrofit	4,088,918	3,024,807	<b>-26%</b>	14,461	16,326	13%	13,105,244	2,470,582	<b>-81%</b>	3,348,498	3,688,929	<b>10%</b>
B2 - Low-Income Hard-to-Measure	321,103	244,681	-24%	-	-	-	-	-	-	-	-	-
<b>C - Commercial &amp; Industrial</b>	<b>45,966,511</b>	<b>28,526,892</b>	<b>-38%</b>	<b>1,025,967</b>	<b>572,552</b>	<b>-44%</b>	<b>151,567,960</b>	<b>80,248,981</b>	<b>-47%</b>	<b>96,795,098</b>	<b>94,088,637</b>	<b>-3%</b>
C1 - C&I New Construction	4,402,273	3,186,412	-28%	134,599	63,238	-53%	13,783,062	8,343,122	-39%	8,343,122	8,277,787	-1%
C1a - C&I New Buildings & Major Renovations	3,166,606	2,052,151	<b>-35%</b>	27,346	27,673	1%	3,874,283	3,852,346	-1%	3,852,346	4,055,090	5%
C1b - C&I Initial Purchase & End of Useful Life	1,235,667	1,134,261	-8%	107,253	35,565	<b>-67%</b>	9,908,779	4,490,775	<b>-55%</b>	4,490,775	4,222,698	-6%
C2 - C&I Retrofit	40,548,023	24,873,530	-39%	891,368	509,314	-43%	137,784,898	71,905,859	-48%	88,451,976	85,810,850	-3%
C2a - C&I Existing Building Retrofit	10,795,292	10,033,439	-7%	181,336	225,747	24%	25,628,139	31,199,655	22%	40,839,071	40,662,321	0%
C2b - C&I Small Business	22,421,832	11,782,397	<b>-47%</b>	394,006	155,910	<b>-60%</b>	70,382,709	23,262,804	<b>-67%</b>	27,561,191	26,675,289	-3%
C2c - C&I Multifamily Retrofit	2,317,888	628,770	<b>-73%</b>	15,976	3,134	<b>-80%</b>	2,051,029	357,671	<b>-83%</b>	460,423	582,538	<b>27%</b>
C2d - C&I Upstream Lighting	5,013,011	2,428,924	<b>-52%</b>	300,050	124,523	<b>-58%</b>	39,723,021	17,085,729	<b>-57%</b>	19,591,291	17,890,702	-9%
C3 - C&I Hard-to-Measure	1,016,215	466,950	-54%	-	-	-	-	-	-	-	-	-
<b>Grand Total</b>	<b>127,321,073</b>	<b>104,755,424</b>	<b>-18%</b>	<b>1,691,761</b>	<b>1,765,473</b>	<b>4%</b>	<b>343,187,138</b>	<b>300,950,000</b>	<b>-12%</b>	<b>354,695,044</b>	<b>300,492,906</b>	<b>-15%</b>

**Notes**

- Program Costs are presented in nominal dollars (2016\$, 2017\$, 2018\$). Benefits are presented in real dollars (2016\$).
- Significant variances, for which explanation are provided, are defined as:
  - (1) variances between planned and actual core initiative budget of ten percent or greater
  - (2) variances between planned and preliminary core initiative total lifetime savings showing a decrease of ten percent or greater
  - (3) variances between planned and preliminary core initiative total resource benefits showing a decrease of ten percent or greater
  - (4) variances between preliminary and evaluated core initiative total benefits of ten percent or greater.
- Cells highlighted teal in the above table indicate the Program Administrator has provided an explanation in its Term Report.

**Program Administrator Budget**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Planned Program Administrator Budget									
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs			
<b>A - Residential</b>	<b>3,633,642</b>	<b>1,458,259</b>	<b>46,096,813</b>	<b>14,393,310</b>	<b>2,305,762</b>	<b>67,887,786</b>	-	<b>67,887,786</b>	<b>269</b>
A1 - Residential Whole House	2,341,248	538,916	33,890,497	12,049,834	1,866,186	50,686,681	-	50,686,681	4,762
A1a - Residential New Construction	64,193	21,277	976,362	274,527	47,998	1,384,357	-	1,384,357	5,166
A1b - Residential Multi-Family Retrofit	107,467	57,403	1,245,568	827,960	80,371	2,318,768	-	2,318,768	2,369
A1c - Residential Home Energy Services - Measures	1,895,192	297,803	31,162,726	5,874,508	1,523,493	40,753,722	-	40,753,722	4,971
A1d - Residential Home Energy Services - RCS	243,269	113,852	-	4,710,910	182,006	5,250,037	-	5,250,037	-
A1e - Residential Behavior/Feedback Program	31,127	48,581	505,842	361,929	32,318	979,797	-	979,797	816
A2 - Residential Products	588,171	426,318	9,436,690	1,771,799	439,576	12,662,554	-	12,662,554	52
A2a - Residential Heating & Cooling Equipment	267,450	88,014	4,612,880	623,489	200,404	5,792,237	-	5,792,237	409
A2b - Residential Consumer Products	51,832	86,182	470,864	466,968	38,738	1,114,585	-	1,114,585	150
A2c - Residential Lighting	268,889	252,122	4,352,946	681,342	200,434	5,755,733	-	5,755,733	26
A3 - Residential Hard-to-Measure	704,223	493,026	2,769,625	571,677	-	4,538,550	-	4,538,550	-
A3a - Residential Statewide Marketing	-	336,052	-	-	-	336,052	-	336,052	-
A3b - Residential Statewide Database	39,759	-	-	-	-	39,759	-	39,759	-
A3c - Residential DOER Assessment	435,267	-	-	-	-	435,267	-	435,267	-
A3d - Residential EEAC Consultants	-	-	-	-	-	-	-	-	-
A3e - Residential Sponsorships & Subscriptions	77,010	31,925	-	-	-	108,936	-	108,936	-
A3f - Residential HEAT Loan	152,186	27,548	2,679,625	310,877	-	3,170,236	-	3,170,236	-
A3g - Residential Workforce Development	-	-	-	58,800	-	58,800	-	58,800	-
A3h - Residential R&D and Demonstration	-	22,500	90,000	202,000	-	314,500	-	314,500	-
A3i - Residential Education	-	75,000	-	-	-	75,000	-	75,000	-
<b>B - Low-Income</b>	<b>817,937</b>	<b>170,639</b>	<b>9,612,430</b>	<b>2,399,117</b>	<b>466,652</b>	<b>13,466,775</b>	-	<b>13,466,775</b>	<b>4,676</b>
B1 - Low-Income Whole House	571,354	96,119	9,612,430	2,399,117	466,652	13,145,672	-	13,145,672	4,564
B1a - Low-Income Single Family Retrofit	393,722	73,712	6,478,250	1,789,595	321,475	9,056,754	-	9,056,754	4,717
B1b - Low-Income Multi-Family Retrofit	177,632	22,407	3,134,180	609,522	145,177	4,088,918	-	4,088,918	4,259
B2 - Low-Income Hard-to-Measure	246,583	74,520	-	-	-	321,103	-	321,103	-
B2a - Low-Income Statewide Marketing	-	68,051	-	-	-	68,051	-	68,051	-
B2b - Low-Income Statewide Database	8,051	-	-	-	-	8,051	-	8,051	-
B2c - Low-Income DOER Assessment	88,143	-	-	-	-	88,143	-	88,143	-
B2d - Low-Income Energy Affordability Network	121,372	-	-	-	-	121,372	-	121,372	-
B2e - Low-Income Sponsorships & Subscriptions	29,017	6,469	-	-	-	35,486	-	35,486	-
<b>C - Commercial &amp; Industrial</b>	<b>2,594,057</b>	<b>723,130</b>	<b>35,192,707</b>	<b>5,908,271</b>	<b>1,548,346</b>	<b>45,966,511</b>	-	<b>45,966,511</b>	<b>6,155</b>
C1 - C&I New Construction	216,627	29,301	3,152,630	848,735	154,980	4,402,273	-	4,402,273	16,867
C1a - C&I New Buildings & Major Renovations	154,720	16,786	2,173,550	710,999	110,551	3,166,606	-	3,166,606	28,528
C1b - C&I Initial Purchase & End of Useful Life	61,907	12,515	979,080	137,736	44,429	1,235,667	-	1,235,667	8,238
C2 - C&I Retrofit	1,958,615	416,428	31,860,077	4,919,536	1,393,366	40,548,023	-	40,548,023	5,626
C2a - C&I Existing Building Retrofit	523,896	142,392	8,567,665	1,187,740	373,599	10,795,292	-	10,795,292	22,823
C2b - C&I Small Business	1,076,817	190,142	17,889,385	2,501,325	764,163	22,421,832	-	22,421,832	10,405
C2c - C&I Multifamily Retrofit	112,956	57,321	1,245,568	821,463	80,580	2,317,888	-	2,317,888	2,368
C2d - C&I Upstream Lighting	244,946	26,573	4,157,460	409,007	175,024	5,013,011	-	5,013,011	1,393
C3 - C&I Hard-to-Measure	418,815	277,400	180,000	140,000	-	1,016,215	-	1,016,215	-
C3a - C&I Statewide Marketing	-	225,897	-	-	-	225,897	-	225,897	-
C3b - C&I Statewide Database	26,726	-	-	-	-	26,726	-	26,726	-
C3c - C&I DOER Assessment	292,590	-	-	-	-	292,590	-	292,590	-
C3d - C&I EEAC Consultants	-	-	-	-	-	-	-	-	-
C3e - C&I Sponsorships & Subscriptions	99,499	21,503	-	-	-	121,002	-	121,002	-
C3f - C&I Workforce Development	-	30,000	-	100,000	-	130,000	-	130,000	-
C3g - C&I R&D and Demonstration	-	-	180,000	40,000	-	220,000	-	220,000	-
<b>Grand Total</b>	<b>7,045,636</b>	<b>2,352,028</b>	<b>90,901,950</b>	<b>22,700,697</b>	<b>4,320,761</b>	<b>127,321,073</b>	-	<b>127,321,073</b>	<b>485</b>

2016-2018 Evaluated Program Administrator Budget									
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total PA Costs			
<b>A - Residential</b>	<b>3,688,613</b>	<b>1,400,396</b>	<b>47,041,085</b>	<b>13,175,956</b>	<b>2,376,617</b>	<b>67,682,666</b>	-	<b>67,682,666</b>	<b>145</b>
A1 - Residential Whole House	2,552,691	492,877	31,936,754	11,087,402	1,407,026	47,476,749	-	47,476,749	1,770
A1a - Residential New Construction	69,736	11,300	1,675,529	398,574	120,764	2,275,904	-	2,275,904	2,121
A1b - Residential Multi-Family Retrofit	116,906	21,930	1,037,906	350,610	87,843	1,615,194	-	1,615,194	1,018
A1c - Residential Home Energy Services - Measures	2,067,713	406,631	29,084,456	5,731,176	1,039,909	38,329,885	-	38,329,885	1,587
A1d - Residential Home Energy Services - RCS	264,611	48,173	-	4,440,558	133,068	4,886,409	-	4,886,409	-
A1e - Residential Behavior/Feedback Program	33,725	4,843	138,863	166,484	25,442	369,358	-	369,358	14,774
A2 - Residential Products	635,735	453,412	11,586,171	1,662,760	969,591	15,307,669	-	15,307,669	35
A2a - Residential Heating & Cooling Equipment	293,589	71,367	3,635,267	576,585	228,169	4,804,978	-	4,804,978	615
A2b - Residential Consumer Products	55,791	108,451	982,543	444,333	176,483	1,767,601	-	1,767,601	176
A2c - Residential Lighting	286,355	273,593	6,968,361	641,842	564,939	8,735,090	-	8,735,090	21
A3 - Residential Hard-to-Measure	500,188	454,107	3,518,160	425,793	-	4,898,248	-	4,898,248	-
A3a - Residential Statewide Marketing	-	323,737	-	-	-	323,737	-	323,737	-
A3b - Residential Statewide Database	3,206	-	-	-	-	3,206	-	3,206	-
A3c - Residential DOER Assessment	331,473	-	-	-	-	331,473	-	331,473	-
A3d - Residential EEAC Consultants	-	-	-	-	-	-	-	-	-
A3e - Residential Sponsorships & Subscriptions	-	-	-	-	-	-	-	-	-
A3f - Residential HEAT Loan	165,508	28,476	3,518,160	387,991	-	4,100,136	-	4,100,136	-
A3g - Residential Workforce Development	-	-	-	-	37,775	-	-	37,775	-
A3h - Residential R&D and Demonstration	-	-	-	26	-	26	-	26	-
A3i - Residential Education	-	101,893	-	-	-	101,893	-	101,893	-
<b>B - Low-Income</b>	<b>750,703</b>	<b>195,892</b>	<b>6,001,440</b>	<b>1,211,249</b>	<b>386,583</b>	<b>8,545,867</b>	-	<b>8,545,867</b>	<b>1,503</b>
B1 - Low-Income Whole House	577,715	124,199	6,001,440	1,211,249	386,583	8,301,186	-	8,301,186	1,460
B1a - Low-Income Single Family Retrofit	397,978	93,553	3,797,610	723,182	264,055	5,276,378	-	5,276,378	1,937
B1b - Low-Income Multi-Family Retrofit	179,737	30,646	2,203,830	488,067	122,528	3,024,807	-	3,024,807	1,021
B2 - Low-Income Hard-to-Measure	172,987	71,693	-	-	-	244,681	-	244,681	-
B2a - Low-Income Statewide Marketing	-	71,693	-	-	-	71,693	-	71,693	-
B2b - Low-Income Statewide Database	659	-	-	-	-	659	-	659	-
B2c - Low-Income DOER Assessment	80,073	-	-	-	-	80,073	-	80,073	-
B2d - Low-Income Energy Affordability Network	92,256	-	-	-	-	92,256	-	92,256	-
B2e - Low-Income Sponsorships & Subscriptions	-	-	-	-	-	-	-	-	-
<b>C - Commercial &amp; Industrial</b>	<b>2,824,348</b>	<b>593,663</b>	<b>19,333,353</b>	<b>4,059,993</b>	<b>1,715,534</b>	<b>28,526,892</b>	-	<b>28,526,892</b>	<b>5,693</b>
C1 - C&I New Construction	265,280	38,533	1,958,018	703,662	220,918	3,186,412	-	3,186,412	7,697
C1a - C&I New Buildings & Major Renovations	193,317	22,961	1,130,269	540,550	165,053	2,052,151	-	2,052,151	17,391
C1b - C&I Initial Purchase & End of Useful Life	71,963	15,571	827,750	163,112	55,865	1,134,261	-	1,134,261	3,832
C2 - C&I Retrofit	2,326,108	329,894	17,375,335	3,347,578	1,494,616	24,873,530	-	24,873,530	5,411
C2a - C&I Existing Building Retrofit	670,624	79,476	7,944,113	943,480	395,746	10,033,439	-	10,033,439	16,475
C2b - C&I Small Business	1,255,475	193,832	7,727,034	1,833,060	772,996	11,782,397	-	11,782,397	7,392
C2c - C&I Multifamily Retrofit	126,889	16,765	268,992	154,548	61,575	628,770	-	628,770	7,485
C2d - C&I Upstream Lighting	273,121	39,821	1,435,195	416,489	264,299	2,428,924	-	2,428,924	1,051
C3 - C&I Hard-to-Measure	232,960	225,237	-	8,753	-	466,950	-	466,950	-
C3a - C&I Statewide Marketing	-	222,116	-	-	-	222,116	-	222,116	-
C3b - C&I Statewide Database	2,326	-	-	-	-	2,326	-	2,326	-
C3c - C&I DOER Assessment	229,066	-	-	-	-	229,066	-	229,066	-
C3d - C&I EEAC Consultants	-	-	-	-	-	-	-	-	-
C3e - C&I Sponsorships & Subscriptions	1,567	3,071	-	-	-	4,638	-	4,638	-
C3f - C&I Workforce Development	-	50	-	8,726	-	8,776	-	8,776	-
C3g - C&I R&D and Demonstration	-	-	-	27	-	27	-	27	-
<b>Grand Total</b>	<b>7,263,663</b>	<b>2,189,951</b>	<b>72,375,877</b>	<b>18,447,198</b>	<b>4,478,734</b>	<b>104,755,424</b>	-	<b>104,755,424</b>	<b>219</b>

2016-2018 Planned v. Evaluated Budget (%)									
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total PA Costs			
<b>A - Residential</b>	<b>2%</b>	<b>-4%</b>	<b>2%</b>	<b>-8%</b>	<b>3%</b>	<b>0%</b>		<b>0%</b>	<b>-46%</b>
A1 - Residential Whole House	9%	-9%	-6%	-8%	-25%	-6%		-6%	-63%
A1a - Residential New Construction	9%	-47%	72%	45%	152%	64%		64%	-59%
A1b - Residential Multi-Family Retrofit	9%	-62%	-17%	-58%	9%	-30%		-30%	-57%
A1c - Residential Home Energy Services - Measures	9%	37%	-7%	-2%	-32%	-6%		-6%	-68%
A1d - Residential Home Energy Services - RCS	9%	-58%		-6%	-27%	-7%		-7%	
A1e - Residential Behavior/Feedback Program	8%	-90%	-73%	-54%	-21%	-62%		-62%	1709%
<b>A2 - Residential Products</b>	<b>8%</b>	<b>6%</b>	<b>23%</b>	<b>-6%</b>	<b>121%</b>	<b>21%</b>		<b>21%</b>	<b>-34%</b>
A2a - Residential Heating & Cooling Equipment	10%	-19%	-21%	-8%	14%	-17%		-17%	50%
A2b - Residential Consumer Products	8%	26%	109%	-5%	356%	59%		59%	17%
A2c - Residential Lighting	6%	9%	60%	-6%	182%	52%		52%	-21%
<b>A3 - Residential Hard-to-Measure</b>	<b>-29%</b>	<b>-8%</b>	<b>27%</b>	<b>-26%</b>		<b>8%</b>		<b>8%</b>	
A3a - Residential Statewide Marketing		-4%				-4%		-4%	
A3b - Residential Statewide Database	-92%					-92%		-92%	
A3c - Residential DOER Assessment	-24%					-24%		-24%	
A3d - Residential EEAC Consultants									
A3e - Residential Sponsorships & Subscriptions	-100%	-100%				-100%		-100%	
A3f - Residential HEAT Loan	9%	3%	31%	25%		29%		29%	
A3g - Residential Workforce Development						-36%		-36%	
A3h - Residential R&D and Demonstration		-100%	-100%	-100%		-100%		-100%	
A3i - Residential Education		36%				36%		36%	
<b>B - Low-Income</b>	<b>-8%</b>	<b>15%</b>	<b>-38%</b>	<b>-50%</b>	<b>-17%</b>	<b>-37%</b>		<b>-37%</b>	<b>-68%</b>
B1 - Low-Income Whole House	1%	29%	-38%	-50%	-17%	-37%		-37%	-68%
B1a - Low-Income Single Family Retrofit	1%	27%	-41%	-60%	-18%	-42%		-42%	-59%
B1b - Low-Income Multi-Family Retrofit	1%	37%	-30%	-20%	-16%	-26%		-26%	-76%
<b>B2 - Low-Income Hard-to-Measure</b>	<b>-30%</b>	<b>-4%</b>				<b>-24%</b>		<b>-24%</b>	
B2a - Low-Income Statewide Marketing		5%				5%		5%	
B2b - Low-Income Statewide Database	-92%					-92%		-92%	
B2c - Low-Income DOER Assessment	-9%					-9%		-9%	
B2d - Low-Income Energy Affordability Network	-24%					-24%		-24%	
B2e - Low-Income Sponsorships & Subscriptions	-100%	-100%				-100%		-100%	
<b>C - Commercial &amp; Industrial</b>	<b>9%</b>	<b>-18%</b>	<b>-45%</b>	<b>-31%</b>	<b>11%</b>	<b>-38%</b>		<b>-38%</b>	<b>-8%</b>
C1 - C&I New Construction	22%	32%	-38%	-17%	43%	-28%		-28%	-54%
C1a - C&I New Buildings & Major Renovations	25%	37%	-48%	-24%	49%	-35%		-35%	-39%
C1b - C&I Initial Purchase & End of Useful Life	16%	24%	-15%	18%	26%	-8%		-8%	-53%
<b>C2 - C&amp;I Retrofit</b>	<b>19%</b>	<b>-21%</b>	<b>-45%</b>	<b>-32%</b>	<b>7%</b>	<b>-39%</b>		<b>-39%</b>	<b>-4%</b>
C2a - C&I Existing Building Retrofit	28%	-44%	-7%	-21%	6%	-7%		-7%	-28%
C2b - C&I Small Business	17%	2%	-57%	-27%	1%	-47%		-47%	-29%
C2c - C&I Multifamily Retrofit	12%	-71%	-78%	-81%	-24%	-73%		-73%	216%
C2d - C&I Upstream Lighting	12%	50%	-65%	2%	51%	-52%		-52%	-24%
<b>C3 - C&amp;I Hard-to-Measure</b>	<b>-44%</b>	<b>-19%</b>	<b>-100%</b>	<b>-94%</b>		<b>-54%</b>		<b>-54%</b>	
C3a - C&I Statewide Marketing		-2%				-2%		-2%	
C3b - C&I Statewide Database	-91%					-91%		-91%	
C3c - C&I DOER Assessment	-22%					-22%		-22%	
C3d - C&I EEAC Consultants									
C3e - C&I Sponsorships & Subscriptions	-98%	-86%				-96%		-96%	
C3f - C&I Workforce Development		-100%				-93%		-93%	
C3g - C&I R&D and Demonstration			-100%	-100%		-100%		-100%	
<b>Grand Total</b>	<b>3%</b>	<b>-7%</b>	<b>-20%</b>	<b>-19%</b>	<b>4%</b>	<b>-18%</b>		<b>-18%</b>	<b>-55%</b>

**Notes**

- Costs for each year are presented in nominal dollars (2016\$, 2017\$, 2018\$).
- Refer to common definitions for allocation of costs.
- The above tables do not include costs associated with the Program Administrator's demand reduction demonstrations.
- In accordance with the Department's directive in 2016 2018 Three-Year Plans Order, D.P.U. 15-160 through D.P.U. 15-169, at 40, the Program Administrators are providing notice to the Department of a reclassification in cost categories for potential studies. Potential study costs were classified as PP&A in the 2016-2018 Three-Year Plan because they were expected to be expended as part of a planning process; however, the Program Administrators determined in 2016 that the costs are more appropriately classified as Evaluation and Market Research based on cost causation principles. While potential studies continue to be a planning tool for the Program Administrators, these studies are more appropriately categorized as market research costs and therefore were charged to Evaluation and Market Research. All Program Administrators have made this change consistently. No other change in cost categories has been made by the Program Administrators since the 2016-2018 Three-Year Plan.

## Demand Response Budget

### 2016-2018 Actual

Cape Light Compact

August 1, 2019

2016-2018 Actual Demand Response Budget						
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>2016</b>		1,488	53,258	125,240	7,290	187,277
A - Residential		1,488	50,658	112,716	7,290	172,153
B - Low-Income						-
C - Commercial & Industrial			2,600	12,524		15,124
<b>2017</b>			2,307	257,050	151,017	410,374
A - Residential			2,307	257,050	103,682	363,038
B - Low-Income						-
C - Commercial & Industrial					47,336	47,336
<b>2018</b>		1,747	103,852	179,474	167,189	452,261
A - Residential		1,747	103,852	179,474	92,193	377,265
B - Low-Income						-
C - Commercial & Industrial					74,996	74,996
<b>2016-2018</b>	-	3,235	159,417	561,764	325,497	1,049,912
A - Residential	-	3,235	156,817	549,240	203,165	912,456
B - Low-Income	-	-	-	-	-	-
C - Commercial & Industrial	-	-	2,600	12,524	122,332	137,456

#### Notes

- Costs for each year are presented in nominal dollars (2016\$, 2017\$, 2018\$).

## Demand Response Budget

### Actual Budgets Inclusive of Demand Response

Cape Light Compact

August 1, 2019

Cape Light Compact JPE

D.P.U. 19-96

2016-2018 Energy Efficiency Term Report

August 1, 2019

Part One, Page 9 of 33

2016 Total Budget (Energy Efficiency Budget + Demand Response Budget)								
Sector	Program Costs						Performance Incentive	Total Program Administrator Budget
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs		
A - Residential	\$ 1,033,006	\$ 363,875	\$ 11,315,728	\$ 3,297,115	\$ 622,681	\$ 16,632,404	\$ -	\$ 16,632,404
B - Low-Income	\$ 216,961	\$ 48,807	\$ 2,140,346	\$ 381,001	\$ 62,084	\$ 2,849,199	\$ -	\$ 2,849,199
C - Commercial & Industrial	\$ 689,932	\$ 152,381	\$ 5,553,910	\$ 1,142,063	\$ 421,577	\$ 7,959,863	\$ -	\$ 7,959,863
<b>Grand Total</b>	<b>\$ 1,939,898</b>	<b>\$ 565,063</b>	<b>\$ 19,009,984</b>	<b>\$ 4,820,179</b>	<b>\$ 1,106,342</b>	<b>\$ 27,441,466</b>	<b>\$ -</b>	<b>\$ 27,441,466</b>

2017 Total Budget (Energy Efficiency Budget + Demand Response Budget)								
Sector	Program Costs						Performance Incentive	Total Program Administrator Budget
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs		
A - Residential	\$ 1,245,323	\$ 408,870	\$ 15,364,325	\$ 4,481,030	\$ 994,709	\$ 22,494,257	\$ -	\$ 22,494,257
B - Low-Income	\$ 251,257	\$ 63,118	\$ 2,007,738	\$ 357,110	\$ 150,150	\$ 2,829,372	\$ -	\$ 2,829,372
C - Commercial & Industrial	\$ 954,322	\$ 162,680	\$ 6,261,169	\$ 1,176,324	\$ 644,439	\$ 9,198,934	\$ -	\$ 9,198,934
<b>Grand Total</b>	<b>\$ 2,450,902</b>	<b>\$ 634,667</b>	<b>\$ 23,633,232</b>	<b>\$ 6,014,464</b>	<b>\$ 1,789,298</b>	<b>\$ 34,522,563</b>	<b>\$ -</b>	<b>\$ 34,522,563</b>

2018 Total Budget (Energy Efficiency Budget + Demand Response Budget)								
Sector	Program Costs						Performance Incentive	Total Program Administrator Budget
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs		
A - Residential	\$ 1,410,284	\$ 630,885	\$ 20,517,849	\$ 5,947,051	\$ 962,391	\$ 29,468,460	\$ -	\$ 29,468,460
B - Low-Income	\$ 282,485	\$ 83,968	\$ 1,853,356	\$ 473,138	\$ 174,349	\$ 2,867,296	\$ -	\$ 2,867,296
C - Commercial & Industrial	\$ 1,180,094	\$ 278,602	\$ 7,520,874	\$ 1,754,130	\$ 771,850	\$ 11,505,550	\$ -	\$ 11,505,550
<b>Grand Total</b>	<b>\$ 2,872,863</b>	<b>\$ 993,455</b>	<b>\$ 29,892,079</b>	<b>\$ 8,174,319</b>	<b>\$ 1,908,591</b>	<b>\$ 43,841,307</b>	<b>\$ -</b>	<b>\$ 43,841,307</b>

2016-2018 Total Budget (Energy Efficiency Budget + Demand Response Budget)								
Sector	Program Costs						Performance Incentive	Total Program Administrator Budget
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs		
A - Residential	\$ 3,688,613	\$ 1,403,630	\$ 47,197,902	\$ 13,725,196	\$ 2,579,781	\$ 68,595,122	\$ -	\$ 68,595,122
B - Low-Income	\$ 750,703	\$ 195,892	\$ 6,001,440	\$ 1,211,249	\$ 386,583	\$ 8,545,867	\$ -	\$ 8,545,867
C - Commercial & Industrial	\$ 2,824,348	\$ 593,663	\$ 19,335,953	\$ 4,072,517	\$ 1,837,866	\$ 28,664,347	\$ -	\$ 28,664,347
<b>Grand Total</b>	<b>\$ 7,263,663</b>	<b>\$ 2,193,185</b>	<b>\$ 72,535,295</b>	<b>\$ 19,008,962</b>	<b>\$ 4,804,231</b>	<b>\$ 105,805,336</b>	<b>\$ -</b>	<b>\$ 105,805,336</b>

#### Notes

- For supporting information on the Total Program Administrator Budget, which includes Performance Incentives, see the Program Administrator Budget Table.

## Savings

### 2016-2018 Planned vs. Evaluated

Cape Light Compact

August 1, 2019

2016-2018 Planned Net Savings							
Program	# of Participants	Electric Savings				Natural Gas Savings	
		Annual Capacity (kW)		Energy (MWh)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime
<b>A - Residential</b>	<b>251,967</b>	<b>8,006</b>	<b>10,954</b>	<b>57,234</b>	<b>610,325</b>	<b>(3,030,779)</b>	<b>(2,988,139)</b>
A1 - Residential Whole House	10,645	4,021	5,551	24,304	277,289	104,378	93,896
A1a - Residential New Construction	268	261	525	1,760	35,606	3,474	5,211
A1b - Residential Multi-Family Retrofit	979	48	431	1,086	15,917	8,519	6,848
A1c - Residential Home Energy Services - Measures	8,198	3,627	4,478	20,907	222,228	54,360	43,812
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	1,200	86	118	550	3,537	38,025	38,025
A2 - Residential Products	241,322	3,985	5,402	32,931	333,037	(3,135,157)	(3,082,035)
A2a - Residential Heating & Cooling Equipment	14,153	508	1,221	4,285	61,699	(122,472)	(220,450)
A2b - Residential Consumer Products	7,410	432	267	2,449	20,711	6,660	4,662
A2c - Residential Lighting	219,759	3,045	3,915	26,197	250,627	(3,019,345)	(2,866,248)
<b>B - Low-Income</b>	<b>2,880</b>	<b>872</b>	<b>1,691</b>	<b>5,314</b>	<b>55,469</b>	<b>-</b>	<b>-</b>
B1 - Low-Income Whole House	2,880	872	1,691	5,314	55,469	-	-
B1a - Low-Income Single Family Retrofit	1,920	673	788	4,060	41,008	-	-
B1b - Low-Income Multi-Family Retrofit	960	199	903	1,254	14,461	-	-
<b>C - Commercial &amp; Industrial</b>	<b>7,468</b>	<b>22,375</b>	<b>17,715</b>	<b>113,244</b>	<b>1,025,967</b>	<b>(5,659,133)</b>	<b>(7,759,925)</b>
C1 - C&I New Construction	261	1,123	1,391	7,095	134,599	(2,901,028)	(5,810,818)
C1a - C&I New Buildings & Major Renovations	111	290	160	1,674	27,346	19,813	30,863
C1b - C&I Initial Purchase & End of Useful Life	150	833	1,231	5,421	107,253	(2,920,841)	(5,841,681)
C2 - C&I Retrofit	7,207	21,252	16,324	106,149	891,368	(2,758,106)	(1,949,107)
C2a - C&I Existing Building Retrofit	473	2,385	2,039	15,061	181,336	441,881	408,935
C2b - C&I Small Business	2,155	6,565	4,831	30,302	394,006	(941,314)	(1,227,893)
C2c - C&I Multifamily Retrofit	979	46	432	1,086	15,976	8,796	8,665
C2d - C&I Upstream Lighting	3,600	12,256	9,022	59,700	300,050	(2,267,469)	(1,138,813)
<b>Grand Total</b>	<b>262,315</b>	<b>31,254</b>	<b>30,360</b>	<b>175,793</b>	<b>1,691,761</b>	<b>(8,689,912)</b>	<b>(10,748,064)</b>



## Savings

### 2016-2018 Planned vs. Evaluated

Cape Light Compact

August 1, 2019

Program	2016-2018 Planned Net Savings					
	Deliverable Fuel Savings				Other Savings	
	Oil (MMBTU)		Propane (MMBTU)		Water (Gallons)	
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
<b>A - Residential</b>	<b>156,715</b>	<b>3,248,453</b>	<b>24,630</b>	<b>527,245</b>	<b>12,432,142</b>	<b>115,959,834</b>
A1 - Residential Whole House	174,505	3,418,851	29,174	570,889	11,994,982	112,899,714
A1a - Residential New Construction	145	3,618	4,087	99,090	-	-
A1b - Residential Multi-Family Retrofit	984	16,633	40	696	403,510	2,824,572
A1c - Residential Home Energy Services - Measures	173,256	3,397,406	25,012	470,752	10,096,476	95,125,182
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	119	1,194	35	351	1,494,996	14,949,960
A2 - Residential Products	(17,790)	(170,398)	(4,544)	(43,644)	437,160	3,060,120
A2a - Residential Heating & Cooling Equipment	-	-	-	-	-	-
A2b - Residential Consumer Products	76	529	67	466	437,160	3,060,120
A2c - Residential Lighting	(17,866)	(170,927)	(4,611)	(44,110)	-	-
<b>B - Low-Income</b>	<b>38,001</b>	<b>862,563</b>	<b>2,913</b>	<b>57,008</b>	<b>7,615,680</b>	<b>38,078,400</b>
B1 - Low-Income Whole House	38,001	862,563	2,913	57,008	7,615,680	38,078,400
B1a - Low-Income Single Family Retrofit	17,235	343,415	2,913	57,008	5,247,360	26,236,800
B1b - Low-Income Multi-Family Retrofit	20,766	519,148	-	-	2,368,320	11,841,600
<b>C - Commercial &amp; Industrial</b>	<b>(6,183)</b>	<b>270,697</b>	<b>10,394</b>	<b>131,299</b>	<b>1,183,617</b>	<b>5,372,210</b>
C1 - C&I New Construction	330	5,181	-	-	-	-
C1a - C&I New Buildings & Major Renovations	330	5,181	-	-	-	-
C1b - C&I Initial Purchase & End of Useful Life	-	-	-	-	-	-
C2 - C&I Retrofit	(6,513)	265,515	10,394	131,299	1,183,617	5,372,210
C2a - C&I Existing Building Retrofit	941	5,328	1,403	16,462	25,996	194,967
C2b - C&I Small Business	35,514	461,549	8,951	114,057	322,118	1,417,476
C2c - C&I Multifamily Retrofit	975	19,342	40	780	835,504	3,759,767
C2d - C&I Upstream Lighting	(43,943)	(220,704)	-	-	-	-
<b>Grand Total</b>	<b>188,532</b>	<b>4,381,712</b>	<b>37,937</b>	<b>715,552</b>	<b>21,231,439</b>	<b>159,410,444</b>

# Savings

## 2016-2018 Planned vs. Evaluated

Cape Light Compact

August 1, 2019

2016-2018 Evaluated Net Savings							
Program	# of Participants	Electric Savings				Natural Gas Savings	
		Annual Capacity (kW)		Energy (MWh)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime
<b>A - Residential</b>	<b>466,686</b>	<b>15,063</b>	<b>16,752</b>	<b>99,239</b>	<b>795,280</b>	<b>(104,595)</b>	<b>8,060,131</b>
A1 - Residential Whole House	26,830	4,934	6,406	31,709	315,880	595,792	12,618,808
A1a - Residential New Construction	1,073	516	606	3,035	39,919	(16,166)	(98,186)
A1b - Residential Multi-Family Retrofit	1,587	113	407	1,413	17,017	162	1,612
A1c - Residential Home Energy Services - Measures	24,145	4,261	5,374	27,110	258,252	606,350	12,682,111
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	25	44	20	152	692	5,446	33,271
A2 - Residential Products	439,856	10,129	10,346	67,530	479,400	(700,387)	(4,558,676)
A2a - Residential Heating & Cooling Equipment	7,817	499	572	3,726	57,623	(7,942)	(140,444)
A2b - Residential Consumer Products	10,071	901	278	4,044	38,022	2,510	17,568
A2c - Residential Lighting	421,968	8,729	9,495	59,760	383,754	(694,955)	(4,435,800)
<b>B - Low-Income</b>	<b>5,686</b>	<b>941</b>	<b>1,193</b>	<b>5,562</b>	<b>47,288</b>	<b>1,128</b>	<b>13,445</b>
B1 - Low-Income Whole House	5,686	941	1,193	5,562	47,288	1,128	13,445
B1a - Low-Income Single Family Retrofit	2,724	661	597	3,696	31,763	1,095	13,054
B1b - Low-Income Multi-Family Retrofit	2,962	280	596	1,866	15,525	33	391
<b>C - Commercial &amp; Industrial</b>	<b>5,011</b>	<b>10,056</b>	<b>8,790</b>	<b>52,637</b>	<b>560,810</b>	<b>(212,299)</b>	<b>(2,489,204)</b>
C1 - C&I New Construction	414	819	715	4,257	62,634	(77,116)	(1,153,379)
C1a - C&I New Buildings & Major Renovations	118	290	243	1,835	27,341	(2,319)	(32,958)
C1b - C&I Initial Purchase & End of Useful Life	296	529	472	2,422	35,293	(74,798)	(1,120,421)
C2 - C&I Retrofit	4,597	9,237	8,075	48,380	498,176	(135,183)	(1,335,825)
C2a - C&I Existing Building Retrofit	609	3,024	2,740	17,435	225,747	(16,574)	(241,030)
C2b - C&I Small Business	1,594	2,627	2,496	11,874	150,707	(55,719)	(728,865)
C2c - C&I Multifamily Retrofit	84	23	81	400	3,891	-	-
C2d - C&I Upstream Lighting	2,310	3,563	2,758	18,672	117,831	(62,890)	(365,930)
<b>Grand Total</b>	<b>477,383</b>	<b>26,059</b>	<b>26,735</b>	<b>157,438</b>	<b>1,403,378</b>	<b>(315,766)</b>	<b>5,584,372</b>

## Savings

### 2016-2018 Planned vs. Evaluated

Cape Light Compact

August 1, 2019

Cape Light Compact JPE

D.P.U. 19-96

2016-2018 Energy Efficiency Term Report

August 1, 2019

Part One, Page 13 of 33

Program	2016-2018 Evaluated Net Savings					
	Deliverable Fuel Savings				Other Savings	
	Oil (MMBTU)		Propane (MMBTU)		Water (Gallons)	
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
<b>A - Residential</b>	<b>43,787</b>	<b>1,484,279</b>	<b>21,654</b>	<b>544,602</b>	<b>10,465,705</b>	<b>80,928,946</b>
A1 - Residential Whole House	87,224	1,761,965	30,735	603,296	9,255,772	72,459,413
A1a - Residential New Construction	(1,106)	(6,856)	5,945	139,809	-	-
A1b - Residential Multi-Family Retrofit	25	319	87	1,796	578,352	4,048,463
A1c - Residential Home Energy Services - Measures	88,127	1,767,402	24,649	461,353	8,229,220	65,537,158
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	177	1,100	54	338	448,200	2,873,792
A2 - Residential Products	(43,436)	(277,686)	(9,081)	(58,693)	1,209,933	8,469,533
A2a - Residential Heating & Cooling Equipment	(183)	(2,040)	(26)	(286)	-	-
A2b - Residential Consumer Products	93	651	36	251	1,209,933	8,469,533
A2c - Residential Lighting	(43,346)	(276,296)	(9,091)	(58,659)	-	-
<b>B - Low-Income</b>	<b>9,328</b>	<b>185,526</b>	<b>1,866</b>	<b>36,973</b>	<b>5,629,003</b>	<b>31,892,120</b>
B1 - Low-Income Whole House	9,328	185,526	1,866	36,973	5,629,003	31,892,120
B1a - Low-Income Single Family Retrofit	8,673	172,422	1,097	21,601	4,523,055	26,201,835
B1b - Low-Income Multi-Family Retrofit	655	13,104	769	15,372	1,105,948	5,690,285
<b>C - Commercial &amp; Industrial</b>	<b>(12,419)</b>	<b>(85,284)</b>	<b>4,580</b>	<b>49,479</b>	<b>2,216,448</b>	<b>10,777,762</b>
C1 - C&I New Construction	(337)	(4,569)	599	8,980	222,400	1,681,646
C1a - C&I New Buildings & Major Renovations	(409)	(5,775)	599	8,980	178,648	1,495,840
C1b - C&I Initial Purchase & End of Useful Life	72	1,206	-	-	43,752	185,806
C2 - C&I Retrofit	(12,082)	(80,714)	3,981	40,499	1,994,048	9,096,116
C2a - C&I Existing Building Retrofit	(2,442)	(30,999)	3,823	38,420	795,995	4,608,743
C2b - C&I Small Business	427	866	100	942	1,140,060	4,081,416
C2c - C&I Multifamily Retrofit	94	1,704	58	1,137	57,994	405,957
C2d - C&I Upstream Lighting	(10,161)	(52,286)	-	-	-	-
<b>Grand Total</b>	<b>40,696</b>	<b>1,584,521</b>	<b>28,099</b>	<b>631,055</b>	<b>18,311,156</b>	<b>123,598,828</b>

## Savings

### 2016-2018 Planned vs. Evaluated

Cape Light Compact

August 1, 2019

2016-2018 Planned v. Evaluated Net Savings (%)							
Program	# of Participants	Electric Savings				Natural Gas Savings	
		Annual Capacity (kW)		Energy (MWh)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime
<b>A - Residential</b>	<b>85%</b>	<b>88%</b>	<b>53%</b>	<b>73%</b>	<b>30%</b>	<b>-97%</b>	<b>-370%</b>
A1 - Residential Whole House	152%	23%	15%	30%	14%	471%	13339%
A1a - Residential New Construction	300%	98%	15%	72%	12%	-565%	-1984%
A1b - Residential Multi-Family Retrofit	62%	137%	-6%	30%	7%	-98%	-76%
A1c - Residential Home Energy Services - Measures	195%	17%	20%	30%	16%	1015%	28847%
A1d - Residential Home Energy Services - RCS							
A1e - Residential Behavior/Feedback Program	-98%	-49%	-83%	-72%	-80%	-86%	-13%
A2 - Residential Products	82%	154%	92%	105%	44%	-78%	48%
A2a - Residential Heating & Cooling Equipment	-45%	-2%	-53%	-13%	-7%	-94%	-36%
A2b - Residential Consumer Products	36%	108%	4%	65%	84%	-62%	277%
A2c - Residential Lighting	92%	187%	143%	128%	53%	-77%	55%
<b>B - Low-Income</b>	<b>97%</b>	<b>8%</b>	<b>-29%</b>	<b>5%</b>	<b>-15%</b>		
B1 - Low-Income Whole House	97%	8%	-29%	5%	-15%		
B1a - Low-Income Single Family Retrofit	42%	-2%	-24%	-9%	-23%		
B1b - Low-Income Multi-Family Retrofit	209%	40%	-34%	49%	7%		
<b>C - Commercial &amp; Industrial</b>	<b>-33%</b>	<b>-55%</b>	<b>-50%</b>	<b>-54%</b>	<b>-45%</b>	<b>-96%</b>	<b>-68%</b>
C1 - C&I New Construction	59%	-27%	-49%	-40%	-53%	-97%	-80%
C1a - C&I New Buildings & Major Renovations	6%	0%	52%	10%	0%	-112%	-207%
C1b - C&I Initial Purchase & End of Useful Life	97%	-36%	-62%	-55%	-67%	-97%	-81%
C2 - C&I Retrofit	-36%	-57%	-51%	-54%	-44%	-95%	-31%
C2a - C&I Existing Building Retrofit	29%	27%	34%	16%	24%	-104%	-159%
C2b - C&I Small Business	-26%	-60%	-48%	-61%	-62%	-94%	-41%
C2c - C&I Multifamily Retrofit	-91%	-49%	-81%	-63%	-76%	-100%	-100%
C2d - C&I Upstream Lighting	-36%	-71%	-69%	-69%	-61%	-97%	-68%
<b>Grand Total</b>	<b>82%</b>	<b>-17%</b>	<b>-12%</b>	<b>-10%</b>	<b>-17%</b>	<b>-96%</b>	<b>-152%</b>

## Savings

### 2016-2018 Planned vs. Evaluated

Cape Light Compact

August 1, 2019

Program	2016-2018 Planned v. Evaluated Net Savings (%)					
	Deliverable Fuel Savings				Other Savings	
	Oil (MMBTU)		Propane (MMBTU)		Water (Gallons)	
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
<b>A - Residential</b>	<b>-72%</b>	<b>-54%</b>	<b>-12%</b>	<b>3%</b>	<b>-16%</b>	<b>-30%</b>
A1 - Residential Whole House	-50%	-48%	5%	6%	-23%	-36%
A1a - Residential New Construction	-864%	-290%	45%	41%		
A1b - Residential Multi-Family Retrofit	-97%	-98%	114%	158%	43%	43%
A1c - Residential Home Energy Services - Measures	-49%	-48%	-1%	-2%	-18%	-31%
A1d - Residential Home Energy Services - RCS						
A1e - Residential Behavior/Feedback Program	48%	-8%	53%	-4%	-70%	-81%
A2 - Residential Products	144%	63%	100%	34%	177%	177%
A2a - Residential Heating & Cooling Equipment						
A2b - Residential Consumer Products	23%	23%	-46%	-46%	177%	177%
A2c - Residential Lighting	143%	62%	97%	33%		
<b>B - Low-Income</b>	<b>-75%</b>	<b>-78%</b>	<b>-36%</b>	<b>-35%</b>	<b>-26%</b>	<b>-16%</b>
B1 - Low-Income Whole House	-75%	-78%	-36%	-35%	-26%	-16%
B1a - Low-Income Single Family Retrofit	-50%	-50%	-62%	-62%	-14%	0%
B1b - Low-Income Multi-Family Retrofit	-97%	-97%			-53%	-52%
<b>C - Commercial &amp; Industrial</b>	<b>101%</b>	<b>-132%</b>	<b>-56%</b>	<b>-62%</b>	<b>87%</b>	<b>101%</b>
C1 - C&I New Construction	-202%	-188%				
C1a - C&I New Buildings & Major Renovations	-224%	-211%				
C1b - C&I Initial Purchase & End of Useful Life						
C2 - C&I Retrofit	85%	-130%	-62%	-69%	68%	69%
C2a - C&I Existing Building Retrofit	-360%	-682%	173%	133%	2962%	2264%
C2b - C&I Small Business	-99%	-100%	-99%	-99%	254%	188%
C2c - C&I Multifamily Retrofit	-90%	-91%	43%	46%	-93%	-89%
C2d - C&I Upstream Lighting	-77%	-76%				
<b>Grand Total</b>	<b>-78%</b>	<b>-64%</b>	<b>-26%</b>	<b>-12%</b>	<b>-14%</b>	<b>-22%</b>

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Planned Benefits								
Program	Electric Benefits							
	Capacity					Energy		
	Summer Generation	Trans.	Distrib.	Electric Capacity DRIPE	Total Capacity Benefits	Electric	Electric Energy DRIPE	Total Energy Benefits
<b>A - Residential</b>	<b>15,535,029</b>	<b>3,771,384</b>	<b>12,630,473</b>	-	<b>31,936,886</b>	<b>49,854,686</b>	<b>5,199,605</b>	<b>55,054,291</b>
A1 - Residential Whole House	9,192,682	2,185,018	7,317,687	-	18,695,387	23,162,922	2,151,169	25,314,092
A1a - Residential New Construction	949,301	216,834	726,183	-	1,892,318	3,304,821	174,450	3,479,272
A1b - Residential Multi-Family Retrofit	80,353	19,779	66,240	-	166,373	1,404,882	103,560	1,508,442
A1c - Residential Home Energy Services - Measures	8,077,455	1,926,383	6,451,513	-	16,455,351	18,188,501	1,836,150	20,024,650
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	85,572	22,022	73,751	-	181,345	264,718	37,010	301,728
A2 - Residential Products	6,342,347	1,586,366	5,312,786	-	13,241,499	26,691,763	3,048,436	29,740,199
A2a - Residential Heating & Cooling Equipment	1,173,901	278,968	934,271	-	2,387,139	5,069,632	380,091	5,449,723
A2b - Residential Consumer Products	593,575	152,080	509,322	-	1,254,977	1,492,225	197,943	1,690,168
A2c - Residential Lighting	4,574,872	1,155,318	3,869,194	-	9,599,384	20,129,906	2,470,401	22,600,307
<b>B - Low-Income</b>	<b>1,569,101</b>	<b>384,293</b>	<b>1,287,007</b>	-	<b>3,240,400</b>	<b>4,400,629</b>	<b>447,482</b>	<b>4,848,111</b>
B1 - Low-Income Whole House	1,569,101	384,293	1,287,007	-	3,240,400	4,400,629	447,482	4,848,111
B1a - Low-Income Single Family Retrofit	1,289,784	313,320	1,049,317	-	2,652,421	3,203,755	343,156	3,546,911
B1b - Low-Income Multi-Family Retrofit	279,317	70,973	237,689	-	587,979	1,196,874	104,326	1,301,200
<b>C - Commercial &amp; Industrial</b>	<b>30,012,441</b>	<b>7,608,582</b>	<b>25,481,357</b>	-	<b>63,102,379</b>	<b>77,816,660</b>	<b>9,521,353</b>	<b>87,338,013</b>
C1 - C&I New Construction	3,301,007	770,855	2,581,617	-	6,653,479	11,329,883	744,476	12,074,359
C1a - C&I New Buildings & Major Renovations	669,118	158,829	531,923	-	1,359,871	2,250,478	140,355	2,390,834
C1b - C&I Initial Purchase & End of Useful Life	2,631,888	612,026	2,049,693	-	5,293,608	9,079,405	604,121	9,683,526
C2 - C&I Retrofit	26,711,434	6,837,727	22,899,740	-	56,448,901	66,486,777	8,776,877	75,263,654
C2a - C&I Existing Building Retrofit	4,860,032	1,169,761	3,917,562	-	9,947,354	13,731,622	1,195,139	14,926,761
C2b - C&I Small Business	13,544,889	3,245,191	10,868,236	-	27,658,317	30,507,271	2,459,400	32,966,672
C2c - C&I Multifamily Retrofit	90,728	21,865	73,227	-	185,820	1,328,608	103,169	1,431,776
C2d - C&I Upstream Lighting	8,215,784	2,400,910	8,040,715	-	18,657,410	20,919,276	5,019,169	25,938,445
<b>Grand Total</b>	<b>47,116,571</b>	<b>11,764,259</b>	<b>39,398,836</b>	-	<b>98,279,666</b>	<b>132,071,974</b>	<b>15,168,440</b>	<b>147,240,414</b>

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

Program	2016-2018 Planned Benefits						
	Non-Electric Resource Benefits						
	Natural Gas Benefits			Other Resource Benefits			
	Natural Gas	Natural Gas DRIPE	Total Gas Benefits	Oil	Propane	Water	Total Other Resource Benefits
<b>A - Residential</b>	<b>(2,494,193)</b>	<b>(301,399)</b>	<b>(2,795,592)</b>	<b>68,212,157</b>	<b>10,139,946</b>	<b>1,228,830</b>	<b>79,580,933</b>
A1 - Residential Whole House	74,803	9,922	84,725	71,602,680	10,959,771	1,196,183	83,758,634
A1a - Residential New Construction	4,166	389	4,555	77,225	1,912,329	-	1,989,554
A1b - Residential Multi-Family Retrofit	5,395	793	6,188	343,568	13,300	30,134	387,002
A1c - Residential Home Energy Services - Measures	34,008	5,117	39,125	71,158,304	9,027,551	1,007,598	81,193,454
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	31,234	3,622	34,857	23,582	6,590	158,452	188,624
A2 - Residential Products	(2,568,996)	(311,321)	(2,880,317)	(3,390,523)	(819,824)	32,647	(4,177,701)
A2a - Residential Heating & Cooling Equipment	(188,670)	(13,750)	(202,420)	-	-	-	-
A2b - Residential Consumer Products	3,784	591	4,375	10,217	8,665	32,647	51,529
A2c - Residential Lighting	(2,384,111)	(298,161)	(2,682,272)	(3,400,740)	(828,489)	-	(4,229,230)
<b>B - Low-Income</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>18,252,861</b>	<b>1,093,272</b>	<b>408,015</b>	<b>19,754,149</b>
B1 - Low-Income Whole House	-	-	-	18,252,861	1,093,272	408,015	19,754,149
B1a - Low-Income Single Family Retrofit	-	-	-	7,163,681	1,093,272	281,131	8,538,084
B1b - Low-Income Multi-Family Retrofit	-	-	-	11,089,180	-	126,884	11,216,065
<b>C - Commercial &amp; Industrial</b>	<b>(6,114,581)</b>	<b>(658,771)</b>	<b>(6,773,352)</b>	<b>5,347,370</b>	<b>2,496,508</b>	<b>57,041</b>	<b>7,900,919</b>
C1 - C&I New Construction	(4,638,308)	(403,720)	(5,042,029)	97,252	-	-	97,252
C1a - C&I New Buildings & Major Renovations	24,101	2,226	26,327	97,252	-	-	97,252
C1b - C&I Initial Purchase & End of Useful Life	(4,662,409)	(405,946)	(5,068,355)	-	-	-	-
C2 - C&I Retrofit	(1,476,273)	(255,050)	(1,731,323)	5,250,118	2,496,508	57,041	7,803,667
C2a - C&I Existing Building Retrofit	307,912	42,573	350,485	90,619	310,876	2,044	403,539
C2b - C&I Small Business	(945,673)	(97,196)	(1,042,868)	8,614,835	2,170,693	15,061	10,800,589
C2c - C&I Multifamily Retrofit	5,961	917	6,878	371,679	14,939	39,936	426,554
C2d - C&I Upstream Lighting	(844,474)	(201,344)	(1,045,818)	(3,827,015)	-	-	(3,827,015)
<b>Grand Total</b>	<b>(8,608,774)</b>	<b>(960,170)</b>	<b>(9,568,944)</b>	<b>91,812,389</b>	<b>13,729,727</b>	<b>1,693,886</b>	<b>107,236,002</b>

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

Program	2016-2018 Planned Benefits			
	Total Resource Benefits (Electric + Non-Electric)	Non-Electric, Non-Resource Benefits	Total Benefits	Resource Benefits per Participant
<b>A - Residential</b>	<b>163,776,518</b>	<b>21,654,265</b>	<b>185,430,783</b>	<b>650</b>
A1 - Residential Whole House	127,852,837	19,450,906	147,303,743	12,011
A1a - Residential New Construction	7,365,698	1,467,875	8,833,573	27,484
A1b - Residential Multi-Family Retrofit	2,068,005	651,448	2,719,453	2,112
A1c - Residential Home Energy Services - Measures	117,712,580	17,331,583	135,044,163	14,359
A1d - Residential Home Energy Services - RCS	-	-	-	
A1e - Residential Behavior/Feedback Program	706,554	-	706,554	589
A2 - Residential Products	35,923,681	2,203,359	38,127,040	149
A2a - Residential Heating & Cooling Equipment	7,634,442	548,333	8,182,775	539
A2b - Residential Consumer Products	3,001,049	-	3,001,049	405
A2c - Residential Lighting	25,288,190	1,655,026	26,943,215	115
<b>B - Low-Income</b>	<b>27,842,660</b>	<b>4,855,617</b>	<b>32,698,277</b>	<b>9,668</b>
B1 - Low-Income Whole House	27,842,660	4,855,617	32,698,277	9,668
B1a - Low-Income Single Family Retrofit	14,737,416	3,228,992	17,966,408	7,676
B1b - Low-Income Multi-Family Retrofit	13,105,244	1,626,625	14,731,869	13,651
<b>C - Commercial &amp; Industrial</b>	<b>151,567,960</b>	<b>26,703,331</b>	<b>178,271,292</b>	<b>20,296</b>
C1 - C&I New Construction	13,783,062	-	13,783,062	52,809
C1a - C&I New Buildings & Major Renovations	3,874,283	-	3,874,283	34,903
C1b - C&I Initial Purchase & End of Useful Life	9,908,779	-	9,908,779	66,059
C2 - C&I Retrofit	137,784,898	26,703,331	164,488,230	19,118
C2a - C&I Existing Building Retrofit	25,628,139	4,765,487	30,393,626	54,182
C2b - C&I Small Business	70,382,709	13,717,568	84,100,277	32,660
C2c - C&I Multifamily Retrofit	2,051,029	278,068	2,329,097	2,095
C2d - C&I Upstream Lighting	39,723,021	7,942,209	47,665,230	11,034
<b>Grand Total</b>	<b>343,187,138</b>	<b>53,213,213</b>	<b>396,400,351</b>	<b>1,308</b>



**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Evaluated Benefits								
Program	Electric Benefits							
	Capacity					Energy		
	Summer Generation	Trans.	Distrib.	Electric Capacity DRIPE	Total Capacity Benefits	Electric	Electric Energy DRIPE	Total Energy Benefits
<b>A - Residential</b>	<b>19,556,531</b>	<b>4,911,355</b>	<b>16,448,268</b>	-	<b>40,916,154</b>	<b>61,496,577</b>	<b>7,512,535</b>	<b>69,009,112</b>
A1 - Residential Whole House	9,309,755	2,233,970	7,481,627	-	19,025,352	26,195,122	2,629,453	28,824,574
A1a - Residential New Construction	1,237,071	294,650	986,792	-	2,518,514	3,548,695	277,289	3,825,983
A1b - Residential Multi-Family Retrofit	143,638	36,644	122,722	-	303,005	1,454,270	131,903	1,586,173
A1c - Residential Home Energy Services - Measures	7,913,114	1,898,082	6,356,731	-	16,167,927	21,143,210	2,210,922	23,354,132
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	15,931	4,593	15,382	-	35,906	48,948	9,339	58,286
A2 - Residential Products	10,246,776	2,677,386	8,966,641	-	21,890,802	35,301,456	4,883,082	40,184,538
A2a - Residential Heating & Cooling Equipment	1,115,683	262,606	879,474	-	2,257,763	4,825,787	313,232	5,139,019
A2b - Residential Consumer Products	1,285,647	319,557	1,070,204	-	2,675,408	2,752,570	276,108	3,028,679
A2c - Residential Lighting	7,845,445	2,095,223	7,016,962	-	16,957,631	27,723,098	4,293,742	32,016,840
<b>B - Low-Income</b>	<b>1,249,098</b>	<b>317,056</b>	<b>1,061,828</b>	-	<b>2,627,982</b>	<b>3,589,054</b>	<b>447,025</b>	<b>4,036,079</b>
B1 - Low-Income Whole House	1,249,098	317,056	1,061,828	-	2,627,982	3,589,054	447,025	4,036,079
B1a - Low-Income Single Family Retrofit	909,162	230,354	771,462	-	1,910,978	2,419,585	320,038	2,739,623
B1b - Low-Income Multi-Family Retrofit	339,936	86,702	290,367	-	717,004	1,169,469	126,988	1,296,456
<b>C - Commercial &amp; Industrial</b>	<b>15,889,928</b>	<b>3,960,205</b>	<b>13,262,840</b>	-	<b>33,112,973</b>	<b>42,329,102</b>	<b>5,100,929</b>	<b>47,430,031</b>
C1 - C&I New Construction	1,846,714	439,286	1,471,181	-	3,757,181	4,894,930	411,980	5,306,910
C1a - C&I New Buildings & Major Renovations	670,862	158,860	532,026	-	1,361,748	2,171,353	174,537	2,345,890
C1b - C&I Initial Purchase & End of Useful Life	1,175,851	280,426	939,156	-	2,395,433	2,723,577	237,444	2,961,021
C2 - C&I Retrofit	14,043,214	3,520,919	11,791,658	-	29,355,792	37,434,172	4,688,948	42,123,121
C2a - C&I Existing Building Retrofit	5,987,599	1,439,119	4,819,652	-	12,246,370	17,136,544	1,652,174	18,788,718
C2b - C&I Small Business	5,232,107	1,243,563	4,164,728	-	10,640,399	11,540,571	850,137	12,390,708
C2c - C&I Multifamily Retrofit	34,347	8,399	28,129	-	70,875	297,057	27,339	324,396
C2d - C&I Upstream Lighting	2,789,162	829,837	2,779,149	-	6,398,148	8,460,001	2,159,298	10,619,299
<b>Grand Total</b>	<b>36,695,557</b>	<b>9,188,617</b>	<b>30,772,936</b>	-	<b>76,657,110</b>	<b>107,414,734</b>	<b>13,060,489</b>	<b>120,475,222</b>

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

Program	2016-2018 Evaluated Benefits						
	Non-Electric Resource Benefits						
	Natural Gas Benefits			Other Resource Benefits			
	Natural Gas	Natural Gas DRIPE	Total Gas Benefits	Oil	Propane	Water	Total Other Resource Benefits
<b>A - Residential</b>	<b>7,405,666</b>	<b>36,049</b>	<b>7,441,716</b>	<b>31,718,307</b>	<b>10,503,920</b>	<b>861,072</b>	<b>43,083,299</b>
A1 - Residential Whole House	11,115,967	595,540	11,711,507	37,076,931	11,604,051	770,715	49,451,698
A1a - Residential New Construction	(78,539)	(18,810)	(97,349)	(128,836)	2,698,971	-	2,570,135
A1b - Residential Multi-Family Retrofit	1,172	221	1,394	6,524	34,884	43,191	84,599
A1c - Residential Home Energy Services - Measures	11,166,232	610,235	11,776,467	37,178,002	8,863,923	696,829	46,738,754
A1d - Residential Home Energy Services - RCS	-	-	-	-	-	-	-
A1e - Residential Behavior/Feedback Program	27,102	3,893	30,995	21,241	6,273	30,696	58,210
A2 - Residential Products	(3,710,301)	(559,490)	(4,269,791)	(5,358,624)	(1,100,131)	90,356	(6,368,399)
A2a - Residential Heating & Cooling Equipment	(119,709)	(8,371)	(128,080)	(40,745)	(5,392)	-	(46,136)
A2b - Residential Consumer Products	14,381	1,676	16,057	12,679	4,671	90,356	107,707
A2c - Residential Lighting	(3,604,973)	(552,795)	(4,157,768)	(5,330,559)	(1,099,410)	-	(6,429,969)
<b>B - Low-Income</b>	<b>10,489</b>	<b>725</b>	<b>11,214</b>	<b>3,843,583</b>	<b>702,637</b>	<b>340,685</b>	<b>4,886,906</b>
B1 - Low-Income Whole House	10,489	725	11,214	3,843,583	702,637	340,685	4,886,906
B1a - Low-Income Single Family Retrofit	10,191	704	10,895	3,575,492	412,021	279,758	4,267,271
B1b - Low-Income Multi-Family Retrofit	298	21	319	268,092	290,616	60,927	619,635
<b>C - Commercial &amp; Industrial</b>	<b>(1,907,839)</b>	<b>(252,171)</b>	<b>(2,160,009)</b>	<b>(1,497,336)</b>	<b>934,348</b>	<b>113,932</b>	<b>(449,056)</b>
C1 - C&I New Construction	(894,298)	(90,998)	(985,297)	(85,571)	171,480	17,542	103,451
C1a - C&I New Buildings & Major Renovations	(25,441)	(2,778)	(28,219)	(107,269)	171,480	15,567	79,778
C1b - C&I Initial Purchase & End of Useful Life	(868,857)	(88,221)	(957,078)	21,698	-	1,975	23,673
C2 - C&I Retrofit	(1,013,540)	(161,172)	(1,174,713)	(1,411,764)	762,868	96,390	(552,507)
C2a - C&I Existing Building Retrofit	(187,340)	(15,671)	(203,011)	(582,222)	723,292	48,578	189,648
C2b - C&I Small Business	(556,998)	(66,345)	(623,343)	14,180	17,604	43,481	75,265
C2c - C&I Multifamily Retrofit	-	-	-	33,866	21,972	4,331	60,168
C2d - C&I Upstream Lighting	(269,202)	(79,156)	(348,359)	(877,587)	-	-	(877,587)
<b>Grand Total</b>	<b>5,508,317</b>	<b>(215,396)</b>	<b>5,292,920</b>	<b>34,064,555</b>	<b>12,140,905</b>	<b>1,315,688</b>	<b>47,521,148</b>

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

Program	2016-2018 Evaluated Benefits			
	Total Resource Benefits (Electric + Non-Electric)	Non-Electric, Non-Resource Benefits	Total Benefits	Resource Benefits per Participant
<b>A - Residential</b>	<b>160,450,280</b>	<b>28,466,736</b>	<b>188,917,016</b>	<b>344</b>
A1 - Residential Whole House	109,013,131	24,220,929	133,234,060	4,063
A1a - Residential New Construction	8,817,284	1,282,664	10,099,948	8,217
A1b - Residential Multi-Family Retrofit	1,975,170	701,118	2,676,288	1,245
A1c - Residential Home Energy Services - Measures	98,037,279	22,235,725	120,273,004	4,060
A1d - Residential Home Energy Services - RCS	-	-	-	
A1e - Residential Behavior/Feedback Program	183,398	1,422	184,820	7,336
A2 - Residential Products	51,437,150	4,245,807	55,682,956	117
A2a - Residential Heating & Cooling Equipment	7,222,565	457,991	7,680,556	924
A2b - Residential Consumer Products	5,827,850	-	5,827,850	579
A2c - Residential Lighting	38,386,734	3,787,816	42,174,550	91
<b>B - Low-Income</b>	<b>11,562,182</b>	<b>5,925,070</b>	<b>17,487,252</b>	<b>2,033</b>
B1 - Low-Income Whole House	11,562,182	5,925,070	17,487,252	2,033
B1a - Low-Income Single Family Retrofit	8,928,767	4,869,556	13,798,323	3,278
B1b - Low-Income Multi-Family Retrofit	2,633,415	1,055,514	3,688,929	889
<b>C - Commercial &amp; Industrial</b>	<b>77,933,939</b>	<b>16,154,698</b>	<b>94,088,637</b>	<b>15,553</b>
C1 - C&I New Construction	8,182,245	95,542	8,277,787	19,764
C1a - C&I New Buildings & Major Renovations	3,759,196	295,893	4,055,090	31,858
C1b - C&I Initial Purchase & End of Useful Life	4,423,049	(200,351)	4,222,698	14,943
C2 - C&I Retrofit	69,751,694	16,059,156	85,810,850	15,173
C2a - C&I Existing Building Retrofit	31,021,724	9,640,596	40,662,321	50,939
C2b - C&I Small Business	22,483,029	4,192,261	26,675,289	14,105
C2c - C&I Multifamily Retrofit	455,439	127,099	582,538	5,422
C2d - C&I Upstream Lighting	15,791,502	2,099,200	17,890,702	6,836
<b>Grand Total</b>	<b>249,946,401</b>	<b>50,546,505</b>	<b>300,492,906</b>	<b>524</b>

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Planned v. Evaluated Benefits (%)								
Program	Electric Benefits							
	Capacity					Energy		
	Summer Generation	Trans.	Distrib.	Electric Capacity DRIPE	Total Capacity Benefits	Electric	Electric Energy DRIPE	Total Energy Benefits
<b>A - Residential</b>	<b>26%</b>	<b>30%</b>	<b>30%</b>		<b>28%</b>	<b>23%</b>	<b>44%</b>	<b>25%</b>
A1 - Residential Whole House	1%	2%	2%		2%	13%	22%	14%
A1a - Residential New Construction	30%	36%	36%		33%	7%	59%	10%
A1b - Residential Multi-Family Retrofit	79%	85%	85%		82%	4%	27%	5%
A1c - Residential Home Energy Services - Measures	-2%	-1%	-1%		-2%	16%	20%	17%
A1d - Residential Home Energy Services - RCS								
A1e - Residential Behavior/Feedback Program	-81%	-79%	-79%		-80%	-82%	-75%	-81%
A2 - Residential Products	62%	69%	69%		65%	32%	60%	35%
A2a - Residential Heating & Cooling Equipment	-5%	-6%	-6%		-5%	-5%	-18%	-6%
A2b - Residential Consumer Products	117%	110%	110%		113%	84%	39%	79%
A2c - Residential Lighting	71%	81%	81%		77%	38%	74%	42%
<b>B - Low-Income</b>	<b>-20%</b>	<b>-17%</b>	<b>-17%</b>		<b>-19%</b>	<b>-18%</b>	<b>0%</b>	<b>-17%</b>
B1 - Low-Income Whole House	-20%	-17%	-17%		-19%	-18%	0%	-17%
B1a - Low-Income Single Family Retrofit	-30%	-26%	-26%		-28%	-24%	-7%	-23%
B1b - Low-Income Multi-Family Retrofit	22%	22%	22%		22%	-2%	22%	0%
<b>C - Commercial &amp; Industrial</b>	<b>-47%</b>	<b>-48%</b>	<b>-48%</b>		<b>-48%</b>	<b>-46%</b>	<b>-46%</b>	<b>-46%</b>
C1 - C&I New Construction	-44%	-43%	-43%		-44%	-57%	-45%	-56%
C1a - C&I New Buildings & Major Renovations	0%	0%	0%		0%	-4%	24%	-2%
C1b - C&I Initial Purchase & End of Useful Life	-55%	-54%	-54%		-55%	-70%	-61%	-69%
C2 - C&I Retrofit	-47%	-49%	-49%		-48%	-44%	-47%	-44%
C2a - C&I Existing Building Retrofit	23%	23%	23%		23%	25%	38%	26%
C2b - C&I Small Business	-61%	-62%	-62%		-62%	-62%	-65%	-62%
C2c - C&I Multifamily Retrofit	-62%	-62%	-62%		-62%	-78%	-74%	-77%
C2d - C&I Upstream Lighting	-66%	-65%	-65%		-66%	-60%	-57%	-59%
<b>Grand Total</b>	<b>-22%</b>	<b>-22%</b>	<b>-22%</b>		<b>-22%</b>	<b>-19%</b>	<b>-14%</b>	<b>-18%</b>

**Notes**

- Benefits for each year are presented in real dollars (2016\$).
- Total Resource Benefits are the sum of electric benefits, natural gas benefits, and other resource benefits.

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

Program	2016-2018 Planned v. Evaluated Benefits (%)						
	Non-Electric Resource Benefits						
	Natural Gas Benefits			Other Resource Benefits			
	Natural Gas	Natural Gas DRIPE	Total Gas Benefits	Oil	Propane	Water	Total Other Resource Benefits
<b>A - Residential</b>	<b>-397%</b>	<b>-112%</b>	<b>-366%</b>	<b>-54%</b>	<b>4%</b>	<b>-30%</b>	<b>-46%</b>
A1 - Residential Whole House	14760%	5902%	13723%	-48%	6%	-36%	-41%
A1a - Residential New Construction	-1985%	-4931%	-2237%	-267%	41%		29%
A1b - Residential Multi-Family Retrofit	-78%	-72%	-77%	-98%	162%	43%	-78%
A1c - Residential Home Energy Services - Measures	32734%	11825%	30000%	-48%	-2%	-31%	-42%
A1d - Residential Home Energy Services - RCS							
A1e - Residential Behavior/Feedback Program	-13%	7%	-11%	-10%	-5%	-81%	-69%
A2 - Residential Products	44%	80%	48%	58%	34%	177%	52%
A2a - Residential Heating & Cooling Equipment	-37%	-39%	-37%				
A2b - Residential Consumer Products	280%	184%	267%	24%	-46%	177%	109%
A2c - Residential Lighting	51%	85%	55%	57%	33%		52%
<b>B - Low-Income</b>				<b>-79%</b>	<b>-36%</b>	<b>-17%</b>	<b>-75%</b>
B1 - Low-Income Whole House				-79%	-36%	-17%	-75%
B1a - Low-Income Single Family Retrofit				-50%	-62%	0%	-50%
B1b - Low-Income Multi-Family Retrofit				-98%		-52%	-94%
<b>C - Commercial &amp; Industrial</b>	<b>-69%</b>	<b>-62%</b>	<b>-68%</b>	<b>-128%</b>	<b>-63%</b>	<b>100%</b>	<b>-106%</b>
C1 - C&I New Construction	-81%	-77%	-80%	-188%			6%
C1a - C&I New Buildings & Major Renovations	-206%	-225%	-207%	-210%			-18%
C1b - C&I Initial Purchase & End of Useful Life	-81%	-78%	-81%				
C2 - C&I Retrofit	-31%	-37%	-32%	-127%	-69%	69%	-107%
C2a - C&I Existing Building Retrofit	-161%	-137%	-158%	-742%	133%	2277%	-53%
C2b - C&I Small Business	-41%	-32%	-40%	-100%	-99%	189%	-99%
C2c - C&I Multifamily Retrofit	-100%	-100%	-100%	-91%	47%	-89%	-86%
C2d - C&I Upstream Lighting	-68%	-61%	-67%	-77%			-77%
<b>Grand Total</b>	<b>-164%</b>	<b>-78%</b>	<b>-155%</b>	<b>-63%</b>	<b>-12%</b>	<b>-22%</b>	<b>-56%</b>

**Notes**

- Benefits for each year are presented in real dollars (2016\$).
- Total Resource Benefits are the sum of electric benefits, natural gas benefits, and other resource benefits.

**Benefits (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Planned v. Evaluated Benefits (%)				
Program	Total Resource Benefits (Electric + Non-Electric)	Non-Electric, Non-Resource Benefits	Total Benefits	Resource Benefits per Participant
<b>A - Residential</b>	<b>-2%</b>	<b>31%</b>	<b>2%</b>	<b>-47%</b>
A1 - Residential Whole House	-15%	25%	-10%	-66%
A1a - Residential New Construction	20%	-13%	14%	-70%
A1b - Residential Multi-Family Retrofit	-4%	8%	-2%	-41%
A1c - Residential Home Energy Services - Measures	-17%	28%	-11%	-72%
A1d - Residential Home Energy Services - RCS				
A1e - Residential Behavior/Feedback Program	-74%		-74%	1146%
A2 - Residential Products	43%	93%	46%	-21%
A2a - Residential Heating & Cooling Equipment	-5%	-16%	-6%	71%
A2b - Residential Consumer Products	94%		94%	43%
A2c - Residential Lighting	52%	129%	57%	-21%
<b>B - Low-Income</b>	<b>-58%</b>	<b>22%</b>	<b>-47%</b>	<b>-79%</b>
B1 - Low-Income Whole House	-58%	22%	-47%	-79%
B1a - Low-Income Single Family Retrofit	-39%	51%	-23%	-57%
B1b - Low-Income Multi-Family Retrofit	-80%	-35%	-75%	-93%
<b>C - Commercial &amp; Industrial</b>	<b>-49%</b>	<b>-40%</b>	<b>-47%</b>	<b>-23%</b>
C1 - C&I New Construction	-41%		-40%	-63%
C1a - C&I New Buildings & Major Renovations	-3%		5%	-9%
C1b - C&I Initial Purchase & End of Useful Life	-55%		-57%	-77%
C2 - C&I Retrofit	-49%	-40%	-48%	-21%
C2a - C&I Existing Building Retrofit	21%	102%	34%	-6%
C2b - C&I Small Business	-68%	-69%	-68%	-57%
C2c - C&I Multifamily Retrofit	-78%	-54%	-75%	159%
C2d - C&I Upstream Lighting	-60%	-74%	-62%	-38%
<b>Grand Total</b>	<b>-27%</b>	<b>-5%</b>	<b>-24%</b>	<b>-60%</b>

**Notes**

- Benefits for each year are presented in real dollars (2016\$).
- Total Resource Benefits are the sum of electric benefits, natural gas benefits, and other resource benefits.

**Cost-Effectiveness (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Planned Cost-Effectiveness							
Program	B/C Ratio	Net Benefits	Total TRC Test Benefits	Costs			
				Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
<b>A - Residential</b>	<b>2.31</b>	<b>105,072,107</b>	<b>185,430,783</b>	<b>66,170,031</b>	-	<b>14,188,645</b>	<b>80,358,676</b>
A1 - Residential Whole House	2.49	88,079,699	147,303,743	49,394,275	-	9,829,769	59,224,044
A1a - Residential New Construction	4.28	6,769,835	8,833,573	1,349,533	-	714,206	2,063,739
A1b - Residential Multi-Family Retrofit	1.18	411,743	2,719,453	2,260,081	-	47,628	2,307,709
A1c - Residential Home Energy Services - Measures	2.77	86,264,704	135,044,163	39,711,524	-	9,067,935	48,779,458
A1d - Residential Home Energy Services - RCS	0.00	(5,117,556)	-	5,117,556	-	-	5,117,556
A1e - Residential Behavior/Feedback Program	0.74	(249,027)	706,554	955,581	-	-	955,581
A2 - Residential Products	2.28	21,416,235	38,127,040	12,351,929	-	4,358,876	16,710,804
A2a - Residential Heating & Cooling Equipment	1.01	95,215	8,182,775	5,640,134	-	2,447,426	8,087,560
A2b - Residential Consumer Products	2.15	1,606,704	3,001,049	1,087,883	-	306,462	1,394,345
A2c - Residential Lighting	3.73	19,714,317	26,943,215	5,623,911	-	1,604,987	7,228,899
A3 - Residential Hard-to-Measure	0.00	(4,423,827)	-	4,423,827	-	-	4,423,827
<b>B - Low-Income</b>	<b>2.49</b>	<b>19,584,948</b>	<b>32,698,277</b>	<b>13,113,329</b>	-	-	<b>13,113,329</b>
B1 - Low-Income Whole House	2.55	19,897,922	32,698,277	12,800,355	-	-	12,800,355
B1a - Low-Income Single Family Retrofit	2.04	9,147,730	17,966,408	8,818,678	-	-	8,818,678
B1b - Low-Income Multi-Family Retrofit	3.70	10,750,193	14,731,869	3,981,676	-	-	3,981,676
B2 - Low-Income Hard-to-Measure	0.00	(312,975)	-	312,975	-	-	312,975
<b>C - Commercial &amp; Industrial</b>	<b>2.95</b>	<b>117,870,589</b>	<b>178,271,292</b>	<b>44,729,090</b>	-	<b>15,671,613</b>	<b>60,400,703</b>
C1 - C&I New Construction	2.51	8,281,616	13,783,062	4,302,090	-	1,199,356	5,501,446
C1a - C&I New Buildings & Major Renovations	1.45	1,210,438	3,874,283	3,089,425	-	(425,579)	2,663,846
C1b - C&I Initial Purchase & End of Useful Life	3.49	7,071,178	9,908,779	1,212,665	-	1,624,935	2,837,601
C2 - C&I Retrofit	3.05	110,580,563	164,488,230	39,435,410	-	14,472,257	53,907,667
C2a - C&I Existing Building Retrofit	2.56	18,503,261	30,393,626	10,513,919	-	1,376,446	11,890,365
C2b - C&I Small Business	3.23	58,096,129	84,100,277	21,771,133	-	4,233,016	26,004,148
C2c - C&I Multifamily Retrofit	1.01	22,423	2,329,097	2,259,465	-	47,209	2,306,674
C2d - C&I Upstream Lighting	3.48	33,958,751	47,665,230	4,890,893	-	8,815,586	13,706,479
C3 - C&I Hard-to-Measure	0.00	(991,590)	-	991,590	-	-	991,590
<b>Grand Total</b>	<b>2.58</b>	<b>242,527,643</b>	<b>396,400,351</b>	<b>124,012,451</b>	-	<b>29,860,257</b>	<b>153,872,708</b>

**Cost-Effectiveness (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Evaluated Cost-Effectiveness							
Program	B/C Ratio	Net Benefits	Total TRC Test Benefits	Costs			
				Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
<b>A - Residential</b>	<b>2.18</b>	<b>102,116,417</b>	<b>188,917,016</b>	<b>65,711,082</b>	-	<b>21,089,517</b>	<b>86,800,599</b>
A1 - Residential Whole House	2.30	75,274,989	133,234,060	46,097,618	-	11,861,453	57,959,071
A1a - Residential New Construction	2.73	6,395,277	10,099,948	2,219,082	-	1,485,589	3,704,670
A1b - Residential Multi-Family Retrofit	1.84	1,219,044	2,676,288	1,574,798	-	(117,554)	1,457,244
A1c - Residential Home Energy Services - Measures	2.52	72,579,389	120,273,004	37,200,197	-	10,493,419	47,693,616
A1d - Residential Home Energy Services - RCS	0.00	(4,741,248)	-	4,741,248	-	-	4,741,248
A1e - Residential Behavior/Feedback Program	0.51	(177,473)	184,820	362,293	-	-	362,293
A2 - Residential Products	2.31	31,588,987	55,682,956	14,865,905	-	9,228,064	24,093,969
A2a - Residential Heating & Cooling Equipment	1.23	1,423,834	7,680,556	4,677,838	-	1,578,884	6,256,722
A2b - Residential Consumer Products	2.81	3,752,941	5,827,850	1,712,275	-	362,633	2,074,909
A2c - Residential Lighting	2.68	26,412,212	42,174,550	8,475,791	-	7,286,547	15,762,338
A3 - Residential Hard-to-Measure	0.00	(4,747,558)	-	4,747,558	-	-	4,747,558
<b>B - Low-Income</b>	<b>2.10</b>	<b>9,151,762</b>	<b>17,487,252</b>	<b>8,335,490</b>	-	-	<b>8,335,490</b>
B1 - Low-Income Whole House	2.16	9,390,412	17,487,252	8,096,840	-	-	8,096,840
B1a - Low-Income Single Family Retrofit	2.68	8,647,352	13,798,323	5,150,971	-	-	5,150,971
B1b - Low-Income Multi-Family Retrofit	1.25	743,060	3,688,929	2,945,869	-	-	2,945,869
B2 - Low-Income Hard-to-Measure	0.00	(238,649)	-	238,649	-	-	238,649
<b>C - Commercial &amp; Industrial</b>	<b>2.40</b>	<b>54,865,410</b>	<b>94,088,637</b>	<b>27,740,924</b>	-	<b>11,482,303</b>	<b>39,223,228</b>
C1 - C&I New Construction	2.01	4,152,330	8,277,787	3,111,930	-	1,013,528	4,125,458
C1a - C&I New Buildings & Major Renovations	1.98	2,008,222	4,055,090	2,008,623	-	38,244	2,046,867
C1b - C&I Initial Purchase & End of Useful Life	2.03	2,144,107	4,222,698	1,103,307	-	975,284	2,078,590
C2 - C&I Retrofit	2.48	51,169,271	85,810,850	24,172,803	-	10,468,776	34,641,579
C2a - C&I Existing Building Retrofit	2.88	26,520,518	40,662,321	9,784,563	-	4,357,241	14,141,803
C2b - C&I Small Business	2.03	13,507,616	26,675,289	11,394,137	-	1,773,536	13,167,673
C2c - C&I Multifamily Retrofit	0.96	(26,040)	582,538	615,222	-	(6,644)	608,578
C2d - C&I Upstream Lighting	2.66	11,167,177	17,890,702	2,378,881	-	4,344,643	6,723,524
C3 - C&I Hard-to-Measure	0.00	(456,191)	-	456,191	-	-	456,191
<b>Grand Total</b>	<b>2.24</b>	<b>166,133,589</b>	<b>300,492,906</b>	<b>101,787,496</b>	-	<b>32,571,820</b>	<b>134,359,316</b>



**Cost-Effectiveness (2016\$)**  
**2016-2018 Planned vs. Evaluated**  
 Cape Light Compact  
 August 1, 2019

2016-2018 Planned v. Evaluated Cost-Effectiveness (%)							
Program	B/C Ratio	Net Benefits	Total TRC Test Benefits	Costs			
				Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
<b>A - Residential</b>	<b>-6%</b>	<b>-3%</b>	<b>2%</b>	<b>-1%</b>		<b>49%</b>	<b>8%</b>
A1 - Residential Whole House	-8%	-15%	-10%	-7%		21%	-2%
A1a - Residential New Construction	-36%	-6%	14%	64%		108%	80%
A1b - Residential Multi-Family Retrofit	56%	196%	-2%	-30%		-347%	-37%
A1c - Residential Home Energy Services - Measures	-9%	-16%	-11%	-6%		16%	-2%
A1d - Residential Home Energy Services - RCS		-7%		-7%			-7%
A1e - Residential Behavior/Feedback Program	-31%	-29%	-74%	-62%			-62%
A2 - Residential Products	1%	48%	46%	20%		112%	44%
A2a - Residential Heating & Cooling Equipment	21%	1395%	-6%	-17%		-35%	-23%
A2b - Residential Consumer Products	30%	134%	94%	57%		18%	49%
A2c - Residential Lighting	-28%	34%	57%	51%		354%	118%
A3 - Residential Hard-to-Measure		7%		7%			7%
<b>B - Low-Income</b>	<b>-16%</b>	<b>-53%</b>	<b>-47%</b>	<b>-36%</b>			<b>-36%</b>
B1 - Low-Income Whole House	-15%	-53%	-47%	-37%			-37%
B1a - Low-Income Single Family Retrofit	31%	-5%	-23%	-42%			-42%
B1b - Low-Income Multi-Family Retrofit	-66%	-93%	-75%	-26%			-26%
B2 - Low-Income Hard-to-Measure		-24%		-24%			-24%
<b>C - Commercial &amp; Industrial</b>	<b>-19%</b>	<b>-53%</b>	<b>-47%</b>	<b>-38%</b>		<b>-27%</b>	<b>-35%</b>
C1 - C&I New Construction	-20%	-50%	-40%	-28%		-15%	-25%
C1a - C&I New Buildings & Major Renovations	36%	66%	5%	-35%		-109%	-23%
C1b - C&I Initial Purchase & End of Useful Life	-42%	-70%	-57%	-9%		-40%	-27%
C2 - C&I Retrofit	-19%	-54%	-48%	-39%		-28%	-36%
C2a - C&I Existing Building Retrofit	12%	43%	34%	-7%		217%	19%
C2b - C&I Small Business	-37%	-77%	-68%	-48%		-58%	-49%
C2c - C&I Multifamily Retrofit	-5%	-216%	-75%	-73%		-114%	-74%
C2d - C&I Upstream Lighting	-23%	-67%	-62%	-51%		-51%	-51%
C3 - C&I Hard-to-Measure		-54%		-54%			-54%
<b>Grand Total</b>	<b>-13%</b>	<b>-31%</b>	<b>-24%</b>	<b>-18%</b>		<b>9%</b>	<b>-13%</b>

**Notes**

- Costs and Benefits for each year are presented in real dollars (2016\$).
- The Green Communities Act, in effect during the 2016-2018 term, required that energy efficiency programs be cost-effective. G.L. c. 25, §§ 21(a), 21(b)(3). If a core initiative is not cost-effective, the Program Administrator has provided an explanation in its report filing consistent with the Department's previous directives.

**Minimization of Administrative Costs**

**2016-2018 Planned vs. Actual**

Cape Light Compact

August 1, 2019

2016-2018 Program Planning and Administration Costs								
Program	Planned			Actual			Planned v. Actual (%)	
	Total Program Costs	Program Planning and Administration	PPA as % of Total PA Budget	Total Program Costs	Program Planning and Administration	PPA as % of Total PA Budget	Program Planning and Administration	PPA as % of Total PA Budget
<b>A - Residential</b>	<b>67,887,786</b>	<b>3,633,642</b>	<b>5.4%</b>	<b>67,682,666</b>	<b>3,688,613</b>	<b>5.4%</b>	<b>1.5%</b>	<b>1.8%</b>
A1 - Residential Whole House	50,686,681	2,341,248	4.6%	47,476,749	2,552,691	5.4%	9.0%	16.4%
A1a - Residential New Construction	1,384,357	64,193	4.6%	2,275,904	69,736	3.1%	8.6%	-33.9%
A1b - Residential Multi-Family Retrofit	2,318,768	107,467	4.6%	1,615,194	116,906	7.2%	8.8%	56.2%
A1c - Residential Home Energy Services - Measures	40,753,722	1,895,192	4.7%	38,329,885	2,067,713	5.4%	9.1%	16.0%
A1d - Residential Home Energy Services - RCS	5,250,037	243,269	4.6%	4,886,409	264,611	5.4%	8.8%	16.9%
A1e - Residential Behavior/Feedback Program	979,797	31,127	3.2%	369,358	33,725	9.1%	8.3%	187.4%
A2 - Residential Products	12,662,554	588,171	4.6%	15,307,669	635,735	4.2%	8.1%	-10.6%
A2a - Residential Heating & Cooling Equipment	5,792,237	267,450	4.6%	4,804,978	293,589	6.1%	9.8%	32.3%
A2b - Residential Consumer Products	1,114,585	51,832	4.7%	1,767,601	55,791	3.2%	7.6%	-32.1%
A2c - Residential Lighting	5,755,733	268,889	4.7%	8,735,090	286,355	3.3%	6.5%	-29.8%
A3 - Residential Hard-to-Measure	4,538,550	704,223	15.5%	4,898,248	500,188	10.2%	-29.0%	-34.2%
A3a - Residential Statewide Marketing	336,052	-	0.0%	323,737	-	0.0%	-	-
A3b - Residential Statewide Database	39,759	39,759	100.0%	3,206	3,206	100.0%	-91.9%	0.0%
A3c - Residential DOER Assessment	435,267	435,267	100.0%	331,473	331,473	100.0%	-23.8%	0.0%
A3d - Residential EEAC Consultants	-	-	-	-	-	-	-	-
A3e - Residential Sponsorships & Subscriptions	108,936	77,010	70.7%	-	-	-	-100.0%	-100.0%
A3f - Residential HEAT Loan	3,170,236	152,186	4.8%	4,100,136	165,508	4.0%	8.8%	-15.9%
A3g - Residential Workforce Development	58,800	-	0.0%	37,775	-	0.0%	-	-
A3h - Residential R&D and Demonstration	314,500	-	0.0%	26	-	0.0%	-	-
A3i - Residential Education	75,000	-	0.0%	101,893	-	0.0%	-	-
<b>B - Low-Income</b>	<b>13,466,775</b>	<b>817,937</b>	<b>6.1%</b>	<b>8,545,867</b>	<b>750,703</b>	<b>8.8%</b>	<b>-8.2%</b>	<b>44.6%</b>
B1 - Low-Income Whole House	13,145,672	571,354	4.3%	8,301,186	577,715	7.0%	1.1%	60.1%
B1a - Low-Income Single Family Retrofit	9,056,754	393,722	4.3%	5,276,378	397,978	7.5%	1.1%	73.5%
B1b - Low-Income Multi-Family Retrofit	4,088,918	177,632	4.3%	3,024,807	179,737	5.9%	1.2%	36.8%
B2 - Low-Income Hard-to-Measure	321,103	246,583	76.8%	244,681	172,987	70.7%	-29.8%	-7.9%
B2a - Low-Income Statewide Marketing	68,051	-	0.0%	71,693	-	0.0%	-	-
B2b - Low-Income Statewide Database	8,051	8,051	100.0%	659	659	100.0%	-91.8%	0.0%
B2c - Low-Income DOER Assessment	88,143	88,143	100.0%	80,073	80,073	100.0%	-9.2%	0.0%
B2d - Low-Income Energy Affordability Network	121,372	121,372	100.0%	92,256	92,256	100.0%	-24.0%	0.0%
B2e - Low-Income Sponsorships & Subscriptions	35,486	29,017	81.8%	-	-	-	-100.0%	-100.0%
<b>C - Commercial &amp; Industrial</b>	<b>45,966,511</b>	<b>2,594,057</b>	<b>5.6%</b>	<b>28,526,892</b>	<b>2,824,348</b>	<b>9.9%</b>	<b>8.9%</b>	<b>75.4%</b>
C1 - C&I New Construction	4,402,273	216,627	4.9%	3,186,412	265,280	8.3%	22.5%	69.2%
C1a - C&I New Buildings & Major Renovations	3,166,606	154,720	4.9%	2,052,151	193,317	9.4%	24.9%	92.8%
C1b - C&I Initial Purchase & End of Useful Life	1,235,667	61,907	5.0%	1,134,261	71,963	6.3%	16.2%	26.6%
C2 - C&I Retrofit	40,548,023	1,958,615	4.8%	24,873,530	2,326,108	9.4%	18.8%	93.6%
C2a - C&I Existing Building Retrofit	10,795,292	523,896	4.9%	10,033,439	670,624	6.7%	28.0%	37.7%
C2b - C&I Small Business	22,421,832	1,076,817	4.8%	11,782,397	1,255,475	10.7%	16.6%	121.9%
C2c - C&I Multifamily Retrofit	2,317,888	112,956	4.9%	628,770	126,889	20.2%	12.3%	314.1%
C2d - C&I Upstream Lighting	5,013,011	244,946	4.9%	2,428,924	273,121	11.2%	11.5%	130.1%
C3 - C&I Hard-to-Measure	1,016,215	418,815	41.2%	466,950	232,960	49.9%	-44.4%	21.1%
C3a - C&I Statewide Marketing	225,897	-	0.0%	222,116	-	0.0%	-	-
C3b - C&I Statewide Database	26,726	26,726	100.0%	2,326	2,326	100.0%	-91.3%	0.0%
C3c - C&I DOER Assessment	292,590	292,590	100.0%	229,066	229,066	100.0%	-21.7%	0.0%
C3d - C&I EEAC Consultants	-	-	-	-	-	-	-	-
C3e - C&I Sponsorships & Subscriptions	121,002	99,499	82.2%	4,638	1,567	33.8%	-98.4%	-58.9%
C3f - C&I Workforce Development	130,000	-	0.0%	8,776	-	0.0%	-	-
C3g - C&I R&D and Demonstration	220,000	-	0.0%	27	-	0.0%	-	-
<b>Grand Total</b>	<b>127,321,073</b>	<b>7,045,636</b>	<b>5.5%</b>	<b>104,755,424</b>	<b>7,263,663</b>	<b>6.9%</b>	<b>3.1%</b>	<b>25.3%</b>

**Notes**

• Costs for each year are presented in nominal dollars (2016\$, 2017\$, 2018\$).

• General Laws c. 25, § 19(b) requires the Department, when authorizing energy efficiency programs, to ensure that such programs minimize administrative costs to the fullest extent practicable. Administrative costs, also commonly referred to as PP&A costs, have traditionally been defined as all in-house and outsourced costs associated with planning activities and program administration. These include costs associated with developing program plans and day-to-day program administration, including labor, overhead costs, and any regulatory costs associated with energy efficiency activities.

• The Program Administrator has explained in its report filing the reasons for increases between planned and actual PP&A spending by sector.

**Program Planning and Administration**  
**2016-2018 Program Administration Budget**  
*Cape Light Compact*  
 August 1, 2019

2016-2018 Program Planning and Administration Expenditures							
Year	Internal Costs	External Costs					Total Program Planning and Administration
	Labor, benefits, employee expenses, materials, and overhead	Legal Services	Assessments	Other Vendor Services	Hard to Measure Sponsorships & Subscriptions	Total External Costs	
<b>Actual</b>	<b>2,951,053</b>	<b>1,941,358</b>	<b>732,868</b>	<b>1,636,818</b>	<b>1,567</b>	<b>4,312,611</b>	<b>7,263,663</b>
2016	779,960	527,023	265,608	365,741	1,567	1,159,938	1,939,898
2017	960,231	704,630	260,363	525,678	-	1,490,671	2,450,902
2018	1,210,862	709,705	206,897	745,399	-	1,662,001	2,872,863

**Notes**

- Costs for each year are presented in nominal dollars (2016\$, 2017\$, 2018\$).
- Assessments include assessed costs associated with the Department of Energy Resources (DOER), Residential Conservation Services (RCS), Energy Efficiency Advisory Council (EEAC) Consultants, and the Low-Income Energy Affordability Network (LEAN). Note that the electric Program Administrators did not budget for the EEAC Consultant fees as these costs were traditionally paid by the DOER directly using RGGI proceeds allocated to the electric PAs.
- Other Vendor Services include costs associated with third-party consultants that assist with program planning and administration.
- The data included in the Hard to Measure Sponsorship and Subscriptions column is consistent with the hard-to-measure Sponsorships & Subscriptions line in the Budget table; for additional information on sponsorships & subscriptions, please see Appendix G.

## Customer Sector Cost Allocation

### 2016-2018 Planned vs. Actual

Cape Light Compact

August 1, 2019

2016-2018 Customer Sector Cost Allocation						
Customer Sector	Planned		Actual		Planned v. Actual (%)	
	Program Costs	% of Program Costs	Program Costs	% of Program Costs	Program Costs	% of Program Costs
A - Residential	67,887,786	53.3%	67,682,666	64.6%	0%	21.2%
B - Low-Income	13,466,775	10.6%	8,545,867	8.2%	-37%	-22.9%
C - Commercial & Industrial	45,966,511	36.1%	28,526,892	27.2%	-38%	-24.6%
<b>Grand Total</b>	<b>127,321,073</b>	<b>100%</b>	<b>104,755,424</b>	<b>100%</b>	<b>-18%</b>	<b>0%</b>

#### Notes

- Costs for each year are presented in nominal dollars (2016\$, 2017\$, 2018\$).
- General Laws c. 25, § 19(c) requires that at least 10 percent of the amount expended for electric energy efficiency programs and at least 20 percent of the amount expended for gas energy efficiency programs be spent on low-income programs.
- If the low-income budget did not meet the statutory minimum of the amount expended for energy efficiency, the Program Administrator has explained in its report filing why not, and explained the steps the Program Administrator has taken to ensure compliance in the next term.

**Competitive Procurement**  
**2016-2018 Planned vs. Actual**  
*Cape Light Compact*  
 August 1, 2019

2016-2018 Outsourced and Competitively Procured Services										
Customer Sector	Competitively Procured Services Costs (\$)					Competitively Procured Services Costs as a Percent of Total Sector Costs (%)				
	Total Cost of Services	In-House Activities	Outsourced Activities			Total Cost of Services	In-House Activities	Outsourced Activities		
			Total Outsourced	Competitively Procured	Non-Competitively Procured			Total Outsourced	Competitively Procured	Non-Competitively Procured
<b>Planned</b>	<b>36,419,123</b>	<b>6,736,881</b>	<b>29,682,242</b>	<b>27,753,232</b>	<b>1,929,009</b>	<b>100%</b>	<b>18%</b>	<b>82%</b>	<b>76%</b>	<b>5%</b>
A - Residential	21,790,973	3,634,866	18,156,107	17,188,155	967,952	100%	17%	83%	79%	4%
B - Low-Income	3,854,345	413,097	3,441,249	3,125,995	315,254	100%	11%	89%	81%	8%
C - Commercial & Industrial	10,773,804	2,688,918	8,084,886	7,439,083	645,803	100%	25%	75%	69%	6%
<b>Actual</b>	<b>32,379,546</b>	<b>9,924,574</b>	<b>22,454,973</b>	<b>20,062,492</b>	<b>2,392,481</b>	<b>100%</b>	<b>31%</b>	<b>69%</b>	<b>62%</b>	<b>7%</b>
A - Residential	20,641,581	5,332,831	15,308,750	14,043,359	1,265,390	100%	26%	74%	68%	6%
B - Low-Income	2,544,427	555,816	1,988,611	1,678,470	310,142	100%	22%	78%	66%	12%
C - Commercial & Industrial	9,193,539	4,035,927	5,157,612	4,340,663	816,950	100%	44%	56%	47%	9%
<b>Planned v. Actual (%)</b>	<b>-11%</b>	<b>47%</b>	<b>-24%</b>	<b>-28%</b>	<b>24%</b>	<b>0%</b>	<b>66%</b>	<b>-15%</b>	<b>-19%</b>	<b>39%</b>
A - Residential	-5%	47%	-16%	-18%	31%	0%	55%	-11%	-14%	38%
B - Low-Income	-34%	35%	-42%	-46%	-2%	0%	104%	-12%	-19%	49%
C - Commercial & Industrial	-15%	50%	-36%	-42%	27%	0%	76%	-25%	-32%	48%

**Notes**

- Costs for each year are presented in nominal dollars (2016\$, 2017\$, 2018\$).
- General Laws c. 25, § 19(b) requires that the Department ensure that energy efficiency programs use competitive procurement processes to the fullest extent practicable.
- Costs for the Competitively Procured Services analysis include Program Planning and Administration; Marketing and Advertising; Sales, Technical Assistance & Training; and Evaluation and Market Research.
- The Program Administrator has explained in its report filing the reasons for significant differences between planned and actual outsourced activities and competitively procured activities.

**Greenhouse Gas Reductions**  
**2016-2018 Planned vs. Evaluated**

Cape Light Compact  
 August 1, 2019

2016-2018 Planned Greenhouse Gas Reductions						
Customer Sector	Adjusted Gross Annual Savings			Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	NOX	SO2	CO2
A - Residential	67,676	(3,997,400)	121,139	11.12	2.87	19,822
B - Low-Income	5,314	-	38,001	0.87	0.23	5,692
C - Commercial & Industrial	99,439	(5,020,658)	5,207	16.34	4.22	20,172
<b>Grand Total</b>	<b>172,429</b>	<b>(9,018,058)</b>	<b>164,347</b>	<b>28.34</b>	<b>7.31</b>	<b>45,686</b>

2016-2018 Evaluated Greenhouse Gas Reductions						
Customer Sector	Adjusted Gross Annual Savings			Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	NOX	SO2	CO2
A - Residential	117,147	(387,549)	21,498	19.26	4.97	57,338
B - Low-Income	5,562	1,128	9,328	0.91	0.24	3,507
C - Commercial & Industrial	50,480	(203,281)	(9,587)	8.30	2.14	22,974
<b>Grand Total</b>	<b>173,189</b>	<b>(589,702)</b>	<b>21,239</b>	<b>28.47</b>	<b>7.35</b>	<b>83,819</b>

2016-2018 Planned v. Evaluated Greenhouse Gas Reductions (%)						
Customer Sector	Adjusted Gross Annual Savings			Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	NOX	SO2	CO2
A - Residential	73%	-90%	-82%	73%	73%	189%
B - Low-Income	5%		-75%	5%	5%	-38%
C - Commercial & Industrial	-49%	-96%	-284%	-49%	-49%	14%
<b>Grand Total</b>	<b>0%</b>	<b>-93%</b>	<b>-87%</b>	<b>0%</b>	<b>0%</b>	<b>83%</b>

**Notes**

- GHG reductions are provided for information purposes only. They are not included in the TRC test.
- The GHG factors have been updated since the 2016-2018 Plan in coordination with the Department of Environmental Protection ("DEP") to reflect the most up to date information available.
- The Program Administrators have worked with DEP to properly capture the full impact of energy efficiency measures on GHG emissions. These reductions are calculated using factors prepared by DEP, which are based on adjusted gross annual electric energy, natural gas, oil, and propane savings. For projected emissions reductions in future years for the electric sector, Program Administrators are using values that are consistent with the values used in the Massachusetts Clean Energy and Climate Plan for 2020, as provided by DEP.

## Calculated Fields

### Values used in pivot table formulas

Cape Light Compact

August 1, 2019

Field	Formula
B/C Ratio	=Total Benefits /Total Resource Costs (First Yr\$)
Net Benefits	=Total Benefits -Total Resource Costs (First Yr\$)
PPA % of Total Costs	=Program Planning and Administration/Total Program Costs'
Total PA Budget (Program + PI)	=Total Program Costs'+Performance Incentive'
Program Costs / Participant	=Total Program Costs'/Participants
Resource Benefit / Participant	=Total Resource Benefits'/Participants

### Notes

- The above calculations are used to prepare the previous data tables.
- This table is provided consistent with the Department's directives in D.P.U. 18-110 through D.P.U. 18-119, at 75 to provide a detailed list of calculated fields used in creating the pivot tables.

## **PART TWO – NARRATIVE**

### **1. CORE INITIATIVE VARIANCES & COST-EFFECTIVENESS**

As described below and as shown in the Significant Variances table in Part One, Data tables, a number of the Compact’s core initiatives experienced significant variances between planned budgets and actual expenditures. In some cases, pursuant to § 3.8.1 and § 3.8.2 of the Revised Energy Efficiency Guidelines set forth in D.P.U. 11-120-A, Phase II (January 31, 2013) (“Guidelines”), the Compact sought review and support from the Energy Efficiency Advisory Council (“EEAC”) and approval from the Department to make substantial mid-term modifications (“modifications” or “MTMs”) to its Energy Efficiency Plans.

On March 28, 2017, the Compact filed an MTM with the Department seeking to (1) expand its demand response demonstration offering to include a thermal storage component for its C&I customers and (2) suspend enrollment in its 2016–2018 Residential Behavior/Feedback core initiative. To implement the demand response demonstration offering changes, the Compact proposed to increase its three-year residential sector budget by \$205,602, and to increase its three-year C&I sector budget by \$907,567, for a total proposed budget increase of \$1,113,169. For its Residential Behavioral/Feedback core initiative, the Compact proposed to reduce the three-year budget by \$508,103. In its November 5, 2018 Order, the Department did not approve the Compact’s demand response demonstration offering adjustments but approved the Compact’s discontinuation of the Residential Behavior/Feedback core initiative (D.P.U. 17-84).

#### **A. Residential Programs**

##### **(1) Residential Whole House**

The Residential Whole House program was cost-effective for the term with a benefit-cost ratio of 2.30.

##### **a. Residential New Construction & Major Renovation**

###### Significant Variances

For this core initiative, actual expenditures were significantly higher than the planned budget, as were electric savings and total resource benefits.

The primary reason for the increase in costs is the higher than planned participation, resulting in higher incentive and sales, technical assistance, and training (“STAT”) costs in each of the three years of the term. The Compact has a history of significant variances between planned and actual costs, savings, and benefits for its Residential New Construction core initiative. This is tied to the relatively small number of participants and the difficulty in predicting participant decisions in this core initiative. There is a wide variation in savings and benefits achieved within each home, and the choices made by participants greatly impact the core initiative’s results.



The Programs Administrators implemented a new “performance based” incentive structure in this core initiative starting in July 2017, to better align savings with incentives. As a result, the core initiative has remained cost-effective throughout the term, despite increasing baselines.

Additionally, evaluated benefits were significantly lower than preliminary benefits. This change is due to a reduction in attributable energy savings as a result of the 2015–2016 Massachusetts Single-Family Code Compliance Baseline Study. This study updated the User Defined Reference Home (“UDRH”) to reflect current common installation practices for non-participating homes, and it found significant increases in energy efficiency for several measures in non-participating homes. Some of these measures included duct leakage, air leakage, and ceiling insulation. These updates significantly decreased the total claimable benefits for the non-lighting low-rise portion of the Residential New Construction core initiative.

In addition, a decrease in measure lives for lighting measures (per the Lighting Market Adoption Model and Lighting Worksheet evaluation methodology) reduced lifetime MWh savings, directly affecting total benefits.

In response to the variances, the Compact increased its planned budget for this core initiative in the 2019–2021 Three-Year Plan. The Compact expects high participation rates will continue because of several new statewide efforts. In 2019, the Program Administrators added the Renovations & Additions path to this core initiative, enabling customers undergoing an addition or home renovation to receive incentives for upgrading the energy efficiency of their project above standard building practices. Also in 2019, the Program Administrators launched Passive House incentives through this core initiative, beginning first with incentives for high rise multi-family developments. The goal is to encourage developers to undertake passive house designs, while incentives help cover incremental costs in both design and construction.

#### Cost-Effectiveness

The Residential New Construction core initiative was cost-effective for the term with a benefit-cost ratio of 2.73.

### **b. Residential Multi-Family Retrofit**

#### Significant Variances

For this core initiative, actual expenditures, lifetime savings, and total resource benefits were significantly less than planned.

The Compact’s budget, savings, and benefits variances are driven by the actual measure mix in each year of the 2016–2018 Three-Year Plan, rather than by low participation. The Compact exceeded its participation goals for the term but installed a different distribution of measures than expected. In all three years of the term, the Compact installed more inexpensive, lower-savings measures such as LEDs and programmable thermostats, and fewer costly, higher-savings measures

such as weatherization. This actual measure mix is driven by customer demand and can vary by year.

The Compact continued to evaluate opportunities for additional measures in 2018 such as custom air source heat pump projects, specifically those projects designed to convert electric baseboard heated complexes to air source heat pumps. One such project was completed in 2019, and another has been identified and is expected to be completed in late 2019 or early 2020. In addition, the Compact and its lead vendor continue to look for ways to increase condo-owner program participation through improved communications and marketing. In 2018, an online portal was established. This allowed new participating condo associations to review efficiency offers and documents and enroll via the portal, thereby vastly improving project coordination and customer convenience.

Additionally, evaluated benefits were significantly higher than preliminary benefits. This is primarily due to an increase in realization rates for core measures such as insulation, air sealing thermostats, and lighting. The results from the 2016 National Grid Multi-Family Program Gas and Electric Impact Study (“Multi-Family Impact Study”) (2016 Plan Year Report, Appendix 4D, Study 16-13) were significantly lower than expected. This was a statewide study and the results applied to all Program Administrators. In response, the Program Administrators negotiated a 60 percent realization rate with the EEAC that would be applied to the 2016–2018 planned multi-family savings and agreed to further investigate the realization rate in this study.

To further explore the poor electric realization rate and factors that may have contributed to this finding, the Program Administrators directed Navigant to conduct a new multi-family study. The goal of this study, entitled “Multifamily Program Improvement Strategies (2016 Plan Year Report, Appendix 4D, Study 16-14),” was to identify actionable strategies and innovations to improve the multi-family program performance, realization rates, and overall program cost-effectiveness for both the residential and commercial sectors. This research was intended to provide additional context for the aforementioned Multi-Family Impact Study’s low electric realization rate. Based on the best information available the Program Administrators and EEAC Consultants collaboratively developed the 86.2 percent realization rates to be applied to multi-family program savings for 2016 and beyond, until superseded by new evaluation findings.

For the 2019–2021 Three-Year Plan, the Compact, along with other Program Administrators, redesigned the core initiative’s delivery under the umbrella of the new Residential Coordinated Delivery core initiative (“RCD”). The changes focus on increased customer satisfaction and percentage of individual unit participation at multi-family sites through improved delivery protocols, tiered incentives, and greater contractor market participation. The Program Administrators plan to launch these changes beginning in January 2020. In addition, the Compact planned for fewer weatherization measures in the 2019–2021 term, in recognition of the trend of encountering fewer weatherization opportunities among participants in recent years.

Cost-Effectiveness

The Residential Multi-Family Retrofit core initiative was cost-effective for the term with a benefit-cost ratio of 1.84.

**c. Residential Home Energy Services – Measures / RCS**

Significant Variances

i. Home Energy Services - Measures

For this core initiative, evaluated benefits were significantly less than preliminary benefits. This is primarily due to a decrease in measure lives for lighting measures. The method the Program Administrators use to calculate an adjusted measure life (per the Lighting Market Adoption Model and Lighting Worksheet evaluation methodology) for residential lighting measures considers both regulatory and market conditions, both of which changed substantially from the time the final plan was filed. The result is evaluated measure lives that are much shorter than planned, and a corresponding decrease in benefits. In 2018, an evaluation titled Home Energy Services Impact Evaluation (2019–2021 Plan, Appendix S, Study 13) also reduced the realization rates for core measures such as insulation and air sealing.

ii. Home Energy Services - RCS

There are no significant variances to report for this core initiative.

Cost-Effectiveness

The Residential Home Energy Services - Measures core initiative was cost-effective for the term with a benefit-cost ratio of 2.52.

**d. Residential Behavior/Feedback**

Significant Variances

For this core initiative, actual expenditures, lifetime savings, and total resource benefits were significantly lower than planned. A combination of lower than anticipated evaluated savings and suspended enrollment of new participants were the primary reasons that the costs, savings, and benefits were lower than expected.

As explained in the cost-effectiveness section below, in 2018, the Department approved discontinuation of this core initiative. See D.P.U. 17-100, Pre-filed Testimony of Margaret T. Downey for more information on this core initiative’s history, costs, and savings.

In the 2019–2021 Plan, consistent with the other Program Administrators, the Compact will provide customers with a home energy report as part of this core initiative. This is the first time the Compact has offered such a measure, and it is a different type of offering than the Compact has offered customers within this core initiative in the past. Consistent with the 2019–2021 Three-

Year Plan, the Compact expects this core initiative will provide savings and benefits to customers going forward.

#### Cost-Effectiveness

The Residential Behavior/Feedback core initiative was not cost-effective for the term with a benefit-cost ratio of 0.51. This core initiative was not cost-effective due to high costs and low savings. In 2016, the Compact first proposed discontinuing enrollment in this core initiative because it was not cost-effective and not expected to become cost-effective. The Compact was not aware of any design or implementation changes to the core initiative that would make it cost-effective going forward. In November 2018, the Department approved the Compact's proposal to discontinue enrollment (D.P.U. 17-84, at 23-24).

In 2019–2021, the Compact expects this core initiative will be cost-effective over the three-year term.

#### (2) Residential Products

The Residential Products program was cost-effective for the term with a benefit-cost ratio of 2.31.

##### **a. Residential Heating and Cooling Equipment**

#### Significant Variances

For this core initiative, actual expenditures were significantly lower than the planned budget. Nevertheless, the Compact achieved considerable savings and benefits, resulting in higher than planned cost-effectiveness.

In 2016, this variance was primarily caused by decreased participation for central air conditioning and heat pump measures (both early replacement and regular offers), as well as for heat pump water heaters and circulator pumps. Despite a direct mail marketing campaign for heat pump water heaters in the fall of 2016, the Compact was unable to reach the established participation goals. Circulator pump submittals were slow at the beginning of 2016, which prompted a statewide marketing effort that began in August 2016. In response to these variances, the Compact continued working with its vendor and trade allies to increase its marketing and outreach efforts.

In 2017, the variance in spending was primarily caused by decreased participation for mini-split heat pumps greater than SEER 20. Notably, the structure of the customer's incentive for mini-split heat pumps changed in 2017 such that incentives were provided based on the number of mini-split "heads" that are installed within a home, rather than a fixed per-system incentive. The reason for this change was to promote whole house heating and cooling. The Compact worked with its vendor to promote the new incentive structure to contractors by holding events, sending newsletters, and creating marketing and educational materials.

The Compact's annual spending for this core initiative was greater in 2018 than in 2016 or 2017. Although spending was still below the 2018 planned budget, actual savings and benefits exceeded the annual goals. The Compact increased HVAC measure installations in the final year, especially central air systems and circulator pumps, exceeding planned participation. Consistent with 2016 and 2017, the Compact did not install as many heat pump systems as planned in 2018. This contributed to lower spending in 2018 relative to the 2018 plan. For the three years in total, the Compact's mix of measures was relatively consistent with the plan but at a lower volume than anticipated.

In response to these variances, the Compact and other Program Administrators spent considerable time planning enhancements to the residential programs in the 2019–2021 Three-Year Plan, including a revised approach to delivering residential HVAC measures. The Compact adjusted its overall budget and participation goals based on the participation trends from the 2016–2018 Three-Year Plan. A more detailed description of program enhancements is included in the 2019–2021 Three-Year Plan filing.

#### Cost-Effectiveness

The Residential Heating & Cooling Equipment core initiative was cost-effective for the term with a benefit-cost ratio of 1.23.

#### **b. Residential Consumer Products**

##### Significant Variances

For this core initiative, actual expenditures were significantly higher than the planned budget, as were lifetime electric savings and total resource benefits.

The primary reason for the increase in costs is higher than planned participation in 2017 and 2018, more than compensating for the underspending in 2016. In 2016, the statewide refrigerator recycling vendor went into receivership and ceased operations. In 2017, the hiring of a new recycling vendor, combined with highly successful marketing and product sales, led to higher than expected cumulative spending. In 2018, these 2017 trends continued with participation more than doubling as compared to planned. The core initiative experienced an increase in process measures such as variable speed pool pumps, dehumidifiers, and refrigerator recycling, which provided the greatest impacts on savings and expenditures.

The Compact exceeded its savings and benefits goals in all three years of the plan term. In 2016, the Compact surpassed planned goals through sales of less expensive measures. These higher savings in 2016 were then augmented by higher than expected participation in both 2017 and 2018.

The Compact increased the incentive budget for this core initiative in 2019 in response to this variance.

Cost-Effectiveness

The Residential Consumer Products core initiative was cost-effective for the term with a benefit-cost ratio of 2.81.

**c. Residential Lighting**

Significant Variances

For this core initiative, actual expenditures were significantly higher than the planned budget, as were lifetime electric savings and total resource benefits.

Highly successful marketing drove higher program participation in both 2017 and 2018 leading to higher than expected program costs. Through their lead program vendor, the Program Administrators engaged in a continuous series of marketing campaigns and special offers to drive participation.

The Compact projected participation in lighting programs would begin to drop off in 2018 due to anticipated lighting market and regulatory changes (as reflected in lower planned quantities for 2018). In fact, the upward trend in lighting sales from 2017 continued through 2018, yielding a significant cumulative variance in budget over the three-year term. In particular, LED fixtures were popular, driving increased expenditures in 2018.

Additionally, evaluated benefits were significantly lower than preliminary benefits. The variance resulted from an evaluation that reduced the claimable measure lives for lighting measures. The method that the Program Administrators use to calculate an adjusted measure life (see Appendix 4C, Study 17-6, Lighting Market Adoption Model and the Technical Reference Library) for residential lighting measures takes into account both regulatory and market conditions, both of which changed substantially from the time the final 2016–2018 Three-Year Plan was filed. The result is evaluated measure lives that are much shorter than planned, and a corresponding decrease in benefits.

The Compact increased the incentive budget for 2019 for this core initiative in response to the budget variance.

Cost-Effectiveness

The Residential Lighting core initiative was cost-effective for the term with a benefit-cost ratio of 2.68.

## **B. Low-Income Programs**

### (1) Low-Income Whole House

The Low-Income Whole House program was cost-effective for the term with a benefit-cost ratio of 2.16.

#### **a. Low-Income Single Family Retrofit**

##### Significant Variances

For this core initiative, actual expenditures and total resource benefits were significantly lower than planned.

Fewer weatherization measures were installed than planned over the three years of the term, which is driving the variances in budget and benefits for this core initiative. The Compact met its participation goals throughout the term and met its cumulative savings goal through 2017. The increasingly downward trend in weatherization installations prevented the Compact from reaching its savings goal in 2018 and for the term overall. The downward trend in weatherization is a result of the Compact having previously provided weatherization services to many customers identified on the low-income discount rate. Unlike many energy efficiency measures that evolve with changing technology, once a home is weatherized (insulation and air sealing) there is less opportunity to provide additional weatherization measures to these customers. Fewer than expected lighting measures was a secondary factor contributing to reduced savings and expenditures for this core initiative.

Additionally, evaluated benefits were significantly higher than preliminary benefits. This change is due to the adoption of updated values for non-energy benefits (“NEBs”). In August 2016, the Program Administrators completed a study titled “Low-Income Single Family Health and Safety-Related Non-Energy Impacts Study,” that produced substantially higher NEB values that are considered more robust than their previous counterparts, which is due primarily to the study’s ability to better detect, quantify, and monetize improvements in health status and mortality (e.g., reduced asthma, thermal stress, missed work days, and home fires) from weatherization.

The Compact is not planning significant changes to the design or implementation of the core initiative because of these variances. The cost of saved energy for the term was less than planned, resulting in greater savings per dollar spent. The Compact is also looking at possible ways to increase weatherization opportunities to customers who are income eligible but are not on the low-income discount rate. Serving this population of income eligible customers (hard-to-reach and hard-to-serve) will require targeted marketing and additional barrier remediation opportunities. In addition, the Compact is looking at opportunities to offer air source heat pumps and heat pump water heaters through this core initiative in the 2019–2021 term. Lastly, for the 2019–2021 Three-Year Plan, the Compact planned to install fewer weatherization measures to reflect recent trends.

### Cost-Effectiveness

The Low-Income Single Family Retrofit core initiative was cost-effective for the term with a benefit-cost ratio of 2.68.

#### **b. Low-Income Multi-Family Retrofit**

##### Significant Variances

For this core initiative, actual expenditures and total resource benefits were significantly lower than planned.

Compared to the plan, the Compact installed fewer weatherization measures (which are more costly) and more lighting measures at a lower cost due to statewide contract price adjustments. The Compact's service territory has less low-income multi-family housing stock than elsewhere in Massachusetts. The Compact has provided weatherization services to most low-income multi-family buildings in its service territory. Unlike many energy efficiency measures that evolve with changing technology, once a multi-family building is weatherized (insulation and air sealing) there is little opportunity to provide additional weatherization measures to these customers.

Additionally, evaluated benefits were significantly higher than preliminary benefits. The change is due to the adoption of updated values NEBs. An evaluation that was conducted in 2018 to comprehensively look at NEBs for multi-family homes found that the Program Administrators were under-counting NEBs associated with common area lighting.

The Compact is not planning significant changes to the design or implementation of the core initiative because of these variances. The Compact remains committed to providing comprehensive energy efficiency services to the low-income customer sector, including weatherization, wherever applicable. In addition, the Compact is continuing to evaluate air source heat pump project opportunities and is expected to complete two such projects in 2019.

### Cost-Effectiveness

The Low-Income Multi-Family Retrofit core initiative was cost-effective for the term with a benefit-cost ratio of 1.25.

#### **C. Commercial and Industrial Programs**

##### (1) C&I New Construction

The Commercial & Industrial ("C&I") New Construction program was cost-effective for the term with a benefit-cost ratio of 2.01.



**a. C&I New Buildings & Major Renovations**

Significant Variances

For this core initiative, actual expenditures were significantly lower than the planned budget, although the Compact met its savings and benefit goals.

The Compact set its budget based on projections as well as historical performance. In this core initiative, the Compact was able to achieve more savings per dollar than originally expected. The Compact planned for more HVAC measures than it installed, and such measures tend to have higher incremental costs. In contrast, the Compact received more applications and completed more projects with lighting opportunities that have lower incremental costs. As a result, fewer incentives were necessary to achieve planned lifetime electric savings and total resource benefits.

Given the variable nature of this core initiative, the Compact does not currently expect to make any significant changes to the core initiative's design or implementation.

Cost-Effectiveness

The C&I New Buildings & Major Renovations core initiative was cost-effective for the term with a benefit-cost ratio of 1.98.

**b. C&I Initial Purchase & End of Useful Life**

Significant Variances

For this core initiative, lifetime savings and total resource benefits were significantly lower than planned.

Most of the Compact's planned savings and benefits were attributable to the anticipated 2016 completion of a single Combined Heat and Power ("CHP") project. This CHP project was delayed during 2016 but completed in early 2017. The CHP project did not save as much electricity as expected with a commensurate decline in benefits. In contrast, the Compact completed more projects than anticipated related to prescriptive HVAC, lighting, compressed air, motors and drives, and refrigeration. These measures tend to require higher incentive costs relative to lifetime electric savings and total resource benefits than CHP projects.

This core initiative can be highly variable due to the nature of the opportunities it addresses. Given this variability, the Compact does not currently expect to make any significant changes in the core initiative's design or implementation.

Cost-Effectiveness

The C&I Initial Purchase & End of Useful Life core initiative was cost-effective for the term with a benefit-cost ratio of 2.03.

(2) C&I Retrofit Program

The C&I Retrofit program was cost-effective for the term with a benefit-cost ratio of 2.48.

**a. C&I Existing Buildings Retrofit**

Significant Variances

There are no significant variances for this core initiative.

Cost-Effectiveness

The C&I Existing Building Retrofit core initiative was cost-effective for the term with a benefit-cost ratio of 2.88.

**b. C&I Small Business**

Significant Variances

For this core initiative, actual expenditures, lifetime savings, and total resource benefits were significantly lower than planned.

These variances are the result of less participation than expected across all three years of the term. Beginning with the 2016–2018 Three-Year Plan, the Compact implemented a new effort for its small C&I customers, modeled after the Compact’s Home Energy Services core initiative. The enhancements were designed to alleviate participation barriers for smaller customers, thereby increasing the core initiative’s participation. While the Compact actively promoted this core initiative and sought to serve customers comprehensively, many customers were still only interested in lighting projects. In 2018, the Compact increased its outreach efforts to businesses through area Chambers of Commerce, in-person outreach, and canvassing of businesses. The Compact also increased its marketing to businesses and held promotions to gain more participation. Despite these efforts which significantly increased spending, savings, and benefits in 2018 compared to 2016 and 2017, the Compact was not able to close the gap from the prior two years and achieve the three-year targets.

The Compact does not currently expect to make any significant changes in the core initiative’s design or implementation.

Cost-Effectiveness

The C&I Small Business core initiative was cost-effective for the term with a benefit-cost ratio of 2.03.

**c. C&I Multi-Family Retrofit**

Significant Variances

For this core initiative, actual expenditures, lifetime savings, and total resource benefits were significantly lower than planned.

This core initiative is delivered to customers in conjunction with the Residential Multi-Family core initiative. Expenditures and savings between the two sectors depend on the metering structure of participating multi-family units. The number of residential-metered buildings served versus C&I-metered buildings served changes each year, and 2016 was the first year the Program Administrators forecasted and reported the sectors separately. Since multi-family buildings served by the Program Administrators may be residentially or commercially metered, large swings in production between these sectors are common in the Compact's service territory. Therefore, production in one sector is not necessarily indicative of overall performance within the multi-family space. In 2016–2018, commercial meters made up a smaller proportion of multi-family program meters than the Compact planned for each year of the term.

Additionally, evaluated benefits were significantly higher than preliminary benefits. This change is primarily due to an increase in realization rates for core measures such as insulation, air sealing, thermostats, and lighting. The results from the Multi-Family Impact Study were significantly lower than expected. This was a statewide study and the results applied to all Program Administrators. In response, the Program Administrators negotiated a 60 percent realization rate with the EEAC that would be applied to the 2016–2018 planned multi-family savings and agreed to further investigate the realization rate in this study.

To further explore the poor electric realization rate and factors that may have contributed to this finding, the Program Administrators directed Navigant to conduct a new multi-family study. The goal of this study, entitled “Multi-family Program Improvement Strategies (2016 Plan Year Report, Appendix 4D, Study 16-14),” was to identify actionable strategies and innovations to improve the multi-family program performance, realization rates, and overall program cost-effectiveness for both the residential and commercial sectors. This research was intended to provide additional context for the aforementioned Multi-Family Impact Study's low electric realization rate. Based on the best information available, the Program Administrators and EEAC Consultants collaboratively developed the 86.2 percent specific realization rates to be applied to multi-family program savings for 2016 and beyond, until superseded by new evaluation findings.

The Compact remains committed to pursuing all opportunities within multi-family buildings, regardless of whether they are residentially or commercially metered. There are no changes planned for this initiative in response to these variances. However, with the 2019–2021 Three-Year Plan, the Compact did allocate a lower proportion of overall planned multi-family program activity to the commercial sector than it did in the 2016–2018 Three-Year Plan.

### Cost-Effectiveness

The C&I Multi-Family Retrofit core initiative was not cost-effective for the term with a benefit-cost ratio of 0.96. In the C&I Multi-Family core initiative, the Program Administrators offered certain measures that are not cost-effective on their own but allow the Program Administrators to attract participants and lead to deeper savings. In the past, when the multi-family programs were marketed primarily through the residential core initiative, these measures were offset by more cost-effective measures, keeping the core initiative cost-effective overall. While the multi-family vendors continue to screen projects based on the whole building, the Program Administrators established a separate C&I multi-family core initiative to reflect C&I meters in multi-family buildings with the 2016–2018 Three-Year Plan. Due to evaluation results and the lack of more cost-effective residential metered measures (such as insulation), this core initiative did not screen as cost-effective in 2016 and 2017. The Program Administrators ceased to offer in-unit fixtures to mitigate the cost-effectiveness concerns, and in 2018 the core initiative screened as cost-effective. However, the Program Administrators continued to offer common area fixtures, which the Program Administrators believe are necessary to attract owners to participate in the program. Combined, the Residential Multi-Family core initiative and the C&I Multi-Family core initiative are cost-effective for the 2016–2018 term.

The Program Administrators believe that it is important to continue to offer equitable service to multi-family buildings. In the 2019–2021 Three-Year Plan this core initiative is bundled into the C&I Existing Building Retrofit core initiative, which has a planned benefit-cost ratio of 3.80.

#### **d. C&I Upstream Lighting**

##### Significant Variances

For this core initiative, actual expenditures, lifetime savings, and total resource benefits were significantly lower than planned.

These variances were a result of changes in planned to actual measure mix. The Compact exceeded its planned linear LED installations, but underachieved on screw-in LED installations. Linear LEDs were a smaller portion of the overall planned budget and savings than screw-in LEDs and had a higher cost per unit. Since screw-in LEDs were a larger portion of the planned budget and savings, its underperformance in this measure category had more pronounced effects on overall performance for the core initiative. These changes were the result of market demand.

In response to these variances, and as a matter of normal business practice, the Compact is working with its lead vendor to increase distributor participation in the core initiative and to include new measures as appropriate.

Cost-Effectiveness

The C&I Upstream Lighting core initiative was cost-effective for the term with a benefit-cost ratio of 2.66.

## 2. LOW-INCOME COST ALLOCATION

The Green Communities Act requires that at least 10 percent of electric efficiency funding be spent on low-income programs (G.L. c. 25 § 19(c)). The table below summarizes and compares the Compact’s planned and actual program budget allocation by customer sector by year and in total for the three-year term.

2016-2018 Customer Sector Cost Allocation						
Customer Sector	Planned		Actual		Planned v. Actual (%)	
	Program Costs	% of Program Costs	Program Costs	% of Program Costs	Program Costs	% of Program Costs
<b>2016 Allocation</b>						
A - Residential	21,642,293	55.7%	16,460,252	60.4%	-23.9%	8.4%
B - Low-Income	4,040,498	10.4%	2,849,199	10.5%	-29.5%	0.5%
C - Commercial & Industrial	13,162,821	33.9%	7,944,739	29.2%	-39.6%	-14.0%
<b>Grand Total</b>	<b>38,845,613</b>	<b>100%</b>	<b>27,254,189</b>	<b>100%</b>	<b>-30%</b>	<b>0%</b>
<b>2017 Allocation</b>						
A - Residential	22,558,347	53.4%	22,131,219	64.9%	-1.9%	21.5%
B - Low-Income	4,460,916	10.6%	2,829,372	8.3%	-36.6%	-21.5%
C - Commercial & Industrial	15,216,941	36.0%	9,151,599	26.8%	-39.9%	-25.5%
<b>Grand Total</b>	<b>42,236,204</b>	<b>100%</b>	<b>34,112,189</b>	<b>100%</b>	<b>-19%</b>	<b>0%</b>
<b>2018 Allocation</b>						
A - Residential	23,687,146	51.2%	29,091,195	67.0%	22.8%	30.9%
B - Low-Income	4,965,362	10.7%	2,867,296	6.6%	-42.3%	-38.5%
C - Commercial & Industrial	17,586,749	38.0%	11,430,554	26.3%	-35.0%	-30.7%
<b>Grand Total</b>	<b>46,239,256</b>	<b>100%</b>	<b>43,389,045</b>	<b>100%</b>	<b>-6%</b>	<b>0%</b>
<b>2016-2018 Allocation</b>						
A - Residential	67,887,786	53.3%	67,682,666	64.6%	-0.3%	21.2%
B - Low-Income	13,466,775	10.6%	8,545,867	8.2%	-36.5%	-22.9%
C - Commercial & Industrial	45,966,511	36.1%	28,526,892	27.2%	-37.9%	-24.6%
<b>Grand Total</b>	<b>127,321,073</b>	<b>100%</b>	<b>104,755,424</b>	<b>100%</b>	<b>-18%</b>	<b>0%</b>

At 8.2 percent, the Compact’s three-year low-income budget did not meet the 10 percent statutory minimum expended for electric energy efficiency resources. The Compact spent less than expected on the low-income sector for all three years of the term, though the Compact spent over 10 percent on the low-income sector in 2016. For more information regarding spending variances in the Low-Income Single Family and Low-Income Multi-Family core initiatives for the 2016–2018 term, see Part Two 1.B in this report.

The Compact has historically spent a substantial amount on low-income customers. As summarized in the table below, the Compact’s spending in 2016–2018, totaling \$8,545,867 across

the three years, is consistent with spending in the 2010-2012 Three-Year Plan term (\$7,395,926) and the 2013-2015 Three-Year Plan term (\$9,067,395). Further, the Compact expects to spend an additional \$25,788,310 by the end of 2021, which is 16 percent of the total spending for the 2019–2021 timeframe.

Year	Low-Income Spending (\$)	Annual Increase in Low-Income Spending	Total Portfolio Spending (\$)	Low-Income Spending as Percent of Total Spending (%)
2010	1,826,691		13,531,218	13.5%
2011	2,489,571	36%	16,908,160	14.7%
2012	3,079,664	24%	25,857,219	11.9%
2013	2,713,226	-12%	25,638,933	10.6%
2014	2,683,268	-1%	36,757,137	7.3%
2015	3,670,901	37%	38,346,488	9.6%
2016	2,849,199	-22%	27,254,189	10.5%
2017	2,829,372	-1%	34,112,189	8.3%
2018	2,867,296	1%	43,389,045	6.6%
2019 (planned)	4,177,118	46%	43,915,682	10%
2020 (planned)	9,172,553	120%	56,181,306	16%
2021 (planned)	12,438,639	36%	61,830,825	20%

The Compact is exploring innovative solutions to best serve low-income customers within its service territory. In the 2019–2021 Three-Year Plan, the Compact proposed to include a new offering (the Cape and Vineyard Electrification Offering, “CVEO”) designed, in part, to address the issue of upfront cost barriers for low-income customers to install heat pumps, batteries, and solar. The Department did not approve the offering but directed the Compact to refine its offering and submit a revised proposal and budget (*Cape Light Compact JPE*, D.P.U. 18-116, 2019). The Compact intends to submit its updated CVEO offering in 2019, with a continued focus on addressing the upfront cost barriers faced by low-income customers. The 2019–2021 budgets in the table above are consistent with the Compact’s Compliance Filing in D.P.U. 18-116 submitted on February 19, 2019. In the Compliance Filing, the Compact removed the CVEO budget from 2019 consistent with the Department’s directives, but it maintained the 2020 and 2021 budgets proposed in the plan because there are several activities occurring in 2019 that make it premature for the Compact to speculate on changes to the budget in 2020 and 2021.

### **3. MINIMIZATION OF ADMINISTRATIVE COSTS**

The Green Communities Act requires that energy efficiency programs minimize administrative costs to the fullest extent practicable (G.L. c. 25 § 19(b)). In accordance with the GCA, the Compact has sought to minimize administrative costs to the fullest extent practicable.

Please refer to the Administrative Costs table in the Compact's Data Tables for a summary and comparison by core initiative of (i) planned and actual Program Planning and Administration ("PP&A") costs, and (ii) planned and actual PP&A costs as a percent of total program costs.

Compared to the three-year planned budget, three-year actual PP&A costs were 1.5 percent greater for the residential sector, 8.2 percent lower for the low-income sector, 8.9 percent greater for the C&I sector, and 3.1 percent greater for the Compact in total. All sectors are within 10 percent of planned spending, indicating the Compact's PP&A spending was consistent with its 2016–2018 Three-Year Plan.



#### 4. COMPETITIVE PROCUREMENT

The Green Communities Act requires that energy efficiency programs utilize competitive procurement processes to the fullest extent practicable (G.L. c. 25 § 19(b)). In accordance with the GCA, the Compact has utilized competitive procurement processes to the fullest extent practicable.

Please refer to the Competitive Procurement table in the Compact's Data Tables for a summary and comparison of planned and actual outsourced program activities by sector. Almost 90 percent of the Compact's total outsourced costs were competitively procured. Therefore, any changes from the 2016-2018 Three-Year Plan in the Compact's competitively procured costs will drive changes in the Compact's outsourced costs.

For the residential sector, compared to the three-year planned budget, three-year actual outsourced costs were 16 percent less and competitively procured costs were 18 percent less. This was primarily driven by lower than planned STAT costs in 2016 and to some extent in 2017 for the Home Energy Services Measures and RCS core initiatives. This is because the Compact completed approximately 75 percent of its Home Energy Assessments ("HEAs") goal of 4,000 in 2016. Fewer HEAs were completed in part because of the transition to a common vendor between the Compact and National Grid (see *Colonial Gas Company d/b/a National Grid*, D.P.U. 16-169). The common vendor, the Compact's lead vendor for this core initiative, required additional time and resources to consistently serve mutual customers of the Compact and National Grid.

For the low-income sector, compared to the three-year planned budget, three-year actual outsourced costs were 42 percent less and competitively procured costs were 46 percent less. This is primarily because fewer HVAC and weatherization measures were installed, which are higher in both costs and savings. See Part Two 1.B for an explanation by core initiative.

For the C&I sector, compared to the three-year planned budget, three-year actual outsourced costs were 36 percent less and competitively procured costs were 42 percent less. The C&I sector was generally underspent over the three-year term, as explained by core initiative in Part Two 1.C, which contributed to lower competitively procured costs than planned. In addition, the Compact spent less on STAT costs than planned because the need for sales, technical assistance and training was less than expected because customers were more interested in implementation of lighting projects, which are less intensive in terms of engineering support.

## **5. BENEFIT-COST RATIO SCREENING TOOL**

Please see Appendix A, the CD-ROM accompanying this report, for the Benefit-Cost Ratio Screening Tool in Microsoft Excel format.

## **6. STATEWIDE TECHNICAL REFERENCE MANUAL/LIBRARY**

The Technical Reference Manual (“TRM”) documents how the energy efficiency Program Administrators consistently, reliably, and transparently calculate savings resulting from the installation of prescriptive energy efficiency measures. The TRM provides methods, formulas, and default assumptions for estimating energy, peak demand, and other resource impacts from energy efficiency measures. The Technical Reference Manual – 2018 Report Version is available at Appendix B. Please see Appendix 3 to the Compact’s 2016 Plan-Year Report in D.P.U. 17-100 for the Technical Reference Manual – 2016 Report Version, and Appendix 3 to the Compact’s 2017 Plan-Year Report in D.P.U. 18-51 for the Technical Reference Manual – 2017 Report Version.

The electronic version, the eTRM, is available at:

<https://www.massavedata.com/Public/TechnicalReferenceLibrary>.

## 7. STATEWIDE EVALUATION STUDIES SUMMARY

### A. Previously Submitted Evaluation Studies Incorporated by Reference

Under the guidance and direction of the Evaluation Management Committee, 171 evaluation studies were completed during the 2016–2018 term. The majority of these studies were previously submitted to the Department in D.P.U. 17-100 (*2016 Energy Efficiency Plan-Year Report*), D.P.U. 18-51 (*2017 Energy Efficiency Plan-Year Report*) and D.P.U. 18-110 through D.P.U. 18-119 (*2019–2021 Electric & Gas Three-Year Energy Efficiency Plan*). Previously submitted studies are incorporated in the instant docket by reference. Please refer to the table below for a complete list of these studies. The table provides the name of each study, the applicable fuel, the location of the study in each report/plan, and the primary EM&V contractor conducting the study. All completed studies are also available on the Massachusetts Energy Efficiency Advisory Council’s website at: <http://ma-eeac.org/studies/>.

<b>Evaluation Studies Completed during the 2016–2018 Term Previously Submitted in other Dockets</b>			
<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
<b>Residential</b>			
Lighting Interactive Effects Study Results Memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-1	Electric	NMR Group, Inc.
2015 - 16 Lighting Market Assessment Consumer Survey and On-Site Saturation Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-2	Electric	NMR Group, Inc.
Residential Lighting Hours-of-Use Update Memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-3	Electric	NMR Group, Inc.
Lighting Market Adoption Model/Interim Reflector Model	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-4	Electric/ Gas	NMR Group, Inc.
Quarterly Lighting Market Scan I & II	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-5	Electric/ Gas	NMR Group, Inc.
Massachusetts Supplier Interviews - Interim Findings Memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-6	Electric	NMR Group, Inc.
Lighting Decision Making Memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-7	Electric	NMR Group, Inc.

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Sales and Shipment Data Analysis Memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-8	Electric	NMR Group, Inc.
Lighting Shelf Stocking	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-9	Electric	NMR Group, Inc.
2016-2017 Lighting Market Assessment Consumer Survey and On-Site Saturation Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-10	Electric	NMR Group, Inc.
Market Progress Assessment Memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-11	Electric	NMR Group, Inc.
Multifamily Market Movement Assessment	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-12	Electric	NMR Group, Inc.
2013 National Grid Multifamily Program Gas and Electric Impact Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-13	Electric/ Gas	DNV GL
Multifamily Program Improvement Strategies: Preliminary Results - Summary of Task 2b and 3 Findings	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-14	Electric/ Gas	Navigant Consulting Inc.
Ductless Mini-Split Heat Pump Impact Evaluation	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-15	Electric/ Gas	The Cadmus Group, Inc.
2015-16 Massachusetts Single-Family Code Compliance/Baseline Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-16	Electric/ Gas	NMR Group, Inc.
Massachusetts Multifamily High Rise Baseline Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-17	Electric/ Gas	NMR Group, Inc.
Heat Pump Water Heaters Impact Study: Volume 1	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-18	Electric	Navigant Consulting Inc.
Heating/Cooling Contractor Interview Findings	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-19	Electric/ Gas	Navigant Consulting Inc.
HEHE Condensing Equipment Barriers	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-20	Gas	Navigant Consulting Inc.
2015 Single-Family Stretch Code Update Compliance and Potential	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-1	Electric/ Gas	NMR Group, Inc.

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
2017 Massachusetts Single-Family New Construction Mini-Baseline/Compliance Study	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-2	Electric/ Gas	NMR Group, Inc.
Lighting Market Scan	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-3	Electric	NMR Group, Inc.
What is Next for Products - Market Scan	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-4	Electric	NMR Group, Inc.
Lighting Decision Making	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-5	Electric	NMR Group, Inc.
Lighting Market Adoption Model Findings	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-6	Electric	NMR Group, Inc.
Products Impact Evaluation of In-service and Short-Term Retention Rates Study	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-7	Electric	NMR Group, Inc.
2017-18 Residential Lighting Market Assessment Study	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-8	Electric	NMR Group, Inc.
Web Scraping Results June 2016 – November 2017	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-9	Electric	NMR Group, Inc.
Sales Data Analysis and Modeling	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-10	Electric	NMR Group, Inc.
Lighting Supplier Insights	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-11	Electric	NMR Group, Inc.
Appliance Recycling Database Review and Savings Update	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-12	Electric	NMR Group, Inc.
Gas Condensing Boilers Losses and Savings Potential	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-13	Gas	Navigant Consulting, Inc.
Baseline Load Shape Study Cooling Season Short Report	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-14	Electric	Navigant Consulting, Inc.
Baseline Load Shape Study Heating Season Short Report	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-15	Electric	Navigant Consulting, Inc.

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Ductless Mini-Split Heat Pump Survey	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-16	Electric	Navigant Consulting, Inc.
Ductless Mini-Split Heat Pump Cost Study	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-17	Electric	Navigant Consulting, Inc.
Connected Thermostats and Technology Literature Review	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-18	Electric/ Gas	Navigant Consulting, Inc.
Moderate Income Market Characterization Survey Findings	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-19	Electric/ Gas	Navigant Consulting, Inc.
Home Energy Services Process Evaluation	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-20	Electric/ Gas	Navigant Consulting, Inc.
Multi-Family Program Impact and Net-to-Gross Evaluation	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-21	Electric/ Gas	Navigant Consulting, Inc.
Products Net-to-Gross Report	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 1	Electric	NMR Group, Inc.
LED Net-to Gross Consensus Panel Report	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 2	Electric	NMR Group, Inc.
Advanced Power Strip Metering Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 3	Electric	NMR Group, Inc.
Products Impact Evaluation of In-service and Short-Term Retention Rates Study Revised	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 4	Electric	NMR Group, Inc.
Massachusetts Residential New Construction Incremental Cost	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 5	Electric	NMR Group, Inc.
Shelf Stocking Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 6	Electric	NMR Group, Inc.
HEA LED NTG Consensus	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 7	Electric	NMR Group, Inc.
MA RLPNC Cross-Sector Sale HOU Update	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 8	Electric	NMR Group, Inc.

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Appliance Recycling Report	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 9	Electric	NMR Group, Inc.
Baseline Load Shape Study Comprehensive Report	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 10	Electric	Navigant Consulting, Inc.
Water Heating, Boiler, and Furnace Cost Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 11	Electric/ Gas	Navigant Consulting, Inc.
Low Rise Measure Review	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 12	Electric/ Gas	Navigant Consulting, Inc.
Home Energy Services Impact Evaluation	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 13	Electric/ Gas	Navigant Consulting, Inc.
Heating and Cooling Early Retirement Net-to-Gross	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 14	Electric/ Gas	Navigant Consulting, Inc.
Heat Loan Assessment	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 15	Electric/ Gas	Navigant Consulting, Inc.
Multi-Family Program Impact and Net-to-Gross Evaluation Updated	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 16	Electric/ Gas	Navigant Consulting, Inc.
Wi-Fi Thermostat Impact Evaluation --Secondary Research Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 17	Electric/ Gas	Navigant Consulting, Inc.
Ductless Mini-Split Heat Pump Cost Study Updated	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 18	Electric	Navigant Consulting, Inc.
Cost Study of Heat Pump Installations for Dual Fuel Operation	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 19	Electric/ Gas	Navigant Consulting, Inc.
Energy Optimization Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 20	Electric/ Gas	Navigant Consulting, Inc.
Understanding the Role of Weather in Air Conditioning Use Behavior and Demand Response Program Participation	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 21	Electric	Navigant Consulting, Inc.



Study Name	Study Location and Number	Fuel	EM&V Contractor
<b>Commercial &amp; Industrial</b>			
Massachusetts C&I Market Characterization On-Site Assessments and Market Share and Sales Trends Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-21	Electric/ Gas	DNV GL
2015 Comprehensive Commercial and Industrial Customer Profile Report	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-22	Electric/ Gas	DNV GL
Massachusetts Commercial/Industrial Baseline Framework	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-23	Electric/ Gas	DNV GL
Massachusetts Commercial and Industrial Impact Evaluation of 2013 Custom Process Installations	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-24	Electric	DNV GL
Gas Boiler Market Characterization Study Phase II - Final Report	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-25	Gas	DNV GL
Recalculation of Prescriptive Program Gas Boiler Savings Using New Baseline	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-26	Gas	DNV GL
Prescriptive Commercial & Industrial Programmable Thermostat Evaluation	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-27	Gas	DNV GL
Steam Trap Evaluation Phase 2	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-28	Gas	DNV GL
Assessment of the Drivers of Net-to-Gross	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-29	Electric/ Gas	NMR Group, Inc.
2016 PA Differences	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-22	Electric/ Gas	DNV GL
Upstream HVAC Initiative Process Evaluation	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-23	Electric	DNV GL
Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Program	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-24	Electric	DNV GL
Combined Heat and Power Process Evaluation	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-25	Electric	DNV GL

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
MA C&I Incentivized Share of High-Efficiency Equipment	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-26	Electric/ Gas	DNV GL
Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-27	Electric/ Gas	DNV GL
Commercial and Industrial 2011-2016 Mid-size Customer Assessment	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-28	Electric/ Gas	DNV GL
Massachusetts Commercial Energy Code Compliance and Baseline for IECC 2012	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-29	Electric/ Gas	DNV GL
Massachusetts Commercial/Industrial Baseline Framework	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-30	Electric/ Gas	DNV GL
Prescriptive C&I Loadshapes of Savings	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-31	Electric	DNV GL
Massachusetts Commercial and Industrial Impact Evaluation of 2014 Custom CDA Installations	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-32	Electric/ Gas	DNV GL
Impact Evaluation of PY2016 Massachusetts Commercial & Industrial Small Business Initiative: Phase I	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 22	Electric	DNV GL
LED Market Monitor Study: Lighting Market Model Summary Memorandum	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 23	Electric	DNV GL
TWGA CI Portfolio Modelling Findings and Conclusions Memo	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 24	Electric/ Gas	DNV GL
Baseline Transition Planning Net-to-Gross Revisions Final Report	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 25	Electric/ Gas	DNV GL
Expected Useful Life (EUL) Estimation for Air Conditioning Equipment from Current Age Distribution, Results to Date	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 26	Electric/ Gas	DNV GL
Massachusetts C&I Upstream Lighting Net-to-Gross Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U Study 27	Electric	DNV GL

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
MA C&I Upstream Lighting In-Service Rate (ISR) Analysis Summary	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 28	Electric	DNV GL
<b>Special &amp; Cross Cutting</b>			
Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-30	Electric	Tetra Tech
Top Down Modeling Extended Methods Review	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-31	Electric/ Gas	Tetra Tech
Combined Code Compliance Support Initiative memo	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-32	Electric/ Gas	Tetra Tech
Stretch Code Market Effects Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-33	Electric/ Gas	Tetra Tech
Net-to-Gross Methodology Research	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-34	Electric/ Gas	Tetra Tech
Commercial Code Compliance Documentation Assessment Final Report	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-35	Electric/ Gas	Tetra Tech/Cadmus
Low-Income Single Family Health- and Safety-Related Non-Energy Impacts Study	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-36	Electric/ Gas	Three <sup>3</sup> /NMR Group Inc.
2016 Massachusetts Statewide Marketing Campaign	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-37	Electric/ Gas	Opinion Dynamics
Evaluation Report for Cape Light Compact's Demand Response Demonstration Offering	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-38	Electric	Navigant Consulting Inc.
2016 Residential Wi-Fi Thermostat DR Evaluation Final Report	2016 Plan-Year Report D.P.U. 17-100 Appendix 4D, Study 16-39	Electric	Navigant Consulting Inc.
Lighting Distribution Modeling	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-33	Electric	NMR Group, Inc.
Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings, January through June 2017	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-34	Electric/ Gas	NMR Group, Inc.

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Summary of Findings from Winter 2017 HVAC Manufacturer Panel Interviews	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-35	Electric/ Gas	NMR Group, Inc.
Non-Energy Impact Framework Study	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-36	Electric/ Gas	NMR Group, Inc.
Status and Directions for Top Down Work	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-37	Electric/ Gas	NMR Group, Inc.
Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings, July through December 2017	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-38	Electric/ Gas	NMR Group, Inc.
Interim Net to Gross Coordination Observations and Considerations	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-39	Electric/ Gas	NMR Group, Inc.
Market-Rate Multifamily NEI – Phase I Final Memo	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-40	Electric/ Gas	NMR Group, Inc.
Community Based Program Design Effectiveness	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-41	Electric/ Gas	Opinion Dynamics
Education Kits Program Deemed Savings Review Results	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-42	Electric/ Gas	Opinion Dynamics
2017 Residential Wi-Fi Thermostat DR Evaluation	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-43	Electric	Navigant Consulting, Inc.
2017 Seasonal Savings Evaluation	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-44	Electric	Navigant Consulting, Inc.
Evaluation of 2017 Demand Response Demonstration: C&I Connected Solutions	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-45	Electric	DNV GL
2013 - 2015 Residential Customer Profile Report	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-46	Electric/ Gas	DNV GL
2016 Comprehensive Commercial and Industrial Customer Profile Report	2017 Plan-Year Report D.P.U. 18-51 Appendix 4D, Study 17-47	Electric/ Gas	DNV GL
CLC and NGrid Education Kits Program Evaluation	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 29	Electric/ Gas	Opinion Dynamics

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Massachusetts Residential HVAC Net-to-Gross and Market Effects Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 30	Electric	NMR Group, Inc.
Massachusetts Commercial and Industrial Upstream HVAC/Heat Pump and Hot Water NTG and Market Effects Indicator Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 31	Electric/ Gas	NMR Group, Inc.
Non-Residential Code Compliance Support Initiative Attribution and Net Savings Assessment	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 32	Electric/ Gas	NMR Group, Inc.
Residential New Construction and CCSI Attribution Assessment	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 33	Electric/ Gas	NMR Group, Inc.
Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 34	Electric/ Gas	NMR Group, Inc.
Initial Considerations for Attribution/Net-to-Gross Estimation for Energy Optimization	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 35	Electric/ Gas	NMR Group, Inc.
Low-Income Multifamily Health- and Safety-Related NEIs Study Preliminary Findings Report	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 36	Electric/ Gas	NMR Group, Inc.
NEI Reference Table Memo	2019-2021 Three-Year Plan D.P.U. 18-110 – D.P.U. 18-119 Appendix U, Study 37	Electric/ Gas	NMR Group, Inc.

**B. Annual Summary for Year Three (2018)**

The following evaluation studies, completed after the Program Administrators filed their 2019–2021 Three-Year Plans, are included in this Term Report. Summaries of these evaluations are included at Appendix C and full copies are available at Appendix D. Additionally, all currently completed studies are available on the Council’s website at: <http://ma-eeac.org/studies/>.

<b>Evaluation Studies Completed in Advance of the 2016–2018 Term Report Not Previously Submitted</b>			
<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
<b>Residential Program Studies</b>			
Residential Lighting Market Scan	Appendix D, Study 18-1	Electric	NMR Group, Inc.
2018-19 Residential Lighting Market Assessment Study	Appendix D, Study 18-2	Electric	NMR Group, Inc.
Delta Watt Update	Appendix D, Study 18-3	Electric	NMR Group, Inc.
Appliance Recycling Report	Appendix D, Study 18-4	Electric	NMR Group, Inc.
Mini-Split Heat Pump Incremental Cost Assessment	Appendix D, Study 18-5	Electric/ Gas	NMR Group, Inc.
Advanced Power Strip Metering Study - REVISED	Appendix D, Study 18-6	Electric	NMR Group, Inc.
Lighting Sales Data Analysis	Appendix D, Study 18-7	Electric	NMR Group, Inc.
Census of Massachusetts Multifamily Buildings	Appendix D, Study 18-8	Electric/ Gas	Navigant Consulting, Inc.
2017 Income Eligible Process Evaluation Findings	Appendix D, Study 18-9	Electric/ Gas	Navigant Consulting, Inc.
Assessment of Combined Behavior and Wi-Fi Thermostat Programs Memo	Appendix D, Study 18-10	Electric/ Gas	Navigant Consulting, Inc.
Massachusetts Residential Baseline Study - 2018 Comprehensive Report	Appendix D, Study 18-11	Electric/ Gas	Navigant Consulting, Inc.
2018 Massachusetts Summer Thermostat Optimization Evaluation	Appendix D, Study 18-12	Electric	Navigant Consulting, Inc.
Lighting Interactive Effects Study	Appendix D, Study 18-13	Electric	Navigant Consulting, Inc.
<b>Commercial &amp; Industrial Studies</b>			
Lighting Hours of Use Study	Appendix D, Study 18-14	Electric	DNV GL
C&I Upstream Lighting Evaluation	Appendix D, Study 18-15	Electric	DNV GL
Upstream Water Heater Deemed Savings Impact Evaluation	Appendix D, Study 18-16	Gas	DNV GL

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Methods and Evaluation of Control Measures	Appendix D, Study 18-17	Electric/ Gas	DNV GL
MA C&I Comprehensive Lighting Inventory	Appendix D, Study 18-18	Electric	DNV GL
Massachusetts Commercial and Industrial Impact Evaluation of 2016 Custom Electric Installations	Appendix D, Study 18-19	Electric	DNV GL
Impact Evaluation of 2016 Custom Gas Installations	Appendix D, Study 18-20	Gas	DNV GL
C&I Lighting Market Actor Data Collection Results Package	Appendix D, Study 18-21	Electric	DNV GL
Air Compressor, Air Dryer, and Infrared Heater ISP Studies, and Lighting Outyear Factor and Equivalent Measure Life Update	Appendix D, Study 18-22	Electric/ Gas	DNV GL
Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study	Appendix D, Study 18-23	Electric	DNV GL
Two-Tier Steam Trap Savings Study	Appendix D, Study 18-24	Gas	ERS
Impact Evaluation of Commercial Water Heaters	Appendix D, Study 18-25	Gas	ERS
MA Small Business Lighting Updated Impact Results	Appendix D, Study 18-26	Electric	DNV GL
<b>Special &amp; Cross Sector Studies</b>			
Massachusetts Statewide Residential and Commercial 2018 Awareness Survey	Appendix D, Study 18-27	Electric/ Gas	ILLUME Advising, LLC
Residential HVAC Efficient Market Share Estimates	Appendix D, Study 18-28	Electric/ Gas	NMR Group, Inc.
Follow-up Interviews with CCSI Commercial Training Attendees	Appendix D, Study 18-29	Electric/ Gas	NMR Group, Inc.
Analyses of Immediate Code Compliance Support Initiative Residential Training Surveys on 2015 IECC – May 31 through November 21, 2017	Appendix D, Study 18-30	Electric/ Gas	NMR Group, Inc.
Analyses of Immediate Code Compliance Support Initiative Residential Classroom Training Surveys—February 14 through April 19, 2018	Appendix D, Study 18-31	Electric/ Gas	NMR Group, Inc.

<b>Study Name</b>	<b>Study Location and Number</b>	<b>Fuel</b>	<b>EM&amp;V Contractor</b>
Analyses of Immediate Code Compliance Support Initiative Commercial Classroom Training Surveys—April 24 through October 1, 2018	Appendix D, Study 18-32	Electric/ Gas	NMR Group, Inc.
Findings of Follow Up Interviews with Massachusetts Code Compliance Support Initiative Residential Training Attendees	Appendix D, Study 18-33	Electric/ Gas	NMR Group, Inc.
Process Assessment for the Cross-Cutting Code Compliance Support Initiative Evaluation	Appendix D, Study 18-34	Electric/ Gas	NMR Group, Inc.
Solar and Home Energy Services Safety Remediation Non-Energy Impacts Study	Appendix D, Study 18-35	Electric/ Gas	NMR Group, Inc.
C&I NTG MOU Research Results	Appendix D, Study 18-36	Electric/ Gas	NMR Group, Inc.
2016 Residential Customer Profile Stakeholder Summary	Appendix D, Study 18-37	Electric/ Gas	DNV GL
2017 Residential Customer Profile Study	Appendix D, Study 18-38	Electric/ Gas	DNV GL
2016 C&I Customer Profile Project Deep Dive Report - Advanced Lighting	Appendix D, Study 18-39	Electric	DNV GL
2016 C&I Customer Profile Project Deep Dive Report - Exploration of HVAC Trends	Appendix D, Study 18-40	Electric/ Gas	DNV GL
2017 Commercial and Industrial Customer Profile Study Report	Appendix D, Study 18-41	Electric/ Gas	DNV GL
Enhanced Customer-Level Database Capabilities	Appendix D, Study 18-42	Electric/ Gas	DNV GL
Cape Light Compact 2018 Smart A/C Savings Program Evaluation	Appendix D, Study 18-43	Electric	Navigant Consulting, Inc.
2018 Crosscutting Demand Demonstration Project Evaluation Report	Appendix D, Study 18-44	Electric	Energy & Resource Solutions (ERS)
2018 Residential Wi-Fi Thermostat Demand Response Evaluation	Appendix D, Study 18-45	Electric	Navigant Consulting, Inc.
Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions	Appendix D, Study 18-46	Electric	Energy & Resource Solutions (ERS)



Study Name	Study Location and Number	Fuel	EM&V Contractor
Cost-Effectiveness of Electric Demand Response for Residential End-Uses	Appendix D, Study 18-47	Electric	Navigant Consulting, Inc.
Low-Income Multifamily Health and Safety Non-Energy Impacts Study: Phase 1 Findings	Appendix D, Study 18-48	Electric/ Gas	NMR Group, Inc.

### C. Summary of the Studies with the Most Significant Effects

In 2018, the PAs completed 48 evaluation studies for the 2016–2018 Energy Efficiency Term Report and 37 evaluation studies that were filed as part of the 2019–2021 Energy Efficiency Three-Year Plan, D.P.U. 18-110 through D.P.U. 18-119 (“2019–2021 Three-Year Plan”). The studies that produced the most significant results were as follows:<sup>1</sup>

1. Home Energy Services Impact Evaluation (2019–2021 Three-Year Plan, Appendix U, Study 13)
2. 2017 Income Eligible Process Evaluation Findings (2016–2018 Term Report, Appendix D, Study 18-9)
3. LED Market Monitor – Lighting Market Model Summary Memo (2019-2021 Three-Year Plan, Appendix U, Study 23)
4. Residential New Construction and CCSI Attribution Assessment and Commercial and Industrial Upstream HVAC/Heat Pump and Hot Water NTG and Market Effects Indicator Study (2019-2021 Three-Year Plan, Appendix U, Studies 33 and 31)
5. Massachusetts Commercial and Industrial Impact Evaluation of 2016 Custom Electric Installations and Impact Evaluation of 2016 Custom Gas Installations (2016–2018 Term Report, Appendix D, Studies 18-19 and 18-20)

#### 1. Home Energy Services (HES) Impact Evaluation

The purpose of this study was to estimate the gross per-unit energy savings associated with 29 HES measures offered in 2015 and 2016, exclusive of LED lighting or smart strips. The evaluation team used billing analysis, engineering algorithms, and building simulation.

The study found that HES participants who weatherized their natural gas heated homes (*i.e.*, installed air sealing and/or insulation) saved, on average statewide, 130 therms per year, which is

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<sup>1</sup> The PAs combined similar studies together in the list (4 and 5). This was done when there were similar study ideas, such as NTG that both relied on market effects indicators (4) or studies that revolved around similar evaluation strategies such as the studies for custom electric and gas projects that had similar discussion items (5).

somewhat lower than the statewide findings from the previous evaluation in 2012. The study yielded realization rates ranging between 68 percent and 83 percent that the PAs are applying to adjust the ex-ante gross savings produced by each HES Lead Vendor's ("LV") proprietary energy modeling software. The impact of applying these results varies by PA, but in most cases causes a reduction in savings compared to previous results. The PAs are currently undertaking follow-up studies to better understand the drivers of the savings disparity between the LV-generated ex-ante savings and evaluator ex post savings for weatherization measures and hope to use the results to improve the LV estimates that are being presented to customers.

In addition, the study found that programmable and wi-fi thermostats save an estimated 3.6 percent and 6 percent, respectively, of HES participants' annual heating consumption, savings for furnaces increased but boilers decreased, and savings for refrigerator replacement increased. A copy of the complete study can be found in the 2019-2021 Three-Year Plan, Appendix U, Study 13.

## 2. 2017 Income Eligible Process Evaluation Findings

The purpose of this study was to address questions about whether the Low-Income Program is delivered in a consistent way across implementing agencies and whether potential variance in customer experiences related to varying program delivery methods may affect customer satisfaction. The evaluation team gathered data from four primary sources to complete this targeted process evaluation: (1) in-depth interviews with PA and LEAN staff; (2) in-depth interviews with agencies including lead agency and sub-agency staff; (3) interviews with multi-family property owners and managers; and (4) observational ride-alongs with select agency staff (e.g., installation specialists, auditors, quality control inspectors) combined with in-person customer interviews while onsite with customers. In addition, the team completed secondary research and analysis of technologies offered in income eligible programs outside of Massachusetts, marketing material and outreach messaging, and previous evaluation studies.

The study produced a number of key findings and recommendations that will inform and improve the delivery of the Income Eligible program, with a focus on four primary areas of concern: marketing effectiveness, outreach innovation, consistency in customer experience, and future savings opportunities. A copy of the complete study can be found in Appendix D, Study 18-9.

## 3. LED Market Monitor – Lighting Market Model Summary Memo

This study analyzed the C&I lighting market in Massachusetts and developed future market share forecasts by lighting technology with and without program intervention. The research objectives addressed by this model included:

- Developing a detailed first year inventory of the installed stock of lighting equipment in Massachusetts C&I facilities, including the number of lamps installed by building type, lighting application, and equipment technology.

- Developing algorithms for forecasting annual changes in the installed stock through 2026 that can support future planning efforts, including research into the future industry standard practice (“ISP”) for C&I lighting.
- Estimating annual energy use for the actual or forecasted installed inventory by building type, lighting application group, and equipment technology for the 2015-2026 period.

The model developed for this study used a stock adjustment modeling approach to forecast the size and composition of the stock of C&I lighting each year and the energy consumption associated with that stock. Each year, a portion of the total installed stock of lamps was assumed to be replaced because of equipment failure, equipment retrofits, or new construction. The model included 13 unique building types, 5 major interior and exterior lighting applications (*e.g.*, linear and screw-based), and 14 specific equipment types (*e.g.*, CFL, LED). Data from the 2015 MA C&I Market Characterization On-Site Assessments and Market Share and Sales Trends Study, price forecasts, and customer adoption were used to develop the model.

This model is the first iteration of an ongoing effort and will continue to be updated as additional data become available during the 2019-2021 three-year plan and future years. This model will be used to inform and guide how much savings will be claimed for C&I Lighting and how long the PAs will be able to claim C&I Lighting savings for the current program offerings. A copy of the complete study can be found in the 2019-2021 Three-Year Plan, Appendix U, Study 23.

#### 4. Residential New Construction and CCSI Attribution Assessment

##### Commercial and Industrial Upstream HVAC/Heat Pump and Hot Water NTG and Market Effects

Both of these studies were designed to develop prospective net-to-gross (“NTG”) ratios for the 2019-2021 program period. The residential study developed NTG ratios for the low-rise portion of the Residential New Construction (“RNC”) program and the residential portion of the Code Compliance Support Initiative (“CCSI”), and the C&I study estimated NTG ratios for selected equipment types supported by the Upstream HVAC/Heat Pump (“HP”) Initiative and the Upstream Water Heater Initiative. Both of these studies relied on market effects indicators, as well as a consensus-building approach to determine the prospective NTG ratios.

##### *Residential New Construction and CCSI Attribution Assessment*

Depending on the municipality, new homes in Massachusetts must comply with either the base International Energy Conservation Code (“IECC”) requirements or the stretch code requirements. This study, therefore, considered the effect of the PAs’ programs on RNC program and non-program homes in both stretch code and non-stretch code municipalities.

The evaluation team selected 15 RNC industry experts to participate in a three-round Delphi panel survey to estimate measure-level counterfactual efficiency values for program and non-program

homes, and then to develop a prospective forecast for the 2019-2021 period. Delphi panelists were provided with information from previous studies and RNC/CCSI program documentation, including baseline studies, program records and achievements, code changes, and surveys and interviews from attendees of the CCSI trainings. The evaluation then used a modeling effort to calculate the difference in energy consumption from program and non-program homes as they were constructed (the as-built scenario) and as panelists suggested they would appear in the absence of the programs (the counterfactual scenario) to develop the NTG ratios.

The Delphi panelists indicated that the program has had a substantial impact on the building practices in the single-family new construction market, and they expect that the programs will continue to have a similar impact on this market in the future. Delphi panelists indicated that the programs have had the largest impact on duct leakage, air infiltration, and insulation installation quality. The prospective NTG ratios for the low-rise RNC program and the residential portion of the CCSI range from 0.96 in 2019 to 1.10 in 2021, which are lower than the previous value that was developed in 2014 but still indicative of a highly effective program. A copy of the complete study can be found in the 2019-2021 Three-Year Plan, Appendix U, Study 33.

#### *Commercial and Industrial Upstream HVAC/Heat Pump and Hot Water NTG and Market Effects*

The study addressed five types of HVAC/HP and gas-fired water heating equipment, which PA staff selected in collaboration with the evaluation team:

- Ductless mini-split heat pumps
- Electric water-source heat pumps
- Air-cooled unitary/split central air conditioning (>5 tons)
- Gas-fired storage water heaters between 76,000 and 300,000 BTU/hour
- Gas-fired tankless water heaters between 180,000 and 199,900 BTU/hour

The study relied on in-depth interviews with program staff and participating distributors, surveys with participating buyers, and a Consensus Group process to converge on recommended NTG ratios for each equipment type. The NTG ratios were lowest for gas-fired storage water heaters and indirect water heaters (29 percent in 2019) and highest for volume water heaters and gas-fired tankless water heaters (60 percent in 2019). The NTG ratios and associated findings from this study provide evidence that the Upstream HVAC/Heat Pump Initiative and the Upstream Water Heater Initiative were not inducing savings as expected and could benefit from a program review. This research suggested that while the initiatives did modify distributor behavior by motivating distributors to stock and upsell high-efficiency equipment more than they had before, these changes may not have had much impact on the surveyed buyers' decision-making.

As a result of these low NTG findings, the PAs implementers and evaluators have worked closely to make adjustments to the current program offerings. These measure modifications resulted in increasing the rated efficiency of the current measure offerings with the goal of making the measures more effective in influencing customer decision making to install high efficiency

equipment. The adopted NTG ratios for the 2019–2021 Three-Year Plan are still lower than those used in the 2016–2018 Three-Year Plan but should lead to a more effective program offering. A copy of the complete study can be found in the 2019–2021 Three-Year Plan, Appendix U, Study 31.

## 5. Impact Evaluations of Custom Electric and Gas Installations

The objective of these impact evaluations is to provide verification and re-estimation of electric energy, electric demand, and gas savings estimates for a sample of statistically selected PY2016 C&I custom electric and gas projects through site-specific file review, inspection, monitoring, and analysis. These studies yielded realization rates that the PAs are applying to adjust their ex-ante gross savings for C&I custom projects. The PAs have also undertaken a rolling impact evaluation approach, which will yield updated results on an annual basis.

### *Electric*

This is the second statewide impact evaluation of custom lighting projects and the first impact evaluation that combined all other custom electric end-uses, excluding the Comprehensive Design Approach (“CDA”) and Combined Heat and Power (“CHP”) measures. For lighting, the statewide energy realization rate of 92 percent from this study is 6 percent lower than the realization rate determined in the previous 2012 impact evaluation study (of PY2010 projects), with operational discrepancies (operating hours) as the primary driver of the savings variance (-11.7 percent).

A similar comparison of non-lighting results could not be completely replicated since this study evaluated these projects holistically for the first time instead of providing results at the end-use level. However, analysis of prior end-use specific evaluation results was done using the PY2016 savings estimates by end-use to estimate the differences between this study and prior non-lighting results. Based on this analysis, the custom non-lighting statewide energy realization rate of 67 percent from this study is approximately 20 percent lower for this group of measures as compared to prior results, with operational discrepancies as the primary driver of the savings variance (-27.0 percent). A copy of the complete study can be found in Appendix D, Study 18-19.

### *Gas*

The statewide realization rate of 82 percent from this study is 6 percent lower than the realization rate determined in the previous 2015 impact evaluation study (of PY2013 projects). The savings variance in this study is driven by these main factors: the magnitude of the original annual load served by the installed measure (-5.6 percent), underperforming installed measures (-5.0 percent), and the removal or failure of measures (-4.5 percent). A copy of the complete study can be found in Appendix D, Study 18-20.

**D. Evaluation Studies Recommendations Table**

Appendix E provides a table summarizing all evaluation study recommendations and, if applicable, whether the Program Administrators (or the Compact for Compact-specific recommendations) have implemented the recommendation to date.

## **8. THREE-YEAR COSTS**

### **A. Invoice Summary Table**

Please refer to Appendix F for an invoice summary table for each core initiative, sorted by budget category. The Compact will continue to maintain all invoices associated with the implementation of its energy efficiency programs.

### **B. Sponsorships and Subscriptions**

Please refer to Appendix G for a list of all organizations or items the Compact sponsored or subscribed to during the term. The list includes the following: (a) name of the sponsored organization or item, (b) description of organization or item, (c) cost category; (d) annual funding, (e) purpose of the item, (f) whether the organization is a lobbyist, and (g) an analysis describing why the expense was reasonable, prudently incurred, and how it provided a direct benefit to Massachusetts' ratepayers. Appendix G also provides, where applicable, supporting documentation to justify the purpose and benefit. For any sponsored organization that is a registered lobbyist, Appendix G also provides details of the structure and function of the organization; percent of resources devoted to lobbying and legislative activities; and the method used to derive the percentage.

## **9. PERFORMANCE INCENTIVE MODELS**

The purpose of this section is to provide detailed supporting documentation on performance incentives that each Program Administrator proposes to collect. This section is not applicable to the Compact; as a municipal aggregator and public entity, the Compact does not collect any performance incentives.



**10. ACTIVE DEMAND DEMONSTRATION SUMMARY**

Please refer to Appendix I for a summary of the Compact's active demand demonstration.

**APPENDIX A**  
**BENEFIT-COST RATIO SCREENING TOOL**

Please see the Microsoft Excel workbook accompanying this report for the benefit-cost ratio screening tool.

**APPENDIX B**  
**TECHNICAL REFERENCE MANUAL – 2018 REPORT VERSION**

Please see Statewide Appendix B filed under separate cover. The electronic version, the eTRM, is available at:

<https://www.masssavedata.com/Public/TechnicalReferenceLibrary>.

**APPENDIX C**  
**STATEWIDE EVALUATION STUDIES SUMMARY**

## APPENDIX C

### Statewide Evaluation Studies Summary

#### Contents

Study 18-01: Residential Lighting Market Scan.....	3
Study 18-02: 2018-19 Residential Lighting Market Assessment Study.....	6
Study 18-03: Delta Watt Update.....	9
Study 18-04: Appliance Recycling Report.....	12
Study 18-05: Mini-Split Heat Pump Incremental Cost Assessment.....	14
Study 18-06: Advanced Power Strip Metering Study - REVISED.....	16
Study 18-07: Lighting Sales Data Analysis.....	18
Study 18-08: Census of Massachusetts Multifamily Buildings.....	20
Study 18-09: 2017 Income Eligible Process Evaluation Findings.....	27
Study 18-10: Assessment of Combined Behavior and Wi-Fi Thermostat Programs Memo.....	30
Study 18-11: Massachusetts Residential Baseline Study - 2018 Comprehensive Report.....	32
Study 18-12: 2018 Massachusetts Summer Thermostat Optimization Evaluation.....	37
Study 18-13: Lighting Interactive Effects Study.....	41
Study 18-14: Lighting Hours of Use Study.....	44
Study 18-15: C&I Upstream Lighting Evaluation.....	47
Study 18-16: Upstream Water Heater Deemed Savings Impact Evaluation.....	51
Study 18-17: Methods and Evaluation of Control Measures.....	55
Study 18-18: MA C&I Comprehensive Lighting Inventory.....	59
Study 18-19: Massachusetts Commercial and Industrial Impact Evaluation of 2016 Custom Electric Installations.....	61
Study 18-20: Impact Evaluation of 2016 Custom Gas Installations.....	65
Study 18-21: C&I Lighting Market Actor Data Collection Results Package.....	68
Study 18-22: Air Compressor, Air Dryer, and Infrared Heater ISP Studies, and Lighting Outyear Factor and Equivalent Measure Life Update.....	70
Study 18-23: Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study.....	75
Study 18-24: Two-Tier Steam Trap Savings Study.....	79
Study 18-25: Impact Evaluation of Commercial Water Heaters.....	81
Study 18-26: MA Small Business Lighting Updated Impact Results.....	84
Study 18-27: Massachusetts Statewide Residential and Commercial 2018 Awareness Survey ..	87

Study 18-28: Residential HVAC Efficient Market Share Estimates .....	89
Study 18-29: Follow-up Interviews with CCSI Commercial Training Attendees.....	91
Study 18-30: Analyses of Immediate Code Compliance Support Initiative Residential Training Surveys on 2015 IECC – May 31 through November 21, 2017.....	93
Study 18-31: Analyses of Immediate Code Compliance Support Initiative Residential Classroom Training Surveys—February 14 through April 19, 2018.....	95
Study 18-32: Analyses of Immediate Code Compliance Support Initiative Commercial Classroom Training Surveys—April 24 through October 1, 2018.....	97
Study 18-33: Findings of Follow Up Interviews with Massachusetts Code Compliance Support Initiative Residential Training Attendees .....	99
Study 18-34: Process Assessment for the Cross-Cutting Code Compliance Support Initiative Evaluation .....	101
Study 18-35: Solar and Home Energy Services Safety Remediation Non-Energy Impacts Study .....	103
Study 18-36: C&I NTG MOU Research Results.....	105
Study 18-37: 2016 Residential Customer Profile Stakeholder Summary.....	107
Study 18-38: 2017 Residential Customer Profile Study .....	109
Study 18-39: 2016 C&I Customer Profile Project Deep Dive Report - Advanced Lighting .....	111
Study 18-40: 2016 C&I Customer Profile Project Deep Dive Report - Exploration of HVAC Trends .....	113
Study 18-41: 2017 Commercial and Industrial Customer Profile Study Report .....	115
Study 18-42: Enhanced Customer-Level Database Capabilities .....	117
Study 18-43: Cape Light Compact 2018 Smart A/C Savings Program Evaluation .....	119
Study 18-44: 2018 Crosscutting Demand Demonstration Project Evaluation Report.....	121
Study 18-45: 2018 Residential Wi-Fi Thermostat Demand Response Evaluation.....	123
Study 18-46: Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions .....	126
Study 18-47: Cost-Effectiveness of Electric Demand Response for Residential End-Uses.....	129
Study 18-48: Low-Income Multifamily Health and Safety Non-Energy Impacts Study: Phase 1 Findings.....	131

## **Study 18-01: Residential Lighting Market Scan**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 3/25/2019

### **Study Objective and Summary of Results:**

The purpose of this study was to present information published in 2016 and 2018 on the state of the U.S. residential lighting market. The report was delivered as six separate memoranda, each building on the previous to incorporate newly available material. Results are split into two sections; (1) reports of where the market is headed, and (2) recent estimates of the lighting market. Indicators of where the market is headed rely on national, and state and regional (outside Massachusetts) saturation forecasts, projected lighting sales, and a look at the potential effects of Energy Independence and Security Act (EISA) regulation. Recent estimates draw from reports on residential lighting market share, socket saturation, NTG reports, and information published on ENERGY STAR certified products and their prevalence in the market.

Although the market scan is aimed at reporting information from outside of Massachusetts, comparisons are drawn throughout the report. Overall the findings regarding recent estimates typically indicate that Massachusetts is performing favorably, or at least comparably, with the rest of the country when comparing the metrics like efficient lighting market share and saturation. The report also suggests uncertainty remains surrounding the future of the residential lighting market.

Key findings include the following:

- **The future of the lighting market remains uncertain.** In February 2019, the Department of Energy (DOE) released a notice of proposed rulemaking (NOPR) stating intentions to roll back the expanded definitions of general service lamps (GSLs) and general service incandescent lamps (GSILs) that DOE had instated in January 2017. If this rollback occurs, very few non A-lamp bulbs would be subjected to the 45 lumen per watt requirement set forth by EISA. Sales data on currently EISA exempt lumen bins suggest this roll back would lead to far fewer LEDs sold in exempt categories, potentially costing consumers a reported \$12 billion per year in energy savings.
- **LEDs continued to grow as the dominant technology in the A-lamp category both regionally and nationally.** This prominence is not the case for specialty and directional bulbs, highlighting the potential impacts of DOE rulemaking scaling back the expanded GSL definitions. A study of the lighting market in 2017-2018 for the Pacific Northwest found that LEDs made up 47% of all general-purpose bulbs, but incandescents were still the dominant technology among decorative and candelabra-based lamps (74%). The National Electrical Manufacturers Association (NEMA) also found LEDs to be the dominant technology in the A-lamp market, reporting that they accounted for 65% of shipments in the third quarter of 2018 (based on a recent update to NEMA's estimation methodology.)

- **Net-to-Gross (NTG) Ratios in some parts of the nation remain higher than the planned 2019 to 2021 estimates for Massachusetts.** In areas with younger programs (Illinois and Missouri), NTG ratios for upstream lighting programs ranged from 0.58 to 0.87 depending on bulb type, on par with, or greater than, many of the values we have observed in prior market scans. By comparison, prospective NTG ratios included in the 2019 to 2021 plan for Massachusetts stood at 35% to 45% for 2019, 30% to 40% for 2020, and 25% to 45% for 2021. The difference is likely driven by a combination of market maturity and estimation methodology.
- **Studies from other regions suggest that availability of LEDs is lower in hard-to-reach neighborhoods and discount stores.** A recent study conducted in Michigan found that LEDs were significantly more expensive in areas with a greater proportion of the population below the poverty line. A separate study conducted by the Consumer Federation of America examined the availability and prominence of LEDs at retail outlets in five states (one in New England and the others in the Mid-Atlantic) and concluded that drugstores and discount stores were less likely to sell LEDs and did not feature them as prominently as major home improvement and mass merchandise stores. These results may point to opportunities in the HTR lighting market for increased LED program activity.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Retail: Rebates & Upstream
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

The findings in this study will help to characterize the current and future state of the national lighting market. The discussion of the status of EISA may help to inform when and to what extent future federal intervention will impact the national market and can provide guidance towards how aggressively future lighting programs need to be pursued. The findings also provide a barometer to show the level of success that lighting program activity has already achieved in Massachusetts through comparisons with the rest of the country.

#### **Overview of Study Method:**

This study comprises a literature review of recently produced, publicly available research, reports, and evaluation results to provide insights into how program administrators and consumers across the nation are responding to changes in the lighting market. The specific topics of interest that were identified included, (1) where other program administrators think – and evaluation reports



suggest – the market is headed, (2) market share of various bulb types, (3) socket saturation and household penetration of various bulb types, and (4) recent estimates of net-to-gross ratios for CFL and LED programs.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-01.**

**Study 18-02: 2018-19 Residential Lighting Market Assessment Study**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 3/29/2019

**Study Objective and Summary of Results:**

The goal of this study was to update in-service rates (ISR), hours-of-use (HOU), and estimates of lighting saturation and other critical market indicators in Massachusetts and portions of Upstate New York.

The study provides the following key findings:

**Impact Factor Updates**

As part of this study, NMR prepared updated estimates of residential lighting HOU and provided updated discounted lifetime in-service rates for LEDs. These impact factors are provided in the table below.

**Updated Impact Factors**

Factor	Prior Value	Updated Value
LED Daily HOU	3.0	<b>3.0</b>
LED Discounted Lifetime ISR		
A-line ISR <sup>1</sup>	93%	<b>91%</b>
Reflector ISR	94% <sup>2</sup>	<b>93%</b> <sup>3</sup>
Specialty ISR	94% <sup>2</sup>	<b>93%</b> <sup>3</sup>

<sup>1</sup> Assumes a sunset year of 2022.

<sup>2</sup> Assumes a sunset year of 2023.

<sup>3</sup> Assumes a sunset year of 2024. The PAs and EEAC consultants agreed to increase the sunset year based on recent DOE action that may result in reflectors and other specialty lamps being exempt from EISA Phase 2.

**Market Indicator Findings**

Evidence from this study suggests that the Massachusetts programs continue to have a strong impact on saturation of LEDs. While consumers in New York are also adopting LEDs, LED saturation and replacement rates there continue to lag those found in Massachusetts.

- LED saturation is significantly higher in Massachusetts (34%) compared to New York (22%).
- Massachusetts households are significantly more likely than New York households to choose LEDs as replacement bulbs (60% vs. 48%).

- ENERGY STAR® LEDs (the only type of LEDs supported by the Massachusetts programs) account for the entire difference in LED saturation between Massachusetts and New York.
- Saturation of specialty LED lamps in Massachusetts continues to outpace that in New York for both reflectors (49% vs. 27%) and other specialty bulbs (44% vs. 29%).
- The gap in LED saturation between Massachusetts and New York has continued to widen for reflectors and held steady for A-lines and other specialty bulbs this year.

Despite the strong evidence of program effects, this study also found preliminary indications that LED saturation growth has begun to level off.

- The proportion of bulbs replaced by LEDs in Massachusetts has held steady at 60%
- The gap in ENERGY STAR LED saturation between Massachusetts and New York, which had widened for the past three years (2016-18), held steady at 12% this year
- First-year in-service rate fell from 79% to 65% in Massachusetts

This potential slowdown is not entirely unexpected and may signal that Massachusetts is reaching an inflection point on the S-curve of market adoption. However, we caution that one year of data do not constitute a trend, and it would be premature to conclude that the market has reached maturity without further supporting data.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Retail: Rebates & Upstream
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

*The HOU estimates remain unchanged from the prior evaluation and do not impact savings. The discounted lifetime ISR decreased by 2% for A-line, and 1% for reflector and other specialty LEDs. This decrease in ISR lowers savings for lighting.*

*Key estimates of saturation and other market indicators help inform program design, planning, and implementation of the upstream lighting program as it continues forward into 2019 and 2020. The study provides strong evidence that the upstream program continues to impact the market, supporting the continued existence of the program.*

**Overview of Study Method:**

*The data for this study came from nearly annual on-site lighting inventories of homes in Massachusetts and a comparison area (portions of New York). The most recent wave of visits was completed between October and December of 2018.*

*The 2019 Market Assessment represents the most recent efforts in a long-term series of on-site data collection. All of the households in both Massachusetts and New York had taken part in prior on-site visits (panel visits). To date, six waves of panel visits have been completed in Massachusetts and four waves of panel visits have been completed in New York.*

*The on-site survey data from both Massachusetts and the New York comparison area were weighted to reflect the population proportions for home ownership (tenure) and education in Massachusetts based on the Public Use Microdata Sample (PUMS) from the American Community Survey (ACS) 5-Year Estimates.*

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-02.**

### **Study 18-03: Delta Watt Update**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 4/10/2019

#### **Study Objective and Summary of Results:**

This evaluation was developed for the Massachusetts Program Administrators (PAs) to update some of the inputs used to calculate LED delta watts in the RLPNC 17-6 Lighting Market Adoption Models (MAMs). The PAs and EEAC consultants agreed to update equivalent wattage and sales weights based on 2018 program tracking data, which ties the delta watts directly to program sales. However, they also agreed to retain the estimated future market share values from the 2017 MAMs (RLPNC 17-6). The decision to keep the same future market share estimates reflected the continued market uncertainty related to federal standards, which existed when the estimates were developed in 2017 and remains in place now. Further, based on developments over the past year, the market is generally moving in the direction that MAM participants assumed when they made their predictions in 2017. Therefore, little value would be gained in updating market share for 2018.

The study objectives included the following:

- Update the sales weights and wattage bins
- Update the following 2017 Annual Report MAMs:
  - Standard (A-line) model – update
  - Reflector model – update
  - Other Specialty model – update

Key findings in this study include:

Updating the sales share and wattage based on actual 2018 LED sales, resulted in increased delta watts for GSL and Specialty and decreased delta watts for Reflectors. The gross delta watts from 2017 and 2018 are summarized in the table below.

### MAM Gross Delta Watt Comparison 2017 vs. 2018

Bulb Type and MAM Year	Delta Watts							
	2018	2019	2020	2021	2022	2023	2024	2025
GSL 2017	33	33	34	34	34	34	34	35
GSL 2018	36	36	38	38	38	38	38	38
Reflector 2017	46	46	46	47	47	47	47	47
Reflector 2018	42	42	42	43	42	43	43	43
Specialty 2017	36	37	37	38	39	39	40	40
Specialty 2018	39	40	41	41	42	42	43	43

#### Core Initiatives or End Uses to which the Results of the Study Apply:

- Residential
- All Program Paths
- Lighting
- Electric Only

#### Evaluation Recommendations:

No formal recommendations were made in this evaluation.

#### Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:

N/A (no formal recommendations were made in this evaluation)

#### How the Study Affects Program Results and Its Significance:

The increase in delta watts for GSL and Specialty LEDs increases first-year program savings. The decrease in delta watts for Reflectors reduces first-year program savings.

#### Overview of Study Method:

NMR reviewed and cleaned the 2018 sales data obtained from EFI. In total, the data contained sales records for 7,149,075 LEDs. After cleaning, NMR grouped LEDs into three types: General Service (GSL) (71%), Reflector (17%), and other Specialty (11%). NMR was unable to categorize about one-percent of LEDs due to insufficient information.

As the EFI data do not include equivalent incandescent wattage, after categorizing LEDs by type, NMR leveraged web scraping and 2018 shelf stocking data to lookup manufacturer-specified equivalent incandescent wattage. In total, we were able to assign incandescent wattage for 80% of total LEDs sold in 2018 (or 71% of unique LED model #s). These equivalent incandescent wattages were used to assign LEDs to the appropriate 2017 MAM equivalent wattage bins. After

binning LEDs, we updated sales weights, which are equivalent to the proportions of 2018 program-supported bulbs in each wattage bin.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-03.**

## **Study 18-04: Appliance Recycling Report**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 3/26/2019

### **Study Objective and Summary of Results:**

In 2017, the Program Administrators completed an impact and process study to estimate savings based on the characteristics and alternative outcomes for refrigerators and freezers recycled through the program. The current report updates the per-unit savings estimates based on the characteristics of refrigerators and freezers recycled through the program in 2018. This update is necessary since expected savings change based on the characteristics of recycled appliances, which change over time.

The study objectives included the following:

- Identify the current characteristics of refrigerators and freezers recycled through the program in 2018 and compare them to those recycled in 2017 as identified in the RLPNC 18-1 Appliance Recycling Study
- Calculate per-unit gross energy savings (measured as unit energy consumption or UEC), adjusted gross savings, and net savings for the 2018 program using the realization rates and net-to-gross ratios developed in the original 2017 study.

Key findings in this study include:

- **Annual per-unit refrigerator savings increased by 1% from 1,018 kWh in 2017 to 1,207 kWh in 2018.** The increase reflected the larger size of units recycled in 2018 as well as the greater prevalence of primary units and side-by-side door configuration.
- **Annual per-unit freezer savings increased by 4% from 740 kWh in 2017 to 769 kWh in 2018.** The increase reflected the older age and larger size of freezers recycled in 2018 compared to 2017.
- **Application of the realization rates from the 2017 study to the 2018 gross energy savings yielded an adjusted gross savings of 903 kWh for each refrigerator and 523 kWh for each freezer.** The realization rate was 88% for refrigerators and 68% for freezers.
- **Application of the net-to-gross ratios from the 2017 study to the 2018 adjusted gross energy savings yielded a net savings of 398 kWh for each refrigerator and 295 kWh for each freezer.** The net-to-gross ratio was 44% for refrigerators and 56% for freezers.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Electric Only

### **Evaluation Recommendations:**

The study made a single recommendation:



NMR recommends that the PAs update the energy savings estimates in the table below for use in the 2018 annual report.

	<b>Refrigerators</b>		<b>Freezers</b>	
	<b>Factors</b>	<b>Savings</b>	<b>Factors</b>	<b>Savings</b>
<b>Per unit Gross Energy Savings (kWh)</b>	n/a	1,027	n/a	769
<b>Per Unit Adjusted Gross Savings (kWh)</b>	88%	904	68%	523
<b>Net Savings (kWh)</b>	44%	398	56%	295

*Rationale: This study’s scope did not include updates to realization rates and net-to-gross ratios, but it did conclude that the units recycled in 2018 used more energy than those recycled in 2017, mainly due to size, configuration, and primary use. As a result, the per-unit gross savings – and therefore the adjusted gross and net savings– increased in 2018.*

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt and/or are considering some of the recommendations, as described below.

**How the Study Affects Program Results and Its Significance:**

By updating per-unit savings based on the characteristics of the units recycled in 2018, the study results will provide greater accuracy in annual reporting of total program savings.

**Overview of Study Method:**

NMR used a spreadsheet-based estimation approach advocated in the Uniform Methods Project (UMP) to guide the estimation of per-unit gross energy savings. This involved applying UMP-derived regression coefficients to the characteristics of units recycled through the program in 2018, as reported in program tracking data. The study supplemented the 2018 program tracking data with inputs drawn from the prior RLPNC 18-1 Appliance Recycling study, specifically location in unconditioned space, realization rates, and net-to-gross ratios. All calculations were performed in Excel Spreadsheets.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-04.**

### **Study 18-05: Mini-Split Heat Pump Incremental Cost Assessment**

**Type of Study:** Technology Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 11/27/2018

#### **Study Objective and Summary of Results:**

The purpose of this study was to compare the initial costs (i.e., equipment and installation costs) and operating costs associated with heating, cooling, and water heating for two versions of a single-family home that meets the Stretch Energy Code target – an Energy Rating Index (ERI) of 55. The traditional version of the house has a gas furnace, electric Central Air Conditioning (CAC) system, and an instantaneous gas water heater, while the mini-split version of the house has a ducted mini-split heat pump and a heat pump water heater. Both versions have a first and second floor, an unfinished basement, and 2,500 square feet of living area.

The study provides the following key findings:

- The traditional house with gas heat has lower initial costs than the mini-split house. The HVAC equipment and installation cost for the mini-split house is \$1,586 higher than for the traditional house, driven primarily by the higher cost to purchase mini-split equipment compared to a gas furnace.
- The DHW equipment and installation cost for the mini-split house is \$832 less than the traditional house, driven by a significantly lower cost to install a heat pump water heater than an instantaneous gas water heater.
- The combined initial HVAC and DHW cost for the mini-split house is 106% of the combined initial HVAC and DHW cost for the traditional house.
- The combined annual HVAC and DHW operating cost for the mini-split house is 133% of the combined annual HVAC and DHW operating cost for the traditional house.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- New Buildings & Major Renovations
- HVAC & Hot Water
- Electric & Gas

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

### **How the Study Affects Program Results and Its Significance:**

*This study provides information on the relative equipment, installation, and operating costs for projects using standard equipment configurations found in the low-rise residential new construction program and compares those costs to a similar home using all electric heat pump technologies. This information is valuable as the PAs consider strategic electrification efforts.*

### **Overview of Study Method:**

*This study leveraged a model floor plan from a Massachusetts home designer which was then modified to meet criteria that are representative of a typical residential new construction home. The team researched locally representative envelope efficiencies by reviewing publicly available building permit applications and interviewing a local building inspector. This home was then modeled twice using traditional HVAC systems and again using ductless mini-split heat pumps and a heat pump water heater to assess the operating costs of both HVAC configurations. Equipment and installation costs were obtained through a combination of interviews with local distributors and online sources.*

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-05.**

**Study 18-06: Advanced Power Strip Metering Study - REVISED**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 3/18/2019

**Study Objective and Summary of Results:**

The objectives of this study were to investigate three impact factors for Advanced Power Strips (APS):

- Baseline Energy Use
- Energy Reduction Potential (ERP)
- Realization Rate (savings reduction due to improperly setup APS)

Importantly, this study was designed as a metering study and not as an impact evaluation, therefore, it is necessary to combine results with in-service rate and short-term retention to calculate adjusted gross savings. The table below presents the updated metered impact factors for baseline energy use and ERP. The realization rate was 92% for all technologies.

**Updated Metered Impact Factors**

	Updated Value
<b>Baseline Usage</b>	
Tier 1 – All (blend of HEC and PC)	<b>449 kWh</b>
Tier 2 – All (HEC only)	<b>471 kWh</b>
<b>Energy Reduction Potential (ERP)</b>	
Tier 1 – All	<b>25%</b>
Tier 2 – All	<b>44%</b>
<b>Baseline Demand</b>	
Tier 1 – All	<b>52 W</b>
Tier 2 – All	<b>58 W</b>
<b>Demand Reduction Potential (DRP)</b>	
Tier 1 – All	<b>19%</b>
Tier 2 – All	<b>41%</b>

The study provides the following key findings:

- All types of APS strips demonstrated statistically significant savings compared to non-smart power strips.
- Although there was variation across ERP values based on both Tier 1 end-uses and Tier 2 technology types, the differences between these groups were not statistically significant.
- Study results were in line with other advanced power strip field studies.

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential

- All Program Paths
- Electric Only

### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

### **How the Study Affects Program Results and Its Significance:**

*The results of this study are being used to adjust claimed savings for Tier 1 and Tier 2 APS. Specifically, this study provided evaluated impact factors (baseline use, energy reduction potential, and realization rate) for APS.*

*For Tier 1 APS, this study found lower baseline energy usage and realization rates compared to what was assumed for 2018 program planning. However, the study found higher energy reduction potential. When combined, this leads to an overall increase in gross unadjusted savings compared to planning.*

*For Tier 2 APS, this study found lower baseline energy usage, realization rates, and ERP compared to what was assumed for 2018 program planning. When combined, this leads to an overall decrease in gross unadjusted savings compared to planning.*

### **Overview of Study Method:**

*The study relied on in-home metering of end-use energy consumption. In total, the study metered 133 sites, including 65 control sites and 68 treatment sites. Metering occurred over approximately nine months for both control and treatment sites, with treatment sites switching midway from having no APS unit installed (pre-period) to having an APS unit installed (post-period).*

*Through our analysis of the energy usage at these treated sites, along with a control group that did not receive APS units, we produced estimates for baseline usage, ERP, and estimated annual energy savings (i.e., delta kilowatt hours, kWh).*

*For realization rate, NMR examined the setup of 26 pre-existing Tier 1 APS units that had been self-installed by customers participating in the RES 1 Baseline Study. While NMR did not include these sites in the baseline energy use analysis, the existing APS units provided an opportunity to observe whether customers were correctly configuring APS devices. This is important because improperly setup devices are likely to lead to lower than expected energy savings. Based on this sample of 26 Tier 1 APS units, we calculated a realization rate to correct for lost savings due to non-optimal set-ups. We calculated this realization rate as 92%. While this value was derived based on a sample of Tier 1 APS units, lacking similar data on Tier 2 units, the PAs and EEAC consultants agreed to apply it to Tier 1 and Tier 2 units, regardless of technology.*

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-06.**

### **Study 18-07: Lighting Sales Data Analysis**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 11/26/2018

#### **Study Objective and Summary of Results:**

For this study, NMR analyzed third-party light bulb sales data obtained on behalf of the Program Administrators (PAs) from the Consortium for Retail Energy Efficiency Data (CREED). It compares market conditions in Massachusetts to the nation, other states with upstream lighting programs, and states without upstream lighting programs. The objectives of this study were:

- Examine current market share in Massachusetts, states with lighting programs, states without lighting programs, and the entire nation
- Provide breakdowns of market share by bulb type (i.e., LEDs, CFLs, halogens, and incandescents), shape (A-line, reflector, and all other), and ENERGY STAR status
- Explore trends in bulb market and shipment share based on LightTracker and NEMA data
- Assess market share in very low (<310) and very high (>3,300) lumen bins, which roughly coincide with ranges that will remain exempt when Phase 2 of the Energy Independence and Security Act (EISA) goes into effect in 2020
- Compare average prices of LEDs to other bulb types

Key findings in this study include:

- **Massachusetts had the highest market share of efficient lamps (LEDs and CFLs) in 2017 compared to the US, average program states, and average non-program states.** Energy-efficient bulbs (LEDs and CFLs) accounted for a larger share of the market in Massachusetts (57%) than in the US overall (41%), as well as in both program (43%) and non-program states (30%)
- **The combined market share in Massachusetts for LEDs and CFLs increased by over ten percentage points between 2016 and 2017, while the efficient share nationwide remained virtually the same.** Massachusetts saw its LED market share increase from 26% in 2016 to 49% in 2017, while the national LED market share increased from 26% to 35% across the same period.
- **Massachusetts LED market share in 2017 was highest among reflector and A-line bulbs. Incandescent bulbs continued to dominate specialty bulbs.** The LightTracker point-of-sale data (representing about 26% of bulb sales in Massachusetts) suggest that LEDs made up 31% of A-line and 41% of reflector market shares in Massachusetts. LEDs accounted for 17% of globes and 7% of candelabras, whereas incandescents continued to account for most of sales of these two shapes.
- **A greater portion of LED bulbs sold in Massachusetts in 2017 were ENERGY STAR qualified compared to the non-program comparison areas.** Nearly four out of five LEDs (79%) sold in Massachusetts in discount, dollar, drug, grocery, mass merchandise,

and some membership stores qualified for the ENERGY STAR label. Non-program states had only a 59% ENERGY STAR market share.

- **In Massachusetts, LEDs garnered the majority of the A-line bulbs market in the 60-watt equivalent range (750 to 1,049 lumens), while incandescents dominated lumen bins that are currently EISA exempt.** While they were a majority (51%) in the 750 to 1,049 lumen bin in Massachusetts (this bin accounts for half of all A-line bulb sales), LEDs still had significant growth potential in all other lumen bins. Halogens had the largest market share in four of the five lumen bins currently subject to EISA
- **LED prices were higher than incandescents and halogens in all regions examined – but prices for efficient bulbs were lowest in Massachusetts.** Massachusetts had the lowest average LED prices (\$3.45 compared to \$3.56 or higher in other areas) despite having a higher proportion of ENERGY STAR LEDs than the comparison areas. The substantial program incentives in Massachusetts certainly help explain the lower average.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Retail: Rebates & Upstream
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

The Study provided valuable context as the PAs continue to monitor the residential lighting market and the impact of the Residential Lighting Initiative. The results suggest that, in 2017, the Residential Lighting Initiative contributed to increased market share and lower shelf prices of ENERGY STAR LEDs. The results of this study are being used to inform program design and planning.

#### **Overview of Study Method:**

Using lighting bulb sales data compiled by CREED as part of the LightTracker Initiative (2009 to 2017), shipment data (2011-2017) from NEMA, and program activity data, NMR employed a series of descriptive analysis tasks. The CREED data were generated from point-of-sale (POS) sales data (from grocery, drug, dollar, discount, mass merchandiser, and selected club stores), and National Consumer Panel state sales data (from home improvement, hardware, online, and selected club stores).

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-07.**

## **Study 18-08: Census of Massachusetts Multifamily Buildings**

**Type of Study:** Process Evaluation  
**Evaluation Conducted by:** Navigant Consulting  
**Date Evaluation Completed:** 5/31/2019

### **Study Objective and Summary of Results:**

The Census of Multifamily Buildings study focused on identifying the population of multifamily buildings in Massachusetts, as well as the subset of this population that are condominium (condo) buildings. For the purposes of this study, multifamily buildings are defined as having five residential units or more. The census also focused on characterizing interactions of these properties with Mass Save initiatives.

This study had two main objectives:

1. Identify multifamily properties in Massachusetts and characterize any past program interactions with this population.
2. Analyze the compiled multifamily building data to identify opportunities for customized multifamily program delivery strategies to maximize energy savings and equitably serve the market.

The study provides the following key findings:

The RES 43 study focused on identifying multifamily buildings with five residential units or more. The study team used the following definitions:

- **Building:** A single address that may have one or more electric or gas account
- **Property:** A group of buildings that are centrally managed that consist of multiple addresses

The study team determined whether each address in the ACL was multifamily if it met any of several criteria:

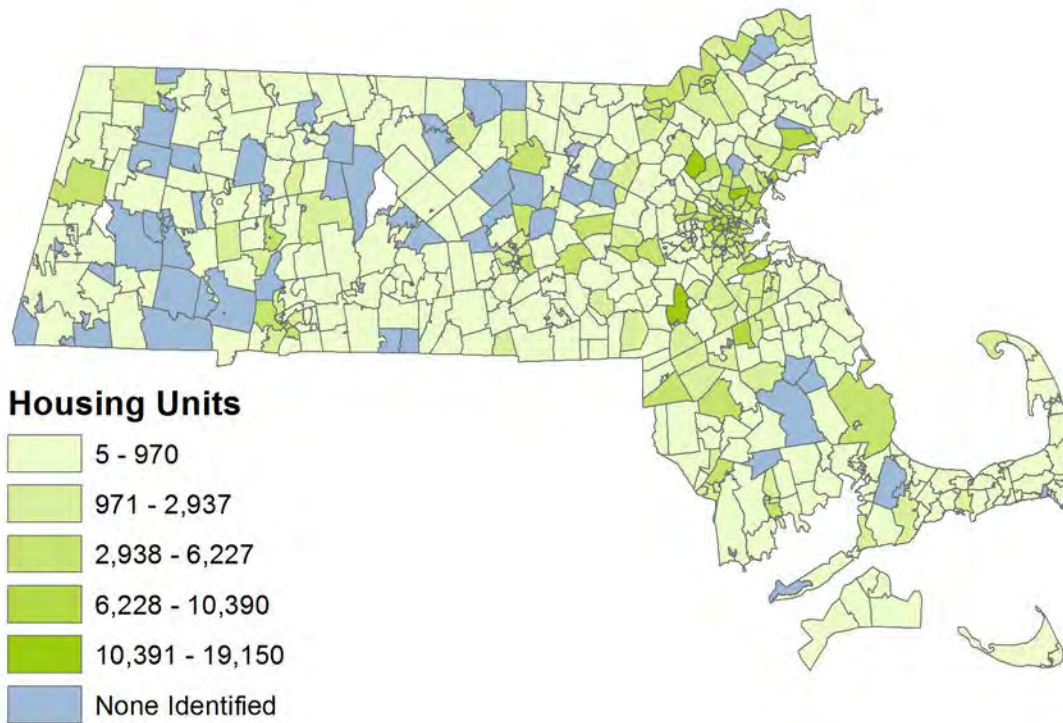
- Has five or more housing units at the address
- Has a property tax use code indicating a multifamily building with five or more housing units
- Historically participated in a multifamily program
- Has one or more accounts under multifamily-specific rate codes

Using these criteria, the study team developed a multifamily building database and an interactive dashboard that contain a series of maps illustrating the geographic location of multifamily properties in Massachusetts. The team identified 37,751 multifamily buildings statewide, representing 611,381 housing units. Of interest among all multifamily buildings are condo



properties, where individual housing units may have multiple different owners. The team identified 6,713 condo buildings with five or more units, representing 111,005 housing units, or roughly 18% of the total. Figure ES-2 shows the distribution of multifamily housing units by ZIP code throughout Massachusetts.

**Figure ES-1. Distribution of Multifamily Housing Units by ZIP Code**

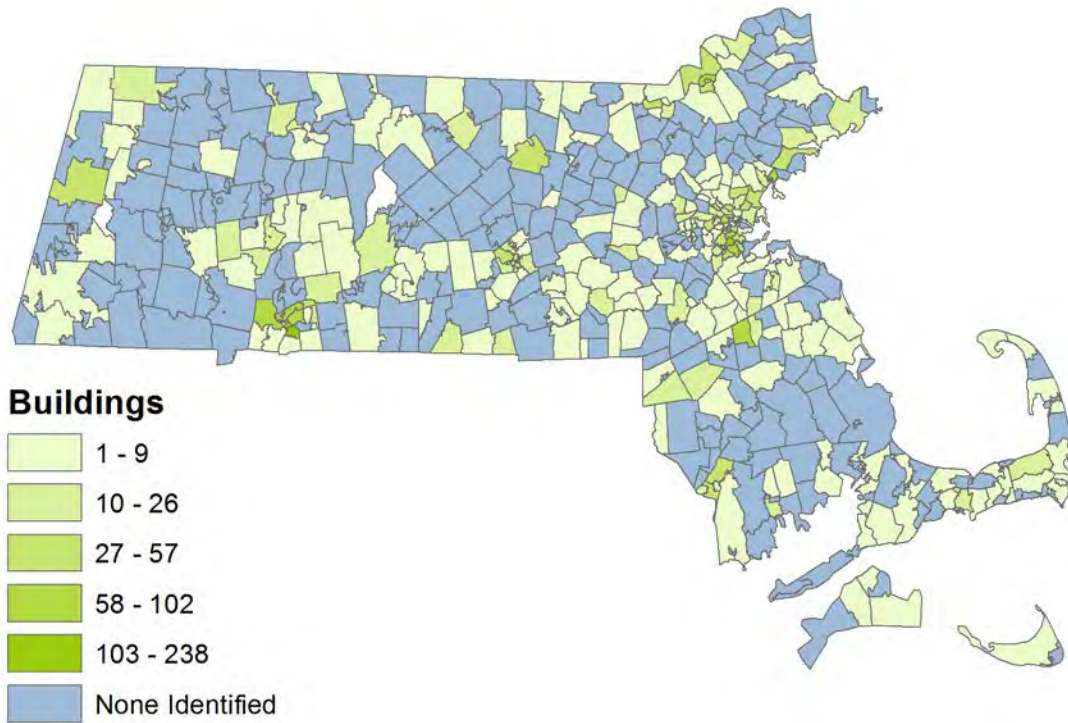


*Source: Navigant analysis*

The multifamily database also contains various characteristics for each property. The study team classified the number and location of buildings by the number of housing units, meter type, fuel type, income level, ownership (i.e., condo vs. apartment), and seasonality. Although the team lacked account-level income data to fully identify all low-income properties, it was able to identify low-income addresses based on other criteria including low-income rate codes (i.e. 50% or more of accounts flagged as having low-income rate codes), previous participation in a low-income program, ownership by a housing authority, and subsidized housing tax use codes.

Figure ES-3 shows the geographic distribution of low-income properties throughout Massachusetts. Identified low-income buildings make up 10% of all multifamily buildings. Due to incomplete data, the study team cannot estimate how many additional properties would qualify as low-income. To provide additional low-income context, the team added a field to the multifamily database that indicates the percentage of the population in the block group containing each address that has income less than 200% of the poverty line.

**Figure ES-2. Locations of Low-Income Multifamily Buildings**

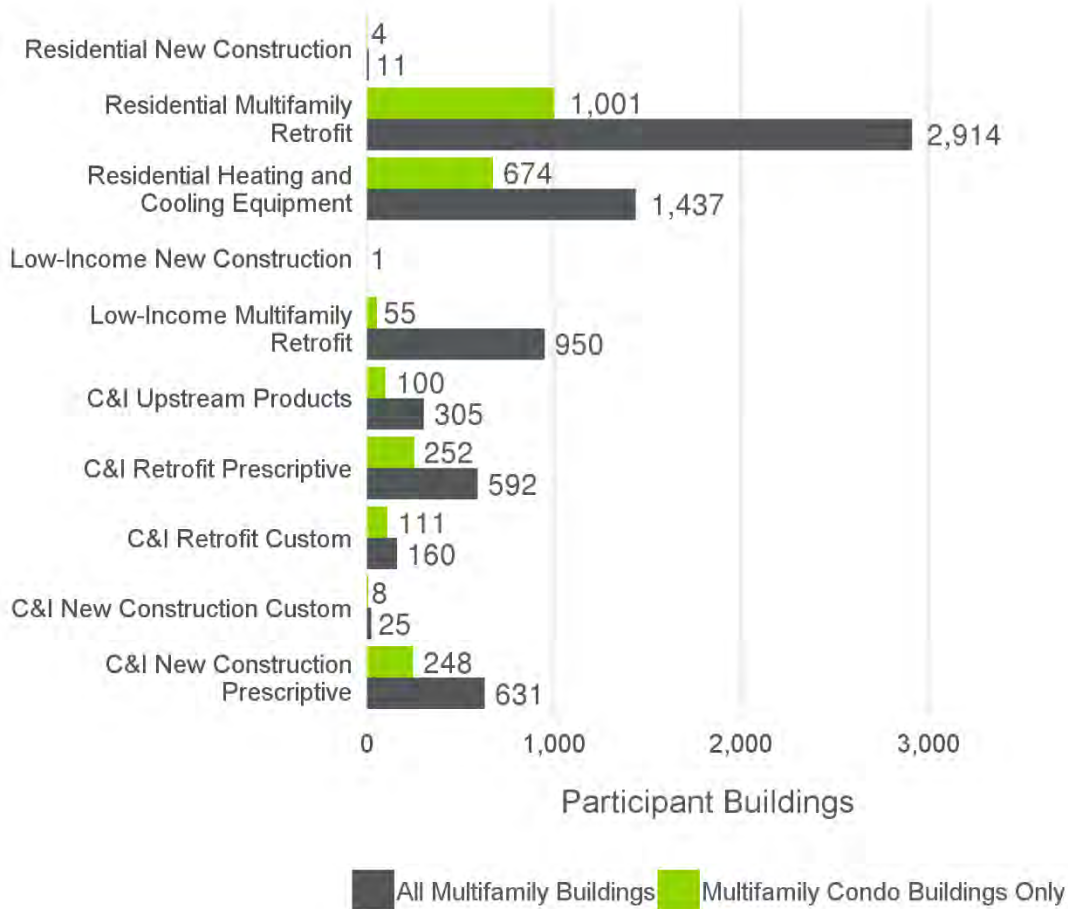


*Source: Navigant analysis*

The study team analyzed the historical participation of low-income and market rate multifamily buildings in relevant multifamily programs. The programs and years considered were based on data available at time of the analysis, namely participant tracking data for 2013-2016.<sup>1</sup> The number of buildings that participated in each program is shown in Figure ES-4.

<sup>1</sup> The PAs offered multifamily programs prior to 2013 (the Multifamily Retrofit Working Group was formed in 2008-2009), which means this analysis will not capture all past participants.

**Figure ES-3. Multifamily Building Participation by Program**



Note: The participant building in the Low-Income New Construction program is in the All Multifamily Buildings group.

Source: Navigant analysis

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential & Income-Eligible
- Electric & Gas
- Multifamily Programs

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

Although there were no formal recommendations or considerations in RES 43, the team would like to recognize future program opportunities that were identified.

The census of all multifamily properties and the analysis of historical program interactions identified geographic areas and customer segments that show opportunity for improving participation based on 2013-2016 participation data. As new questions emerge, and program needs evolve, the multifamily database can be used to explore characteristics of these properties and gain new insights. Based on its analysis, the study team identified potential strategies that PAs can consider:

### **1. Continuous improvement of the multifamily database and dashboard**

The multifamily database could be regularly refreshed with updated and more complete data sources, such as ACLs, property tax data, participation data, and billing data. The study team has returned PA-specific databases to each PA; with the PAs' feedback, the database itself can be further refined. Such refinements could include grouping unique addresses into multifamily properties by synthesizing geographic, tax, and PA account data. The Power BI dashboard could be further developed into an online tool to provide quick access to important metrics for the PAs.

### **2. Multifamily properties consisting of multiple buildings**

The study team identified numerous multifamily buildings that did not have more than five units but have historically participated in multifamily programs. These properties may be centrally managed and consist of multiple buildings, which are treated as multifamily by PAs. Future research could be conducted to better identify this population.

### **3. Geographic areas for new participants**

The multifamily database can be used to explore and find areas with multifamily buildings to target to increase participation. There are several geographic regions in Massachusetts that have a significant number of identified multifamily buildings that may not have participated in Mass Save programs. Such cities/regions offer a valuable opportunity to market multifamily programs.

### **4. Fuel type**

The study team had limited information regarding fuel type but identified that approximately 54% of buildings had both electric and gas service. Additionally, as much as 32% of multifamily buildings may use delivered fuels. Importantly, this percentage likely includes buildings that use electric resistance heat or heat pumps and should be considered as an upper bound. Further investigation into the types of heating systems that are installed in multifamily buildings could inform strategies to tailor incentives around fuel type and improve the success of engaging these customers.

### **5. Low-income properties**

While the study team was able to identify some low-income properties based on rate code and past participation, there are likely additional low-income properties that have not been identified in the database. This gap could be addressed by using the low-income block group information in the multifamily database to identify areas with higher low-income populations to find new participants. Further identifying such low-income properties would enhance the PAs' ability to serve these customers.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

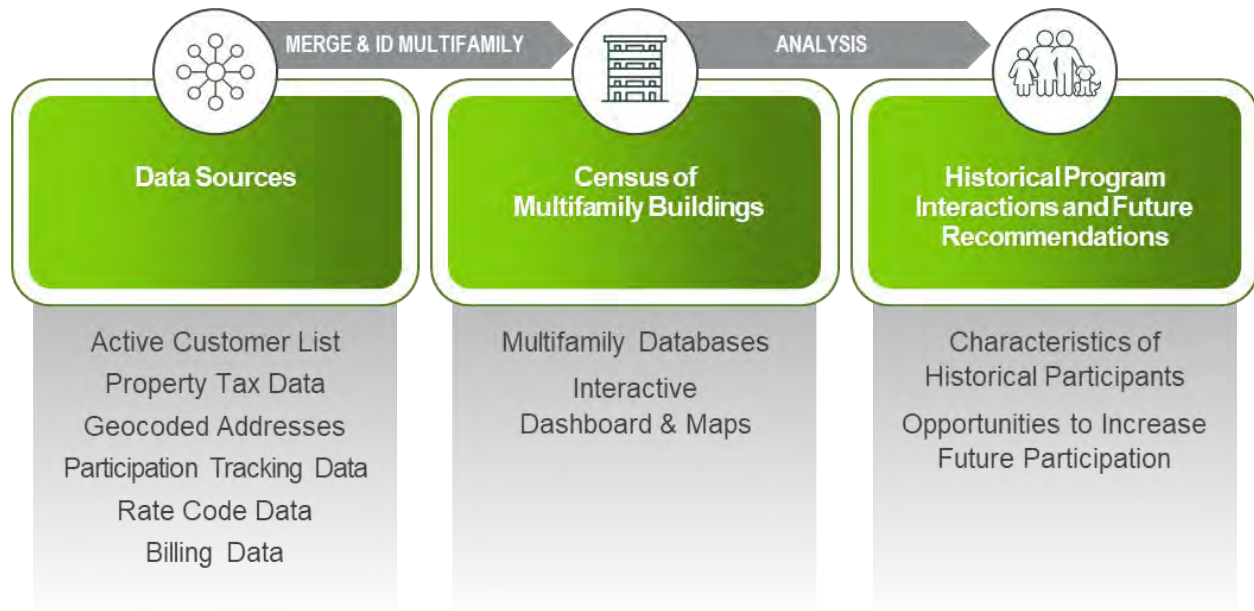
**How the Study Affects Program Results and Its Significance:**

No direct program savings estimates were impacted from the RES 43 study. Findings from this study help inform future multifamily program initiatives.

**Overview of Study Method:**

Figure ES-1 depicts the study’s process. The study team first merged compiled active customer lists (ACLs) for all program administrators with various data sources to add a variety of customer-specific details, creating an augmented ACL. The team then analyzed this ACL to identify multifamily addresses based on several criteria including the number of housing units, property tax use code, billing rate code, and past participation in multifamily programs. This analysis produced a multifamily building database, which the study team explored to understand trends in past participation and identify future opportunities to increase participation in energy efficiency programs.

**Figure ES-4. Analysis Methodology for RES 43 Study**



*Source: Navigant*

Importantly, the multifamily database and this analysis must be contextualized in terms of the data that was available to the study team. The multifamily database was created using snapshots of data sources when each was extracted. Data sources such as participant tracking and billing data were

only available for the years 2013 through 2016. As a result, not every account in the multifamily database has complete information, which must be considered when interpreting this analysis. Readers should be cautious not to draw strong conclusions regarding the population of multifamily buildings and trends in historical participation. Instead, the multifamily database is a useful tool for exploring the multifamily population across the state and can be updated to increase the databases accuracy and completeness.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-08.**

### **Study 18-09: 2017 Income Eligible Process Evaluation Findings**

**Type of Study:** Process Evaluation  
**Evaluation Conducted by:** Navigant Consulting  
Illume Advising  
**Date Evaluation Completed:** 2/7/2019

#### **Study Objective and Summary of Results:**

The purpose of this study was to address questions raised in the study planning stages about whether the Low-Income Program is delivered in a consistent way across implementing agencies, and whether potential variance in customer experiences related to varying program delivery methods may affect customer satisfaction.

The study provides the following key findings:

- Relying on the Mass Save brand alone may not be the most effective marketing strategy to raise awareness about the Income Eligible Program. Materials that include both the names of the agency and the PA add legitimacy to the program as customers' familiarity with the agency is reinforced by the idea that the program is backed by their local utility.
- Most agencies and PAs do not have a way to measure the efficacy of their marketing strategies, though they agreed it would be useful. Tracking this information in a consistent way across Massachusetts would help inform best practices in marketing.
- A group of customers exist that are unaware of the Income Eligible program offering. The extent to which income eligible customers are unaware of the program requires further investigation. Lack of awareness is one of the largest barriers to participation. PA project managers believed this was especially true for small and midsized property owners, however, additional research is needed to determine levels of awareness among potential multifamily customers.
- The leading barrier to participation for homeowners and renters (both single-family and multifamily) appears to be limited personal availability, which can make it difficult for agencies to schedule appointments in a timely manner.
- There is an opportunity to emphasize the comprehensive training and intrinsic value of the work in recruiting potential new hires.
- Agencies reported collecting, storing, and reporting program participant data using different systems including software, spreadsheets, and in some cases, paper. While neither agencies nor PAs described these varying practices as problematic for gathering and reporting program performance measures, these practices create barriers to accessing participant data for the purposes of examining processes quantitatively and understanding the overall effectiveness of program implementation.
- The Best Practices Working Group, managed by LEAN and attended by PAs and agency representatives, serves as the hub for communication between stakeholders about program policies and directives. In addition to participation in the working group, agency

representatives reported having great relationships with their PA contacts and feeling supported when they reached out by phone or email as needed.

- Based on a literature review, the team identified six measures that are not currently offered or that were previously considered for inclusion in the program that are worth further consideration.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Income-Eligible
- Existing Building Retrofits
- Process
- Electric & Gas

### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** Explore strategies for identifying and reaching smaller multifamily property owners.

**Recommendation 2:** Identify crucial participant data points needed to quantitatively assess effectiveness of program implementation processes.

**Recommendation 3:** In accordance with DOE requirements and schedules, utilize an electronic audit tool approved by DOE to collect and store participant and performance measure data, including key data points needed to quantitatively assess the effectiveness of program implementation processes. Note that other data required to meet DOE paper requirements may still be collected and stored using paper.

**Recommendation 4:** Explore how statewide Mass Save marketing resources can be better used at the local level, especially among agencies and PAs with fewer marketing resources.

**Recommendation 5:** Investigate the viability of establishing a thorough, statewide assessment of marketing effectiveness with ongoing tracking and monitoring of marketing material performance metrics.

**Recommendation 6:** Review the measure list identified as part of this study and determine whether there is value in conducting additional research to develop Massachusetts- and low-income-specific applicability factors, costs, and savings.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

### **How the Study Affects Program Results and Its Significance:**

No direct program savings estimates were impacted from the RES 38 study. Findings from this study help inform the single-family and multifamily Income Eligible Program delivery with a



focus on four primary areas of concern: marketing effectiveness, outreach innovation, consistency in customer experience, and future savings opportunities.

**Overview of Study Method:**

The team gathered data from four primary sources to complete this targeted process evaluation: 1) in-depth interviews with PA and LEAN staff; 2) in-depth interviews with agencies including lead agency and sub-agency staff; 3) interviews with multifamily property owners and managers; and 4) observational ride-alongs with select implementing agency staff (e.g., installation specialists, auditors, quality control inspectors) combined with in-person customer interviews while onsite with customers

The team also completed the following secondary research and analysis:

- Industry scan of technologies offered in income eligible programs outside of Massachusetts, reviewing literature from 10 sources
- Review of marketing material and outreach messaging, assessing 58 marketing-related documents and materials from four PAs and eight agencies
- Review of previous evaluation results and recommendations

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-09.**

## **Study 18-10: Assessment of Combined Behavior and Wi-Fi Thermostat Programs Memo**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** Navigant Consulting

**Date Evaluation Completed:** 2/6/2019

### **Study Objective and Summary of Results:**

This study was designed to determine whether customers who receive Home Energy Report (HER) treatments and install Wi-Fi thermostats have higher, lower or statistically identical Wi-Fi thermostat savings relative to customers that only install Wi-Fi thermostats without HER treatment.

The study provides the following key findings:

The power analysis indicated that either incremental savings would need to be 2.0% or larger, or the data variability would need to be lower than observed in previous analyses, for the incremental savings results to be statistically significant at the 90% confidence level. The evaluation team expects incremental savings will be less than 2% and therefore recommends discontinuing the Behavior 1 study.

However, the RES 24 study, currently underway, will likely be able to answer this research question using a different approach. The RES 24 study is a large-scale study of Wi-Fi thermostat savings and may have a large enough sample size to break out HER recipients from non-HER recipients and estimate Wi-Fi thermostat savings separately for the two groups.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Electric & Gas
- Home Energy Report Program

### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

### **How the Study Affects Program Results and Its Significance:**

No direct program savings estimates were impacted from this study. Findings conclude that the data are insufficient to generate statistically significant and meaningful estimates of incremental savings from Wi-Fi thermostats with HERs. Therefore, we believe the evaluation phase of the Behavior 1 study should not be pursued. However, the RES 24 study will likely be able to answer this research question.

### **Overview of Study Method:**

The evaluation team leveraged program tracking data to identify customers who:

- Installed a Wi-Fi thermostat

- Did not receive additional measures via an energy efficiency program<sup>2</sup>

Customers with thermostats and no cross-program participation were then categorized as HER recipients, HER controls, and non-HER customers.

Finally, the evaluation team conducted a power analysis to assess whether the customer counts were sufficient to reliably measure incremental savings.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-10.**

<sup>2</sup> The tracking data review accounted for measures received in the following residential programs: Low-income Single Family Retrofit, Consumer Products, Heat Loan, Heating & Cooling Equipment, Home Energy Services, Lighting, Multi-Family Retrofit, and New Construction.

## **Study 18-11: Massachusetts Residential Baseline Study - 2018 Comprehensive Report**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** Navigant Consulting

**Date Evaluation Completed:** 4/15/2019

### **Study Objective and Summary of Results:**

The primary goal of the Residential Baseline Study is to collect saturation, penetration, characterization, and usage data for all major electric and gas appliances and equipment in Massachusetts homes. This data supports energy and peak demand savings calculations for program evaluation and design and provides additional insight into the savings potential in the existing residential buildings market. The secondary goal of this study is to support other research that the PAs are undertaking—such as energy efficiency potential studies and market effects research—by providing comprehensive data for the sampled customers.

This report is intended to answer the primary research question stated in the study’s Stage 3 Plan: “How and when are people using the electric equipment in their homes?” The Navigant team presents key findings from the data collected between January 2017 and October 2018.

The study provides the following key findings:

- Massachusetts experienced higher average temperatures and more extreme peak temperatures in summer 2018 compared with summer 2017.
- The saturations of cooling end uses are increasing. The saturation of natural gas heat is increasing, while the saturation of fuel oil heat has remained constant.
- Emerging technologies such as EVs and solar PV systems are increasing in saturation.
- Gas end uses have increased in saturation in the past year, while oil end uses have remained constant.
- While HVAC is the most seasonally variable end use category, refrigerators, water heaters, dehumidifiers, and pool pumps all contribute seasonal variation.
- Statewide electricity consumption from certain high consumption, low saturation end uses, like ductless heat pumps and central AC, could increase dramatically with increasing adoption.
- Cooling is responsible for half of summer peak demand.
- Refrigerators, dehumidifiers, clothes dryers, primary TVs and their peripherals, and pool pumps also contribute to the summer peak demand in Massachusetts.
- The higher temperatures in Massachusetts in summer 2018 resulted in higher average consumption for all cooling end uses.

- In 2018, HVAC had peak demands about 20% higher than in 2017. Peak demands for water heaters and pool pumps were lower in 2018 than in 2017.
- The top contributors to summer peak demand across all homes in Massachusetts are central ACs and room ACs.
- Unmetered loads contributed most to Massachusetts' winter peak demand. These end uses include lighting and various small plug loads. On winter peak days, HVAC loads are large but relatively flat.
- When the major end uses are disaggregated further, no single HVAC end use dominates winter peak demand. However, the aggregate HVAC category presents significant savings opportunities. Savings opportunities may also exist for clothes dryers and water heaters.
- If saturation of ductless heat pumps continues to rise, they could quickly become the single most important driver of winter peak aside from lighting.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Electric & Gas
- Residential Heating and Cooling
- Residential Consumer Products

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Conclusion 1: Across all homes in Massachusetts, central ACs and room ACs are the largest contributors to peak demand. Collectively, cooling makes up more than half of total residential summer system peak demand.** During summer system peak, central AC loads averaged 1.9 kW, and room AC loads averaged 0.7 kW. During summer on-peak, central AC loads averaged 0.8 kW and room AC loads averaged 0.3 kW. Saturation of central cooling (including shared and individual household equipment) increased from 29% of households in 2008 to 39% in 2018, while room AC saturation decreased from 64% in 2008 to 57% in 2018. The central cooling saturation increase is driven primarily by increases in the prevalence of individual household ducted central AC and ductless heat pumps. However, 2018 saw a spike in room AC purchases and a reduction in the number of households reporting they had no cooling.

**Consideration: Central AC should be the focus of efforts to reduce peak demands, but ductless heat pumps and room AC are also important to a comprehensive program offering.** Because peak usage is driven as much by Energy Efficiency Ratio (EER) as by Seasonal Energy Efficiency Ratio (SEER), the PAs should consider including EER requirements in addition to SEER requirements to steer customers toward AC and HP offerings with higher peak demand savings. Massachusetts has significant opportunities for early central AC and HP retirement. Over 40% of central systems in Massachusetts have an EER of 9 or lower. This creates opportunities for approximately 0.7 kW of peak demand savings per system replaced with a new code-minimum efficiency system, in addition to significant energy

savings. These low efficiency systems will generally be 12-25 years old during the 2019-2021 program period.

**Conclusion 2: Across the remaining end uses, individual homes have a wide variety of significant end use loads during summer peak times.** Electric clothes dryers are common (57% of homes), but they have large variability in usage compared with other end uses. About half of users did not use their dryers at all during peak times, while the top 25% of users have an average of greater than 0.4 kW during peak. Dehumidifiers are relatively common (38% of homes). More than 25% of dehumidifiers were not in use at all during peak times, but the top 25% have a mean peak of greater than 0.5 kW. Electric water heaters are uncommon (14% of homes), but they have a mean of 0.2 kW during summer system peak and the top 25% of users have a mean peak of 0.5 kW. Pool pumps are rare (7% of homes), but they have a mean summer system peak demand of 0.6 kW.

**Consideration: PAs should consider targeting homes with dehumidifiers, clothes dryers, and pool pumps for additional peak demand savings with low impacts on occupant comfort.** Dehumidifiers, clothes dryers, and pool pumps all have opportunities for peak savings of at least 0.2 kW without negatively affecting overall equipment performance or comfort.

**Conclusion 3: Heat pump water heaters use about half as much electricity as domestic water heaters, which corroborates much of the expected energy savings.** Electric water heating load will become more important as more people switch from oil or propane heat sources to electricity. Once a home has a heat pump water heater, its water heating summer peak demand is relatively small. However, the increasing saturation of electric water heating in general means that peak demand savings opportunities remain.

**Consideration: Energy efficiency program offerings should encourage heat pump water heaters for both energy and demand savings.** Demand response offerings for heat pump water heaters will not have large effects during the summer or winter, but they may be worth targeting if higher peak users could be identified or influenced through behavior-based messaging.

**Conclusion 4: Electric resistance heat has a surprisingly flat hourly load shape on peak days and can be highly variable.** The top 25% of households with electric resistance heat consume approximately 10 times as much as the median. It may be difficult to generate winter electric HVAC peak demand or energy savings with program interventions because without screening low impacts are likely.

**Consideration: Consider targeting high users to help increase savings.** A bill-based electric resistance heating targeting algorithm could be developed and tested using this data. Consider promoting dual fuel heat pumps as part of energy optimization offerings due to their lower peak impact.

**Conclusion 5: Electric water heaters offer the largest non-HVAC, non-lighting opportunity for winter peak demand savings.**

**Consideration:** If the PAs are looking for opportunities to reduce winter peak demand, they should consider electric water heater demand response opportunities.

**Conclusion 6:** HVAC end uses have summer system peak impacts that are more than double ISO-NE summer on-peak impacts, which means that using ISO-NE on-peak to account for the system peak benefits of HVAC energy efficiency significantly undervalues these resources. In addition, the 2018 summer system peak occurred during the 4 p.m.-5 p.m. hour, and many of the highest hour loads for the year occurred during the 5 p.m. to 6 p.m. hour. Hours later in the day have much higher coincidence with lighting resources as well.

**Consideration:** Consider advocating for ISO-NE to shift back the on-peak definition to 2 p.m.-6 p.m., including June 1 through September 15, and making changes to the seasonal peak definition to better align with system peak. Consider shifting all energy efficiency resources bid into the ISO-NE forward capacity market to ISO-NE seasonal peak resources because almost every measure will be about the same, while lighting and HVAC will get much higher values. Consider changing avoided costs to align better with system peak regardless of how the energy efficiency resource is being bid.

**Conclusion 7:** More than 10% of homes in Massachusetts purchased room ACs in the summer of 2018. This significant increase may contribute to higher cooling consumption in future years. The flow of room ACs into Massachusetts homes increases during summer with extreme high temperatures.

**Consideration:** Consider program activities and messaging that could help increase the efficiency of room ACs purchased during heat waves.

**Conclusion 8:** Secondary TVs and their peripherals had summer consumption that was similar to that of primary TVs and peripherals. Additional data is being collected that will confirm if this holds true over a full year.

**Consideration:** Consider behavioral messaging and energy efficiency measures focused on reducing consumption from secondary TVs and their peripherals.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

The PAs are reviewing considerations from this comprehensive report and will appropriately incorporate the results into all residential initiatives.

#### **Overview of Study Method:**

The previous comprehensive report for the Residential Baseline Study was finalized in July 2018. Since then, the following changes have been made to the study, which may materialize in changes to the outputs reported in this document:

- In May 2018, the team started metering secondary TVs and their peripherals.

- The definitions of the peak periods have changed to provide one value consistent with how resources are currently bid into the ISO-NE forward capacity market and another value that represents ISO-NE and traditional electric utility system peak impacts.
- Individual lighting load shapes have been removed from the overall results tables and figures because they are incongruent with the rest of the metered data. Lighting energy consumption is now being included with the other remaining load in a category called lighting and other, which should be mostly lighting.
- All previously surveyed study participants were recruited to take a follow-up survey indicating what they have changed in their residence over the past year. Additionally, new customers were surveyed with the same survey that was used in the first year.
- The team added a new module to the follow-up survey that asked survey respondents who indicated they had purchased a new piece of equipment to take pictures of their new equipment's nameplate or invoice.
- Starting in October 2018, the research team collected data about recent fuel deliveries for oil and other delivered fuels.
- The team removed the behavior-related questions from the survey instrument.
- The team did not measure the operating efficiency of boilers.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-11.**



## **Study 18-12: 2018 Massachusetts Summer Thermostat Optimization Evaluation**

**Type of Study:** Impact Evaluation  
**Evaluation Conducted by:** Navigant Consulting  
**Date Evaluation Completed:** 3/29/2019

### **Study Objective and Summary of Results:**

The purpose of this study was to assess the technical feasibility of the summer thermostat optimization program (called Seasonal Savings, hereafter SS) deployed in National Grid (NGrid) and Cape Light Compact (CLC) service territories in 2018, and to estimate associated energy and demand savings and calculate realization rates.

In 2018, NGrid was in its second year of deployment. As a result, the study had a secondary objective of assessing whether savings were different for the second (2018) cohort, how savings were different for thermostats receiving a second year of setpoint adjustments, and whether setpoint adjustments from the first year persisted.

The study provides the following key findings:

- Under half of thermostats in the ITT group opted in to programs—38% for CLC and 47% for NGrid.
- The cooling setpoint schedules for the treated thermostats were adjusted upward during the program period—0.41°F for CLC and 0.59°F for NGrid.
- The largest setpoint adjustments took place during the middle of the weekdays, when customers were least likely to be at home—0.76°F for CLC and 1.25°F for NGrid.
- The average energy savings per treated thermostat between July 2, 2018 and September 30, 2018 were 31.1 kWh for CLC, 30.6 kWh for NGrid, and 30.5 kWh combined.
- The program yielded average energy savings between July 2, 2018 and September 30, 2018 of 3.4% for CLC, 3.0% for NGrid, and 3.0% combined for program participants.
- The average demand savings per treated thermostat from July 2, 2018 to August 31, 2018 were 30 W for CLC, 60 W for NGrid, and 57 W combined.
- The program yielded average peak demand savings thermostat between July 2, 2018 and August 31, 2018 of 3.3% for CLC, 6.4% for NGrid, and 6.1% combined.
- The program achieved energy savings between July 2, 2018 and September 30, 2018 of 46 MWh for CLC, 464 MWh for NGrid, and 508 MWh combined.
- The program achieved demand savings between July 2, 2018 and August 31, 2018 of 44 kW for CLC, 903 kW for NGrid, and 947 kW combined.
- (*NGrid only*) There is some persistence from program year 2017 to program year 2018.
- (*NGrid only*) Average daily energy savings between July 2, 2018 and September 30, 2018 were 0.31 kWh per treated thermostat (2.7% of cooling load) for the 2018 cohort (new devices only) compared with 0.40 kWh (3.5% of cooling load) for the 2017 cohort though this difference was not statistically significant.
- Navigant recommends CLC claim the combined per-thermostat energy and demand savings as the CLC values were not statistically significant.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Existing Building Retrofits
- Behavior
- Electric Only

### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** NGrid should claim average energy savings of 30.6 kWh per treated thermostat in Massachusetts in 2018. CLC should claim average energy savings of 30.5 kWh per treated thermostat in Massachusetts in 2018.

**Recommendation 2:** NGrid should claim average demand savings of 60 W per treated thermostat in Massachusetts in 2018. CLC should claim average demand savings of 57 W per treated thermostat in Massachusetts in 2018.

**Recommendation 3:** In 2019, deploy the SS program to all Massachusetts PAs to better inform a PA-specific (or statewide) savings value or realization rate for inclusion in the Technical Reference Manual.

**Recommendation 4:** The summer SS program should continue to be evaluated to assess the ability of the program to realize incremental savings associated with redeployment. The 2018 exploratory analysis found that setpoint adjustments persist and continued from 2017.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

### **How the Study Affects Program Results and Its Significance:**

The study found average energy savings of approximately 31 kWh per treated thermostat and average demand savings of 57-60 kW per treated thermostat in 2018 validating the technical feasibility of the thermostat optimization program. The *NGrid only* portion of the study found (1) savings were lower for the newest (2018) cohort of thermostats, though this difference was not statistically significant, and (2) evidence of persistence.

All Massachusetts PAs plan to deploy the SS program during summer 2019 to better inform a PA-specific savings value or realization rate for inclusion in the Technical Reference Manual. In particular, the 2019 summer SS evaluation will further assess the ability of the program to realize incremental savings associated with redeployment.

### **Overview of Study Method:**

The study relied on thermostat telemetry data and thermostat-level participation data. A total of 48,102 thermostats (42,820 in National Grid's service territory and 5,282 in CLC's service

territory) were included in the study (7% of the 51,568 thermostats in the PAs combined service territories were excluded from the analysis due to data quality).

1. An exploratory analysis of the data was performed to:
  - Assess program eligibility and opt-in rates, providing insight into customer acceptance of the thermostat optimization solution
  - Confirm the thermostat optimization algorithm was operating as intended (i.e., increasing setpoints and reducing runtime for treated thermostats) over time
  - Analyze whether there are setpoint differences between weekdays/weekends and across hours of the day
  - Compare data across several groups, including treated versus control
  - (*NGrid only*) Compare data across several additional groups to better understand persistence of savings, first-year savings, and second-year savings
2. A regression-based modeling approach was used to estimate energy savings and demand impacts over the cooling season. The SS program uses a randomized encouragement design (RED) in which all customers in a PA's service territory with a Nest thermostat were randomly assigned into one of two groups.<sup>3</sup> These two groups are the intent to treat (ITT) group, where participants are randomly assigned to receive the program offering, and the control group, where participants are randomly assigned to *not* receive the program offering.<sup>4</sup>

All qualified customers were provided the program offering on the thermostat itself and through Nest's mobile app. Some portion of ITT customers chose to opt in and enrolled into the program, while others did not. The group of customers that opted in is referred to as the treated group. Thermostats that were part of the ITT group but either did not qualify or did not opt in are referred to as the untreated group.

SS savings are evaluated by comparing the ITT group (both treated and untreated thermostats) to the control group using a linear fixed effects (or difference-in-differences) regression model to estimate energy and demand savings. The estimate of savings is then scaled by the program opt-in rate to calculate savings per treated thermostat.

Because advanced metering infrastructure data was unavailable, the study relied exclusively on thermostat telemetry data to estimate impacts after converting thermostat runtime to power. The thermostat runtime to power conversion was based on an analysis of metering data from Phase 2 of the 2017 Massachusetts Baseline Study (n=92) and assumptions regarding average size (3.0 tons) and efficiency (10.7 Energy Efficiency

<sup>3</sup> NGrid is in its second year of deployment. The random assignment of devices into the ITT group or the control group that were in the 2017 study remained the same in 2018.

<sup>4</sup> For each PA, 70% of thermostats were randomly assigned to the ITT group while the remaining 30% were assigned to the control group.

Ratio) of air conditioners based on a field study (n=52) of DR program participants conducted in October 2017.

The study estimated energy and demand savings for NGrid and CLC separately and combined. Energy savings were estimated for the following periods: summer, summer on peak, summer off peak, tune-up, and post tune-up<sup>5</sup>; demand savings were estimated for the summer on-peak period, as well as an adjusted summer period which assumes zero demand savings prior to program launch. The study developed realization rates for energy (summer) and demand (summer on-peak) savings.

*(NGrid only)* Because National Grid was in its second year of deployment, the study also estimated first-year and second-year savings for NGrid using the same models described above but for certain populations of thermostats.

- The study used only the new thermostats added in the 2018 program year and compared average energy and demand savings per thermostat to average energy and demand savings per thermostat in 2017. (2018 Thermostat Cohort)
- The study used only thermostats that were part of the 2017 deployment and compared average energy savings per thermostat in 2018 to average energy savings per thermostat in 2017. (2017 Thermostat Cohort)

#### **Application of Results: Retrospectively**

**A copy of the complete study can be found in Appendix D, Study 18-12.**

<sup>5</sup> Summer – all hours June 1 through September 30 while SS program is active; Summer On-Peak – weekdays, non-holidays from 7 AM to 11 PM, June 1 through September 30 while SS program is active; Summer Off-Peak – all hours not on-peak; Tune-Up – all hours July 2 through July 29; Post Tune-Up – all hours July 30 through September 30

### **Study 18-13: Lighting Interactive Effects Study**

**Type of Study:** Impact Evaluation  
**Evaluation Conducted by:** Navigant Consulting  
**Date Evaluation Completed:** 4/8/2019

#### **Study Objective and Summary of Results:**

This memo details the findings from an update to the Lighting Interactive Effects study conducted for the Program Administrators (PAs) and Energy Efficiency Advisory Council (EEAC) consultants during the 2013-2015 evaluation period.

The previous Lighting Interactive Effects study was finalized in June 2016<sup>6</sup>. Since then, the definitions of the peak periods have changed. Navigant accounted for these changes in the Residential Baseline study (RES 1)<sup>7</sup> and demand impact model. For consistency, the previous Lighting Interactive Effects memo has been updated to align with the same peak definitions found in the demand impact model.

To complete this update, Navigant made the following changes:

- The previous analysis utilized a typical meteorological year (TMY3)<sup>8</sup> weather file and to be consistent with RES 1, the team decided to use the median of 16 years' of recent actual meteorological year (AMY) weather files for Worcester<sup>9</sup> to more accurately reflect recent weather patterns in Massachusetts.
- Revised the peak period definitions to include an on-peak, system peak and seasonal peak for both the winter and summer periods.
- Updated HVAC and socket saturations used to weight results throughout the analysis.

The results of this update and the previous analysis allow the PAs and EEAC to better understand and report the true impact of energy efficient lighting retrofits on heating and cooling consumption.

The study provides the following key findings:

<sup>6</sup> [http://ma-eeac.org/wordpress/wp-content/uploads/MA-Lighting-Interactive-Effects-Results-Memo\\_15June2016-Final.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA-Lighting-Interactive-Effects-Results-Memo_15June2016-Final.pdf)

<sup>7</sup> The comprehensive report is still under review and this citation will be updated when the report is public.

<sup>8</sup> Brief summary of the TMY3 definition can be located at [https://rredc.nrel.gov/solar/old\\_data/nsrdb/1991-2005/tmy3/](https://rredc.nrel.gov/solar/old_data/nsrdb/1991-2005/tmy3/)

<sup>9</sup> The previous analysis used Norwood as the location for single family and low-rise models, but we decided to remain consistent across all building types and therefore used Worcester throughout the updated analysis.

**Table 1: Average IE Factor in Massachusetts for the Residential Upstream Lighting Initiative**

Factor	Average IE Factor			
	Original Results	On-Peak	System Peak	ISO-NE Seasonal Peak
Electric Energy IE Factor	1.01	1.02		
Electric Demand IE Factor - Winter	0.93	0.92	0.92	0.92
Electric Demand IE Factor - Summer	1.20	1.20	1.21	1.22
Heating Fuel IE Factor	2,295	2,261		

The results showed minimal changes from the previous analysis. Overall, our models showed consistent results across peak definitions showing minimal variance for interactive effect factors when considering periods of high demand.

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Electric & Gas
  - Home Energy Services
  - Single Family Low Income
  - Multifamily Low Income
  - Residential New Construction (Low Rise)
  - Multifamily (Standard Income)

**Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** The evaluation team recommends using the findings from the analysis to accurately account for the HVAC impacts from residential lighting retrofits found in the Upstream Lighting initiative. At the time of the 2016 study, the evaluation methodology for the Multifamily Standard Income initiative was under revision. A billing analysis was subsequently finalized, and therefore, as with HES, the program does not need interactive effects applied.

As a result, savings estimates for all three of HES, Residential New Construction, and Multifamily Standard Income can no longer be improved by applying IE factors. However, the Low Income programs can continue to apply the IE factors as shown in the table below.

**Table 2: Lighting IE Factors to Be Applied in Massachusetts Residential DI Programs**

Factor	HES	Low Income Single Family	Low Income Multifamily	Residential New Construction (Low Rise)	Multifamily Standard Income
Electric Energy IE Factor	N/A	✓	✓	N/A	N/A
Electric Demand IE Factor - Winter	N/A	✓	✓	N/A	N/A
Electric Demand IE Factor - Summer	N/A	✓	✓	N/A	N/A
Heating Fuel IE Factor (Btu/kWh)	N/A	N/A	N/A	N/A	N/A

N/A = not applicable because interactive effects are calculated through billing analysis or modeling

TBD = application of interactive effects is still to be determined

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

**How the Study Affects Program Results and Its Significance:**

The study found interactive effect factors that need to be applied to lighting savings in the upstream lighting program and also recommended applying the results to other residential initiatives.

**Overview of Study Method:**

The goal of this study was to determine a statewide average for the heating, ventilation, and air conditioning impacts of residential lighting measures, quantified using interactive effects factors. To accomplish this, the team developed and calibrated hourly building energy simulation models for single family, low-rise multifamily and high-rise multifamily structures. The team weighted the model results using socket saturations for each building type and Massachusetts-specific housing stock data to arrive at one statewide average.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-13.**

**Study 18-14: Lighting Hours of Use Study**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 4/12/2019

**Study Objective and Summary of Results:**

The purpose of this study was to develop building level annual hours of use (HOU) estimates for estimating savings for the upstream lighting program offering.

The study provides the following key findings:

- Hours of use estimates were generated for twelve different building types based on data collected in MA beginning in 2010.
- Building type hours of use:

Building Type	Count of Buildings	Hours of Use	Standard Error	Absolute Precision (t-value)	Relative Precision (t-value)
College & University	19	4,839	892	1,546	±32.0%
Grocery/Food Sales	28	5,468	252	430	±7.9%
Hospital	15	5,413	545	959	±17.7%
Industrial/Manufacturing	21	4,988	494	852	±17.1%
K-12 School	37	2,788	197	332	±11.9%
Lodging	34	4,026	511	865	±21.5%
Medical Office	10	3,673	134	245	±6.7%
Office Building	64	4,181	262	438	±10.5%
Other	105	4,336	373	619	±14.3%
Restaurant/Food Service	19	5,018	707	1,226	±24.4%
Retail	44	4,939	341	573	±11.6%
Warehouse and storage	10	6,512	634	1,163	±17.9%
Overall	406	4,416	30	50	±1.1%

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits & New Buildings & Major Renovations
- Lighting
- Electric Only



### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** For lighting savings estimation, use the building specific hours of use provided in the table above.

**Recommendation 2:** For Government Buildings, use the Office Building hours from the table above.

**Recommendation 3:** For Police/Fire Stations and Court Buildings, use the “Other” building type from the table above.

**Recommendation 4:** For Multifamily and Other-Automotive, use the “Other” building type from the table above.

**Recommendation 5:** If a building type is unknown, use the “Overall” result from the table above, which represents the average operating hours of all building types combined

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt and/or are considering some of the recommendations, as described below.

### **How the Study Affects Program Results and Its Significance:**

The upstream subcommittee is considering moving away from product specific annual HOU estimates to building level HOU estimates for several reasons, including improved customer targeting, alignment with commercial lighting best practices, and in response to recent evaluation findings and Energy Efficiency Advisory Council (EEAC) feedback, to leverage upstream leads to get deeper energy efficiency savings. This study provides building type HOU estimates that can be applied prospectively to future upstream lighting savings estimates.

### **Overview of Study Method:**

This study made use of site level lighting fixture savings results from all of the C&I lighting impact evaluations conducted in MA since 2010. DNV GL performed a thorough review of completed impact evaluation projects to identify known sources of lighting fixture savings profiles. In total, 458 unique sites have been metered and evaluated by the DNV GL team during this period. These impact evaluations include:

- P12 – 2010 Custom Lighting (45 sites)
- P12 – 2010 Prescriptive Lighting (57 sites, including 12 months of metering)
- P17 – 2012 Upstream Lighting (81 sites)
- P58 – 2016 Upstream Lighting (170 sites)
- P69 – 2016 Small Business Lighting (105 sites)

There are two study caveats:

1. All of the hours of use estimates are based on metered profiles (with the exception of exterior lighting on timers), however, only those from the P12 Prescriptive Lighting evaluation are based on a full year of metered data. For all other sites, the metering period was typically 8-12 weeks, and was extrapolated to the rest of the year using knowledge of the individual building annual operating schedules as reported by each customer.
2. The profiles have been selected opportunistically, as available from past study efforts, and therefore cannot be guaranteed to be representative of a population. The profiles were examined for anomalies which may have warranted exclusion or special handling in the aggregated result.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-14.**

### **Study 18-15: C&I Upstream Lighting Evaluation**

**Type of Study:** Process Evaluation, Impact Evaluation, Market Characterization

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 1/15/2019

#### **Study Objective and Summary of Results:**

This study had multiple research objectives:

1. Process evaluation
  - a. Gauge the success of recent process improvements to the Massachusetts C&I Upstream Lighting Initiative (“Initiative”)
  - b. Measure participating customer and trade ally satisfaction with the Initiative
2. ISR analysis
  - a. Calculate in-service rate alternatives from the prior impact evaluation for use by the PAs in the 2019-2021 Three-Year Plan
3. ISP research
  - a. Understand the current state of the C&I market for non-screw-based LED lighting
4. NTG analysis
  - a. Inform NTG estimation
5. Measure life
  - a. Inform measure life and baseline estimation efforts

The following are summaries of the key findings. Fuller descriptions of these findings appear in the final report.

Initiative satisfaction and awareness:

- Lighting distributors have high awareness of and strong participation in the new Initiative Process Improvements such as the distributor panel.
- Participating lighting distributors were very satisfied with the overall Initiative but were less satisfied with its specific components such as the inspection process.
- However, lighting distributors reported many challenges adapting to the new requirements and some suggested that they are negatively affecting their business.
- Lighting distributors credited Initiative staff with being responsive to their inquiries and offering training opportunities

- Satisfaction with the Initiative among participating end users was very high.
- Participating/non-participating end users and non-participating contractors had high awareness of the Initiative discounts.
- Few end users noticed the recent Initiative changes, and those that did notice were not negatively affected by them.

#### Site visits and in-service rates:

- While the 2018 site visits found that in-service rates had improved, additional data collection is needed beyond the initial 23 sites visited.
- While the Initiative QC inspections provided useful information, the sites targeted were not representative of the participant population.
- Lighting distributors mostly blamed delayed installations for the prevalence of missing lamps and contractors felt similar, though they did hypothesize that it could also be due to using the units at other sites or customers over-ordering.

#### Massachusetts Lighting:

- Participating distributors and contractors sell most of their LEDs in Massachusetts through the Initiative and actively promote its discounts.
- A high rate of LED adoption is evident across the Massachusetts lighting market.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- New Construction
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** Use the revised ISR of 76.2% and savings factors presented in this report and MA C&I Upstream Lighting ISR Analysis Summary Memo<sup>10</sup> for 2019-2021 Three Year Planning.

**Recommendation 2:** Build upon the initial June and July 2018 site visits with “rolling” data collection.

<sup>10</sup> DNV GL submitted a MA C&I Upstream Lighting In-Service Rate (ISR) Analysis Summary memo on September 21, 2018 documenting the new savings factors to be used by the PAs for the 2019-2021 Three-Year Plan

**Recommendation 3:** For subsequent evaluation, target a more representative sample of sites for QC inspection.

**Recommendation 4:** Clarify how QC inspection data is incorporated into the tracking data and portal.

**Recommendation 5:** Enforce customer self-installation rules.

**Recommendation 6:** Provide better Initiative education for smaller distributors and contractors.

**Recommendation 7:** Make improvements to the portal, especially concerning customer address verification functionality and product validation capabilities.

**Recommendation 8:** Provide more detailed information of inspection results both through the distributor portal and to participating contractors.

**Recommendation 9:** Provide both customers and contractors with more education on advanced lighting controls.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

#### **How the Study Affects Program Results and Its Significance:**

The study developed a revised lighting ISR of 76% to be used by the PAs in their Three-Year Planning. This represents increase from the overall PY2015 installation rate (65%). Recommended savings factors to be used in three-year planning were presented as part of a separate ISR Analysis Summary.

The study also recommended several actionable improvements to the Initiative including better enforcement of rules for customer self-installation of Initiative-discounted lighting products, improving customer address verification functionality and product validation capabilities in the lighting distributor portal, providing more information on the QC inspection process, offering better Initiative education for smaller lighting distributors and contractors, and educating contractors and customers about advanced lighting controls.

#### **Overview of Study Method:**

DNV GL conducted this evaluation using data gathered from various stakeholders involved in the Initiative. This includes in-depth interviews with Initiative actors, implementation contractors, 40 participating distributors and contractors, and 14 nonparticipating contractors. It also includes surveys with 200 recent participating end users (Wave 1 from participants in 2017 Q4 and Wave 2 from 2018 Q1) and 276 nonparticipating end users, as well as 23 site visits from participants in

2018 Q1. We also reviewed PY2015 and 2018 Q1 QC contractor<sup>11</sup> inspection data received from the Massachusetts PA project lead and Implementation vendor.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-15.**

<sup>11</sup> The contractor retained by the electric PAs to perform inspections of incentivized products as part of the Quality Assurance (QA) and Quality Control (QC) plan.

**Study 18-16: Upstream Water Heater Deemed Savings Impact Evaluation**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 4/23/2019

**Study Objective and Summary of Results:**

This study had multiple research objectives including:

- Provide updated recommendations on what assumptions for baseline energy efficiency should be used for comparison with the energy-efficient models rebated by the Massachusetts C&I Upstream Hot Water Initiative (Initiative)
- Test and compare a variety of lower-cost and higher-cost field measurement techniques to determine the most accurate way to estimate savings without unreasonable expense.

The following are summaries of the key findings. Fuller descriptions of these findings appear in the above-mentioned memoranda.

**Baseline Findings:**

The study’s findings concerning what the baseline assumptions should be for the commercial water heating technologies which the Initiative incentives included:

- The study recommended new baselines for condensing volume, condensing tank-style, and condensing tankless water heaters. Table 1 compares the new recommended baseline efficiency values with those values currently in the Massachusetts TRM. These new baseline efficiency recommendations, along with new water consumption estimates for tankless water heaters coming out of the water heater quick hit study, were used to estimate new deemed savings estimates for these measures.

**Table 1: Comparing new recommended baseline efficiencies with current TRM values**

Initiative -Rebated WH Type	New Recommended Baseline Efficiency	Current TRM Values
Condensing Volume	83% thermal efficiency 0.83 Energy Factor	80% thermal efficiency
Condensing Tank-Style	80% thermal efficiency 0.59 Energy Factor	80% thermal efficiency
Condensing Tankless	87% thermal efficiency 0.71 energy factor	0.61 energy factor

- The study estimated the Early Replacement rate for commercial water heaters to be 25%. This was derived from combining the Early Replacement estimates from three different water heater vendor types.

### **Field Measurement Findings:**

The study's findings concerning how to conduct field measurements of commercial water heater operating characteristics included:

- Gas usage was successfully monitored at the pilot sites that did not experience significant problems with the modems and loggers. If gas consumption is all that is desired, then sub-metering pre and post WH retrofits is one method to get defensible savings. However, sub-metering is intrusive, costly, and potentially very dangerous if conducted improperly.
- Condensate production showed a strong, positive, linear correlation with gas consumption in three of six pilot sites monitored. The other three sites produced insufficient condensate pump data and, as a result, the correlation was either low or could not be established. Condensate production shows promise as a minimally intrusive method of estimating gas consumption of condensing water heaters but more research into this correlation is required before it can be confidently recommended as primary method.
- Determining operating thermal efficiencies based on field monitoring of inlet and outlet water flows and temperatures is not feasible. The pilot monitoring produced data with many quality issues because of faulty meters and modem or logger connectivity problems. In conclusion, the distribution systems and operations at commercial and industrial facilities are too complex (various mixing valves, constant circulation, inconsistent end uses, etc.) for simple metering (metering only at the WH) to produce reasonable and intelligible data. Robust, and therefore complex, monitoring systems are recommended to capture all the necessary flows and parameters of large commercial and non-residential sites like the ones in this pilot sample. Combustion efficiency could likely be monitored over time in a less invasive and more accurate way, but it was not a monitoring option chosen for this pilot study because water consumption data was a higher priority for the PA's for this study.
- Commercial systems require more site-specific data gathering, and intricate metering configurations. While the study's more intrusive measurement methods (e.g., installing gas and water meters) had a good design foundation, they were still not robust enough to address the intricacies encountered in the field.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- Hot Water
- Gas Only

### **Evaluation Recommendations:**

The evaluators conducting this study developed the following recommendations (the full memoranda contain more details on these recommendations).

**Recommendation 1: Use the recommended baseline efficiency values in this study both for the 2018 program savings estimates and saving estimates going forward:** The baseline values



in this memorandum were based on a “preponderance of the evidence” analysis based on data sources including in-depth interviews with three different groups of commercial water heater trade allies and dozens of recent Massachusetts commercial water heater installations from the Project 41: MA C&I Market Characterization On-site Assessments database.

**Recommendation 2: Require the Initiative to collect information on energy factors (EFs) and standby losses:** The evaluators’ review of the range of energy efficiencies in the data from the Project 41: Massachusetts C&I Market Characterization On-site Assessments, as well as from industry sources, revealed that among tank-style WHs with similar thermal efficiencies, there can be a wide range of EFs. This could be due to variations in standby losses in the storage elements, to differences in the tanks’ insulation levels, or to different configurations in the systems.

**Recommendation 3: Coordinate with installation contractors to develop and maintain a project lead contact information list:** Developing a simplified, standardized index denoting the installation vendor project lead could reduce evaluation costs, speed up survey timelines and ensure better access to decision makers for net-to-gross (NTG) studies.

**Recommendation 4: Use the actual thermal energy efficiencies of the installed equipment for all Initiative-rebated water heaters, not just for volume water heaters.** Currently actual thermal efficiencies are allowed in the Initiative’s savings calculations for volume water heaters, but not for other Initiative-rebated water heater types. We believe that this allowance for the volume water heaters be extended to all program-rebated water heaters. Initiative tracking data shows that the average thermal efficiency of the installed units (> 95%) is much higher than the minimum program-qualifying efficiency (92%). Therefore, using the minimum program-qualifying efficiency for the deemed savings calculations underrepresents the incremental efficiency achieved by the Initiative to a non-trivial extent.

**Recommendation 5: Ways to improve future field measurements of commercial water heater operating characteristics:** These kinds of measurements would produce more reliable estimates for gas and condensate data, with the following improvements:

- Improved measurement methods and equipment (e.g., higher quality meters and sensors);
- Refined M&V plans reviewed by 3rd party (manufacturers, subject matter experts, etc.) to ensure that deployment will be successful;
- More time spent onsite understanding the facility (e.g., areas with best signal strength for modems), the WH system operation and sequencing, and the distribution system components and end uses;
- Greater use of controls monitoring if certain barriers (e. g, the ability to understand/translate proprietary controls language) can be overcome; and
- More complete collection of historical gas and water consumption data.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt and/or are considering some of the recommendations, as described below.

Baseline recommendations made as part of this study will be adopted, while all other recommendations are currently under consideration by the PAs.

### **How the Study Affects Program Results and Its Significance:**

The study developed new recommended baseline energy efficiency assumptions for the condensing water heater types which the Initiative incentivizes. These new baseline efficiency recommendations, along with new water consumption estimates for tankless water heaters coming out of the MA19C10-G-WHGPD Quick Hit study on water consumption for tankless WHs, were used to estimate new deemed savings estimates for these measures. In addition, the study produced a new estimate for early replacement rates for commercial water heaters.

The study also recommended several actionable improvements to the Initiative including collecting EF information for rebated water heaters, using the actual thermal energy efficiencies of the installed equipment for all Initiative-rebated water heaters (not just for volume water heaters), and coordinating with installation contractors to develop and maintain a project lead contact information list.

### **Overview of Study Method:**

To estimate the energy efficiency of baseline equipment, DNV GL examined the energy efficiency ratings of the most recently-installed commercial water heaters from the Project 41: Existing Building Onsite Assessment database. To estimate the mix of baseline commercial water heater types, we supplemented this information on recently-installed units from the Project 41 database with sales estimates from distributors and contractors who sell or install commercial water heaters. During the 2017-2018 period, the study completed interviews with 16 participating commercial water heater distributors, 20 participating commercial water heater contractors, and 15 nonparticipating water heater contractors.

The pilot study involved installing meters for measuring gas flow, water flow, condensate pump operation, combustion fan operation, and electric load at six different sites. The onsite engineers also measured the temperature and humidity of the flue gas exhaust and did spot measurements of condensate production. One site also had a pre-installed monitoring system (Modbus) which the evaluation team was able to access digitally. Modems allowed the evaluation engineers to access some of these system performance data remotely.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-16.**

## **Study 18-17: Methods and Evaluation of Control Measures**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 3/18/2019

### **Study Objective and Summary of Results:**

The Massachusetts Program Administrators (PAs) and Energy Efficiency Advisory Council (EEAC) commissioned the Methods and Evaluation of Control Measures (P71) study to explore the potential of using consumption data analysis to assess energy savings for building automation systems.

The first phase of the Evaluation of Control Measures study assessed the feasibility of using utility consumption data for estimating savings for BAS systems installed alone. An unresolved question was whether monthly utility consumption data could be used to effectively estimate BAS savings in targeted small commercial offerings. The simulation exercise calculated the level of precision and degree of bias with which BAS and associated measure savings could be estimated using monthly data.

Phase 1 of the Evaluation of Control Measures study established that an aggregate, billing analysis approach including a comparison group was both:

- Feasible, with respect to precision, given the number of BAS being installed and the energy usage characteristics of these kinds of sites, and
- An approach that addressed the potential for biased savings estimates due to non-stable consumption, year over year.

Phase 2 was designed to developed BAS savings for the 124 sites that, by that time, would have sufficient post-installation data to produce valid savings estimates. In phase 2 we found that:

- CDA using a site-level approach is a technically feasible way to estimate savings for a challenging measure such as a BAS, if a BAS has been installed without additional energy efficiency measures. However, given the likelihood that multiple measures are installed with the BAS, site-level estimates are not particularly useful to the PAs for estimating savings from BAS in the absence of other measure.
- For measure-level estimates, the combination of increased standard errors and low estimated BAS savings produced results that were not satisfactory with respect to precision.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- Electric & Gas
- Small Business

## **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** Savings estimates should be analyzed on an observed (actual) weather basis (rather than a typical weather basis), because it will increase the flexibility and timeliness of the estimates.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

### **How the Study Affects Program Results and Its Significance:**

Methods and Evaluation of Control Measures was an exploratory study. The findings do not affect estimated or projected savings.

### **Overview of Study Method:**

The analysis applied the full range of site-level and aggregate CDA methods to a sample of Coffee Chain and Italian Chain stores to estimate:

- The year-over-year consumption stability (non-program-related change) within sites
- The variability in consumption across sites
- Based on the items listed above, estimate the error and precision of savings estimates produced by a consumption data analysis

## **PHASE 1**

### **Sample selection**

A search of the MA C&I Evaluation Database identified 530 electric records and 435 gas records for the Coffee Chain and 23 electric and gas records for the Italian Chain. After ineligible sites were removed, electric consumption data for 389 Coffee Chain and 13 Italian Chain stores, and gas bill series for 228 Coffee Chain and 9 Italian Chain stores remained in the sample.

### **Testing site-level CDA**

Site-level CDA quantifies change in consumption at a single site. The study employed regression models based on pre-period consumption and weather to predict post-installation consumption at the site.

### **Testing aggregate CDA**

The aggregate CDA built on aspects of the site-level regression approach. The end-product was an estimate of average savings across the group of sites. The aggregate approach applied standard billing analysis methods.

1. Determine the stability of monthly gas and electric consumption prior to program involvement.

2. CDA techniques were applied on two years of monthly billing data to test levels of consumption stability on sites with no BAS program activity.
3. Determine whether changes in consumption using monthly data are sufficient to estimate whole-building interactive savings produced by BAS installations.
4. This step aggregated predicted consumption vs actual consumption for a no-program scenario. It quantified the drift in consumption to determine the level of precision of post-consumption estimates given the natural variability in branded food service site data.
5. Conduct a simulated program savings evaluation.
6. CDA was simulated with the consumption data for both the Coffee and the Italian Chains to determine whether an aggregate, comparison group approach would support estimates of savings at some known level of precision.

## PHASE 2

### Sample selection

Billing data through December 2017 were extracted from the MA Evaluation Database. Eversource and National Grid provided additional consumption data for January through June 2018 to extend the period of analysis and increase the number of eligible BAS enabled sites in the analysis.

Tracking data from the MA Evaluation Database provided the official record of BAS installations and all additional measures. In addition, we extracted all instances of program activity for participants and potential comparison group sites for measures that were not installed concurrently with the BAS.

### CDA

For the CDA we estimate savings using two regression models that highlight different aspects of the data; site-level savings estimates from a forecast approach and a pre-post approach. The pre-post approach also supports a statistically adjusted engineering (SAE) model for measure-level results.

In preparation for the CDA, DNV GL developed two comparison groups for this analysis; a matched comparison group and a cluster-weighted comparison group.

**Forecast approach.** The forecast approach maximizes the use of post-installation data by including sites with less than a year of post-installation data. The pre-installation period model is used to forecast an estimate of post-installation baseline consumption under post-installation weather conditions.

**Pre-post site-level and SAE model.** For sites with sufficient post-installation data, we compared pre-and post-installation models to develop an estimate of savings under any weather condition. These results can be aggregated to yield an average site-level estimate of savings across the population or broken out to measure-level estimates.

**Application of Results:** Prospectively

Additional analysis of the CDA methods described here should be performed on BAS project sites before a final determination is made regarding the appropriateness of using CDA to evaluate savings from BAS projects.

**A copy of the complete study can be found in Appendix D, Study 18-17.**

### **Study 18-18: MA C&I Comprehensive Lighting Inventory**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL  
NMR Group

**Date Evaluation Completed:** 4/17/2019

#### **Study Objective and Summary of Results:**

The purpose of this study was to complete comprehensive on-site lighting inventories across the C&I population, and to aggregate those results to develop estimates of the overall market adoption and saturation of LEDs in Massachusetts.

The study provides the following key findings:

- The current saturation of linear LEDs across the C&I Market in Massachusetts is 26%; the current saturation of non-linear LEDs is 73%.
- Roughly 40% of C&I sites in Massachusetts have modified or improved their lighting systems since 2016, and in about 95% of these projects, LEDs have been an element of the project.
- Over 30% of sites with recent projects indicated that they were largely motivated to implement a lighting project to improve equipment efficiency and/or replace poorly-performing equipment.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- All Program Paths
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

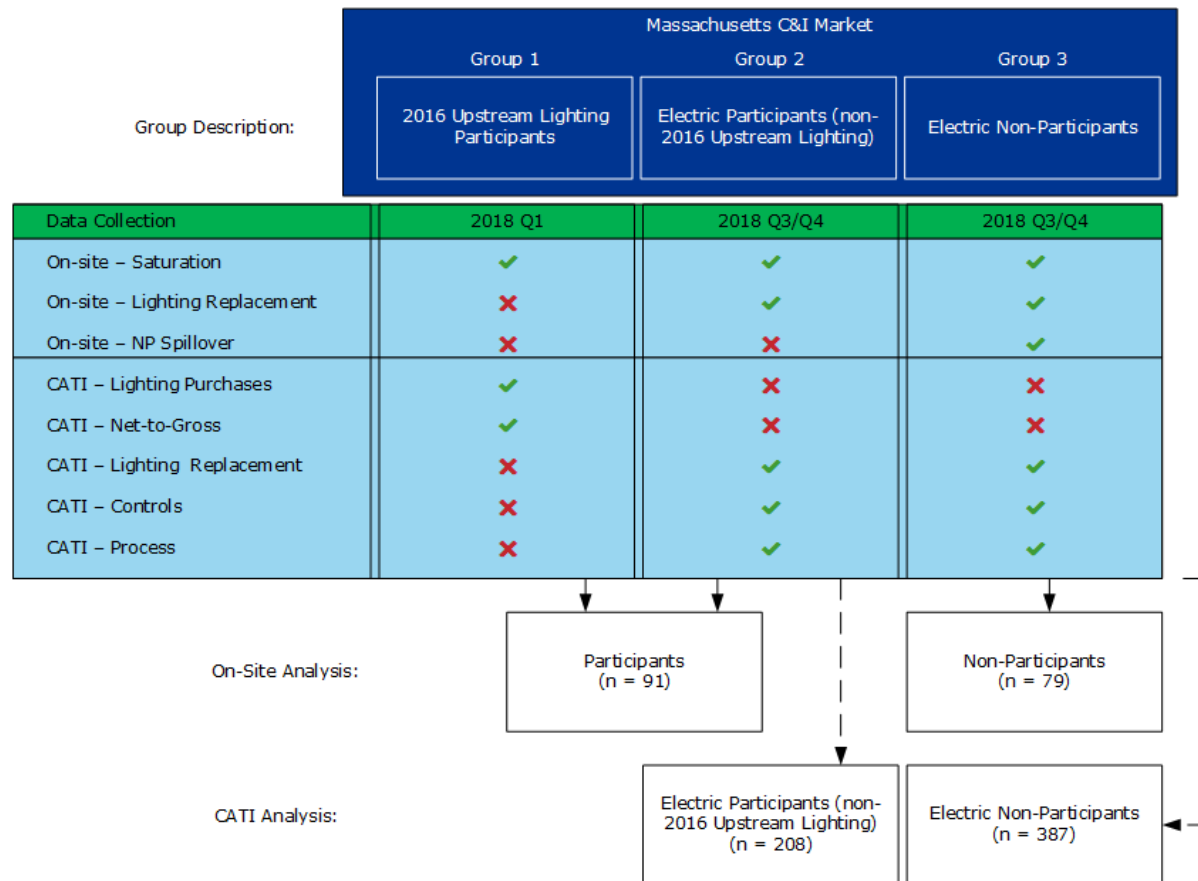
The results of this study provide the PAs with insight into the growth of the LED market in Massachusetts between 2015 and 2018. The 2018 saturation results were used to recalibrate the LED Market Model and provide adjusted 2019-2026 market share and saturation forecasts which the PAs can use to inform future planning efforts. Similarly, the results of the LED Market Model are used to calculate the effective measure life of program LEDs, an input that will be applied to

program planning to assess savings potential during the 2019-2021 period and applied retrospectively to 2019 program results.

**Overview of Study Method:**

At the direction of the Massachusetts Program Administrators (PAs) and Energy Efficiency Advisory Council EM&V Consultants (EEAC), DNV GL conducted computer-assisted telephone interviews (CATI surveys) and on-site lighting inventories with lighting participant and non-participant customers in the fall of 2018. These efforts were conducted with the primary goal of combining the results of on-site lighting data inventories conducted with 2016 Upstream Lighting participants in early 2018 with on-site data from the remainder of the commercial and industrial (C&I) population to develop linear and non-linear lighting saturation estimates representative of all Massachusetts C&I facilities. Figure 1 details the three independent samples we surveyed that represent the entire MA C&I market. The figure also includes the time period each group was surveyed, the type of information collected from each sample, and how we categorized each group in the results presented in this report.

**Figure 1. 2018 Data Collection and Aggregation Activities**



**Application of Results: Retrospectively and Prospectively**

**A copy of the complete study can be found in Appendix D, Study 18-18.**



**Study 18-19: Massachusetts Commercial and Industrial Impact Evaluation of 2016 Custom Electric Installations**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** DNV GL  
Energy and Resource Solutions (ERS)  
DMI

**Date Evaluation Completed:** 4/30/2019

**Study Objective and Summary of Results:**

The objective of this impact evaluation is to provide verification or re-estimation of electric energy and demand savings estimates for a sample of custom lighting and non-lighting electric projects through site-specific inspection, monitoring, and analysis.

The results of this study are realization rates for custom lighting and non-lighting electric energy efficiency measures. Realization rates were calculated at the statewide level as well as separately for National Grid and Eversource and will be used to determine the final achieved adjusted gross savings for PY2018 for these impact categories.

The study provides the following key findings:

<b>Lighting</b>	<b>Annual kWh</b>	<b>Summer On-Peak kW</b>	<b>Winter On-Peak kW</b>
	<b>Relative Precision @ 90% Confidence</b>	<b>Relative Precision @ 80% Confidence</b>	<b>Relative Precision @ 80% Confidence</b>
Statewide Realization Rate	92.4%	86.5%	81.7%
Statewide Relative Precision	6.30%	11.84%	8.92%
<b>National Grid (n=22)</b>			
National Grid Realization Rate	96.8%	100.8%	82.9%
National Grid Relative Precision	7.5%	12.9%	9.9%
<b>Eversource (n = 21)</b>			
Eversource Realization Rate	88.1%	66.5%	78.9%
Eversource Relative Precision	11.0%	23.6%	15.0%
<b>Non-Lighting</b>	<b>Annual kWh</b>	<b>Summer On-Peak kW</b>	<b>Winter On-Peak kW</b>
	<b>Relative Precision @ 90% Confidence</b>	<b>Relative Precision @ 80% Confidence</b>	<b>Relative Precision @ 80% Confidence</b>
Statewide Realization Rate	67.0%	69.8%	58.0%

Statewide Relative Precision	8.72%	11.87%	10.90%
<b>National Grid (n=39)</b>			
Realization Rate	64.2%	69.5%	66.0%
Relative Precision	14.4%	15.8%	12.9%
<b>Eversource (n = 38)</b>			
Realization Rate	67.1%	67.6%	52.0%
Relative Precision	10.9%	16.4%	14.4%

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Electric Only

**Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** The realization results from this study should be applied retrospectively to custom lighting and non-lighting projects installed in 2018. The results should also be applied to future program years until new realization rates are published. The results provide custom lighting and non-lighting realization rates for National Grid, Eversource, and statewide.

1. National Grid and Eversource should use their own PA specific realization rates for lighting and non-lighting projects, respectively.
2. Cape Light Compact and Unitil should use the statewide realization rates for lighting and non-lighting projects, respectively.

**Recommendation 2:** The prospective lighting realization rate results from this study shall replace the retrospective lighting realization rates used by each PA once their custom lighting projects are developed using the established lighting baselines in the ISP repository. Until that point, the retrospective lighting realization rates should be applied to future program years until new realization rates are published.

**Recommendation 3:** The evaluator recommends the Massachusetts PAs and EEAC continue to sponsor the rolling impact evaluation approach for custom electric installations. These results will be updated annually as subsequent impact evaluations of 2017 and 2018 program years are completed. This aligns with the new impact evaluation paradigm as part of the impact framework.

**Recommendation 4:** Future custom electric projects should standardize how baseline conditions and operation are documented in applications.

1. Custom non-lighting applications should clearly document the source of their baseline operating condition and control strategy and use actual trend data whenever possible. The application should seek to understand and account for any planned operational strategy changes after the measure installation is complete.

2. Custom lighting applications that exceed 500,000 kWh in annual claimed energy savings should require photographs and detailed descriptions regarding dominant existing lighting system types, quantities, and condition.
3. For custom lighting applications the dominant existing lighting control strategy should be photographed (whenever possible) and documented clearly in the application file. If possible, pre-metering of hours of use for spaces to be controlled should be done to capture baseline conditions.
4. The source used to estimate baseline annual operating hours should be clearly stated.

**Recommendation 5:** Custom lighting applications should report claimed lighting controls savings separate from fixture replacement savings in the tracking database. Currently, evaluators are only able to determine the claimed lighting controls savings when examining the custom lighting application excel worksheets. These are only provided when projects are drawn for evaluation. Gross realization rates associated with fixture replacements are inevitably different from the savings attributed to lighting control reductions. As a result, the evaluators are unable to effectively extrapolate the observed differences in fixture vs control savings to the population. The current observed practice is for custom lighting applications to bundle both fixture and control savings claims into the same application tracking line item.

**Recommendation 6:** The evaluator recommends including a summary of the baseline selection in the project documentation. Especially given the adoption of a new evaluation baseline framework, the program should document how the baseline was determined for unique custom projects in this impact category and provide clear statements on each decision made. This will be especially important when the program selected baseline for a Lost Opportunity project is a different system type than the pre-existing equipment at a facility.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

#### **How the Study Affects Program Results and Its Significance:**

This is the second statewide impact evaluation of custom lighting projects and the first impact evaluation that combined all other custom electric end-uses, excluding CDA and CHP. For lighting, the realization rates are lower but not substantially so as the overall statewide change in energy realization rates is down by roughly 6%.

A similar comparison of non-lighting results could not be completely replicated since this round of custom electric impact evaluation grouped these projects together for the first time. However, analysis of prior end-use specific evaluation results was done using the PY2016 savings estimates by end-use to estimate the differences between this study and prior non-lighting results. Based on this analysis, the custom non-lighting statewide realization rate was found to be approximately 20% lower for this group of measures as compared to prior results.

### **Overview of Study Method:**

The DNV GL team utilized the following approach for this impact evaluation, which was consistent with the procedures and protocols developed during previous rounds of Custom electric impact evaluation:

- Examined the 2016 large C&I custom electric population to improve understanding of the relative impact of this category.
- Designed an efficient sampling plan for the selection of custom lighting and non-lighting projects to achieve the agreed upon relative precision targets using the error ratios determined in the previous custom electric evaluations. The primary sample design for this study was expected to achieve a statewide lighting and non-lighting electric energy savings realization rate results with  $\pm 10\%$  relative precision at the 90% confidence interval, and statewide summer and winter peak demand savings realization rate results with  $\pm 10\%$  relative precision at the 80% confidence interval. National Grid and Eversource lighting and non-lighting electric energy savings precision targets were each set at  $\pm 15\%$  for each PA at the 90% confidence interval.
- Performed a full file review of all sampled custom lighting and non-lighting projects to provide an in-depth review of baselines for each project and to provide the stakeholders with an early and accurate assessment of the impact of baseline changes for planning purposes.
- Reviewed the TA studies, model files, and calculations used to develop the tracking savings for each sampled participant to develop site specific M&V plans.
- Performed comprehensive data collection, including metering and trend data, at each sample site to support an independent analysis of achieved gross gas energy savings realization rates.
- Established baselines for each sampled project based on the materials reviewed and additional data collected.
- Documented the evaluation activities completed in a comprehensive site-specific M&V report.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-19.**

**Study 18-20: Impact Evaluation of 2016 Custom Gas Installations**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** DNV GL  
Energy and Resource Solutions (ERS)  
DMI

**Date Evaluation Completed:** 4/1/2019

**Study Objective and Summary of Results:**

The primary objective of this evaluation was to provide verification and re-estimation of energy savings for a sample of statistically selected custom gas projects through site-specific inspection, monitoring, and analysis. The results of this study will be used to determine the gross realization rates for custom gas energy efficiency projects implemented in PY2018 and beyond.

A new steam trap calculator was introduced in 2017, reducing average steam trap savings. The PY2016 steam trap projects were calculated using the old calculator, although there is an expectation that the new calculator will be used starting with PY2017 and going forward. As a consequence of this systematic change in practice, this study calculated realization rates for PY2018 application assuming the new calculator is fully adopted by the program, which has been confirmed by all of the gas PAs.

The study provides the following key findings:

The results are summarized in and Table 1-2.

**Table 1-1. PA and Statewide Summary Results - Prospective**

<b>Results by PA</b>	<b>Berkshire</b>	<b>Columbia</b>	<b>Eversource</b>	<b>Liberty</b>	<b>National Grid</b>	<b>Unitil</b>	<b>Statewide</b>
Realization rate	40%	80%	72%	71%	88%	116%	82%
RP 80% CI	37%	6%	25%	21%	9%	0%	9%
Error bound	15%	5%	18%	15%	8%	0%	7%
Sample size	3	13	12	2	21	2	53
Error ratio	0.50	0.17	0.66	0.22	0.31	0.00	0.49

The difference between the statewide tracked and evaluated savings was driven by these main factors: the magnitude of the original annual load served by the installed measure (-5.6%), underperforming installed measures (-5.0%), and the removal or failure of measures (-4.5%). More details about the differences are presented in Section 3.2.

The differences due to baseline changes as observed in the primary and desk review sites accounted for less than 1% of the program-reported (tracking) savings. The methods used by the PAs to determine the baseline are appropriate.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Gas Only

### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** The study produced statewide results that are reliable ( $\pm 9$  at 80% confidence level). The evaluation team designed the sampling plan so that individual realization rates will be applied for those PAs with more than ten sites and if a final precision meets the intended precision targets ( $\pm 20\%$ ). The relative precision of the retrospective realization rates for National Grid ( $\pm 9\%$ ), and Columbia ( $\pm 6\%$ ) is sufficient to warrant application of their individual PA realization rate according to the sampling plan.

**Recommendation 2:** The realization rate for Eversource had a wider error band ( $\pm 25\%$ ) than the targeted 80/20 precision, therefore Eversource is recommended to use the statewide results. Berkshire, Liberty, and Unitil are also recommended to use statewide results because fewer than ten sites were evaluated in their territory.

**Recommendation 3:** The realization rates should be used for planning and program reporting, including the application of retrospective rates to program year PY2018 and subsequent years until the PAs demonstrate the new steam traps savings calculator is fully deployed and used.

**Recommendation 4:** The use of a 0.60 error ratio in the sample design was confirmed in the subsequent evaluation, which yielded a statewide error ratio of 0.52. A value of 0.60 is recommended for future evaluations.

**Recommendation 5:** Our site engineers struggle to capture winter period metering with every evaluation because of the late winter evaluation start. Starting the evaluation is contingent on sampling and sampling is contingent on tracking data. We recommend applying sampling methods that do not require final reporting data sets. This should be possible with the rolling sample approach, which allows for subsequent corrections.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

Specifically, the PAs have adopted Recommendation 3, by confirming that all steam trap projects completed in PY2018 used the new steam trap savings calculator, and are, therefore, applying the associated realization rate for PY2018, referred to as the “prospective” rate in the study.

### **How the Study Affects Program Results and Its Significance:**

The PY2016 statewide realization rate from this study is 6% lower than the 88% realization rate determined in the previous impact evaluation study conducted for PY2013.

### **Overview of Study Method:**

The DNV GL team utilized the following approach for this impact evaluation, which was consistent with the procedures and protocols developed during previous rounds of Custom Gas impact evaluation:

- Examined the 2016 large C&I custom gas population to improve understanding of the relative impact of this category.
- Designed an efficient sampling plan for the selection of custom gas projects to achieve the agreed relative precision targets using the error ratio of 0.6 determined in the previous custom gas evaluations. The primary sample design was targeted for  $\pm 10\%$  relative precision on statewide annual energy at the 80% confidence interval. The sample design also targeted a  $\pm 20\%$  relative precision at the 80% confidence interval for Columbia, Eversource, and National Grid.
- Performed a full file review of all sampled custom gas projects to provide an in-depth review of baselines for each project and to provide the stakeholders with an early and accurate assessment of the impact of baseline changes for planning purposes.
- Reviewed the TA studies, model files, and calculations used to develop the tracking savings for each sampled participant to develop site specific M&V plans.
- Performed comprehensive data collection, including metering and trend data, at each sample site to support an independent analysis of achieved gross gas energy savings realization rates.
- Established baselines for each sampled project based on the materials reviewed and additional data collected.
- Documented the evaluation activities completed in a comprehensive site-specific M&V report.
- Extrapolated the sample results to the population to estimate statewide realization rates for the impact category.

### **Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-20.**

### **Study 18-21: C&I Lighting Market Actor Data Collection Results Package**

**Type of Study:** Market Effects Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 4/26/2019

#### **Study Objective and Summary of Results:**

The overall objective of this study was to conduct market research to support a quantification of the market effects of the Massachusetts Program Administrators' (PAs') efforts to promote high-performance T-8 (HPT8) lamps and commercial LED lighting products, and to conduct a market effects baseline study for C&I lighting controls in the non-residential sector.

The study provides the following key findings:

- Initial cost and hesitation to using new technologies continues to be a barrier to LED and advanced lighting control adoption in Massachusetts.
- A sizable share of CFL sales in Massachusetts are pin-based CFLs which do not have a suitable LED replacement similar to screw-based CFLs.
- Market actors believe incentive programs help increase awareness of LEDs and lighting controls and assert that sales of this equipment would have been lower in the absence of the program.
- It is becoming increasingly more difficult to achieve enough survey completes with market actors in Massachusetts and other states to provide quantitative results.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- All Program Paths
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

The results of this study provide the PAs with insight into how market actors approach recommendations and support for installations of LED equipment and lighting controls. Due to difficulties associated with collecting data from market actors, market effects were not assessed as part of this study.



**Overview of Study Method:**

This study attempted to collect the following data. Achieved sample is also included in the table.

Research Effort	MA Target	MA complete	Comparison Area Target	Comparison Area Complete
Distributor IDI	25	20	25	16
Distributor Sales Panel	10-12	2	10-12	0
Contractor CATI	35	31	35	19
Designer IDI	10	10	5	5

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-21.**

## **Study 18-22: Air Compressor, Air Dryer, and Infrared Heater ISP Studies, and Lighting Outyear Factor and Equivalent Measure Life Update**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL  
Energy and Resource Solutions (ERS)

**Date Evaluation Completed:** 4/30/2019

### **Study Objective and Summary of Results:**

The objectives of this study were to:

- Employ a high rigor approach to characterize the industry standard practice (ISP) baseline technologies in Massachusetts for the lost opportunity installation of industrial plant air compressors and air dryers that provide 75 to 145 psig air.
- Test a low rigor approach and attempt to determine the ISP baseline for the lost opportunity installation of infrared heaters (IR).
- To determine the outyear factor and equivalent measure life for lighting measures, which are to be used for calculating lifetime savings and accounts for dual baseline and replace-on-failure effects.

The study provides the following key findings:

- For air compressors and compressed air dryers:
  - The industry standard practice for general plant air supply remains load-unload controlled oil-lubricated twin-rotor screw air compressors. Standard practice for compressed air drying remains constant-on refrigerated dryers.
  - The study makes minor changes to the Mass Save baseline in that it specifies presumed compressed air storage tank capacity (which affects cycling losses), specifies the minimum dewpoint condition for the refrigerated dryer ISP, expands the range applicability of the compressor ISP from 200 to 350 hp, and slightly modifies the sectors expected to use oil-free compressors
- For infrared heaters:
  - Unit heaters should remain the assumed ISP equipment when IR systems are installed as a lost opportunity measure. For lost opportunity new construction IR and unit heater installations, the thermal efficiency of the ISP is 82%. For lost opportunity, replace on failure installations, the ISP is a new unit that can be installed in the same location at the lowest cost.
- For lighting:
  - A table of outyear factors and equivalent measure lives by year and by measure group type was produced. These values should be used as placeholders for PY2019 until updated EMLs are available. These values should not be applied retrospectively to PY2018.

<b>Outyear factor with adjustment for replace on burnout</b>	<b>PY2019</b>	<b>PY2020</b>	<b>PY2021</b>
Indoor HID Lamp	0.99	1.00	1.00
Indoor Linear Lamp	0.85	0.85	0.84
Indoor Screw-Based Decorative	0.84	0.81	0.77
Indoor Screw-Based General	0.64	0.58	0.54
Indoor Screw-Based Other	0.90	0.86	0.82
Outdoor HID Lamp	0.99	0.99	0.99
Outdoor Linear Lamp	0.92	0.92	0.92
Outdoor Screw-Based Decorative	0.79	0.74	0.70
Outdoor Screw-Based General	0.70	0.64	0.60
Outdoor Screw-Based Other	0.91	0.86	0.82

<b>Equivalent measure life with a ROB adjustment and ER</b>	<b>PY2019</b>	<b>PY2020</b>	<b>PY2021</b>
	Indoor HID Lamp	14.9	15.0
Indoor Linear Lamp	13.5	13.5	13.4
Indoor Screw-Based Decorative	4.5	4.4	4.2
Indoor Screw-Based General	4.4	4.2	4.0
Indoor Screw-Based Other	10.1	9.7	9.3
Outdoor HID Lamp	14.9	14.9	14.9
Outdoor Linear Lamp	14.2	14.2	14.2
Outdoor Screw-Based Decorative	4.3	4.1	4.0
Outdoor Screw-Based General	4.7	4.5	4.3
Outdoor Screw-Based Other	10.1	9.7	9.3

- 12.2% of program savings classified as replace-on-failure. The impact of replace-on-failure is included in these two lighting tables.

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- All Program Paths
- Process, HVAC, & Lighting
- Electric & Gas
- The results apply to air compressor, air dryer, infrared heater, and upstream and downstream retrofit lighting savings for both prescriptive and custom tracks.

**Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1: For compressed air and air dryer measures, use the following table:**

<b>System Type</b>	<b>Industry Standard Practice</b>
General industrial air compressors larger than 15 hp and up to 350 hp	Oil-flooded, air-cooled single-stage rotary screw compressor Load/no load control For replace on failure: 1 gal/cfm storage <sup>a</sup> For new construction: 4 gal/cfm storage <sup>a</sup>
Air compressors for use in pharmacological, food, medical, and nano-production industries, as well as any application where oil-free air is required	Oil-free, air-cooled single-stage rotary screw compressor Load/no load control
General industrial compressed air dryers with dew point requirement >38°F	Non-cycling refrigerated dryer
Compressed air dryers with dew point requirement <38°F	Desiccant dryer

<sup>a</sup> If actual on-site storage is not known. The cfm basis is the largest single trim compressor capacity.

**Recommendation 2: For infrared heater measures, the following ISP baseline assumptions should be adopted:**

1. For lost opportunity IR installations, assume the specified thermal efficiency of the industry standard practice is 82%. This represents an increase compared to the 2016-2018 Massachusetts Technical Reference Manual (TRM) baseline of 80% for the low intensity IR heater measure.
2. For lost opportunity unit heater installations, assume the specified thermal efficiency of the industry standard practice is 82%. This represents an increase compared to the MA TRM baseline of 80% for the condensing unit heater measure.
3. For replace on failure installations, assume the industry standard practice is a new unit that can be installed in the same location at the lowest cost

**Recommendation 3: For lighting measures:**

The table of outyear factors and equivalent measure lives and the replace-on-failure fraction should be used in calculating lifetime measure savings for upstream and downstream retrofit measures as placeholder values for PY2019 until updated EMLs are available. These values should not be applied retrospectively to PY2018.

Additional saturation data should be collected through the end of the 2019-2021 term to recalibrate the Market Model.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt and/or are considering some of the recommendations, as described below.

Recommendations pertaining to compressed air measures and infrared heaters, as detailed above, are currently under consideration. Lighting factor adjustments have been incorporated into 2019-2021 planning assumptions for all PAs, though some numbers were subsequently adjusted from the tables above to account for anticipated, near-term changes in the lighting markets and impacts on outyear factors and equivalent measure lives.

### **How the Study Affects Program Results and Its Significance:**

- For air compressors and compressed air dryers:

The study essentially affirms the current Massachusetts baseline. The study makes minor changes to the current baseline in that it specifies presumed compressed air storage tank capacity (which affects cycling losses), specifies the minimum dewpoint condition for the refrigerated dryer ISP, expands the range applicability of the compressor ISP from 200 to 350 hp, and slightly modifies the sectors expected to use oil-free compressors

- For infrared heaters:

The Massachusetts energy efficiency program administrators currently assume the baseline equipment for prescriptive lost opportunity installations of low intensity IR heaters has a thermal efficiency of 80%. This study finds that for these installations, the ISP baseline thermal efficiency is 2% better at 82%.

- For lighting:

Program Year 2019 is the first year incorporating Baseline Framework principles which specifies dual baseline treatment of retrofit measures and rules for determining measure baselines. The net effect is a small (1-2%) increase in lifetime savings from what they would be without the application of Baseline Framework principles.

### **Overview of Study Method:**

- For air compressors and compressed air dryers:

This study was designed as a high rigor ISP study. The Draft P73B ISP Protocol<sup>12</sup> provides guidelines on assigning low and high levels of rigor in determining ISP. The high rigor protocol is restricted to those high impact measures, where significant program-wide savings or incentives are at risk. This study involved background research and two rounds of interviews. The first of these was a group discussion with PA representatives to establish a working understanding of the incentive programs as they currently exist. The second round of interviews involved individual discussions with 10 market actors including regional vendors, manufacturers, and industry experts

- For infrared heaters:

This study was designed as a low rigor ISP study. Per the P73B ISP Protocol, the low rigor protocol applies to measures where there is less savings and incentive dollars at risk. For

<sup>12</sup> Revised Draft *General Industry Standard Practices Protocols* prepared for and delivered to MA P73B ISP Working Group by Kevin Boyd, Jon Maxwell, and Betsy Ricker of ERS on 9/14/2017.

this study, the first stage included literature review, interviews with the program administrators (PAs) and data review. Stage 2 included in-depth interviews with eight market actors, including contractors, manufacturers, and distributors.

- For lighting:

The outyear factor is used to calculate the second period savings of dual baseline retrofit measures. The second period savings is the difference between the wattage of the high efficiency lamp and the average wattage per lamp in the future year when the old lamp would have naturally failed. The average market watts was derived from outputs of the MA C&I LED Lighting Market Model.

The baseline for replace-on-failure lighting is the market baseline excluding the program sponsored measure. The MA C&I LED Lighting Market Model was also used to determine the average wattage of replace-on-failure market. The fraction of the program that is replace on failure was determined by averaging the results of surveys of end-users, contractors, and distributors from multiple studies.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-22.**

## **Study 18-23: Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 6/2/2017

### **Study Objective and Summary of Results:**

The objective of this study was to investigate and recommend baseline assumptions for injection molding machines (IMMs) that would be used to compute savings estimates in the most recent and future impact evaluations, and to provide recommendations for future ex-ante tracking estimates. Baseline recommendations are based on identified industry standard practice for the selection of new IMM equipment.

The study provides the following key findings:

#### Existing Practices

- Limited research has been completed on industry standard practice for IMM selection and purchase. A California industry standard practice (CA ISP) study was completed in 2013. The recommended ISPs are either Hybrid or All-electric machines based on sector served and machine size.
- Other program administrators in the country assume that Hydraulic machines represent the baseline, but have not completed research to support this assumption. Other than in Michigan, all program administrators support IMM installations through their custom program offerings. Michigan uses a prescriptive approach.

#### Machine Selection Practice

- The machine types considered for purchase are based on the parts expected to be produced and the specifications or customer requirements for those parts. The selection process does not vary significantly from one state to another for the same parts. Regional differences based on the area's mix of industries will impact the common type of machines operated in that region.
- While current IMM users and manufacturers use the terms "hydraulic", "hybrid", and "all-electric", there are currently seven different types of IMMs being sold. Interview respondents stated that there is some confusion in the industry regarding whether some types should be considered hydraulic or hybrid machines. We have ranked these types from least to most efficient. Respondents stated that the least efficient single speed hydraulic IMMs are rarely sold at this time (interviews completed in 2016). The most efficient types are all-electric IMMs. All machine types are outlined in Appendix A.
- Key considerations of the manufactured part that can limit the number of options considered for machine type selection are wall thickness, tolerance, contamination, clamping force, and required machine speed.

- Massachusetts has a number of manufacturers serving the medical and electronics sectors, with some packaging and a small amount of automotive.
- On average, interview respondents believe that two-thirds of IMMs purchased to make medical parts are all-electric.
- On average, interview respondents believe that over 60% of IMMs purchased to make electronics, automotive, or packaging parts are hybrid or all-electric.
- Interview respondents believe that the majority of small IMM purchases are all-electric.
- Participants making medical parts that were sampled for impact evaluation stated that all-electric machines were the only machine type considered for the project. This information aligned with net-to-gross survey results for the same year, including one participant surveyed for both studies.
- Participants not making medical parts that were sampled for impact evaluation stated that alternative less-efficient machines were considered for the project. This information aligned with the net-to-gross survey results for the same year, including one participant surveyed for both studies.

#### Estimating Energy Consumption

- Estimating machine consumption, no matter the type or configuration, is complex. Consumption is dependent on the machine being used, the material being processed, and the cycle profile required.

#### Market Changes

- Interview respondents stated that the economic downturn starting in 2008 resulted in no significant changes in industry practices until recently. Recent years have seen more growth in the industry with increased machine options.
- Interview respondents believe that high efficiency equipment will continue to gain market share in the future. Specifically, in the next 3-5 years it will become standard practice to purchase machines with servo motor driven hydraulics.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- New Buildings & Major Renovations
- Process
- Electric Only

#### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** Future commercial and industrial custom measure impact evaluations should assume that the industry standard practice for the lost opportunity purchase of a new IMM to produce medical parts is an all-electric IMM. This is supported by the literature review, data review, and interview results. This standard practice is not expected to change in the future.



**Recommendation 2:** Future commercial and industrial custom measure impact evaluations should assume that the industry standard practice for the lost opportunity purchase of a new IMM with less than 200 tons of clamping force is an all-electric IMM. This is supported by the literature review and interview results. The 200-ton threshold is recommended based on the information presented in the CA ISP study and the interview findings. This standard practice may change as the mix of equipment available for purchase and associated costs change. DNV GL recommends reviewing this recommendation prior to the start of the 2020 program year.

**Recommendation 3:** Future commercial and industrial custom measure impact evaluations should assume that the industry standard practice for the lost opportunity purchase for all other new IMM is a machine that has variable volume hydraulic pumping. This standard practice may change as the mix of equipment available for purchase and associated costs change. DNV GL recommends reviewing this recommendation prior to the start of the 2020 program year. This is supported by the literature review, data review, and interview results.

**Recommendation 4:** Future commercial and industrial impact evaluations should continue the practice of specifying the assumed baseline machine model or models for each project sampled. This information will be necessary to accurately estimate the energy consumption in the baseline case as there is not sufficient information to accurately estimate consumption without it. The baseline machine should align with the agreed industry standard practice definition and continue to be a machine that is able to meet the required product specifications for the expected parts at time of selection and was a machine the manufacturer stocked at the time (i.e., not a custom-built machine).

**Recommendation 5:** Future commercial and industrial impact evaluations should utilize the savings calculation framework in the report to estimate evaluated gross energy savings. Evaluated gross energy savings should continue to be calculated based on the normal production volume and practices found at the time of evaluation. Future evaluations should be prepared for situations where the as-found normal production practice is different than expected at the time of machine selection. This framework should be reviewed and updated if necessary at the conclusion of future impact evaluation studies that include the evaluation of lost opportunity IMM installations.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt the recommendations.

#### **How the Study Affects Program Results and Its Significance:**

IMM specification practices and the IMM market are multifaceted and complex. Establishing a simple industry standard practice baseline that can be applied across the state for all machine purchases is challenging based on the variations that appear to exist within the market. The standard practice technology is likely determined by the industry the user expects the machine to serve or the parts expected to be manufactured, and the user's selection factor priorities. However, consistent with the conclusions of the CA ISP study, there is clear evidence that industry standard practice in Massachusetts is no longer the installation of the least efficient hydraulic injection molding machines available in the market.

**Overview of Study Method:**

The DNV GL team utilized the following research tasks for this baseline study:

3. A review of existing IMM literature.
4. A review of program participation data, net-to-gross survey data, sampled evaluation participant survey results, and end-use metering results.
5. In-depth interviews with IMM market actors.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-23.**

### **Study 18-24: Two-Tier Steam Trap Savings Study**

**Type of Study:** Impact Evaluation  
**Evaluation Conducted by:** Energy and Resource Solutions (ERS)  
**Date Evaluation Completed:** 4/26/2018

#### **Study Objective and Summary of Results:**

The goals of this study are as follows:

- Generate two prescriptive steam trap repair and replacement deemed savings estimates by leveraging the existing data collected from the Phase 2 Steam Trap Evaluation.
- Establish qualification criteria to be used when assigning the proper savings tier for prescriptive steam trap replacements.

The study provides the following key findings:

ERS chose pressure as the sole key variable and 15 psig as the threshold value for the deemed savings tiers for the reasons listed below:

- Pressure is an easily identifiable parameter in the field.
- The industry widely accepts 15 psig as the maximum for low-pressure applications.
- Pressure is routinely used as the qualification criteria for deemed steam trap savings in other jurisdictions' technical resource manuals (TRMs).
- Most steam systems will operate exclusively in one range or the other. While low-pressure boilers can't create high-pressure steam, it is likely that high-pressure systems include a small number of low-pressure traps. Review of historic trap data and discussions with PAs confirmed that there are a limited number of distinct high-pressure customers throughout the state (less than 8%) and that they are unlikely to use the prescriptive savings stream when applying for incentives.
- The previous Phase 2 study identified pressure as the most divisive parameter among the custom savings equation inputs.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- Other
- Gas Only

#### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** ERS recommends that the PAs adopt a two-tier approach for prescriptive steam trap savings in 2019 and beyond using the following criteria for applying deemed savings appropriately:

- If the system operating pressure is  $\leq 15$  psig, PAs should claim 8.4 MMBtu/yr for every steam trap repaired or replaced at the facility through the program.
- If the system operating pressure is  $>15$  psig, PAs should claim 35.6 MMBtu/yr for every steam trap repaired or replaced at the facility through the program.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt the recommendations.

**How the Study Affects Program Results and Its Significance:**

For prescriptive steam trap projects in 2019 and beyond, the PAs should adopt the two-tier approach depending on system operating pressure rather than a single deemed savings value for all steam traps.

**Overview of Study Method:**

A prototype model-basis approach was used to calculate the deemed savings values, which involves tabulating the various parameters from the custom savings equation and taking median and weighted average values. A breakdown of the approach used is below:

6. Determine the best variable to use for bifurcating the results (pressure).
7. Review the data and past interviews to determine the most appropriate breakpoint between the two categories (15 psig).
8. Analyze the other variables in the savings equation for variability as a function of the defining variable (enthalpy, orifice size, annual hours, and efficiency vary with pressure, the other variables do not).
9. Run the prototype calculations twice, using the low- and high-pressure configurations for all variables.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-24.**

### **Study 18-25: Impact Evaluation of Commercial Water Heaters**

**Type of Study:** Impact Evaluation, Market Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 5/27/2019

#### **Study Objective and Summary of Results:**

This study had two research objectives including:

- Conduct a critical review of a 2018 analysis of daily water consumption for tankless water heaters (WHs) by the third-party implementer of the Massachusetts C&I Upstream Water Heater Initiative (Initiative) and using that analysis, or an alternative analysis, recommend water consumption estimation methods to be used for calculating deemed savings for this measure
- Conduct a technical reference manual (TRM) review to determine what estimates of average daily water consumption for commercial tankless water heaters are used in jurisdictions outside of Massachusetts.

The following are summaries of the key findings.

- A review of the water usage values in the readily-available TRMs support the Initiative implementer's recent proposal to increase hot water usage values for tankless WH in C&I facilities.
- The 2018 analysis of daily water consumption for tankless WHs by the third-party implementer of the Initiative demonstrated the need to revise the current Massachusetts TRM assumption for water consumption in tankless water heaters (64 gallons-per-day (GPD)). However, the evaluators recommended alternative approaches for calculating the GPD estimates because they had concerns about the third-party implementer's analysis combining usage-per-building data from California or New York sources with units-per-building from Massachusetts PA tracking data. They also noted that half the GPD values in the implementer's analysis came from a single study which focused on California hot water usage values specific to food service end uses.

The evaluators recommended using an alternative approach to estimate GPD for tankless water heaters which could be applied in three different ways:

- 1) a single GPD value for the whole year;
- 2) a more granular approach where a GPD value is assigned to a participating facility based on its classification to one of five different hot water usage categories (multifamily, manufacturing, low usage, medium usage, and high usage); and
- 3) an even more granular approach where a participating site would be assigned a GPD value based on one of 16 building type categories.

- The study calculated the 2018 deemed energy savings values for WH types rebated by the Initiative. Table 1 shows these values which incorporated two adjustments:
  - 1) revised estimates for the energy efficiencies of baseline equipment coming out of Project 77: Upstream Water Heater Deemed Savings Impact Evaluation; and
  - 2) new GPD estimates for tankless water heaters coming out of MA19C10-G-WHGPD - Market Quick Hit Study on Water Consumption for Tankless WHs.

**Table 2: 2018 Condensing Water Heater Savings by Water Heater Type**

Commercial WH Type	Efficiency Requirement	2018 Savings	Recalculated 2018 Savings with New Baselines	Savings Change	Realization Rate
Condensing Volume	≥0.92 thermal efficiency	5.07 (therms/MBH input)	3.67 (therms/MBH input)	28% decrease	0.72
Condensing Tank Style	≥0.95 thermal efficiency	6.14 (therms/MBH input)	6.14 (therms/MBH input)	No change	1.00
Condensing Tankless	≥0.94 Energy Factor	90 (therms/unit)	86 (therms/unit)	4% decrease in savings	0.96

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- Hot Water
- Gas Only

**Evaluation Recommendations:**

The evaluators conducting this study developed the following recommendations (the full memoranda contain more details on these recommendations):

**Recommendation 1: Use new estimates for water consumption in tankless water heaters.** The study described a recommended method for calculating new GPD estimates for commercial

tankless WHs in Massachusetts. This method involved constructing a Massachusetts-specific building type table using New York TRM, American Society of Heating, Refrigerating and A-C Engineers (ASHRAE), and Food Service Technology Center (FSTC) gpd values modified with Massachusetts-specific building type, size, and demographics information. As noted, this method allowed the GPD value to be applied in three different ways:

- 1) a single GPD value for the whole year;
- 2) a more granular approach where a GPD value is assigned to a participating facility based on its classification to one of five different hot water usage categories (multifamily, manufacturing, low usage, medium usage, and high usage); and
- 3) an even more granular approach where a participating site would be assigned a GPD value based on one of 16 building type categories.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs plan to adopt the recommendations.

#### **How the Study Affects Program Results and Its Significance:**

The Energy Efficiency Advisory Council (EEAC) and the Program Administrators (PAs) agreed to have the single value GPD estimate from the evaluators, which was based on the 2018 participant mix, to be applied to the 2018 Initiative results retrospectively. A similar adjustment factor will be used for 2019 and incorporating any additional granularity identified, and beginning in 2020, the EEAC and the PAs agreed to use the more granular approach developed by the evaluation team where a GPD value is assigned to a participating facility based on its classification to one of five different hot water usage categories. The PAs are currently working with Initiative implementers to incorporate these new GPD estimates into the Initiative's tracking system.

This Quick Hit study also used the new single-value GPD estimate for 2018, along with revised estimates for the energy efficiencies of baseline equipment coming out of Project 77, to calculate revised energy savings estimates for the 2018 Initiative (see Table 1 above).

#### **Overview of Study Method:**

The study conducted a TRM review to determine what estimates of average daily water consumption for commercial tankless water heaters are used in jurisdictions outside of Massachusetts. The study also conducted a critical review of a 2018 analysis of daily water consumption for tankless WHs by the third-party implementer of the Initiative.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-25.**

**Study 18-26: MA Small Business Lighting Updated Impact Results**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Conducted:** 7/22/2019

**Study Objective and Summary of Results:**

The objective of this memo is to correct errors identified as part of the PY2016 Massachusetts Commercial & Industrial Small Business Initiative: Phase I study as previously filed.

The error was the result of inadvertently excluding the electric kWh heating penalty from the electric kWh impact results and including those impacts in the non-electric MMBTU heating factor. Note that this change did not impact the winter Coincidence Factor or the Winter kW HVAC Interactive Effect as the electric heating penalty was correctly accounted for in the winter kW results.

Secondly, upon performing the expansion analysis, DNV GL also found that the kWh discrepancies were not being allocated correctly. While not impacting the overall kWh savings estimate, the discrepancy analysis misallocated the overall divergence from 100% realization rate into five discrepancy categories (documentation, technology, quantity, operational, and HVAC interactive adjustments). These updates were also made at this time.

Updates to the relevant impact factors from the original report are presented in Table 1 and Table 2. In the tables below, values in bold have changed from the report version, and should replace those from Tables 1-2 and 1-3 in the original report. As expected, the overall energy kWh realization rate reduced slightly due to the correct application of the electric heating penalty to the energy realization rate. Table 1 also shows the correct distribution of savings among the five discrepancy categories described above.

**Table 3. Examination of statewide energy realization rates for SB lighting measures**

Savings Parameter	Energy - LED	
	kWh	% Gross
Gross savings (Tracking)	103,763,075.57	
<b>Documentation Adjustment</b>	<b>(451,648.90)</b>	<b>-0.44%</b>
<b>Technology Adjustment</b>	<b>(1,191,988.25)</b>	<b>-1.15%</b>
<b>Quantity Adjustment</b>	<b>(6,371,417.86)</b>	<b>-6.14%</b>
<b>Operational Adjustment</b>	<b>(391,988.85)</b>	<b>-0.38%</b>
<b>HVAC Interactive Adjustment</b>	<b>1,578,709.22</b>	<b>1.52%</b>
<b>Adjusted Gross savings</b>	<b>96,934,740.94</b>	<b>93.42%</b>
<b>Gross Realization Rate</b>	<b>93.42%</b>	



<b>Relative Precision</b>	<b>6.23%</b>
<b>Confidence Interval</b>	<b>90.00%</b>
<b>Error Ratio</b>	<b>29.83%</b>

**Table 2. Statewide factors for SB lighting measures**

Savings Parameter	Overall	
	Value	Precision at 80% Confidence
<b>Installation Rate (Quantity Adjustment)</b>	<b>98.7%</b>	<b>±1.1%</b>
<b>Delta Watts (Technology Adjustment)</b>	<b>99.3%</b>	<b>±0.7%</b>
<b>Connected kW Realization Rate</b>	<b>96.7%</b>	<b>±2.5%</b>
Summer kW Realization Rate	90.6%	±2.5%
Winter kW Realization Rate	102.8%	±11.8%
Summer Coincidence Factor	57.0%	±14.1%
Winter Coincidence Factor	57.9%	±8.3%
Summer kW HVAC Interactive Effect	108.4%	±1.7%
Winter kW HVAC Interactive Effect	99.4%	±0.8%
<b>kWh Factors (Precisions at 90% confidence)</b>		
<b>kWh HVAC Interactive Effect</b>	<b>101.7%</b>	<b>±0.6%</b>
<b>Hours of Use Realization Rate</b>	<b>99.6%</b>	<b>±6.2%</b>
% On Peak kWh	71.2%	±10.2%
<b>Non-Electric</b>		
<b>Heating HVAC Interaction Effect (MMBtu/kWh)</b>	<b>-0.00090</b>	

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- Lighting
- Electric Only

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

The memo and corrected factors have the effect of reducing the energy realization rate from what was produced as part of the PY2016 Massachusetts Commercial & Industrial Small Business Initiative: Phase I study. In addition, the corrections also have the effect of decreasing the non-electric heating penalty originally produced as part of that study.

**Overview of Study Method:**

A reallocation of impacts between non-electric impacts and electric impacts was performed to produce correct values for the non-electric heating penalty and associated energy factor impacts as described above.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-26.**

## **Study 18-27: Massachusetts Statewide Residential and Commercial 2018 Awareness Survey**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** Illume Advising

**Date Evaluation Conducted:** 5/8/2018

### **Study Objective and Summary of Results:**

This study was conducted among residential and commercial and industrial (C&I) customers. This study set out to answer:

- Has customer awareness of Mass Save changed over time?
- What, if any, are the awareness differences across key segments of interest, including low-income and Spanish-speaking customers?
- How familiar are customers with the Mass Save brand?
- Are customers aware of the link between their utility or energy efficiency service provider and Mass Save?
- Was the messaging of the 2017 Mass Save campaign clear to customers?
- How aware are customers of the new Mass Save website?
- What feedback do customers have regarding the new website? Are customers satisfied with the new website?
- How influential is the Mass Save marketing campaign on participation in PA energy efficiency programs?

The study provides the following key findings:

- **Brand awareness continues to increase:** Residential and C&I customer awareness and familiarity of the Mass Save brand continues to increase. Low-income and Latino customer awareness of Mass Save, while lower than the general population, increased at a higher rate than the general population from 2016 to 2017.
- **Website awareness and use is high, indicating high engagement with the website:** most customers were aware of the MassSave.com website, and many visited the website since its redesign in June 2017. Overall, customers gave similar ratings of website usefulness and likeliness to recommend the site, whether they had visited the site before or after the redesign.
- **Customers recall a variety of outreach initiatives and consider messaging clear:** most customers recall seeing Mass Save outreach and noted those messages were clear. Recall of outreach for residential customers and a deeper knowledge of Mass Save for C&I customers led to increased perception that Mass Save can help save money on energy bills.
- **Knowledge of brand sponsorship:** half of both residential and C&I customers perceive that PAs sponsor Mass Save. The proportion of residential customers reporting state

government sponsors the brand continues on an upward trend. C&I customers who have participated in efficiency programs are more likely to mention PAs sponsor Mass Save, while residential customers rating they are familiar with the brand are more likely to mention state government sponsors Mass Save.

- **The more aware of Mass Save customers are, the more likely they are to participate in programs:** Residential and C&I customers aware of Mass Save were more likely to be aware of energy saving programs, and residential customers familiar with Mass Save were more likely to participate in these programs.

**Core Initiatives to which the Results of the Study Apply:**

- All Initiatives (Electric & Gas)

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Study results help to inform media buys for the next year's statewide marketing efforts.

**Overview of Study Method:**

To support the Mass Save campaign, the research team fielded general population surveys of residential and C&I customers using a mixed-mode approach that included both telephone and web-based surveys. The overarching objective of these statewide surveys was to assess customer awareness of the Mass Save brand. The key research questions are summarized in Figure 1 below.

The research team fielded surveys in January and February 2018. In total, 569 residential and 232 C&I customers completed surveys.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-27.**

### **Study 18-28: Residential HVAC Efficient Market Share Estimates**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Completed:** 11/29/2018

#### **Study Objective and Summary of Results:**

The primary objective of this study was to update market share and unit sales estimates included in Table 9 of the *2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing* study (212 HEHE study).

This involved collecting 2017 MA unit sales data for selected commonly installed residential HVAC equipment and information about the relative efficiency level of the systems sold from a sample of HVAC distributors.

The study provides the following key findings:

- The study team obtained useful responses from 10 (34%) of the sample frame of 29 eligible HVAC distributor contacts.
- Respondents reported that their responses were reliable: at least half said their sales estimates were somewhat or very accurate for all technologies.
- Distributors reported that, on average, almost half of the central air conditioners they sold in 2017 were at federal minimum efficiency standards; central air source heat pumps (ASHP) were similar (44%).
- Six in ten mini-split air source heat pumps and natural gas boilers (60% and 61%, respectively) sold in 2017 were eligible for incentives, on average.
- Only two distributors estimated the percentage of the Massachusetts market they believed their sales represented. Extrapolating from these two distributors' responses, the study developed a speculative estimate of the percentage of the market represented by respondents for each equipment type.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Retail: Rebates & Upstream
- Hot Water & HVAC
- Electric & Gas

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

This study will not immediately affect savings. Quantifying HVAC distributor sales in the state can help implementers optimize program design, and lead to better planning and more comprehensive evaluation of existing programs.

**Overview of Study Method:**

The team developed a short web-based survey to gather unit sales data from distributors. The team reached out by email and phone to a sample frame of 29 different distributors to encourage them to respond to the survey. The sample frame of contacts was provided to the team by the program implementers. Thirty-four percent of eligible contacts provided usable sales data, 13% started the survey but gave partial or unusable results, 3% refused, and 48% did not respond. The team offered contacts an incentive of \$250 to participate. As the survey deadline neared, the team offered an additional \$100 to further boost participation.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-28.**

### **Study 18-29: Follow-up Interviews with CCSI Commercial Training Attendees**

**Type of Study:** Process Evaluation  
**Evaluation Conducted by:** NMR Group  
The Cadmus Group  
**Date Evaluation Conducted:** 2/16/2017

#### **Study Objective and Summary of Results:**

The purpose of this study was to assess how well the classroom trainings sponsored by the Code Compliance Support Initiative (CCSI) are meeting the needs of code officials, builders, and other market actors to enable enhanced compliance with the current energy codes. Evaluation activities covering the CCSI trainings include in-depth interviews with commercial trainees examining how much they are using what they have learned in their everyday jobs.

Cadmus, with oversight by NMR, conducted in-depth interviews with 60 commercial classroom training attendees approximately six months after the trainings examining how much the training information they were using in their everyday work. This study covered commercial classroom trainings conducted from February 2015 through April 2016.

The follow-up interviews with commercial training attendees provide the following key findings:

- More than one-half of all respondents—58 percent of municipal building code employees and 50 percent of building professionals—made some changes to their work as a result of the trainings.
- Municipal building code employees paid more attention to certain aspects of a project, such as insulation and air sealing, during inspections, and increased their permit review of recessed lighting, HVAC ratings, and exterior walls predominantly on insulation and envelope areas, ventilation, and builders and contractor education.
- Building professionals said the trainings affected the resources they used and their current practices, which they modified to reflect updated code requirements paying greater attention to detail. Some also noted they had become known as a resource for energy code information by peers and colleagues due to the training
- More than 90 percent of both the municipal code employees and building professionals said they shared information from the training with other parties. Over half (59 percent) of the municipal building code employees shared information with colleagues in their office and other building departments. One-third of the municipal building code employees shared the information with builders and contractors. The majority (81 percent) of the building professionals who shared information from the training also did so with their colleagues. Over half (54 percent) of all respondents said they had shared the training handouts.

#### **Core Initiatives to which the Results of the Study Apply:**

- C&I New Construction: New Buildings & Major Renovations (Electric & Gas)

- Other (specify below) (Electric & Gas)
- Code Compliance Support Initiative

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Not applicable

**Overview of Study Method:**

The follow-up interview report analyzed 60 in-depth interviews conducted by telephone with individuals who had attended commercial classroom trainings approximately six months earlier.

**Application of Results:**

N/A

**A copy of the complete study can be found in Appendix D, Study 18-29.**



**Study 18-30: Analyses of Immediate Code Compliance Support Initiative Residential Training Surveys on 2015 IECC – May 31 through November 21, 2017**

**Type of Study:** Process Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Conducted:** 3/21/2018

**Study Objective and Summary of Results:**

The purpose of this study was to assess how well the classroom trainings sponsored by the Code Compliance Support Initiative (CCSI) are meeting the needs of code officials, builders, and other market actors to enable enhanced compliance with the current energy codes. NMR provided a memo with data from classroom training registration, and immediate paper surveys filled out by training attendees at the conclusion of each classroom training. This study covered residential classroom trainings conducted from May 31, 2017 through November 21, 2017.

The immediate survey response memos provide the following key findings:

- Training attendees continued to provide fairly positive feedback on the trainings in the later part of 2017. The most recent immediate survey respondents provided training usefulness ratings that are about the same as the ratings for all 2015 IECC trainings from August 2016 through November 2017.
- Most training attendees also indicated that they would likely use the information provided within the next three months.

**Core Initiatives to which the Results of the Study Apply:**

- Residential New Construction (Electric & Gas)
- Other (specify below) (Electric & Gas)
- Code Compliance Support Initiative

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Not applicable

**Overview of Study Method:**

The immediate training survey response memos analyzed responses to paper surveys completed by training attendees at the end of each session, feedback provided during the training through an Audience Response System (ARS), and information gathered during the registration process.

**Application of Results: Retrospectively and Prospectively**

**A copy of the complete study can be found in Appendix D, Study 18-30.**

**Study 18-31: Analyses of Immediate Code Compliance Support Initiative Residential Classroom Training Surveys—February 14 through April 19, 2018**

**Type of Study:** Process Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Conducted:** 6/29/2018

**Study Objective and Summary of Results:**

The purpose of this study was to assess how well the classroom trainings sponsored by the Code Compliance Support Initiative (CCSI) are meeting the needs of code officials, builders, and other market actors to enable enhanced compliance with the current energy codes. This study covered residential classroom trainings conducted from February 14, 2018 through April 19, 2018.

NMR provided a memo with data from classroom training registration, and immediate paper surveys filled out by training attendees in 2018 at the conclusion of each classroom training. These were the first surveys to be collected since implementation of the CCSI passed from CLEAResult to Performance Systems Development (PSD). The memo was provided on June 29, 2018.

The residential immediate survey response memo provides the following key findings:

- While respondents provided generally positive feedback on the quality of the residential trainings, the feedback on the presenter's skills was less positive than for previous residential trainings.
- Attendees at the 2018 residential trainings perceived the trainings as less useful than attendees at the 2016 and 2017 residential trainings. It is possible that this may be due in part to the shorter length of the 2018 trainings.

**Core Initiatives to which the Results of the Study Apply:**

- Residential New Construction (Electric & Gas)
- Other (specify below) (Electric & Gas)
- Code Compliance Support Initiative

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Not applicable

**Overview of Study Method:**

The immediate training survey response memo analyzed responses to paper surveys completed by attendees at the end of each residential classroom training session and information gathered during the registration process.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-31.**

**Study 18-32: Analyses of Immediate Code Compliance Support Initiative Commercial Classroom Training Surveys—April 24 through October 1, 2018**

**Type of Study:** Process Evaluation  
**Evaluation Conducted by:** NMR Group  
The Cadmus Group  
**Date Evaluation Conducted:** 1/11/2019

**Study Objective and Summary of Results:**

The purpose of this study was to assess how well the commercial classroom trainings sponsored by the Code Compliance Support Initiative (CCSI) are meeting the needs of code officials, builders, and other market actors to enable enhanced compliance with the current energy codes. This study covered commercial classroom trainings conducted from April 24, 2018 through October 1, 2018.

Cadmus, with oversight by NMR, provided a memo with data from classroom training registration, and immediate paper surveys filled out by training attendees in 2018 at the conclusion of each classroom training. These were the first surveys to be collected since implementation of the CCSI passed from CLEAResult to Performance Systems Development (PSD). The memo was provided on January 11, 2019.

The immediate survey response memo provided the following key findings:

- The commercial training surveys showed an improvement the quality and usefulness ratings of the trainings over the five month period studied. The overall ratings were similar to those from the 2016-2017 period.

**Core Initiatives to which the Results of the Study Apply:**

- C&I New Construction: New Buildings & Major Renovations (Electric & Gas)
- Other (specify below) (Electric & Gas)
- Code Compliance Support Initiative

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Not applicable

**Overview of Study Method:**

The immediate training survey response memos analyzed responses to paper surveys completed by attendees at the end of each classroom training session and information gathered during the registration process.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-32.**

**Study 18-33: Findings of Follow Up Interviews with Massachusetts Code Compliance Support Initiative Residential Training Attendees**

**Type of Study:** Process Evaluation

**Evaluation Conducted by:** NMR Group

**Date Evaluation Conducted:** 1/17/2018

**Study Objective and Summary of Results:**

The purpose of these studies was to assess how well the classroom trainings sponsored by the Code Compliance Support Initiative (CCSI) are meeting the needs of code officials, builders, and other market actors to enable enhanced compliance with the current energy codes. This study covered residential classroom trainings conducted from July 2016 through June 2017.

NMR conducted in-depth interviews with 40 training attendees approximately six months after the trainings examining how much the training information they were using in their everyday work. The report from these interviews was provided on January 17, 2018.

The follow-up interview report provides the following key findings:

- Most residential respondents—85 percent of municipal building code employees and 65 percent of building professionals—made some changes to their work as a result of the trainings, predominantly on insulation and envelope areas, ventilation, and builders and contractor education.
- Almost all residential respondents (93%) had shared some of the information from the trainings with other parties; close to one-half (45%) also shared the handouts and other materials provided at the trainings.

**Core Initiatives to which the Results of the Study Apply:**

- Residential New Construction (Electric & Gas)
- Other (specify below) (Electric & Gas)
- Code Compliance Support Initiative

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Not applicable

**Overview of Study Method:**

The follow-up interview report analyzed in-depth interviews conducted by telephone with individuals who had attended classroom trainings approximately six months earlier.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-33.**



## **Study 18-34: Process Assessment for the Cross-Cutting Code Compliance Support Initiative Evaluation**

**Type of Study:** Process Evaluation  
**Evaluation Conducted by:** NMR Group  
The Cadmus Group  
**Date Evaluation Completed:** 1/11/2019

### **Study Objective and Summary of Results:**

The purpose of this study was to assess how well three different aspects of the Code Compliance Support Initiative (CCSI)—classroom trainings, webinars, and assistance provided through the Mass Save Technical Support line—are meeting the needs of code officials, builders, and other market actors to enable enhanced compliance with the current energy codes. A report covering these areas for the residential and commercial sectors was provided to PAs on January 11, 2019.

The process assessment provides the following key findings:

- The team found all the residential and commercial classroom trainings attended to be informative overall and engaging for participants of all skill and knowledge levels. However, there was little coverage of stretch code provisions.
- As with the classroom trainings, the team found all six webinars attended to be comprehensive and appropriately detailed for their topics and the one-hour timeframe. The webinars effectively applied to a wide variety of occupations and skill levels.
- The presentation slides for the classroom trainings were high quality and useful. However, copies were not provided to the attendees.
- All six classroom trainings reviewed were held in conjunction with building code official gatherings. As a result, almost all attendees worked for municipal building departments. However, the trainings were applicable to a wide range of occupations. Unlike the classroom trainings, most webinar attendees were not code officials. They worked as energy professionals, architects, and builders.
- Since the inception of the CCSI, code officials have been the largest single group asking for code support. Many individuals have contacted Mass Save repeatedly for code support over the years.
- In the past year, there has been a marked improvement in resolution times, with close to three-quarters of requests resolved on the date they are received.

### **Core Initiatives to which the Results of the Study Apply:**

- Residential New Construction (Electric & Gas)
- C&I New Construction: New Buildings & Major Renovations (Electric & Gas)
- Other (specify below) (Electric & Gas)
- Code Compliance Support Initiative

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Not applicable.

**Overview of Study Method:**

The study team attended six classroom trainings and six webinars (three residential and three commercial). The team also reviewed data on all inquiries received through the Mass Save Technical Support line since the beginning of the CCSI in 2014. The trainings and webinars were assessed on their structure and pace, areas covered and comprehensiveness, usefulness, quality of the presentations and the presenters' skills, and handling of the questions posed. The inquiries received by the Mass Save Technical Support line were assessed on who used the service, the types of questions asked, how they were addressed, and how long it took to resolve the issues raised.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-34.**

## **Study 18-35: Solar and Home Energy Services Safety Remediation Non-Energy Impacts Study**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** NMR Group

Three Cubed

**Date Evaluation Conducted:** 3/20/2019

### **Study Objective and Summary of Results:**

The primary objective of the 2018 Solar and Home Energy Services Safety Remediation NEI study was to assist the Massachusetts Sponsors in identifying NEIs associated with the installation of solar photovoltaic (PV) panels, energy-storage batteries, and the remediation of knob and tube (K&T) wiring and asbestos. This study addresses these NEIs together because both are being considered as new offerings in the 2019-2021 program cycle.

The study offers the following key findings:

- The study suggests two NEIs the PAs may wish to consider incorporating into their BCR models associated with energy storage batteries (reliability of medical equipment at \$0.14 per household per year and avoided deaths at \$1.72 per household per year).
- The study suggests two NEIs associated with solar PV panels (low-income rate discounts at the same level the PAs currently claim and cost of equipment maintenance at -\$308.30 per household per year).
- The study prepared algorithms for the PAs to use should they choose to collect data to quantify three additional NEIs associated with knob and tube remediation (avoided fires, electrical shocks, and trips and falls) and one additional NEI associated with asbestos remediation (avoided medical costs).
- The study team found that three NEIs would require significant research in order to be monetized (home durability and thermal comfort associated with solar PV panels, and reduced rodent infestation associated with knob and tube remediation).
- The study team concluded that the most worthwhile research to monetize other NEIs would be a study to estimate the avoided medical costs associated with asbestos remediation.
- Based on the study findings, the PAs may wish to consider incorporating non-program financial support, such as federal and state tax credits, and incentives such as those offered through the Solar Massachusetts Renewable Target (SMART) Program, into their BCR models, as reductions in participants' out-of-pocket (OOP) costs rather than as benefits.

### **Core Initiatives to which the Results of the Study Apply:**

- Residential Home Energy Services (Electric & Gas)
- Low-Income Single Family Retrofit (Electric & Gas)
- Low-Income Multi-Family Retrofit (Electric & Gas)
- Residential Multi-Family Retrofit (Electric & Gas)

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

The application of these values is currently under consideration.

**Overview of Study Method:**

The study team used a literature review and other secondary research to identify non-energy impacts (NEIs) that can be used in regulatory benefit-cost ratio (BCR) models. The study also estimated the cost of future research and potential NEI value to identify the NEIs that would be the best candidates for future monetization. The final memo contains suggested values to be used for filing purposes.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-35.**

### **Study 18-36: C&I NTG MOU Research Results**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** Tetra Tech  
DNV GL

**Date Evaluation Conducted:** 2/15/2019

#### **Study Objective and Summary of Results:**

The primary objective of the Memo of Understanding (MOU) research was to conduct a literature review and compare survey responses of MOU and non-MOU customers to the 2016 free-ridership and spillover study to determine whether changes should be considered to the NTG methodology to account for the impact of the MOU. The research was focused on Eversource account managers, customers, and data.

The study provides the following key findings:

- MOUs influence custom adoption of stretch savings goals by program participation.
- MOU customers stated they would not have been able to undertake all of the projects without the assistance they received from the MOU.
- Free-ridership rates were lower among MOU respondents. The current survey algorithm does include the potential to lower free-ridership rates due to past program participation.
- It is unclear if respondents were considering the MOU during survey responses or just their general interactions with the programs.

#### **Core Initiatives to which the Results of the Study Apply:**

- C&I New Construction: New Buildings & Major Renovations (Electric & Gas)
- C&I New Construction: Initial Purchase & End of Useful Life (Electric & Gas)
- C&I Retrofit: Existing Building (Electric & Gas)
- C&I Retrofit: Small Business (Electric & Gas)
- C&I Retrofit: C&I Multi-Family (Electric & Gas)

#### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** Flag MOU customers in participation data.

**Recommendation 2:** Include the main MOU contact name and contact details with the participation data.

**Recommendation 3:** For MOU customers, modify survey questions to specifically reference the MOU when asking about the program assistance they may have received.

**Recommendation 4:** For MOU customers, add survey questions regarding the respondent's personal involvement with the MOU.

**Recommendation 5:** For MOU customers, add a survey question regarding the influence of the MOU in their decision to implement the project.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

**How the Study Affects Program Results and Its Significance:**

This study will not immediately affect savings. Additional questions will be added to future net-to-gross studies and results will be analyzed across all program administrators.

**Overview of Study Method:**

The MOU research focused on Eversource customers because Eversource was the only PA that had MOU customers included in the C&I Net to Gross evaluation (TXC49) survey. The methodology used for this study was to perform in-depth interviews with two Eversource account executives and two Eversource customers who have existing MOUs in place. These interviews were supplemented with a literature review and analysis of data from the TXC49 C&I net-to-gross survey.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-36.**

### **Study 18-37: 2016 Residential Customer Profile Stakeholder Summary**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 7/1/2019

#### **Study Objective and Summary of Results:**

The objectives of the Residential Customer Profile Stakeholder Summary are:

- To analyze PAs' 2013-2016 billing and tracking data with third-party data to explore evolving trends and their implications in the residential energy efficiency landscape.
- Concisely convey the most critical data elements of the 2016 data analysis, identified by the Massachusetts Program Administrators (PAs) and Energy Efficiency Advisory Council (EEAC) Consultants in a format accessible to a wide (including non-technical audience).<sup>13</sup>

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential & Income-Eligible
- All Program Paths
- All End Uses
- Electric & Gas

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

In its integration of diverse data sources, the Residential Customer Profile has the potential to show the PAs not only where they can focus their efforts, but what building characteristics and socioeconomic factors exist in each area of potential focus.

#### **Overview of Study Method:**

The RCPS uses the PAs' 2013-2016 billing and tracking data after it has been through the extract, transform, and load (ETL) process. The PA data provided includes:

- Detailed energy efficiency tracking data – including upstream, behavioral, and HES Lead Vendor Data – pertaining to the customers, projects, equipment, and vendors associated with the energy efficiency measures.

<sup>13</sup> Full reporting of 2016 Residential Customer Profile results are included in the 2013-2017 Residential Customer Profile Study; a 2017 Stakeholder Summary will follow submission of the 2013-2017 Residential Customer Profile Study Comprehensive Report.

- Monthly billing data including customer's contact, rate, and location information for each billed period.

The result is the population of all billed customers and energy efficiency program participants for the time series. This data is integrated with third party information including the American Community Survey block groups, the MA Emergency 911 database, and the MA Level 3 Tax Assessors data for the most recently available year for each town in MA.

Although the RCPS is presented as a static report, DNV GL continues to refine, update, and load additional data into the MA Evaluation Database as new material becomes available; each year's RCPS presents a snapshot of the current database. As PAs identify new attributes that yield better insight into the data, DNV GL incorporates them into the MA Evaluation Database and retrospectively applies them to the time-series data.

Data is then analyzed at the appropriate level for the different analysis metrics in the report. Results are presented in charts, tables, and maps ranging from classical descriptive statistical summaries though more complex analyses including geographic weighted regressions.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-37.**



### **Study 18-38: 2017 Residential Customer Profile Study**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 7/1/2019

#### **Study Objective and Summary of Results:**

The principal research objectives of the RCPS core report are to:

- Report on the location-level (within year, and over time) aggregated savings and participation rates, by PA, fuel, and geography
- Present a snapshot of Massachusetts Residential energy efficiency landscape by analyzing 2013-2017 customer usage, savings, incentive, and program participation data using charts, tables, and geographic outputs; particularly presenting detailed views of the 2016 and 2017 data not yet included in prior publications (i.e., the 2013-2015 RCPS report or the 2016 RCP stakeholder summary).
- Provide key observations ahead of the RCPS comprehensive report and 2017 stakeholder summary. The 2017 stakeholder summary conveys the most critical data elements identified by the PAs and EEAC Consultants in a graphical format to serve a wide (including non-technical) stakeholder audience.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential & Income-Eligible
- All Program Paths
- All End Uses
- Electric & Gas

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

#### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

#### **How the Study Affects Program Results and Its Significance:**

The 2017 RCPS analyzes and reports on the Massachusetts Program Administrators' (PAs') energy efficiency program tracking and residential customer consumption data to offer diverse views of participation, savings, and geographic dynamics within the PAs' residential customer population. The RCPS assesses the energy efficiency program tracking and billed usage data for residential gas and electric customers, and identifies and summarizes salient trends in participation and savings. The PAs can use the results of this study to inform program design all across the Residential portfolio. In its integration of diverse data sources, the Residential Customer Profile has the potential to show the PAs not only where they can focus their efforts, but what building characteristics and socioeconomic factors exist in each area of potential focus.

### **Overview of Study Method:**

The RCPS uses the PAs' 2013-2017 billing and tracking data after it has been through the extract, transform, and load (ETL) process. The PA data provided includes:

- Detailed energy efficiency tracking data – including upstream, behavioral, and HES Lead Vendor Data – pertaining to the customers, projects, equipment, and vendors associated with the energy efficiency measures.
- Monthly billing data including customer's contact, rate, and location information for each billed period.

The result is the population of all billed customers and energy efficiency program participants for the time series. This data is integrated with third party information including the American Community Survey block groups, the MA Emergency 911 database, and the MA Level 3 Tax Assessors data for the most recently available year for each town in MA.

Although the RCPS is presented as a static report, DNV GL continues to refine, update, and load additional data into the MA Evaluation Database as new material becomes available; each year's RCPS presents a snapshot of the current database. As PAs identify new attributes that yield better insight into the data, DNV GL incorporates them into the MA Evaluation Database and retrospectively applies them to the time-series data.

Data is then analyzed at the appropriate level for the different analysis metrics in the report. Results are presented in charts, tables, and maps ranging from classical descriptive statistical summaries though more complex analyses including geographic weighted regressions.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-38.**

### **Study 18-39: 2016 C&I Customer Profile Project Deep Dive Report - Advanced Lighting**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 8/21/2017

#### **Study Objective and Summary of Results:**

The purpose of this Deep Dive was to provide an in-depth view of the commercial and industrial (C&I) lighting market from 2011-2015. DNV GL developed this Deep Dive report as an expansion of the annual C&I Customer Profile Study (CCPS).

The study provides the following key findings:

- While non-upstream lighting savings have been relatively steady since 2013, upstream lighting savings have been increasing at a faster rate, causing upstream to play a larger role in total lighting savings each year. The overall savings mix between upstream and non-upstream savings was steady between 2014 and 2015.
- Since 2012, the upstream lighting pathway has generated more projects than the non-upstream pathway, which is generally driven by prescriptive lighting. Although the upstream lighting program has been increasing in total lighting projects and savings since its inception, this does not appear to have negatively impacted the performance of the non-upstream lighting program.
- Linear and Other LED (not screw-based) and Screw-Based Lamps represent the two largest lighting broad categories. Other/Custom is a large source of savings for non-upstream installations. The projects associated with these savings are often more complex than the projects in other categories.
- Prescriptive gross savings have remained relatively constant over the past 5 years, illustrating the overall increase in lighting savings primarily caused by increases in custom and upstream lighting savings.
- Incentives for non-upstream classes (retrofit and new construction) increased sharply between the periods 2012 and 2013. While not isolated to any particular lighting end use categories, the largest increase was in the “Linear and Other Fluorescent (not screw-based)” category specifically focused on HPT8s and low-watt T8s.

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- All Program Paths
- Lighting
- Electric Only

#### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

In interpreting these key findings, the reader should be mindful of the time lag between the analysis years (2011-2015) and the time this report was finalized. Findings that were true in 2015 or earlier within fast-moving markets, such as lighting, may not have the necessary longevity to be applied prospectively.

**Overview of Study Method:**

All data contained in this report is subject to the methodology contained in the 2015 CCPS.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-39.**

## **Study 18-40: 2016 C&I Customer Profile Project Deep Dive Report - Exploration of HVAC Trends**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 2/9/2018

### **Study Objective and Summary of Results:**

The primary objectives of the HVAC Deep Dive were to:

1. Explore the finer details of commercial and industrial (C&I) HVAC (2011 to 2016 installations), which had been steadily decreasing in gross energy savings (kWh and therms) and share of savings from 2013-2015.
2. Understand the composition of HVAC gross energy savings in terms of measures, customers, and savings year over year.

The study provides the following key findings:

- HVAC trends in historic participation, savings, and incentives are driven primarily by results from the largest PAs in the electric and gas markets.
- Across the electric and gas PAs, the Health Care and Social Assistance, Educational Services, and Manufacturing industry sectors play important roles each year.
- For the electric PAs, it appears that HVAC savings are becoming costlier to achieve (in terms of \$/kWh saved); this trend is less apparent for the gas PAs, although 2016 could point toward a similar pattern emerging.
- While the gas analysis was able to identify where decreases in HVAC participation and savings are occurring across the PAs, industry sectors and end uses, it did not yield answers as to why this trend is occurring.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- All Program Paths
- HVAC
- Electric & Gas

### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

### **How the Study Affects Program Results and Its Significance:**

From 2012 to 2014, while the annual incentives paid in HVAC programs increased substantially, savings did not show a corresponding increase. This indicates that it was relatively costly to the PAs to achieve HVAC savings from 2012 to 2014. Both Eversource and National Grid show a trend of decreased proportional savings from custom projects over time, which could indicate that it is becoming more difficult and costlier to engage customers in these high-impact custom opportunities. The availability of upstream options could also be attracting customers not previously reached by other offerings. Eversource has consistently generated a higher percentage of savings from custom projects than other PAs, which may indicate that its recruitment strategies for customers needing custom solutions have a larger impact and could be emulated by the other PAs.

### **Overview of Study Method:**

The methodology used throughout this Deep Dive stems from the 2016 Comprehensive C&I Customer Profile Study (CCPS).

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-40.**

## **Study 18-41: 2017 Commercial and Industrial Customer Profile Study Report**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 4/18/2019

### **Study Objective and Summary of Results:**

The overall goals of the 2017 Commercial & Industrial Customer Profile Study (CCPS) are to analyze, summarize, and report on the energy efficiency program tracking data and billed usage data for all C&I gas and electric customers served by the PAs. This project identifies historical trends, their potential drivers, and their future implications for PA customer populations. The project also identifies possible areas of further research to inform the future direction of the PAs' programs.

The study provides the following key findings:

1. Electric participation and savings rates decreased for the second year in a row.
2. While savings from non-lighting end uses increased in 2017, upstream and non-upstream lighting savings decreased, contributing to an overall decline in electric savings.
3. The decline in savings from screw-based LEDs more than offset annual savings increases from linear LEDs in all delivery pathways, resulting in an overall decline in lighting savings.
4. The upstream pathway was effective for providing commodity-style HVAC measures, such as unitary systems.
5. The 2017 gas participation rates are the highest since 2013.
6. Custom projects continue to provide substantial electric and gas savings and play a critical role in meeting PAs' savings goals.
7. Control measures increased savings for electric and gas projects in 2017, which may indicate growing market adoption.
8. Small and medium-sized electric accounts have demonstrated improved performance metrics since 2013 through increased depth of savings and increased participation.
9. Small gas accounts have realized increased depth of savings, while the performance metrics for medium-sized gas accounts have remained steady.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- All Program Paths
- All End Uses
- Electric & Gas

### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** Add a location-level analysis grain to future CCPS reports.

**Recommendation 2:** Leverage the combination of location-level analyses, energy use, and American Community Survey block group data to identify and quantify opportunities for strategic electrification and fuel switching.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

**How the Study Affects Program Results and Its Significance:**

The analysis and reporting of the statewide data allow the following:

- Accurately quantify and report on trends and time series evolution in the Massachusetts C&I landscape;
- Develop narratives about these trends and their implications for a variety of stakeholder interests; and
- Help formulate testable hypotheses for future process, market, and impact assessment studies.

The CCPS report also allows the PAs to evaluate how their standardized data compares to other PAs' standardized data and compares to the state as a whole while always maintaining PAs' customer and IT system confidentiality.

**Overview of Study Method:**

DNV GL updated the results from the 2016 CCPS using 2017 data provided by the PAs. DNV GL tabulated year-over-year totals by program, program type, delivery track, end use, measure type, industry segment, and geography. When possible, DNV GL also included breakdowns of these tables for each PA. Analysis of the tracking data by geography was conducted at the town level. The CCPS generated summary-level analyses using six years (2012-2017) of PA billing and tracking data along with third-party tax assessor data.

The high-level list of analysis topics is:

- Tables and charts from previous CCPS reports, focusing on the PA-level participation, average savings, participant-weighted savings, and average participant savings;
- Detailed PA summary tables and the by-PA breakdown tables of participation and savings from the 2017 CCPS report;
- Time-series analyses including 2017 data and removing 2011 data;
- Identification of key findings, impacts of large projects, and any other notable items found in the analysis this year;
- Geographic information system (GIS) analysis to reflect 2017 data as town-level maps, and as an opportunity to see dual-fuel, MMBtu totals; and
- New analyses.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-41.**



## **Study 18-42: Enhanced Customer-Level Database Capabilities**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 2/7/2019

### **Study Objective and Summary of Results:**

The purpose of this study was to identify and acquire third-party data to support ongoing EM&V efforts and develop the iterative logic model that uses geographic and string-search algorithms to perform increasingly accurate levels of matching between datasets.

### **The Study Provides the Following Key Findings:**

This study developed a series of logic models that integrated third-party datasets with the PAs' C&I and Residential customer information systems, to help PAs and evaluation contractors better understand the customer population. Integrating third-party data helped develop additional analysis grains including location, tax parcel, and cross-fuel customers. It also provided a large, documented, and standardized set of new variables that evaluation projects could incorporate into data mining and analytical undertakings.

We identified the following 9 overarching benefits, most of them realized in the 2017 follow-on projects:

- Improve normalization of customer-level energy consumption
- Improve service and program offerings to multi-site customers
- Provide cross-referencing for customer matching while preserving customer confidentiality
- Leverage economies of scale by linking customers, integrating data and classifying customer attributes at a single point in the process
- Provide all PAs with a standardized set of firm-o-graphic attributes
- Enable prospect modeling capability for non-participating customers leveraging cross-PA participation data
- Identify opportunities for deeper measure-level penetration using participation information from other PA territories
- Enhance survey and site visit value for campus locations
- Facilitate two-way flow of data between DNV GL and PA teams

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial & Residential
- All Program Paths
- All End Uses
- Electric & Gas

**Evaluation Recommendations:**

No formal recommendations were made as a part of this evaluation study.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

This study illustrated that when and where appropriate, third-party datasets can be integrated with PA data to yield additional insights. The study built core logic models to allow this integration to happen quickly in the future as needed. It also identified the sorts of questions that various data types could help the PAs answer as they look to inform program design and/or strategy in the coming years.

**Overview of Study Method:**

Prior to the data integration, DNV GL conducted a series of in-depth interviews with PA staff to better understand key data needs and overarching benefits the PAs hoped to achieve via the database enhancement effort. As part of the data integration, the project identified and acquired third-party data to support ongoing EM&V efforts. It also developed the iterative logic model that uses geographic and string-search algorithms to perform increasingly accurate levels of matching between datasets.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-42.**

### **Study 18-43: Cape Light Compact 2018 Smart A/C Savings Program Evaluation**

**Type of Study:** Pilot Evaluation and Demonstration Projects

**Evaluation Conducted by:** Navigant Consulting

**Date Evaluation Completed:** 1/28/2019

#### **Study Objective and Summary of Results:**

The purpose of this study was to further test the scalability of Cape Light Compact's Smart A/C demand response program, including for mini-split systems (harnessing Sensibo devices).

The study provides the following key findings:

- Sensibo devices cannot capture all manual setpoint and device mode changes made by participants or the mini-split runtime. Therefore, if there is a desire to continue to leverage Sensibo devices for DR, end-use or whole-home interval meters should be installed to facilitate evaluation of event behavior as well as demand impacts.
- Sensibo devices and the Honeywell thermostats exhibited unexpected temperature setpoint profiles during events (i.e., systematic fluctuations). This suggests further testing of the integration of these device types with the DR software platform used is needed.
- In addition to incentives, program participants were motivated to enroll in the program to reduce environmental impacts. Further emphasize environmental benefits in future marketing efforts.
- BYOT participants cited remote control of their home's temperature as the primary driver for getting a Wi-Fi thermostat. Two of eight BYOT survey respondents received a Mass Save incentive toward their thermostat purchase. In future marketing efforts, continue to market Mass Save rebates and emphasize the benefits of remote control (e.g., convenience, potential for savings).
- Sensibo and BYOT devices in auto and dry modes were treated the same by the program as devices in off or heat modes—they were not engaged for DR events. Investigate opportunities to engage these devices for events if there is a potential for demand savings.
- Program literature stated that setpoints would be increased by 3°F -4°F during events. The median indoor temperature change for full participants across events and devices types was 2°F -3°F, but changes in indoor temperature did reach as much as 7°F. Ensure all setpoint adjustments do not exceed what is stated in program literature.
- Refresh interim savings estimate with forthcoming 2018 Residential Baseline Load Shape Study and 2018 National Grid DR savings estimates. Consider a small interval meter study to capture demand savings from devices where runtime is not available (Sensibos).

#### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- Electric Only

### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

### **How the Study Affects Program Results and Its Significance:**

The Smart A/C Savings program aims to reduce peak demand of residential customers with central air conditioners (ACs) and mini-split heat pumps by allowing CLC to control the thermostat setpoint during periods of peak demand. The 2018 demand response (DR) season confirmed the program was successful both in testing the effectiveness of thermostats as a residential DR technology and in customer acceptance of the program offering.

### **Overview of Study Method:**

Navigant conducted the following activities as part of the evaluation of CLC's 2018 DR program:

- **Participation assessment:** For all enrolled devices, the evaluation team analyzed device telemetry data to assess opt-out rates during events throughout the DR season, providing insight into customers' general thermostat usage behavior, customer acceptance of the DR solution, and the ability to successfully leverage Sensibo devices for DR. In addition, this participation assessment provided insight into Wi-Fi connectivity issues, informing the scalability of the program.
- **Customer surveys:** In 2018, the team conducted a web-based post-event survey and a post-season survey to solicit feedback regarding customer motivations for program participation, event awareness and comfort level, customer acceptance of the technology and program offering, actions taken during the event, and customer satisfaction.
- **Interim impact estimate:** Navigant informed an interim 2018 demand savings estimate for enrolled mini-splits and central ACs by leveraging the 2017 Residential Baseline Load Shape Study and previously completed Wi-Fi thermostat DR evaluations in Massachusetts.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-43.**

## **Study 18-44: 2018 Crosscutting Demand Demonstration Project Evaluation Report**

**Type of Study:** Impact Evaluation and Process Evaluation

**Evaluation Conducted by:** Energy and Resource Solutions (ERS)

**Date Evaluation Completed:** 3/1/2019

### **Study Objective and Summary of Results:**

This study is evaluating a medium and large commercial/industrial customer demand management demonstration project. In the demonstration, Eversource has contracted with seven vendors to test performance and market acceptance of different solutions. The vendors are using a variety of technologies, controlling for different objectives (e.g. called events versus daily load management), and using different recruitment and financial strategies to enroll customers. The evaluation spans two years, covering the performance of the demonstration project in summers of 2018 and 2019 and subsequent winters through December 2019.

The evaluation scope includes both impact—measuring how much load reduction each vendor delivers—and learning more about customer satisfaction, scalability, market barriers, and value.

This document is an interim report, written to provide fast feedback after the first season of enrollment and events. The final report will be completed after December 2019.

The 2018 interim evaluation found that:

- The evaluated demand reduction at system peak hour (August 29, 2018, hour ending at 5 p.m.) was 8,669 kW.
- The batteries and manual curtailment solutions reduced load as expected and reported. The thermal storage solutions' performance was as reported for one vendor and unclear for the second. Controls-based solutions will be evaluated next year.
- Manual curtailment (whereby the vendor simply notifies the participant of an upcoming event time and date and leaves it to the participant to implement changes) has much more performance variability than other solutions but also greater participation (75% of early enrollees) and a greater contribution to demand reduction (97% of total project load reduction using one metric).
- Participating customers generally are very satisfied.
- The market still needs education regarding the concept of peak demand generally and on demand response options in particular.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Existing Building Retrofits
- Active Demand Reductions
- Electric Only

### **Evaluation Recommendations:**

No formal recommendations were made in this evaluation. This is an interim report. It includes six program and three evaluation-oriented provisional recommendations. The final report will include formal recommendations. Provisional recommendations include:

1. Clarify the role of Eversource account executives in recruitment
2. Streamline the interconnection approval process
3. Use a centralized dispatch platform to call DR events
4. Optimize battery recharge schedules
5. Optimize thermal storage discharge schedules
6. Explore optimal relationship between ISO-NE and Eversource DR offerings
7. Require site-specific DR strategies and affected equipment specifications to be provided by the vendors
8. Standardize vendor committed and reported site load reduction.
9. Involve evaluators during DR feasibility testing to minimize customer touch points

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation). The recommendations are preliminary based on year 1 findings and will be formalized at the end of year 2.

### **How the Study Affects Program Results and Its Significance:**

The interim quantitative findings are not intended for application. Eversource and its vendors are enhancing marketing collaboration through account representatives, considering dispatch changes, and refining data delivery protocols in the second year, and are incorporating qualitative findings from the evaluation as they do so.

### **Overview of Study Method:**

For controls-based solutions, impact evaluation was based on analysis of premise-level interval data. Battery impact evaluation used interval data of the battery systems. For thermal storage-based solutions evaluation was based on data collected by HVAC and refrigeration equipment loggers and engineering calculations. Impact was calculated against settlement baselines (e.g. ISO-NE adjusted “10-of-10”), regression baselines, and/or pre/post engineering baselines, depending on vendor goals.

Process-oriented data collection was based on telephone-based expert interviews with Eversource and vendor staff and a combination of in-person, phone, and online surveying of participants.

All 24 participants that enrolled prior to the summer of 2018 season were attempted to be evaluated for impact and invited to participate in the process evaluation survey.

**Application of Results:** This is an interim research report. The quantitative results should not be applied retrospectively or prospectively.

**A copy of the complete study can be found in Appendix D, Study 18-44.**

## **Study 18-45: 2018 Residential Wi-Fi Thermostat Demand Response Evaluation**

**Type of Study:** Pilot Evaluation and Demonstration Projects

**Evaluation Conducted by:** Navigant Consulting

**Date Evaluation Completed:** 3/28/2019

### **Study Objective and Summary of Results:**

The purpose of this study was to test the effectiveness of thermostats as a residential demand reduction (DR) technology and in customer acceptance of the program offering. This study confirmed the technical feasibility of using thermostats to reduce household peak demands; however, it has not looked at whether that control will be cost-effective for the electric system, program administrators, and/or customers. In 2018, there were 7 event days where the average high temperature was above 90°F compared to 0 event days in the 2017 DR season. The hotter weather conditions in 2018 provided an opportunity to test program performance in warmer weather compared to prior years.

The study provides the following key findings:

- Overall thermostat connectivity issues are lower in 2018 (1%) compared to 2017 (6%).
- The full participation rate increased in 2018 to 66%, partially attributable to a lower rate of connectivity issues and more customers in cooling mode at the start of the event.
- Opt-out rates varied by event but averaged 18% throughout the season.
- The average opt-out rate was higher in 2018 compared to 2017, when it averaged 12%. The removal of the participation requirement and a hotter summer were contributing factors.
- Average savings per event in 2018 were 0.71 kW per thermostat, higher than the 2017 (0.51) and 2016 (0.38) DR seasons due to the higher temperatures during the 2018 event.
- Average total savings per event were 4,941 kW. The maximum event savings in 2018 were 6,208 kW.
- Total demand impacts were 5,343 kW during the 2018 ISO-NE annual peak hour on August 29, 2018.
- Enrollment in the ConnectedSolutions program increased to 7,087 thermostats by September 30, 2018, up from 4,719 thermostats at the same time in 2017.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- New Buildings & Major Renovations
- HVAC
- Electric Only

## **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** For 2018, National Grid should claim an average demand savings of 0.71 kW per thermostat enrolled in ConnectedSolutions in Massachusetts

**Recommendation 2:** Remove thermostats that persistently opt-out (i.e., consider implementing auto-unenroll functionality)

**Recommendation 3:** Proactively monitor connectivity issues; remove thermostats with persistent connectivity issues; consider implementing an auto-unenroll functionality

## **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

## **How the Study Affects Program Results and Its Significance:**

The study found average demand reductions of 0.71 kW per thermostat in Massachusetts. This represents an increase of the savings estimated for 2017 (0.51 kW) and 2016 (0.38 kW). In percentage terms, average savings per thermostat decreased due to an increase in the baseline kilowatt per thermostat resulting from hotter weather in 2018.

Firm Load Dispatch (FLD) which dispatches thermostats over time, flattening the demand reduction for a longer duration, was implemented for four events in 2018. The study found average impacts were higher for FLD events. National Grid will continue to employ FLD in future program years.

Findings from the thermostat usage assessment suggested differences in participation rates across thermostats. National Grid will continue to work with the implementation contractor to test new thermostat manufacturers.

## **Overview of Study Method:**

The study relied on several methods:

1. A thermostat usage assessment was performed using thermostat telemetry data and event participation data to analyze thermostat participation status on event days for customers assigned to an experimental group that was called for an event. To analyze the thermostat telemetry data, all enrolled devices were first categorized by event into one of five participation status categories: full participant, opt out, system off/heat, failed, and no connectivity. Observations were made for each event and trends across the DR season.
2. A regression-based modeling approach was used to estimate demand impacts and energy savings over the event period. Customers assigned to an experimental group called for an event were compared to the control group (or the experimental group that was not called for the event).



Because advanced metering infrastructure data was unavailable, the study relied exclusively on thermostat telemetry data to estimate impacts after converting thermostat runtime to power. The thermostat runtime to power conversion was based on an analysis of metering data from Phase 2 of the 2017 Massachusetts Baseline Study (n=92) and assumptions regarding average size (3.0 tons) and efficiency (10.7 Energy Efficiency Ratio) of air conditioners based on a field study (n=52) of DR program participants conducted in October 2017.

The study modeled both the average treatment effect, in which impacts are modeled for thermostats in the following categories – full participant, opt-out, and system off/heat. The treatment effect of the treated, in which impacts are modeled for only thermostats in the full participant category.

**Application of Results:** Retrospectively

**A copy of the complete study can be found in Appendix D, Study 18-45.**

## **Study 18-46: Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions**

**Type of Study:** Pilot Evaluation and Demonstration Projects

**Evaluation Conducted by:** DNV GL

**Date Evaluation Completed:** 4/29/2019

### **Study Objective and Summary of Results:**

The purpose of this study was to test the effectiveness of the Connected Solutions Demonstration as a C&I demand reduction (DR) offering and to assess customer acceptance of the demonstration. This study confirmed the viability of using the Connected Solutions approach to reduce C&I peak demands; although it did not consider the cost effectiveness of the solution for the electric system, program administrators, and/or customers. In 2018, there were 6 event days called, including an event that fell in the ICAP hour.

The study provides the following key findings:

- The Demonstration is ready to become a full-scale offering, pending vetting of final changes that are recommended in this study.
- There were substantial interval data storage issues in the 2018 effort that prevented a full data-driven settlement process and validation.
- Using the hybrid baseline, the Demonstration exceeded its goal of 50 MW by achieving 51.3 MW of load reduction from participants with sufficient data. This level of achieved curtailment was 30% less than the enrolled reduction estimates.
- The use of a hybrid baseline creates an upward bias in the curtailed load estimate. This is further evidenced by the ex post regression analysis, which provides impacts that are 17% lower than the hybrid baseline.
- There is potential for interaction between the Demonstration and the ISO NE market that do not appear to have occurred in the 2018 season but can complicate operations in future seasons.
- National Grid successfully managed several substantial changes between the 2017 and 2018 offerings and maintained or increased participant satisfaction with the Demonstration overall and many of its sub-elements during this transition.
- Despite improvements in recruitment, there are some signals that lead generation might be a concern moving forward, particularly if the program moves back into the mainstream C&I population (i.e., customers that are not existing ISO NE participants).
- There continues to be a need for a formal mechanism for National Grid to receive sales information from the CSPs and better confirm enrollments for CSPs.
- The 2017 enrollees that were contacted in this study were largely satisfied with the incentives received for their curtailment during the 2017 summer season (4 on a 5-point scale).

- The 2018 Demonstration included an increased incentive for participants in two towns (Bellingham and Tewksbury) to geotarget DR activity. CSPs largely reported that there was not much time to market that area, it was difficult to implement and the coordination between National Grid and AutoGrid was not fully developed.
- There is evidence that in 2018 the use of multiple CSPs was successful. The three CSPs that were engaged in the Demonstration targeted different size (average load) and curtailment levels among the customers enrolled in the program. There is also evidence that the three CSPs tended to enroll different business types.

### **Core Initiatives or End Uses to which the Results of the Study Apply:**

- Commercial & Industrial
- Active Demand Reductions
- Electric Only

### **Evaluation Recommendations:**

The following recommendations were made by the evaluators conducting this study.

**Recommendation 1:** We recommend developing a reliable data warehouse for customer interval data and confirm its gathering of data as part of normal program management checks. For the sake of redundancy, consider making it a requirement that CSPs maintain a full set of customer interval data for a set period after each season. Customers in the ISO NE markets are expected to already have this system in place.

**Recommendation 2:** We recommend National Grid develop Demonstration requirements that minimize the potential negative implications of program overlap with ISO NE activity. Allow customers to obtain ISO NE capacity supply obligations only if active energy market activity is foregone and Demonstration event days are reported as unavailable back to ISO NE.

**Recommendation 3:** We recommend that National Grid use a regression model approach to estimate impacts for annual reporting needs. The regression approach uses all data across the summer to set the most appropriate baseline that would have happened absent the curtailment.

**Recommendation 4:** We recommend the Connected Solutions C&I Program be evaluated as part of the National Grid portfolio. This should occur within two years of its operation as a program. This can include an early examination of whether the final changes made as a result of this study are working as intended, assess settled values against enrolled estimates, perform ex-post regressions as needed to support annual claimed savings estimates, and ensure program satisfaction and operation are satisfactory.

### **Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

The PAs are considering all recommendations for adoption at this time. The PAs have not formally adopted or rejected any recommendations that require changes to program design and operations.

### **How the Study Affects Program Results and Its Significance:**

The study determined that National Grid exceeded the goal of 50 MW by achieving 51.3 MW of load reduction from participants with sufficient data. However, the enrolled load reductions of 77.MW were higher than the achieved load reductions. National Grid was able to increase participating from 99 enrollees with 20.6 MW in enrolled capacity to 276 participants with 77.7 MW in enrolled capacity in 2018.

### **Overview of Study Method:**

The study relied on several methods:

1. A verification of the settled DR values was performed using interval data from National Grid. This process was driven by reproducing customer load curtailment based on hybrid baseline. That baseline is the larger curtailment amount estimated by an unadjusted or additive-adjusted rolling 10-of-10 baseline with a practical maximum load reduction equal to the maximum load during the 10 baseline pool days.
2. A regression-based modeling approach was used to estimate demand impacts and for each event period using data from the full summer. This regression-based estimate of load reduction provided a comprehensive view of load curtailment across the summer for each customer and the Demonstration in aggregate and is referred to in the report as an ex post estimate. DNV GL used a regression specification that includes schedule and weather independent variables.
3. Interviews were performed with a National Grid Program Manager, DR Management System Vendor and three CSPs. These interviews largely focused on program design, marketing, delivery, performance, experience with the demonstration and effectiveness of demonstration changes between the 2017 and 2018 seasons.
4. The study also included surveys with two groups of participating customers: 1) thirteen customers we had interviewed for the 2017 evaluation; and 2) participants who joined the program in 2018. These surveys focused on many of the same items as the interviews discussed in the previous bullet in addition the impact of curtailment, interactions between the demonstration and ISO NE markets, and acceptance of the DR solution.

**Application of Results:** Retrospectively and Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-46.**

### **Study 18-47: Cost-Effectiveness of Electric Demand Response for Residential End-Uses**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** Navigant Consulting

**Date Evaluation Completed:** 4/18/2019

#### **Study Objective and Summary of Results:**

To inform the direction of National Grid’s residential demand response (DR) offerings, Navigant researched benefits and costs of demand reduction for DR-enabled appliances. For thirteen residential end uses, each paired with different enabling devices and DR strategies, this study provides estimates of:

- 1) Potential savings per unit during summer peak period;<sup>14</sup>
- 2) Current and forecasted market saturation data;
- 3) Approximate incremental costs for summer DR;
- 4) Benefit-cost ratio.

Accordingly, this report is intended to document the relative potential and cost-effectiveness of various residential DR programs, providing National Grid a basis for selecting a subset of these programs to pursue in the years ahead.

The three end uses with the highest benefit-cost ratios are summarized below.

- **Central Air Conditioners:** Using the 2018 evaluated impact results for National Grid’s ongoing residential Wi-Fi thermostat DR program, central air conditioners have the highest per-unit impact for an appliance (0.71 kW), excluding battery storage. DR for central air conditioners proves to be cost-effective, with a BCR of 2.9. Program potential is estimated to be 8.2 MW in 2019 and 23.0 MW by 2028 due to the increasing penetration of Wi-Fi thermostats.
- **Battery Storage:** Assuming a “Bring-Your-Own” battery program, residential battery storage systems, both for customers with and without solar, are associated with high benefits to costs because system and installation costs are borne by the customer. With a per-unit impact of 4 kW, Navigant estimates a BCR of 4.7 for both systems when combined with solar. Systems with no solar are somewhat less cost-effective (with a BCR of 1.6) due to the inability of residential battery systems to export to the grid in Massachusetts. Projected peak reduction in 2028 is dependent on market adoption in Massachusetts over the next ten years. Based on current market adoption forecasts, Navigant estimates that peak reduction associated with a DR program for residential batteries to be 32 MW for customers with solar and 5.0 MW for customers without solar by 2028.
- **Pool Pumps:** Pool pumps are found to have the second greatest per-unit impact for an appliance (0.61 kW). As a result, DR will likely be cost-effective for programs featuring smart pool pumps (i.e., pool pumps with Wi-Fi built-in) and simple mechanical switches.

<sup>14</sup> For the purposes of this study, National Grid has defined summer peak periods as non-holiday weekdays from 2 p.m. to 5 p.m. from June 1 through September 30.

Additionally, the BCR for the Wi-Fi switch option was estimated to be 1. One advantage of DR for pool pumps is that it is assumed to be less of an inconvenience to participants – in contrast to some other end-uses – and, therefore, the rate of opt-out is assumed to be low. However, the low penetration of pool pumps in MA shows that the MW benefit 10 years out remains modest at 5.4 MW for built-in and 2.6 MW for smart or simple switch programs. This lower benefit may not be able to support the upfront cost IS/IT, administration, and marketing cost to set up a pool pump program. These upfront costs are not included in the BCR estimates.

**Core Initiatives or End Uses to which the Results of the Study Apply:**

- Residential
- All Program Paths
- Active Demand Reductions
- Electric Only

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)

**How the Study Affects Program Results and Its Significance:**

Due to this study focusing on planning, there are no current impacts on any programs. National Grid will use these results to help plan for future potential program offerings.

**Overview of Study Method:**

The study consists of two phases:

- **Phase 1:** Research of DR-enabled appliances  
In Phase 1, which occurred from August 2017 to October 2017, Navigant conducted a literature review and analysis of MA Residential Baseline Study (MA Baseline Study) survey data (from 2017) related to appliance saturation to collect information on potential impacts and costs of DR for the end uses considered in the study.
- **Phase 2:** Load Shape Development and Analysis  
To estimate potential impacts of DR by end use type, Navigant constructed average daily load shapes for each end use type using end-use metering data from the MA Baseline Study for the 2017 and 2018 summer periods. This phase allowed for refinement of the potential savings per end use, and incorporation of avoided costs from the 2018 Avoided Energy Supply Cost (AESC) Study to measure cost-effectiveness of each of the options considered in this study.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-47.**

## **Study 18-48: Low-Income Multifamily Health and Safety Non-Energy Impacts Study: Phase 1 Findings**

**Type of Study:** Impact Evaluation

**Evaluation Conducted by:** NMR Group

Three Cubed

**Date Evaluation Conducted:** 7/15/2019

### **Study Objective and Summary of Results:**

The overall objective of this two-phase study is to evaluate the health- and safety-related NEIs attributable to improvements in the energy efficiency of income-eligible multifamily buildings sponsored by the MA PAs. The study complements previous MA research that estimated NEIs attributable to weatherizing low-income single-family (LISF) homes. The research is being conducted in conjunction with a larger, national evaluation. It is funded in part by The JPB Foundation and is slated for completion in 2020 (Phase 2).

The objective of Phase 1 of this study was to develop health and safety-related NEI estimates for low-income multifamily (LIMF) households to complement the LISF health and safety NEI estimates developed previously. Thus far the study has yielded a qualitative assessment of the core NEIs examined in the first phase of this study. Phase 2 will quantify the NEIs prioritized in this qualitative assessment. In addition, Phase 2 will involve incorporating pre- and post-weatherization data into the analysis of the core NEIs previously monetized by the LISF study and/or the national evaluations of the U.S. Department of Energy's (DOE) Weatherization Assistance Program (WAP), as well as developing estimates of potential new NEIs.

Thus far, Phase 1 offers the following key findings:

- The study team developed preliminary NEI estimates for all 13 core NEIs that were previously monetized by the MA PA's 2016 LISF study, the 2014 national evaluations of the U.S. DOE's Weatherization Assistance Program, or both. The study team also developed a new NEI for reductions in arthritis symptoms. Because of difficulties achieving the expected response rate and some demographic differences among the study groups, and thus generalizing to the population of interest, it is not appropriate to report and apply NEI values based on Phase 1 data alone.
- The study differentiates between (1) NEIs for which the study team found statistically significant impacts of weatherization while attempting to control for confounding factors, such as age or employment status, with a regression analysis, and (2) NEIs for which the team found evidence without attempting to control for confounding factors. The study notes that for both (1) and (2) the findings could be due to differences in study groups rather than to weatherization impacts.
- The study resulted in the following qualitative assessment of each of the core NEIs examined in Phase 1:

- Thermal stress – cold: Initial evidence of NEI from linear regression analysis
  - Thermal stress – hot: Initial evidence from resident survey analysis
  - Asthma: Initial evidence of NEI from linear regression analysis
  - Missed days of work: Initial evidence from resident survey analysis
  - Reduced fire risk: Evidence from secondary data analysis
  - Home productivity: Initial evidence from resident survey analysis
  - Short-term loans: Initial evidence from resident survey analysis
  - Low-birth-weight infants: Initial evidence from resident survey analysis
  - Food assistance: Initial evidence from resident survey analysis
  - Trips and falls (inside): No evidence from resident survey analysis
  - CO poisoning: No evidence of CO monitor installation (MA only)
  - Prescription medicine: Initial evidence from resident survey analysis
  - Work productivity: Initial evidence from resident survey analysis
  - Arthritis: Initial evidence from resident survey analysis
- In addition, the study found some initial, preliminary evidence of the following NEIs that will be explored further in Phase 2:
    - Spoiled food
    - Noise pollution
    - Residential instability
    - COPD
    - CVD
    - Diabetes
    - Headaches
    - Dental health
  - The Phase 1 results suggest that many NEIs associated with health and safety impacts may have improved post-weatherization. The results also suggest that draftiness, dustiness, rodent infestation, intrusion of outdoor noise, and presence of mold may have been reduced due to weatherization. Overall, these results offer tentative, initial support for the hypotheses that (1) improving the EE of LIMF buildings results in positive NEIs and (2) both NEIs and NEI values are different for residents of MF housing than for residents of SF homes.

**Core Initiatives to which the Results of the Study Apply:**

- Low-Income Multi-Family Retrofit (Electric & Gas)

**Evaluation Recommendations:**

No formal recommendations were made in this evaluation.

**Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:**

N/A (no formal recommendations were made in this evaluation)



### **How the Study Affects Program Results and Its Significance:**

This study will not immediately affect the benefits reported for the PAs' LIMF program until the Phase 2 results expected in spring 2020 are produced.

### **Overview of Study Method:**

NMR Group, Inc. and Three3 (the study team) followed a classic quasi-experimental research design. The sample consists of existing MF buildings with five or more units in MA and in other cold-climate states in the Northeast and Midwest. Each of these buildings fell into one of three research groups: Comparison with Treatment (CwT) (i.e., already weatherized buildings); Treatment (T) (i.e., buildings that had not yet been weatherized but will be); and Control (C) (i.e., buildings that would not be weatherized during the data collection period). To be eligible for this study, CwT and T buildings needed to have installed, or be scheduled to install, a comprehensive set of weatherization measures (i.e., air sealing, insulation, and/or heating/cooling equipment).

The primary data collection instrument, a Resident Survey (RS), asked households a series of questions about health, well-being, affordability, dwelling quality, and household characteristics. In-field staff equipped with digital data collection tools distributed survey packets in the buildings, interviewed building managers, and documented building characteristics and systems conditions that can provide insights into NEIs. The team also solicited participating agencies to provide documentation on weatherization measures installed in the CwT and T groups.

The research efforts, which are still underway, are yielding three sets of data: (1) RS results, (2) building characteristics and conditions observed on site by in-field staff, and (3) weatherization measures installed in participating CwT and T buildings. The installed measures data inform NEI estimates and allow the team to correlate specific NEIs with specific measures or combinations of measures installed.

The team distributed the RS to MA residents between January 2018 and June 2018 as part of the first phase (Phase I) of the study. Phase I survey distribution continued in other states through November 15, 2018. In Summer/Fall of 2019, approximately one-year after the Phase I survey period, the team will commence Phase II. This will involve re-contacting T and C group respondents and asking them to complete a follow-up RS. By this time the T group will have been weatherized, providing the opportunity to compare survey findings both pre- and post-weatherization from the same household (matched pairs analysis) to estimate changes in health attributable to weatherization for many NEIs. For other NEIs the study team will use a cross-sectional approach, comparing changes between the T and C groups in health and household-related outcomes affected by weatherization while trying to control for potentially confounding differences between groups.

**Application of Results:** Prospectively

**A copy of the complete study can be found in Appendix D, Study 18-48.**

**APPENDIX D  
EVALUATION STUDIES**

Please see Statewide Appendix D filed under separate cover.

**APPENDIX E**  
**SUMMARY OF EVALUATION STUDY RECOMMENDATIONS**

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
1-266	<i>See 2013-2015 Energy Efficiency Term Report, D.P.U. 16-120 through D.P.U. 16-130</i>														
267	Lighting Interactive Effects Study Results Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-1	Electric	The evaluation team recommends using the findings from the analysis to accurately account for the HVAC impacts from residential lighting retrofits found in the Upstream Lighting initiative and also recommended applying the results to the Low Income Single Family, Low Income Multi-Family, and Residential New Construction (Low Rise) core initiatives.	Statewide	Yes, the PAs plan to adopt the recommendations.							
268	Lighting Interactive Effects Study Results Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-1	Electric	The recommended application of interactive effects is shown in Table 2 based upon review of current program savings estimates across the residential portfolio.	Statewide	Yes, the PAs plan to adopt the recommendations.							
269	2015-16 Lighting Market Assessment Consumer Survey and On-site Saturation Study	Residential	2016 Plan Year Report	App. 4D, Study 16-2	Electric	The PAs should continue with existing plans to educate consumers about and provide incentives for LED bulbs through the current 2016-2018 program cycle. In addition, the PAs should carefully assess the need for continued support in the next program cycle (2018 – 2021), as opportunities may continue to exist. The results of forthcoming evaluation studies to be completed in 2016 and 2017 will provide additional insights to assist in this recommendation.	Statewide	Yes							
270	2015-16 Lighting Market Assessment Consumer Survey and On-site Saturation Study	Residential	2016 Plan Year Report	App. 4D, Study 16-2	Electric	The PAs should continue with plans to phase out support for standard CFLs in a controlled manner, including removing all CFLs incentives in the 2017 program year.	Statewide	Yes							
271	2015-16 Lighting Market Assessment Consumer Survey and On-site Saturation Study	Residential	2016 Plan Year Report	App. 4D, Study 16-2	Electric	The PAs should continue their efforts through the upstream program in hard-to-reach (HTR) stores and through their low-income direct-install programs, to help low-income, renter, and other HTR groups to transition to LEDs. It will be important for the PAs to monitor the success of these efforts over the next year to ensure that these demographic groups successfully transition from CFLs to LEDs and don't backslide to less efficient bulb types.	Statewide	Yes							
272	Residential Lighting Hours-of-Use Update Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-3	Electric	Estimated HOU for CFLs should be revised downward (by about 3%) for any retrospective or prospective CFL savings calculations.	Statewide	Yes							
273	Residential Lighting Hours-of-Use Update Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-3	Electric	Estimated HOU for LEDs should be revised upward (by about 3%) for any retrospective and prospective LED savings calculations.	Statewide	Yes							
274	Residential Lighting Hours-of-Use Update Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-3	Electric	The evaluation team does not recommend any changes for direct-install lighting programs. For these programs, the PAs should continue to use the all-bulb HOU estimates provided in the HOU report. For the household level, this estimate is 2.7 (see Table ES-1 in the HOU report). However, whenever possible the PAs should track installed bulbs by room type and apply the room-specific HOU estimates also found in Table ES-1.	Statewide	Yes							
275	Lighting Market Adoption Model/Interim Reflector Model	Residential	2016 Plan Year Report	App. 4D, Study 16-4	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
276	Quarterly Lighting Market Scan I & II	Residential	2016 Plan Year Report	App. 4D, Study 16-5	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
277	Massachusetts Supplier Interviews – Interim Findings Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-6	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
278	Lighting Decision Making Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-7	Electric	Continue program support for efficient lighting.	Statewide	Yes							
279	Lighting Decision Making Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-7	Electric	Do not focus messaging on particular socioeconomic groups.	Statewide	No, need to promote income-based offers.							
280	Lighting Decision Making Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-7	Electric	Pursue marketing messages outside of the retail environment.	Statewide	Yes							
281	Lighting Decision Making Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-7	Electric	Pursue ways to change shelf-stocking practices of grocery and discount stores.	Statewide	Yes							
282	Sales and Shipment Data Analysis Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-8	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
283	Lighting Shelf Stocking Survey	Residential	2016 Plan Year Report	App. 4D, Study 16-9	Electric	The PAs should continue to support retail lighting with a broad range of retail partners. There is clear evidence from this study that the program continues to influence the Massachusetts lighting market in favor of efficient lamps, and that the program encourages higher quality products at a lower cost in a variety of store channels.	Statewide	Yes							
284	2016-2017 Lighting Market Assessment Consumer Surveys and On-Site Saturation Study	Residential	2016 Plan Year Report	App. 4D, Study 16-10	Electric	The PAs should continue with existing plans to educate consumers about and provide incentives for LED bulbs through the current 2016-2018 program cycle. In addition, the PAs should continue to carefully assess the need for continued support in the next program cycle (2019 – 2021), as opportunities may continue to exist, especially among any EISA-exempt bulbs.	Statewide	Yes							
285	Market Progress Assessment Memo	Residential	2016 Plan Year Report	App. 4D, Study 16-11	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
286	Multifamily Market Movement Assessment	Residential	2016 Plan Year Report	App. 4D, Study 16-12	Electric	Given that free ridership has been calculated under two entirely separate methods, it is our recommendation that the PAs continue to assume a free ridership level of 18%.	Statewide	Yes							
287	2013 National Grid Multifamily Program Gas and Electric Impact Study	Residential	2016 Plan Year Report	App. 4D, Study 16-13	Electric/Gas	Regularly enter the physical location of installed lighting, which would allow optimal use of the regional HOU study to inform the hours of use estimates in the tracking system	Statewide	Yes							
288	2013 National Grid Multifamily Program Gas and Electric Impact Study	Residential	2016 Plan Year Report	App. 4D, Study 16-13	Electric/Gas	Given the difficulty in observing lighting savings due to its low savings signature, consider other evaluation methods in subsequent studies of this program when predominate savings is from lighting	Statewide	Will Consider for Future Studies							
289	2013 National Grid Multifamily Program Gas and Electric Impact Study	Residential	2016 Plan Year Report	App. 4D, Study 16-13	Electric/Gas	Consider performing a small sample of inspections to ensure accurate tracking of measure locations, quantities and pre-existing conditions (when possible), along with verification of account to facility mapping	Statewide	Yes							
290	Multifamily Program Improvement Strategies: Preliminary Results – Summary of Task 2b and 3 Findings	Residential	2016 Plan Year Report	App. 4D, Study 16-14	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
291	Ductless Mini-Split Heat Pump Impact Evaluation	Residential	2016 Plan Year Report	App. 4D, Study 16-15	Electric	Explore ways to improve the PAs' existing lost opportunity program for DMSHPs, such as how best to encourage the installation of multiple DMSHP heads to better match existing zones and displace primary system operation.	Statewide	Yes							
292	Ductless Mini-Split Heat Pump Impact Evaluation	Residential	2016 Plan Year Report	App. 4D, Study 16-15	Electric	Explore methods for targeting homes with electric resistance heating for DMSHP retrofits since DMSHPs will nearly be always less expensive to operate than electric resistance heat.	Statewide	Yes							
293	Ductless Mini-Split Heat Pump Impact Evaluation	Residential	2016 Plan Year Report	App. 4D, Study 16-15	Electric	Target propane-heated homes for DMSHPs since DMSHPs always operate less expensively than propane heating systems.	Statewide	Yes							
294	Ductless Mini-Split Heat Pump Impact Evaluation	Residential	2016 Plan Year Report	App. 4D, Study 16-15	Electric	Explore methods for addressing oil-heated homes, which would include educating homeowners to turn off a DMSHP during very cold outdoor conditions, when an oil-fired system would operate less expensively (depending on energy prices).	Statewide	Yes							
295	Ductless Mini-Split Heat Pump Impact Evaluation	Residential	2016 Plan Year Report	App. 4D, Study 16-15	Electric	Based on large energy-usage differences in DMSHP-cooled homes and central air conditioner-cooled homes, examine opportunities for a new construction measure to substitute DMSHPs for central air conditioners.	Statewide	Yes							
296	2015-16 Massachusetts Single-Family Code Compliance/Baseline Study: Volume 3	Residential	2016 Plan Year Report	App. 4D, Study 16-16	Electric/Gas	The PAs should focus CCSI training efforts on air and duct leakage requirements. These measures are mandatory requirements and show the largest opportunity for savings from compliance enhancement efforts.	Statewide	Yes							
297	2015-16 Massachusetts Single-Family Code Compliance/Baseline Study: Volume 3	Residential	2016 Plan Year Report	App. 4D, Study 16-16	Electric/Gas	The program should inform HERS raters that the manufacturer R-value ratings for bubble wrap duct insulation are overstated to ensure that they treat bubble wrap the same way when entering the information into REM/Rate.	Statewide	No, we abide by HERS Standards							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
298	2015-16 Massachusetts Single-Family Code Compliance/Baseline Study: Volume 3	Residential	2016 Plan Year Report	App. 4D, Study 16-16	Electric/Gas	Going forward, the program will be incorporating water-saving UDRH inputs and will be calculating Domestic Hot Water (DHW) energy consumption more precisely. Future baseline on-site inspections should include collecting data on the longest length of DHW piping (from water heater to fixture), level of DHW pipe insulation, hot water fixture flow rates, and presence of hot water drain recovery devices. Installing these items in rated homes will provide savings to the program.	Statewide	Yes							
299	Massachusetts Multifamily High Rise Baseline Study-FINAL REPORT	Residential	2016 Plan Year Report	App. 4D, Study 16-17	Electric/Gas	The PAs should use the new UDRH inputs that were agreed to as part of this study to calculate program savings.	Statewide	Yes							
300	Massachusetts Multifamily High Rise Baseline Study-FINAL REPORT	Residential	2016 Plan Year Report	App. 4D, Study 16-17	Electric/Gas	The PAs should conduct a process evaluation for the MFHR program to gain a better understanding of the MFHR market.	Statewide	Will Consider for Future Studies							
301	Heat Pump Water Heaters Impact Study: Volume 1	Residential	2016 Plan Year Report	App. 4D, Study 16-18	Electric	Update deemed savings value to assess retrospective program savings (1652 kWh/year with average fossil fuel penalties of 0.50 MMBtu/yr oil, 0.10 MMBtu/yr natural gas, and 0.07 MMBtu/yr propane).	Statewide	Yes							
302	Heat Pump Water Heaters Impact Study: Volume 1	Residential	2016 Plan Year Report	App. 4D, Study 16-18	Electric	Once the HPWH metering data from Residential Baseline study becomes available, determine whether to proceed with the re-scope and execution of Task 4 - Engineering Analysis of the HPWH impact study, which is intended to develop improved and forward-looking energy savings and demand savings values.	Statewide	Will Consider for Future Studies							
303	Heat Pump Water Heaters Impact Study: Volume 1	Residential	2016 Plan Year Report	App. 4D, Study 16-18	Electric	Track the water heater industry transition to uniform energy factor (UEF) metric.	Statewide	Yes							
304	Heat Pump Water Heaters Impact Study: Volume 1	Residential	2016 Plan Year Report	App. 4D, Study 16-18	Electric	Given the savings and high level of satisfaction expressed by customers, continue to support and encourage the adoption of HPWH technology.	Statewide	Yes, the PAs plan to adopt the recommendation.							
305	Heating/Cooling Contractor Interview Findings	Residential	2016 Plan Year Report	App. 4D, Study 16-19	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
306	HEHE Condensing Equipment Barriers	Residential	2016 Plan Year Report	App. 4D, Study 16-20	Gas	Consider promoting moderate outdoor reset control improvements across all high-efficiency installations.	Statewide	Yes							
307	HEHE Condensing Equipment Barriers	Residential	2016 Plan Year Report	App. 4D, Study 16-20	Gas	Consider working with regional partners to research and potentially promote smarter supply temperature modulation technologies.	Statewide	Yes							
308	HEHE Condensing Equipment Barriers	Residential	2016 Plan Year Report	App. 4D, Study 16-20	Gas	Consider a study to assess savings potential for simultaneous envelope and control improvements.	Statewide	Yes							
309	Massachusetts C&I Market Characterization On-Site Assessments and Market Share and Sales Trends Study	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-21	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
310	2015 Comprehensive Commercial and Industrial Customer Profile Report	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-22	Electric/Gas	Where possible, capture the account number as a data field in the upstream lighting and HVAC data.	Statewide	Yes							
311	Massachusetts Commercial/Industrial Baseline Framework	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-23	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
312	Massachusetts Commercial and Industrial Impact Evaluation of 2013 Custom Process Installations	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-24	Electric	The realization results from this study should be used by the PAs to calculate the adjusted gross savings achieved by program year 2016 projects in this impact category. The results should also be applied to future program years until new realization rates are published. The sample was designed to provide realization rates for National Grid, Eversource-NSTAR Only, Eversource-WMECO Only, Eversource-All, and statewide. 1. The National Grid specific results should be used by National Grid since they exceed the design criteria for precision. Electric energy savings realization rate (kWh RR) of 66.8%. Summer on-peak demand savings realization rate (SkW RR) of 65.0% and winter on-peak demand savings realization rate (WkW RR) of 74.3%. 2. The Eversource-WMECO stratum did not achieve its design criteria for precision on energy savings. Eversource should therefore either apply the Eversource-All results to its entire portfolio (kWh RR of 60.7%, SkW RR of 62.0%, WkW RR of 59.7%), or use the Eversource-NSTAR result (kWh RR of 92.7%, SkW RR of 101.0%, WkW RR of 73.0%) for the NSTAR territory and the statewide result (kWh RR of 63.2%, SkW RR of 62.3%, WkW RR of 65.4%) for the WMECO territory. 3. All other PAs should use the statewide realization rates (kWh RR of 63.2%, SkW RR of 62.3%, WkW RR of 65.4%).	Statewide	Yes							
313	Massachusetts Commercial and Industrial Impact Evaluation of 2013 Custom Process Installations	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-24	Electric	Future commercial and industrial custom measure impact evaluations should include an initial task in each evaluation that reviews and reports what actual project documentation was provided. The results of this review should be provided to the PAs and PAs should be given the opportunity to locate and provide additional files.	Statewide	Yes							
314	Massachusetts Commercial and Industrial Impact Evaluation of 2013 Custom Process Installations	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-24	Electric	Future commercial and industrial custom measure impact evaluations should include language in the Stage 3 work plan that clearly defines the PAs' tasks and associated time frame for each task.	Statewide	Yes							
315	Massachusetts Commercial and Industrial Impact Evaluation of 2013 Custom Process Installations	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-24	Electric	Future commercial and industrial custom measure impact evaluations should include language in the Stage 3 work plan that clearly defines an agreed standard schedule for each site-specific M&V study.	Statewide	Yes							
316	Gas Boiler Market Characterization Study Phase II - Final Report	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-25	Gas	Raise the baseline assumption from 80% to 85% efficiency for boiler less than 2,000 MBH in size.	Statewide	Yes							
317	Gas Boiler Market Characterization Study Phase II - Final Report	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-25	Gas	Offered a tiered rebate structure for all program-eligible models.	Statewide	No, existing program delivery is currently under consideration which affects incentives. Recommendation may be considered at a later time.							
318	Gas Boiler Market Characterization Study Phase II - Final Report	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-25	Gas	Continue with the planned contractor education effort.	Statewide	Yes							
319	Recalculation of Prescriptive Program Gas Boiler Savings Using New Baseline (Memo)	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-26	Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
320	Prescriptive Commercial & Industrial Programmable Thermostat Evaluation	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-27	Gas	Continue to offer this measure at the current deemed value of 32 therms per thermostat.	Statewide	Yes							
321	Prescriptive Commercial & Industrial Programmable Thermostat Evaluation	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-27	Gas	Shift resources towards smart web-enable thermostat or mini-EMS systems, both for energy efficiency and electrical demand response	Statewide	Currently Under Consideration							
322	Steam Trap Evaluation Phase 2	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-28	Gas	The PAs should use the revised custom savings equation and tool for projects installed in 2017 and moving forward.	Statewide	Yes							
323	Steam Trap Evaluation Phase 2	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-28	Gas	The PAs should update the deemed savings value for prescriptive trap replacements from 25.7 to 12.2 MMBtu/year and should apply it both retrospectively to 2016 prescriptive projects and prospectively for 2017 and going forward.	Statewide	Yes							
324	Assessment of the Drivers of Net-to-Gross	Commercial & Industrial	2016 Plan Year Report	App. 4D, Study 16-29	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
325	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Do not continue to pursue boiler sales data from the manufacturers and manufacturers' representatives panel.	Statewide	Yes							
326	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Leverage the panel to inform program design.	Statewide	Yes							
327	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Learn from the national perspective on programs that panelists provide.	Statewide	Yes, ongoing							
328	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Use the panel to support market effects evaluation as described in the report.	Statewide	Yes, ongoing							
329	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	If PAs decide to maintain and continue collecting data from the panel, adjust data collection methods, questions, timing, and approaches to engage the panel as described in the report.	Statewide	Yes							
330	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Consider asking panelists for anecdotal evidence of differential sales of qualifying equipment in Massachusetts directly, without requesting sales data.	Statewide	Yes							
331	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Consider measuring and tracking the percentage of model lineups that meet program criteria and track changes over time as a way to help identify market effects.	Statewide	Investigated and decided not to go forward because the indicator wasn't as helpful as expected							
332	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	The Upstream HVAC/Heat Pump process evaluation should assess partners' and preferred manufacturers' perceptions of the administrative burden posed by the program.	Statewide	Yes							
333	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Be careful not to overburden partners in the C&U Upstream HVAC/Heat Pump program with data requests, and consider whether the current honorarium to help defray the costs of preparing the data is sufficient.	Statewide	N/A: we are no longer asking partners for sales data							
334	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Reconsider the threshold at which to purchase HARDI data from D&R.	Statewide	Yes							
335	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Consider exploring the feasibility and likely impact of offering training in proper specification and installation for various types of HVAC equipment.	Statewide	Yes							
336	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	If PAs have not already done so, investigate how, if at all, Mass Save could leverage wireless interfaces for gas boilers as a program opportunity.	Statewide	No, upstream doesn't have boilers in the program yet.							
337	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Consider examining the rate of PVC-vented boilers in the state, and assess the potential measurability and likely value of non-energy benefits (health and safety) that could potentially be obtained through eliminating PVC venting of boilers.	Statewide	No, upstream doesn't have boilers in the program yet.							
338	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	Continue to work with other organizations to move toward greater standardization of program performance requirements and testing procedures for ductless mini-split heat pumps.	Statewide	Yes							
339	Results of Spring 2016 HVAC Manufacturer Panel Maintenance & Pilot Data Collection by Cross-Cutting Team	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-30	Electric/Gas	If PAs have not already done so, examine supporting RTUs that are very high efficiency at partial load to see if this represents a promising program opportunity.	Statewide	Currently Under Consideration							
340	Top-Down Modeling Extended Methods Review	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-31	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
341	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-32	Electric/Gas	Regarding the trainings, improve the quality of the handouts to better serve as an educational resource and include some modules which incorporate on-site or hands-on work, explore different technologies and project types. The trainings could also be better marketed to industry groups that are currently underrepresented, such as building contractors and equipment suppliers and used as a vehicle to increase communications between code officials and building professionals.	Statewide	Yes							



Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
342	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-32	Electric/Gas	Regarding technical support services, develop energy code implementation resources, specifically checklists for inspections and plan review, and use appropriate media for distributing code-related information to industry professionals. The PAs may also work to better market technical support services and resources offered by Mass Save and reduce response times.	Statewide	Yes							
343	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-32	Electric/Gas	Regarding energy code enforcement, put more emphasis on the information required by building departments to document energy code compliance. The trainings should also highlight the importance of, and best practices related to energy code enforcement with code officials, who may sometimes be prone to rely too much on the design plans submitted.	Statewide	Yes							
344	Cross Cutting Stretch Code Market Effects Study	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-33	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
345	Net-to-Gross Methodology Research	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-34	Electric/Gas	Either consider this final report to be a supplement to the 2011 framework documents or preferably, update the 2011 NTG framework documents to reflect the current range of practices adopted or being explored in Massachusetts for self-report methods.	Statewide	Will Consider for Future Studies							
346	Net-to-Gross Methodology Research	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-34	Electric/Gas	Update question wording surrounding the efficiency portion of the current NTG questions asked of customers and vendors in self-report studies based on the recommendations in the final baseline framework. For true custom measures that do not have a recognizable market and thus need a project-specific baseline, have one contractor team conduct NTG and the baseline work at the same time, on the same sample. Update algorithms used to develop NTG estimates to align with market actor responses to the ISP or "unique" baselines.	Statewide	Will Consider for Future Studies							
347	Cross Cutting Code Compliance Support Initiative Commercial Code Compliance Documentation Assessment	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-35	Electric/Gas	Develop and provide a compliance checklist via the Code Compliance Support Initiative (CSI). The checklist should be relatively simple and linked directly to the code requirements.	Statewide	Yes							
348	Cross Cutting Code Compliance Support Initiative Commercial Code Compliance Documentation Assessment	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-35	Electric/Gas	Provide a back-to-basics training course on energy codes along with current CSI trainings. This training could serve as a practicum involving building plans and/or a building site visit focusing on how to prioritize the plan review and field inspection process to ensure that inspectors review, at a minimum, the features with the greatest impact on building energy use.	Statewide	Yes							
349	Cross Cutting Code Compliance Support Initiative Commercial Code Compliance Documentation Assessment	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-35	Electric/Gas	Ensure that all online resources provided through Mass Save are updated regularly to ensure they can act as a reliable source of up-to-date information.	Statewide	Yes							
350	Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEI) Study	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-36	Electric/Gas	Replace the health- and safety-related NEIs derived from the 2011 NMR study and currently used by the PAs with the study's NEI estimates for thermal stress, reduced asthma, fewer missed days at work, increased home productivity, reduced CO poisoning, and reduced fire.	Statewide	Yes							
351	Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEI) Study	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-36	Electric/Gas	Do not apply the study's NEI for reduced use of short-term predatory loans because it does not likely represent an additional benefit beyond the participant bill savings already claimed by the PAs.	Statewide	Yes							
352	2016 Massachusetts Statewide Marketing Campaign - Post Campaign Report	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-37	Electric/Gas	The study did not offer any recommendations	N/A	N/A							
353	Evaluation Report for Cape Light Compact's 2016 Demand Response Demonstration Offering	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-38	Electric	The study did not offer any recommendations	N/A	N/A							
354	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Reduce the percentage of ineligible customers with a more targeted marketing effort or ensure the program is not over-screening participants.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
355	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Automate screening process where possible (i.e., confirm thermostat connection to central air conditioning (CAC), thermostat connectivity issues, etc.).	PA Specific	Yes	Yes, National Grid periodically checks thermostat connectivity.	N/A	N/A	N/A	N/A	N/A	N/A

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356	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Facilitate more detailed enrollment analytics (count number of completes by field and state for the entire season).	PA Specific	No, see PA specific response.	No, customers enroll in this program through many paths, such as our enrollment website, their thermostat manufacturer's website, through the thermostat manufacturer's app, and/or through prompts on their thermostat. Unfortunately, in depth analytics for some of these pathways is considered sensitive information by the thermostat manufacturers.	N/A	N/A	N/A	N/A	N/A	N/A
357	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Continue to send advance notification.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
358	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Provide customers options to tailor the frequency of event notifications.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
359	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Monitor participation throughout the DR season to identify customers that opt out frequently and conduct customer outreach.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
360	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Consider modifications to program design to reduce extent of opt outs (e.g., participation incentives).	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
361	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Determine which Honeywell models have a larger share of connectivity issues. If the issue is model-specific, consider restricting models eligible for program participation.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
362	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Monitor connectivity throughout the DR season to identify devices with persistent issues and conduct customer outreach.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
363	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Remove thermostats with persistent connectivity issues.	PA Specific	Yes, the PAs plan to adopt the recommendation.	Yes	N/A	N/A	N/A	N/A	N/A	N/A
364	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Continue to test combinations of setback strategies and performance incentive mechanisms in 2017.	PA Specific	Yes, the PAs plan to adopt the recommendation.	Yes	N/A	N/A	N/A	N/A	N/A	N/A
365	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Weigh pre-cooling against adding load during likely high load hours compared to higher sustained savings during the DR event.	PA Specific	Yes, the PAs plan to adopt the recommendation.	Yes	N/A	N/A	N/A	N/A	N/A	N/A
366	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Add a temperature threshold to the event criteria.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
367	2016 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2016 Plan Year Report	App. 4D, Study 16-39	Electric	Continue to monitor the effect of multiple thermostats on savings to determine whether the program should continue to limit the number of thermostats per participating customer.	PA Specific	Yes, the PAs plan to adopt the recommendation.	Yes	N/A	N/A	N/A	N/A	N/A	N/A
368	2015 Single-Family Stretch Code Update Compliance and Potential	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-1	Electric/Gas	The PAs should continue to provide trainings and support for compliance enhancement in stretch code municipalities.	Statewide	Yes							
369	2015 Single-Family Stretch Code Update Compliance and Potential	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-1	Electric/Gas	The PAs should measure compliance with homes that were permitted and built under the 2015 Stretch Code Update.	Statewide	Yes							
370	2017 Massachusetts Single-Family New Construction Mini-Baseline/Compliance Study	Residential	2017 Plan Year Report	Appendix 4D, Study 17-2	Electric/Gas	The CCSI should continue to focus training efforts on air leakage and duct leakage requirements. The 2015-16 baseline study showed that these measures represent some of the largest savings opportunities from compliance enhancement. Given that compliance rates have not increased, the savings associated with these measures are still available.	Statewide	Yes							
371	2017 Massachusetts Single-Family New Construction Mini-Baseline/Compliance Study	Residential	2017 Plan Year Report	Appendix 4D, Study 17-2	Electric/Gas	The program should continue its successful promotion of high-efficiency residential new construction. As new energy codes are adopted, the program should consider adjusting participation requirements in order to maintain a substantial efficiency gap between program and non-program homes.	Statewide	Yes							
372	Lighting Market Scan	Residential	2017 Plan Year Report	Appendix 4D, Study 17-3	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
373	What Is Next for Products – Market Scan	Residential	2017 Plan Year Report	Appendix 4D, Study 17-4	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
374	Lighting Decision Making	Residential	2017 Plan Year Report	Appendix 4D, Study 17-5	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							

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375	Market Adoption Model Findings Memo	Residential	2017 Plan Year Report	Appendix 4D, Study 17-6	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
376	Products Impact Evaluation of In-service and Short-Term Retention Rates Study	Residential	2017 Plan Year Report	Appendix 4D, Study 17-7	Electric	The PAs should use the combined Massachusetts ISR/short term retention rates listed in the table below for the 2017 Annual Report, the 2018 Annual Report, and program planning for 2019 to 2021 for all evaluated products.	Statewide	Yes, the PAs will apply the results for the 2017 Annual Report and the 2018 Annual Report.							
377	2017-18 Residential Lighting Market Assessment	Residential	2017 Plan Year Report	Appendix 4D, Study 17-8	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
378	Web Scraping Results June 2017- November 2017	Residential	2017 Plan Year Report	Appendix 4D, Study 17-9	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
379	Sales Data Analysis and Modeling	Residential	2017 Plan Year Report	Appendix 4D, Study 17-10	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
380	Lighting Supplier Insights; and ENERGY STAR Partners Meeting	Residential	2017 Plan Year Report	Appendix 4D, Study 17-11	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
381	Appliance Recycling Database Review and Savings Update	Residential	2017 Plan Year Report	Appendix 4D, Study 17-12	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
382	Gas Condensing Boilers Losses and Savings Potential	Residential	2017 Plan Year Report	Appendix 4D, Study 17-13	Gas	The research team does not recommend pursuing House Control systems as a smart condensing boiler control measure in Massachusetts at this time	Statewide	Yes							
383	Gas Condensing Boilers Losses and Savings Potential	Residential	2017 Plan Year Report	Appendix 4D, Study 17-13	Gas	The expected small magnitude and high variability of incremental boiler savings from control upgrades at the time of weatherization do not warrant a rigorous verification study; such an effort would be prohibitively expensive.	Statewide	Yes							
384	Gas Condensing Boilers Losses and Savings Potential	Residential	2017 Plan Year Report	Appendix 4D, Study 17-13	Gas	The PAs should not pursue additional research to increase condensing boiler efficiency to unattainable efficiency levels. The PAs may wish to consider low-cost strategies such as providing guidance on best practices for outdoor reset control programming.	Statewide	Yes							
385	Gas Condensing Boilers Losses and Savings Potential	Residential	2017 Plan Year Report	Appendix 4D, Study 17-13	Gas	Navigant does not recommend discontinuing current program offerings for condensing boilers on the basis of this study.	Statewide	Yes							
386	Baseline Load Shape Study Cooling Season Short Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-14	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
387	Baseline Load Shape Study Heating Season Short Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-15	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
388	Ductless Mini-Split Heat Pump Survey	Residential	2017 Plan Year Report	Appendix 4D, Study 17-16	Electric	The Mass Save Residential Heating and Cooling program should adjust the heating effective full load hour (EFLH) value used for calculating savings from DMSHPs to 535 EFLH (from the currently used value of 451 EFLH).	Statewide	Yes							
389	Ductless Mini-Split Heat Pump Survey	Residential	2017 Plan Year Report	Appendix 4D, Study 17-16	Electric	The Mass Save Heating & Cooling program should continue enforcing the program changes enacted in 2016, as these program changes are resulting in higher heating usage of rebated DMSHPs.	Statewide	Yes							
390	Ductless Mini-Split Heat Pump Cost Study	Residential	2017 Plan Year Report	Appendix 4D, Study 17-17	Electric	To motivate the adoption of smaller capacity systems at very high-efficiencies, the PAs should consider adding a premium rebate level at 28 SEER and 14 HSPF.	Statewide	No, PAs want to avoid overly complex rebate structures							
391	Ductless Mini-Split Heat Pump Cost Study	Residential	2017 Plan Year Report	Appendix 4D, Study 17-17	Electric	PAs should consider limiting the rebate eligibility for DMSHP systems to systems that are cold-climate qualified. This limitation may be implemented by requiring cold-climate qualification(s) or by providing specific efficiency requirements at low outdoor temperatures.	Statewide	Yes							
392	Ductless Mini-Split Heat Pump Cost Study	Residential	2017 Plan Year Report	Appendix 4D, Study 17-17	Electric	Since ducted DMSHP systems may comprise an increasing portion of DMSHP rebate claims, the PAs should consider evaluating how equipment and installation costs of ducted systems compare to the non-ducted systems examined in this study.	Statewide	Will Consider for Future Studies							
393	Connected Thermostats and Technology Literature Review	Residential	2017 Plan Year Report	Appendix 4D, Study 17-18	Electric/Gas	Conduct a primary research study of smart thermostat savings in MA to produce rigorous MA-specific savings values.	Statewide	Yes							
394	Connected Thermostats and Technology Literature Review	Residential	2017 Plan Year Report	Appendix 4D, Study 17-18	Electric/Gas	Continue to rely on secondary research estimates of savings from other connected devices in the near-term due to primary research feasibility constraints and relative immaturity of the market.	Statewide	Yes							
395	Connected Thermostats and Technology Literature Review	Residential	2017 Plan Year Report	Appendix 4D, Study 17-18	Electric/Gas	Revisit and update the secondary literature research on other connected devices on a regular basis to keep pace with the rapidly evolving consumer market, and to gauge if and when primary research may become feasible and warranted for key connected devices beyond thermostats.	Statewide	Will Consider for Future Studies							

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396	Moderate Income Market Characterization Survey Findings Final Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-19	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
397	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	Provide energy specialists and HPCs with verbal tools. One way the PAs can help energy specialists and HPCs broach the topic of income is to provide them with specific language to use. Using specific, vetted language repeatedly will increase comfort with the topic. Another option could be bundling the discussion of the HEAT loan and the moderate-income offer, as both relate to financial offers and energy specialists and HPCs have no problem talking with customers about the HEAT loan.	Statewide	Yes							
398	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	Through existing or new working groups, the PAs, EEAC, and any other relevant stakeholders should standardize the type of information collected during inspections and how data are analyzed and shared across stakeholders. The evaluation team recommends the parties agree on the optimal level of QA/QC effort for each HES stage and who (LV, CMC or both) should complete that type of QA/QC. From here, the PAs and EEAC need to determine what data should be collected, analyzed, and reported to various parties for each QA/QC type. The evaluation team recognizes that changing QA/QC processes, data capture, and reporting systems comes with a cost. However, there are also cost inefficiencies under the current system that could be recouped, reallocated more optimally, or improved with additional reporting.	Statewide	No, PAs are working with vendors to standardize data collection and standards							
399	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	Work with CMC and the LVs to prospectively track the costs for conducting QA/QC statewide and by inspection type. The total cost of statewide QA/QC activities completed by both CMC and LVs, is unknown. Understanding the cost of QA/QC is necessary for determining the value and appropriate level of future investment in QA/QC.	Statewide	No, current contract structures don't itemize some of these costs. Understanding costs is not an indicator of valuing QA/QC.							
400	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	Clearly delineate LV and CMC responsibilities to minimize overlap in QA/QC activities. The evaluation team recommends the PAs work with the LVs and CMC to determine where and how to streamline these activities based on the desired outputs for each type of QA/QC.	Statewide	Yes							
401	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	Reconsider the format (and potential necessity) of CMC's Tier 1 inspection process. While the PAs report that Tier 1 inspections provide peace of mind related to the energy specialist or HPC interactions with customers, follow-up activities—including customer satisfaction surveys and Tier 2, Tier 3, final inspections, and even evaluation activities—are likely to identify any customer interaction issues. Additionally, it is unclear how the Tier 1 inspection provides on-the-job training since, as currently structured, CMC does not share their inspection in real time. The PAs and CMC should redesign their Tier 1 inspection to involve more immediate and direct communication.	Statewide	No, Tier 1 inspections are critical for maintaining professional standards and catching safety issues which CMC inspectors do relay in real time.							
402	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	Set up systems to report inspection results that allow the PAs and LVs to more systematically identify specific areas for improvement. Expanding database functionality to report out the individual ratings of all the metrics assessed will enable the PAs and LVs to efficiently analyze and isolate trends and identify where trainings are needed. This additional capability will also more readily allow the PAs to illustrate the value of the QA/QC process to stakeholders.	Statewide	Yes							

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403	Home Energy Services Process Evaluation Comprehensive Report	Residential	2017 Plan Year Report	Appendix 4D, Study 17-20	Electric/Gas	The PAs should examine historical trends in participation and consider the implications on future HES design. As noted above, participation in HES declined in 2016 and 2017 relative to previous years. This may be due, as PA and LV managers suggested, to less extreme weather and more favorable fuels prices demotivating customers to enroll. It could also be, at least in part, due to HES, as a result of its long tenure in the state, reaching a participation saturation threshold. It's possible that the customers that have not participated in HES to date will be motivated to do so for different reasons, whether alternative measures or a different delivery mechanism. An analysis of historical HES trends might results in the identification of other harder-to-reach customers segments (specific cultural groups, geographic portions of the state, or customers living in homes of certain age or type) that may be more responsive to alternative strategies.	Statewide	Yes							
404	Multi-family Program Impact and Net-to-Gross Evaluation	Residential	2017 Plan Year Report	Appendix 4D, Study 17-21	Electric/Gas	To update the 2017 MMRP common area lighting savings, Eversource should replace its currently used space-by-space deemed HOU values with the updated space-by-space deemed HOU results from this study: <ul style="list-style-type: none"> <li>•Interior, Circulation: 8,307 hrs/yr, 23 hrs/day</li> <li>•Interior, Other: 1,115 hrs/yr, 11 hrs/day</li> <li>•Exterior: 689 hrs/yr, 13 hrs/day</li> <li>•Parking Garage: 8,760 hrs/day, 24 hrs/day</li> </ul>	Statewide	Yes							
405	Multi-family Program Impact and Net-to-Gross Evaluation	Residential	2017 Plan Year Report	Appendix 4D, Study 17-21	Electric/Gas	To update the 2017 MMRP common area lighting savings, all PAs other than Eversource should apply the found realization rates of 0.91 for interior lighting and 0.98 for exterior lighting to the common area HOU.	Statewide	Yes							
406	Multi-family Program Impact and Net-to-Gross Evaluation	Residential	2017 Plan Year Report	Appendix 4D, Study 17-21	Electric/Gas	For all future program years (2018 and beyond), all PAs should switch to using the space-by-space deemed HOU values identified in Recommendation 1. When the deemed HOU values are applied they should be accompanied by an HOU realization rate of 1.0.	Statewide	Yes							
407	Multi-family Program Impact and Net-to-Gross Evaluation	Residential	2017 Plan Year Report	Appendix 4D, Study 17-21	Electric/Gas	The PAs should apply the found lighting ISRs (1.0 for common areas and 0.88 for in-unit) retroactively to 2017 program savings and proactively to future program savings and planning.	Statewide	Yes							
408	Multi-family Program Impact and Net-to-Gross Evaluation	Residential	2017 Plan Year Report	Appendix 4D, Study 17-21	Electric/Gas	The PAs should apply the NTG ratio proactively to future program savings and planning. The program-level NTG ratio identified in this study should be applied to gross electric and fuel savings from all measures in the MMRP.	Statewide	Yes							
409	Multi-family Program Impact and Net-to-Gross Evaluation	Residential	2017 Plan Year Report	Appendix 4D, Study 17-21	Electric/Gas	The PAs should work with the implementation and QA/QC vendors to identify the correct flag in the project database to ensure clarity around whether QA/QC visits can both occur when a project is in process and after completion. In addition, the PAs should work with the implementation and QA/QC vendors to clarify what data should be collected at each type of site visit.	Statewide	Yes							
410	2016 PA Differences	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-22	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
411	Upstream HVAC Initiative Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-23	Electric	Update the incentivized technologies to include VRF.	Statewide	Yes							
412	Upstream HVAC Initiative Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-23	Electric	Address lengthy rebate processing times.	Statewide	Yes							
413	Upstream HVAC Initiative Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-23	Electric	Develop a focused marketing campaign.	Statewide	Yes							
414	Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-24	Electric	For retrospective application of results (PY2017), the PAs should apply the results in the table in the study (the table includes gross energy realization rate and connected kW realization rate for TLEDs, Stairwell Kits, retrofit kits, A-lines and decoratives, and G24s . Due partly to precision that is sub-optimal for retrofit kits individually, the PAs should use the combined results for retrofit kits, A-lines and decoratives, and G24s.	Statewide	Yes							

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415	Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-24	Electric	For prospective application of results (PY2018 and beyond), the PAs should replace tracking system factors with evaluated system factors. This will enable the PAs to update results after an installation rate study is conducted in 2018.	Statewide	Yes							
416	Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-24	Electric	In their new address validation process, the PAs' vendor should include a flag for customers that have key account managers. The PAs could use this flag to compare the purchase details with any other current or planned PA initiatives the customer could participate in, and direct those customers to the initiative that best fits the customer's needs. This would help close the gap between vendor-driven and key account-driven initiatives in cases where this is warranted.	Statewide	Yes							
417	Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-24	Electric	The PAs' vendor should record and track any customer follow-up activity relating to initiative products in the new inspection tracking system. The PAs' vendor should actively check in with the PAs to confirm any direct contact the PAs have had with a customer and any changes to product sales based on that activity are reflected in the tracking data. This will help ensure that when the PAs are contacted by a customer directly and work with that customer to return or exchange any products received through the initiative, this activity gets tracked and saved, to be retrievable later.	Statewide	Yes							
418	Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-24	Electric	The PAs' vendor should add data validation to tracking data entries so that returns cannot be entered without linking sales to support the return. Initiative tracking data associated with a site can include a negative sales quantity. A negative sales quantity can also be a correction made to the tracking database if the third-party QC contractor cannot find the lamps at the site. In order to more easily verify lamp returns made by customers and to avoid possible keying errors, negative sales entries should be linked to the sale in the tracking database. The PAs' vendor should record their follow-up on QC contractor results and how those results were reflected in their tracking system.	Statewide	Yes							
419	Impact Evaluation of PY2015 Massachusetts Commercial and Industrial Upstream Lighting Initiative	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-24	Electric	Conduct a study in 2018 of initial install rates for very recent projects, to assess whether the rates have increased in response to the most recent upstream initiative changes made by the PAs.	Statewide	Yes							
420	Combined Heat and Power Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-25	Electric	Massachusetts CHP staff should continue applying cost-effectiveness screens when identifying CHP candidates. Failure to do so could result in "stranded" CHP projects that are under-utilized or retired before their useful life as seen in other states.	Statewide	Yes							
421	Combined Heat and Power Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-25	Electric	CHP PA staff should work together to identify if any discrepancies exist with regards to CHP implementation in their territories. Furthermore, PA staff should jointly work with the DOER to identify how (if at all) metrics such as heat recovery requirements might differ between the PA implementation and the DOER's Alternative Portfolio Standard (APS) Incentive for CHP.	Statewide	Yes							
422	Combined Heat and Power Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-25	Electric	PA staff should look for cost effective micro CHP solutions for customers with smaller thermal loads. Micro CHP technologies (50 kW or less) for small hotels, restaurants, multi-family housing, and small assisted living facilities may prove to be cost effective.	Statewide	Yes							
423	Combined Heat and Power Process Evaluation	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-25	Electric	PA staff should expand marketing and outreach efforts to mid-sized customers with average loads as low as 50 kW and sufficient coincident thermal load, not just the customers with the largest thermal and electrical loads.	Statewide	No, small customer potential will be investigated as indicated by response on micro-CHP prior to making a decision on expanding marketing and outreach.							
424	C&I Incentivized Share of High Efficiency Equipment Final Memo	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-26	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
425	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Initiate a Traditional evaluation of Custom measures. A combined Custom segment may be adapted into a longer duration structure (Multiyear staged or continuous Rolling) that still facilitates annual result generation for regulatory and other needs. Alternatively, perform Reconnaissance on Custom HVAC and Custom Lighting to investigate whether the previous evaluation results appear to be stable.	Statewide	Yes							
426	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Lay groundwork for Multiyear staging with a year one effort for Small Business Lighting and Custom Gas. A Multiyear evaluation strategy could involve year one lighting-only work followed up with non-lighting in year two plus a small supplemental sample of lighting. In concert, these evaluations would lay the groundwork for a three to five-year "sliding window" multiyear evaluation.	Statewide	Yes							
427	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Test quarterly data delivery in a Staged evaluation. Two prescriptive measures – lighting and compressed air – are good candidates for quarterly staged evaluation due to minimal savings seasonality. We recommend testing the feasibility of quarterly tracking system delivery and midyear sampling with one or both of these measures. This would serve as a proof of concept of the Staged evaluation structure and is likely to generate lessons for future updates to this impact framework.	Statewide	No, quarterly data delivery has been too challenging to implement successfully. However, PAs are striving to integrate more recent data into staged evaluations.							
428	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Explore feasibility of continuous data delivery for Rolling evaluation. Concurrent with the quarterly data delivery test immediately above, explore the manner in which continuous data delivery may be feasible for the same population segments of prescriptive lighting and compressed air.	Statewide	No, continuous data delivery has been too challenging to implement successfully. However, PAs are striving to integrate more recent data into staged evaluations.							
429	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Identify candidates for Reconnaissance work. Suggested candidates include variable speed drives, motors, and prescriptive gas.	Statewide	Currently Under Consideration							
430	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Revisit desk reviews and develop a protocol. Once a cornerstone of impact evaluation in the Northeast, and still a dominant tool in other parts of the country, file reviews are a cost-effective way to examine measure performance. A large sample of file reviews with a nested, smaller sample of field M&V is a reliable, tried-and-true method.	Statewide	Yes							
431	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	Remain open to the full spectrum of available M&V methods. Massachusetts gross impact evaluation most often employs IPMVP Option A and B (retrofit-isolation) approaches. Building simulation (Option D) is used in select instances, and billing analysis (Option C) is less frequently employed. All methods have their merits and places, so choosing an M&V approach might go hand in hand with the structuring and timing issues laid out above.	Statewide	Yes							
432	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	The framework recommends integrating some participant free ridership and spillover analysis with gross impact evaluation. We recommend this be done for all custom impact evaluations.	Statewide	Currently Under Consideration							
433	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	ISP research should be completed as part of an ad hoc or "focused study" under this impact evaluation framework.	Statewide	Yes							
434	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	The DNV GL team recommends that a prioritization of equipment needing measure life research be completed.	Statewide	Yes							
435	Massachusetts Commercial and Industrial Gross Impact Evaluation Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-27	Electric/Gas	The DNV GL team recommends coordinating with implementation to determine if they see value to ex-ante EM&V baseline review. The review would focus on the selection and the efficiency of the baseline. Since the purpose of ex-ante EM&V baseline review would be to benefit implementation, they should drive the decision to engage in this strategy, which is voluntary in nature	Statewide	Yes							
436	Commercial & Industrial 2011-2016 Mid-size Customer Assessment	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-28	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							

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437	MA Commercial Energy Code Compliance and Baseline for IECC 2012 Final Report	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-29	Electric	The evidence from this study strongly suggests that the PAs should be adjusting their program planning and implementation to account for changing standard practices.	Statewide	Yes							
438	MA Commercial Energy Code Compliance and Baseline for IECC 2012 Final Report	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-29	Electric	Conduct a short-term study to corroborate the 2017 Study baseline findings in accordance with the ISP Framework. The lighting and boiler end-uses are currently in the scope of existing ISP research, and other measures should undergo a similar level of research before adopting ISP efficiency values.	Statewide	Yes							
439	MA Commercial Energy Code Compliance and Baseline for IECC 2012 Final Report	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-29	Electric	Focus future training on energy code changes, field verifications, and specific provisions that are not easily understood and/or complied with.	Statewide	Yes							
440	MA Commercial Energy Code Compliance and Baseline for IECC 2012 Final Report	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-29	Electric	Engage NRNC projects as early in the design phase as possible to improve building features.	Statewide	Yes							
441	MA Commercial Energy Code Compliance and Baseline for IECC 2012 Final Report	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-29	Electric	Expand the PA program participation data collection effort to provide more detailed information about program participation.	Statewide	No, though PAs frequently examine their data collection protocols in an effort to improve data quality.							
442	Massachusetts Commercial & Industrial Baseline Framework	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-30	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
443	Prescriptive C&I Loadshapes of Savings	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-31	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
444	Massachusetts Commercial and Industrial Impact Evaluation of 2014 Custom CDA Installations	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-32	Electric/Gas	Apply the realization rates results from this study (57% electric kWh, 101% gas therms) to adjust the gross savings claimed for CDA projects in program year 2017.	Statewide	PAs are applying the study's realization rate results to program year 2017.							
445	Massachusetts Commercial and Industrial Impact Evaluation of 2014 Custom CDA Installations	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-32	Electric/Gas	Adopt a baseline for LPD that is consistent with current industry standard practice.	Statewide	Yes							
446	Massachusetts Commercial and Industrial Impact Evaluation of 2014 Custom CDA Installations	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-32	Electric/Gas	Adopt the ISPs developed for parking garage exhaust fan, kitchen hood, and laboratory fume hood controls; and foil coil unit EC motors	Statewide	Yes							
447	Massachusetts Commercial and Industrial Impact Evaluation of 2014 Custom CDA Installations	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-32	Electric/Gas	Re-examine and adjust the realization rate to apply to post-2017 CDA projects to account for the adoption of new baselines/ISPs as well as process improvements made by the program.	Statewide	Currently Under Consideration							
448	Massachusetts Commercial and Industrial Impact Evaluation of 2014 Custom CDA Installations	Commercial & Industrial	2017 Plan Year Report	Appendix 4D, Study 17-32	Electric/Gas	Improve the commissioning process to ensure ECM installation and intended function.	Statewide	Yes							
449	Lighting Distribution Model Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-33	Electric	Use the output of the saturation model based on demographic predictors, but excluding drive time, as an input to the top-down model. The results of the purchase model can be used to test this input's sensitivity.	Statewide	Yes							
450	Lighting Distribution Model Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-33	Electric	Ignore PA service territory boundaries when considering the distribution of program-subsidized bulbs to households in the state since there is no evidence of an effect of retail proximity provided by estimates of drive-time from households to retail locations.	Statewide	Yes							
451	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings, January through June 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-34	Electric/Gas	Provide additional trainings in the future.	Statewide	Yes							
452	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings, January through June 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-34	Electric/Gas	Consider options for providing greater outreach to builders, contractors, and subcontractors to encourage attendance at the trainings.	Statewide	Yes							
453	Winter 2017 HVAC Manufacturer Panel Interviews	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-35	Electric/Gas	Continue to monitor changes to and adoption of the NEEP CCASHP specification.	Statewide	Yes							
454	Winter 2017 HVAC Manufacturer Panel Interviews	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-35	Electric/Gas	Consider the following options for program support: (a) Providing program support for VRF heat pump systems. If there already is program support for VRF heat pump systems, clarify this in the program materials. (b) Quality installation and verification (QIV)-type programs for systems other than AC. (c) Encouraging manufacturers who educate distributors and contractors to include information about the dangers of PVC as a venting material and safer alternatives to PVC. Should PAs launch a QIV-type program for boilers in the future, include this information.	Statewide	Yes for VRF. Currently under consideration for QIV. The upstream program does not include boilers.							



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455	Winter 2017 HVAC Manufacturer Panel Interviews	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-35	Electric/Gas	Assess potential savings from promoting boiler zone valves.	Statewide	The upstream program doesn't yet include boilers.							
456	Winter 2017 HVAC Manufacturer Panel Interviews	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-35	Electric/Gas	Continue annual data collection from HVAC panel, with bi-annual data collection for stable markets.	Statewide	No, since the manufacturer panel was not able to provide data, annual interviews are not needed, but bi-annual interviews will be considered.							
457	Winter 2017 HVAC Manufacturer Panel Interviews	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-35	Electric/Gas	Continue providing token gifts/cards on an annual basis to HVAC panelists to maintain relationships.	Statewide	No, PAs will provide token gifts/cards when they collect data.							
458	Winter 2017 HVAC Manufacturer Panel Interviews	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-35	Electric/Gas	Update cover of program rebate form to show efficient, qualifying equipment.	Statewide	No, most rebate forms are now only available for submission through the online submission portal called MAP.							
459	Non-Energy Impact Framework Study Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-36	Electric/Gas	Due to the double-counting associated with property values or rental income and the individual non-property value NEIs that are the source of changes in property value or rental income, we recommend that the PAs not count their existing property value NEIs for those measures. Rather, in the benefit-cost ratio (BCR) calculations, the PAs should count the NEI values associated with the individual amenities, such as improved comfort, health, home durability, reduced O&M costs, and reduced tenant complaints. For those measures that only have property value NEIs, such as appliances and low-flow showerheads, we recommend using in the BCR calculations the property value NEIs as proxies for the individual NEIs that have yet to be counted.	Statewide	Yes							
460	Non-Energy Impact Framework Study Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-36	Electric/Gas	PAs should review the BCR-model-related differences highlighted in the report and determine whether there is a reason for each. If so, the PAs should cite their reason for using the values. If not, the PAs should update their claimed NEI values to match the relevant Massachusetts NEI studies. For the NEIs that apply to measures for some PAs but not others (i.e., price hedging and rate discounts), each PA should determine if these apply to their measures.	Statewide	Yes							
461	Non-Energy Impact Framework Study Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-36	Electric/Gas	In cases where the PAs decide to apply an NEI for one initiative or measure to a different initiative or measure, we suggest providing clear public documentation of how the decision was made, such as via citation of the source of each NEI in the technical reference manual (TRM).	Statewide	Yes							
462	Status and Directions for Top-Down Work	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-37	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
463	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings. July through December 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-38	Electric/Gas	Provide additional trainings in the future.	Statewide	Yes							
464	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings. July through December 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-38	Electric/Gas	Consider options for providing greater outreach to builders, contractors, and subcontractors to encourage attendance at the trainings.	Statewide	Yes							
465	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings. July through December 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-38	Electric/Gas	Examine options to encourage more builders and contractors to attend the trainings. This may include continuing education credits, having local code officials promote the trainings, working with homebuilder associations and local media to promote the trainings, or offering trainings in the evenings with dinner included. Promotion of the trainings should also emphasize that they cover the most recent codes going into effect, including the stretch code.	Statewide	Yes							
466	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings. July through December 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-38	Electric/Gas	Consider additional focus on areas such as insulation, ventilation, and HVAC, as suggested by some residential respondents.	Statewide	Yes							

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467	Cross Cutting Code Compliance Support Initiative Evaluation of Classroom Trainings. July through December 2017	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-38	Electric/Gas	Consider additional focus on areas such as a structured process for consistently enforcing the code, including checklists, taking photographs, and on-site inspections, as suggested by some commercial respondents.	Statewide	Yes							
468	Interim Net to Gross Coordination Observations and Considerations Memo	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-39	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
469	Market-Rate Multifamily NEI – Phase Final Memo	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-40	Electric/Gas	For measures that exist in both the LIMF initiative and market-rate MF initiative (hot water measures, lighting, thermostats, air sealing, refrigerators), the team recommends that the PAs apply the associated LIMF owner NEIs to market rate MF projects (Rental Units Marketability, Reduced Tenant Complaints, Property Durability, Equipment Maintenance and Reliability [thermostats only]). For those MF NEIs that have both occupant and owner values (increased home/property durability), the team recommends applying the owner NEI only.	Statewide	Yes							
470	Market-Rate Multifamily NEI – Phase Final Memo	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-40	Electric/Gas	For common area lighting installed through the residential MF Retrofit initiative, the team recommends applying the C&I lighting O&M NEI value. The team notes that C&I Retrofit NEIs are currently applied to eligible C&I measures installed through the C&I MF Retrofit initiative.	Statewide	Yes							
471	Market-Rate Multifamily NEI – Phase Final Memo	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-40	Electric/Gas	Ensure that the C&I MF NEIs for common area measures (i.e., not in-unit measures) are being applied consistently across the PAs' BCRs and reflect the diversity of the C&I NEIs provided by the source document.	Statewide	Yes							
472	Community Based Program Design Effectiveness Study: Phase 1 Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-41	Electric/Gas	Build CBPs that involve consistent communication with local partners.	Statewide	Yes							
473	Community Based Program Design Effectiveness Study: Phase 1 Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-41	Electric/Gas	Design inclusive programs that offer communities support in reaching their own energy and nonenergy goals.	Statewide	Yes							
474	Community Based Program Design Effectiveness Study: Phase 1 Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-41	Electric/Gas	Be flexible with program design, participant engagement strategies, and marketing, but standardize what you can.	Statewide	Yes							
475	Community Based Program Design Effectiveness Study: Phase 1 Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-41	Electric/Gas	Consider program implementation methods that provide data to rigorously capture non-energy and/or long-term outcomes.	Statewide	Yes							
476	Community Based Program Design Effectiveness Study: Phase 1 Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-41	Electric/Gas	Fully answering questions of CBP viability and tactic effectiveness calls for evaluation methods that better facilitate attribution analysis	Statewide	Will Consider for Future Studies							
477	Education Kits Program Deemed Savings Review Results	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-42	Electric/Gas	The evaluation team recommends using the values in Table 1 as preliminary deemed gross savings estimates for CLC, and the values in Table 2 for NGRID. These calculated results incorporate the mix of single-family versus multifamily households and the weighted mix of fuel types for hot water and temperature cards. These tables also include the estimate useful life of each of the measures as established by the Massachusetts TRM3 (for LEDs, aerators, and showerheads) and the Illinois TRM (for temperature cards).	PA Specific	Yes. Cape Light Compact is the only PA claiming savings for this program in 2017, the results from this memo will be applied accordingly.	N/A	N/A	N/A	N/A	N/A	Yes. Cape Light Compact is the only PA claiming savings for this program in 2017, the results from this memo will be applied accordingly.	N/A
478	National Grid 2017 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-43	Electric	For 2017, National Grid should claim an average demand savings of 0.44 kW per thermostat in Massachusetts (0.48 kW per ecobee, 0.53 kW per Honeywell, and 0.41 kW per Nest).	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
479	National Grid 2017 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-43	Electric	Remove thermostats that persistently opt out (i.e., consider implementing auto-unenroll functionality) or modify the Nest participation incentive structure to include a participation requirement.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
480	National Grid 2017 Residential Wi-Fi Thermostat DR Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-43	Electric	Proactively monitor connectivity issues; remove thermostats with persistent connectivity issues; consider implementing an auto-unenroll functionality.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
481	2017 Seasonal Savings Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-44	Electric/Gas	National Grid should claim average energy savings of 22.7 kWh per thermostat in 2017.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
482	2017 Seasonal Savings Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-44	Electric/Gas	National Grid should claim average demand savings of 0.044 kW in 2017.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A

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483	2017 Seasonal Savings Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-44	Electric/Gas	National Grid should continue offering a summer thermostat optimization program to achieve energy and demand savings and consider offering a winter thermostat optimization program to address electric and gas savings.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
484	2017 Seasonal Savings Evaluation	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-44	Electric/Gas	The summer seasonal savings program should be evaluated an additional year to: - assess how customers respond to two summers of schedule adjustments - understand whether customers leave SS during hot weather - seek to ascertain a relationship between savings and weather - develop an approach to incorporate SS into the Massachusetts and Rhode Island Technical Reference Manuals	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
485	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	Given the divergence between delivered load reduction and committed capacity at the customer level, National Grid should develop a way to manage this shortfall. We recommend that National Grid either recognize this underperformance as part of establishing a planning assumption that reflects the difference between the reduction committed versus achieved, or consider an adjustment to the incentive structure to bring performance and committed capacity into closer alignment.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
486	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	We recommend examining the root cause(s) that prevented prediction of the system peak. Understanding this cause will enable corrections to be made before the 2018 summer season.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
487	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	We recommend improvements to data availability for AutoGrid to calculate and provide event performance values to customers and vendors to confirm their performance level and as a touchpoint to foster further demonstration engagement.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
488	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	We recommend revising demonstration supporting information to better describe how customers will be paid, the level of incentive they can expect, the possibility of events being cancelled or not allowing cancellations, and the (potential) ancillary benefits of participation such as ICAP tag reduction.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
489	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	We recommend revising the process for uploading data needed as part of the enrollment process to make it more flexible and easier for CSP data submissions.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
490	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	We recommend working with CSPs to develop a more effective system to support demonstration management needs in terms of tracking marketing leads and the sales pipeline.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
491	Evaluation of 2017 Demand Response Demonstration - C&I Connected Solutions	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-45	Electric	Recognizing that we were unable to ask participants about satisfaction with their incentive payments due to evaluation timing, we recommend that National Grid or the vendors inquire with participants about the sufficiency of their final 2017 incentive payments. Alternatively, DNV GL can ask about them as part of the 2018 season evaluation, though incentive receipt would have occurred roughly 11 months prior, if gathered this way.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
492	2013-2015 Residential Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-46	Electric/Gas	Build on the demographic and geographic analyses to better understand how within and across PA differences affect engagement in the PAs' energy efficiency programs	Statewide	Currently Under Consideration							
493	2013-2015 Residential Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-46	Electric/Gas	Leverage the contribution ratio statistic to capture non-data elements including implementation, strategy, and other stakeholder anecdotal experiences in the Residential Customer Profile report in a rigorous, transparent and mathematically robust way	Statewide	Currently Under Consideration							
494	2013-2015 Residential Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-46	Electric/Gas	Conduct any time series analyses at the location level rather than the account level for a more robust picture of participation and savings through time.	Statewide	Yes							
495	2013-2015 Residential Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-46	Electric/Gas	Leverage the building vintage, style and use code from the tax data to further segment participant and customer populations	Statewide	Currently Under Consideration							

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496	2013-2015 Residential Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-46	Electric/Gas	Leverage the combination of the tax data, the PAs' energy use information, and American Community Survey block group data to identify and quantify where opportunities for energy optimization efforts may exist	Statewide	Currently Under Consideration							
497	2016 Comprehensive Commercial & Industrial Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-47	Electric/Gas	Increase communication and improve data intake processes to enhance the quality of ongoing and future evaluation efforts.	Statewide	Currently Under Consideration							
498	2016 Comprehensive Commercial & Industrial Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-47	Electric/Gas	Consider leveraging the upstream tracking data to further engage small and mid-size participants that might offer opportunities for increased depth of savings.	Statewide	Currently Under Consideration							
499	2016 Comprehensive Commercial & Industrial Customer Profile Report	Special & Cross Sector	2017 Plan Year Report	Appendix 4D, Study 17-47	Electric/Gas	Investigate the feasibility of a premise-level analysis grain in future C&I Customer Profile reports.	Statewide	Currently Under Consideration							
500	Products Net-to-Gross Report	Residential	2019-2021 Three-Year Plan	Appendix U, Study 1	Electric	Use the recommended prospective NTGRs for the products presented in Table 1 in the report.	Statewide	Yes							
501	LED Net-to-Gross Consensus Panel Report	Residential	2019-2021 Three-Year Plan	Appendix U, Study 2	Electric	Use the NTGRs listed in Table 1 for planning the 2019 to 2021 programs.	Statewide	Yes							
502	Advanced Power Strip Metering Study	Residential	2019-2021 Three-Year Plan	Appendix U, Study 3	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
503	Products Impact Evaluation of In-service and Short-Term Retention Rates Study	Residential	2019-2021 Three-Year Plan	Appendix U, Study 4	Electric	The PAs should use the combined Massachusetts ISR/short-term retention rates listed in Table 1 for the 2017 Annual Report, the 2018 Annual Report, updates to the TRM, and program planning for 2019 to 2021 for all evaluated products.	Statewide	Yes							
504	Massachusetts Residential New Construction Incremental Cost	Residential	2019-2021 Three-Year Plan	Appendix U, Study 5	Electric	Allocate incremental costs based on the relative proportion of incentives provided for both the low-rise and MFHR programs. For example, if the electric PAs pay 40% of the incentives for all low-rise housing units (overall incremental cost of \$2.00 per square foot) and the gas PAs pay 60% of the incentives, then the electric PAs would account for an incremental cost of \$0.80 per square foot and the gas PAs would account for \$1.20 per square foot.	Statewide	Yes							
505	Shelf Stocking Study Report	Residential	2019-2021 Three-Year Plan	Appendix U, Study 6	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
506	Home Energy Assessment LED Net-to-Gross Consensus	Residential	2019-2021 Three-Year Plan	Appendix U, Study 7	Electric	Use the final NTGR and Effective Useful Life (EUL) agreed to as part of the consensus process and included in Table 1.	Statewide	Yes							
507	MA RLPNC Cross-Sector Sale HOU Update	Residential	2019-2021 Three-Year Plan	Appendix U, Study 8	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
508	Appliance Recycling Report	Residential	2019-2021 Three-Year Plan	Appendix U, Study 9	Electric	Adopt the gross energy savings estimates, realization rates, and net-to-gross ratios reported in Table 5 in the report. The net-to-gross ratio should be applied to adjusted gross energy savings.	Statewide	Yes							
509	Baseline Load Shape Study Comprehensive Report	Residential	2019-2021 Three-Year Plan	Appendix U, Study 10	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
510	Water Heating, Boiler, and Furnace Cost Study	Residential	2019-2021 Three-Year Plan	Appendix U, Study 11	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
511	Low Rise Measure Review	Residential	2019-2021 Three-Year Plan	Appendix U, Study 12	Electric/Gas	The study recommended gross and net savings assumptions for low-rise measures.	Statewide	Yes							
512	Home Energy Services Impact Evaluation	Residential	2019-2021 Three-Year Plan	Appendix U, Study 13	Electric/Gas	Use the ex post results determined through this evaluation as ex ante savings for future program years.	Statewide	Yes							
513	Home Energy Services Impact Evaluation	Residential	2019-2021 Three-Year Plan	Appendix U, Study 13	Electric/Gas	Investigate programmable and wi-fi thermostats further.	Statewide	Yes							
514	Heating and Cooling Early Retirement Net-to-Gross	Residential	2019-2021 Three-Year Plan	Appendix U, Study 14	Electric/Gas	Continue to promote the program benefit of eliminating the risk of equipment failure, in marketing and messaging through contractors and Home Energy Assessments.	Statewide	Yes							
515	Heating and Cooling Early Retirement Net-to-Gross	Residential	2019-2021 Three-Year Plan	Appendix U, Study 14	Electric/Gas	Continue to encourage both contractors and energy specialists to promote the HEAT loan offering to eligible customers, as this appears to be a key decision-making influence for some customers.	Statewide	Yes							
516	Heating and Cooling Early Retirement Net-to-Gross	Residential	2019-2021 Three-Year Plan	Appendix U, Study 14	Electric/Gas	Consider exploring the prevalence of nonparticipating customers replacing their HVAC equipment early in more detail in future research to better understand the extent to which waiting for a Home Energy Assessment is limiting participation as well as the existence of spillover.	Statewide	No, program changed and requirement for an audit is no longer required							
517	Heating and Cooling Early Retirement Net-to-Gross	Residential	2019-2021 Three-Year Plan	Appendix U, Study 14	Electric/Gas	Incorporate the results from the replacement type analysis into future program planning and gross savings estimations.	Statewide	Yes							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
518	HEAT Loan Assessment	Residential	2019-2021 Three-Year Plan	Appendix U, Study 15	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
519	Multi-Family Program Impact and Net-to-Gross Evaluation Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 16	Electric/Gas	To update the 2017 MMRP common area lighting savings, Eversource should replace its currently used space-by-space deemed HOU values with the updated space-by-space deemed HOU results from this study, as reported in Table 13.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
520	Multi-Family Program Impact and Net-to-Gross Evaluation Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 16	Electric/Gas	To update the 2017 MMRP common area lighting savings, all PAs other than Eversource should apply the found realization rates of 0.91 for interior lighting and 0.98 for exterior lighting to the common area HOU (also reported in Table 12).	PA Specific	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes
521	Multi-Family Program Impact and Net-to-Gross Evaluation Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 16	Electric/Gas	For all future program years (2018 and beyond), all PAs should switch to using the space-by-space deemed HOU values reported in Table 13. When the deemed HOU values are applied they should be accompanied by a HOU realization rate of 1.0.	Statewide	Yes							
522	Multi-Family Program Impact and Net-to-Gross Evaluation Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 16	Electric/Gas	The PAs should apply the ISRs retroactively to 2017 program savings and proactively to future program savings and planning.	Statewide	Yes							
523	Multi-Family Program Impact and Net-to-Gross Evaluation Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 16	Electric/Gas	The PAs should apply the NTG ratio proactively to future program savings and planning. The program-level NTG ratio identified in this study should be applied to gross electric and fuel savings from all measures in the MMRP.	Statewide	Yes							
524	Multi-Family Program Impact and Net-to-Gross Evaluation Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 16	Electric/Gas	The PAs should work with the implementation and QA/QC vendors to identify the correct flag in the project database to ensure clarity around whether QA/QC visits can both occur when a project is in process and after completion. In addition, the PAs should work with the implementation and QA/QC vendors to clarify what data should be collected at each type of site visit.	Statewide	Yes							
525	Wi-Fi Thermostat Impact Evaluation--Secondary Research Study	Residential	2019-2021 Three-Year Plan	Appendix U, Study 17	Electric/Gas	Use annual savings values of 160.9 kWh and 31.1 Therms until primary research and analysis findings are complete. These values should be applied prospectively for 2019 and future planning.	Statewide	Yes							
526	Ductless Mini-Split Heat Pump Cost Study Updated	Residential	2019-2021 Three-Year Plan	Appendix U, Study 18	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
527	Cost Study of Heat Pump Installations for Dual Fuel Operation	Residential	2019-2021 Three-Year Plan	Appendix U, Study 19	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
528	Energy Optimization Study	Residential	2019-2021 Three-Year Plan	Appendix U, Study 20	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
529	Understanding the Role of Weather in Air Conditioning Use Behavior and Demand Response Program Participation	Residential	2019-2021 Three-Year Plan	Appendix U, Study 21	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
530	Impact Evaluation of PY2016 C&I Small Business Initiative - Phase 1 Lighting Evaluation	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 22	Electric	For retrospective application of results (PY2018), we recommend that the PAs apply the results in the first table on the previous page.	Statewide	Yes							
531	Impact Evaluation of PY2016 C&I Small Business Initiative - Phase 1 Lighting Evaluation	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 22	Electric	For prospective application of results (PY2019 and beyond), we recommend that the PAs adopt one of two options: 1) wholesale application of prospective RRs to tracking savings, or 2) replace tracking system factors with the evaluated system factors listed in the second table on the previous page.	Statewide	Currently Under Consideration							
532	Impact Evaluation of PY2016 C&I Small Business Initiative - Phase 1 Lighting Evaluation	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 22	Electric	The PAs should work with vendors to standardize how savings from tube LEDs (TLEDs), in particular "plug and play" TLED retrofits of fluorescent fixtures, are classified and tracked. As TLEDs were emerging when the 2013-15 MA TRM was completed, its standard fixture wattage table does not address TLEDs; therefore, evaluators found variation among vendors in how TLED fixture wattage was estimated. The PAs should provide more comprehensive guidance to vendors on when to classify fixtures as prescriptive or custom, how to estimate custom fixture wattages appropriately (e.g., through DLC reference), and which supporting documentation should be included in the application.	Statewide	Yes							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
533	Impact Evaluation of PY2016 C&I Small Business Initiative - Phase 1 Lighting Evaluation	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 22	Electric	In 2019, Massachusetts will transition to a lifetime savings calculation and subsequent dual baseline approach. This study estimated the impacts of such a transition to lifetime savings but referenced a placeholder out-year factor of 60%. The P75 LED Market study will provide more accurate and granular data on the anticipated C&I LED market as compared with existing technologies. Additionally, the P73D study may provide more Massachusetts-specific research on remaining useful life (RUL) for C&I lighting systems. This information should be paired with the granular, fixture-level evaluation data available from this study to refine the lifetime savings impact	Statewide	Yes							
534	Impact Evaluation of PY2016 C&I Small Business Initiative - Phase 1 Lighting Evaluation	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 22	Electric	As this study represents only Phase I of the Small Business Initiative impact evaluation, we recommend that Phase II is executed as soon as possible. This study examined performance of lighting measures only (fixtures and controls), but as the penetration of LEDs grows rapidly, the Initiative must look to non-lighting technologies to diversify their measure offerings and compensate for more limited lighting fixture savings in future program years. Phase II should include an assessment of missed non-lighting opportunities among major measure categories such as refrigeration, HVAC, envelope, and DHW.	Statewide	Yes							
535	LED Market Monitor Study: Lighting Market Model Summary Memo	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 23	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
536	TWGA (Task A Working Group) CI Portfolio Modelling Findings and Conclusions	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 24	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
537	Baseline Transition Planning Net-to-Gross Revisions Final Report	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 25	Electric/Gas	For the 2018 Plan, use the NTG results from the C&I NTG study (TXC49).	Statewide	Yes							
538	Baseline Transition Planning Net-to-Gross Revisions Final Report	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 25	Electric/Gas	Ask the intermediate efficiency questions only where it is applicable, extending what was done for TXC49.	Statewide	Will Consider for Future Studies							
539	Baseline Transition Planning Net-to-Gross Revisions Final Report	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 25	Electric/Gas	Improve the generic intermediate efficiency question.	Statewide	Will Consider for Future Studies							
540	Baseline Transition Planning Net-to-Gross Revisions Final Report	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 25	Electric/Gas	For selected high importance, intermediate baseline measures, ask which measure-specific, alternative technologies would have been adopted if not what was adopted through the program.	Statewide	Will Consider for Future Studies							
541	Baseline Transition Planning Net-to-Gross Revisions Final Report	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 25	Electric/Gas	For complex or combination measures, use the Integrated Gross-Net method.	Statewide	Will Consider for Future Studies							
542	Baseline Transition Planning Net-to-Gross Revisions Final Report	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 25	Electric/Gas	Review the applicability of the timing component of the current NTGR method in relation to the dual baseline methods defined in the Baseline Framework and developed in Track A.	Statewide	Will Consider for Future Studies							
543	Expected Useful Life (EUL) Estimation for Air Conditioning Equipment from	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 26	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
544	Massachusetts C&I Upstream Lighting Net-to-Gross Study	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 27	Electric	Ensure program records include account numbers going forward and assess effectiveness of this requirement.	Statewide	Currently Under Consideration							
545	MA C&I Upstream Lighting In-Service Rate Analysis Summary	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 28	Electric	Use the revised lighting installation rate of 76.2% and savings factors presented in this memo for 2019-2021 Three Year Planning.	Statewide	Yes							
546	MA C&I Upstream Lighting In-Service Rate Analysis Summary	Commercial & Industrial	2019-2021 Three-Year Plan	Appendix U, Study 28	Electric	Build upon the initial July 2018 site visits with "rolling" data collection.	Statewide	Yes							
547	CLC and National Grid Education Kits Deemed Savings Review Memo	Residential	2019-2021 Three-Year Plan	Appendix U, Study 29	Electric/Gas	To ensure that ISRs pass regulatory scrutiny and are accepted in the state, PAs should incorporate collecting feedback from parents as part of the program implementation process. That can be best done through parent reply cards distributed with the kits. These reply cards could either collect the desired data or ask parent to volunteer for a follow-up phone survey with the evaluation team.	PA Specific	No, Education Kits are no longer offered	No					No	
548	CLC and National Grid Education Kits Deemed Savings Review Memo	Residential	2019-2021 Three-Year Plan	Appendix U, Study 29	Electric/Gas	We recommend a kit distribution deadline of early May to allow time for students to install items and upload survey responses before the end of the school year.	PA Specific	No, Education Kits are no longer offered	No					No	

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549	Massachusetts Residential HVAC Net-to-Gross and Market Effects Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 30	Electric/Gas	Incorporate the NTGRs recommended by the Consensus Group for equipment incented with "Standard" rebates into the 2019-2021 Technical Reference Manual.	Statewide	Yes							
550	Massachusetts Residential HVAC Net-to-Gross and Market Effects Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 30	Electric/Gas	Measure the same market indicators in future studies of the programs' residential HVAC activities, and compare the results to track progress over time.	Statewide	Yes							
551	Massachusetts Residential HVAC Net-to-Gross and Market Effects Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 30	Electric/Gas	The programs should continue to target both customers and contractors.	Statewide	Yes							
552	Massachusetts Commercial and Industrial Upstream HVAC/Heat Pump and Hot Water NTG and Market Effects Indicator Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 31	Electric/Gas	Adopt the 2019-2021 prospective NTGRs developed as part of this study, contingent on actual changes made to the initiative.	Statewide	Yes							
553	Non-Residential Code Compliance Support Initiative Attribution and Net Savings Assessment	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 32	Electric/Gas	Maintain the CCSI program and use evaluation and compliance study results to target opportunities for improvement in order to maximize the impact and related savings from the program.	Statewide	Yes							
554	Residential New Construction and CCSI Attribution Assessment	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 33	Electric/Gas	Use the prospective 2019 NTG ratio of 0.96 for the duration of the 2019-2021 program period.	Statewide	Yes							
555	Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 34	Electric/Gas	Incorporate the NTG rates recommended by the evaluation team into the next three-year plan.	Statewide	Yes							
556	Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 34	Electric/Gas	Develop a consistent and systematic approach across NTG studies to handle cases with very high gross savings that heavily influence the calculated NTG values from the study year, but are not necessarily indicative of future typical values for the program.	Statewide	Will Consider for Future Studies							
557	Massachusetts Sponsors' Commercial and Industrial Programs Free-ridership and Spillover Study	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 34	Electric/Gas	Ensure contact information for the decision maker is recorded in the tracking system and available for evaluators.	Statewide	Currently Under Consideration							
558	Initial Considerations for Attribution/Net-to-Gross Estimation for Energy Optimization	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 35	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
559	Low-Income Multifamily Health- and Safety-Related Non-Energy Impacts (NEI) Study Preliminary Findings Report	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 36	Electric/Gas	For planning purposes, the study team recommends that the PAs adopt the preliminary single point estimate for NEIs presented in the report.	Statewide	Yes							
560	Low-Income Multifamily Health- and Safety-Related Non-Energy Impacts (NEI) Study Preliminary Findings Report	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 36	Electric/Gas	Since the traditional cost tests are still in use, the study team recommends that the Short-Term High-Interest Loan LIMF NEI not be counted, though it could be considered if a different cost were used in the future.	Statewide	Yes							
561	Low-Income Multifamily Health- and Safety-Related Non-Energy Impacts (NEI) Study Preliminary Findings Report	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 36	Electric/Gas	The evaluators recommend that the study team and the PAs initiate a dialogue surrounding pursuing monetization of another dozen NEI candidates to be included in the final analysis	Statewide	Yes							
562	NEI Reference Table Memo	Special & Cross Sector	2019-2021 Three-Year Plan	Appendix U, Study 37	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
563	Lighting Market Scan	Residential	2016-2018 Term Report	Appendix D, Study 18-1	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
564	Lighting Onsites	Residential	2016-2018 Term Report	Appendix D, Study 18-2	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
565	LED Delta Watt Update	Residential	2016-2018 Term Report	Appendix D, Study 18-3	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
566	Appliance Recycling Update	Residential	2016-2018 Term Report	Appendix D, Study 18-4	Electric	NMR recommends that the PAs update the energy savings estimates for refrigerators and freezers for per unit gross energy savings, per unit adjusted gross savings, and net savings for use in the 2018 annual report. Recommended values are shown in the report.	Statewide	Yes							
567	Mini-Split Heat Pump Incremental Cost Assessment	Residential	2016-2018 Term Report	Appendix D, Study 18-5	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
568	Advanced Power Strip Metering Study, Revised Results Memo	Residential	2016-2018 Term Report	Appendix D, Study 18-6	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
569	Lighting Sales Data Analysis	Residential	2016-2018 Term Report	Appendix D, Study 18-7	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
570	Census of Massachusetts Multifamily and Condo Properties	Residential	2016-2018 Term Report	Appendix D, Study 18-8	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
571	2017 Income Eligible Process Evaluation Findings	Residential	2016-2018 Term Report	Appendix D, Study 18-9	Electric/Gas	Explore strategies for identifying and reaching smaller multifamily property owners.	Statewide	Yes							

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572	2017 Income Eligible Process Evaluation Findings	Residential	2016-2018 Term Report	Appendix D, Study 18-9	Electric/Gas	Identify crucial participant data points needed to quantitatively assess effectiveness of program implementation processes.	Statewide	Yes							
573	2017 Income Eligible Process Evaluation Findings	Residential	2016-2018 Term Report	Appendix D, Study 18-9	Electric/Gas	In accordance with DOE requirements and schedules, utilize an electronic audit tool approved by DOE to collect and store participant and performance measure data, including key data points needed to quantitatively assess the effectiveness of program implementation processes. Note that other data (e.g. data required to meet DOE paper requirements) may still be collected and stored using paper.	Statewide	Yes in process							
574	2017 Income Eligible Process Evaluation Findings	Residential	2016-2018 Term Report	Appendix D, Study 18-9	Electric/Gas	Explore how statewide Mass Save marketing resources can be better used at the local level, especially among agencies and PAs with fewer marketing resources.	Statewide	Yes							
575	2017 Income Eligible Process Evaluation Findings	Residential	2016-2018 Term Report	Appendix D, Study 18-9	Electric/Gas	Investigate the viability of establishing a thorough, statewide assessment of marketing effectiveness with ongoing tracking and monitoring of marketing material performance metrics.	Statewide	No, hasn't been done yet but will be							
576	2017 Income Eligible Process Evaluation Findings	Residential	2016-2018 Term Report	Appendix D, Study 18-9	Electric/Gas	Review the measure list identified as part of this study and determine whether there is value in conducting additional research to develop Massachusetts- and low-income specific applicability factors, costs, and savings.	Statewide	Yes							
577	Behavior 1 - Assessment of Combined Behavior and Wi-Fi Tstat Program: Phase 1	Residential	2016-2018 Term Report	Appendix D, Study 18-10	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
578	Residential Baseline Study: Phase 3 Panel Study	Residential	2016-2018 Term Report	Appendix D, Study 18-11	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
579	2018 Massachusetts Summer Thermostat Optimization Evaluation	Residential	2016-2018 Term Report	Appendix D, Study 18-12	Electric	NGrid should claim average energy savings of 30.6 kWh per treated thermostat in Massachusetts in 2018. CLC should claim average energy savings of 30.5 kWh per treated thermostat in Massachusetts in 2018.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	Yes	N/A
580	2018 Massachusetts Summer Thermostat Optimization Evaluation	Residential	2016-2018 Term Report	Appendix D, Study 18-12	Electric	NGrid should claim average demand savings of 60 W per treated thermostat in Massachusetts in 2018. CLC should claim average demand savings of 57 W per treated thermostat in Massachusetts in 2018.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	Yes	N/A
581	2018 Massachusetts Summer Thermostat Optimization Evaluation	Residential	2016-2018 Term Report	Appendix D, Study 18-12	Electric	In 2019, deploy the SS program to all Massachusetts PAs to better inform a PA-specific (or statewide) savings value or realization rate for inclusion in the Technical Reference Manual.	PA Specific	No, not all PAs were able to contract with NEST							
582	2018 Massachusetts Summer Thermostat Optimization Evaluation	Residential	2016-2018 Term Report	Appendix D, Study 18-12	Electric	The summer SS program should continue to be evaluated to assess the ability of the program to realize incremental savings associated with redeployment. The 2018 exploratory analysis found that setpoint adjustments persist and continued from 2017.	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	Yes	N/A
583	Lighting Interactive Effects Peak Period Adjustment	Residential	2016-2018 Term Report	Appendix D, Study 18-13	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
584	Lighting Hours of Use Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-14	Electric	For lighting savings estimation, use the building specific hours of use provided in the report.	Statewide	Yes							
585	Lighting Hours of Use Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-14	Electric	For Government Buildings, use the Office Building hours from the report.	Statewide	Yes							
586	Lighting Hours of Use Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-14	Electric	For Police/Fire Stations and Court Buildings, use the "Other" building type from the report.	Statewide	Yes							
587	Lighting Hours of Use Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-14	Electric	For Multifamily and Other-Automotive, use the "Other" building type from the report.	Statewide	Yes							
588	Lighting Hours of Use Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-14	Electric	If a building type is unknown, use the "Overall" result from the report, which represents the average operating hours of all building types combined	Statewide	Yes							
589	Process Evaluation of C&I Upstream Lighting	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-15	Electric	For subsequent evaluation, target a more representative sample of sites for QC inspection.	Statewide	Yes							
590	Process Evaluation of C&I Upstream Lighting	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-15	Electric	Clarify how QC inspection data is incorporated into the tracking data and portal.	Statewide	Yes							
591	Process Evaluation of C&I Upstream Lighting	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-15	Electric	Enforce customer self-installation rules.	Statewide	Yes							
592	Process Evaluation of C&I Upstream Lighting	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-15	Electric	Provide better Initiative education for smaller distributors and contractors.	Statewide	Yes							
593	Process Evaluation of C&I Upstream Lighting	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-15	Electric	Make improvements to the portal, especially concerning customer address verification functionality and product validation capabilities.	Statewide	Yes							





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606	Impact Evaluation of Custom Electric Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-19	Electric	Custom lighting applications should report claimed lighting controls savings separate from fixture replacement savings in the tracking database. Currently, evaluators are only able to determine the claimed lighting controls savings when examining the custom lighting application excel worksheets. These are only provided when projects are drawn for evaluation. Gross realization rates associated with fixture replacements are inevitably different from the savings attributed to lighting control reductions. As a result, the evaluators are unable to effectively extrapolate the observed differences in fixture vs control savings to the population. The current observed practice is for custom lighting applications to bundle both fixture and control savings claims into the same application tracking line item.	Statewide	Currently Under Consideration							
607	Impact Evaluation of Custom Electric Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-19	Electric	The evaluator recommends including a summary of the baseline selection in the project documentation. Especially given the adoption of a new evaluation baseline framework, the program should document how the baseline was determined for unique custom projects in this impact category and provide clear statements on each decision made. This will be especially important when the program selected baseline for a Lost Opportunity project is a different system type than the pre-existing equipment at a facility.	Statewide	Currently Under Consideration							
608	Impact Evaluation of Custom Gas Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-20	Gas	The study produced statewide results that are reliable (±9 at 80% confidence level). The evaluation team designed the sampling plan so that individual realization rates will be applied for those PAs with more than ten sites and if a final precision meets the intended precision targets (±20%). The relative precision of the retrospective realization rates for National Grid (±9%), and Columbia (±6%) is sufficient to warrant application of their individual PA realization rate according to the sampling plan.	Statewide	Yes							
609	Impact Evaluation of Custom Gas Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-20	Gas	The realization rate for Eversource had a wider error band (±25%) than the targeted 80/20 precision, therefore Eversource is recommended to use the statewide results. Berkshire, Liberty, and Unitil are also recommended to use statewide results because fewer than ten sites were evaluated in their territory.	Statewide	Currently Under Consideration							
610	Impact Evaluation of Custom Gas Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-20	Gas	The realization rates should be used for planning and program reporting, including the application of retrospective rates to program year PY2018 and subsequent years until the PAs demonstrate the new steam traps savings calculator is fully deployed and used.	Statewide	Yes							
611	Impact Evaluation of Custom Gas Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-20	Gas	The use of a 0.60 error ratio in the sample design was confirmed in the subsequent evaluation, which yielded a statewide error ratio of 0.52. A value of 0.60 is recommended for future evaluations.	Statewide	Yes, the new study assumes an error ratio of 0.6 for all PAs except Eversource, which used 0.65 based on the last impact evaluation							
612	Impact Evaluation of Custom Gas Installations	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-20	Gas	Apply sampling methods that do not require final reporting data sets. This should be possible with the rolling sample approach, which allows for subsequent corrections.	Statewide	Currently Under Consideration							
613	C&I Lighting Market Effects Contractor and Distributor Results Memo	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-21	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
614	Baseline Transition Planning Track B - ISP	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-22	Electric/Gas	For compressed air and air dryer measures, use the industry standard practice for each system type as described in the report.	Statewide	Currently under consideration							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
615	Baseline Transition Planning Track B - ISP	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-22	Electric/Gas	For infrared heater measures, the following ISP baseline assumptions should be adopted: 1. For lost opportunity IR installations, assume the specified thermal efficiency of the industry standard practice is 82%. This represents an increase compared to the 2016-2018 Massachusetts Technical Reference Manual (TRM) baseline of 80% for the low intensity IR heater measure. 2. For lost opportunity unit heater installations, assume the specified thermal efficiency of the industry standard practice is 82%. This represents an increase compared to the MA TRM baseline of 80% for the condensing unit heater measure. 3. For replace on failure installations, assume the industry standard practice is a new unit that can be installed in the same location at the lowest cost	Statewide	Currently under consideration							
616	Baseline Transition Planning Track B - ISP	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-22	Electric/Gas	The PAs should use the EMLs in Table 6 as placeholder values for PY2019 until updated EMLs are available after the next Market Model update, expected in Q1 2020. These values should not be applied retrospectively to PY2018.	Statewide	Currently Under Consideration							
617	Baseline Transition Planning Track B - ISP	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-22	Electric/Gas	Additional annual saturation data should be collected through the end of the 2019-2021 term to closely monitor changes in the C&I lighting market, particularly within linear lighting applications. These results should be used as calibration points in the Market Model to verify or improve the market share forecasts that are used to establish future market baselines for EML calculations.	Statewide	Currently Under Consideration							
618	Baseline Transition Planning Track B - ISP	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-22	Electric/Gas	The PAs should consider additional improvements to the Market Model that will reduce the uncertainty of the future market share forecasts.	Statewide	Currently Under Consideration							
619	Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-23	Electric	Future commercial and industrial custom measure impact evaluations should assume that the industry standard practice for the lost opportunity purchase of a new IMM to produce medical parts is an all-electric IMM. This is supported by the literature review, data review, and interview results. This standard practice is not expected to change in the future.	Statewide	Yes							
620	Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-23	Electric	Future commercial and industrial custom measure impact evaluations should assume that the industry standard practice for the lost opportunity purchase of a new IMM with less than 200 tons of clamping force is an all-electric IMM. This is supported by the literature review and interview results. The 200-ton threshold is recommended based on the information presented in the CA ISP study and the interview findings. This standard practice may change as the mix of equipment available for purchase and associated costs change. DNV GL recommends reviewing this recommendation prior to the start of the 2020 program year.	Statewide	Yes							
621	Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-23	Electric	Future commercial and industrial custom measure impact evaluations should assume that the industry standard practice for the lost opportunity purchase for all other new IMMs is a machine that has variable volume hydraulic pumping. This standard practice may change as the mix of equipment available for purchase and associated costs change. DNV GL recommends reviewing this recommendation prior to the start of the 2020 program year. This is supported by the literature review, data review, and interview results.	Statewide	Yes							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
622	Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-23	Electric	Future commercial and industrial impact evaluations should continue the practice of specifying the assumed baseline machine model or models for each project sampled. This information will be necessary to accurately estimate the energy consumption in the baseline case as there is not sufficient information to accurately estimate consumption without it. The baseline machine should align with the agreed industry standard practice definition and continue to be a machine that is able to meet the required product specifications for the expected parts at time of selection and was a machine the manufacturer stocked at the time (i.e., not a custom-built machine).	Statewide	Yes							
623	Massachusetts Commercial and Industrial Injection Molding Machine Market Assessment Baseline Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-23	Electric	Future commercial and industrial impact evaluations should utilize the savings calculation framework in the report to estimate evaluated gross energy savings. Evaluated gross energy savings should continue to be calculated based on the normal production volume and practices found at the time of evaluation. Future evaluations should be prepared for situations where the as found normal production practice is different than expected at the time of machine selection. This framework should be reviewed and updated if necessary at the conclusion of future impact evaluation studies that include the evaluation of lost opportunity IMM installations.	Statewide	Yes							
624	Two-Tier Steam Trap Savings Study	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-24	Gas	ERS recommends that the PAs adopt a two-tier approach for prescriptive steam trap savings in 2019 and beyond in accordance with the following: (1) If the system operating pressure is ≤15 psig, PAs should claim 8.4 MMBtu/yr for every steam trap repaired or replaced at the facility through the program, or (2) If the system operating pressure is >15 psig, PAs should claim 35.6 MMBtu/yr for every steam trap repaired or replaced at the facility through the program.	Statewide	Yes							
625	Market Quick Hit Study on Water Consumption for Tankless Water Heaters	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-25	Gas	Use new estimates for water consumption in tankless water heaters.	Statewide	Yes							
626	MA Small Business Lighting Updated Impact Results	Commercial & Industrial	2016-2018 Term Report	Appendix D, Study 18-26	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
627	Massachusetts Statewide Residential and Commercial 2018 Awareness Survey	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-27	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
628	Residential HVAC Efficient Market Share Estimates	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-28	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
629	Follow-up Interviews with CCSI Commercial Training Attendees	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-29	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
630	Analysis of Immediate Code Compliance Support Initiative Residential Training Surveys on 2015 IECC - May 31 through November 21, 2017	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-30	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
631	Analysis of Immediate Code Compliance Support Initiative Residential Classroom Training Surveys - February 14 through April 19, 2018	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-31	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
632	Analysis of Immediate Code Compliance Support Initiative Commercial Classroom Training Surveys - April 24 through October 1, 2018	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-32	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
633	Findings of Follow Up Interviews with Massachusetts Code Compliance Support Initiative Residential Training Attendees	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-33	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
634	Process Assessment for the Cross-Cutting Code Compliance Support Initiative Evaluation	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-34	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
635	Solar and Home Energy Services Safety Remediation Non-Energy Impacts Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-35	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
636	Massachusetts Sponsors' Commercial and Industrial Programs MOU Research Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-36	Electric/Gas	Flag MOU customers in participation data.	Statewide	Currently Under Consideration							
637	Massachusetts Sponsors' Commercial and Industrial Programs MOU Research Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-36	Electric/Gas	Include the main MOU contact name and contact details with the participation data.	Statewide	Currently Under Consideration							
638	Massachusetts Sponsors' Commercial and Industrial Programs MOU Research Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-36	Electric/Gas	For MOU customers, modify survey questions to reference the MOU when asking about the program assistance they may have received.	Statewide	Currently Under Consideration							
639	Massachusetts Sponsors' Commercial and Industrial Programs MOU Research Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-36	Electric/Gas	For MOU customers, add survey questions regarding the respondent's personal involvement with the MOU.	Statewide	Will Consider for Future Studies							
640	Massachusetts Sponsors' Commercial and Industrial Programs MOU Research Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-36	Electric/Gas	For MOU customers, add a survey question regarding the influence of the MOU in their decision to implement the project.	Statewide	Will Consider for Future Studies							
641	2016 Residential Customer Profile Stakeholder Summary	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-37	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
642	2017 Residential Customer Profile Study	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-38	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
643	2016 C&I Customer Profile Project Deep Dive Report - Advanced Lighting	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-39	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
644	2016 C&I Customer Profile Project Deep Dive Report - Exploration of HVAC Trends	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-40	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							
645	2017 Commercial and Industrial Customer Profile Study Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-41	Electric/Gas	Add a location-level analysis grain to future CCPS reports.	Statewide	Yes							
646	2017 Commercial and Industrial Customer Profile Study Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-41	Electric/Gas	Leverage the combination of location-level analyses, energy use, and American Community Survey block group data to identify and quantify opportunities for strategic electrification and fuel switching.	Statewide	Currently Under Consideration							
647	Enhanced Customer-Level Database Capabilities	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-42	Electric/Gas	Annually rerun the tax integration process.	Statewide	Currently Under Consideration							
648	Enhanced Customer-Level Database Capabilities	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-42	Electric/Gas	Continue to refine the logic models.	Statewide	Currently Under Consideration							
649	Enhanced Customer-Level Database Capabilities	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-42	Electric/Gas	Integrate physiographic information with residential data.	Statewide	Currently Under Consideration							
650	Enhanced Customer-Level Database Capabilities	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-42	Electric/Gas	Continue to pursue ways to use this data.	Statewide	Yes							
651	Cape Light Compact 2018 Smart A/C Savings Program Evaluation	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-43	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
652	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Consider how to balance recruiting expectations between the vendor and the Eversource AEs.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
653	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Continue to work with the interconnection team to advocate for a streamlined interconnection process.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
654	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Use a centralized dispatch platform to call DR events and allow enough time for vendors to integrate before the summer	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
655	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Continue to work with battery implementers to optimize recharging.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
656	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Use thermal storage for longer dispatch windows.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
657	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Continue to explore the optimal relationship between Eversource load control programs and the ISO-NE market offerings.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
658	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	The vendors should provide their initial committed reduction per site and, at the end of each season, their reported load reduction.	PA Specific	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A
659	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	The vendors should inventory and document all affected equipment.	PA Specific	Currently under consideration	N/A	Currently under consideration	N/A	N/A	N/A	N/A	N/A
660	2018 Crosscutting Demand Demonstration Project Evaluation Report	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-44	Electric	Involve M&V contractor during DR feasibility testing to allow for real-time verification of manual curtailment and BMS controls projects.	PA Specific	Currently under consideration	N/A	Currently under consideration	N/A	N/A	N/A	N/A	N/A
661	2018 Residential Wi-Fi Thermostat Demand Response Evaluation	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-45	Electric	For 2018, National Grid should claim an average demand savings of 0.71 kW per thermostat enrolled in Connected Solutions in Massachusetts	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A

Rec #	Study Name	Sector	Filing/Docket	Study Location and Number	Fuel	Recommendation	PA Specific / Statewide	Did the Program Administrator implement the recommendation (Yes, No & Explain Why not, Currently Under Consideration, Will Consider for Future Studies, N/A)	National Grid	Eversource	CMA	Liberty	Berkshire	CLC	Unitil
662	2018 Residential Wi-Fi Thermostat Demand Response Evaluation	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-45	Electric	Remove thermostats that persistently opt-out (i.e., consider implementing auto-unenroll functionality)	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
663	2018 Residential Wi-Fi Thermostat Demand Response Evaluation	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-45	Electric	Proactively monitor connectivity issues; remove thermostats with persistent connectivity issues; consider implementing an auto-unenroll functionality	PA Specific	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
664	Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-46	Electric	Develop a reliable data warehouse for customer interval data and confirm its gathering of data as part of normal program management checks. For the sake of redundancy, consider making it a requirement that CSPs maintain a full set of customer interval data for a set period after each season. Customers in the ISO NE markets are expected to already have this system in place.	PA Specific	Currently under consideration	Currently under consideration	N/A	N/A	N/A	N/A	N/A	N/A
665	Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-46	Electric	Develop Demonstration requirements that minimize the potential negative implications of program overlap with ISO NE activity. Allow customers to obtain ISO NE capacity supply obligations only if active energy market activity is foregone and Demonstration event days are reported as unavailable back to ISO NE.	PA Specific	Currently under consideration	Currently under consideration	N/A	N/A	N/A	N/A	N/A	N/A
666	Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-46	Electric	Use a regression model approach to estimate impacts for annual reporting needs. The regression approach uses all data across the summer to set the most appropriate baseline that would have happened absent the curtailment.	PA Specific	Currently under consideration	Currently under consideration	N/A	N/A	N/A	N/A	N/A	N/A
667	Evaluation Of 2018 Demand Response Demonstration: C&I Connected Solutions	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-46	Electric	Evaluate the Connected Solutions C&I Program as part of the National Grid portfolio. This should occur within two years of its operation as a program. This can include an early examination of whether the final changes made as a result of this study are working as intended, assess settled values against enrolled estimates, perform ex-post regressions as needed to support annual claimed savings estimates, and ensure program satisfaction and operation are satisfactory.	PA Specific	Yes but study is in early planning stages.	Yes but study is in early planning stages.	N/A	N/A	N/A	N/A	N/A	N/A
668	Cost-Effectiveness of Demand Response for Residential End Uses	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-47	Electric	No formal recommendations were made in this evaluation.	N/A	N/A							
669	LIMF NEI Phase 1 Findings	Special & Cross Sector	2016-2018 Term Report	Appendix D, Study 18-48	Electric/Gas	No formal recommendations were made in this evaluation.	N/A	N/A							

## **APPENDIX F INVOICE SUMMARY TABLES**

The tables that follow provide a summary of invoices for each core initiative, sorted by budget category. The Compact will continue to maintain all invoices associated with the implementation of its energy efficiency programs.

The invoice summary tables are a summary of how invoices were paid by the Compact. While the invoices are organized by core initiative, not all costs in the invoices are specific to each core initiative. Such costs include IT support, legal services, general marketing for the efficiency programs, and other efficiency-related overhead costs provided by third-party vendors. These costs are allocated to each core initiative based on the core initiative's planned percentage of total costs. Additionally, the tables represent vendor invoices only. They do not include costs that are not paid via an invoice to a vendor, such as internal labor costs, internal expenses, direct incentive payments to participants, or loans repaid by participants as part of multi-year financing opportunities in certain core initiatives. Therefore, the totals in the tables will not match the totals in the Term Report Data tables.

Note that a Motion for Protective Treatment of Confidential Information is being submitted as part of this filing for information included in this appendix. As discussed in that motion, the Compact requests that the Department protect from public disclosure non-public vendor pricing information. Public disclosure of this information would reveal the Compact's proprietary, confidential pricing information, disclosure of which could harm the competitive business position of the Compact and its vendors.

## ***Vendor Invoice Summary Table***

### ***Notes***

Cape Light Compact  
D.P.U. 19-96  
August 1, 2019

- The following tables represents vendor invoices only. They do not include costs that are not paid via an invoice to a vendor, such as internal labor costs, internal expenses, direct incentive payments to participants, or loans repaid by participants as part of multi-year financing opportunities in certain core initiatives. Therefore, the totals in these tables will not match the totals in the Term Report Data tables.
- Allocated costs are those costs that are not specific to each core initiative. Such costs include IT support, legal services, general marketing for the efficiency programs, and other efficiency-related overhead costs provided by third-party vendors. These costs are allocated to each core initiative based on the core initiative's planned percentage of total costs.
- River Energy facilitates payment to other vendors for all PAs in order to minimize the administrative burdens and associated costs of invoicing; River Energy also provides meeting facilitation and other consulting services.



**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1a - Residential New Construction  
Cape Light Compact

2016 A1a - Residential New Construction						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.2A	-	-	-	-	-	-
2273.2B	-	-	-	-	-	-
2273.2C	-	-	-	-	-	-
2273.2D	-	-	-	-	-	-
2273.2E	-	-	-	-	-	-
2273.2F	-	-	-	-	-	-
2273.2G	-	-	-	-	-	-
2273.2H	-	-	-	-	-	-
2273.2I	-	-	-	-	-	-
2273.2J	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
16-806-01	-	-	-	-	-	-
16-806-02	-	-	-	-	-	-
16-806-03	-	-	-	-	-	-
16-806-04	-	-	-	-	-	-
16-806-05	-	-	-	-	-	-
16-806-06	-	-	-	-	-	-
16-806-07	-	-	-	-	-	-
16-806-08	-	-	-	-	-	-
16-806-09	-	-	-	-	-	-
16-806-10	-	-	-	-	-	-
16-806-11	-	-	-	-	-	-
16-806-12	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2016-199	-	-	-	-	-	-
<b>Home Energy Raters</b>						
7027	-	-	-	-	-	-
<b>ICF Resources, L.L.C.</b>						
BI_CLC E 01-17	-	-	-	-	-	-
BI_CLC E 06-16	-	-	-	-	-	-
BI_CLC E 07-16	-	-	-	-	-	-
BI_CLC E 08-16	-	-	-	-	-	-
BI_CLC E 09-16	-	-	-	-	-	-
BI_CLC E 10-16	-	-	-	-	-	-
BI_CLC E 11-16	-	-	-	-	-	-
BI_CLC E 12-16	-	-	-	-	-	-
BI_CLC_E 05-16	-	-	-	-	-	-
CAPE U01-16 NLI	-	-	-	-	-	-
CAPE U04-16	-	-	-	-	-	-
CAPE U05-16	-	-	-	-	-	-
CAPE U06-16	-	-	-	-	-	-
CAPE U08-16	-	-	-	-	-	-
CAPE U09-16	-	-	-	-	-	-
CAPE U10-16	-	-	-	-	-	-
CAPE U11-16	-	-	-	-	-	-
CAPE U12-15 NLI	-	-	-	-	-	-
CAPE U12-16	-	-	-	-	-	-
CAPE-U02-16-NLI	-	-	-	-	-	-
CAPE-U03-16-NLI	-	-	-	-	-	-
CAPEU07-16	-	-	-	-	-	-
CLC A001-16	-	-	-	-	-	-
CLC A005-16	-	-	-	-	-	-
CLC A006-16	-	-	-	-	-	-
CLC A007-16	-	-	-	-	-	-
CLC A008-16	-	-	-	-	-	-
CLC A009-16	-	-	-	-	-	-
CLC A010-16	-	-	-	-	-	-
CLC A011-16	-	-	-	-	-	-
CLC A012-15	-	-	-	-	-	-
CLC A012-16	-	-	-	-	-	-
CLC E 01-16	-	-	-	-	-	-
CLC E 02-16	-	-	-	-	-	-
CLC E 04-16	-	-	-	-	-	-
CLC-A002-16	-	-	-	-	-	-
CLC-A003-16	-	-	-	-	-	-
CLC-A004-16	-	-	-	-	-	-
CLC-E-03-16	-	-	-	-	-	-
RECORD	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7870DEC15	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1010 B	-	-	-	-	-	-
1011 B	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
INV-222963	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1a - Residential New Construction  
Cape Light Compact

2016 A1a - Residential New Construction						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
CLEARresult Consulting, Inc.	-	-	-	-	-	-
6073	-	-	-	-	-	-
6226	-	-	-	-	-	-
6288	-	-	-	-	-	-
6377	-	-	-	-	-	-
6444	-	-	-	-	-	-
6528	-	-	-	-	-	-
6634	-	-	-	-	-	-
6698	-	-	-	-	-	-
6759	-	-	-	-	-	-
6785	-	-	-	-	-	-
6898	-	-	-	-	-	-
6949	-	-	-	-	-	-
6985	-	-	-	-	-	-
River Energy - NESAs	-	-	-	-	-	-
12597	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1b - Residential Multi-Family Retrofit  
Cape Light Compact

2016 A1b - Residential Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>						
136172	-	-	-	-	-	-
137454	-	-	-	-	-	-
138822	-	-	-	-	-	-
139288	-	-	-	-	-	-
139289	-	-	-	-	-	-
140347	-	-	-	-	-	-
140478	-	-	-	-	-	-
141624	-	-	-	-	-	-
141723	-	-	-	-	-	-
143007	-	-	-	-	-	-
143166	-	-	-	-	-	-
144228	-	-	-	-	-	-
144246	-	-	-	-	-	-
145508	-	-	-	-	-	-
145540	-	-	-	-	-	-
146603	-	-	-	-	-	-
146730	-	-	-	-	-	-
147834	-	-	-	-	-	-
148886	-	-	-	-	-	-
149808	-	-	-	-	-	-
150164	-	-	-	-	-	-
150964	-	-	-	-	-	-
151461	-	-	-	-	-	-
151485	-	-	-	-	-	-
152893	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
16-806-01	-	-	-	-	-	-
16-806-02	-	-	-	-	-	-
16-806-03	-	-	-	-	-	-
16-806-04	-	-	-	-	-	-
16-806-05	-	-	-	-	-	-
16-806-06	-	-	-	-	-	-
16-806-07	-	-	-	-	-	-
16-806-08	-	-	-	-	-	-
16-806-09	-	-	-	-	-	-
16-806-10	-	-	-	-	-	-
16-806-11	-	-	-	-	-	-
16-806-12	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
491904	-	-	-	-	-	-
0100000566	-	-	-	-	-	-
0100000884	-	-	-	-	-	-
0100001518	-	-	-	-	-	-
0100001962	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7870DEC15	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
INV-222963	-	-	-	-	-	-
225978	-	-	-	-	-	-
INV-216021	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
INV-234833	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

A1 - Residential Whole House

A1c - Residential Home Energy Services - Measures

Cape Light Compact

2016 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.1H	-	-	-	-	-	-
<b>Rise Engineering</b>						
139042	-	-	-	-	-	-
139553	-	-	-	-	-	-
139791	-	-	-	-	-	-
140479	-	-	-	-	-	-
141317	-	-	-	-	-	-
141694	-	-	-	-	-	-
141983	-	-	-	-	-	-
142036	-	-	-	-	-	-
142447	-	-	-	-	-	-
143039	-	-	-	-	-	-
143046	-	-	-	-	-	-
144145	-	-	-	-	-	-
144274	-	-	-	-	-	-
144365	-	-	-	-	-	-
145013	-	-	-	-	-	-
145697	-	-	-	-	-	-
145700	-	-	-	-	-	-
145701	-	-	-	-	-	-
145728	-	-	-	-	-	-
146333	-	-	-	-	-	-
147143	-	-	-	-	-	-
147144	-	-	-	-	-	-
147180	-	-	-	-	-	-
147229	-	-	-	-	-	-
147781	-	-	-	-	-	-
147782	-	-	-	-	-	-
147801	-	-	-	-	-	-
148853	-	-	-	-	-	-
149027	-	-	-	-	-	-
149102	-	-	-	-	-	-
149103	-	-	-	-	-	-
149728	-	-	-	-	-	-
150141	-	-	-	-	-	-
150143	-	-	-	-	-	-
150215	-	-	-	-	-	-
151376	-	-	-	-	-	-
151454	-	-	-	-	-	-
151527	-	-	-	-	-	-
152111	-	-	-	-	-	-
152156	-	-	-	-	-	-
152518	-	-	-	-	-	-
154255	-	-	-	-	-	-
W/E 02/12/2016	-	-	-	-	-	-
W/E 03/11/2016	-	-	-	-	-	-
W/E 04/22/2016	-	-	-	-	-	-
W/E 07.15.16	-	-	-	-	-	-
W/E 10/28/16	-	-	-	-	-	-
W/E 12/16/16	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
16-806-01	-	-	-	-	-	-
16-806-02	-	-	-	-	-	-
16-806-03	-	-	-	-	-	-
16-806-04	-	-	-	-	-	-
16-806-05	-	-	-	-	-	-
16-806-06	-	-	-	-	-	-
16-806-07	-	-	-	-	-	-
16-806-08	-	-	-	-	-	-
16-806-09	-	-	-	-	-	-
16-806-10	-	-	-	-	-	-
16-806-11	-	-	-	-	-	-
16-806-12	-	-	-	-	-	-
<b>Creative Services, Inc.</b>						
1334154	-	-	-	-	-	-
1336298	-	-	-	-	-	-
1336654	-	-	-	-	-	-
1337012	-	-	-	-	-	-
1337398	-	-	-	-	-	-
1337762	-	-	-	-	-	-
1337789	-	-	-	-	-	-
1337802	-	-	-	-	-	-
1339242	-	-	-	-	-	-
1339632	-	-	-	-	-	-
1340434	-	-	-	-	-	-
1340838	-	-	-	-	-	-
1341258	-	-	-	-	-	-
1341640	-	-	-	-	-	-
1341707	-	-	-	-	-	-
1342083	-	-	-	-	-	-
1343232	-	-	-	-	-	-
1344247	-	-	-	-	-	-
132258-1	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House

A1c - Residential Home Energy Services - Measures

Cape Light Compact

2016 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Energy Federation, Inc.	-	-	-	-	-	-
0445833-IN	-	-	-	-	-	-
0450024-IN	-	-	-	-	-	-
0454182-IN	-	-	-	-	-	-
0454214-IN	-	-	-	-	-	-
0459929-IN	-	-	-	-	-	-
0466093-IN	-	-	-	-	-	-
0467539-IN	-	-	-	-	-	-
0475447-IN	-	-	-	-	-	-
0479864-IN	-	-	-	-	-	-
0482353-IN	-	-	-	-	-	-
0489177-IN	-	-	-	-	-	-
0492779-IN	-	-	-	-	-	-
0495171-IN	-	-	-	-	-	-
0501290-IN	-	-	-	-	-	-
0504588-IN	-	-	-	-	-	-
0507653-IN	-	-	-	-	-	-
0512129-IN	-	-	-	-	-	-
0513416-IN	-	-	-	-	-	-
0524213-IN	-	-	-	-	-	-
0526651-IN	-	-	-	-	-	-
0528341-IN	-	-	-	-	-	-
0532376-IN	-	-	-	-	-	-
0535232-IN	-	-	-	-	-	-
0551050-IN	-	-	-	-	-	-
0553102-IN	-	-	-	-	-	-
0553371-IN	-	-	-	-	-	-
0582621-IN	-	-	-	-	-	-
0582728-IN	-	-	-	-	-	-
0582800-IN	-	-	-	-	-	-
0598266-IN	-	-	-	-	-	-
0601875-IN	-	-	-	-	-	-
0616598-IN	-	-	-	-	-	-
0616803-IN	-	-	-	-	-	-
0624739-IN	-	-	-	-	-	-
0626263-IN	-	-	-	-	-	-
0654797-IN	-	-	-	-	-	-
0672639-IN	-	-	-	-	-	-
0687008-IN	-	-	-	-	-	-
0690351-IN	-	-	-	-	-	-
0690980-IN	-	-	-	-	-	-
0693762-IN	-	-	-	-	-	-
Galligan Energy Consulting Inc.	-	-	-	-	-	-
2016-199	-	-	-	-	-	-
Heritage Press, Inc.	-	-	-	-	-	-
00098458	-	-	-	-	-	-
00098459	-	-	-	-	-	-
00098460	-	-	-	-	-	-
00098461	-	-	-	-	-	-
00098462	-	-	-	-	-	-
KEMA, Inc.	-	-	-	-	-	-
10010601	-	-	-	-	-	-
Navigant Consulting, Inc.	-	-	-	-	-	-
491904	-	-	-	-	-	-
0100000566	-	-	-	-	-	-
0100000884	-	-	-	-	-	-
0100001518	-	-	-	-	-	-
0100001962	-	-	-	-	-	-
491902	-	-	-	-	-	-
Nexant Inc	-	-	-	-	-	-
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-000205758E	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
7831FEB16	-	-	-	-	-	-
7870CL JUL16	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
Vineyard Gazette, LLC.	-	-	-	-	-	-
300699846	-	-	-	-	-	-
The Cadmus Group, Inc.	-	-	-	-	-	-
INV-222963	-	-	-	-	-	-
225978	-	-	-	-	-	-
INV-216021	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
228135	-	-	-	-	-	-
INV-221284	-	-	-	-	-	-
INV-224582	-	-	-	-	-	-
INV-229111	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House

A1c - Residential Home Energy Services - Measures

Cape Light Compact

2016 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
CLEAResult Consulting, Inc.	-	-	-	-	-	-
20160131-531CLC418	-	-	-	-	-	-
MV Times Corporation, Inc. The Martha's Vineyard Times	-	-	-	-	-	-
301090074	-	-	-	-	-	-
River Energy - CLEAResult	-	-	-	-	-	-
10833	-	-	-	-	-	-
11017	-	-	-	-	-	-
11151	-	-	-	-	-	-
11160	-	-	-	-	-	-
11335	-	-	-	-	-	-
11420	-	-	-	-	-	-
11535	-	-	-	-	-	-
11682	-	-	-	-	-	-
11849	-	-	-	-	-	-
11938	-	-	-	-	-	-
12084	-	-	-	-	-	-
12248	-	-	-	-	-	-
12385	-	-	-	-	-	-
12536	-	-	-	-	-	-
River Energy - Graham Built Homes	-	-	-	-	-	-
10965	-	-	-	-	-	-
12220	-	-	-	-	-	-
River Energy - Rebello Construction	-	-	-	-	-	-
10916	-	-	-	-	-	-
River Energy - Cape Cod Insulation	-	-	-	-	-	-
10642	-	-	-	-	-	-
River Energy - KSV	-	-	-	-	-	-
10859	-	-	-	-	-	-
10992	-	-	-	-	-	-
11111	-	-	-	-	-	-
11136	-	-	-	-	-	-
11296	-	-	-	-	-	-
River Energy - Superior Energy Solutions	-	-	-	-	-	-
11181	-	-	-	-	-	-
River Energy - Oasis	-	-	-	-	-	-
11645	-	-	-	-	-	-
River Energy - Green Bean Energy	-	-	-	-	-	-
11591	-	-	-	-	-	-
River Energy - American Installation	-	-	-	-	-	-
11027	-	-	-	-	-	-
11240	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2016 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>	-	-	-	-	-	-
145697	-	-	-	-	-	-
145700	-	-	-	-	-	-
139044	-	-	-	-	-	-
139792	-	-	-	-	-	-
140480	-	-	-	-	-	-
141257	-	-	-	-	-	-
141316	-	-	-	-	-	-
141863	-	-	-	-	-	-
142413	-	-	-	-	-	-
143038	-	-	-	-	-	-
144146	-	-	-	-	-	-
144276	-	-	-	-	-	-
145014	-	-	-	-	-	-
146990	-	-	-	-	-	-
147142	-	-	-	-	-	-
147209	-	-	-	-	-	-
147783	-	-	-	-	-	-
148852	-	-	-	-	-	-
149020	-	-	-	-	-	-
149668	-	-	-	-	-	-
151167	-	-	-	-	-	-
152050	-	-	-	-	-	-
152076	-	-	-	-	-	-
152116	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>	-	-	-	-	-	-
16-806-01	-	-	-	-	-	-
16-806-02	-	-	-	-	-	-
16-806-03	-	-	-	-	-	-
16-806-04	-	-	-	-	-	-
16-806-05	-	-	-	-	-	-
16-806-06	-	-	-	-	-	-
16-806-07	-	-	-	-	-	-
<b>KEMA, Inc.</b>	-	-	-	-	-	-
10010601	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
491904	-	-	-	-	-	-
0100000566	-	-	-	-	-	-
0100000884	-	-	-	-	-	-
0100001518	-	-	-	-	-	-
0100001962	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-222963	-	-	-	-	-	-
225978	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
228135	-	-	-	-	-	-
INV-224582	-	-	-	-	-	-
INV-229111	-	-	-	-	-	-
<b>River Energy - CLEAResult</b>	-	-	-	-	-	-
11017	-	-	-	-	-	-
11160	-	-	-	-	-	-
11335	-	-	-	-	-	-
11420	-	-	-	-	-	-
11535	-	-	-	-	-	-
11682	-	-	-	-	-	-
11849	-	-	-	-	-	-
12084	-	-	-	-	-	-
12248	-	-	-	-	-	-
12385	-	-	-	-	-	-
12536	-	-	-	-	-	-
<b>River Energy - RCS</b>	-	-	-	-	-	-
10948	-	-	-	-	-	-
<b>River Energy - RichMay</b>	-	-	-	-	-	-
10752	-	-	-	-	-	-
10938	-	-	-	-	-	-
11055	-	-	-	-	-	-
11363	-	-	-	-	-	-
11401	-	-	-	-	-	-
11671	-	-	-	-	-	-
11813	-	-	-	-	-	-
12020	-	-	-	-	-	-
12159	-	-	-	-	-	-
12330	-	-	-	-	-	-
12497	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2016 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
River Energy - Ansafo	-	-	-	-	-	-
10652	-	-	-	-	-	-
10670	-	-	-	-	-	-
10773	-	-	-	-	-	-
10798	-	-	-	-	-	-
10974	-	-	-	-	-	-
11075	-	-	-	-	-	-
11118	-	-	-	-	-	-
11250	-	-	-	-	-	-
11258	-	-	-	-	-	-
11440	-	-	-	-	-	-
11469	-	-	-	-	-	-
11478	-	-	-	-	-	-
11601	-	-	-	-	-	-
11609	-	-	-	-	-	-
11618	-	-	-	-	-	-
11750	-	-	-	-	-	-
11779	-	-	-	-	-	-
11795	-	-	-	-	-	-
11957	-	-	-	-	-	-
11979	-	-	-	-	-	-
11988	-	-	-	-	-	-
12112	-	-	-	-	-	-
12138	-	-	-	-	-	-
12147	-	-	-	-	-	-
12270	-	-	-	-	-	-
12281	-	-	-	-	-	-
12290	-	-	-	-	-	-
12429	-	-	-	-	-	-
12438	-	-	-	-	-	-
12560	-	-	-	-	-	-
12623	-	-	-	-	-	-
River Energy - KSV	-	-	-	-	-	-
10859	-	-	-	-	-	-
10992	-	-	-	-	-	-
11111	-	-	-	-	-	-
11136	-	-	-	-	-	-
11296	-	-	-	-	-	-
River Energy - Oasis	-	-	-	-	-	-
11645	-	-	-	-	-	-
River Energy - Verizon	-	-	-	-	-	-
12623	-	-	-	-	-	-
12614	-	-	-	-	-	-
<b>Grand Total</b>						



**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1e - Residential Behavior/Feedback Program  
Cape Light Compact

2016 A1e - Residential Behavior/Feedback Program						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0427436-IN	-	-	-	-	-	-
0589640-IN	-	-	-	-	-	-
0608879-IN	-	-	-	-	-	-
<b>EnergyWright, Inc.</b>						
16-110	-	-	-	-	-	-
16-111	-	-	-	-	-	-
16-118	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
491904	-	-	-	-	-	-
484160	-	-	-	-	-	-
486627	-	-	-	-	-	-
490240	-	-	-	-	-	-
493774	-	-	-	-	-	-
<b>Panera Bread Company/Panera, LLC</b>						
20355100050	-	-	-	-	-	-
<b>People Power Company</b>						
CL033-B	-	-	-	-	-	-
CLC027-B	-	-	-	-	-	-
CLC028-B	-	-	-	-	-	-
CLC029-B	-	-	-	-	-	-
CLC030-B	-	-	-	-	-	-
CLC031-B	-	-	-	-	-	-
CLC032-B	-	-	-	-	-	-
CLC034-B	-	-	-	-	-	-
CLC035-B	-	-	-	-	-	-
CLC036-B	-	-	-	-	-	-
CLC037-B	-	-	-	-	-	-
CLC038-B	-	-	-	-	-	-
<b>TWOMBLY, CHRISTINE C</b>						
02-25-16-02-29-16	-	-	-	-	-	-
RESED-12/16	-	-	-	-	-	-
<b>WB MASON</b>						
I32312435	-	-	-	-	-	-
I32342622	-	-	-	-	-	-
I34578299	-	-	-	-	-	-
I34604756	-	-	-	-	-	-
I38869487	-	-	-	-	-	-
I40849350	-	-	-	-	-	-
I40881514	-	-	-	-	-	-
I42076669	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
INV-222963	-	-	-	-	-	-
<b>Cole-Parmer Instrument</b>						
9521697	-	-	-	-	-	-
9528591	-	-	-	-	-	-
9530132	-	-	-	-	-	-
9533243	-	-	-	-	-	-
9536186	-	-	-	-	-	-
9536664	-	-	-	-	-	-
9569422	-	-	-	-	-	-
9795745	-	-	-	-	-	-
9804037	-	-	-	-	-	-
<b>Educational Innovation</b>						
739124-1	-	-	-	-	-	-
707083-1	-	-	-	-	-	-
726814-1	-	-	-	-	-	-
<b>National Energy Education Development</b>						
77992	-	-	-	-	-	-
78087	-	-	-	-	-	-
<b>EnergySolutions Training</b>						
1901	-	-	-	-	-	-
<b>Sally Andreola</b>						
2016-3	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2016 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Blackhawk Engagement</b>						
4Q 640112	-	-	-	-	-	-
4Q 640213	-	-	-	-	-	-
4Q 640313	-	-	-	-	-	-
4Q 640413	-	-	-	-	-	-
5G 55ME072	-	-	-	-	-	-
5G 650059	-	-	-	-	-	-
5G 650155	-	-	-	-	-	-
5G 650258	-	-	-	-	-	-
5G 650458	-	-	-	-	-	-
5G 65ME006	-	-	-	-	-	-
5G 65ME018	-	-	-	-	-	-
5G 65ME024	-	-	-	-	-	-
5G 65ME030	-	-	-	-	-	-
5G 65ME036	-	-	-	-	-	-
5G 65ME042	-	-	-	-	-	-
5G 65ME048	-	-	-	-	-	-
5G 65ME054	-	-	-	-	-	-
5G 65ME060	-	-	-	-	-	-
5G 65ME066	-	-	-	-	-	-
5G 65NE012	-	-	-	-	-	-
5G650356	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0485592	-	-	-	-	-	-
0192060-IN	-	-	-	-	-	-
0413156-IN	-	-	-	-	-	-
0413660-IN	-	-	-	-	-	-
0422161-IN	-	-	-	-	-	-
0427544-IN	-	-	-	-	-	-
0431109-IN	-	-	-	-	-	-
0437503-IN	-	-	-	-	-	-
0441114-IN	-	-	-	-	-	-
0444878-IN	-	-	-	-	-	-
0445793-IN	-	-	-	-	-	-
0445810-IN	-	-	-	-	-	-
0447456-IN	-	-	-	-	-	-
0447945-IN	-	-	-	-	-	-
0450075-IN	-	-	-	-	-	-
0453693-IN	-	-	-	-	-	-
0453752-IN	-	-	-	-	-	-
0454200-IN	-	-	-	-	-	-
0454598-IN	-	-	-	-	-	-
0458198-IN	-	-	-	-	-	-
0458845-IN	-	-	-	-	-	-
0458864-IN	-	-	-	-	-	-
0461833-IN	-	-	-	-	-	-
0465422-IN	-	-	-	-	-	-
0466032-IN	-	-	-	-	-	-
0470170-IN	-	-	-	-	-	-
0470887-IN	-	-	-	-	-	-
0474143-IN	-	-	-	-	-	-
0476500-IN	-	-	-	-	-	-
0477189-IN	-	-	-	-	-	-
0478933-IN	-	-	-	-	-	-
0479506-IN	-	-	-	-	-	-
0484807-IN	-	-	-	-	-	-
0488215-IN	-	-	-	-	-	-
0490077-IN	-	-	-	-	-	-
0491480-IN	-	-	-	-	-	-
0492568-IN	-	-	-	-	-	-
0493598-IN	-	-	-	-	-	-
0496873-IN	-	-	-	-	-	-
0497163-IN	-	-	-	-	-	-
0500226-IN	-	-	-	-	-	-
0501906-IN	-	-	-	-	-	-
0504580-IN	-	-	-	-	-	-
0506765-IN	-	-	-	-	-	-
0507399-IN	-	-	-	-	-	-
0509844-IN	-	-	-	-	-	-
0510887-IN	-	-	-	-	-	-
0513036-IN	-	-	-	-	-	-
0514737-IN	-	-	-	-	-	-
0516286-IN	-	-	-	-	-	-
0520119-IN	-	-	-	-	-	-
0524965-IN	-	-	-	-	-	-
0526883-IN	-	-	-	-	-	-
0529701-IN	-	-	-	-	-	-
0534896-IN	-	-	-	-	-	-
0537362-IN	-	-	-	-	-	-
0542914-IN	-	-	-	-	-	-
0546159-IN	-	-	-	-	-	-
0547188-IN	-	-	-	-	-	-
0566441-IN	-	-	-	-	-	-
0577962-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2016 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
0581445-IN	-	-	-	-	-	-
0598146-IN	-	-	-	-	-	-
0604159-IN	-	-	-	-	-	-
0611896-IN	-	-	-	-	-	-
0618139-IN	-	-	-	-	-	-
0635313-IN	-	-	-	-	-	-
0644320-IN	-	-	-	-	-	-
0661016-IN	-	-	-	-	-	-
0671020-IN	-	-	-	-	-	-
0671372-IN	-	-	-	-	-	-
0684029-IN	-	-	-	-	-	-
0684576-IN	-	-	-	-	-	-
0721047-IN	-	-	-	-	-	-
0742205-IN	-	-	-	-	-	-
0744088-IN	-	-	-	-	-	-
0747631-IN	-	-	-	-	-	-
0763865-IN	-	-	-	-	-	-
0771197-IN	-	-	-	-	-	-
0771229-IN	-	-	-	-	-	-
0779730-IN	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
491904	-	-	-	-	-	-
0100000566	-	-	-	-	-	-
0100001518	-	-	-	-	-	-
0100001962	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1010 B	-	-	-	-	-	-
1011 B	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
1009 B	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-222963	-	-	-	-	-	-
INV-216021	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
228135	-	-	-	-	-	-
INV-221284	-	-	-	-	-	-
INV-229111	-	-	-	-	-	-
INV-235507	-	-	-	-	-	-
<b>CLEARResult Consulting, Inc.</b>	-	-	-	-	-	-
85-CAPE LIGHT	-	-	-	-	-	-
85-CAPE LIGHT-1	-	-	-	-	-	-
86-CAPE LIGHT	-	-	-	-	-	-
87-CAPE LIGHT	-	-	-	-	-	-
88-CAPE LIGHT	-	-	-	-	-	-
89-CAPE LIGHT	-	-	-	-	-	-
89-CAPE LIGHT-1	-	-	-	-	-	-
90-CAPE LIGHT	-	-	-	-	-	-
91-CAPE LIGHT	-	-	-	-	-	-
91-CAPE LIGHT-1	-	-	-	-	-	-
92-CAPE LIGHT	-	-	-	-	-	-
92-CAPE LIGHT A	-	-	-	-	-	-
93-CAPE LIGHT	-	-	-	-	-	-
93-CAPE LIGHT A	-	-	-	-	-	-
94-CAPE LIGHT	-	-	-	-	-	-
95-CAPE LIGHT	-	-	-	-	-	-
96-CAPE LIGHT	-	-	-	-	-	-
<b>River Energy - CLEARResult</b>	-	-	-	-	-	-
11849	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2b - Residential Consumer Products  
Cape Light Compact

2016 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Appliance Recycling Centers of America, Inc.</b>						
45170	-	-	-	-	-	-
45171	-	-	-	-	-	-
45172	-	-	-	-	-	-
45173	-	-	-	-	-	-
45193	-	-	-	-	-	-
45194	-	-	-	-	-	-
45352	-	-	-	-	-	-
45353	-	-	-	-	-	-
45597	-	-	-	-	-	-
45598	-	-	-	-	-	-
45787	-	-	-	-	-	-
45788	-	-	-	-	-	-
45967	-	-	-	-	-	-
45968	-	-	-	-	-	-
<b>Blackhawk Engagement</b>						
1F 51ME072	-	-	-	-	-	-
1F 61ME006	-	-	-	-	-	-
2E 52ME072	-	-	-	-	-	-
<b>Crane Appliance</b>						
FA00002444-1	-	-	-	-	-	-
FA00002734	-	-	-	-	-	-
FA00002739	-	-	-	-	-	-
OR00001422	-	-	-	-	-	-
OR00001423	-	-	-	-	-	-
OR00001424	-	-	-	-	-	-
OR00001425	-	-	-	-	-	-
OR00001426	-	-	-	-	-	-
OR00001427	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0451076	-	-	-	-	-	-
0663187	-	-	-	-	-	-
0406494-IN	-	-	-	-	-	-
0411204-IN	-	-	-	-	-	-
0413665-IN	-	-	-	-	-	-
0413671-IN	-	-	-	-	-	-
0414646-IN	-	-	-	-	-	-
0416806-IN	-	-	-	-	-	-
0417636-IN	-	-	-	-	-	-
0417639-IN	-	-	-	-	-	-
0419242-IN	-	-	-	-	-	-
0419254-IN	-	-	-	-	-	-
0419294-IN	-	-	-	-	-	-
0419295-IN	-	-	-	-	-	-
0420178-IN	-	-	-	-	-	-
0420283-IN	-	-	-	-	-	-
0427570-IN	-	-	-	-	-	-
0431089-IN	-	-	-	-	-	-
0434138-IN	-	-	-	-	-	-
0438054-IN	-	-	-	-	-	-
0440262-IN	-	-	-	-	-	-
0440263-IN	-	-	-	-	-	-
0440316-IN	-	-	-	-	-	-
0440325-IN	-	-	-	-	-	-
0447600-IN	-	-	-	-	-	-
0448887-IN	-	-	-	-	-	-
0452679-IN	-	-	-	-	-	-
0452707-IN	-	-	-	-	-	-
0453770-IN	-	-	-	-	-	-
0453771-IN	-	-	-	-	-	-
0453809-IN	-	-	-	-	-	-
0453810-IN	-	-	-	-	-	-
0456268-IN	-	-	-	-	-	-
0459365-IN	-	-	-	-	-	-
0465398-IN	-	-	-	-	-	-
0465433-IN	-	-	-	-	-	-
0465434-IN	-	-	-	-	-	-
0467547-IN	-	-	-	-	-	-
0468166-IN	-	-	-	-	-	-
0468192-IN	-	-	-	-	-	-
0471419-IN	-	-	-	-	-	-
0475549-IN	-	-	-	-	-	-
0479427-IN	-	-	-	-	-	-
0479496-IN	-	-	-	-	-	-
0480985-IN	-	-	-	-	-	-
0482441-IN	-	-	-	-	-	-
0489672-IN	-	-	-	-	-	-
0490762-IN	-	-	-	-	-	-
0490764-IN	-	-	-	-	-	-
0490772-IN	-	-	-	-	-	-
0490774-IN	-	-	-	-	-	-
0490776-IN	-	-	-	-	-	-
0490778-IN	-	-	-	-	-	-
0492124-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2b - Residential Consumer Products  
Cape Light Compact

2016 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
0492158-IN	-	-	-	-	-	-
0492160-IN	-	-	-	-	-	-
0493590-IN	-	-	-	-	-	-
0493604-IN	-	-	-	-	-	-
0498661-IN	-	-	-	-	-	-
0499465-IN	-	-	-	-	-	-
0501342-IN	-	-	-	-	-	-
0502574-IN	-	-	-	-	-	-
0507280-IN	-	-	-	-	-	-
0509854-IN	-	-	-	-	-	-
0514117-IN	-	-	-	-	-	-
0515622-IN	-	-	-	-	-	-
0518712-IN	-	-	-	-	-	-
0518725-IN	-	-	-	-	-	-
0523040-IN	-	-	-	-	-	-
0523828-IN	-	-	-	-	-	-
0527656-IN	-	-	-	-	-	-
0534708-IN	-	-	-	-	-	-
0539816-IN	-	-	-	-	-	-
0539908-IN	-	-	-	-	-	-
0553431-IN	-	-	-	-	-	-
0578569-IN	-	-	-	-	-	-
0578649-IN	-	-	-	-	-	-
0583484-IN	-	-	-	-	-	-
0590226-IN	-	-	-	-	-	-
0600758-IN	-	-	-	-	-	-
0622308-IN	-	-	-	-	-	-
0663187-IN	-	-	-	-	-	-
0669261-IN	-	-	-	-	-	-
0705998-IN	-	-	-	-	-	-
0706055-IN	-	-	-	-	-	-
0725110-IN	-	-	-	-	-	-
0765647-IN	-	-	-	-	-	-
0774040-IN	-	-	-	-	-	-
0786579-IN	-	-	-	-	-	-
Lockheed Martin Corporation	-	-	-	-	-	-
21738006	-	-	-	-	-	-
21738007	-	-	-	-	-	-
E1603-060R	-	-	-	-	-	-
E1604-002A	-	-	-	-	-	-
E1605-030A	-	-	-	-	-	-
E1606-036A	-	-	-	-	-	-
E1607-084A	-	-	-	-	-	-
E1609-052A	-	-	-	-	-	-
E1610-088	-	-	-	-	-	-
E1611-039	-	-	-	-	-	-
E1612-128	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
The Cadmus Group, Inc.	-	-	-	-	-	-
INV-222963	-	-	-	-	-	-
INV-216021	-	-	-	-	-	-
INV-220484	-	-	-	-	-	-
INV-220489	-	-	-	-	-	-
INV-222404	-	-	-	-	-	-
INV-222409	-	-	-	-	-	-
INV-224279	-	-	-	-	-	-
INV-224323	-	-	-	-	-	-
INV-225277	-	-	-	-	-	-
INV-225307	-	-	-	-	-	-
INV-226925	-	-	-	-	-	-
INV-226930	-	-	-	-	-	-
INV-229315	-	-	-	-	-	-
INV-229319	-	-	-	-	-	-
INV-230075	-	-	-	-	-	-
INV-230079	-	-	-	-	-	-
INV-231299	-	-	-	-	-	-
INV-231304	-	-	-	-	-	-
INV-233168	-	-	-	-	-	-
INV-233175	-	-	-	-	-	-
INV-234269	-	-	-	-	-	-
INV-234276	-	-	-	-	-	-
INV-235694	-	-	-	-	-	-
INV-235699	-	-	-	-	-	-
INV-236978	-	-	-	-	-	-
Interstate Refrigerant	-	-	-	-	-	-
1968	-	-	-	-	-	-
Jaco Environmental	-	-	-	-	-	-
CC562-566	-	-	-	-	-	-
Grand Total	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products  
A2c - Residential Lighting  
Cape Light Compact

2016 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.1A	-	-	-	-	-	-
2273.1B	-	-	-	-	-	-
2273.1C	-	-	-	-	-	-
2273.1E	-	-	-	-	-	-
2273.1G	-	-	-	-	-	-
2273.1I	-	-	-	-	-	-
2273.1J	-	-	-	-	-	-
2273.1D	-	-	-	-	-	-
2273.1F	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0416806-IN	-	-	-	-	-	-
0419254-IN	-	-	-	-	-	-
0438054-IN	-	-	-	-	-	-
0452707-IN	-	-	-	-	-	-
0465398-IN	-	-	-	-	-	-
0479427-IN	-	-	-	-	-	-
0492124-IN	-	-	-	-	-	-
0518725-IN	-	-	-	-	-	-
0523040-IN	-	-	-	-	-	-
0600758-IN	-	-	-	-	-	-
0705998-IN	-	-	-	-	-	-
0774040-IN	-	-	-	-	-	-
0407985-IN	-	-	-	-	-	-
0413977-IN	-	-	-	-	-	-
0419293-IN	-	-	-	-	-	-
0422171-IN	-	-	-	-	-	-
0431114-IN	-	-	-	-	-	-
0440261-IN	-	-	-	-	-	-
0442085-IN	-	-	-	-	-	-
0450363-IN	-	-	-	-	-	-
0453769-IN	-	-	-	-	-	-
0455672-IN	-	-	-	-	-	-
0460032-IN	-	-	-	-	-	-
0465427-IN	-	-	-	-	-	-
0470155-IN	-	-	-	-	-	-
0476454-IN	-	-	-	-	-	-
0477176-IN	-	-	-	-	-	-
0480984-IN	-	-	-	-	-	-
0482360-IN	-	-	-	-	-	-
0488241-IN	-	-	-	-	-	-
0489218-IN	-	-	-	-	-	-
0492157-IN	-	-	-	-	-	-
0494372-IN	-	-	-	-	-	-
0499446-IN	-	-	-	-	-	-
0502573-IN	-	-	-	-	-	-
0502805-IN	-	-	-	-	-	-
0506988-IN	-	-	-	-	-	-
051382-IN	-	-	-	-	-	-
0518711-IN	-	-	-	-	-	-
0525328-IN	-	-	-	-	-	-
0535393-IN	-	-	-	-	-	-
0538430-IN	-	-	-	-	-	-
0539735-IN	-	-	-	-	-	-
0553826-IN	-	-	-	-	-	-
0580819-IN	-	-	-	-	-	-
0615332-IN	-	-	-	-	-	-
0617609-IN	-	-	-	-	-	-
0620432-IN	-	-	-	-	-	-
0656333-IN	-	-	-	-	-	-
0669250-IN	-	-	-	-	-	-
0671245-IN	-	-	-	-	-	-
0706725-IN	-	-	-	-	-	-
0706742-IN	-	-	-	-	-	-
0757017-IN	-	-	-	-	-	-
0786523-IN	-	-	-	-	-	-
0802631-IN	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10010601	-	-	-	-	-	-
<b>Lockheed Martin Corporation</b>						
21738006	-	-	-	-	-	-
21738007	-	-	-	-	-	-
E1603-060R	-	-	-	-	-	-
E1604-002A	-	-	-	-	-	-
E1605-030A	-	-	-	-	-	-
E1606-036A	-	-	-	-	-	-
E1607-084A	-	-	-	-	-	-
E1609-052A	-	-	-	-	-	-
E1610-088	-	-	-	-	-	-
E1611-039	-	-	-	-	-	-
E1612-128	-	-	-	-	-	-
E1608-036A	-	-	-	-	-	-
<b>Nexant Inc</b>						
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-0000205758E	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products  
A2c - Residential Lighting  
Cape Light Compact

2016 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
Northeast Energy Efficiency Partnerships	-	-	-	-	-	-
5280	-	-	-	-	-	-
The Cadmus Group, Inc.	-	-	-	-	-	-
INV-222963	-	-	-	-	-	-
225978	-	-	-	-	-	-
INV-216021	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
228135	-	-	-	-	-	-
INV-221284	-	-	-	-	-	-
INV-224582	-	-	-	-	-	-
INV-229111	-	-	-	-	-	-
INV-220484	-	-	-	-	-	-
INV-220489	-	-	-	-	-	-
INV-222404	-	-	-	-	-	-
INV-222409	-	-	-	-	-	-
INV-224279	-	-	-	-	-	-
INV-224323	-	-	-	-	-	-
INV-225277	-	-	-	-	-	-
INV-225307	-	-	-	-	-	-
INV-226925	-	-	-	-	-	-
INV-226930	-	-	-	-	-	-
INV-229315	-	-	-	-	-	-
INV-229319	-	-	-	-	-	-
INV-230075	-	-	-	-	-	-
INV-230079	-	-	-	-	-	-
INV-231299	-	-	-	-	-	-
INV-231304	-	-	-	-	-	-
INV-233168	-	-	-	-	-	-
INV-233175	-	-	-	-	-	-
INV-234269	-	-	-	-	-	-
INV-234276	-	-	-	-	-	-
INV-235694	-	-	-	-	-	-
INV-235699	-	-	-	-	-	-
INV-236978	-	-	-	-	-	-
Consortium For Energy Efficiency	-	-	-	-	-	-
RECLAS	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1a - Low-Income Single Family Retrofit*  
Cape Light Compact

2016 B1a - Low-Income Single Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
16-806-01	-	-	-	-	-	-
16-806-02	-	-	-	-	-	-
16-806-03	-	-	-	-	-	-
16-806-04	-	-	-	-	-	-
16-806-05	-	-	-	-	-	-
16-806-06	-	-	-	-	-	-
16-806-07	-	-	-	-	-	-
16-806-08	-	-	-	-	-	-
16-806-09	-	-	-	-	-	-
16-806-10	-	-	-	-	-	-
16-806-11	-	-	-	-	-	-
16-806-12	-	-	-	-	-	-
<b>Heritage Press, Inc.</b>						
00098847	-	-	-	-	-	-
099808	-	-	-	-	-	-
099818	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10010601	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100000566	-	-	-	-	-	-
0100000884	-	-	-	-	-	-
0100001518	-	-	-	-	-	-
0100001962	-	-	-	-	-	-
<b>Nexant Inc</b>						
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-0000205758E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7870DEC15	-	-	-	-	-	-
7831FEB16	-	-	-	-	-	-
7870CLJUL16	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1010 B	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
1009 B	-	-	-	-	-	-
<b>THREE 3, INC</b>						
1	-	-	-	-	-	-
103	-	-	-	-	-	-
<b>Vineyard Gazette, LLC.</b>						
300699846	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
225978	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
228135	-	-	-	-	-	-
INV-224582	-	-	-	-	-	-
INV-229111	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
 B1 - Low-Income Whole House  
 B1a - Low-Income Single Family Retrofit  
 Cape Light Compact

2016 B1a - Low-Income Single Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Housing Assistance Corporation	-	-	-	-	-	-
REFRIGERATOR 2017-01	-	-	-	-	-	-
04.07.16_MARKETING	-	-	-	-	-	-
04.11.16_SOFTWARE	-	-	-	-	-	-
06.30.2016_LIMF_B_AS	-	-	-	-	-	-
BL-2016-05BR	-	-	-	-	-	-
BL-2016-06BR	-	-	-	-	-	-
BL-2016-08BR	-	-	-	-	-	-
LIGHTING 2016-11	-	-	-	-	-	-
LIGHTING 2016-12	-	-	-	-	-	-
LIGHTING INV 2016-07	-	-	-	-	-	-
LIGHTING INV 2016-09	-	-	-	-	-	-
LIGHTING INV 2016-16	-	-	-	-	-	-
LIGHTING_2016-10	-	-	-	-	-	-
LIGHTING-2016-01A	-	-	-	-	-	-
LIGHTING-2016-02A	-	-	-	-	-	-
LIGHTING2016-04	-	-	-	-	-	-
LIGHTING2016-05	-	-	-	-	-	-
LIGHTING2016-08	-	-	-	-	-	-
LIGHTING-2016-1	-	-	-	-	-	-
LIGHTING-2016-2	-	-	-	-	-	-
LIGHTING-2016-3	-	-	-	-	-	-
REF INVOICE 2016-10	-	-	-	-	-	-
REFRIGERATOR 2016-09	-	-	-	-	-	-
REFRIGERATOR 2016-11	-	-	-	-	-	-
REFRIGERATOR 2016-12	-	-	-	-	-	-
REFRIGERATOR-2016-02	-	-	-	-	-	-
REFRIGERATOR-2016-03	-	-	-	-	-	-
REFRIGERATOR-2016-1	-	-	-	-	-	-
REFRIGERATOR-2016-1A	-	-	-	-	-	-
REFRIGERATOR-2016-3A	-	-	-	-	-	-
WEATHER 2016-07	-	-	-	-	-	-
Weather 2016-09	-	-	-	-	-	-
WEATHER 2016-11	-	-	-	-	-	-
WEATHER 2016-12	-	-	-	-	-	-
WEATHER2016-08	-	-	-	-	-	-
WEATHER-2016-10	-	-	-	-	-	-
WEATHERIZATION2016-1	-	-	-	-	-	-
WEATHERIZATION2016-2	-	-	-	-	-	-
WEATHERIZATION2016-3	-	-	-	-	-	-
WEATHERIZATION2016-4	-	-	-	-	-	-
WEATHERIZATION2016-5	-	-	-	-	-	-
WEATHZTN 2016-06	-	-	-	-	-	-
MV Times Corporation, Inc. The Martha's Vineyard Times	-	-	-	-	-	-
301090074	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1b - Low-Income Multi-Family Retrofit*  
Cape Light Compact

2016 B1b - Low-Income Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
16-806-01	-	-	-	-	-	-
16-806-02	-	-	-	-	-	-
16-806-03	-	-	-	-	-	-
16-806-04	-	-	-	-	-	-
16-806-05	-	-	-	-	-	-
16-806-06	-	-	-	-	-	-
16-806-07	-	-	-	-	-	-
16-806-08	-	-	-	-	-	-
16-806-09	-	-	-	-	-	-
16-806-10	-	-	-	-	-	-
16-806-11	-	-	-	-	-	-
16-806-12	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10010601	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100000566	-	-	-	-	-	-
0100000884	-	-	-	-	-	-
0100001518	-	-	-	-	-	-
0100001962	-	-	-	-	-	-
<b>Nexant Inc</b>						
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-0000205758E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7870DEC15	-	-	-	-	-	-
7870CL JUL16	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1010 B	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
1009 B	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
225978	-	-	-	-	-	-
INV-216021	-	-	-	-	-	-
INV-231495	-	-	-	-	-	-
228135	-	-	-	-	-	-
INV-224582	-	-	-	-	-	-
INV-229111	-	-	-	-	-	-
<b>Housing Assistance Corporation</b>						
04.11.16_SOFTWARE	-	-	-	-	-	-
06.30.2016_LIMF_B_AS	-	-	-	-	-	-
02.23.16_LIMF_IND	-	-	-	-	-	-
03.02.16_LIMF_BHA_B	-	-	-	-	-	-
03.15.16_LIMF_IND	-	-	-	-	-	-
04.04.16_LIMF_FHA_B	-	-	-	-	-	-
04.14.16_LIMF_215MAI	-	-	-	-	-	-
04.14.16_LIMF_FOUND	-	-	-	-	-	-
04.14.16_LIMF_OLDCOL	-	-	-	-	-	-
04.15.16_LIMF_IND	-	-	-	-	-	-
05.26.16_LIMF_IND	-	-	-	-	-	-
06.03.16_LIMF_ROSEMO	-	-	-	-	-	-
06.17.16_LIMF_ROSEMO	-	-	-	-	-	-
06.26.2016_LIMF_B_IS	-	-	-	-	-	-
06.29.2016_LIMF_B_GO	-	-	-	-	-	-
06.30.16_LIMF_INDV	-	-	-	-	-	-
07.20.2016_LIMF_B_CH	-	-	-	-	-	-
08.22.16_LIMF_B_FHA	-	-	-	-	-	-
08.25.16_LIMF_B_DHA	-	-	-	-	-	-
08.30.16_LIMF_IND	-	-	-	-	-	-
08.31.16_LIMF_BR_FAL	-	-	-	-	-	-
08.31.16_LIMF_BR_IJH	-	-	-	-	-	-
09.29.16_LIMF_Bulbs	-	-	-	-	-	-
1.5.17_LIMF_Individu	-	-	-	-	-	-
11.04.16_LIMF	-	-	-	-	-	-
11.15.16_LIMF	-	-	-	-	-	-
11.16.16_LIMF	-	-	-	-	-	-
11.17.16_LIMF_WZ_IJH	-	-	-	-	-	-
11.22.16_LIMF	-	-	-	-	-	-
11.29.16_LIMF_FIXTUR	-	-	-	-	-	-
12.05.16_LIMF_INDIVI	-	-	-	-	-	-
12.20.16_LIMF_INDIVI	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2016 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>						
137678	-	-	-	-	-	-
<b>Demand Management</b>						
7362	-	-	-	-	-	-
7363	-	-	-	-	-	-
7364	-	-	-	-	-	-
7365	-	-	-	-	-	-
7367	-	-	-	-	-	-
7368	-	-	-	-	-	-
7369	-	-	-	-	-	-
7371	-	-	-	-	-	-
7406	-	-	-	-	-	-
7407	-	-	-	-	-	-
7408	-	-	-	-	-	-
7409	-	-	-	-	-	-
7410	-	-	-	-	-	-
7412	-	-	-	-	-	-
7413	-	-	-	-	-	-
7415	-	-	-	-	-	-
7416	-	-	-	-	-	-
7417	-	-	-	-	-	-
7418	-	-	-	-	-	-
7419	-	-	-	-	-	-
7421	-	-	-	-	-	-
7461	-	-	-	-	-	-
7462	-	-	-	-	-	-
7463	-	-	-	-	-	-
7464	-	-	-	-	-	-
7465	-	-	-	-	-	-
7466	-	-	-	-	-	-
7467	-	-	-	-	-	-
7473	-	-	-	-	-	-
7476	-	-	-	-	-	-
7477	-	-	-	-	-	-
7480	-	-	-	-	-	-
201601CS-A	-	-	-	-	-	-
201605CS	-	-	-	-	-	-
201606CS	-	-	-	-	-	-
201607CS	-	-	-	-	-	-
201608CS	-	-	-	-	-	-
201609CS	-	-	-	-	-	-
201610CS	-	-	-	-	-	-
201611CS	-	-	-	-	-	-
201612CS	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2016-129	-	-	-	-	-	-
2016-132	-	-	-	-	-	-
2016-133	-	-	-	-	-	-
2016-137	-	-	-	-	-	-
2016-138	-	-	-	-	-	-
2016-143	-	-	-	-	-	-
2016-144	-	-	-	-	-	-
2016-153	-	-	-	-	-	-
2016-154	-	-	-	-	-	-
2016-161	-	-	-	-	-	-
2016-162	-	-	-	-	-	-
2016-166	-	-	-	-	-	-
2016-167	-	-	-	-	-	-
2016-172	-	-	-	-	-	-
2016-177	-	-	-	-	-	-
2016-178	-	-	-	-	-	-
2016-184	-	-	-	-	-	-
2016-185	-	-	-	-	-	-
2016-188	-	-	-	-	-	-
2016-190	-	-	-	-	-	-
2016-191	-	-	-	-	-	-
2016-196	-	-	-	-	-	-
2016-197	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2016 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
KEMA, Inc.	-	-	-	-	-	-
10004941	-	-	-	-	-	-
10005925	-	-	-	-	-	-
10006088	-	-	-	-	-	-
10006096	-	-	-	-	-	-
10006105	-	-	-	-	-	-
10006121	-	-	-	-	-	-
10007296	-	-	-	-	-	-
10007307	-	-	-	-	-	-
10007320	-	-	-	-	-	-
10007403	-	-	-	-	-	-
10007422	-	-	-	-	-	-
10008751	-	-	-	-	-	-
10008779	-	-	-	-	-	-
10008790	-	-	-	-	-	-
10008822	-	-	-	-	-	-
10008868	-	-	-	-	-	-
10008879	-	-	-	-	-	-
10008943	-	-	-	-	-	-
10010403	-	-	-	-	-	-
10010433	-	-	-	-	-	-
10010443	-	-	-	-	-	-
10010474	-	-	-	-	-	-
10012302	-	-	-	-	-	-
10012331	-	-	-	-	-	-
10012343	-	-	-	-	-	-
10012369	-	-	-	-	-	-
10012374	-	-	-	-	-	-
10012418	-	-	-	-	-	-
10012429	-	-	-	-	-	-
10012434	-	-	-	-	-	-
10013473	-	-	-	-	-	-
10013499	-	-	-	-	-	-
10013509	-	-	-	-	-	-
10013521	-	-	-	-	-	-
10013568	-	-	-	-	-	-
10013581	-	-	-	-	-	-
10013603	-	-	-	-	-	-
10014212	-	-	-	-	-	-
10014241	-	-	-	-	-	-
10014252	-	-	-	-	-	-
10014280	-	-	-	-	-	-
10014296	-	-	-	-	-	-
10014337	-	-	-	-	-	-
10014348	-	-	-	-	-	-
10014359	-	-	-	-	-	-
10014370	-	-	-	-	-	-
10014381	-	-	-	-	-	-
10014392	-	-	-	-	-	-
10014415	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1010 B	-	-	-	-	-	-
1011 B	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
TRC Engineers	-	-	-	-	-	-
184457	-	-	-	-	-	-
WOLLENBURG, STEPHAN	-	-	-	-	-	-
August 2016 EE	-	-	-	-	-	-
DECEMBER 2016 - EE	-	-	-	-	-	-
JULY 2016 - EE	-	-	-	-	-	-
JUNE 2016-EE	-	-	-	-	-	-
NOVEMBER 2016 - EE	-	-	-	-	-	-
OCTOBER 2016 - EE	-	-	-	-	-	-
SEPTEMBER 2016-EE	-	-	-	-	-	-
The Weidt Group, Inc.	-	-	-	-	-	-
1701883	-	-	-	-	-	-
1701884	-	-	-	-	-	-
1701885	-	-	-	-	-	-
Efficiency Foward, Inc./dba Design Lights Consortium	-	-	-	-	-	-
INV:2017DLC MEMB FE	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2016 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
CLEARresult Consulting, Inc.	-	-	-	-	-	-
6073	-	-	-	-	-	-
6226	-	-	-	-	-	-
6288	-	-	-	-	-	-
6377	-	-	-	-	-	-
6444	-	-	-	-	-	-
6528	-	-	-	-	-	-
6634	-	-	-	-	-	-
6698	-	-	-	-	-	-
6759	-	-	-	-	-	-
6785	-	-	-	-	-	-
6898	-	-	-	-	-	-
6949	-	-	-	-	-	-
6985	-	-	-	-	-	-
Jacobson Energy Research	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
River Energy - O'Brien & Neville	-	-	-	-	-	-
12356	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1b - C&I Initial Purchase & End of Useful Life  
Cape Light Compact

2016 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>						
1029024	-	-	-	-	-	-
INCENTIVE-2016	-	-	-	-	-	-
INCENTIVE-2016-1	-	-	-	-	-	-
<b>Blackhawk Engagement</b>						
5G 640127	-	-	-	-	-	-
5G 640228	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
15-806HV-11	-	-	-	-	-	-
16-806HV-01	-	-	-	-	-	-
16-806HV-02	-	-	-	-	-	-
16-806HV-04	-	-	-	-	-	-
16-806HV-05	-	-	-	-	-	-
16-806HV-06	-	-	-	-	-	-
16-806HV-07	-	-	-	-	-	-
16-806HV-08	-	-	-	-	-	-
16-806HV-09	-	-	-	-	-	-
16-806HV-10	-	-	-	-	-	-
16-806HV-11	-	-	-	-	-	-
16-806HV-12	-	-	-	-	-	-
16-806HV-6A	-	-	-	-	-	-
<b>Demand Management</b>						
201606CS	-	-	-	-	-	-
201607CS	-	-	-	-	-	-
201608CS	-	-	-	-	-	-
201609CS	-	-	-	-	-	-
201610CS	-	-	-	-	-	-
201611CS	-	-	-	-	-	-
201612CS	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0501350	-	-	-	-	-	-
0394509-IN	-	-	-	-	-	-
0402320-IN	-	-	-	-	-	-
0416092-IN	-	-	-	-	-	-
0422158-IN	-	-	-	-	-	-
0436464-IN	-	-	-	-	-	-
0444870-IN	-	-	-	-	-	-
0451484-IN	-	-	-	-	-	-
0454597-IN	-	-	-	-	-	-
0463584-IN	-	-	-	-	-	-
0470081-IN	-	-	-	-	-	-
0483707-IN	-	-	-	-	-	-
0492111-IN	-	-	-	-	-	-
0493003-IN	-	-	-	-	-	-
0506433-IN	-	-	-	-	-	-
0515617-IN	-	-	-	-	-	-
0519378-IN	-	-	-	-	-	-
0519650-IN	-	-	-	-	-	-
0535620-IN	-	-	-	-	-	-
0542662-IN	-	-	-	-	-	-
0583036-IN	-	-	-	-	-	-
060213-IN	-	-	-	-	-	-
0659551-IN	-	-	-	-	-	-
0683001-IN	-	-	-	-	-	-
0687467-IN	-	-	-	-	-	-
0706148-IN	-	-	-	-	-	-
0771178-IN	-	-	-	-	-	-
0775521-IN	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2016-138	-	-	-	-	-	-
2016-188	-	-	-	-	-	-
2016-173	-	-	-	-	-	-
2016-183	-	-	-	-	-	-
2016-189	-	-	-	-	-	-
2016-195	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1b - C&I Initial Purchase & End of Useful Life  
Cape Light Compact

2016 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
KEMA, Inc.	-	-	-	-	-	-
10004941	-	-	-	-	-	-
10005925	-	-	-	-	-	-
10006096	-	-	-	-	-	-
10006105	-	-	-	-	-	-
10007307	-	-	-	-	-	-
10007403	-	-	-	-	-	-
10007422	-	-	-	-	-	-
10008751	-	-	-	-	-	-
10008868	-	-	-	-	-	-
10008879	-	-	-	-	-	-
10008943	-	-	-	-	-	-
10010433	-	-	-	-	-	-
10010443	-	-	-	-	-	-
10010474	-	-	-	-	-	-
10012302	-	-	-	-	-	-
10012331	-	-	-	-	-	-
10012343	-	-	-	-	-	-
10012369	-	-	-	-	-	-
10012374	-	-	-	-	-	-
10012418	-	-	-	-	-	-
10012429	-	-	-	-	-	-
10013473	-	-	-	-	-	-
10013521	-	-	-	-	-	-
10013568	-	-	-	-	-	-
10013603	-	-	-	-	-	-
10014212	-	-	-	-	-	-
10014241	-	-	-	-	-	-
10014280	-	-	-	-	-	-
10014337	-	-	-	-	-	-
10014359	-	-	-	-	-	-
10014370	-	-	-	-	-	-
10014381	-	-	-	-	-	-
10014392	-	-	-	-	-	-
10006238	-	-	-	-	-	-
10007340	-	-	-	-	-	-
10007389	-	-	-	-	-	-
10008767	-	-	-	-	-	-
10008857	-	-	-	-	-	-
10010460	-	-	-	-	-	-
10012318	-	-	-	-	-	-
10012385	-	-	-	-	-	-
10013488	-	-	-	-	-	-
10013552	-	-	-	-	-	-
10014228	-	-	-	-	-	-
10014291	-	-	-	-	-	-
Navigant Consulting, Inc.	-	-	-	-	-	-
484160	-	-	-	-	-	-
486627	-	-	-	-	-	-
490240	-	-	-	-	-	-
493774	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
7870CL JUL16	-	-	-	-	-	-
People Power Company	-	-	-	-	-	-
CLC033-B	-	-	-	-	-	-
CLC027-B	-	-	-	-	-	-
CLC028-B	-	-	-	-	-	-
CLC029-B	-	-	-	-	-	-
CLC030-B	-	-	-	-	-	-
CLC031-B	-	-	-	-	-	-
CLC032-B	-	-	-	-	-	-
CLC034-B	-	-	-	-	-	-
CLC035-B	-	-	-	-	-	-
CLC036-B	-	-	-	-	-	-
CLC037-B	-	-	-	-	-	-
CLC038-B	-	-	-	-	-	-
Ridley & Associates, Inc.	-	-	-	-	-	-
MARCH 2016	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1010 B	-	-	-	-	-	-
1011 B	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
1009 B	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*C1 - C&I New Construction*  
*C1b - C&I Initial Purchase & End of Useful Life*  
Cape Light Compact

2016 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
TRC Engineers	-	-	-	-	-	-
184457	-	-	-	-	-	-
188517	-	-	-	-	-	-
193116	-	-	-	-	-	-
202554	-	-	-	-	-	-
211071	-	-	-	-	-	-
214590	-	-	-	-	-	-
215307	-	-	-	-	-	-
206633-R	-	-	-	-	-	-
WOLLENBURG, STEPHAN	-	-	-	-	-	-
August 2016 EE A	-	-	-	-	-	-
Northeast Energy Efficiency Partnerships	-	-	-	-	-	-
5280	-	-	-	-	-	-
Efficiency Foward, Inc./dba Design Lights Consortium	-	-	-	-	-	-
INV:2017DLC MEMB FE	-	-	-	-	-	-
Jacobson Energy Research	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
River Energy - O'Brien & Neville	-	-	-	-	-	-
12356	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2016 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>						
140475	-	-	-	-	-	-
141824	-	-	-	-	-	-
143337	-	-	-	-	-	-
144270	-	-	-	-	-	-
145535	-	-	-	-	-	-
146562	-	-	-	-	-	-
147794	-	-	-	-	-	-
148085	-	-	-	-	-	-
148969	-	-	-	-	-	-
150188	-	-	-	-	-	-
152154	-	-	-	-	-	-
138913 B	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
15-806CI-12	-	-	-	-	-	-
<b>Demand Management</b>						
7480	-	-	-	-	-	-
201605CS	-	-	-	-	-	-
201606CS	-	-	-	-	-	-
201607CS	-	-	-	-	-	-
201608CS	-	-	-	-	-	-
201609CS	-	-	-	-	-	-
201610CS	-	-	-	-	-	-
201611CS	-	-	-	-	-	-
201612CS	-	-	-	-	-	-
7366	-	-	-	-	-	-
7370	-	-	-	-	-	-
7411	-	-	-	-	-	-
7414	-	-	-	-	-	-
7420	-	-	-	-	-	-
7422	-	-	-	-	-	-
7426	-	-	-	-	-	-
7468	-	-	-	-	-	-
7469	-	-	-	-	-	-
7470	-	-	-	-	-	-
7471	-	-	-	-	-	-
7472	-	-	-	-	-	-
7474	-	-	-	-	-	-
7475	-	-	-	-	-	-
7478	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2016-137	-	-	-	-	-	-
2016-143	-	-	-	-	-	-
2016-144	-	-	-	-	-	-
2016-153	-	-	-	-	-	-
2016-154	-	-	-	-	-	-
2016-142	-	-	-	-	-	-
2016-145	-	-	-	-	-	-
2016-158	-	-	-	-	-	-
2016-186	-	-	-	-	-	-
2016-187	-	-	-	-	-	-
2016-192	-	-	-	-	-	-
2016-198	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2016 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
KEMA, Inc.	-	-	-	-	-	-
10004941	-	-	-	-	-	-
10005925	-	-	-	-	-	-
10006088	-	-	-	-	-	-
10006096	-	-	-	-	-	-
10006105	-	-	-	-	-	-
10007296	-	-	-	-	-	-
10007307	-	-	-	-	-	-
10007403	-	-	-	-	-	-
10007422	-	-	-	-	-	-
10008751	-	-	-	-	-	-
10008779	-	-	-	-	-	-
10008822	-	-	-	-	-	-
10008868	-	-	-	-	-	-
10008879	-	-	-	-	-	-
10008943	-	-	-	-	-	-
10010403	-	-	-	-	-	-
10010433	-	-	-	-	-	-
10010443	-	-	-	-	-	-
10010474	-	-	-	-	-	-
10012302	-	-	-	-	-	-
10012331	-	-	-	-	-	-
10012343	-	-	-	-	-	-
10012369	-	-	-	-	-	-
10012374	-	-	-	-	-	-
10012418	-	-	-	-	-	-
10012429	-	-	-	-	-	-
10012434	-	-	-	-	-	-
10013473	-	-	-	-	-	-
10013509	-	-	-	-	-	-
10013521	-	-	-	-	-	-
10013568	-	-	-	-	-	-
10013603	-	-	-	-	-	-
10014212	-	-	-	-	-	-
10014241	-	-	-	-	-	-
10014280	-	-	-	-	-	-
10014296	-	-	-	-	-	-
10014337	-	-	-	-	-	-
10014348	-	-	-	-	-	-
10014359	-	-	-	-	-	-
10014370	-	-	-	-	-	-
10014381	-	-	-	-	-	-
10014392	-	-	-	-	-	-
10008817	-	-	-	-	-	-
10008893	-	-	-	-	-	-
10008939	-	-	-	-	-	-
10010397	-	-	-	-	-	-
10010422	-	-	-	-	-	-
10010485	-	-	-	-	-	-
10013532	-	-	-	-	-	-
10014312	-	-	-	-	-	-
10014320	-	-	-	-	-	-
10014403	-	-	-	-	-	-
Nexant Inc	-	-	-	-	-	-
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-0000205758E	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
Peregrine Energy Group, Inc.	-	-	-	-	-	-
4,428	-	-	-	-	-	-
4,454	-	-	-	-	-	-
4,475	-	-	-	-	-	-
4,512	-	-	-	-	-	-
4,513	-	-	-	-	-	-
4,587	-	-	-	-	-	-
4,609	-	-	-	-	-	-
4,686	-	-	-	-	-	-
4,719	-	-	-	-	-	-
6/1/16-6/30/16	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2016 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
TRC Engineers	-	-	-	-	-	-
184457	-	-	-	-	-	-
188517	-	-	-	-	-	-
193116	-	-	-	-	-	-
202554	-	-	-	-	-	-
211071	-	-	-	-	-	-
206633-R	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
225698	-	-	-	-	-	-
228622	-	-	-	-	-	-
221088R	-	-	-	-	-	-
WOLLENBURG, STEPHAN	-	-	-	-	-	-
JULY 2016 - EE	-	-	-	-	-	-
OCTOBER 2016 - EE	-	-	-	-	-	-
Efficiency Foward, Inc./dba Design Lights Consortium	-	-	-	-	-	-
INV:2017DLC MEMB FE	-	-	-	-	-	-
Jacobson Energy Research	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
25	-	-	-	-	-	-
River Energy - O'Brien & Neville	-	-	-	-	-	-
12356	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2b - C&I Small Business  
Cape Light Compact

2016 C2b - C&I Small Business						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>						
137554	-	-	-	-	-	-
137555	-	-	-	-	-	-
138911	-	-	-	-	-	-
139515	-	-	-	-	-	-
140476	-	-	-	-	-	-
140477	-	-	-	-	-	-
141822	-	-	-	-	-	-
141823	-	-	-	-	-	-
143311	-	-	-	-	-	-
143338	-	-	-	-	-	-
144273	-	-	-	-	-	-
145175	-	-	-	-	-	-
145534	-	-	-	-	-	-
145536	-	-	-	-	-	-
146561	-	-	-	-	-	-
146563	-	-	-	-	-	-
147795	-	-	-	-	-	-
147796	-	-	-	-	-	-
148967	-	-	-	-	-	-
148968	-	-	-	-	-	-
150196	-	-	-	-	-	-
151538	-	-	-	-	-	-
152128	-	-	-	-	-	-
152151	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2016-162	-	-	-	-	-	-
2016-178	-	-	-	-	-	-
2016-182	-	-	-	-	-	-
2016-194	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10004941	-	-	-	-	-	-
10005925	-	-	-	-	-	-
10006096	-	-	-	-	-	-
10006105	-	-	-	-	-	-
10007307	-	-	-	-	-	-
10007403	-	-	-	-	-	-
10007422	-	-	-	-	-	-
10008751	-	-	-	-	-	-
10008779	-	-	-	-	-	-
10008822	-	-	-	-	-	-
10008868	-	-	-	-	-	-
10008879	-	-	-	-	-	-
10008943	-	-	-	-	-	-
10010403	-	-	-	-	-	-
10010433	-	-	-	-	-	-
10010443	-	-	-	-	-	-
10010474	-	-	-	-	-	-
10012302	-	-	-	-	-	-
10012331	-	-	-	-	-	-
10012343	-	-	-	-	-	-
10012369	-	-	-	-	-	-
10012374	-	-	-	-	-	-
10012418	-	-	-	-	-	-
10012429	-	-	-	-	-	-
10012434	-	-	-	-	-	-
10013473	-	-	-	-	-	-
10013509	-	-	-	-	-	-
10013521	-	-	-	-	-	-
10013568	-	-	-	-	-	-
10013603	-	-	-	-	-	-
10014212	-	-	-	-	-	-
10014241	-	-	-	-	-	-
10014280	-	-	-	-	-	-
10014296	-	-	-	-	-	-
10014337	-	-	-	-	-	-
10014359	-	-	-	-	-	-
10014370	-	-	-	-	-	-
10014381	-	-	-	-	-	-
10014392	-	-	-	-	-	-
10008817	-	-	-	-	-	-
10008893	-	-	-	-	-	-
10008939	-	-	-	-	-	-
10010397	-	-	-	-	-	-
10010485	-	-	-	-	-	-
10013532	-	-	-	-	-	-
10014312	-	-	-	-	-	-
10014320	-	-	-	-	-	-
10008803	-	-	-	-	-	-
10010498	-	-	-	-	-	-
10012356	-	-	-	-	-	-
10012396	-	-	-	-	-	-
10013595	-	-	-	-	-	-
10014266	-	-	-	-	-	-
<b>Nexant Inc</b>						
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-0000205758E	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2b - C&I Small Business  
Cape Light Compact

2016 C2b - C&I Small Business						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
7831FEB16	-	-	-	-	-	-
Ridley & Associates, Inc.	-	-	-	-	-	-
MARCH 2016	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
TRC Engineers	-	-	-	-	-	-
184457	-	-	-	-	-	-
Northeast Energy Efficiency Partnerships	-	-	-	-	-	-
5280	-	-	-	-	-	-
National Resource Management	-	-	-	-	-	-
APRIL 2016 MEDIUM	-	-	-	-	-	-
AUGUST 2016 NRM	-	-	-	-	-	-
AUGUST 2016 NRM A	-	-	-	-	-	-
BTUARY 2016 MEDIUM	-	-	-	-	-	-
DECEMBER2016SMALL	-	-	-	-	-	-
EBRUARY 2016 SMALL	-	-	-	-	-	-
JUNE 2016 NRM	-	-	-	-	-	-
JUNE2016NRM	-	-	-	-	-	-
MAY2016SMALL	-	-	-	-	-	-
NOVEMBER2016MEDIUM	-	-	-	-	-	-
OCT 2016 SMALL	-	-	-	-	-	-
River Energy - O'Brien & Neville	-	-	-	-	-	-
12356	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2c - C&I Multifamily Retrofit  
Cape Light Compact

2016 C2c - C&I Multifamily Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>Rise Engineering</b>						
136172	-	-	-	-	-	-
137454	-	-	-	-	-	-
138822	-	-	-	-	-	-
140347	-	-	-	-	-	-
140478	-	-	-	-	-	-
141624	-	-	-	-	-	-
141723	-	-	-	-	-	-
143007	-	-	-	-	-	-
143166	-	-	-	-	-	-
144228	-	-	-	-	-	-
145508	-	-	-	-	-	-
146603	-	-	-	-	-	-
147834	-	-	-	-	-	-
148886	-	-	-	-	-	-
150164	-	-	-	-	-	-
150964	-	-	-	-	-	-
137541	-	-	-	-	-	-
139514	-	-	-	-	-	-
140474	-	-	-	-	-	-
141820	-	-	-	-	-	-
143332	-	-	-	-	-	-
144271	-	-	-	-	-	-
152058	-	-	-	-	-	-
152945	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2016-136	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10004941	-	-	-	-	-	-
10005925	-	-	-	-	-	-
10006096	-	-	-	-	-	-
10006105	-	-	-	-	-	-
10007307	-	-	-	-	-	-
10007403	-	-	-	-	-	-
10007422	-	-	-	-	-	-
10008751	-	-	-	-	-	-
10008868	-	-	-	-	-	-
10008879	-	-	-	-	-	-
10008943	-	-	-	-	-	-
10010433	-	-	-	-	-	-
10010443	-	-	-	-	-	-
10010474	-	-	-	-	-	-
10012302	-	-	-	-	-	-
10012331	-	-	-	-	-	-
10012343	-	-	-	-	-	-
10012369	-	-	-	-	-	-
10012374	-	-	-	-	-	-
10012418	-	-	-	-	-	-
10012429	-	-	-	-	-	-
10013473	-	-	-	-	-	-
10013521	-	-	-	-	-	-
10013568	-	-	-	-	-	-
10013603	-	-	-	-	-	-
10014212	-	-	-	-	-	-
10014241	-	-	-	-	-	-
10014280	-	-	-	-	-	-
10014337	-	-	-	-	-	-
10014359	-	-	-	-	-	-
10014370	-	-	-	-	-	-
10014381	-	-	-	-	-	-
10014392	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7870DEC15	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
<b>Northeast Energy Efficiency Partnerships</b>						
5280	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
C2 - C&I Retrofit  
C2d - C&I Upstream Lighting  
Cape Light Compact

2016 C2d - C&I Upstream Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
16-806UP-01	-	-	-	-	-	-
16-806UP-02	-	-	-	-	-	-
16-806UP-03	-	-	-	-	-	-
16-806UP-04	-	-	-	-	-	-
16-806UP-05	-	-	-	-	-	-
16-806UP-06	-	-	-	-	-	-
16-806UP-07	-	-	-	-	-	-
16-806UP-08	-	-	-	-	-	-
16-806UP-09	-	-	-	-	-	-
16-806UP-10	-	-	-	-	-	-
16-806UP-11	-	-	-	-	-	-
16-806UP-12	-	-	-	-	-	-
<b>Ecova, Inc.</b>						
RECORD	-	-	-	-	-	-
109366U	-	-	-	-	-	-
10936CL	-	-	-	-	-	-
366206U	-	-	-	-	-	-
388206U	-	-	-	-	-	-
402106U	-	-	-	-	-	-
413006U	-	-	-	-	-	-
422006U	-	-	-	-	-	-
459306U	-	-	-	-	-	-
466406U	-	-	-	-	-	-
484106A	-	-	-	-	-	-
484106B	-	-	-	-	-	-
484106U	-	-	-	-	-	-
502606U	-	-	-	-	-	-
514206U	-	-	-	-	-	-
527306U	-	-	-	-	-	-
534806U	-	-	-	-	-	-
542606U	-	-	-	-	-	-
LED FIXTURE	-	-	-	-	-	-
PB-003662	-	-	-	-	-	-
PB-003882	-	-	-	-	-	-
PB-004021	-	-	-	-	-	-
PB-004130	-	-	-	-	-	-
PB-004220	-	-	-	-	-	-
PB-004593	-	-	-	-	-	-
PB-004664	-	-	-	-	-	-
PB-004841	-	-	-	-	-	-
PB-005026	-	-	-	-	-	-
PB-005142	-	-	-	-	-	-
PB-005273	-	-	-	-	-	-
PB-005348	-	-	-	-	-	-
PB-005358	-	-	-	-	-	-
PB-005426	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10004941	-	-	-	-	-	-
10005925	-	-	-	-	-	-
10006096	-	-	-	-	-	-
10006105	-	-	-	-	-	-
10007307	-	-	-	-	-	-
10007403	-	-	-	-	-	-
10007422	-	-	-	-	-	-
10008751	-	-	-	-	-	-
10008868	-	-	-	-	-	-
10008879	-	-	-	-	-	-
10008943	-	-	-	-	-	-
10010433	-	-	-	-	-	-
10010443	-	-	-	-	-	-
10010474	-	-	-	-	-	-
10012302	-	-	-	-	-	-
10012331	-	-	-	-	-	-
10012343	-	-	-	-	-	-
10012369	-	-	-	-	-	-
10012374	-	-	-	-	-	-
10012418	-	-	-	-	-	-
10012429	-	-	-	-	-	-
10013473	-	-	-	-	-	-
10013521	-	-	-	-	-	-
10013568	-	-	-	-	-	-
10013603	-	-	-	-	-	-
10014212	-	-	-	-	-	-
10014241	-	-	-	-	-	-
10014280	-	-	-	-	-	-
10014337	-	-	-	-	-	-
10014359	-	-	-	-	-	-
10014370	-	-	-	-	-	-
10014381	-	-	-	-	-	-
10014392	-	-	-	-	-	-
10010485	-	-	-	-	-	-
10008803	-	-	-	-	-	-
10010498	-	-	-	-	-	-
10012356	-	-	-	-	-	-
10013595	-	-	-	-	-	-
10014266	-	-	-	-	-	-
10012401	-	-	-	-	-	-
10013504	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C2 - C&I Retrofit  
C2d - C&I Upstream Lighting  
Cape Light Compact

2016 C2d - C&I Upstream Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Nexant Inc	-	-	-	-	-	-
178957E	-	-	-	-	-	-
205656E	-	-	-	-	-	-
INV-0000205758E	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7870DEC15	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1015B	-	-	-	-	-	-
1016 B	-	-	-	-	-	-
1017 B	-	-	-	-	-	-
1018B	-	-	-	-	-	-
1019 B	-	-	-	-	-	-
1020 B	-	-	-	-	-	-
1012B	-	-	-	-	-	-
1013B	-	-	-	-	-	-
1014B	-	-	-	-	-	-
Northeast Energy Efficiency Partnerships	-	-	-	-	-	-
5280	-	-	-	-	-	-
Efficiency Forward, Inc./dba Design Lights Consortium	-	-	-	-	-	-
INV:2017DLC MEMB FE	-	-	-	-	-	-
River Energy - O'Brien & Neville	-	-	-	-	-	-
12356	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1a - Residential New Construction  
Cape Light Compact

2017 A1a - Residential New Construction						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2273.1S, 2273.2S, 2273.1T, 2273.2T, 2273.1U, 2273.2U, 2293E,	-	-	-	-	-	-
2293F, 2293G	-	-	-	-	-	-
2273.2K	-	-	-	-	-	-
2273.2L	-	-	-	-	-	-
2273.2M	-	-	-	-	-	-
2273.2V	-	-	-	-	-	-
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
Invoice 2273.1R, 2273.2R, 2273.1Q, 2273.2Q, 2293C, 2293D	-	-	-	-	-	-
Invoice 2273.2N, 2273.2O, 2273.2P	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
17-806-01	-	-	-	-	-	-
17-806-02	-	-	-	-	-	-
17-806-03	-	-	-	-	-	-
17-806-04	-	-	-	-	-	-
17-806-07	-	-	-	-	-	-
17-806-08	-	-	-	-	-	-
17-806-09,17-806HV-10	-	-	-	-	-	-
17-806-10,17-806-11	-	-	-	-	-	-
17-806-12, 17-806HV-12	-	-	-	-	-	-
Invoice 17-806-05	-	-	-	-	-	-
PO-0015, PO-0016, PO-0017	-	-	-	-	-	-
<b>ICF Resources, L.L.C.</b>						
BI_CLC E 02-17	-	-	-	-	-	-
BI_CLC E 04-17	-	-	-	-	-	-
BI_CLC E 5-17	-	-	-	-	-	-
CAPE U01-17	-	-	-	-	-	-
CAPE U04-17	-	-	-	-	-	-
CAPEU03-17	-	-	-	-	-	-
CLC A001-17	-	-	-	-	-	-
CLC A003-17	-	-	-	-	-	-
CLC A004-17	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>CLEARResult Consulting, Inc.</b>						
7082	-	-	-	-	-	-
7119	-	-	-	-	-	-
7170	-	-	-	-	-	-
7245	-	-	-	-	-	-
7335	-	-	-	-	-	-
09-CAPELIGHT_WFD, 105-CAPE LIGHT, 7613	-	-	-	-	-	-
7445, 103-CAPE LIGHT, 07-CAPELIGHT_WFD	-	-	-	-	-	-
Invoice 7525	-	-	-	-	-	-
Invoices 102-CAPE LIGHT & 7385	-	-	-	-	-	-
<b>River Energy - Committee Meeting</b>						
13903,13912, 13921, 13956, 14036	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House

A1a - Residential New Construction

Cape Light Compact

2017 A1a - Residential New Construction						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
ICF Resources, L.L.C.	-	-	-	-	-	-
BI_CLC E 01-18, CAPE U12-17, CLC A012-17	-	-	-	-	-	-
BI_CLC E 09-17, CAPE U08-17, CLC A008-17	-	-	-	-	-	-
BI_CLC E 10-17, CAPE U09-17, CLC A009-17	-	-	-	-	-	-
BI_CLC E 11-17, CAPE U10-17, CLC A010-17	-	-	-	-	-	-
BI_CLC E 12-17, CAPE U11-17, CLC A011-17	-	-	-	-	-	-
CLC A006-17; BI_CLC E 07-17	-	-	-	-	-	-
Invoice CAPE U06-17	-	-	-	-	-	-
Invoices BI_CLC E 03-17, CAPE U02-17, CLC A002-17	-	-	-	-	-	-
Invoices CLC A005-17, CAPE U05-17, BI_CLC E 06-17	-	-	-	-	-	-
Invoices CLC A007-17, BI_CLC RENO 8-17, MF8-17CLC	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
Performance Systems Development of New York, LLC	-	-	-	-	-	-
19304, 19305, 19396, 19397	-	-	-	-	-	-
DNV GL Energy Insights USA, Inc.	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
Synapse Energy Economics	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1b - Residential Multi-Family Retrofit  
Cape Light Compact

2017 A1b - Residential Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293H	-	-	-	-	-	-
<b>Rise Engineering</b>						
153191	-	-	-	-	-	-
153388	-	-	-	-	-	-
154135	-	-	-	-	-	-
154363	-	-	-	-	-	-
155638	-	-	-	-	-	-
155742	-	-	-	-	-	-
157054	-	-	-	-	-	-
157057	-	-	-	-	-	-
158474	-	-	-	-	-	-
158492	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
17-806-01	-	-	-	-	-	-
17-806-02	-	-	-	-	-	-
17-806-03	-	-	-	-	-	-
17-806-04	-	-	-	-	-	-
17-806-07	-	-	-	-	-	-
17-806-08	-	-	-	-	-	-
17-806-09,17-806HV-10	-	-	-	-	-	-
17-806-10,17-806-11	-	-	-	-	-	-
17-806-12, 17-806HV-12	-	-	-	-	-	-
Invoice 17-806-05	-	-	-	-	-	-
PO-0015, PO-0016, PO-0017	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>Illume Advising, LLC</b>						
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>						
153389; 155642; 157053; 158475; 159782; 160763; 160764; 161569	-	-	-	-	-	-
163227,163240, 163241, 163284, 163313, 163476	-	-	-	-	-	-
163244, 163245, 163251	-	-	-	-	-	-
164299,164635,164636,164720,165594,165873,	-	-	-	-	-	-
Invoice 159781 CAP002 17-06R Project RIS-81-17-0034	-	-	-	-	-	-
Invoice 165696, 167894, 167895, 167966, 167976, 167980,	-	-	-	-	-	-
167981, 167990, 168013, 168017, 168018	-	-	-	-	-	-
Invoice 165953, 165954, 167143, 167970	-	-	-	-	-	-
Invoices 159617, 160664, 162071	-	-	-	-	-	-
Invoices 162121,162123,162275,162276	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

A1 - Residential Whole House  
A1c - Residential Home Energy Services - Measures  
Cape Light Compact

2017 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293H	-	-	-	-	-	-
<b>Rise Engineering</b>						
153260	-	-	-	-	-	-
153266	-	-	-	-	-	-
154148	-	-	-	-	-	-
154187	-	-	-	-	-	-
154277	-	-	-	-	-	-
154311	-	-	-	-	-	-
155111	-	-	-	-	-	-
155668	-	-	-	-	-	-
155684	-	-	-	-	-	-
155717	-	-	-	-	-	-
156601	-	-	-	-	-	-
157039	-	-	-	-	-	-
157051	-	-	-	-	-	-
157094	-	-	-	-	-	-
158050	-	-	-	-	-	-
158452	-	-	-	-	-	-
158489	-	-	-	-	-	-
158516	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
17-806-01	-	-	-	-	-	-
17-806-02	-	-	-	-	-	-
17-806-03	-	-	-	-	-	-
17-806-04	-	-	-	-	-	-
Invoice 17-806-05	-	-	-	-	-	-
PO-0015, PO-0016, PO-0017	-	-	-	-	-	-
<b>Creative Services, Inc.</b>						
1342461	-	-	-	-	-	-
1344305	-	-	-	-	-	-
1345292	-	-	-	-	-	-
1345637	-	-	-	-	-	-
1347090	-	-	-	-	-	-
1347452	-	-	-	-	-	-
1351453	-	-	-	-	-	-
1353005	-	-	-	-	-	-
1353393	-	-	-	-	-	-
Invoice 1349469	-	-	-	-	-	-
Invoice 1349848	-	-	-	-	-	-
Invoice 1350266	-	-	-	-	-	-
Invoice 1351054	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0122675-IN	-	-	-	-	-	-
0124831-IN	-	-	-	-	-	-
0125469-IN, 0149473-IN, 0179700-IN, 0228223-IN, 0250101-IN, 0360866-IN, 0370926-IN, 0388273-IN, 0414587-IN, 0468236-IN, 0734297-IN, 0951910-IN, 1001993-IN, 1011801-IN, 1019005-IN, 1025783-IN, 0128344-IN, 0158109-IN, 0168616-IN, 0199236-IN, 0226631-IN, 0235860-IN, 0267759-IN, 0319288-IN, 0348717-IN, 0358830-IN, 0378177-IN, 0477066-IN, 0480314-IN, 0488768-IN, 0491593-IN, 0501797-I	-	-	-	-	-	-
0173756-IN	-	-	-	-	-	-
0298350-IN, 0371689-IN, 0372286-IN, 0372682-IN, 0372692-IN	-	-	-	-	-	-
0516271-IN	-	-	-	-	-	-
0537529-IN	-	-	-	-	-	-
0762418-IN	-	-	-	-	-	-
0766861-IN	-	-	-	-	-	-
0771215-IN	-	-	-	-	-	-
0790287-IN	-	-	-	-	-	-
0790494-IN	-	-	-	-	-	-
0826763-IN	-	-	-	-	-	-
0828485-IN	-	-	-	-	-	-
0829496-IN	-	-	-	-	-	-
0830115-IN	-	-	-	-	-	-
0835383-IN	-	-	-	-	-	-
0856168-IN	-	-	-	-	-	-
0857130-IN	-	-	-	-	-	-
0857178-IN	-	-	-	-	-	-
0892677-IN	-	-	-	-	-	-
0898456-IN	-	-	-	-	-	-
0908698-IN	-	-	-	-	-	-
0909840-IN	-	-	-	-	-	-
0930735-IN	-	-	-	-	-	-
0932158-IN	-	-	-	-	-	-
0963680-IN	-	-	-	-	-	-
0969520-IN	-	-	-	-	-	-
0974306-IN	-	-	-	-	-	-
0977066-IN	-	-	-	-	-	-
1010963-IN	-	-	-	-	-	-
1058325-IN, 1058327-IN, 1058901-IN, 1062296-IN, 1065784-IN, 1066218-IN, 1075205-IN, 1088404-IN, 1090036-IN, 1097604-IN, 1107772-IN, 1118504-IN, 1124136-IN, 1124445-IN	-	-	-	-	-	-
1164584-IN	-	-	-	-	-	-
Customer 10-CAPE	-	-	-	-	-	-
INVOICE 0123342-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House  
A1c - Residential Home Energy Services - Measures  
Cape Light Compact

2017 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
INVOICE 0130320-IN	-	-	-	-	-	-
INVOICE 0130613-IN	-	-	-	-	-	-
INVOICE 0173753-IN	-	-	-	-	-	-
INVOICE 0181757-IN	-	-	-	-	-	-
INVOICE 0230964-IN	-	-	-	-	-	-
Invoice 0240727-IN	-	-	-	-	-	-
INVOICE 0304575-IN	-	-	-	-	-	-
INVOICE 0353254-IN	-	-	-	-	-	-
INVOICE 0353610-IN	-	-	-	-	-	-
INVOICE 0364158-IN	-	-	-	-	-	-
INVOICE 0364694-IN	-	-	-	-	-	-
INVOICE 0379401-IN	-	-	-	-	-	-
INVOICE 0379430-IN	-	-	-	-	-	-
Invoice 0477751-IN	-	-	-	-	-	-
INVOICE 0530749-IN	-	-	-	-	-	-
INVOICE 0547197-IN	-	-	-	-	-	-
INVOICE 0973536-IN	-	-	-	-	-	-
INVOICE 0995670-IN	-	-	-	-	-	-
INVOICE 1001768-IN	-	-	-	-	-	-
INVOICE 1011486-IN	-	-	-	-	-	-
INVOICE 1011843-IN	-	-	-	-	-	-
INVOICE 1019599-IN	-	-	-	-	-	-
INVOICE 1025808-IN	-	-	-	-	-	-
INVOICE 1044728-IN	-	-	-	-	-	-
Invoice 1047590-IN	-	-	-	-	-	-
Invoice 1047639-IN	-	-	-	-	-	-
INVOICE 1048341-IN	-	-	-	-	-	-
INVOICE 1048356-IN	-	-	-	-	-	-
Invoice 1126460-IN	-	-	-	-	-	-
Invoice 1129649-IN	-	-	-	-	-	-
Invoice 1164559-IN	-	-	-	-	-	-
Invoice 1176418-IN	-	-	-	-	-	-
Invoice 1185857-IN	-	-	-	-	-	-
Invoice 1186747-IN	-	-	-	-	-	-
Invoice 1189727-IN	-	-	-	-	-	-
Invoice 1192562-IN	-	-	-	-	-	-
Heritage Press, Inc.	-	-	-	-	-	-
00100107	-	-	-	-	-	-
KEMA, Inc.	-	-	-	-	-	-
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
Navigant Consulting, Inc.	-	-	-	-	-	-
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
Nexant Inc	-	-	-	-	-	-
INV-0000219360D	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENOV17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
MV Times Corporation, Inc. The Martha's Vineyard Times	-	-	-	-	-	-
Customer 03101623	-	-	-	-	-	-
River Energy - CLEARResult	-	-	-	-	-	-
12825	-	-	-	-	-	-
12834	-	-	-	-	-	-
13043	-	-	-	-	-	-
13052	-	-	-	-	-	-
13166	-	-	-	-	-	-
13387	-	-	-	-	-	-
14706,14762,14770,14779,14808,14816	-	-	-	-	-	-
13764,13773,13791,13813,13822,13831,13847,13856	-	-	-	-	-	-
14288,14297,14323,14449,14522,14529,14536,14543,14550	-	-	-	-	-	-
Invoices 13609, 13618, 13627, 13645, 13677	-	-	-	-	-	-
Invoices 14559, 14591, 14849, 14856, 14864, 14872, 14886, 14886, 14893, 14931	-	-	-	-	-	-
Falmouth Publishing Co., Inc.	-	-	-	-	-	-
Invoice 39665	-	-	-	-	-	-
Gatehouse Media Massachusetts I, Inc d/b/a Community Newspaper Comp	-	-	-	-	-	-
REF CN13586948 A/C Y0207459	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House  
A1c - Residential Home Energy Services - Measures  
Cape Light Compact

2017 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Illume Advising, LLC	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
Local Media Group, Inc d/b/a Cape Cod Media Group	-	-	-	-	-	-
000052192; 0000560537	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
163227,163240, 163241, 163284, 163313, 163476	-	-	-	-	-	-
Invoice 165696, 167894, 167895, 167966, 167976, 167980, 167981, 167990, 168013, 168017, 168018	-	-	-	-	-	-
165823,165913,165925,165926,166747,166935	-	-	-	-	-	-
162122,164298,164587,164588,164633,164634,164708,164728	-	-	-	-	-	-
159704;159706;159715;160680	-	-	-	-	-	-
160678, 160760, 160792, 160864, 160879, 160880, 160890	-	-	-	-	-	-
160712, 160863, 161999, 162000, 162058, 162136, 162234, 161991, 162131, 163231, 163249	-	-	-	-	-	-
163285, 165898, 166088	-	-	-	-	-	-
164738, 165599, 165899, 165900,165912	-	-	-	-	-	-
DNV GL Energy Insights USA, Inc.	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
Synapse Energy Economics	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
Invoices 159117, 159181, 159626, 159627, 159633	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2017 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293H	-	-	-	-	-	-
<b>Rise Engineering</b>						
153217	-	-	-	-	-	-
154268	-	-	-	-	-	-
155082	-	-	-	-	-	-
155611	-	-	-	-	-	-
155612	-	-	-	-	-	-
155613	-	-	-	-	-	-
155669	-	-	-	-	-	-
155685	-	-	-	-	-	-
156600	-	-	-	-	-	-
157040	-	-	-	-	-	-
157046	-	-	-	-	-	-
158051	-	-	-	-	-	-
158446	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
17-806-07	-	-	-	-	-	-
17-806-08	-	-	-	-	-	-
17-806-09,17-806HV-10	-	-	-	-	-	-
17-806-10,17-806-11	-	-	-	-	-	-
17-806-12, 17-806HV-12	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>MV Times Corporation, Inc. The Martha's Vineyard Times</b>						
Customer 03101623	-	-	-	-	-	-
<b>River Energy - CLEAResult</b>						
12825	-	-	-	-	-	-
12834	-	-	-	-	-	-
13043	-	-	-	-	-	-
13052	-	-	-	-	-	-
13166	-	-	-	-	-	-
13387	-	-	-	-	-	-
14706,14762,14770,14779,14808,14816	-	-	-	-	-	-
13764,13773,13791,13813,13822,13831,13847,13856	-	-	-	-	-	-
14288,14297,14323,14449,14522,14529,14536,14543,14550	-	-	-	-	-	-
Invoices 13609, 13618, 13627, 13645, 13677	-	-	-	-	-	-
Invoices 14559, 14591, 14849, 14856, 14864, 14872, 14886, 14886, 14893, 14931	-	-	-	-	-	-
<b>River Energy - RichMay</b>						
12978	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2017 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>River Energy - Ansafo</b>	-	-	-	-	-	-
14706,14762,14770,14779,14808,14816	-	-	-	-	-	-
13764,13773,13791,13813,13822,13831,13847,13856	-	-	-	-	-	-
14288,14297,14323,14449,14522,14529,14536,14543,14550	-	-	-	-	-	-
12413	-	-	-	-	-	-
12728	-	-	-	-	-	-
12905	-	-	-	-	-	-
12923	-	-	-	-	-	-
13069	-	-	-	-	-	-
13218	-	-	-	-	-	-
13464	-	-	-	-	-	-
13991,14008, 14017, 14059, 14104, 14124, 14131, 14139,	-	-	-	-	-	-
14333,14351,14366,F14384,14400,14409,	-	-	-	-	-	-
14598, 14608, 14614, 14629, 14638, 14662, 14669, 14683	-	-	-	-	-	-
INVOICE 13636, 13652, 13660, 13705, 13714, 13722, 13729,	-	-	-	-	-	-
13747	-	-	-	-	-	-
<b>River Energy - Verizon</b>	-	-	-	-	-	-
13764,13773,13791,13813,13822,13831,13847,13856	-	-	-	-	-	-
13991,14008, 14017, 14059, 14104, 14124, 14131, 14139,	-	-	-	-	-	-
14333,14351,14366,F14384,14400,14409,	-	-	-	-	-	-
14598, 14608, 14614, 14629, 14638, 14662, 14669, 14683	-	-	-	-	-	-
INVOICE 13636, 13652, 13660, 13705, 13714, 13722, 13729,	-	-	-	-	-	-
13747	-	-	-	-	-	-
14167, 14174, 14190, 14213, 14222, 14147, 14231	-	-	-	-	-	-
12788	-	-	-	-	-	-
12797	-	-	-	-	-	-
12914	-	-	-	-	-	-
13088	-	-	-	-	-	-
13245	-	-	-	-	-	-
13482	-	-	-	-	-	-
<b>River Energy - Aspect</b>	-	-	-	-	-	-
14706,14762,14770,14779,14808,14816	-	-	-	-	-	-
13764,13773,13791,13813,13822,13831,13847,13856	-	-	-	-	-	-
Invoices 13609, 13618, 13627, 13645, 13677	-	-	-	-	-	-
13991,14008, 14017, 14059, 14104, 14124, 14131, 14139,	-	-	-	-	-	-
14333,14351,14366,F14384,14400,14409,	-	-	-	-	-	-
14598, 14608, 14614, 14629, 14638, 14662, 14669, 14683	-	-	-	-	-	-
INVOICE 13636, 13652, 13660, 13705, 13714, 13722, 13729,	-	-	-	-	-	-
13747	-	-	-	-	-	-
13310	-	-	-	-	-	-
13434	-	-	-	-	-	-
14167, 14174, 14190, 14213, 14222, 14147, 14231	-	-	-	-	-	-
<b>Falmouth Publishing Co., Inc.</b>	-	-	-	-	-	-
Invoice 39665	-	-	-	-	-	-
<b>Gatehouse Media Massachusetts I, Inc d/b/a Community Newspaper Comp</b>	-	-	-	-	-	-
REF CN13586948 A/C Y0207459	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>Local Media Group, Inc d/b/a Cape Cod Media Group</b>	-	-	-	-	-	-
000052192; 0000560537	-	-	-	-	-	-
<b>River Energy - Verizon</b>	-	-	-	-	-	-
14706,14762,14770,14779,14808,14816	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
153389; 155642; 157053; 158475; 159782; 160763; 160764;	-	-	-	-	-	-
161569	-	-	-	-	-	-
163227,163240, 163241, 163284, 163313, 163476	-	-	-	-	-	-
164299,164635,164636,164720,165594,165873,	-	-	-	-	-	-
Invoice 165696, 167894, 167895, 167966, 167976, 167980,	-	-	-	-	-	-
167981, 167990, 168013, 168017, 168018	-	-	-	-	-	-
165823,165913,165925,165926,166747,166935	-	-	-	-	-	-
162122,164298,164587,164588,164633,164634,164708,164728	-	-	-	-	-	-
160678, 160760, 160792, 160864, 160879, 160880, 160890	-	-	-	-	-	-
160712, 160863, 161999, 162000, 162058, 162136, 162234,	-	-	-	-	-	-
163285, 165898, 166088	-	-	-	-	-	-
Invoice 160793	-	-	-	-	-	-
Invoices 159703 & 159716	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
Invoices 159117, 159181, 159626, 159627, 159633	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1e - Residential Behavior/Feedback Program  
Cape Light Compact

2017 A1e - Residential Behavior/Feedback Program						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293H	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-00002193600	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17; 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>People Power Company</b>						
CLC041	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>WB MASON</b>						
142107555	-	-	-	-	-	-
<b>Educational Innovation</b>						
739124-1	-	-	-	-	-	-
<b>National Energy Education Development</b>						
78573	-	-	-	-	-	-
<b>EnergySolutions Training</b>						
1920	-	-	-	-	-	-
<b>United Parcel Service, Inc.</b>						
0002XA172087	-	-	-	-	-	-
<b>Illume Advising, LLC</b>						
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Sally Andreola</b>						
Invoice 2017-4b	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2017 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.1S, 2273.2S, 2273.1T, 2273.2T, 2273.1U, 2273.2U, 2293E, 2293F, 2293G	-	-	-	-	-	-
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
Invoice 2273.1R, 2273.2R, 2273.1Q, 2273.2Q, 2293C, 2293D	-	-	-	-	-	-
<b>Blackhawk Engagement</b>						
5G 65ME072	-	-	-	-	-	-
5G 75ME006	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0125469-IN, 0149473-IN, 0179700-IN,0228223-IN, 0250101-IN, 0360866-IN, 0370926-IN, 0388273-IN, 0414587-IN, 0468236-IN, 0734297-IN, 0951910-IN, 1001993-IN, 1011801-IN, 1019005-IN, 1025783-IN, 0128344-IN, 0158109-IN, 0168616-IN, 0199236-IN, 0226631-IN, 0235860-IN, 0267759-IN, 0319288-IN, 0348717-IN, 0358830-IN, 0378177-IN, 0477066-IN, 0480314-IN, 0488768-IN, 0491593-IN, 0501797-I	-	-	-	-	-	-
0298350-IN, 0371689-IN, 0372286-IN, 0372682-IN, 0372692-IN	-	-	-	-	-	-
1058325-IN, 1058327-IN, 1058901-IN, 1062296-IN, 1065784-IN, 1066218-IN, 1075205-IN, 1088404-IN, 1090036-IN, 1097604-IN, 1107772-IN, 1118504-IN, 1124136-IN, 1124445-IN	-	-	-	-	-	-
Customer 10-CAPE	-	-	-	-	-	-
0115121-IN	-	-	-	-	-	-
0123525-IN	-	-	-	-	-	-
0125190-IN	-	-	-	-	-	-
0130611-IN	-	-	-	-	-	-
0146937-IN,0363662-IN,0426643-IN,0458159-IN	-	-	-	-	-	-
0178219-IN	-	-	-	-	-	-
0189659-IN	-	-	-	-	-	-
0353650-IN	-	-	-	-	-	-
0372679-IN, 0379327-IN	-	-	-	-	-	-
0378203-IN,1057705-IN,1065805-IN	-	-	-	-	-	-
0584075-IN, 1088378-IN, 1098448-IN	-	-	-	-	-	-
0591898-IN, 1003831-IN	-	-	-	-	-	-
0676947-IN, 0898466-IN, 1012425-IN, 1014314-IN, 1019011-IN	-	-	-	-	-	-
0802213-IN	-	-	-	-	-	-
0806389-IN	-	-	-	-	-	-
0807948-IN	-	-	-	-	-	-
0825646-IN	-	-	-	-	-	-
0834349-IN	-	-	-	-	-	-
0838842-IN	-	-	-	-	-	-
0842872-IN	-	-	-	-	-	-
0873536-IN	-	-	-	-	-	-
0874683-IN	-	-	-	-	-	-
0875430-IN	-	-	-	-	-	-
0913781-IN	-	-	-	-	-	-
0913989-IN	-	-	-	-	-	-
0936742-IN	-	-	-	-	-	-
0940250-IN	-	-	-	-	-	-
0962220-IN	-	-	-	-	-	-
0967975-IN	-	-	-	-	-	-
0992816-IN	-	-	-	-	-	-
1000721-IN	-	-	-	-	-	-
1124738-IN,1172370-IN,1172377-IN,1185203-IN	-	-	-	-	-	-
Invoice 0306836-IN,0892366-IN,0229393-IN,0231370-IN,0235810-IN,0484360-IN,0494347-IN,0523280-IN,0315032-IN	-	-	-	-	-	-
INVOICE 1047051-IN	-	-	-	-	-	-
INVOICE 1054048-IN	-	-	-	-	-	-
Invoice 1125568-IN	-	-	-	-	-	-
Invoice 1126807-IN	-	-	-	-	-	-
Invoice 1163696-IN	-	-	-	-	-	-
Invoice 1186522-IN	-	-	-	-	-	-
Invoice 1189724-IN	-	-	-	-	-	-
Invoice 1189747-IN	-	-	-	-	-	-
<b>Heritage Press, Inc.</b>						
00100107	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2017 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>CLEARResult Consulting, Inc.</b>	-	-	-	-	-	-
09-CAPELIGHT_WFD, 105-CAPE LIGHT, 7613	-	-	-	-	-	-
7445, 103-CAPE LIGHT, 07-CAPELIGHT_WFD	-	-	-	-	-	-
Invoices 102-CAPE LIGHT & 7385	-	-	-	-	-	-
100-CAPE LIGHT	-	-	-	-	-	-
101-CAPE LIGHT	-	-	-	-	-	-
106-CAPE LIGHT	-	-	-	-	-	-
107-CAPE LIGHT	-	-	-	-	-	-
108-CAPE LIGHT	-	-	-	-	-	-
97-CAPE LIGHT	-	-	-	-	-	-
98-CAPE LIGHT	-	-	-	-	-	-
99-CAPE LIGHT	-	-	-	-	-	-
Invoice 104-CAPE LIGHT	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2b - Residential Consumer Products  
Cape Light Compact

2017 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.1S, 2273.2S, 2273.1T, 2273.2T, 2273.1U, 2273.2U, 2293E, 2293F, 2293G	-	-	-	-	-	-
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
Invoice 2273.1R, 2273.2R, 2273.1Q, 2273.2Q, 2293C, 2293D	-	-	-	-	-	-
2273.1V	-	-	-	-	-	-
<b>Appliance Recycling Centers of America, Inc.</b>						
46180	-	-	-	-	-	-
46374	-	-	-	-	-	-
46548	-	-	-	-	-	-
46893	-	-	-	-	-	-
47078	-	-	-	-	-	-
47454	-	-	-	-	-	-
Invoice 47253	-	-	-	-	-	-
Invoice 47650	-	-	-	-	-	-
Invoices 46218,47652,47882,48036,48081	-	-	-	-	-	-
Invoices 46489, 47181, 47199, 47880	-	-	-	-	-	-
Invoices 48244	-	-	-	-	-	-
Invoices 48429	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0128344-IN, 0158109-IN, 0168616-IN, 0199236-IN, 0226631-IN, 0235860-IN, 0267759-IN, 0319288-IN, 0348717-IN, 0358830-IN, 0378177-IN, 0477066-IN, 0480314-IN, 0488768-IN, 0491593-IN, 0501797-I	-	-	-	-	-	-
0298350-IN, 0371689-IN, 0372286-IN, 0372682-IN, 0372692-IN	-	-	-	-	-	-
1058325-IN, 1058327-IN, 1058901-IN, 1062296-IN, 1065784-IN, 1066218-IN, 1075205-IN, 1088404-IN, 1090036-IN, 1097604-IN, 1107772-IN, 1118504-IN, 1124136-IN, 1124445-IN	-	-	-	-	-	-
Customer 10-CAPE	-	-	-	-	-	-
0146937-IN,0363662-IN,0426643-IN,0458159-IN	-	-	-	-	-	-
Invoice 0306836-IN,0892366-IN,0229393-IN,0231370-IN,0235810-IN,0484360-IN,0494347-IN,0523280-IN,0315032-IN	-	-	-	-	-	-
012335-IN	-	-	-	-	-	-
0124285-IN	-	-	-	-	-	-
0126075-IN	-	-	-	-	-	-
0127071-IN	-	-	-	-	-	-
0129747-IN	-	-	-	-	-	-
0150107-IN	-	-	-	-	-	-
0150341-IN	-	-	-	-	-	-
0173758-IN	-	-	-	-	-	-
0173768-IN	-	-	-	-	-	-
0181721-IN	-	-	-	-	-	-
0182670-IN	-	-	-	-	-	-
0289633-IN	-	-	-	-	-	-
0315172-IN	-	-	-	-	-	-
0319155-IN	-	-	-	-	-	-
0354657-IN	-	-	-	-	-	-
0363305-IN	-	-	-	-	-	-
0535611-IN	-	-	-	-	-	-
0671242-IN	-	-	-	-	-	-
0768390-IN	-	-	-	-	-	-
0769271-IN	-	-	-	-	-	-
0771202-IN	-	-	-	-	-	-
0785619-IN	-	-	-	-	-	-
0789865-IN	-	-	-	-	-	-
0800832-IN	-	-	-	-	-	-
0803766-IN	-	-	-	-	-	-
0819611-IN	-	-	-	-	-	-
0823328-IN	-	-	-	-	-	-
0857849-IN	-	-	-	-	-	-
0868548-IN	-	-	-	-	-	-
0896497-IN	-	-	-	-	-	-
0898453-IN	-	-	-	-	-	-
0904871-IN	-	-	-	-	-	-
0925682-IN	-	-	-	-	-	-
0956853-IN	-	-	-	-	-	-
0958895-IN	-	-	-	-	-	-
0981904-IN	-	-	-	-	-	-
1002757-IN	-	-	-	-	-	-
INVOICE 0372701-IN	-	-	-	-	-	-
INVOICE 0373002-IN	-	-	-	-	-	-
INVOICE 0374896-IN	-	-	-	-	-	-
INVOICE 0400952-IN	-	-	-	-	-	-
INVOICE 0403469-IN	-	-	-	-	-	-
INVOICE 0473481-IN	-	-	-	-	-	-
INVOICE 0496834-IN	-	-	-	-	-	-
Invoice 0498221-IN	-	-	-	-	-	-
Invoice 0498227-IN	-	-	-	-	-	-
INVOICE 0536088-IN	-	-	-	-	-	-
INVOICE 0569568-IN	-	-	-	-	-	-
Invoice 0663187-IN	-	-	-	-	-	-
Invoice 1012146-IN	-	-	-	-	-	-
INVOICE 1014327-IN	-	-	-	-	-	-
INVOICE 1023235-IN	-	-	-	-	-	-
INVOICE 1028532-IN	-	-	-	-	-	-
INVOICE 1035496-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2b - Residential Consumer Products  
Cape Light Compact

2017 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Invoice 1047581-IN	-	-	-	-	-	-
INVOICE 1051212-IN	-	-	-	-	-	-
Invoice 1123460-IN	-	-	-	-	-	-
Invoice 1123584-IN	-	-	-	-	-	-
Invoice 1124323-IN	-	-	-	-	-	-
Invoice 1126830-IN	-	-	-	-	-	-
Invoice 1163675-IN	-	-	-	-	-	-
Invoice 1180920-IN	-	-	-	-	-	-
Invoice 1184290-IN	-	-	-	-	-	-
Invoice 1185542-IN	-	-	-	-	-	-
Invoice 1186235-IN	-	-	-	-	-	-
<b>KEMA, Inc.</b>	-	-	-	-	-	-
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Lockheed Martin Corporation</b>	-	-	-	-	-	-
E1701-072	-	-	-	-	-	-
E1705-092A	-	-	-	-	-	-
E1706-036A	-	-	-	-	-	-
E1709-064A, E1710-008A	-	-	-	-	-	-
E1711-035A	-	-	-	-	-	-
E1712-129A	-	-	-	-	-	-
E1801-014A	-	-	-	-	-	-
Invoices E1707-023; E1707-024; E1708-050; E1708-051	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENOV17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-238615	-	-	-	-	-	-
INV-238620	-	-	-	-	-	-
INV-239512	-	-	-	-	-	-
INV-239516	-	-	-	-	-	-
INV-240576	-	-	-	-	-	-
INV-240581	-	-	-	-	-	-
INV-241555	-	-	-	-	-	-
INV-241560	-	-	-	-	-	-
INV-242236	-	-	-	-	-	-
INV-242240	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-246765, INV-246770, INV-246772	-	-	-	-	-	-
INV-247709, INV-247714	-	-	-	-	-	-
INV-248758, INV-248763	-	-	-	-	-	-
INV-249592, INV-249597	-	-	-	-	-	-
INV-250470	-	-	-	-	-	-
Invoices INV-243402; INV-243408; INV-245113; INV-245120	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products

A2c - Residential Lighting

Cape Light Compact

2017 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.1S, 2273.2S, 2273.1T, 2273.2T, 2273.1U, 2273.2U, 2293E, 2293F, 2293G	-	-	-	-	-	-
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
Invoice 2273.1R, 2273.2R, 2273.1Q, 2273.2Q, 2293C, 2293D	-	-	-	-	-	-
2273.1K	-	-	-	-	-	-
2273.1L	-	-	-	-	-	-
2273.1M	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
Invoice 1047631-IN	-	-	-	-	-	-
0128344-IN, 0158109-IN, 0168616-IN, 0199236-IN, 0226631-IN, 0235860-IN, 0267759-IN, 0319288-IN, 0348717-IN, 0358830-IN, 0378177-IN, 0477066-IN, 0480314-IN, 0488768-IN, 0491593-IN, 0501797-I	-	-	-	-	-	-
0298350-IN, 0371689-IN, 0372286-IN, 0372682-IN, 0372692-IN	-	-	-	-	-	-
1058325-IN, 1058327-IN, 1058901-IN, 1062296-IN, 1065784-IN, 1066218-IN, 1075205-IN, 1088404-IN, 1090036-IN, 1097604-IN, 1107772-IN, 1118504-IN, 1124136-IN, 1124445-IN	-	-	-	-	-	-
Customer 10-CAPE	-	-	-	-	-	-
0146937-IN,0363662-IN,0426643-IN,0458159-IN	-	-	-	-	-	-
0372679-IN, 0379327-IN	-	-	-	-	-	-
Invoice 0306836-IN,0892366-IN,0229393-IN,0231370-IN,0235810-IN,0484360-IN,0494347-IN,0523280-IN,0315032-IN	-	-	-	-	-	-
0124285-IN	-	-	-	-	-	-
0173758-IN	-	-	-	-	-	-
0785619-IN	-	-	-	-	-	-
0956853-IN	-	-	-	-	-	-
Invoice 1012146-IN	-	-	-	-	-	-
Invoice 1047581-IN	-	-	-	-	-	-
Invoice 1123584-IN	-	-	-	-	-	-
Invoice 1186235-IN	-	-	-	-	-	-
0105055-IN	-	-	-	-	-	-
0114215-IN	-	-	-	-	-	-
0123033-IN	-	-	-	-	-	-
0129745-IN	-	-	-	-	-	-
0157498-IN	-	-	-	-	-	-
0171564-IN	-	-	-	-	-	-
0182669-IN	-	-	-	-	-	-
0288818-IN	-	-	-	-	-	-
0356133-IN	-	-	-	-	-	-
0767950-IN	-	-	-	-	-	-
0804918-IN	-	-	-	-	-	-
0823323-IN	-	-	-	-	-	-
0847239-IN	-	-	-	-	-	-
0862170-IN	-	-	-	-	-	-
0885718-IN	-	-	-	-	-	-
0893475-IN	-	-	-	-	-	-
0898452-IN	-	-	-	-	-	-
0933596-IN	-	-	-	-	-	-
0949332-IN	-	-	-	-	-	-
0958886-IN	-	-	-	-	-	-
0981099-IN	-	-	-	-	-	-
INVOICE 0374894-IN	-	-	-	-	-	-
Invoice 0407421-IN	-	-	-	-	-	-
Invoice 0498220-IN	-	-	-	-	-	-
INVOICE 0524963-IN	-	-	-	-	-	-
INVOICE 0915030-IN	-	-	-	-	-	-
INVOICE 1016196-IN	-	-	-	-	-	-
INVOICE 1035495-IN	-	-	-	-	-	-
Invoice 1123459-IN	-	-	-	-	-	-
Invoice 1126821-IN	-	-	-	-	-	-
Invoice 1180664-IN	-	-	-	-	-	-
Invoice 1184289-IN	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Lockheed Martin Corporation</b>						
E1701-072	-	-	-	-	-	-
E1705-092A	-	-	-	-	-	-
E1706-036A	-	-	-	-	-	-
E1709-064A, E1710-008A	-	-	-	-	-	-
E1711-035A	-	-	-	-	-	-
E1712-129A	-	-	-	-	-	-
E1801-014A	-	-	-	-	-	-
Invoices E1707-023; E1707-024; E1708-050; E1708-051	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products  
A2c - Residential Lighting  
Cape Light Compact

2017 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-238615	-	-	-	-	-	-
INV-238620	-	-	-	-	-	-
INV-239512	-	-	-	-	-	-
INV-239516	-	-	-	-	-	-
INV-240576	-	-	-	-	-	-
INV-240581	-	-	-	-	-	-
INV-241555	-	-	-	-	-	-
INV-241560	-	-	-	-	-	-
INV-242236	-	-	-	-	-	-
INV-242240	-	-	-	-	-	-
<b>illum Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-246765, INV-246770, INV-246772	-	-	-	-	-	-
INV-247709, INV-247714	-	-	-	-	-	-
INV-248758, INV-248763	-	-	-	-	-	-
INV-249592, INV-249597	-	-	-	-	-	-
INV-250470	-	-	-	-	-	-
Invoices INV-243402; INV-243408; INV-245113; INV-245120	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1a - Low-Income Single Family Retrofit*  
Cape Light Compact

2017 B1a - Low-Income Single Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs						
All IT Allocated Costs						
All Marketing Allocated Costs						
All General Administration Allocated Costs						
<b>NMR Group, Inc.</b>						
2293H						
<b>CMC Energy Services, Inc.</b>						
17-806-01						
17-806-02						
17-806-03						
17-806-04						
17-806-07						
17-806-08						
17-806-09,17-806HV-10						
17-806-10,17-806-11						
17-806-12, 17-806HV-12						
Invoice 17-806-05						
PO-0015, PO-0016, PO-0017						
<b>KEMA, Inc.</b>						
Invoice 10020586						
Invoice 870010002219						
Invoice 870010002394						
Invoice 870010003840						
<b>Navigant Consulting, Inc.</b>						
0100002598						
0100003212						
0100003756						
100007866						
100009162						
100010384						
100012112						
100013946						
100014199						
0100004381;0100005155;0100006143;0100007867						
<b>Nexant Inc</b>						
INV-0000219360D						
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17						
7831.1AUG17						
7831.1DEC17						
7831.1Nov17, 7831.2Nov17						
7831.1Sep17						
7870CAPEDec17						
7870CAPENOV16						
7870CAPENov17						
7870CAPESep17						
<b>Tetra Tech MA, Inc.</b>						
1021 B						
1022 B						
1023 B						
1024 B						
1025B; 1026B						
1027B						
<b>Housing Assistance Corporation</b>						
02.17.2017_MARKETING						
FRIDGE 2017-03						
LIGHTING 2017-01						
LIGHTING 2017-02						
LIGHTING 2017-03						
LIGHTING 2017-04						
LIGHTING 2017-05						
REFRIGERATOR 2017-01						
REFRIGERATOR 2017-02						
REFRIGERATOR 2017-04						
REFRIGERATOR 2017-05						
WEATHER 2017-01						
WEATHER 2017-02						
WEATHER 2017-03						
WEATHER 2017-04						
WEATHER 2017-05						
<b>River Energy - CLEARResult</b>						
14288,14297,14323,14449,14522,14529,14536,14543,14550						
<b>River Energy - Ansafone</b>						
14706,14762,14770,14779,14808,14816						
<b>River Energy - Verizon</b>						
13764,13773,13791,13813,13822,13831,13847,13856						
Invoices 13609, 13618, 13627, 13645, 13677						
13991,14008, 14017, 14059, 14104, 14124, 14131, 14139,						
14333,14351,14366,F14384,14400,14409,						
14598, 14608, 14614, 14629, 14638, 14662, 14669, 14683						
14167, 14174, 14190, 14213, 14222, 14147, 14231						
13079						
13236						
13473						



**Vendor Invoice Summary Table**

B1 - Low-Income Whole House

B1a - Low-Income Single Family Retrofit

Cape Light Compact

2017 B1a - Low-Income Single Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Housing Assistance Corporation</b>	-	-	-	-	-	-
07.31.17_LIMF_WELLS CT FIXTURES; 07.31.2017_LIMF_INDIVIDUALS; LIGHTING INVOICE 2017-07; REFRIGERATOR INVOICE 2017-07; WEATHERIZATION 2017-07	-	-	-	-	-	-
08.15.17_LIMF_B_Bourne,08.31.17_LIMF_CHA_Congregate,08.31.17_LIMF_RF_Cromwell Ct,08.31.17_Osprey Lane,Refrigerator Invoice 2017-08,Lighting Invoice 2018-08,Weatherization 2017-08	-	-	-	-	-	-
08.31.17_Osprey Lane B,10.26.17_LIMF_Fix_Kimber Woods,10.29.17_Marketing,10.30.17_LIMF_Bulbs_CCSR,10.31.17_Bulbs_LIMF_Individuals,10.31.17_LIMF_Individuals Fridges,Lighting Invoice 2017-010,	-	-	-	-	-	-
08.31.2017_LIMF_INDIVIDUALS, 09.26.2017_LIMF_INDIVIDUALS WZ, 09.26.2017_LIMF_INDIVIDUALS FRIDGES, 09.26.17_LIMF_CHA_ANCHORAGE, 09.29.2017_LIMF_INDIVIDUALS, REFRIGERATOR INVOICE 2017-09, WEAT	-	-	-	-	-	-
11.30.17_Bulbs_LIMF_Individuals,11_30_2017_LIMF_Fixtures_Asher Path,12.13.17zz_LIMF_Fixtures_Cromwell Stage 1,Lighting 2017-11,Refrigerator 2017-011,Weatherization 2017-11 INVOICE 12.21.2017_LIMF_Bulbs_Sea street ext., INVOICE 12.31.17_LIMF_Individuals, LIGHTING INVOICE 2017-12, REFRIGERATOR INVOICE 2017-012	-	-	-	-	-	-
INVOICE 12.31.2017_LIMF_Ind_Fridge, Weatherization 2017-12 Invoices 06.23.17_LIMF_Lake St Fixtures, 06.28.2017_LIMF_Individuals Fridges, Refrigerator 2017-06, Lighting 2017-06, 6.30.2017_LIMF_Individuals, Weatherization 2017-06, 06.30.2017_LIMF_215	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>River Energy - Verizon</b>	-	-	-	-	-	-
14706,14762,14770,14779,14808,14816	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-246765, INV-246770, INV-246772	-	-	-	-	-	-
Invoice INV-245122	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1b - Low-Income Multi-Family Retrofit*  
Cape Light Compact

2017 B1b - Low-Income Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>	-	-	-	-	-	-
2273.1S, 2273.2S, 2273.1T, 2273.2T, 2273.1U, 2273.2U, 2293E, 2293F, 2293G	-	-	-	-	-	-
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>	-	-	-	-	-	-
17-806-01	-	-	-	-	-	-
17-806-02	-	-	-	-	-	-
17-806-03	-	-	-	-	-	-
17-806-04	-	-	-	-	-	-
17-806-07	-	-	-	-	-	-
17-806-08	-	-	-	-	-	-
17-806-09,17-806HV-10	-	-	-	-	-	-
17-806-10,17-806-11	-	-	-	-	-	-
17-806-12, 17-806HV-12	-	-	-	-	-	-
Invoice 17-806-05	-	-	-	-	-	-
PO-0015, PO-0016, PO-0017	-	-	-	-	-	-
<b>KEMA, Inc.</b>	-	-	-	-	-	-
Invoice 10020586	-	-	-	-	-	-
Invoice 870010002219	-	-	-	-	-	-
Invoice 870010002394	-	-	-	-	-	-
Invoice 870010003840	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
0100002598	-	-	-	-	-	-
0100003212	-	-	-	-	-	-
0100003756	-	-	-	-	-	-
100007866	-	-	-	-	-	-
100009162	-	-	-	-	-	-
100010384	-	-	-	-	-	-
100012112	-	-	-	-	-	-
100013946	-	-	-	-	-	-
100014199	-	-	-	-	-	-
0100004381;0100005155;0100006143;0100007867	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>Housing Assistance Corporation</b>	-	-	-	-	-	-
01.30.2017_LIMF_RF_C	-	-	-	-	-	-
01.31.2017_LIMF_FIXU	-	-	-	-	-	-
01.31.2017_SF_LIMF_B	-	-	-	-	-	-
02.28.2017_LIMF_FHA_	-	-	-	-	-	-
02.28.2017_LIMF_FRID	-	-	-	-	-	-
02.28.2017_LIMF_MASH	-	-	-	-	-	-
03.05.18_2017 LIMF AMP Fee Correction	-	-	-	-	-	-
03.30.2017_LIMF_FRID	-	-	-	-	-	-
03.30.2017_LIMF_MASH	-	-	-	-	-	-
03.31.17 LIMF_FOUNDE	-	-	-	-	-	-
03.31.2017_LIMF_180	-	-	-	-	-	-
04.12.17 LIMF_FOUNDE	-	-	-	-	-	-
04.30.17 LIMF_MORGAN	-	-	-	-	-	-
04.30.2017_LIMF_INDI	-	-	-	-	-	-
05.10.2017_DENNIS HO	-	-	-	-	-	-
05.30.2017_LIMF_INDI	-	-	-	-	-	-
05.31.17_LIMF_BEARSE	-	-	-	-	-	-
05.31.2017_LIMF_CROM	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1b - Low-Income Multi-Family Retrofit*  
Cape Light Compact

2017 B1b - Low-Income Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Housing Assistance Corporation</b>	-	-	-	-	-	-
07.31.17_LIMF_WELLS CT FIXTURES; 07.31.2017_LIMF_INDIVIDUALS; LIGHTING INVOICE 2017-07; REFRIGERATOR INVOICE 2017-07; WEATHERIZATION 2017-07 08.15.17_LIMF_B Bourne,08.31.17_LIMF_CHA_Congregate,08.3 1.17_LIMF_RF_Cromwell Ct,08.31.17_Osprey Lane,Refrigerator Invoice 2017-08,Lighting Invoice 2018-08,Weatherization 2017- 08 08.31.17_Osprey Lane B,10.26.17_LIMF_Fix_Kimber Woods,10.29.17_Marketing,10.30.17_LIMF_Bulbs_CCSR,10.31.1 7_Bulbs_LIMF_Individuals,10.31.17_LIMF_Individuals Fridges,Lighting Invoice 2017-010,  08.31.2017_LIMF_INDIVIDUALS, 09.26.2017_LIMF_INDIVIDUALS WZ, 09.26.2017_LIMF_INDIVIDUALS FRIDGES, 09.26.17_LIMF_CHA_ANCHORAGE, 09.29.2017_LIMF_INDIVIDUALS, REFRIGERATOR INVOICE 2017- 09, WEAT  11.30.17_Bulbs_LIMF_Individuals,11_30_2017_LIMF_Fixtures_A sher Path,12.13.17zz_LIMF_Fixtures_Cromwell Stage 1,Lighting 2017-11,Refrigerator 2017-011,Weatherization 2017-11 INVOICE 12.21.2017_LIMF_Bulbs_Sea street ext., INVOICE 12.31.17_LIMF_Individuals, LIGHTING INVOICE 2017-12, REFRIGERATOR INVOICE 2017-012  INVOICE 12.31.2017_LIMF_Ind_Fridge, Weatherization 2017-12 Invoices 06.23.17_LIMF_Lake St Fixtures, 06.28.2017_LIMF_Individuals Fridges, Refrigerator 2017-06, Lighting 2017-06, 6.30.2017_LIMF_Individuals, Weatherization 2017-06, 06.30.2017_LIMF 215	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921 0001961, 0001996	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
Invoice 165696, 167894, 167895, 167966, 167976, 167980, 167981, 167990, 168013, 168017, 168018	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010007566	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL 17-080-02CL 17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2017 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
<b>Demand Management</b>						
201701CS	-	-	-	-	-	-
201702CS	-	-	-	-	-	-
201703CS	-	-	-	-	-	-
201704CS	-	-	-	-	-	-
201705CS	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2017-201	-	-	-	-	-	-
2017-202	-	-	-	-	-	-
2017-207	-	-	-	-	-	-
2017-208	-	-	-	-	-	-
2017-214	-	-	-	-	-	-
2017-215	-	-	-	-	-	-
2017-220	-	-	-	-	-	-
2017-221	-	-	-	-	-	-
2017-223	-	-	-	-	-	-
2017-224	-	-	-	-	-	-
2017-235; 2017-236; 2017-237	-	-	-	-	-	-
2017-255, 2017-256, 2017-257, 2017-258, 2017-259	-	-	-	-	-	-
2017-262, 2017-263, 2017-264, 2017-265, 2017-266	-	-	-	-	-	-
2017-267, 2017-268, 2017-269	-	-	-	-	-	-
INVOICE 2017-229, 2017-230, 2017-231, 2017-232	-	-	-	-	-	-
Invoices 2017-241, 2017-242, 2017-243, 2017-245	-	-	-	-	-	-
Invoices 2017-247, 2017-248, 2017-249, 2017-250, 2017-251, 2017-252, 2017-253, 2017-254	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10015609	-	-	-	-	-	-
10015620	-	-	-	-	-	-
10015631	-	-	-	-	-	-
10015650	-	-	-	-	-	-
10016828	-	-	-	-	-	-
10016839	-	-	-	-	-	-
10016866	-	-	-	-	-	-
10016877	-	-	-	-	-	-
10016888	-	-	-	-	-	-
10016918	-	-	-	-	-	-
10016943	-	-	-	-	-	-
10016954	-	-	-	-	-	-
10016965	-	-	-	-	-	-
10017019	-	-	-	-	-	-
10017710	-	-	-	-	-	-
10017734	-	-	-	-	-	-
10017778	-	-	-	-	-	-
10017800	-	-	-	-	-	-
10017826	-	-	-	-	-	-
10017833	-	-	-	-	-	-
10017844	-	-	-	-	-	-
10018552;10018560;10018504;10018494;10018534;10018529;10018583;10018571;10018458;10019232;10019144;10019209;10019191;10019133;10019155;10019167;10019966;10019983;10019955;10020024	-	-	-	-	-	-
870010000129; 870010000068; 870010000471; 870010000109;	-	-	-	-	-	-
870010000030; 870010000009; 8700100000485; 870010000095	-	-	-	-	-	-
870010000459; 870010000079; 870010000044; 870010000465;	-	-	-	-	-	-
870010000081	-	-	-	-	-	-
870010002834; 870010003033; 870010002852; 870010002956	-	-	-	-	-	-
870010002919; 870010002940; 870010002924; 870010002929;	-	-	-	-	-	-
870010002941; 870010002851; 870010003044; 870010002958;	-	-	-	-	-	-
870010003064	-	-	-	-	-	-
870010005862; 870010006008; 870010005916; 870010005938	-	-	-	-	-	-
870010005873; 870010005898; 870010005885; 870010005896;	-	-	-	-	-	-
870010005927; 870010006019; 870010005943	-	-	-	-	-	-
870010006804; 870010006764; 870010006785; 870010006843	-	-	-	-	-	-
870010007276; 870010006832; 870010006821; 870010006745;	-	-	-	-	-	-
870010006751; 870010006816; 870010006775; 870010007304;	-	-	-	-	-	-
870010006790	-	-	-	-	-	-
Invoice 870010007537	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2017 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Tetra Tech MA, Inc.	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
TRC Engineers	-	-	-	-	-	-
239201	-	-	-	-	-	-
The Weidt Group, Inc.	-	-	-	-	-	-
Invoice 1707998	-	-	-	-	-	-
CLEARresult Consulting, Inc.	-	-	-	-	-	-
7082	-	-	-	-	-	-
7119	-	-	-	-	-	-
7170	-	-	-	-	-	-
7245	-	-	-	-	-	-
7335	-	-	-	-	-	-
09-CAPELIGHT_WFD, 105-CAPE LIGHT, 7613	-	-	-	-	-	-
7445, 103-CAPE LIGHT, 07-CAPELIGHT_WFD	-	-	-	-	-	-
Invoice 7525	-	-	-	-	-	-
Invoices 102-CAPE LIGHT & 7385	-	-	-	-	-	-
River Energy - RichMay	-	-	-	-	-	-
12745	-	-	-	-	-	-
14740, 14747, 14754	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
Performance Systems Development of New York, LLC	-	-	-	-	-	-
19304, 19305, 19396, 19397	-	-	-	-	-	-
River Energy - iDeliver Technologies	-	-	-	-	-	-
14333,14351,14366,F14384,14400,14409,	-	-	-	-	-	-
Second Law Engineers, Inc., DBA DMI	-	-	-	-	-	-
201707CS	-	-	-	-	-	-
201709CS	-	-	-	-	-	-
201710CS	-	-	-	-	-	-
201711CS	-	-	-	-	-	-
201712CS	-	-	-	-	-	-
Invoice 201706CS	-	-	-	-	-	-
Invoice 201708CS 8/31/17	-	-	-	-	-	-
DNV GL Energy Insights USA, Inc.	-	-	-	-	-	-
12/17 C&I Milestone Invoice Cover Sheet	-	-	-	-	-	-
12/17 C&I Time & Materials Invoice Cover Shee	-	-	-	-	-	-
Synapse Energy Economics	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
energyOrbit	-	-	-	-	-	-
2133	-	-	-	-	-	-
2145	-	-	-	-	-	-
2183	-	-	-	-	-	-
2197	-	-	-	-	-	-
2234	-	-	-	-	-	-
2243	-	-	-	-	-	-
2273	-	-	-	-	-	-
2300	-	-	-	-	-	-
2323	-	-	-	-	-	-
2478	-	-	-	-	-	-
2500	-	-	-	-	-	-
2226R	-	-	-	-	-	-
2520, 2527, 2528	-	-	-	-	-	-
Invoice 2346	-	-	-	-	-	-
Invoice 2398	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1b - C&I Initial Purchase & End of Useful Life  
Cape Light Compact

2017 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
Invoice 2273.1R, 2273.2R, 2273.1Q, 2273.2Q, 2293C, 2293D	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
17-806-09,17-806HV-10	-	-	-	-	-	-
17-806-12, 17-806HV-12	-	-	-	-	-	-
PO-0015, PO-0016, PO-0017	-	-	-	-	-	-
17-806HV-01	-	-	-	-	-	-
17-806HV-02	-	-	-	-	-	-
17-806HV-03	-	-	-	-	-	-
17-806HV-04	-	-	-	-	-	-
17-806HV-05	-	-	-	-	-	-
17-806HV-07,17-806UP-07	-	-	-	-	-	-
17-806HV-08,17-806UP-08	-	-	-	-	-	-
17-806HV-09, 17-806UP-09	-	-	-	-	-	-
17-806HV-11, 17-806UP-11	-	-	-	-	-	-
<b>Demand Management</b>						
201701CS	-	-	-	-	-	-
201702CS	-	-	-	-	-	-
201703CS	-	-	-	-	-	-
201705CS	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
0126059-IN	-	-	-	-	-	-
0129759-IN	-	-	-	-	-	-
0129766-IN	-	-	-	-	-	-
0771186-IN	-	-	-	-	-	-
0815343-IN	-	-	-	-	-	-
0825649-IN	-	-	-	-	-	-
0833374-IN	-	-	-	-	-	-
0871155-IN	-	-	-	-	-	-
0872051-IN	-	-	-	-	-	-
0912912-IN	-	-	-	-	-	-
0913542-IN	-	-	-	-	-	-
0988093-IN	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
Invoices 2017-247,2017-248,2017-249,2017-250,2017-251,2017-252,2017-253,2017-254	-	-	-	-	-	-
2017-213	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10015609	-	-	-	-	-	-
10015620	-	-	-	-	-	-
10015631	-	-	-	-	-	-
10015650	-	-	-	-	-	-
10016828	-	-	-	-	-	-
10016839	-	-	-	-	-	-
10016866	-	-	-	-	-	-
10016877	-	-	-	-	-	-
10016888	-	-	-	-	-	-
10016918	-	-	-	-	-	-
10016943	-	-	-	-	-	-
10016954	-	-	-	-	-	-
10016965	-	-	-	-	-	-
10017710	-	-	-	-	-	-
10017734	-	-	-	-	-	-
10017778	-	-	-	-	-	-
10017826	-	-	-	-	-	-
10017833	-	-	-	-	-	-
10017844	-	-	-	-	-	-
10018552;10018560;10018504;10018494;10018534;10018529;10018583;10018571;10018458;10019232;10019144;10019209;10019191;10019133;10019155;10019167;10019966;10019983;10019955;10020024	-	-	-	-	-	-
870010000129; 870010000068; 870010000471; 870010000109;	-	-	-	-	-	-
870010000030; 870010000009; 870010000485; 870010000095	-	-	-	-	-	-
870010000459; 870010000079; 870010000044; 870010000465;	-	-	-	-	-	-
870010000081	-	-	-	-	-	-
870010002834; 870010003033; 870010002852; 870010002956	-	-	-	-	-	-
870010002919; 870010002940; 870010002924; 870010002929;	-	-	-	-	-	-
870010002941; 870010002851; 870010003044; 870010002958;	-	-	-	-	-	-
870010003064	-	-	-	-	-	-
870010005862; 870010006008; 870010005916; 870010005938	-	-	-	-	-	-
870010005873; 870010005898; 870010005885; 870010005896;	-	-	-	-	-	-
870010005927; 870010006019; 870010005943	-	-	-	-	-	-
870010006804; 870010006764; 870010006785; 870010006843	-	-	-	-	-	-
870010007276; 870010006832; 870010006821; 870010006745;	-	-	-	-	-	-
870010006751; 870010006816; 870010006775; 870010007304;	-	-	-	-	-	-
870010006790	-	-	-	-	-	-
Invoice 870010007537	-	-	-	-	-	-
10015642	-	-	-	-	-	-
10016932	-	-	-	-	-	-
10017775	-	-	-	-	-	-
10017789	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C1 - C&I New Construction

C1b - C&I Initial Purchase & End of Useful Life

Cape Light Compact

2017 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>River Energy - RichMay</b>	-	-	-	-	-	-
12745	-	-	-	-	-	-
14740, 14747, 14754	-	-	-	-	-	-
<b>Cohen Ventures, Inc./DBA Energy Solutions</b>	-	-	-	-	-	-
17-1574-3-CLC	-	-	-	-	-	-
17-1574-5-CLC	-	-	-	-	-	-
17-1574-7-CLC	-	-	-	-	-	-
17-1574-8-CLC	-	-	-	-	-	-
Invoice 17-1574-1-CLC	-	-	-	-	-	-
INVOICE 17-1574-2-CLC	-	-	-	-	-	-
Invoice 17-1574-4-CLC	-	-	-	-	-	-
INVOICE 17-1574-6-CLC	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>River Energy - iDeliver Technologies</b>	-	-	-	-	-	-
14333,14351,14366,F14384,14400,14409,	-	-	-	-	-	-
<b>Second Law Engineers, Inc., DBA DMI</b>	-	-	-	-	-	-
201707CS	-	-	-	-	-	-
201709CS	-	-	-	-	-	-
201710CS	-	-	-	-	-	-
Invoice 201706CS	-	-	-	-	-	-
Invoice 201708CS 8/31/17	-	-	-	-	-	-
<b>Tradeshaw Management Services</b>	-	-	-	-	-	-
Invoice 1129926 Mini-Split Heat Pump Inst Rebate	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
12/17 C&I Milestone Invoice Cover Sheet	-	-	-	-	-	-
12/17 C&I Time & Materials Invoice Cover Shee	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>energyOrbit</b>	-	-	-	-	-	-
2133	-	-	-	-	-	-
2145	-	-	-	-	-	-
2183	-	-	-	-	-	-
2197	-	-	-	-	-	-
2234	-	-	-	-	-	-
2243	-	-	-	-	-	-
2273	-	-	-	-	-	-
2300	-	-	-	-	-	-
2323	-	-	-	-	-	-
2478	-	-	-	-	-	-
2500	-	-	-	-	-	-
2226R	-	-	-	-	-	-
2520, 2527, 2528	-	-	-	-	-	-
Invoice 2346	-	-	-	-	-	-
Invoice 2398	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2017 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
<b>Rise Engineering</b>						
153104	-	-	-	-	-	-
153145	-	-	-	-	-	-
154250	-	-	-	-	-	-
155682	-	-	-	-	-	-
157010	-	-	-	-	-	-
157480	-	-	-	-	-	-
158383	-	-	-	-	-	-
<b>Demand Management</b>						
201701CS	-	-	-	-	-	-
201702CS	-	-	-	-	-	-
201703CS	-	-	-	-	-	-
201704CS	-	-	-	-	-	-
201705CS	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>						
2017-235; 2017-236; 2017-237	-	-	-	-	-	-
2017-255; 2017-256; 2017-257; 2017-258; 2017-259	-	-	-	-	-	-
2017-262; 2017-263; 2017-264; 2017-265; 2017-266	-	-	-	-	-	-
2017-267; 2017-268; 2017-269	-	-	-	-	-	-
INVOICE 2017-229;2017-230;2017-231;2017-232	-	-	-	-	-	-
Invoices 2017-241; 2017-242; 2017-243; 2017-245	-	-	-	-	-	-
Invoices 2017-247;2017-248;2017-249;2017-250;2017-251;2017-252;2017-253;2017-254	-	-	-	-	-	-
2017-203	-	-	-	-	-	-
2017-209	-	-	-	-	-	-
2017-216	-	-	-	-	-	-
2017-225	-	-	-	-	-	-
2017-226	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10015609	-	-	-	-	-	-
10015620	-	-	-	-	-	-
10015631	-	-	-	-	-	-
10015650	-	-	-	-	-	-
10016828	-	-	-	-	-	-
10016839	-	-	-	-	-	-
10016866	-	-	-	-	-	-
10016877	-	-	-	-	-	-
10016888	-	-	-	-	-	-
10016918	-	-	-	-	-	-
10016943	-	-	-	-	-	-
10016954	-	-	-	-	-	-
10016965	-	-	-	-	-	-
10017710	-	-	-	-	-	-
10017734	-	-	-	-	-	-
10017778	-	-	-	-	-	-
10017826	-	-	-	-	-	-
10017833	-	-	-	-	-	-
10017844	-	-	-	-	-	-
10018552;10018560;10018504;10018494;10018534;10018529;10018583;10018571;10018458;10019232;10019144;10019209;10019191;10019133;10019155;10019167;10019966;10019983;10019955;10020024	-	-	-	-	-	-
870010000129; 870010000068; 870010000471; 870010000109;	-	-	-	-	-	-
870010000030; 870010000009; 870010000485; 870010000095	-	-	-	-	-	-
870010000459; 870010000079; 870010000044; 870010000465;	-	-	-	-	-	-
870010000081	-	-	-	-	-	-
870010002834; 870010003033; 870010002852; 870010002956	-	-	-	-	-	-
870010002919; 870010002940; 870010002924; 870010002929;	-	-	-	-	-	-
870010002941; 870010002851; 870010003044; 870010002958;	-	-	-	-	-	-
870010003064	-	-	-	-	-	-
870010005862; 870010006008; 870010005916; 870010005938	-	-	-	-	-	-
870010005873; 870010005898; 870010005885; 870010005896;	-	-	-	-	-	-
870010005927; 870010006019; 870010005943	-	-	-	-	-	-
870010006804; 870010006764; 870010006785; 870010006843	-	-	-	-	-	-
870010007276; 870010006832; 870010006821; 870010006745;	-	-	-	-	-	-
870010006751; 870010006816; 870010006775; 870010007304;	-	-	-	-	-	-
870010006790	-	-	-	-	-	-
Invoice 870010007537	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17; 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2017 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Peregrine Energy Group, Inc.	-	-	-	-	-	-
4786	-	-	-	-	-	-
Invoice 4975	-	-	-	-	-	-
Tetra Tech MA, Inc.	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
TRC Engineers	-	-	-	-	-	-
239201	-	-	-	-	-	-
River Energy - RichMay	-	-	-	-	-	-
12745	-	-	-	-	-	-
14740, 14747, 14754	-	-	-	-	-	-
River Energy - North Atlantic Energy Advisors	-	-	-	-	-	-
Invoices 14559, 14591, 14849, 14856, 14864, 14872, 14886, 14886, 14893, 14931	-	-	-	-	-	-
13531	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
National Resource Management, Inc.	-	-	-	-	-	-
NOVEMBER 2017 MUNICIPAL	-	-	-	-	-	-
River Energy - iDeliver Technologies	-	-	-	-	-	-
14333, 14351, 14366, F14384, 14400, 14409,	-	-	-	-	-	-
Second Law Engineers, Inc., DBA DMI	-	-	-	-	-	-
201707CS	-	-	-	-	-	-
201709CS	-	-	-	-	-	-
201710CS	-	-	-	-	-	-
201711CS	-	-	-	-	-	-
201712CS	-	-	-	-	-	-
Invoice 201706CS	-	-	-	-	-	-
Invoice 201708CS 8/31/17	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
Invoice 165696, 167894, 167895, 167966, 167976, 167980, 167981, 167990, 168013, 168017, 168018	-	-	-	-	-	-
162122, 164298, 164587, 164588, 164633, 164634, 164708, 164728	-	-	-	-	-	-
160712, 160863, 161999, 162000, 162058, 162136, 162234, 164738, 165599, 165899, 165900, 165912	-	-	-	-	-	-
Invoice 163233	-	-	-	-	-	-
DNV GL Energy Insights USA, Inc.	-	-	-	-	-	-
12/17 C&I Milestone Invoice Cover Sheet	-	-	-	-	-	-
12/17 C&I Time & Materials Invoice Cover Shee	-	-	-	-	-	-
Synapse Energy Economics	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
energyOrbit	-	-	-	-	-	-
2133	-	-	-	-	-	-
2145	-	-	-	-	-	-
2183	-	-	-	-	-	-
2197	-	-	-	-	-	-
2234	-	-	-	-	-	-
2243	-	-	-	-	-	-
2273	-	-	-	-	-	-
2300	-	-	-	-	-	-
2323	-	-	-	-	-	-
2478	-	-	-	-	-	-
2500	-	-	-	-	-	-
2226R	-	-	-	-	-	-
2520, 2527, 2528	-	-	-	-	-	-
Invoice 2346	-	-	-	-	-	-
Invoice 2398	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
Invoices 159117, 159181, 159626, 159627, 159633	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2b - C&I Small Business  
Cape Light Compact

2017 C2b - C&I Small Business						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
<b>Rise Engineering</b>						
153129	-	-	-	-	-	-
153144	-	-	-	-	-	-
154249	-	-	-	-	-	-
154273	-	-	-	-	-	-
155677	-	-	-	-	-	-
155683	-	-	-	-	-	-
157009	-	-	-	-	-	-
157036	-	-	-	-	-	-
158412	-	-	-	-	-	-
158413	-	-	-	-	-	-
<b>Appliance Recycling Centers of America, Inc.</b>						
Invoices 46218,47652,47882,48036,48081	-	-	-	-	-	-
47088	-	-	-	-	-	-
47089	-	-	-	-	-	-
<b>Demand Management</b>						
201705CS	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10015609	-	-	-	-	-	-
10015620	-	-	-	-	-	-
10015631	-	-	-	-	-	-
10015650	-	-	-	-	-	-
10016828	-	-	-	-	-	-
10016839	-	-	-	-	-	-
10016866	-	-	-	-	-	-
10016877	-	-	-	-	-	-
10016888	-	-	-	-	-	-
10016918	-	-	-	-	-	-
10016943	-	-	-	-	-	-
10016954	-	-	-	-	-	-
10016965	-	-	-	-	-	-
10017710	-	-	-	-	-	-
10017734	-	-	-	-	-	-
10017778	-	-	-	-	-	-
10017826	-	-	-	-	-	-
10017833	-	-	-	-	-	-
10017844	-	-	-	-	-	-
10018552;10018560;10018504;10018494;10018534;10018529;10018583;10018571;10018458;10019232;10019144;10019209;10019191;10019133;10019155;10019167;10019966;10019983;10019955;10020024	-	-	-	-	-	-
870010000129; 870010000068; 870010000471; 870010000109; 870010000030; 870010000009; 870010000485; 870010000095	-	-	-	-	-	-
870010000459; 870010000079; 870010000044; 870010000465; 870010000081	-	-	-	-	-	-
870010002834; 870010003033; 870010002852; 870010002956	-	-	-	-	-	-
870010002919; 870010002940; 870010002924; 870010002929; 870010002941; 870010002851; 870010003044; 870010002958; 870010003064	-	-	-	-	-	-
870010005862; 870010006008; 870010005916; 870010005938	-	-	-	-	-	-
870010005873; 870010005898; 870010005885; 870010005896; 870010005927; 870010006019; 870010005943	-	-	-	-	-	-
870010006804; 870010006764; 870010006785; 870010006843	-	-	-	-	-	-
870010007276; 870010006832; 870010006821; 870010006745; 870010006751; 870010006816; 870010006775; 870010007304; 870010006790	-	-	-	-	-	-
Invoice 870010007537	-	-	-	-	-	-
10016899	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>National Resource Management</b>						
APRIL 2017 SMALL	-	-	-	-	-	-
FEBRUARY2017MEDIUM	-	-	-	-	-	-
FEBRUARY2017SMALL	-	-	-	-	-	-
MAY 2017 MEDIUM	-	-	-	-	-	-
MAY 2017 SMALL	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2b - C&I Small Business  
Cape Light Compact

2017 C2b - C&I Small Business						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
River Energy - North Atlantic Energy Advisors						
Invoices 13537, 13546, 13566, 13574, 13602						
Illume Advising, LLC						
0001921						
0001961, 0001996						
National Resource Management, Inc.						
Invoice August 2017 Small						
Invoice June 2017 Small						
JULY 2017 MEDIUM						
JULY 2017 SMALL						
November 2017 Medium						
November 2017 Small						
OCTOBER 2017 SMALL, OCTOBER 2017 MEDIUM						
SEPTEMBER 2017 MEDIUM						
Second Law Engineers, Inc., DBA DMI						
201707CS						
201709CS						
201711CS						
201712CS						
Invoice 201706CS						
Invoice 201708CS 8/31/17						
Thielsch Engineering Inc/Rise Engineering						
163244, 163245, 163251						
Invoice 165696, 167894, 167895, 167966, 167976, 167980, 167981, 167990, 168013, 168017, 168018						
Invoices 162121, 162123, 162275, 162276						
162122, 164298, 164587, 164588, 164633, 164634, 164708, 164728						
159704; 159706; 159715; 160680						
160678, 160760, 160792, 160864, 160879, 160880, 160890						
160712, 160863, 161999, 162000, 162058, 162136, 162234, 163285, 165898, 166088						
164738, 165599, 165899, 165900, 165912						
DNV GL Energy Insights USA, Inc.						
12/17 C&I Milestone Invoice Cover Sheet						
12/17 C&I Time & Materials Invoice Cover Shee						
Synapse Energy Economics						
17-080-01CL						
17-080-02CL						
17-080-03CL						
Thielsch Engineering Inc/Rise Engineering						
Invoices 159117, 159181, 159626, 159627, 159633						
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2c - C&I Multifamily Retrofit  
Cape Light Compact

2017 C2c - C&I Multifamily Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10015609	-	-	-	-	-	-
10015620	-	-	-	-	-	-
10015631	-	-	-	-	-	-
10015650	-	-	-	-	-	-
10016828	-	-	-	-	-	-
10016839	-	-	-	-	-	-
10016866	-	-	-	-	-	-
10016877	-	-	-	-	-	-
10016888	-	-	-	-	-	-
10016918	-	-	-	-	-	-
10016943	-	-	-	-	-	-
10016954	-	-	-	-	-	-
10016965	-	-	-	-	-	-
10017710	-	-	-	-	-	-
10017734	-	-	-	-	-	-
10017778	-	-	-	-	-	-
10017826	-	-	-	-	-	-
10017833	-	-	-	-	-	-
10017844	-	-	-	-	-	-
10018552;10018560;10018504;10018494;10018534;10018529;10018583;10018571;10018458;10019232;10019144;10019209;10019191;10019133;10019155;10019167;10019966;10019983;10019955;10020024	-	-	-	-	-	-
870010000129; 870010000068; 870010000471; 870010000109; 870010000030; 870010000009; 870010000485; 870010000095; 870010000459; 870010000079; 870010000044; 870010000465; 870010000081	-	-	-	-	-	-
870010002834; 870010003033; 870010002852; 870010002956; 870010002919; 870010002940; 870010002924; 870010002929; 870010002941; 870010002851; 870010003044; 870010002958; 870010003064	-	-	-	-	-	-
870010005862; 870010006008; 870010005916; 870010005938; 870010005873; 870010005898; 870010005885; 870010005896; 870010005927; 870010006019; 870010005943	-	-	-	-	-	-
870010006804; 870010006764; 870010006785; 870010006843; 870010007276; 870010006832; 870010006821; 870010006745; 870010006751; 870010006816; 870010006775; 870010007304; 870010006790	-	-	-	-	-	-
Invoice 870010007537	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>						
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>Illume Advising, LLC</b>						
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>						
153389; 155642; 157053; 158475; 159782; 160763; 160764; 161569	-	-	-	-	-	-
163244, 163245, 163251	-	-	-	-	-	-
164299,164635,164636,164720,165594,165873,	-	-	-	-	-	-
Invoice 165953, 165954, 167143, 167970	-	-	-	-	-	-
Invoices 162121,162123,162275,162276	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
12/17 C&I Milestone Invoice Cover Sheet	-	-	-	-	-	-
12/17 C&I Time & Materials Invoice Cover Shee	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2d - C&I Upstream Lighting  
Cape Light Compact

2017 C2d - C&I Upstream Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2273.1S, 2273.2S, 2273.1T, 2273.2T, 2273.1U, 2273.2U, 2293E, 2293F, 2293G	-	-	-	-	-	-
2293A;2293B;2273.1N;2273.1O;2273.1P	-	-	-	-	-	-
2293H	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
PO-0015, PO-0016, PO-0017	-	-	-	-	-	-
17-806HV-07,17-806UP-07	-	-	-	-	-	-
17-806HV-08,17-806UP-08	-	-	-	-	-	-
17-806HV-09, 17-806UP-09	-	-	-	-	-	-
17-806HV-11, 17-806UP-11	-	-	-	-	-	-
17-806UP-01	-	-	-	-	-	-
17-806UP-02	-	-	-	-	-	-
17-806UP-03	-	-	-	-	-	-
17-806UP-04	-	-	-	-	-	-
17-806UP-05	-	-	-	-	-	-
17-806UP-10	-	-	-	-	-	-
17-806UP-12	-	-	-	-	-	-
<b>Ecova, Inc.</b>						
554806U	-	-	-	-	-	-
567106U	-	-	-	-	-	-
582006U	-	-	-	-	-	-
594006U	-	-	-	-	-	-
652506U, PB-006525	-	-	-	-	-	-
663406U, 682506U, PB-006634, PB-006825, PB-007189	-	-	-	-	-	-
704506U, PB-007045	-	-	-	-	-	-
718906U	-	-	-	-	-	-
Invoice 610206U & PB-006102	-	-	-	-	-	-
PB-005548	-	-	-	-	-	-
PB-005671	-	-	-	-	-	-
PB-005820	-	-	-	-	-	-
PB-005940	-	-	-	-	-	-
PB-006238, PB-006245, 6238.624506I	-	-	-	-	-	-
PB-006368; 636806U;	-	-	-	-	-	-
PN-005548	-	-	-	-	-	-
<b>KEMA, Inc.</b>						
10015609	-	-	-	-	-	-
10015620	-	-	-	-	-	-
10015631	-	-	-	-	-	-
10015650	-	-	-	-	-	-
10016828	-	-	-	-	-	-
10016839	-	-	-	-	-	-
10016866	-	-	-	-	-	-
10016877	-	-	-	-	-	-
10016888	-	-	-	-	-	-
10016918	-	-	-	-	-	-
10016943	-	-	-	-	-	-
10016954	-	-	-	-	-	-
10016965	-	-	-	-	-	-
10017710	-	-	-	-	-	-
10017734	-	-	-	-	-	-
10017778	-	-	-	-	-	-
10017826	-	-	-	-	-	-
10017833	-	-	-	-	-	-
10017844	-	-	-	-	-	-
10018552;10018560;10018504;10018494;10018534;10018529;10018583;10018571;10018458;10019232;10019144;10019209;10019191;10019133;10019155;10019167;10019966;10019983;10019955;10020024	-	-	-	-	-	-
870010000129; 870010000068; 870010000471; 870010000109;	-	-	-	-	-	-
870010000030; 870010000009; 870010000485; 870010000095	-	-	-	-	-	-
870010000459; 870010000079; 870010000044; 870010000465;	-	-	-	-	-	-
870010000081	-	-	-	-	-	-
870010002834; 870010003033; 870010002852; 870010002956	-	-	-	-	-	-
870010002919; 870010002940; 870010002924; 870010002929;	-	-	-	-	-	-
870010002941; 870010002851; 870010003044; 870010002958;	-	-	-	-	-	-
870010003064	-	-	-	-	-	-
870010005862; 870010006008; 870010005916; 870010005938	-	-	-	-	-	-
870010005873; 870010005898; 870010005885; 870010005896;	-	-	-	-	-	-
870010005927; 870010006019; 870010005943	-	-	-	-	-	-
870010006804; 870010006764; 870010006785; 870010006843	-	-	-	-	-	-
870010007276; 870010006832; 870010006821; 870010006745;	-	-	-	-	-	-
870010006751; 870010006816; 870010006775; 870010007304;	-	-	-	-	-	-
870010006790	-	-	-	-	-	-
Invoice 870010007537	-	-	-	-	-	-
10016844	-	-	-	-	-	-
10017706	-	-	-	-	-	-
<b>Nexant Inc</b>						
INV-0000219360D	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2d - C&I Upstream Lighting  
Cape Light Compact

2017 C2d - C&I Upstream Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1APR17; 7831.1MAY17	-	-	-	-	-	-
7831.1AUG17	-	-	-	-	-	-
7831.1DEC17	-	-	-	-	-	-
7831.1Nov17, 7831.2Nov17	-	-	-	-	-	-
7831.1Sep17	-	-	-	-	-	-
7870CAPEDec17	-	-	-	-	-	-
7870CAPENOV16	-	-	-	-	-	-
7870CAPENov17	-	-	-	-	-	-
7870CAPESep17	-	-	-	-	-	-
<b>Tetra Tech MA, Inc.</b>	-	-	-	-	-	-
1021 B	-	-	-	-	-	-
1022 B	-	-	-	-	-	-
1023 B	-	-	-	-	-	-
1024 B	-	-	-	-	-	-
1025B; 1026B	-	-	-	-	-	-
1027B	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
0001921	-	-	-	-	-	-
0001961, 0001996	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
12/17 C&I Milestone Invoice Cover Sheet	-	-	-	-	-	-
12/17 C&I Time & Materials Invoice Cover Shee	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-01CL	-	-	-	-	-	-
17-080-02CL	-	-	-	-	-	-
17-080-03CL	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1a - Residential New Construction  
Cape Light Compact

2018 A1a - Residential New Construction						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>	-	-	-	-	-	-
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2273.2W	-	-	-	-	-	-
22931	-	-	-	-	-	-
2273.2X	-	-	-	-	-	-
2273.2Y	-	-	-	-	-	-
2273.2Z	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2273.2AA	-	-	-	-	-	-
2273.2AB	-	-	-	-	-	-
2273.2AC	-	-	-	-	-	-
2273.2AF	-	-	-	-	-	-
2273.2AG	-	-	-	-	-	-
2273.2AD	-	-	-	-	-	-
2273.2AE	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2273.2AH	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>	-	-	-	-	-	-
18-806C-07	-	-	-	-	-	-
18-806C-10	-	-	-	-	-	-
<b>ICF Resources, L.L.C.</b>	-	-	-	-	-	-
BI_CLC E 02-18	-	-	-	-	-	-
CAPE U01-18	-	-	-	-	-	-
BI_CLC E 03-18	-	-	-	-	-	-
BI_CLC_RENO 3-18	-	-	-	-	-	-
CAPE U02-18	-	-	-	-	-	-
BI_CLC E 04-18	-	-	-	-	-	-
BI_CLC_RENO 4-18	-	-	-	-	-	-
CAPE U03-18	-	-	-	-	-	-
BI_CLC E 05-18	-	-	-	-	-	-
CAPE U04-18	-	-	-	-	-	-
BI_CLC E 06-18	-	-	-	-	-	-
BI_CLC E RENO 06-18	-	-	-	-	-	-
CAPE U05-18	-	-	-	-	-	-
BI_CLC E 07-18	-	-	-	-	-	-
CAPE U06-18	-	-	-	-	-	-
BI_CLC E RENO 08.18	-	-	-	-	-	-
CAPE U07-18	-	-	-	-	-	-
BI_CLC E 09-18	-	-	-	-	-	-
BI_CLC E R&A 09-18	-	-	-	-	-	-
CAPE U08-18	-	-	-	-	-	-
BI_CLC E 08-18	-	-	-	-	-	-
BI_CLC E 10-18	-	-	-	-	-	-
CAPE U09-18	-	-	-	-	-	-
BI_CLC E 11-18	-	-	-	-	-	-
CAPE U10-18	-	-	-	-	-	-
BI_CLC E 12-18	-	-	-	-	-	-
CAPE U11-18	-	-	-	-	-	-
CAPE U12-18	-	-	-	-	-	-
BI_CLC E 01-19	-	-	-	-	-	-
CLC A001-18	-	-	-	-	-	-
CLC A002-18	-	-	-	-	-	-
CLC A003-18	-	-	-	-	-	-
CLC A004-18	-	-	-	-	-	-
CLC A005-18	-	-	-	-	-	-
CLC RNA A006-18	-	-	-	-	-	-
CLC A006-18	-	-	-	-	-	-
CLC A007-18	-	-	-	-	-	-
CLC RNA A007-18	-	-	-	-	-	-
CLC A008-18	-	-	-	-	-	-
CLC RNA A008-18	-	-	-	-	-	-
CLC A009-18	-	-	-	-	-	-
CLC RNA A009-18	-	-	-	-	-	-
CLC A010-18	-	-	-	-	-	-
CLC RNA A010-18	-	-	-	-	-	-
CLC A011-18	-	-	-	-	-	-
CLC A012-18	-	-	-	-	-	-
CLC RNA A012-18	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1a - Residential New Construction  
Cape Light Compact

2018 A1a - Residential New Construction						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Navigator Consulting, Inc.</b>	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
01000322688	-	-	-	-	-	-
100033066	-	-	-	-	-	-
01000352048	-	-	-	-	-	-
01000338218	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>CLEARResult Consulting, Inc.</b>	-	-	-	-	-	-
7671	-	-	-	-	-	-
7691	-	-	-	-	-	-
<b>River Energy - Committee Meeting</b>	-	-	-	-	-	-
14794	-	-	-	-	-	-
14900	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Performance Systems Development of New York, LLC</b>	-	-	-	-	-	-
19515	-	-	-	-	-	-
19599	-	-	-	-	-	-
19700	-	-	-	-	-	-
19794	-	-	-	-	-	-
19903	-	-	-	-	-	-
19992	-	-	-	-	-	-
20067	-	-	-	-	-	-
20123	-	-	-	-	-	-
20235	-	-	-	-	-	-
20388	-	-	-	-	-	-
20518	-	-	-	-	-	-
20526	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1b - Residential Multi-Family Retrofit  
Cape Light Compact

2018 A1b - Residential Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>	-	-	-	-	-	-
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>	-	-	-	-	-	-
18-806-5C	-	-	-	-	-	-
18-806C-11	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>	-	-	-	-	-	-
1735365-IN	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
100017126	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
01000322688	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
invoice 0100017126	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-257776	-	-	-	-	-	-
INV-258768	-	-	-	-	-	-
INV-261518	-	-	-	-	-	-
INV-263179	-	-	-	-	-	-
INV-263809	-	-	-	-	-	-
INV-265280	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1b - Residential Multi-Family Retrofit  
Cape Light Compact

2018 A1b - Residential Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Synapse Energy Economics	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
Liturgical Publications, Inc.	-	-	-	-	-	-
06-5314-0009-0001	-	-	-	-	-	-
River Energy - Rental Housing Association	-	-	-	-	-	-
16142	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
168694	-	-	-	-	-	-
169987	-	-	-	-	-	-
171360	-	-	-	-	-	-
173117	-	-	-	-	-	-
174652	-	-	-	-	-	-
176093	-	-	-	-	-	-
177929	-	-	-	-	-	-
177928	-	-	-	-	-	-
180338	-	-	-	-	-	-
181870	-	-	-	-	-	-
181878	-	-	-	-	-	-
183910	-	-	-	-	-	-
183909	-	-	-	-	-	-
185826	-	-	-	-	-	-
185825	-	-	-	-	-	-
188582	-	-	-	-	-	-
168866	-	-	-	-	-	-
169931	-	-	-	-	-	-
171348	-	-	-	-	-	-
173003	-	-	-	-	-	-
174409	-	-	-	-	-	-
176092	-	-	-	-	-	-
176045	-	-	-	-	-	-
177826	-	-	-	-	-	-
180337	-	-	-	-	-	-
179825	-	-	-	-	-	-
183833	-	-	-	-	-	-
181859	-	-	-	-	-	-
185669	-	-	-	-	-	-
187954	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**

A1 - Residential Whole House  
A1c - Residential Home Energy Services - Measures  
Cape Light Compact

2018 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
18-806-01	-	-	-	-	-	-
18-806-02	-	-	-	-	-	-
18-806-03	-	-	-	-	-	-
18-806-04	-	-	-	-	-	-
18-806-5B	-	-	-	-	-	-
18-806-06A	-	-	-	-	-	-
18-806B-07	-	-	-	-	-	-
18-806B-08	-	-	-	-	-	-
10/806B-09	-	-	-	-	-	-
18-806B-10	-	-	-	-	-	-
18-806B-11	-	-	-	-	-	-
18-806B-12	-	-	-	-	-	-
<b>Creative Services, Inc.</b>						
1355225	-	-	-	-	-	-
1356371	-	-	-	-	-	-
1358761	-	-	-	-	-	-
1359183	-	-	-	-	-	-
1362026	-	-	-	-	-	-
1361666	-	-	-	-	-	-
1362403	-	-	-	-	-	-
1363797	-	-	-	-	-	-
1363456	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
1189374-IN	-	-	-	-	-	-
1189740-IN	-	-	-	-	-	-
1190860-IN	-	-	-	-	-	-
1191130-IN	-	-	-	-	-	-
1186255-IN	-	-	-	-	-	-
1214047-IN	-	-	-	-	-	-
1216565-IN	-	-	-	-	-	-
1205709-IN	-	-	-	-	-	-
1221124-IN	-	-	-	-	-	-
1213759-IN	-	-	-	-	-	-
0353276-IN	-	-	-	-	-	-
1124159-IN	-	-	-	-	-	-
1224462-IN	-	-	-	-	-	-
1214627-IN	-	-	-	-	-	-
1224120-IN	-	-	-	-	-	-
1246592-IN	-	-	-	-	-	-
1253125-IN	-	-	-	-	-	-
1253532-IN	-	-	-	-	-	-
1247744-IN	-	-	-	-	-	-
1248308-IN	-	-	-	-	-	-
1247730-IN	-	-	-	-	-	-
1251753-IN	-	-	-	-	-	-
1255377-IN	-	-	-	-	-	-
1265125-IN	-	-	-	-	-	-
1292169-IN	-	-	-	-	-	-
1329404-IN	-	-	-	-	-	-
1332019-IN	-	-	-	-	-	-
1305706-IN	-	-	-	-	-	-
1310490-IN	-	-	-	-	-	-
1267356-IN	-	-	-	-	-	-
1333990-IN	-	-	-	-	-	-
1362427-IN	-	-	-	-	-	-
1401978-IN	-	-	-	-	-	-
1473865-IN	-	-	-	-	-	-
1466849-IN	-	-	-	-	-	-
1310482-IN	-	-	-	-	-	-
1356883-IN	-	-	-	-	-	-
1401535-IN	-	-	-	-	-	-
1449700-IN	-	-	-	-	-	-
1463844-IN	-	-	-	-	-	-
1498960-IN	-	-	-	-	-	-
1446459-IN	-	-	-	-	-	-
1446475-IN	-	-	-	-	-	-
1446513-IN	-	-	-	-	-	-
1449509-IN	-	-	-	-	-	-
1450472-IN	-	-	-	-	-	-
1452304-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House

A1c - Residential Home Energy Services - Measures

Cape Light Compact

2018 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
1492489-IN	-	-	-	-	-	-
1492016-IN	-	-	-	-	-	-
1515254-IN	-	-	-	-	-	-
1509349-IN	-	-	-	-	-	-
1535392-IN	-	-	-	-	-	-
1535695-IN	-	-	-	-	-	-
1423141-IN	-	-	-	-	-	-
1452558-IN	-	-	-	-	-	-
1538968-IN	-	-	-	-	-	-
1553925-IN	-	-	-	-	-	-
1555743-IN	-	-	-	-	-	-
1508583-IN	-	-	-	-	-	-
1564333-IN	-	-	-	-	-	-
1570935-IN	-	-	-	-	-	-
1555163-IN	-	-	-	-	-	-
1570207-IN	-	-	-	-	-	-
1588559-IN	-	-	-	-	-	-
1383840-IN	-	-	-	-	-	-
1383066-IN	-	-	-	-	-	-
1571565-IN	-	-	-	-	-	-
1591723-IN	-	-	-	-	-	-
1604358-IN	-	-	-	-	-	-
1587858-IN	-	-	-	-	-	-
1609541-IN	-	-	-	-	-	-
1623614-IN	-	-	-	-	-	-
1607875-IN	-	-	-	-	-	-
1619666-IN	-	-	-	-	-	-
1607900-IN	-	-	-	-	-	-
1626214-IN	-	-	-	-	-	-
1672929-IN	-	-	-	-	-	-
1467111-IN	-	-	-	-	-	-
1666859-IN	-	-	-	-	-	-
1664354-IN	-	-	-	-	-	-
1703837-IN	-	-	-	-	-	-
1710509-IN	-	-	-	-	-	-
1726126-IN	-	-	-	-	-	-
1265120-IN	-	-	-	-	-	-
1729365-IN	-	-	-	-	-	-
1508580-IN	-	-	-	-	-	-
1708555-IN	-	-	-	-	-	-
1726984-IN	-	-	-	-	-	-
1757391-IN	-	-	-	-	-	-
1708581-IN	-	-	-	-	-	-
1771038-IN	-	-	-	-	-	-
1743352-IN	-	-	-	-	-	-
1735196-IN	-	-	-	-	-	-
1743775-IN	-	-	-	-	-	-
1726112-IN	-	-	-	-	-	-
1532952-IN	-	-	-	-	-	-
1740812-IN	-	-	-	-	-	-
1748238-IN	-	-	-	-	-	-
1771389-IN	-	-	-	-	-	-
1787502-IN	-	-	-	-	-	-
1754100-IN	-	-	-	-	-	-
1732444-IN	-	-	-	-	-	-
1216764-IN	-	-	-	-	-	-
1248326-IN	-	-	-	-	-	-
1287977-IN	-	-	-	-	-	-
1330880-IN	-	-	-	-	-	-
1500655-IN	-	-	-	-	-	-
1555725-IN	-	-	-	-	-	-
1400419-IN	-	-	-	-	-	-
1451225-IN	-	-	-	-	-	-
1583156-IN	-	-	-	-	-	-
1617700-IN	-	-	-	-	-	-
1691559-IN	-	-	-	-	-	-
1727249-IN	-	-	-	-	-	-
Heritage Press, Inc.	-	-	-	-	-	-
101668	-	-	-	-	-	-
Navigant Consulting, Inc.	-	-	-	-	-	-
100017126	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
01000322688	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
invoice 0100017126	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House  
A1c - Residential Home Energy Services - Measures  
Cape Light Compact

2018 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Nexant Inc	-	-	-	-	-	-
2430E	-	-	-	-	-	-
Opinion Dynamics Corp.	-	-	-	-	-	-
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
The Cadmus Group, Inc.	-	-	-	-	-	-
INV-256571	-	-	-	-	-	-
INV-257567	-	-	-	-	-	-
INV-258782	-	-	-	-	-	-
INV-259840	-	-	-	-	-	-
INV-260467	-	-	-	-	-	-
INV-261619	-	-	-	-	-	-
MV Times Corporation, Inc. The Martha's Vineyard Times	-	-	-	-	-	-
301117779	-	-	-	-	-	-
301117756	-	-	-	-	-	-
301118100	-	-	-	-	-	-
301118450	-	-	-	-	-	-
301117944	-	-	-	-	-	-
River Energy - CLEAResult	-	-	-	-	-	-
15534	-	-	-	-	-	-
15838	-	-	-	-	-	-
15831	-	-	-	-	-	-
16076	-	-	-	-	-	-
17447	-	-	-	-	-	-
17462	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
188773	-	-	-	-	-	-
DNV GL Energy Insights USA, Inc.	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
Synapse Energy Economics	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
AIA Corporation	-	-	-	-	-	-
GPP2283058	-	-	-	-	-	-
ASAP Printing & Promotions, Inc./DBA Associated Services	-	-	-	-	-	-
10583	-	-	-	-	-	-
Liturgical Publications, Inc.	-	-	-	-	-	-
06-5314-0009-0001	-	-	-	-	-	-
06-5314-0009-0001A	-	-	-	-	-	-
06-5291-0003-0002	-	-	-	-	-	-
Local Media Group, Inc d/b/a Cape Cod Media Group	-	-	-	-	-	-
175322	-	-	-	-	-	-
175323	-	-	-	-	-	-
177822	-	-	-	-	-	-
182177	-	-	-	-	-	-
Love Local Media	-	-	-	-	-	-
10.23.18	-	-	-	-	-	-
Shoreline Graphics LLC/Proforma Shoreline Graphics	-	-	-	-	-	-
90D5306962	-	-	-	-	-	-
90D5307025	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A1 - Residential Whole House

A1c - Residential Home Energy Services - Measures

Cape Light Compact

2018 A1c - Residential Home Energy Services - Measures						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
168852	-	-	-	-	-	-
168845	-	-	-	-	-	-
169357	-	-	-	-	-	-
169977	-	-	-	-	-	-
170036	-	-	-	-	-	-
170797	-	-	-	-	-	-
171323A	-	-	-	-	-	-
171467	-	-	-	-	-	-
172257	-	-	-	-	-	-
173185	-	-	-	-	-	-
173426	-	-	-	-	-	-
173135	-	-	-	-	-	-
173852	-	-	-	-	-	-
174648	-	-	-	-	-	-
174636	-	-	-	-	-	-
176292	-	-	-	-	-	-
176318	-	-	-	-	-	-
177978	-	-	-	-	-	-
177972	-	-	-	-	-	-
177662	-	-	-	-	-	-
177700	-	-	-	-	-	-
179906	-	-	-	-	-	-
179978	-	-	-	-	-	-
180028	-	-	-	-	-	-
181044	-	-	-	-	-	-
181879	-	-	-	-	-	-
181894	-	-	-	-	-	-
183399	-	-	-	-	-	-
183825	-	-	-	-	-	-
183846	-	-	-	-	-	-
185123	-	-	-	-	-	-
185771	-	-	-	-	-	-
185823	-	-	-	-	-	-
186923	-	-	-	-	-	-
186990	-	-	-	-	-	-
187610	-	-	-	-	-	-
187625	-	-	-	-	-	-
188403	-	-	-	-	-	-
188496	-	-	-	-	-	-
188335	-	-	-	-	-	-
188773	-	-	-	-	-	-
invoice #188773	-	-	-	-	-	-
176953	-	-	-	-	-	-
179977	-	-	-	-	-	-
180827	-	-	-	-	-	-
188438	-	-	-	-	-	-
Language Line Services, Inc/DBA LanguageLine Solutions Inc	-	-	-	-	-	-
4371882	-	-	-	-	-	-
4392100	-	-	-	-	-	-
River Energy - artco RMG	-	-	-	-	-	-
16208	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2018 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
18-806-01	-	-	-	-	-	-
18-806-02	-	-	-	-	-	-
18-806-03	-	-	-	-	-	-
18-806-04	-	-	-	-	-	-
18-805-5A	-	-	-	-	-	-
18-806-06	-	-	-	-	-	-
18-806A-07	-	-	-	-	-	-
18-806A-08	-	-	-	-	-	-
10-806A-09	-	-	-	-	-	-
18-806A-10	-	-	-	-	-	-
18-806A-11	-	-	-	-	-	-
18-806A-12	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
0100032268B	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>River Energy - CLEAResult</b>						
15534	-	-	-	-	-	-
15838	-	-	-	-	-	-
15831	-	-	-	-	-	-
16076	-	-	-	-	-	-
17447	-	-	-	-	-	-
17462	-	-	-	-	-	-
<b>River Energy - Ansafone</b>						
15182	-	-	-	-	-	-
14988	-	-	-	-	-	-
15370	-	-	-	-	-	-
15553	-	-	-	-	-	-
15791	-	-	-	-	-	-
16231	-	-	-	-	-	-
16406	-	-	-	-	-	-
16663	-	-	-	-	-	-
16839	-	-	-	-	-	-
17022	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2018 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>River Energy - Verizon</b>	-	-	-	-	-	-
15460	-	-	-	-	-	-
15822	-	-	-	-	-	-
15995	-	-	-	-	-	-
16012	-	-	-	-	-	-
16278	-	-	-	-	-	-
16452	-	-	-	-	-	-
<b>River Energy - Aspect</b>	-	-	-	-	-	-
14980	-	-	-	-	-	-
15190	-	-	-	-	-	-
15362	-	-	-	-	-	-
16038	-	-	-	-	-	-
16091	-	-	-	-	-	-
16216	-	-	-	-	-	-
16398	-	-	-	-	-	-
16831	-	-	-	-	-	-
17030	-	-	-	-	-	-
16641	-	-	-	-	-	-
<b>River Energy - Verizon</b>	-	-	-	-	-	-
15013	-	-	-	-	-	-
15004	-	-	-	-	-	-
15230	-	-	-	-	-	-
15601	-	-	-	-	-	-
16680	-	-	-	-	-	-
16671	-	-	-	-	-	-
16879	-	-	-	-	-	-
17054	-	-	-	-	-	-
17045	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
168844	-	-	-	-	-	-
168849	-	-	-	-	-	-
169337	-	-	-	-	-	-
169978	-	-	-	-	-	-
170035	-	-	-	-	-	-
171321	-	-	-	-	-	-
170798	-	-	-	-	-	-
171402	-	-	-	-	-	-
172258	-	-	-	-	-	-
173074	-	-	-	-	-	-
173131	-	-	-	-	-	-
173845	-	-	-	-	-	-
174649	-	-	-	-	-	-
174641	-	-	-	-	-	-
176191	-	-	-	-	-	-
175695	-	-	-	-	-	-
176278	-	-	-	-	-	-
177660	-	-	-	-	-	-
177590	-	-	-	-	-	-
177786	-	-	-	-	-	-
179061	-	-	-	-	-	-
179905	-	-	-	-	-	-
179965	-	-	-	-	-	-
181876	-	-	-	-	-	-
181068	-	-	-	-	-	-
181855	-	-	-	-	-	-
183125	-	-	-	-	-	-
183826	-	-	-	-	-	-
183230	-	-	-	-	-	-
183860	-	-	-	-	-	-
184998	-	-	-	-	-	-
185690	-	-	-	-	-	-
185124	-	-	-	-	-	-
185735	-	-	-	-	-	-
186930	-	-	-	-	-	-
186848	-	-	-	-	-	-
187466	-	-	-	-	-	-
188334	-	-	-	-	-	-
188402	-	-	-	-	-	-
187618	-	-	-	-	-	-



**Vendor Invoice Summary Table**

A1 - Residential Whole House  
A1d - Residential Home Energy Services - RCS  
Cape Light Compact

2018 A1d - Residential Home Energy Services - RCS						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Illume Advising, LLC	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A1 - Residential Whole House  
A1e - Residential Behavior/Feedback Program  
Cape Light Compact

2018 A1e - Residential Behavior/Feedback Program						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>National Energy Education Development Project, Inc.</b>						
79124	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
1547104-IN	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
0100032268B	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
010003821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>People Power Company</b>						
CLC-047	-	-	-	-	-	-
CLC-048	-	-	-	-	-	-
Reversed - CLC-048	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Deborah J. Shiflett</b>						
EnEdAd 7 April 2018	-	-	-	-	-	-
EnEdAd 8 May 2018	-	-	-	-	-	-
EnEdAd 9 June/July 2018	-	-	-	-	-	-
<b>Illume Advising, LLC</b>						
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2018 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>	-	-	-	-	-	-
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>	-	-	-	-	-	-
1185455-IN	-	-	-	-	-	-
1207395-IN	-	-	-	-	-	-
1186283-IN	-	-	-	-	-	-
1189297-IN	-	-	-	-	-	-
1206055-IN	-	-	-	-	-	-
1192561-IN	-	-	-	-	-	-
1219685-IN	-	-	-	-	-	-
1217884-IN	-	-	-	-	-	-
1218115-IN	-	-	-	-	-	-
1221710-IN	-	-	-	-	-	-
0484811-IN	-	-	-	-	-	-
1229386-IN	-	-	-	-	-	-
1224153-IN	-	-	-	-	-	-
1248344-IN	-	-	-	-	-	-
1253521-IN	-	-	-	-	-	-
1268316-IN	-	-	-	-	-	-
1303526-IN	-	-	-	-	-	-
1302111-IN	-	-	-	-	-	-
1358552-IN	-	-	-	-	-	-
1304478-IN	-	-	-	-	-	-
1382525-IN	-	-	-	-	-	-
1383688-IN	-	-	-	-	-	-
1422110-IN	-	-	-	-	-	-
1375569-IN	-	-	-	-	-	-
1446524-IN	-	-	-	-	-	-
1446542-IN	-	-	-	-	-	-
1462756-IN	-	-	-	-	-	-
1490120-IN	-	-	-	-	-	-
1320767-IN	-	-	-	-	-	-
1330925-IN	-	-	-	-	-	-
1340413-IN	-	-	-	-	-	-
1491255-IN	-	-	-	-	-	-
1409537-IN	-	-	-	-	-	-
1446420-IN	-	-	-	-	-	-
1466829-IN	-	-	-	-	-	-
1450482-IN	-	-	-	-	-	-
1502710-IN	-	-	-	-	-	-
1514696-IN	-	-	-	-	-	-
1546666-IN	-	-	-	-	-	-
1515735-IN	-	-	-	-	-	-
1560017-IN	-	-	-	-	-	-
1548950-IN	-	-	-	-	-	-
1556700-IN	-	-	-	-	-	-
1578869-IN	-	-	-	-	-	-
1569642-IN	-	-	-	-	-	-
1580097-IN	-	-	-	-	-	-
1594353-IN	-	-	-	-	-	-
1609091-IN	-	-	-	-	-	-
1607351-IN	-	-	-	-	-	-
1603696-IN	-	-	-	-	-	-
1304989-IN	-	-	-	-	-	-
1653055-IN	-	-	-	-	-	-
1685707-IN	-	-	-	-	-	-
1684656-IN	-	-	-	-	-	-
1646076-IN	-	-	-	-	-	-
1693668-IN	-	-	-	-	-	-
1454405-IN	-	-	-	-	-	-
1502718-IN	-	-	-	-	-	-
1709479-IN	-	-	-	-	-	-
1676825-IN	-	-	-	-	-	-
1714792-IN	-	-	-	-	-	-
1481877-IN	-	-	-	-	-	-
1533610-IN	-	-	-	-	-	-
1710503-IN	-	-	-	-	-	-
1727278-IN	-	-	-	-	-	-
1289879-IN	-	-	-	-	-	-
1755767-IN	-	-	-	-	-	-
1736685-IN	-	-	-	-	-	-
1751348-IN	-	-	-	-	-	-
1772094-IN	-	-	-	-	-	-
1770799-IN	-	-	-	-	-	-
1731242-IN	-	-	-	-	-	-
1730425-IN	-	-	-	-	-	-
1769903-IN	-	-	-	-	-	-
1813503-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2018 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
1216571-IN	-	-	-	-	-	-
1217163-IN	-	-	-	-	-	-
1049923-IN	-	-	-	-	-	-
1248090-IN	-	-	-	-	-	-
1248320-IN	-	-	-	-	-	-
1282374-IN	-	-	-	-	-	-
1287582-IN	-	-	-	-	-	-
1329406-IN	-	-	-	-	-	-
1330498-IN	-	-	-	-	-	-
1393057-IN	-	-	-	-	-	-
1400410-IN	-	-	-	-	-	-
1451559-IN	-	-	-	-	-	-
1500476-IN	-	-	-	-	-	-
1502543-IN	-	-	-	-	-	-
1559344-IN	-	-	-	-	-	-
1453294-IN	-	-	-	-	-	-
1564621-IN	-	-	-	-	-	-
1581767-IN	-	-	-	-	-	-
1604359-IN	-	-	-	-	-	-
1625489-IN	-	-	-	-	-	-
1690349-IN	-	-	-	-	-	-
1617697-IN	-	-	-	-	-	-
1703178-IN	-	-	-	-	-	-
1727243-IN	-	-	-	-	-	-
1727825-IN	-	-	-	-	-	-
1771354-IN	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
100017126	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
0100032268B	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
invoice 0100017126	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>CLEAResult Consulting, Inc.</b>	-	-	-	-	-	-
109-CAPE LIGHT	-	-	-	-	-	-
110-CAPE LIGHT	-	-	-	-	-	-
111-CAPE LIGHT	-	-	-	-	-	-
112-CAPE LIGHT	-	-	-	-	-	-
113-CAPE LIGHT	-	-	-	-	-	-
114-CAPE LIGHT	-	-	-	-	-	-
115-CAPE LIGHT	-	-	-	-	-	-
116-CAPE LIGHT	-	-	-	-	-	-
117-CAPE LIGHT	-	-	-	-	-	-
118-CAPE LIGHT	-	-	-	-	-	-
120-CAPE LIGHT	-	-	-	-	-	-
119-CAPE LIGHT	-	-	-	-	-	-
21-CAPELIGHT_WFD	-	-	-	-	-	-
23-CAPELIGHT_WFD	-	-	-	-	-	-
24-CAPELIGHT_WFD	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2a - Residential Heating & Cooling Equipment  
Cape Light Compact

2018 A2a - Residential Heating & Cooling Equipment						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Synapse Energy Economics	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
River Energy - artco RMG	-	-	-	-	-	-
16208	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2b - Residential Consumer Products  
Cape Light Compact

2018 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2273.1W	-	-	-	-	-	-
22931	-	-	-	-	-	-
2273.1X	-	-	-	-	-	-
2273.1Y	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2273.1Z	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2273.1AA	-	-	-	-	-	-
2273.1AB	-	-	-	-	-	-
2273.1AC	-	-	-	-	-	-
2273.1AF	-	-	-	-	-	-
2273.1AG	-	-	-	-	-	-
2273.1AE	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2273.1AD	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2273.1AH	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Appliance Recycling Centers of America, Inc.</b>						
48651	-	-	-	-	-	-
48770	-	-	-	-	-	-
48961	-	-	-	-	-	-
49060	-	-	-	-	-	-
49352	-	-	-	-	-	-
49509	-	-	-	-	-	-
49730	-	-	-	-	-	-
49937	-	-	-	-	-	-
50126	-	-	-	-	-	-
50378	-	-	-	-	-	-
50559	-	-	-	-	-	-
50712	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
1205715-IN	-	-	-	-	-	-
1183310-IN	-	-	-	-	-	-
10344075-IN	-	-	-	-	-	-
1482386-IN	-	-	-	-	-	-
1574472-IN	-	-	-	-	-	-
1755769-IN	-	-	-	-	-	-
1190832-IN	-	-	-	-	-	-
1192873-IN	-	-	-	-	-	-
1185512-IN	-	-	-	-	-	-
1206135-IN	-	-	-	-	-	-
1206151-IN	-	-	-	-	-	-
1214600-IN	-	-	-	-	-	-
1219686-IN	-	-	-	-	-	-
1176420-IN	-	-	-	-	-	-
1214593-IN	-	-	-	-	-	-
1255732-IN	-	-	-	-	-	-
1288716-IN	-	-	-	-	-	-
1287573-IN	-	-	-	-	-	-
1243738-IN	-	-	-	-	-	-
1257939-IN	-	-	-	-	-	-
1257951-IN	-	-	-	-	-	-
1290435-IN	-	-	-	-	-	-
1310020-IN	-	-	-	-	-	-
1332955-IN	-	-	-	-	-	-
1335730-IN	-	-	-	-	-	-
1331479-IN	-	-	-	-	-	-
1358152-IN	-	-	-	-	-	-
1388656-IN	-	-	-	-	-	-
1402540-IN	-	-	-	-	-	-
1423153-IN	-	-	-	-	-	-
1410359-IN	-	-	-	-	-	-
1453538-IN	-	-	-	-	-	-
1453311-IN	-	-	-	-	-	-
1476829-IN	-	-	-	-	-	-
1343273-IN	-	-	-	-	-	-
1357740-IN	-	-	-	-	-	-
1388643-IN	-	-	-	-	-	-
1446490-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
A2 - Residential Products  
A2b - Residential Consumer Products  
Cape Light Compact

2018 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
1482377-IN	-	-	-	-	-	-
1500672-IN	-	-	-	-	-	-
1455918-IN	-	-	-	-	-	-
1489208-IN	-	-	-	-	-	-
1514914-IN	-	-	-	-	-	-
1514916-IN	-	-	-	-	-	-
1500128-IN	-	-	-	-	-	-
1510051-IN	-	-	-	-	-	-
1547104-IN	-	-	-	-	-	-
1515747-IN	-	-	-	-	-	-
1546474-IN	-	-	-	-	-	-
1556014-IN	-	-	-	-	-	-
1535378-IN	-	-	-	-	-	-
1556375-IN	-	-	-	-	-	-
1566882-IN	-	-	-	-	-	-
1559999-IN	-	-	-	-	-	-
1451644-IN	-	-	-	-	-	-
1588575-IN	-	-	-	-	-	-
1607877-IN	-	-	-	-	-	-
1618846-IN	-	-	-	-	-	-
1591726-IN	-	-	-	-	-	-
1574478-IN	-	-	-	-	-	-
1616424-IN	-	-	-	-	-	-
1600946-IN	-	-	-	-	-	-
1622664-IN	-	-	-	-	-	-
1586304-IN	-	-	-	-	-	-
1605088-IN	-	-	-	-	-	-
1617698-IN	-	-	-	-	-	-
1509335-IN	-	-	-	-	-	-
1616251-IN	-	-	-	-	-	-
1628245-IN	-	-	-	-	-	-
1672935-IN	-	-	-	-	-	-
1659279-IN	-	-	-	-	-	-
1684659-IN	-	-	-	-	-	-
1689705-IN	-	-	-	-	-	-
1690365-IN	-	-	-	-	-	-
1697913-IN	-	-	-	-	-	-
1722546-IN	-	-	-	-	-	-
1711556-IN	-	-	-	-	-	-
1712630-IN	-	-	-	-	-	-
1712619-IN	-	-	-	-	-	-
1726958-IN	-	-	-	-	-	-
1708585-IN	-	-	-	-	-	-
1768624-IN	-	-	-	-	-	-
1769313-IN	-	-	-	-	-	-
1772100-IN	-	-	-	-	-	-
1772098-IN	-	-	-	-	-	-
1737346-IN	-	-	-	-	-	-
1731265-IN	-	-	-	-	-	-
1740743-IN	-	-	-	-	-	-
177399-IN	-	-	-	-	-	-
1782436-IN	-	-	-	-	-	-
1730056-IN	-	-	-	-	-	-
1737838-IN	-	-	-	-	-	-
1730072-IN	-	-	-	-	-	-
1731932-IN	-	-	-	-	-	-
1747951-IN	-	-	-	-	-	-
1773799-IN	-	-	-	-	-	-
1217169-IN	-	-	-	-	-	-
1246594-IN	-	-	-	-	-	-
1282369-IN	-	-	-	-	-	-
1327245-IN	-	-	-	-	-	-
1388671-IN	-	-	-	-	-	-
1501545-IN	-	-	-	-	-	-
1536423-IN	-	-	-	-	-	-
1553641-IN	-	-	-	-	-	-
1572730-IN	-	-	-	-	-	-
1610340-IN	-	-	-	-	-	-
1701372-IN	-	-	-	-	-	-
1449488-IN	-	-	-	-	-	-
Navigant Consulting, Inc.	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
01000322688	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products

A2b - Residential Consumer Products

Cape Light Compact

2018 A2b - Residential Consumer Products						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Nexant Inc</b>	-	-	-	-	-	-
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-252269	-	-	-	-	-	-
INV-252276	-	-	-	-	-	-
INV-253923	-	-	-	-	-	-
INV-253928	-	-	-	-	-	-
INV-255591	-	-	-	-	-	-
INV-255596	-	-	-	-	-	-
INV-256743	-	-	-	-	-	-
INV-256748	-	-	-	-	-	-
INV-257767	-	-	-	-	-	-
INV-257773	-	-	-	-	-	-
INV-259821	-	-	-	-	-	-
INV-258760	-	-	-	-	-	-
INV-258765	-	-	-	-	-	-
INV-259826	-	-	-	-	-	-
INV-260445	-	-	-	-	-	-
INV-260452	-	-	-	-	-	-
INV-261510	-	-	-	-	-	-
INV-261515	-	-	-	-	-	-
INV-261619	-	-	-	-	-	-
INV-263171	-	-	-	-	-	-
INV-263300	-	-	-	-	-	-
INV-263801	-	-	-	-	-	-
INV-263806	-	-	-	-	-	-
INV-265272	-	-	-	-	-	-
INV-265277	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Local Media Group, Inc d/b/a Cape Cod Media Group</b>	-	-	-	-	-	-
177822	-	-	-	-	-	-
<b>Lockheed Martin Corporation</b>	-	-	-	-	-	-
E1802-068	-	-	-	-	-	-
E1802-069A	-	-	-	-	-	-
E1803-031A	-	-	-	-	-	-
E1804-053A	-	-	-	-	-	-
E1805-100A	-	-	-	-	-	-
E1806-099A	-	-	-	-	-	-
E1870-076A	-	-	-	-	-	-
E1808-090A	-	-	-	-	-	-
E1809-117A	-	-	-	-	-	-
E1810-048A	-	-	-	-	-	-
E1811-060A	-	-	-	-	-	-
E1812-153A	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-



**Vendor Invoice Summary Table**

A2 - Residential Products  
A2c - Residential Lighting  
Cape Light Compact

2018 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>	-	-	-	-	-	-
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2273.1W	-	-	-	-	-	-
22931	-	-	-	-	-	-
2273.1X	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2273.1Z	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2273.1AA	-	-	-	-	-	-
2273.1AB	-	-	-	-	-	-
2273.1AC	-	-	-	-	-	-
2273.1AF	-	-	-	-	-	-
2273.1AG	-	-	-	-	-	-
2273.1AE	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2273.1AD	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2273.1AH	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>	-	-	-	-	-	-
1205715-IN	-	-	-	-	-	-
1183310-IN	-	-	-	-	-	-
10344075-IN	-	-	-	-	-	-
1402538-IN	-	-	-	-	-	-
1190193-IN	-	-	-	-	-	-
1206149-IN	-	-	-	-	-	-
1214599-IN	-	-	-	-	-	-
1222560-IN	-	-	-	-	-	-
1243130-IN	-	-	-	-	-	-
1246567-IN	-	-	-	-	-	-
1253078-IN	-	-	-	-	-	-
1219150-IN	-	-	-	-	-	-
1288715-IN	-	-	-	-	-	-
1290701-IN	-	-	-	-	-	-
1331473-IN	-	-	-	-	-	-
1371638-IN	-	-	-	-	-	-
1421443-IN	-	-	-	-	-	-
1248264-IN	-	-	-	-	-	-
1446383-IN	-	-	-	-	-	-
1455611-IN	-	-	-	-	-	-
1453308-IN	-	-	-	-	-	-
1342950-IN	-	-	-	-	-	-
1275564-IN	-	-	-	-	-	-
1310030-IN	-	-	-	-	-	-
1357739-IN	-	-	-	-	-	-
1357779-IN	-	-	-	-	-	-
1388641-IN	-	-	-	-	-	-
1422113-IN	-	-	-	-	-	-
1446487-IN	-	-	-	-	-	-
1455832-IN	-	-	-	-	-	-
1489196-IN	-	-	-	-	-	-
1501941-IN	-	-	-	-	-	-
1514910-IN	-	-	-	-	-	-
1517980-IN	-	-	-	-	-	-
1535377-IN	-	-	-	-	-	-
1548739-IN	-	-	-	-	-	-
1547907-IN	-	-	-	-	-	-
1560315-IN	-	-	-	-	-	-
1566875-IN	-	-	-	-	-	-
1559997-IN	-	-	-	-	-	-
1581124-IN	-	-	-	-	-	-
1607876-IN	-	-	-	-	-	-
1586295-IN	-	-	-	-	-	-
1604381-IN	-	-	-	-	-	-
1616433-IN	-	-	-	-	-	-
1617689-IN	-	-	-	-	-	-
1306203-IN	-	-	-	-	-	-
1509334-IN	-	-	-	-	-	-
1336348-IN	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products  
A2c - Residential Lighting  
Cape Light Compact

2018 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
1656415-IN	-	-	-	-	-	-
1666851-IN	-	-	-	-	-	-
1703224-IN	-	-	-	-	-	-
1690364-IN	-	-	-	-	-	-
1712628-IN	-	-	-	-	-	-
1718802-IN	-	-	-	-	-	-
1767437-IN	-	-	-	-	-	-
1769310-IN	-	-	-	-	-	-
1772103-IN	-	-	-	-	-	-
1731660-IN	-	-	-	-	-	-
1748249-IN	-	-	-	-	-	-
1772081-IN	-	-	-	-	-	-
1782231-IN	-	-	-	-	-	-
1731927-IN	-	-	-	-	-	-
1747946-IN	-	-	-	-	-	-
1217169-IN	-	-	-	-	-	-
1246594-IN	-	-	-	-	-	-
1282369-IN	-	-	-	-	-	-
1327245-IN	-	-	-	-	-	-
1388671-IN	-	-	-	-	-	-
1501545-IN	-	-	-	-	-	-
1536423-IN	-	-	-	-	-	-
1572730-IN	-	-	-	-	-	-
1701372-IN	-	-	-	-	-	-
1449488-IN	-	-	-	-	-	-
1727270-IN	-	-	-	-	-	-
Invoice 1047631-IN	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
0100032268B	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
<b>Nexant Inc</b>	-	-	-	-	-	-
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>	-	-	-	-	-	-
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>	-	-	-	-	-	-
INV-252269	-	-	-	-	-	-
INV-252276	-	-	-	-	-	-
INV-253923	-	-	-	-	-	-
INV-253928	-	-	-	-	-	-
INV-255591	-	-	-	-	-	-
INV-255596	-	-	-	-	-	-
INV-256743	-	-	-	-	-	-
INV-256748	-	-	-	-	-	-
INV-257767	-	-	-	-	-	-
INV-257773	-	-	-	-	-	-
INV-259821	-	-	-	-	-	-
INV-258760	-	-	-	-	-	-
INV-258765	-	-	-	-	-	-
INV-259826	-	-	-	-	-	-
INV-260445	-	-	-	-	-	-
INV-260452	-	-	-	-	-	-
INV-261510	-	-	-	-	-	-
INV-261515	-	-	-	-	-	-
INV-263171	-	-	-	-	-	-
INV-263300	-	-	-	-	-	-
INV-263801	-	-	-	-	-	-
INV-263806	-	-	-	-	-	-
INV-265272	-	-	-	-	-	-
INV-265277	-	-	-	-	-	-

**Vendor Invoice Summary Table**

A2 - Residential Products  
A2c - Residential Lighting  
Cape Light Compact

2018 A2c - Residential Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
171323B	-	-	-	-	-	-
<b>Lockheed Martin Corporation</b>	-	-	-	-	-	-
E1802-068	-	-	-	-	-	-
E1802-069A	-	-	-	-	-	-
E1803-031A	-	-	-	-	-	-
E1804-053A	-	-	-	-	-	-
E1805-100A	-	-	-	-	-	-
E1806-099A	-	-	-	-	-	-
E1870-076A	-	-	-	-	-	-
E1808-090A	-	-	-	-	-	-
E1809-117A	-	-	-	-	-	-
E1810-048A	-	-	-	-	-	-
E1811-060A	-	-	-	-	-	-
E1812-153A	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1a - Low-Income Single Family Retrofit*  
Cape Light Compact

2018 B1a - Low-Income Single Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
18-806-03	-	-	-	-	-	-
18-806-04	-	-	-	-	-	-
<b>Heritage Press, Inc.</b>						
102700	-	-	-	-	-	-
102787	-	-	-	-	-	-
<b>Navigant Consulting, Inc.</b>						
100017126	-	-	-	-	-	-
100018944	-	-	-	-	-	-
100020525	-	-	-	-	-	-
100022863	-	-	-	-	-	-
100024119	-	-	-	-	-	-
100025578	-	-	-	-	-	-
0100025883A	-	-	-	-	-	-
100027590	-	-	-	-	-	-
0100025578-A	-	-	-	-	-	-
0100027590-A	-	-	-	-	-	-
100029227	-	-	-	-	-	-
100030415	-	-	-	-	-	-
100031960	-	-	-	-	-	-
100032682	-	-	-	-	-	-
0100032268B	-	-	-	-	-	-
100033066	-	-	-	-	-	-
0100035204B	-	-	-	-	-	-
0100033821B	-	-	-	-	-	-
100035240	-	-	-	-	-	-
100034051	-	-	-	-	-	-
invoice 0100017126	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870CAPEOct18	-	-	-	-	-	-
<b>Housing Assistance Corporation</b>						
Big Fix In The Town of Harwich	-	-	-	-	-	-
10.31.2018_Marketing	-	-	-	-	-	-
Weatherization 2018-01	-	-	-	-	-	-
Appliance Invoice 2018-01	-	-	-	-	-	-
Lighting Invoice 2018-01	-	-	-	-	-	-
Appliance Invoice 2018-02	-	-	-	-	-	-
Lighting Invoice 2018-02	-	-	-	-	-	-
Weatherization 2018-02	-	-	-	-	-	-
Lighting Invoice 2018-03	-	-	-	-	-	-
Appliance Invoice 2018-03	-	-	-	-	-	-
Weatherization 2018-03	-	-	-	-	-	-
Lighting Invoice 2018-04	-	-	-	-	-	-
Weatherization 2018-04	-	-	-	-	-	-
Appliance Invoice 2018-04	-	-	-	-	-	-
Weatherization 2018-05	-	-	-	-	-	-
Lighting Invoice 2018-05	-	-	-	-	-	-
Appliance Invoice 2018-06	-	-	-	-	-	-
Lighting Invoice 2018-06	-	-	-	-	-	-
Weatherization 2018-06	-	-	-	-	-	-
Lighting Invoice 2018-07	-	-	-	-	-	-
Appliance Invoice 2018-07	-	-	-	-	-	-
Weatherization 2018-07	-	-	-	-	-	-
Weatherization 2018-08	-	-	-	-	-	-
Lighting Invoice 2018-08	-	-	-	-	-	-
Lighting Invoice 2018-09	-	-	-	-	-	-
09.30.2018_LIMF_Individuals	-	-	-	-	-	-
Appliance Invoice 2018-09	-	-	-	-	-	-
Weatherization 2018-10	-	-	-	-	-	-
Appliance Invoice 2018-10	-	-	-	-	-	-
Lighting Invoice 2018-10	-	-	-	-	-	-
Lighting Invoice 2018-11	-	-	-	-	-	-
Weatherization 2018-11	-	-	-	-	-	-
December 2018-ASHP MV	-	-	-	-	-	-
Appliance Invoice 2018-11	-	-	-	-	-	-
Lighting Invoice 2018-12	-	-	-	-	-	-
Weatherization 2018-12	-	-	-	-	-	-
05.31.2018_Software	-	-	-	-	-	-
05.31.18_MV Auditor Travel Costs	-	-	-	-	-	-
10.31.18_MV Auditor Travel	-	-	-	-	-	-
10.31.2018_Software Enhancement	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1a - Low-Income Single Family Retrofit*  
Cape Light Compact

2018 B1a - Low-Income Single Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
River Energy - Committee Meeting	-	-	-	-	-	-
15852	-	-	-	-	-	-
16599	-	-	-	-	-	-
River Energy - Verizon	-	-	-	-	-	-
15221	-	-	-	-	-	-
15451	-	-	-	-	-	-
15592	-	-	-	-	-	-
15813	-	-	-	-	-	-
16003	-	-	-	-	-	-
16269	-	-	-	-	-	-
16443	-	-	-	-	-	-
River Energy - Verizon	-	-	-	-	-	-
16870	-	-	-	-	-	-
DNV GL Energy Insights USA, Inc.	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
Synapse Energy Economics	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
AIA Corporation	-	-	-	-	-	-
GP2283058	-	-	-	-	-	-
Shoreline Graphics LLC/Proforma Shoreline Graphics	-	-	-	-	-	-
90D5307482	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
180719	-	-	-	-	-	-
186985	-	-	-	-	-	-
187617	-	-	-	-	-	-
183845	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1b - Low-Income Multi-Family Retrofit*  
Cape Light Compact

2018 B1b - Low-Income Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs						
All IT Allocated Costs						
All Marketing Allocated Costs						
All General Administration Allocated Costs						
<b>NMR Group, Inc.</b>						
2293J						
2293K						
22931						
2293L						
2293M						
2293N						
2293O						
2293R						
2293P						
2293Q						
2293S						
2293T						
<b>Navigant Consulting, Inc.</b>						
100018944						
100020525						
100022863						
100024119						
100025578						
0100025883A						
100027590						
0100025578-A						
0100027590-A						
100029227						
100030415						
100031960						
100032682						
01000322688						
100033066						
0100035204B						
0100033821B						
100035240						
100034051						
<b>Nexant Inc</b>						
2430E						
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18						
7870CAPEJan18						
7831.1Feb18						
7831.1Mar18						
7831.1Apr18						
7870CAPEMay18						
7831.1JUN18						
7870CAPE Aug18						
7870capedEC18						
<b>Housing Assistance Corporation</b>						
01.23.18-LIMF-Fixtures-CCSR Stage 1						
01.23.2018-LIMF-Fixtures-Cromwell Stage 2						
01.31.18-LIMF-Fixtures-CCSR Stage 2						
01.31.2018_LIMF_Individuals						
03.05.2018_LIMF_Fixtures_Cromwell Stage 3						
03.06.2018_LIMF_Pine & Pleasant						
03.19.2018_LIMF_Individuals						
02.28.2018_LIMF_Individuals B & WZ						
03.28.18_LIMF_Fixtures_CCSR Stage 3						
03.31.2018_LIMF_Individuals						
03.31.2018_LIMF_Individual_WZ						
03.31.2018_LIMF_Fixtures_CCSR Stage 4						
04.30.2018_LIMF_Individuals						
04.30.2018_LIMF_Winter Street						
04.30.2018_LIMF_Individual_WZ						
04.30.18_LIMF_FIX_Steven_Stage 1						
05.30.2018_LIMF_Cataumet						
05.31.2018_LIMF_Individual_Appliances						
05.31.2018_LIMF_Individuals						
05.31.2018_LIMF_FIX_Steven_Stage 2						
06.30.2018_LIMF_Individuals						
06.30.2018_LIMF_Plantation Condos						
07.31.18_LIMF_South Cape Apts.						
07.31.2018_LIMF_Individuals						
07.31.2018_LIMF_Individuals Appliances						
07.31.2018_LIMF_Fix_54 Sea Street						
08.31.2018_LIMF_Individuals						
08.30.2018_LIMF_Fix_32 Sea Street						
Weatherization 2018-09						
09.30.2018_LIMF_AMPS						
10.23.2018_LIMF_Gifford Street						
10.25.2018_LIMF_Fix_Cataumet Village						
10.31.2018_LIMF_Fix_South Side Village						
10.31.2018_LIMF_Individuals						
10.31.2018_LIMF_Fix_Plantation Condos						
11.19.2018_LIMF_Fix_South Cape Apts.						
11.28.18_LIMF_Simpkins School						
11.29.18_LIMF_WZ_Plantation Condos						

**Vendor Invoice Summary Table**  
*B1 - Low-Income Whole House*  
*B1b - Low-Income Multi-Family Retrofit*  
Cape Light Compact

2018 B1b - Low-Income Multi-Family Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
11.30.2018_LIMF_Individuals & Cataumet	-	-	-	-	-	-
12.18.2018_LIMF_South Cape Appliances	-	-	-	-	-	-
12.18.2018_LIMF_Plantation Condos	-	-	-	-	-	-
12.18.2018_LIMF_Sea Street Ext	-	-	-	-	-	-
12.19.2018_LIMF_Harry Kemp	-	-	-	-	-	-
12.30.2018_LIMF_Individual Appliances	-	-	-	-	-	-
12.28.2018_LIMF_Fix_Fair Winds	-	-	-	-	-	-
12.30.2018_LIMF_Individual Bulbs	-	-	-	-	-	-
12.30.2018_LIMF_Pearl Street	-	-	-	-	-	-
12.30.2018_LIMF_Mulhern Drive	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
870010020628	-	-	-	-	-	-
870010028577	-	-	-	-	-	-
870010034797	-	-	-	-	-	-
870010026247	-	-	-	-	-	-
870010028555	-	-	-	-	-	-
10517227_201809DMRM	-	-	-	-	-	-
10517227_201811DMRM	-	-	-	-	-	-
10517227_201811DMRT	-	-	-	-	-	-
10517227_201810DMRT	-	-	-	-	-	-
870010038535	-	-	-	-	-	-
10517227_201809DMRT	-	-	-	-	-	-
11_1812DRT	-	-	-	-	-	-
870010048701	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
171239	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2018 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>CLEARresult Consulting, Inc.</b>						
7671	-	-	-	-	-	-
7691	-	-	-	-	-	-
<b>River Energy - RichMay</b>						
17255	-	-	-	-	-	-
<b>River Energy - O'Brien &amp; Neville</b>						
16978	-	-	-	-	-	-
17329	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
01.18 MA-C&I Milestone	-	-	-	-	-	-
01.18 Time and Materials	-	-	-	-	-	-
02.18 MA-C&I Milestone	-	-	-	-	-	-
02.18 MA-C&I Time and Materials	-	-	-	-	-	-
03.18 MA-C&I Milestone	-	-	-	-	-	-
03.18 MA-C&I Time and Materials	-	-	-	-	-	-
04.18 MA-C&I Milestone	-	-	-	-	-	-
04.18 MA-C&I Time & Materials	-	-	-	-	-	-
05.18 MA-C&I Milestone	-	-	-	-	-	-
05.18 MA-C&I Time and Materials	-	-	-	-	-	-
870010028544	-	-	-	-	-	-
06.18 MA-C&I Milestone	-	-	-	-	-	-
06.18 MA-C&I Time & Materials	-	-	-	-	-	-
10517227_201811CIM	-	-	-	-	-	-
10517227_201808M	-	-	-	-	-	-
10517227_201809CIM	-	-	-	-	-	-
10517227_201809DMCIM	-	-	-	-	-	-
10517227_201811DMCIM	-	-	-	-	-	-
10517227_201811DMCIT	-	-	-	-	-	-
10517227_201808T	-	-	-	-	-	-
10517227_201810DMCIT	-	-	-	-	-	-
10517227_201811CIT	-	-	-	-	-	-
10517227_201809CIT	-	-	-	-	-	-
10517227_201809DMCIT	-	-	-	-	-	-
870010053215	-	-	-	-	-	-
11_1812CIM	-	-	-	-	-	-
11_1812DCIM	-	-	-	-	-	-
11_1812CIT	-	-	-	-	-	-
11_1812CIT2	-	-	-	-	-	-
11_1812DCIT	-	-	-	-	-	-
10517227_201811CIT #2	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>energyOrbit</b>						
2562	-	-	-	-	-	-
2548	-	-	-	-	-	-
2572	-	-	-	-	-	-
2536	-	-	-	-	-	-
2583	-	-	-	-	-	-
2606	-	-	-	-	-	-
2596R	-	-	-	-	-	-
2634	-	-	-	-	-	-
2592	-	-	-	-	-	-
2721	-	-	-	-	-	-
2727	-	-	-	-	-	-
2789	-	-	-	-	-	-
2818	-	-	-	-	-	-



**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1a - C&I New Buildings & Major Renovations  
Cape Light Compact

2018 C1a - C&I New Buildings & Major Renovations						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Galligan Energy Consulting Inc.</b>	-	-	-	-	-	-
2018-275	-	-	-	-	-	-
2018-274	-	-	-	-	-	-
2018-278	-	-	-	-	-	-
2018-279	-	-	-	-	-	-
2018-284	-	-	-	-	-	-
2018-285	-	-	-	-	-	-
2018-290	-	-	-	-	-	-
2018-291	-	-	-	-	-	-
2018-295	-	-	-	-	-	-
2018-294	-	-	-	-	-	-
2018-297	-	-	-	-	-	-
2018-296	-	-	-	-	-	-
2018-299	-	-	-	-	-	-
2018-300	-	-	-	-	-	-
2018-303	-	-	-	-	-	-
2018-304	-	-	-	-	-	-
2018-307	-	-	-	-	-	-
2018-308	-	-	-	-	-	-
2018-312	-	-	-	-	-	-
2018-313	-	-	-	-	-	-
2018-316	-	-	-	-	-	-
2018-317	-	-	-	-	-	-
<b>Performance Systems Development of New York, LLC</b>	-	-	-	-	-	-
19516	-	-	-	-	-	-
19598	-	-	-	-	-	-
19699	-	-	-	-	-	-
19795	-	-	-	-	-	-
19902	-	-	-	-	-	-
19991	-	-	-	-	-	-
20066	-	-	-	-	-	-
20124	-	-	-	-	-	-
20236	-	-	-	-	-	-
20392	-	-	-	-	-	-
20523	-	-	-	-	-	-
20531	-	-	-	-	-	-
<b>Second Law Engineers, Inc., DBA DMI</b>	-	-	-	-	-	-
201801CS	-	-	-	-	-	-
201802CS	-	-	-	-	-	-
201803CS	-	-	-	-	-	-
201804CS	-	-	-	-	-	-
201805CS	-	-	-	-	-	-
201806CS	-	-	-	-	-	-
201807CS	-	-	-	-	-	-
201808CS	-	-	-	-	-	-
201809CS	-	-	-	-	-	-
201810CS	-	-	-	-	-	-
201811CS	-	-	-	-	-	-
201812CS	-	-	-	-	-	-
201901CS	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Customertimes, Corp.</b>	-	-	-	-	-	-
CT-01039	-	-	-	-	-	-
CT-01333	-	-	-	-	-	-
CT-01660	-	-	-	-	-	-
CT-01974	-	-	-	-	-	-
<b>River Energy - Energy Efficiency Advisors, Inc.</b>	-	-	-	-	-	-
17146	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1b - C&I Initial Purchase & End of Useful Life  
Cape Light Compact

2018 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293I	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2293I	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
18-806HV-01	-	-	-	-	-	-
18-806HV-02	-	-	-	-	-	-
18-806HV-04	-	-	-	-	-	-
18-806HV-03	-	-	-	-	-	-
18-806HV-05	-	-	-	-	-	-
18-806FS-06	-	-	-	-	-	-
18-806HV-06	-	-	-	-	-	-
18-806FS-07	-	-	-	-	-	-
18-806HV-07	-	-	-	-	-	-
18-806FS-08	-	-	-	-	-	-
18-806HV-08	-	-	-	-	-	-
18-806FS-09	-	-	-	-	-	-
18-806HV-09	-	-	-	-	-	-
18-806FS-10	-	-	-	-	-	-
18-806HV-10	-	-	-	-	-	-
18-806FS-11	-	-	-	-	-	-
18-806HV-11	-	-	-	-	-	-
18-806FS-12	-	-	-	-	-	-
18-806HV-12	-	-	-	-	-	-
<b>Energy Federation, Inc.</b>						
1251783-IN	-	-	-	-	-	-
1265108-IN	-	-	-	-	-	-
1623628-IN	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
INV-258782	-	-	-	-	-	-
INV-259840	-	-	-	-	-	-
<b>River Energy - RichMay</b>						
17255	-	-	-	-	-	-
<b>River Energy - O'Brien &amp; Neville</b>						
16978	-	-	-	-	-	-
17329	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
01.18 MA-C&I Milestone	-	-	-	-	-	-
01.18 Time and Materials	-	-	-	-	-	-
02.18 MA-C&I Milestone	-	-	-	-	-	-
02.18 MA-C&I Time and Materials	-	-	-	-	-	-
03.18 MA-C&I Milestone	-	-	-	-	-	-
03.18 MA-C&I Time and Materials	-	-	-	-	-	-
04.18 MA-C&I Milestone	-	-	-	-	-	-
04.18 MA-C&I Time & Materials	-	-	-	-	-	-
05.18 MA-C&I Milestone	-	-	-	-	-	-
05.18 MA-C&I Time and Materials	-	-	-	-	-	-
870010028544	-	-	-	-	-	-
06.18 MA-C&I Milestone	-	-	-	-	-	-
06.18 MA-C&I Time & Materials	-	-	-	-	-	-
10517227_201811CIM	-	-	-	-	-	-
10517227_201808M	-	-	-	-	-	-
10517227_201809CIM	-	-	-	-	-	-
10517227_201809DMCIM	-	-	-	-	-	-
10517227_201811DMCIM	-	-	-	-	-	-
10517227_201811DMCIT	-	-	-	-	-	-
10517227_201808T	-	-	-	-	-	-
10517227_201810DMCIT	-	-	-	-	-	-
10517227_201811CIT	-	-	-	-	-	-
10517227_201809CIT	-	-	-	-	-	-
10517227_201809DMCIT	-	-	-	-	-	-
870010053215	-	-	-	-	-	-
11_1812CIM	-	-	-	-	-	-
11_1812DCIM	-	-	-	-	-	-
11_1812CIT	-	-	-	-	-	-
11_1812CIT2	-	-	-	-	-	-
11_1812DCIT	-	-	-	-	-	-
10517227_201811CIT #2	-	-	-	-	-	-

**Vendor Invoice Summary Table**  
C1 - C&I New Construction  
C1b - C&I Initial Purchase & End of Useful Life  
Cape Light Compact

2018 C1b - C&I Initial Purchase & End of Useful Life						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
Synapse Energy Economics	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
energyOrbit	-	-	-	-	-	-
2562	-	-	-	-	-	-
2548	-	-	-	-	-	-
2572	-	-	-	-	-	-
2536	-	-	-	-	-	-
2583	-	-	-	-	-	-
2606	-	-	-	-	-	-
2596R	-	-	-	-	-	-
2634	-	-	-	-	-	-
2592	-	-	-	-	-	-
2721	-	-	-	-	-	-
2727	-	-	-	-	-	-
2789	-	-	-	-	-	-
2818	-	-	-	-	-	-
Cohen Ventures, Inc./DBA Energy Solutions	-	-	-	-	-	-
17-1574-18-CLC	-	-	-	-	-	-
16-1538-31	-	-	-	-	-	-
17-1574-9-CLC	-	-	-	-	-	-
17-1574-10-CLC	-	-	-	-	-	-
16-1538-22	-	-	-	-	-	-
17-1574-11-CLC	-	-	-	-	-	-
17-1574-12-CLC	-	-	-	-	-	-
17-1574-13-CLC	-	-	-	-	-	-
16-1538-25	-	-	-	-	-	-
16-1538-26	-	-	-	-	-	-
17-1574-14-CLC	-	-	-	-	-	-
17-1574-15-CLC	-	-	-	-	-	-
17-1574-16-CLC	-	-	-	-	-	-
17-1574-17-CLC	-	-	-	-	-	-
17-1574-19-CLC	-	-	-	-	-	-
17-1574-20-CLC	-	-	-	-	-	-
18-1632-4	-	-	-	-	-	-
Local Media Group, Inc d/b/a Cape Cod Media Group	-	-	-	-	-	-
171994	-	-	-	-	-	-
River Energy - Gaffney Bennett Public Relations	-	-	-	-	-	-
15797	-	-	-	-	-	-
National Resource Management, Inc.	-	-	-	-	-	-
November 15 2018 Medium	-	-	-	-	-	-
Thielsch Engineering Inc/Rise Engineering	-	-	-	-	-	-
180588	-	-	-	-	-	-
Galligan Energy Consulting Inc.	-	-	-	-	-	-
2018-282	-	-	-	-	-	-
2018-288	-	-	-	-	-	-
2018-302	-	-	-	-	-	-
2018-306	-	-	-	-	-	-
2018-307	-	-	-	-	-	-
Gregory R. Abbe	-	-	-	-	-	-
1	-	-	-	-	-	-
2	-	-	-	-	-	-
Second Law Engineers, Inc., DBA DMI	-	-	-	-	-	-
201801CS	-	-	-	-	-	-
201803CS	-	-	-	-	-	-
201804CS	-	-	-	-	-	-
201805CS	-	-	-	-	-	-
201806CS	-	-	-	-	-	-
201807CS	-	-	-	-	-	-
201808CS	-	-	-	-	-	-
201901CS	-	-	-	-	-	-
Illume Advising, LLC	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
Customertimes, Corp.	-	-	-	-	-	-
CT-01039	-	-	-	-	-	-
CT-01333	-	-	-	-	-	-
CT-01660	-	-	-	-	-	-
CT-01974	-	-	-	-	-	-
River Energy - Energy Efficiency Advisors, Inc.	-	-	-	-	-	-
17146	-	-	-	-	-	-
<b>Grand Total</b>						

**Vendor Invoice Summary Table**  
C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2018 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>Efficiency Foward, Inc./dba Design Lights Consortium</b>						
105	-	-	-	-	-	-
<b>River Energy - RichMay</b>						
17255	-	-	-	-	-	-
<b>River Energy - North Atlantic Energy Advisors</b>						
15801	-	-	-	-	-	-
<b>River Energy - O'Brien &amp; Neville</b>						
16978	-	-	-	-	-	-
17329	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
01.18 MA-C&I Milestone	-	-	-	-	-	-
01.18 Time and Materials	-	-	-	-	-	-
02.18 MA-C&I Milestone	-	-	-	-	-	-
02.18 MA-C&I Time and Materials	-	-	-	-	-	-
03.18 MA-C&I Milestone	-	-	-	-	-	-
03.18 MA-C&I Time and Materials	-	-	-	-	-	-
04.18 MA-C&I Milestone	-	-	-	-	-	-
04.18 MA-C&I Time & Materials	-	-	-	-	-	-
05.18 MA-C&I Milestone	-	-	-	-	-	-
05.18 MA-C&I Time and Materials	-	-	-	-	-	-
870010028544	-	-	-	-	-	-
06.18 MA-C&I Milestone	-	-	-	-	-	-
06.18 MA-C&I Time & Materials	-	-	-	-	-	-
10517227_201811CIM	-	-	-	-	-	-
10517227_201808M	-	-	-	-	-	-
10517227_201809CIM	-	-	-	-	-	-
10517227_201809DMCIM	-	-	-	-	-	-
10517227_201811DMCIM	-	-	-	-	-	-
10517227_201811DMCIT	-	-	-	-	-	-
10517227_201808T	-	-	-	-	-	-
10517227_201810DMCIT	-	-	-	-	-	-
10517227_201811CIT	-	-	-	-	-	-
10517227_201809CIT	-	-	-	-	-	-
10517227_201809DMCIT	-	-	-	-	-	-
870010053215	-	-	-	-	-	-
11_1812CIM	-	-	-	-	-	-
11_1812DCIM	-	-	-	-	-	-
11_1812CIT	-	-	-	-	-	-
11_1812CIT2	-	-	-	-	-	-
11_1812DCIT	-	-	-	-	-	-
10517227_201811CIT #2	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>energyOrbit</b>						
2562	-	-	-	-	-	-
2548	-	-	-	-	-	-
2572	-	-	-	-	-	-
2536	-	-	-	-	-	-
2583	-	-	-	-	-	-
2606	-	-	-	-	-	-
2596R	-	-	-	-	-	-
2634	-	-	-	-	-	-
2592	-	-	-	-	-	-
2721	-	-	-	-	-	-
2727	-	-	-	-	-	-
2789	-	-	-	-	-	-
2818	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2a - C&I Existing Building Retrofit  
Cape Light Compact

2018 C2a - C&I Existing Building Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
168699	-	-	-	-	-	-
170030	-	-	-	-	-	-
171278	-	-	-	-	-	-
173104	-	-	-	-	-	-
174405	-	-	-	-	-	-
175835	-	-	-	-	-	-
177540	-	-	-	-	-	-
184039	-	-	-	-	-	-
179962	-	-	-	-	-	-
182055	-	-	-	-	-	-
185884	-	-	-	-	-	-
188282	-	-	-	-	-	-
188910	-	-	-	-	-	-
<b>Galligan Energy Consulting Inc.</b>	-	-	-	-	-	-
2018-273	-	-	-	-	-	-
2018-272	-	-	-	-	-	-
2018-277	-	-	-	-	-	-
2018-280	-	-	-	-	-	-
2018-286	-	-	-	-	-	-
2018-283	-	-	-	-	-	-
2018-289	-	-	-	-	-	-
2018-292	-	-	-	-	-	-
<b>Nstar Electric Company, Eversource Energy</b>	-	-	-	-	-	-
391918	-	-	-	-	-	-
<b>Second Law Engineers, Inc., DBA DMI</b>	-	-	-	-	-	-
201801CS	-	-	-	-	-	-
201802CS	-	-	-	-	-	-
201803CS	-	-	-	-	-	-
201804CS	-	-	-	-	-	-
201805CS	-	-	-	-	-	-
201806CS	-	-	-	-	-	-
201807CS	-	-	-	-	-	-
201808CS	-	-	-	-	-	-
201809CS	-	-	-	-	-	-
201810CS	-	-	-	-	-	-
201901CS	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Customertimes, Corp.</b>	-	-	-	-	-	-
CT-01039	-	-	-	-	-	-
CT-01333	-	-	-	-	-	-
CT-01660	-	-	-	-	-	-
CT-01974	-	-	-	-	-	-
<b>River Energy - Energy Efficiency Advisors, Inc.</b>	-	-	-	-	-	-
17146	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2b - C&I Small Business  
Cape Light Compact

2018 C2b - C&I Small Business						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
22931	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Appliance Recycling Centers of America, Inc.</b>						
48653	-	-	-	-	-	-
49353	-	-	-	-	-	-
49510	-	-	-	-	-	-
49731	-	-	-	-	-	-
49938	-	-	-	-	-	-
50127	-	-	-	-	-	-
50379	-	-	-	-	-	-
50560	-	-	-	-	-	-
<b>Heritage Press, Inc.</b>						
101849	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>Efficiency Forward, Inc./dba Design Lights Consortium</b>						
105	-	-	-	-	-	-
<b>The Cadmus Group, Inc.</b>						
INV-259840	-	-	-	-	-	-
INV-260467	-	-	-	-	-	-
INV-261619	-	-	-	-	-	-
<b>MV Times Corporation, Inc. The Martha's Vineyard Times</b>						
Ref 301109238	-	-	-	-	-	-
301114947	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
01.18 MA-C&I Milestone	-	-	-	-	-	-
01.18 Time and Materials	-	-	-	-	-	-
02.18 MA-C&I Milestone	-	-	-	-	-	-
02.18 MA-C&I Time and Materials	-	-	-	-	-	-
03.18 MA-C&I Milestone	-	-	-	-	-	-
03.18 MA-C&I Time and Materials	-	-	-	-	-	-
04.18 MA-C&I Milestone	-	-	-	-	-	-
04.18 MA-C&I Time & Materials	-	-	-	-	-	-
05.18 MA-C&I Milestone	-	-	-	-	-	-
05.18 MA-C&I Time and Materials	-	-	-	-	-	-
870010038544	-	-	-	-	-	-
06.18 MA-C&I Milestone	-	-	-	-	-	-
06.18 MA-C&I Time & Materials	-	-	-	-	-	-
10517227_201811CIM	-	-	-	-	-	-
10517227_201808M	-	-	-	-	-	-
10517227_201809CIM	-	-	-	-	-	-
10517227_201809DMCIM	-	-	-	-	-	-
10517227_201811DMCIM	-	-	-	-	-	-
10517227_201811DMCIT	-	-	-	-	-	-
10517227_201808T	-	-	-	-	-	-
10517227_201810DMCIT	-	-	-	-	-	-
10517227_201811CIT	-	-	-	-	-	-
10517227_201809CIT	-	-	-	-	-	-
10517227_201809DMCIT	-	-	-	-	-	-
870010053215	-	-	-	-	-	-
11_1812CIM	-	-	-	-	-	-
11_1812DCIM	-	-	-	-	-	-
11_1812CIT	-	-	-	-	-	-
11_1812CIT2	-	-	-	-	-	-
11_1812DCIT	-	-	-	-	-	-
10517227_201811CIT #2	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Curley Direct Mail, LLC</b>						
18-0213	-	-	-	-	-	-
18-0487	-	-	-	-	-	-
<b>Falmouth Publishing Co., Inc.</b>						
53164	-	-	-	-	-	-
<b>Gatehouse Media Massachusetts I, Inc d/b/a Community Newspaper Comp</b>						
CN13717453	-	-	-	-	-	-
CN13717448 8.16	-	-	-	-	-	-
CN13717448 8.17	-	-	-	-	-	-
<b>Hyora Publications DBA/The Cape Cod Chronicle</b>						
18787	-	-	-	-	-	-
<b>Local Media Group, Inc d/b/a Cape Cod Media Group</b>						
171994	-	-	-	-	-	-
175322	-	-	-	-	-	-
177822	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2b - C&I Small Business  
Cape Light Compact

2018 C2b - C&I Small Business						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Sandab Communications LP/ Cape Cod Broadcasting</b>	-	-	-	-	-	-
IN-1180332084	-	-	-	-	-	-
MC-1180332074	-	-	-	-	-	-
MCC-1180331960	-	-	-	-	-	-
MC-1180432629	-	-	-	-	-	-
<b>National Resource Management, Inc.</b>	-	-	-	-	-	-
February 2018 Small	-	-	-	-	-	-
March 2018 Small	-	-	-	-	-	-
March 2018 Medium	-	-	-	-	-	-
April 2018 Small	-	-	-	-	-	-
May 2018 Medium	-	-	-	-	-	-
May 2018 Small	-	-	-	-	-	-
June 2018 Medium	-	-	-	-	-	-
June 2018 Small	-	-	-	-	-	-
July 2018 Medium	-	-	-	-	-	-
July 2018 Small	-	-	-	-	-	-
October 2018 Medium	-	-	-	-	-	-
October 2018 Small	-	-	-	-	-	-
November 15 2018 Small	-	-	-	-	-	-
November 30 2018 Medium	-	-	-	-	-	-
November 30 2018 Small	-	-	-	-	-	-
December 31, 2018 Medium	-	-	-	-	-	-
December 31, 2018 Small	-	-	-	-	-	-
2 December 31, 2018 Small	-	-	-	-	-	-
March 31 2019 Medium	-	-	-	-	-	-
January 31 2019 Small	-	-	-	-	-	-
March 2019 Small	-	-	-	-	-	-
January 31 2018 Medium	-	-	-	-	-	-
<b>Thielsch Engineering Inc/Rise Engineering</b>	-	-	-	-	-	-
168850	-	-	-	-	-	-
168779	-	-	-	-	-	-
168695	-	-	-	-	-	-
170031	-	-	-	-	-	-
169988	-	-	-	-	-	-
170029	-	-	-	-	-	-
171279	-	-	-	-	-	-
171362	-	-	-	-	-	-
171277	-	-	-	-	-	-
173103	-	-	-	-	-	-
173102	-	-	-	-	-	-
173249	-	-	-	-	-	-
173116	-	-	-	-	-	-
174406	-	-	-	-	-	-
174407	-	-	-	-	-	-
174653	-	-	-	-	-	-
175836	-	-	-	-	-	-
175834	-	-	-	-	-	-
175833	-	-	-	-	-	-
175913	-	-	-	-	-	-
177550	-	-	-	-	-	-
177714	-	-	-	-	-	-
177983	-	-	-	-	-	-
177984	-	-	-	-	-	-
180484	-	-	-	-	-	-
180727	-	-	-	-	-	-
180334	-	-	-	-	-	-
181988	-	-	-	-	-	-
181989	-	-	-	-	-	-
182181	-	-	-	-	-	-
182289	-	-	-	-	-	-
184052	-	-	-	-	-	-
184062	-	-	-	-	-	-
184181	-	-	-	-	-	-
184392	-	-	-	-	-	-
185863	-	-	-	-	-	-
185353	-	-	-	-	-	-
185814	-	-	-	-	-	-
185946	-	-	-	-	-	-
188281	-	-	-	-	-	-
188283	-	-	-	-	-	-
188398	-	-	-	-	-	-
188909	-	-	-	-	-	-
188911	-	-	-	-	-	-
188583	-	-	-	-	-	-
193948	-	-	-	-	-	-
191995	-	-	-	-	-	-
193942	-	-	-	-	-	-
191909	-	-	-	-	-	-
194023	-	-	-	-	-	-
194061	-	-	-	-	-	-
192134	-	-	-	-	-	-
171280	-	-	-	-	-	-
191926	-	-	-	-	-	-
<b>Second Law Engineers, Inc., DBA DMI</b>	-	-	-	-	-	-
201801CS	-	-	-	-	-	-
<b>Spyro Mitrokostas</b>	-	-	-	-	-	-
Invoice #1	-	-	-	-	-	-
Invoice #2	-	-	-	-	-	-
Invoice #3	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2c - C&I Multifamily Retrofit  
Cape Light Compact

2018 C2c - C&I Multifamily Retrofit						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>Nexant Inc.</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>DNV GL Energy Insights USA, Inc.</b>						
01.18 MA-C&I Milestone	-	-	-	-	-	-
01.18 Time and Materials	-	-	-	-	-	-
02.18 MA-C&I Milestone	-	-	-	-	-	-
02.18 MA-C&I Time and Materials	-	-	-	-	-	-
03.18 MA-C&I Milestone	-	-	-	-	-	-
03.18 MA-C&I Time and Materials	-	-	-	-	-	-
04.18 MA-C&I Milestone	-	-	-	-	-	-
04.18 MA-C&I Time & Materials	-	-	-	-	-	-
05.18 MA-C&I Milestone	-	-	-	-	-	-
05.18 MA-C&I Time and Materials	-	-	-	-	-	-
870010028544	-	-	-	-	-	-
06.18 MA-C&I Milestone	-	-	-	-	-	-
06.18 MA-C&I Time & Materials	-	-	-	-	-	-
10517227_201811CIM	-	-	-	-	-	-
10517227_201808M	-	-	-	-	-	-
10517227_201809CIM	-	-	-	-	-	-
10517227_201809DMCIM	-	-	-	-	-	-
10517227_201811DMCIM	-	-	-	-	-	-
10517227_201811DMCIT	-	-	-	-	-	-
10517227_201808T	-	-	-	-	-	-
10517227_201810DMCIT	-	-	-	-	-	-
10517227_201811CIT	-	-	-	-	-	-
10517227_201809CIT	-	-	-	-	-	-
10517227_201809DMCIT	-	-	-	-	-	-
870010053215	-	-	-	-	-	-
11_1812CIM	-	-	-	-	-	-
11_1812DCIM	-	-	-	-	-	-
11_1812CIT	-	-	-	-	-	-
11_1812CIT2	-	-	-	-	-	-
11_1812DCIT	-	-	-	-	-	-
10517227_201811CIT #2	-	-	-	-	-	-
<b>Synapse Energy Economics</b>						
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Illume Advising, LLC</b>						
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>						



**Vendor Invoice Summary Table**

C2 - C&I Retrofit  
C2d - C&I Upstream Lighting  
Cape Light Compact

2018 C2d - C&I Upstream Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>Allocated Costs</b>						
All Legal Allocated Costs	-	-	-	-	-	-
All IT Allocated Costs	-	-	-	-	-	-
All Marketing Allocated Costs	-	-	-	-	-	-
All General Administration Allocated Costs	-	-	-	-	-	-
<b>NMR Group, Inc.</b>						
2293J	-	-	-	-	-	-
2293K	-	-	-	-	-	-
22931	-	-	-	-	-	-
2293L	-	-	-	-	-	-
2293M	-	-	-	-	-	-
2293N	-	-	-	-	-	-
2293O	-	-	-	-	-	-
2293R	-	-	-	-	-	-
2293P	-	-	-	-	-	-
2293Q	-	-	-	-	-	-
2293S	-	-	-	-	-	-
2293T	-	-	-	-	-	-
<b>CMC Energy Services, Inc.</b>						
18-806UP-01	-	-	-	-	-	-
18-806UP-02	-	-	-	-	-	-
18-806UP-03	-	-	-	-	-	-
18-806UP-04	-	-	-	-	-	-
18-806UP-05	-	-	-	-	-	-
18-806UP-06	-	-	-	-	-	-
18-806UP-07	-	-	-	-	-	-
18-806UP-09	-	-	-	-	-	-
18-806UP-10	-	-	-	-	-	-
18-806UP-08	-	-	-	-	-	-
18-806UP-11	-	-	-	-	-	-
18-806UP-12	-	-	-	-	-	-
<b>Nexant Inc</b>						
2430E	-	-	-	-	-	-
<b>Opinion Dynamics Corp.</b>						
7831.1Jan18	-	-	-	-	-	-
7870CAPEJan18	-	-	-	-	-	-
7831.1Feb18	-	-	-	-	-	-
7831.1Mar18	-	-	-	-	-	-
7831.1Apr18	-	-	-	-	-	-
7870CAPEMay18	-	-	-	-	-	-
7831.1JUN18	-	-	-	-	-	-
7870CAPE Aug18	-	-	-	-	-	-
7870capedEC18	-	-	-	-	-	-
<b>Efficiency Foward, Inc./dba Design Lights Consortium</b>						
105	-	-	-	-	-	-
<b>CLEAResult Consulting, Inc.</b>						
16373	-	-	-	-	-	-
19440	-	-	-	-	-	-
735206U	-	-	-	-	-	-
749806U	-	-	-	-	-	-
758206U	-	-	-	-	-	-
9203	-	-	-	-	-	-
760606U	-	-	-	-	-	-
PB-007836	-	-	-	-	-	-
11737	-	-	-	-	-	-
13100	-	-	-	-	-	-
14654	-	-	-	-	-	-
15899	-	-	-	-	-	-
17235	-	-	-	-	-	-
18527	-	-	-	-	-	-
19461	-	-	-	-	-	-
11475	-	-	-	-	-	-

**Vendor Invoice Summary Table**

C2 - C&I Retrofit

C2d - C&I Upstream Lighting

Cape Light Compact

2018 C2d - C&I Upstream Lighting						
Vendor, Invoice Number	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs
<b>DNV GL Energy Insights USA, Inc.</b>	-	-	-	-	-	-
01.18 MA-C&I Milestone	-	-	-	-	-	-
01.18 Time and Materials	-	-	-	-	-	-
02.18 MA-C&I Milestone	-	-	-	-	-	-
02.18 MA-C&I Time and Materials	-	-	-	-	-	-
03.18 MA-C&I Milestone	-	-	-	-	-	-
03.18 MA-C&I Time and Materials	-	-	-	-	-	-
04.18 MA-C&I Milestone	-	-	-	-	-	-
04.18 MA-C&I Time & Materials	-	-	-	-	-	-
05.18 MA-C&I Milestone	-	-	-	-	-	-
05.18 MA-C&I Time and Materials	-	-	-	-	-	-
870010028544	-	-	-	-	-	-
06.18 MA-C&I Milestone	-	-	-	-	-	-
06.18 MA-C&I Time & Materials	-	-	-	-	-	-
10517227_201811CIM	-	-	-	-	-	-
10517227_201808M	-	-	-	-	-	-
10517227_201809CIM	-	-	-	-	-	-
10517227_201809DMCIM	-	-	-	-	-	-
10517227_201811DMCIM	-	-	-	-	-	-
10517227_201811DMCIT	-	-	-	-	-	-
10517227_201808T	-	-	-	-	-	-
10517227_201810DMCIT	-	-	-	-	-	-
10517227_201811CIT	-	-	-	-	-	-
10517227_201809CIT	-	-	-	-	-	-
10517227_201809DMCIT	-	-	-	-	-	-
870010053215	-	-	-	-	-	-
11_1812CIM	-	-	-	-	-	-
11_1812DCIM	-	-	-	-	-	-
11_1812CIT	-	-	-	-	-	-
11_1812CIT2	-	-	-	-	-	-
11_1812DCIT	-	-	-	-	-	-
10517227_201811CIT #2	-	-	-	-	-	-
<b>Synapse Energy Economics</b>	-	-	-	-	-	-
17-080-04CL	-	-	-	-	-	-
17-080-05CL	-	-	-	-	-	-
17-080-06CL	-	-	-	-	-	-
<b>Illume Advising, LLC</b>	-	-	-	-	-	-
2029	-	-	-	-	-	-
2054	-	-	-	-	-	-
2085	-	-	-	-	-	-
2126	-	-	-	-	-	-
2189	-	-	-	-	-	-
2317	-	-	-	-	-	-
2345	-	-	-	-	-	-
<b>Grand Total</b>	-	-	-	-	-	-

## APPENDIX G SPONSORSHIPS AND SUBSCRIPTIONS

### 1. Introduction

In the process of preparing this Term Report, the Program Administrators performed a detailed review of the energy efficiency expenses incurred during the period 2016 through 2018 that were categorized as Sponsorships & Subscriptions in the hard-to-measure line items, and similar costs that were included as program expenses.

### 2. Description of 2016–2018 Three-Year Sponsorships and Subscriptions

Below is a list of all organizations or items the Compact sponsored or subscribed to during the term. Section A provides a summary table that includes (a) name of the sponsored organization or item, (b) annual funding, (c) cost category, and (d) whether the organization is a lobbyist. Section B includes, for each sponsored organization, (a) description of organization or item, (b) purpose of the item, and (c) an analysis describing why the expense was reasonable, prudently incurred, and how it provided a direct benefit to Massachusetts’ ratepayers.

#### A. Summary of 2016–2018 Three-Year Sponsorships and Subscriptions

Sponsored Organization Name	Annual Funding				Cost Category	Registered MA Lobbyist
	2016	2017	2018	2016-2018		
Design Lights Consortium	1,567		3,071	4,638	PPA, Marketing	No
<b>Program Expenses included as Sponsorships &amp; Subscriptions in 2013-2015*</b>						
CEE, Lighting for Tomorrow	61			61	STAT	No
Chambers of Commerce	2,150	2,000		4,150	PPA, Marketing	Yes
Table at local events	6,659	3,850		10,509	PPA, Marketing	No
WOMR	1,560			1,560	PPA	No
<b>Total</b>	<b>10,430</b>	<b>5,850</b>		<b>16,580</b>		
<b>Grand Total</b>	<b>11,997</b>	<b>5,850</b>	<b>3,071</b>	<b>20,917</b>		

\*These sponsorship or subscription costs are a program expense in accordance with the Policy on Sponsorships & Subscriptions (August 1, 2016) (the “Policy”) and is therefore not included in the Hard-to-Measure Sponsorships & Subscriptions line item. In accordance with the Policy, for the 2016–2018 Term Report, those expenses directly affecting programs and categorized in program line items that were previously included as Sponsorships & Subscriptions hard-to-measure costs in 2013-2015 are included in this Appendix.

## B. Purpose and Benefit of 2016–2018 Three-Year Sponsorships and Subscriptions

### Design Lights Consortium

**Description of Activities:** The Design Lights Consortium (“DLC”) promotes high quality, high efficiency commercial lighting solutions through collaboration among its federal, regional, state, utility, and energy efficiency program members, luminaire manufacturers, lighting designers, and other industry stakeholders. The DLC Qualified Products List provides the PAs, customers, business partners, and market actors with critical information on verified lighting systems and technologies that meet pre-determined standards regarding testing criteria, quality, specification documentation, and efficiency ratings.

**Energy Efficiency Benefits:** The Mass Save® Program Administrators support the advancement of lighting system technologies, an energy efficiency measure that is prominent in the energy efficiency programs for our customers, particularly LED technologies. In an effort to advance quality lighting products to the market and expedite the review of this technology through the various customer participation pathways, such as upstream point of purchase and downstream prescriptive/customer programs, the PAs support multiple DLC initiatives, including the Qualified Products List. Collaboration with the DLC helps accelerate adoption of more quality LED fixtures and/or lighting technologies in the market and advance new lighting technologies while providing consistency on how these technologies are measured for standards, testing, efficiency, and other critical technology specific criteria in the market. It is also a critical input for consistency in energy efficiency lighting system analysis and technical review as it pertains to energy savings estimates resulting from the installation of lighting systems and technologies that are accepted on the DLC Qualified Product List. The PA partnership with the DLC has been a necessary resource to cost-effectively and efficiently implement lighting systems as a viable energy efficiency measure within the various program delivery models and customer participation pathways.

**Direct Benefit to Ratepayers:** DLC Qualified Products Lists provides customers and business partners with a consistent and industry-recognized resource on lighting system technologies that can be leveraged for designing systems and purchasing equipment. Collaboration with the DLC accelerates the adoption of more quality LED fixtures and/lighting technologies in the market thus providing accessible energy savings for customers. The DLC informs the Program Administrators’ efficiency programs and the lighting industry by maintaining the leading public list of high quality, high efficiency LED products for the commercial sector. This ensures that Massachusetts’ ratepayers are receiving the best quality and efficient products on the market. Finally, the cost of this partnership with the DLC was reasonable and prudent because the Program Administrator gained benefits that they could not gain elsewhere at a similar cost.

### Cape Cod and Martha’s Vineyard Chambers of Commerce

This sponsorship cost is a program expense in accordance with the Policy and is therefore not included in the Hard-to-Measure Sponsorships & Subscriptions line item. In accordance with the Policy, for the 2016–2018 Term Report, those expenses directly affecting programs and

categorized in program line items that were previously included as Sponsorships & Subscriptions hard-to-measure costs in 2013-2015 are included in this Appendix.

**Description of Activities:** Payments made to various Cape Cod and Martha's Vineyard Chambers of Commerce were for annual membership dues. Annual membership dues range from \$100 to \$500. For the chambers that are registered Massachusetts lobbyists, the Compact has requested the additional information required by the Department, including the percent of resources devoted to lobbying and legislative activities. The Compact will supplement this filing with that information upon receipt from the chambers.

**Energy Efficiency Benefits:** The Compact joined chambers of commerce on Cape Cod and Martha's Vineyard in order to have increased access to commercial and industrial customers.

**Direct Benefit to Ratepayers:** Membership in the chambers of commerce allows the Compact to promote energy efficiency programs at chamber events and in chamber newsletters. It also provides access to member lists that the Compact contacted regarding energy efficiency programs. The benefit of membership in chambers of commerce is to increase participation in the Compact's energy efficiency programs.

#### Table at Local Events

This sponsorship cost is a program expense in accordance with the Policy and is therefore not included in the Hard-to-Measure Sponsorships & Subscriptions line item. In accordance with the Policy, for the 2016–2018 Term Report, those expenses directly affecting programs and categorized in program line items that were previously included as Sponsorships & Subscriptions hard-to-measure costs in 2013-2015 are included in this Appendix.

**Description of Activities:** The Compact attends local events on Cape Cod and Martha's Vineyard to promote energy efficiency programs and is sometimes required to pay a fee to have a table at the event. Over the 2016–2018 Term, the Compact paid fees at events hosted by the following organizations:

- Hyannis Rotary Charitable & Educational Association (\$550)
- Martha's Vineyard Agricultural Society (\$9,500)
- Tisbury Police (\$85)
- NEEC (this event was not local, but represented the Compact's share of a statewide event) (\$374)

**Energy Efficiency Benefits:** At these events, the Compact engages with customers and educates them about the offers available to them through the energy efficiency programs. Compact staff can and have directly enrolled customers in the energy efficiency program at the events. At one event, the Compact hosted a dehumidifier turn-in as well. The Compact conducted 10 dehumidifier turn-in events over the 2016–2018 Plan Term, resulting in 974 units turned in, or an average of about 100 turn-ins per event.

**Direct Benefit to Ratepayers:** Increased awareness of energy efficiency programs and instructions on how to participate in the energy efficiency programs.

#### WOMR

This sponsorship cost is a program expense in accordance with the Policy and is therefore not included in the Hard-to-Measure Sponsorships & Subscriptions line item. In accordance with the Policy, for the 2016–2018 Term Report, those expenses directly affecting programs and categorized in program line items that were previously included as Sponsorships & Subscriptions hard-to-measure costs in 2013-2015 are included in this Appendix.

**Description of Activities:** WOMR is a local radio station broadcasting across the outer Cape. Expenditures were for annual sponsorship, and a fee for advertising energy efficiency program on the radio.

**Energy Efficiency Benefits:** Promotes awareness of energy efficiency programs and encourages residents and businesses to participate in energy efficiency programs.

**Direct Benefit to Ratepayers:** Increased awareness of energy efficiency programs and instructions on how to participate in the energy efficiency program.

#### Consortium for Energy Efficiency – Lighting for Tomorrow Sponsorship

This sponsorship cost is a program expense in accordance with the Policy and is therefore not included in the Hard-to-Measure Sponsorships & Subscriptions line item. In accordance with the Policy, for the 2016–2018 Term Report, those expenses directly affecting programs and categorized in program line items that were previously included as Sponsorships & Subscriptions hard-to-measure costs in 2013-2015 are included in this Appendix.

**Description of Activities:** *Lighting for Tomorrow* is a competition organized by the Consortium for Energy Efficiency (“CEE”), the American Lighting Association (“ALA”), and UL. The annual *Lighting for Tomorrow* competition was created in 2002 and provides manufacturers the opportunity to push the industry forward by introducing high quality, innovative designs that contribute to the greater energy efficiency. *Lighting for Tomorrow* has a specific goal of increasing the availability and market adoption of ENERGY STAR® certified residential lighting products.

**Energy Efficiency Benefits:** The Program Administrator has historically sponsored the competition, alongside dozens of other utility partners, to encourage manufacturers to develop high quality energy efficient lighting products, including fixtures, lamps, retrofit kits, and lighting controls, that can ultimately be rolled out to our customers as part of our retail lighting programs. The *Lighting for Tomorrow* competition aims to continue to increase the number of high quality solid-state lighting product offerings in the market eligible to participate in efficiency programs. After winners are selected and available in retail stores for purchase, the PAs are able to encourage

customers to purchase these highly efficient products at a discounted price through our Residential Lighting program, saving them energy and money.

**Direct Benefit to Ratepayers:** Sponsoring the competition helps the PAs learn about new, innovative energy efficiency lighting options that can be used to directly benefit customers by meeting their needs and helping customers save money, while also furthering the Commonwealth's energy efficiency goals. Also, sponsoring the competition offers an opportunity to shape the direction of the manufacturers' products in order to encourage the development of cost-effective, efficient, specialized lighting that customers want to adopt. Supporting competitions, such as *Lighting for Tomorrow*, with other nation leading utilities is an efficient way to encourage manufacturers to innovate and address specific customers' needs.

### C. Lobbying Information

The only registered lobbyist that the Compact supported in the 2016–2018 period was the Cape Cod Chamber of Commerce. The cost was specifically for annual membership dues of up to \$500. The Compact has requested the additional information required by the Department, including the percent of resources devoted to lobbying and legislative activities. The Compact will supplement this filing with that information upon receipt from the chambers.

## **APPENDIX H PERFORMANCE INCENTIVE MODELS**

The purpose of this appendix is to provide detailed supporting documentation on performance incentives that each Program Administrator proposes to collect. This section is not applicable to the Compact; as a municipal aggregator and public entity, the Compact does not collect any performance incentives.



## **APPENDIX I**

### **ACTIVE DEMAND DEMONSTRATION SUMMARY**

#### **A. Statewide Summary**

In the 2016–2018 Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan (“Plan”) the Program Administrators committed to exploring creative new approaches to cost-effective demand reduction. These potential innovative approaches are in addition to the significant amount of demand savings planned to be achieved through energy efficiency programs in the 2016–2018 Three-Year Plan. See Plan at 19 (577 MW summer demand savings and 618 MW winter demand savings). Consistent with the Plan, in 2016 the Program Administrators assembled a Demand Savings Group (“DSG”) consisting of a small group of interested and qualified experts, to research potential electric and gas demand reduction efforts.

Through this highly collaborative and expert driven process, the Program Administrators have considered various approaches to demand demonstration projects, and coordinated with each other to examine various innovative technologies and approaches that could potentially be successfully deployed to address unique opportunities in the Commonwealth. Below is a brief summary of the efforts undertaken by the Program Administrators and DSG over the 2016–2018 plan term to investigate potential cost-effective approaches to achieve active demand reduction:

In 2016 and early 2017, the Program Administrators through the DSG and the Council’s Demand Reduction Subcommittee engaged in a highly collaborative process to investigate and analyze potential demand opportunities. As explained in the 2016 and 2017 Plan Year Reports, this work contributed to the development of several additional demonstration projects and the refinement of approved demonstrations. As such, the Program Administrators’ primary efforts throughout 2017 and 2018 were implementing and reviewing the results of approved demonstration projects, as well as obtaining approval of new demonstration projects that will test a variety of technologies and strategies.

In the summer of 2017, some Program Administrators implemented approved demonstrations in both the Residential and Commercial & Industrial (“C&I”) sectors. National Grid and the Cape Light Compact JPE (the “Compact”) ran a second summer of residential direct load control, targeting connected thermostats controlling cooling loads. Additionally, National Grid implemented the first summer of a C&I load curtailment demonstration offering.

In October 2017, the Department approved most of the proposed Eversource and Unitil demonstration projects (D.P.U. 16-178 and D.P.U. 16-184). The Program Administrators also continued to refine a methodology for assessing the cost-effectiveness of demand reduction programs.

In the summer of 2018, the Program Administrators implemented approved demonstrations in both the Residential and Commercial & Industrial (“C&I”) sectors. National Grid and the Compact

ran a third summer of residential direct load control, targeting connected thermostats controlling cooling loads. Additionally, National Grid implemented the second summer of a C&I load curtailment demonstration offering. Eversource and Unitil began implementing their approved demonstration projects.

The Program Administrators’ demonstrations and research have culminated in the development of new statewide, scalable active demand reduction offerings, which were approved as part of the Program Administrators’ 2019–2021 Three-Year Plan. These residential and C&I offerings are modeled on the National Grid and Compact demand demonstration projects, as well as Eversource’s energy storage demonstration and are designed to be flexible, scalable, cost-effective, and allow for the adoption and incorporation of new innovative connected devices.

The Program Administrators also continue to collaborate on the implementation of the ongoing Eversource and Unitil demonstration projects, which will be implemented in 2019. Consistent with the Department’s directives, the Program Administrators will report on the results of these demonstrations and collaboratively determine whether additional cost-effective active demand reduction offerings may be deployed or how current offerings may be modified. The Program Administrators are incorporating the lessons learned from the ongoing demonstrations into the statewide demand initiatives during the 2019–2021 Plan period.

## B. Meetings and Presentations

In addition to the numerous informal and ad hoc meetings during the plan term, the Program Administrators also participated in formal meetings of the Demand Reduction Subcommittee and the Energy Efficiency Advisory Council (“EEAC”). Below is a list of meetings and presentations over the 2016–2018 plan term.

### **EEAC Meetings and Presentations**

Date	Setting	Topic	Link
2/18/2016	Demand Reduction Subcommittee	Demand Reduction Subcommittee PA Framework & Updates	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Demand-SubCom-PA-Framework-Updates.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Demand-SubCom-PA-Framework-Updates.pdf</a>
2/26/2016	DSG	DSG Coordination, Scope, Milestones, and Timeline	Attached in 2016 Annual Report
2/26/2016	DSG	Draft Milestones	Attached in 2016 Annual Report
3/10/2016	Demand Reduction Subcommittee	DSG Update and Draft PA Report	Attached in 2016 Annual Report

<b>Date</b>	<b>Setting</b>	<b>Topic</b>	<b>Link</b>
3/31/2016	DPU	Initial Report of the Demand Savings Group	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Initial-Report-of-the-Demand-Savings-Group-w-App-3-31-16-1.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Initial-Report-of-the-Demand-Savings-Group-w-App-3-31-16-1.pdf</a>
6/1/2016	Demand Reduction Subcommittee	Cost-Effectiveness	Attached in 2016 Annual Report
6/21/2016	EEAC	Update from PAs on Demand Savings Group	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Update-from-PAs-on-Demand-Savings-Group.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Update-from-PAs-on-Demand-Savings-Group.pdf</a>
8/15/2016	DSG	Lessons Learned and Priorities	Attached in 2016 Annual Report
9/28/2016	Demand Reduction Subcommittee	Matrix of Opportunities	Attached in 2016 Annual Report
10/5/2016	Demand Reduction Subcommittee	Seasonal and Load vs. Pricing Priorities	Attached in 2016 Annual Report
10/19/2016	EEAC	Review of Demand Priorities, Timeline Update, and Next Steps	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Demand-Priorities-PA-Analysis-1.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Demand-Priorities-PA-Analysis-1.pdf</a>
10/21/2016	DSG	New Directions in Demand Response by Mary Ann Piette	Attached in 2016 Annual Report
12/2/2016	Demand Reduction Subcommittee	Overview of Proposed/Approved Demand Reduction Demonstration Projects	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Matrix-Memorandum-12-2-16.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Matrix-Memorandum-12-2-16.pdf</a>
12/2/2016	DSG	Natural Gas Systems Overview	Attached in 2016 Annual Report
12/7/2016	Demand Reduction Subcommittee	Upcoming Milestones for Peak demand Reduction	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Milestones-for-PDR.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Milestones-for-PDR.pdf</a>

<b>Date</b>	<b>Setting</b>	<b>Topic</b>	<b>Link</b>
2/23/2017	Demand Reduction Subcommittee	Demand Reduction Update & Milestones	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/PDR-Timeline-2017.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/PDR-Timeline-2017.pdf</a>
2/23/2017	Demand Reduction Subcommittee	Demand Reduction Projects Evaluation Plan Update	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/MA-PAs-Demand-Reduction-Projects-Evaluation-Plan-Update-1.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/MA-PAs-Demand-Reduction-Projects-Evaluation-Plan-Update-1.pdf</a>
3/15/2017	EEAC	Demand Reduction Update & Milestones	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Peak-Demand-Reduction-Updates-Milestones-3.13-1.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Peak-Demand-Reduction-Updates-Milestones-3.13-1.pdf</a>
5/25/2017	Demand Reduction Subcommittee	2025 California DR Potential Study Presentation by LBNL	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/2025-California-DR-Potential-Study-Presentation-1.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/2025-California-DR-Potential-Study-Presentation-1.pdf</a>
5/25/2017	Demand Reduction Subcommittee	National Grid Demand Reduction Demonstration Project Update	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/National-Grid-Demand-Reduction-Demonstration-Projects-Update.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/National-Grid-Demand-Reduction-Demonstration-Projects-Update.pdf</a>
11/15/2017	EEAC	Program Administrator Demand Demonstration Update	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/PA-Demand-Demonstration-Update.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/PA-Demand-Demonstration-Update.pdf</a>
11/15/2017	EEAC	Eversource and Unutil Demonstration Orders Update	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Eversource-and-Unutil-DPU-Order-Update-11-15-17.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Eversource-and-Unutil-DPU-Order-Update-11-15-17.pdf</a>
11/15/2017	EEAC	Demand Considerations in PA Potential Studies	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Demand-in-Potential-Studies-11-15-17.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Demand-in-Potential-Studies-11-15-17.pdf</a>

Date	Setting	Topic	Link
11/15/2017	EEAC	Active Demand Reduction Cost-Effectiveness Considerations	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/DR-Cost-Effectiveness_FINAL-11-14-17-1.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/DR-Cost-Effectiveness_FINAL-11-14-17-1.pdf</a>
1/30/2018	EEAC	Workshop #6 Active Demand Reduction <sup>2</sup>	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/Active-Demand-Management-Presentation.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/Active-Demand-Management-Presentation.pdf</a>
3/20/2019	EEAC	Active Demand Reduction Demonstration & Initiative Update	<a href="http://ma-eeac.org/wordpress/wp-content/uploads/March-Demand-Presentations_EEAC_3-8-19_Final_corrected.pdf">http://ma-eeac.org/wordpress/wp-content/uploads/March-Demand-Presentations_EEAC_3-8-19_Final_corrected.pdf</a>

### C. PA-Specific Summary of Demand Reduction Demonstration Projects and Proposals

#### 2016 Demonstration Offering

The Compact began enrolling customers in its Demand Response (“DR”) Demonstration Offering (“Offering”) in the spring and summer of 2016. The Compact’s Offering focused on installing connected devices in participating homes and businesses, and then using these connected Wi-Fi thermostats to curtail air conditioning (“AC”) loads during demand response events called by the Compact. The Offering was designed to test demand reduction potential, assess participant acceptance of thermostat setpoint adjustments, determine participant motivators, and identify potential barriers and challenges to implementation at scale.

For the 2016 Offering, the Compact provided and installed near-real-time whole-home energy monitoring equipment, similar to the equipment installed as part of the Residential Behavior/Feedback core initiative, for every participant. The Compact also provided and installed WiFi thermostats for every Offering participant. The Compact provided and installed this equipment to (1) allow for control of the participants’ AC setpoints, (2) measure approximate load reduction achieved through curtailment of AC, and (3) provide an additional incentive for customers to enroll in the Offering.

The Compact enrolled 39 participants (a total of 56 Wi-Fi thermostats) and called eight DR events during August and September 2016. Navigant performed a detailed evaluation of the 2016 Offering, which was included in the 2016 Plan Year Report (2016 Plan Year Report, Attachment 4D, Study 16-38). The evaluation confirmed that load curtailment was achieved from the

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<sup>2</sup> PAs reviewed and suggested edits to EEAC Consultant slides.

thermostat setpoint adjustments on high-temperature event days. However, the impact findings in the evaluation are only descriptive due to the statistically insufficient sample sizes. The evaluation provided an indicative average reduction of 0.4 kilowatts across all events. Navigant found that customers were generally accepting of adjustments to their devices and were satisfied with the program, showing that an aggregated Wi-Fi thermostat adjustments program has potential to be an effective demand response initiative.

Through its experience with the Offering in 2016, the Compact identified two main challenges: (1) the equipment and installation expense and enrollment delay associated with providing thermostats and energy monitoring equipment to participants, and (2) the relatively limited pool of participants with ducted AC controlled by a thermostat. The identification of these challenges led to changes in the 2017 Offering, as described below.

#### 2017 Demonstration Offering

In 2017, the Compact continued implementation of its DR Offering, seeking to both re-enroll participants from 2016 and recruit new participants. The Compact also implemented program adjustments to address some of the challenges identified in 2016.

In order to expand the potential pool of participants beyond customers with central ducted AC, the Compact incorporated a device into its DR platform for controlling ductless mini-split heat pumps (“MSHP”) systems. This type of central AC is more commonly found in the older housing stock in the Compact’s service territory. The MSHP control devices allowed the Compact to adjust the setpoints for MSHP systems, and also allowed customers to control their MSHP systems from their smart phones or computers. The Compact provided the MSHP control devices at no cost to eligible customers as a participation incentive, along with a post-season performance incentive dependent on event participation.

The Compact also transitioned to a “bring-your-own-thermostat” (“BYOT”) program design instead of installing a thermostat as part of the Offering. This allowed customers with eligible thermostats already installed (and possibly incentivized through the Program Administrators’ energy efficiency programs) to enroll in the Offering. The Compact incorporated several models of Honeywell Wi-Fi thermostats into its DR platform to allow for this program transition while maintaining compatibility with the thermostats installed through the Offering in 2016.

Other Offering adjustments in 2017 included calling events solely on an opt-out basis to increase event participation, and the discontinuance of providing and installing Wi-Fi thermostats and energy monitoring equipment to customers through the Offering to reduce costs, reduce enrollment timeframes, and move toward a more sustainable and cost-effective program model.

The Compact had a total of 40 participants in the Offering for 2017. Of these participants, 22 were returning participants from 2016. All of the 18 new participants were customers with MSHP systems. The Compact called seven DR events during July and August 2017.

The Compact, in coordination with Navigant, determined that an evaluation of CLC’s 2017 DR offering was not warranted due to low program enrollment and data constraints.

The Compact identified further challenges in 2017. While the incorporation of MSHP systems led to increased participation, the data limitations of the control device (which only collects information on the signals sent to the MSHP system, but not the behavior of the MSHP system itself) did not allow for a full and thorough evaluation of participation rates and demand reduction

impact. In addition, the Compact learned the importance of retaining customers from year to year (i.e., re-enrolling customers that participated in previous seasons). The Compact also discovered that, due to the types of heating and cooling systems installed in its service territory (and generally in Massachusetts), it is important to incorporate thermostats that do not require a third wire to power the thermostat (the requirement for a third wire limits compatibility with many heating and cooling systems in the Compact's service territory). These lessons learned led to design changes in the Compact's 2018 Offering, as further described below.

### 2018 Demonstration Offering

In 2018, the Compact continued implementation of its DR Offering, with some minor design changes. The Compact incorporated additional two-wire thermostats into its DR platform to allow for increased participation, automatically re-enrolled 2017 Offering participants (with notification and ability to opt out) to enhance 2018 participation, and sought to market the program more heavily through the Residential Home Energy Assessment core initiative and through eligible thermostat device manufacturers.

The Compact had 52 participants (with a total of 91 devices) in 2018. These participants included 19 customers with thermostats installed by the Compact in 2016, 25 customers with MSHP control devices, and 8 customers who enrolled their eligible Wi-Fi thermostats through the BYOT portal. The Compact called eight opt-out DR events in July and August 2018.

Navigant performed an evaluation of the Compact's 2018 Offering. The evaluation report is included as Appendix D, Study 43. Overall, Navigant's evaluation confirmed the Offering was successful both in testing the effectiveness of thermostats as a residential DR technology and in customer acceptance of the program offering. The evaluation found that most customers would participate in the program again in the future. As described in the evaluation report, Navigant provided a savings estimate of 0.19 kW per device for MSHP control devices and 0.62 kW for central AC devices (thermostats), based on the 2017 Residential Baseline Load Shape Study and National Grid's 2017 Wi-Fi Thermostat DR Evaluation.

The Compact learned several lessons through the 2016–2018 DR Offering that were incorporated into the 2019–2021 Energy Efficiency Plan:

- A BYOT model for thermostat DR, which leverages the installed base of Wi-Fi thermostats (which Program Administrators incentivize through rebate programs) is the most efficient and cost-effective way to recruit participants. The Compact will use a BYOT program design going forward to achieve DR savings from cooling load.
- In order to cost-effectively maintain and increase participant enrollment and event participation, the Compact will automatically re-enroll past participants (that have not previously opted out of the program) every year and will call all thermostat DR events on an opt-out basis.
- While MSHP systems are prevalent in the Compact's service territory, the high cost, low peak demand savings estimate, and evaluation difficulty for MSHP control devices mean that it is not cost-effective to incorporate these devices into DR programs going forward.

The Compact will continue to seek cost-effective ways to achieve MSHP demand savings as the technology and DR market evolve.

- The available pool of DR participants for cooling load can vary widely depending on eligible/compatible thermostat models. Going forward, the Compact plans to use a different DR platform vendor that can work with a much wider base of installed Wi-Fi thermostats, including several models that do not require a third wire.
- The lack of widespread interval metering, and therefore, widely available time-varying rate (“TVR”) options for residential customers, means there is generally no bill reduction for DR participants, and therefore no inherent financial motivation to participate in DR programs. This means that the Program Administrators must provide a separate participation incentive in order to recruit participants for these DR programs, which increases overall program costs. Widespread utility deployment of advanced metering, which would most efficiently enable TVRs for residential customers, would provide a direct financial incentive to participate through bill reductions, and would therefore decrease DR program costs and enhance program cost-effectiveness.



**APPENDIX CLC-1**  
**CAPE LIGHT COMPACT TOWN ACTIVITY REPORTS**

The following are the 2018 Town Activity Reports for the Compact. The 2016 and 2017 Town Activity Reports are provided in the Compact's 2016 Plan-Year Report and 2017 Plan-Year Report, respectively.

## Energy Efficiency Program Activity by Town

Town Name: All  
 Program Period: 2018  
 Current Dates: 1/1/2018 - 1/31/2018  
 Cumulative Dates: 1/1/2018 - 1/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 2 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential New Construction (Low-Income)	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Multi-Family Retrofit	33,408.50	\$19,433.52	28	33,408.50	\$19,433.52	28	\$0.00	0.00%
Residential Home Energy Services - Measures	514,774.80	\$801,174.19	836	514,774.80	\$801,174.19	836	\$15,242,046.00	5.26%
Residential Home Energy Services - RCS	0.00	\$118,465.00	542	0.00	\$118,465.00	542	\$1,957,938.00	6.05%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	208,470.70	\$149,580.50	280	208,470.70	\$149,580.50	280	\$0.00	0.00%
Residential Consumer Products	131,523.30	\$40,129.66	274	131,523.30	\$40,129.66	274	\$0.00	0.00%
Residential Lighting	1,746,901.00	\$151,302.88	8,418	1,746,901.00	\$151,302.88	8,418	\$0.00	0.00%
Residential HEAT Loan	0.00	\$215,822.64	202	0.00	\$215,822.64	202	\$0.00	0.00%
<b>Res Subtotal</b>	<b>2,635,078.30</b>	<b>\$1,495,908.39</b>	<b>10,580.00</b>	<b>2,635,078.30</b>	<b>\$1,495,908.39</b>	<b>10,580</b>	<b>\$17,199,984.00</b>	
<b>Res % of Total</b>	<b>73.55%</b>	<b>73.22%</b>	<b>96.13%</b>	<b>73.55%</b>	<b>73.22%</b>	<b>96.13%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	78,678.80	\$81,426.42	92	78,678.80	\$81,426.42	92	\$3,020,168.00	2.70%
Low-Income Multi-Family Retrofit	223,181.50	\$187,469.84	217	223,181.50	\$187,469.84	217	\$0.00	0.00%
<b>LI Subtotal</b>	<b>301,860.30</b>	<b>\$268,896.26</b>	<b>309.00</b>	<b>301,860.30</b>	<b>\$268,896.26</b>	<b>309</b>	<b>\$3,020,168.00</b>	
<b>LI % of Total</b>	<b>8.43%</b>	<b>13.16%</b>	<b>2.81%</b>	<b>8.43%</b>	<b>13.16%</b>	<b>2.81%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$13,805.50	4	0.00	\$13,805.50	4	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$952.25	1	0.00	\$952.25	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$7,445.50	2	0.00	\$7,445.50	2	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	23,529.23	\$7,890.84	9	23,529.23	\$7,890.84	9	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	9,292.08	\$2,201.25	2	9,292.08	\$2,201.25	2	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	1,640.18	\$6,645.01	6	1,640.18	\$6,645.01	6	\$2,073,836.00	0.32%
C&I Existing Building Retrofit - Municipal	96,567.60	\$100,642.91	3	96,567.60	\$100,642.91	3	\$0.00	0.00%
C&I Small Business	97,904.23	\$81,605.55	33	97,904.23	\$81,605.55	33	\$5,867,235.00	1.39%
C&I Multifamily Retrofit	257.00	\$2,411.18	2	257.00	\$2,411.18	2	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	416,421.49	\$54,523.00	55	416,421.49	\$54,523.00	55	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>645,611.81</b>	<b>\$278,122.99</b>	<b>117.00</b>	<b>645,611.81</b>	<b>\$278,122.99</b>	<b>117</b>	<b>\$7,941,071.00</b>	
<b>C&amp;I % of Total</b>	<b>18.02%</b>	<b>13.61%</b>	<b>1.06%</b>	<b>18.02%</b>	<b>13.61%</b>	<b>1.06%</b>	<b>28.20%</b>	
<b>Total</b>	<b>3,582,550.41</b>	<b>\$2,042,927.64</b>	<b>11,006</b>	<b>3,582,550.41</b>	<b>\$2,042,927.64</b>	<b>11,006</b>	<b>\$28,161,223.00</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

# Energy Efficiency Program Activity by Town

Town Name: AQUINNAH  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 3 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	28,092.69	\$15,714.53	4	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	104.00	\$2,216.00	2	23,469.50	\$13,970.95	11	\$19,814.66	70.51%
Residential Home Energy Services - RCS	0.00	\$0.00	0	0.00	\$2,165.00	7	\$2,545.32	85.06%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	0.00	\$0.00	0	2,602.00	\$1,262.00	2	\$0.00	0.00%
Residential Consumer Products	0.00	\$0.00	0	3,818.00	\$455.00	7	\$0.00	0.00%
Residential Lighting	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential HEAT Loan	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>Res Subtotal</b>	<b>104.00</b>	<b>\$2,216.00</b>	<b>2.00</b>	<b>57,982.19</b>	<b>\$33,567.48</b>	<b>31</b>	<b>\$22,359.98</b>	
<b>Res % of Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>98.39%</b>	<b>93.94%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$3,926.22	0.00%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0</b>	<b>\$3,926.22</b>	
<b>LI % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	0.00	\$0.00	0	\$2,695.99	0.00%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	0.00	\$550.00	2	\$7,627.41	7.21%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>\$550.00</b>	<b>2</b>	<b>\$10,323.39</b>	
<b>C&amp;I % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.61%</b>	<b>6.06%</b>	<b>28.20%</b>	
<b>Total</b>	<b>104.00</b>	<b>\$2,216.00</b>	<b>2</b>	<b>57,982.19</b>	<b>\$34,117.48</b>	<b>33</b>	<b>\$36,609.59</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: BARNSTABLE  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 4 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	3,679.62	\$2,167.92	3	71,019.73	\$34,338.95	52	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	68,866.70	\$26,049.92	33	\$0.00	0.00%
Residential Home Energy Services - Measures	128,867.80	\$211,206.84	207	1,538,063.61	\$2,102,177.22	1,582	\$2,964,577.95	70.91%
Residential Home Energy Services - RCS	0.00	\$21,520.00	109	0.00	\$262,347.77	939	\$380,818.94	68.89%
Residential Behavior/Feedback Program	19,105.10	\$3,034.50	1	19,105.10	\$3,034.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	57,830.60	\$42,719.00	72	309,876.20	\$239,321.00	460	\$0.00	0.00%
Residential Consumer Products	48,451.30	\$8,478.85	33	347,325.80	\$69,230.86	735	\$0.00	0.00%
Residential Lighting	998,779.10	\$49,929.14	4,487	10,589,672.50	\$687,050.17	53,950	\$0.00	0.00%
Residential HEAT Loan	0.00	\$106,225.46	79	0.00	\$465,693.42	368	\$0.00	0.00%
<b>Res Subtotal</b>	<b>1,256,713.52</b>	<b>\$445,281.71</b>	<b>4,991.00</b>	<b>12,943,929.64</b>	<b>\$3,889,243.81</b>	<b>58,120</b>	<b>\$3,345,396.89</b>	
<b>Res % of Total</b>	<b>68.22%</b>	<b>64.48%</b>	<b>97.42%</b>	<b>74.83%</b>	<b>61.28%</b>	<b>98.46%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	20,106.50	\$22,789.35	22	238,805.76	\$242,144.89	176	\$587,422.68	41.22%
Low-Income Multi-Family Retrofit	12,311.20	\$14,810.76	47	367,395.16	\$372,050.76	363	\$0.00	0.00%
<b>LI Subtotal</b>	<b>32,417.70</b>	<b>\$37,600.11</b>	<b>69.00</b>	<b>606,200.92</b>	<b>\$614,195.65</b>	<b>539</b>	<b>\$587,422.68</b>	
<b>LI % of Total</b>	<b>1.76%</b>	<b>5.44%</b>	<b>1.35%</b>	<b>3.50%</b>	<b>9.68%</b>	<b>0.91%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	136.66	\$1,048.70	1	683.31	\$26,181.53	5	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	3,656.00	\$960.00	1	5,447.00	\$4,874.25	5	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	1,661.00	\$550.00	1	\$0.00	0.00%
C&I Upstream HVAC	4,751.13	\$1,749.34	4	46,893.13	\$17,322.02	13	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	335,278.41	\$67,118.00	4	1,314,192.31	\$261,837.57	14	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	44,489.06	\$43,603.08	8	451,402.56	\$323,396.72	41	\$403,361.10	80.18%
C&I Existing Building Retrofit - Municipal	0.00	\$514.41	2	447,508.24	\$390,809.50	9	\$0.00	0.00%
C&I Small Business	106,104.58	\$84,633.40	24	941,976.64	\$726,420.28	154	\$1,141,177.21	63.66%
C&I Multifamily Retrofit	1,820.00	\$593.34	1	21,220.00	\$16,414.10	8	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	56,790.38	\$7,451.00	18	517,472.64	\$74,931.98	119	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>553,026.22</b>	<b>\$207,671.27</b>	<b>63.00</b>	<b>3,748,456.83</b>	<b>\$1,842,737.95</b>	<b>369</b>	<b>\$1,544,538.31</b>	
<b>C&amp;I % of Total</b>	<b>30.02%</b>	<b>30.07%</b>	<b>1.23%</b>	<b>21.67%</b>	<b>29.04%</b>	<b>0.63%</b>	<b>28.20%</b>	
<b>Total</b>	<b>1,842,157.44</b>	<b>\$690,553.09</b>	<b>5,123</b>	<b>17,298,587.38</b>	<b>\$6,346,177.41</b>	<b>59,028</b>	<b>\$5,477,357.87</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: BOURNE  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 5 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	5,881.16	\$2,043.29	1	27,093.53	\$9,305.51	24	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	12,872.40	\$8,555.11	16	\$0.00	0.00%
Residential Home Energy Services - Measures	33,030.00	\$82,543.58	76	471,013.00	\$617,316.95	468	\$1,295,573.91	47.65%
Residential Home Energy Services - RCS	0.00	\$7,155.00	35	0.00	\$77,945.00	283	\$166,424.73	46.83%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	13,991.80	\$8,067.50	27	94,698.80	\$60,092.00	151	\$0.00	0.00%
Residential Consumer Products	5,352.20	\$1,533.00	11	98,885.70	\$18,845.50	236	\$0.00	0.00%
Residential Lighting	142,403.50	\$10,853.13	473	2,563,909.90	\$225,184.93	12,124	\$0.00	0.00%
Residential HEAT Loan	0.00	\$21,752.61	16	0.00	\$69,044.57	60	\$0.00	0.00%
<b>Res Subtotal</b>	<b>200,658.66</b>	<b>\$133,948.11</b>	<b>639.00</b>	<b>3,268,473.33</b>	<b>\$1,086,289.57</b>	<b>13,362</b>	<b>\$1,461,998.64</b>	
<b>Res % of Total</b>	<b>48.52%</b>	<b>65.93%</b>	<b>95.23%</b>	<b>69.49%</b>	<b>56.46%</b>	<b>97.45%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	5,521.20	\$1,922.38	4	56,331.36	\$99,463.21	59	\$256,714.28	38.74%
Low-Income Multi-Family Retrofit	959.90	\$398.52	1	250,798.71	\$233,712.64	131	\$0.00	0.00%
<b>LI Subtotal</b>	<b>6,481.10</b>	<b>\$2,320.90</b>	<b>5.00</b>	<b>307,130.07</b>	<b>\$333,175.85</b>	<b>190</b>	<b>\$256,714.28</b>	
<b>LI % of Total</b>	<b>1.57%</b>	<b>1.14%</b>	<b>0.75%</b>	<b>6.53%</b>	<b>17.32%</b>	<b>1.39%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	10,385.00	\$3,120.00	2	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	20,700.00	\$10,200.00	1	27,843.00	\$18,171.75	5	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	3,039.09	\$2,079.50	5	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	24,004.00	\$6,350.00	2	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	29,897.65	\$4,740.40	3	200,847.20	\$45,566.39	13	\$176,276.06	25.85%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	61,712.98	\$56,924.63	3	\$0.00	0.00%
C&I Small Business	61,251.93	\$38,191.18	9	454,524.33	\$316,047.62	56	\$498,714.98	63.37%
C&I Multifamily Retrofit	0.00	\$0.00	0	6,443.00	\$7,565.79	1	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	94,600.78	\$13,768.00	14	339,154.55	\$48,804.86	72	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>206,450.36</b>	<b>\$66,899.58</b>	<b>27.00</b>	<b>1,127,953.16</b>	<b>\$504,630.54</b>	<b>159</b>	<b>\$674,991.04</b>	
<b>C&amp;I % of Total</b>	<b>49.92%</b>	<b>32.93%</b>	<b>4.02%</b>	<b>23.98%</b>	<b>26.23%</b>	<b>1.16%</b>	<b>28.20%</b>	
<b>Total</b>	<b>413,590.12</b>	<b>\$203,168.59</b>	<b>671</b>	<b>4,703,556.55</b>	<b>\$1,924,095.96</b>	<b>13,711</b>	<b>\$2,393,703.96</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: BREWSTER  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 6 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	1,315.73	\$1,545.06	1	53,079.28	\$37,833.11	25	\$0.00	0.00%
Residential Multi-Family Retrofit	7,503.00	\$12,184.05	4	85,537.60	\$61,034.45	35	\$0.00	0.00%
Residential Home Energy Services - Measures	33,327.50	\$62,543.77	58	463,611.60	\$654,202.81	445	\$644,738.55	101.47%
Residential Home Energy Services - RCS	0.00	\$6,415.00	34	0.00	\$90,920.64	310	\$82,820.78	109.78%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	18,820.60	\$9,394.00	21	113,244.00	\$71,550.50	161	\$0.00	0.00%
Residential Consumer Products	4,599.00	\$1,382.50	8	98,493.00	\$19,295.00	249	\$0.00	0.00%
Residential Lighting	63,735.30	\$7,218.85	532	886,671.00	\$89,910.74	5,109	\$0.00	0.00%
Residential HEAT Loan	0.00	\$24,243.32	22	0.00	\$99,486.43	70	\$0.00	0.00%
<b>Res Subtotal</b>	<b>129,301.13</b>	<b>\$124,926.55</b>	<b>680.00</b>	<b>1,700,636.48</b>	<b>\$1,124,233.68</b>	<b>6,404</b>	<b>\$727,559.32</b>	
<b>Res % of Total</b>	<b>97.10%</b>	<b>94.87%</b>	<b>99.42%</b>	<b>74.82%</b>	<b>72.84%</b>	<b>98.96%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	3,856.90	\$6,748.72	4	34,834.20	\$55,175.43	27	\$127,753.11	43.19%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	388.30	\$257.72	1	\$0.00	0.00%
<b>LI Subtotal</b>	<b>3,856.90</b>	<b>\$6,748.72</b>	<b>4.00</b>	<b>35,222.50</b>	<b>\$55,433.15</b>	<b>28</b>	<b>\$127,753.11</b>	
<b>LI % of Total</b>	<b>2.90%</b>	<b>5.13%</b>	<b>0.58%</b>	<b>1.55%</b>	<b>3.59%</b>	<b>0.43%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	44,245.00	\$15,823.00	1	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	96,993.00	\$24,092.75	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	5,271.00	\$2,100.00	1	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	13,475.98	\$4,108.33	2	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	0.00	\$1,525.00	4	\$87,723.26	1.74%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	240,833.34	\$229,669.11	4	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	133,338.19	\$86,156.99	19	\$248,184.04	34.71%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	0.00	\$0.00	0	2,997.14	\$239.00	7	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>537,153.66</b>	<b>\$363,714.18</b>	<b>39</b>	<b>\$335,907.30</b>	
<b>C&amp;I % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>23.63%</b>	<b>23.57%</b>	<b>0.60%</b>	<b>28.20%</b>	
<b>Total</b>	<b>133,158.03</b>	<b>\$131,675.27</b>	<b>684</b>	<b>2,273,012.64</b>	<b>\$1,543,381.01</b>	<b>6,471</b>	<b>\$1,191,219.73</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: CHATHAM  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 7 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	15,630.34	\$7,788.45	10	\$0.00	0.00%
Residential Multi-Family Retrofit	2,566.00	\$3,742.21	1	24,777.30	\$11,271.70	10	\$0.00	0.00%
Residential Home Energy Services - Measures	26,111.80	\$73,540.20	50	395,582.80	\$590,008.39	323	\$402,390.01	146.63%
Residential Home Energy Services - RCS	0.00	\$5,135.00	31	0.00	\$60,267.98	209	\$51,689.56	116.60%
Residential Behavior/Feedback Program	5,945.10	\$994.50	1	5,945.10	\$994.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	6,766.00	\$5,798.50	10	62,784.70	\$38,518.50	73	\$0.00	0.00%
Residential Consumer Products	12,216.40	\$5,388.50	4	81,830.00	\$22,485.00	138	\$0.00	0.00%
Residential Lighting	113,098.30	\$7,484.70	335	1,938,089.60	\$133,338.99	7,356	\$0.00	0.00%
Residential HEAT Loan	0.00	\$13,420.66	15	0.00	\$42,991.11	38	\$0.00	0.00%
<b>Res Subtotal</b>	<b>166,703.60</b>	<b>\$115,504.27</b>	<b>447.00</b>	<b>2,524,639.84</b>	<b>\$907,664.62</b>	<b>8,158</b>	<b>\$454,079.58</b>	
<b>Res % of Total</b>	<b>90.80%</b>	<b>92.42%</b>	<b>98.03%</b>	<b>92.36%</b>	<b>88.54%</b>	<b>99.26%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	3,699.50	\$4,244.00	3	24,177.94	\$22,954.25	15	\$79,732.44	28.79%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	3,940.40	\$3,392.93	4	\$0.00	0.00%
<b>LI Subtotal</b>	<b>3,699.50</b>	<b>\$4,244.00</b>	<b>3.00</b>	<b>28,118.34</b>	<b>\$26,347.18</b>	<b>19</b>	<b>\$79,732.44</b>	
<b>LI % of Total</b>	<b>2.01%</b>	<b>3.40%</b>	<b>0.66%</b>	<b>1.03%</b>	<b>2.57%</b>	<b>0.23%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	762.00	\$400.00	1	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	23,409.20	\$22,912.12	3	\$54,749.27	41.85%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Small Business	11,095.76	\$4,995.57	3	118,881.09	\$64,478.61	24	\$154,895.00	41.63%
C&I Multifamily Retrofit	0.00	\$0.00	0	75.00	\$37.10	1	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	2,104.38	\$239.00	3	37,485.88	\$3,296.13	13	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>13,200.14</b>	<b>\$5,234.57</b>	<b>6.00</b>	<b>180,613.17</b>	<b>\$91,123.96</b>	<b>42</b>	<b>\$209,644.27</b>	
<b>C&amp;I % of Total</b>	<b>7.19%</b>	<b>4.19%</b>	<b>1.32%</b>	<b>6.61%</b>	<b>8.89%</b>	<b>0.51%</b>	<b>28.20%</b>	
<b>Total</b>	<b>183,603.24</b>	<b>\$124,982.84</b>	<b>456</b>	<b>2,733,371.35</b>	<b>\$1,025,135.76</b>	<b>8,219</b>	<b>\$743,456.29</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: CHILMARK  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 8 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	27,193.33	\$13,038.94	2	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	14,683.00	\$15,003.67	9	50,671.20	\$63,956.27	48	\$56,395.57	113.41%
Residential Home Energy Services - RCS	0.00	\$1,480.00	7	0.00	\$10,895.00	41	\$7,244.37	150.39%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	1,420.00	\$813.00	2	9,418.00	\$5,854.00	11	\$0.00	0.00%
Residential Consumer Products	0.00	\$0.00	0	9,396.00	\$2,965.00	16	\$0.00	0.00%
Residential Lighting	0.00	\$0.00	0	1,588.40	\$188.00	15	\$0.00	0.00%
Residential HEAT Loan	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>Res Subtotal</b>	<b>16,103.00</b>	<b>\$17,296.67</b>	<b>18.00</b>	<b>98,266.93</b>	<b>\$96,897.21</b>	<b>133</b>	<b>\$63,639.94</b>	
<b>Res % of Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>89.17%</b>	<b>93.69%</b>	<b>92.36%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$11,174.62	0.00%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0</b>	<b>\$11,174.62</b>	
<b>LI % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	191.00	\$100.00	1	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	2	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	0.00	\$0.00	0	\$7,673.19	0.00%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	5,239.68	\$5,622.75	6	\$21,708.77	25.90%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	0.00	\$0.00	0	6,503.01	\$805.00	2	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>11,933.69</b>	<b>\$6,527.75</b>	<b>11</b>	<b>\$29,381.96</b>	
<b>C&amp;I % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>10.83%</b>	<b>6.31%</b>	<b>7.64%</b>	<b>28.20%</b>	
<b>Total</b>	<b>16,103.00</b>	<b>\$17,296.67</b>	<b>18</b>	<b>110,200.62</b>	<b>\$103,424.96</b>	<b>144</b>	<b>\$104,196.53</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.



## Energy Efficiency Program Activity by Town

Town Name: DENNIS  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 9 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	10,764.20	\$5,984.59	2	74,093.21	\$37,922.97	19	\$0.00	0.00%
Residential Multi-Family Retrofit	5,464.70	\$5,724.00	4	17,676.90	\$11,832.71	16	\$0.00	0.00%
Residential Home Energy Services - Measures	67,832.10	\$129,715.35	125	784,594.20	\$1,261,752.96	851	\$931,289.01	135.48%
Residential Home Energy Services - RCS	0.00	\$14,775.00	73	0.00	\$156,299.05	527	\$119,630.01	130.65%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	15,773.40	\$14,409.00	27	135,957.20	\$103,519.00	223	\$0.00	0.00%
Residential Consumer Products	12,200.60	\$4,791.50	18	144,078.80	\$29,437.00	388	\$0.00	0.00%
Residential Lighting	182,442.60	\$19,261.05	1,167	4,252,437.80	\$386,297.61	22,386	\$0.00	0.00%
Residential HEAT Loan	0.00	\$48,662.03	41	0.00	\$168,480.14	136	\$0.00	0.00%
<b>Res Subtotal</b>	<b>294,477.60</b>	<b>\$243,322.52</b>	<b>1,457.00</b>	<b>5,408,838.11</b>	<b>\$2,155,541.44</b>	<b>24,546</b>	<b>\$1,050,919.02</b>	
<b>Res % of Total</b>	<b>83.39%</b>	<b>81.65%</b>	<b>71.04%</b>	<b>83.48%</b>	<b>77.45%</b>	<b>96.86%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	10,127.00	\$8,209.32	12	108,164.70	\$111,710.07	88	\$184,532.26	60.54%
Low-Income Multi-Family Retrofit	14,069.00	\$23,395.10	569	146,607.96	\$160,087.31	598	\$0.00	0.00%
<b>LI Subtotal</b>	<b>24,196.00</b>	<b>\$31,604.42</b>	<b>581.00</b>	<b>254,772.66</b>	<b>\$271,797.38</b>	<b>686</b>	<b>\$184,532.26</b>	
<b>LI % of Total</b>	<b>6.85%</b>	<b>10.60%</b>	<b>28.33%</b>	<b>3.93%</b>	<b>9.77%</b>	<b>2.71%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	5,429.00	\$1,270.00	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	1,260.00	\$400.00	2	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	6,029.22	\$1,958.17	2	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	144,239.00	\$30,290.19	1	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$275.00	1	10,041.82	\$11,110.69	7	\$126,711.38	8.77%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	15,752.97	\$23,241.64	3	\$0.00	0.00%
C&I Small Business	21,767.88	\$20,829.15	9	346,551.97	\$248,034.71	55	\$358,488.06	69.19%
C&I Multifamily Retrofit	0.00	\$0.00	0	20,870.00	\$9,761.57	4	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	12,688.44	\$1,992.00	3	265,083.61	\$29,632.55	36	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>34,456.32</b>	<b>\$23,096.15</b>	<b>13.00</b>	<b>815,257.60</b>	<b>\$355,699.52</b>	<b>111</b>	<b>\$485,199.44</b>	
<b>C&amp;I % of Total</b>	<b>9.76%</b>	<b>7.75%</b>	<b>0.63%</b>	<b>12.58%</b>	<b>12.78%</b>	<b>0.44%</b>	<b>28.20%</b>	
<b>Total</b>	<b>353,129.91</b>	<b>\$298,023.09</b>	<b>2,051</b>	<b>6,478,868.37</b>	<b>\$2,783,038.34</b>	<b>25,343</b>	<b>\$1,720,650.73</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: EASTHAM  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 10 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	18,328.95	\$9,775.14	4	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	27,125.10	\$83,100.17	76	419,996.20	\$606,225.32	423	\$324,655.58	186.73%
Residential Home Energy Services - RCS	0.00	\$7,375.00	36	0.00	\$78,740.00	275	\$41,704.08	188.81%
Residential Behavior/Feedback Program	289.80	\$51.00	1	289.80	\$51.00	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	12,242.80	\$7,092.00	20	76,419.20	\$45,064.50	109	\$0.00	0.00%
Residential Consumer Products	2,091.00	\$710.00	5	53,578.00	\$10,278.62	152	\$0.00	0.00%
Residential Lighting	4,629.30	\$552.30	13	346,011.60	\$28,863.97	1,238	\$0.00	0.00%
Residential HEAT Loan	0.00	\$6,718.65	10	0.00	\$35,023.10	27	\$0.00	0.00%
<b>Res Subtotal</b>	<b>46,378.00</b>	<b>\$105,599.12</b>	<b>161.00</b>	<b>914,623.75</b>	<b>\$814,021.65</b>	<b>2,229</b>	<b>\$366,359.66</b>	
<b>Res % of Total</b>	<b>36.58%</b>	<b>83.95%</b>	<b>94.71%</b>	<b>74.65%</b>	<b>79.40%</b>	<b>96.33%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	5,015.40	\$8,131.72	5	49,270.40	\$74,727.60	43	\$64,329.58	116.16%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>5,015.40</b>	<b>\$8,131.72</b>	<b>5.00</b>	<b>49,270.40</b>	<b>\$74,727.60</b>	<b>43</b>	<b>\$64,329.58</b>	
<b>LI % of Total</b>	<b>3.96%</b>	<b>6.46%</b>	<b>2.94%</b>	<b>4.02%</b>	<b>7.29%</b>	<b>1.86%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	630.00	\$200.00	1	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	7,341.24	\$1,583.33	2	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	15,960.00	\$5,852.76	2	\$44,172.71	13.25%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	40,329.04	\$33,360.56	2	\$0.00	0.00%
C&I Small Business	70,397.33	\$11,654.74	2	181,049.98	\$93,805.84	26	\$124,972.11	75.06%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	5,002.35	\$399.00	2	15,932.69	\$1,699.00	9	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>75,399.68</b>	<b>\$12,053.74</b>	<b>4.00</b>	<b>261,242.95</b>	<b>\$136,501.49</b>	<b>42</b>	<b>\$169,144.81</b>	
<b>C&amp;I % of Total</b>	<b>59.47%</b>	<b>9.58%</b>	<b>2.35%</b>	<b>21.32%</b>	<b>13.31%</b>	<b>1.82%</b>	<b>28.20%</b>	
<b>Total</b>	<b>126,793.08</b>	<b>\$125,784.58</b>	<b>170</b>	<b>1,225,137.10</b>	<b>\$1,025,250.74</b>	<b>2,314</b>	<b>\$599,834.05</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: EDGARTOWN  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 11 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	13,220.70	\$32,242.58	32	229,793.90	\$309,622.70	174	\$268,260.01	115.42%
Residential Home Energy Services - RCS	0.00	\$4,320.00	18	0.00	\$37,215.00	132	\$34,459.71	108.00%
Residential Behavior/Feedback Program	4,692.10	\$739.50	1	4,692.10	\$739.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	3,928.00	\$2,415.00	4	40,026.80	\$22,861.00	41	\$0.00	0.00%
Residential Consumer Products	1,572.10	\$685.97	5	61,744.10	\$27,660.97	46	\$0.00	0.00%
Residential Lighting	4,231.20	\$223.00	11	54,355.80	\$3,562.20	169	\$0.00	0.00%
Residential HEAT Loan	0.00	\$6,312.44	5	0.00	\$20,087.35	12	\$0.00	0.00%
<b>Res Subtotal</b>	<b>27,644.10</b>	<b>\$46,938.49</b>	<b>76.00</b>	<b>390,612.70</b>	<b>\$421,748.72</b>	<b>575</b>	<b>\$302,719.72</b>	
<b>Res % of Total</b>	<b>47.38%</b>	<b>88.93%</b>	<b>90.48%</b>	<b>54.09%</b>	<b>81.98%</b>	<b>91.27%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	0.00	\$0.00	0	14,119.76	\$16,256.26	11	\$53,154.96	30.58%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>14,119.76</b>	<b>\$16,256.26</b>	<b>11</b>	<b>\$53,154.96</b>	
<b>LI % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.96%</b>	<b>3.16%</b>	<b>1.75%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$145.00	1	0.00	\$13,669.75	1	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	4,267.22	\$2,191.67	4	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	9,149.44	\$2,869.25	2	110,865.18	\$15,161.96	3	\$36,499.51	41.54%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	0.00	\$475.00	1	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	43,386.57	\$26,156.09	8	\$103,263.34	25.33%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	21,552.28	\$2,827.00	5	158,907.82	\$18,794.30	27	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>30,701.72</b>	<b>\$5,841.25</b>	<b>8.00</b>	<b>317,426.80</b>	<b>\$76,448.77</b>	<b>44</b>	<b>\$139,762.85</b>	
<b>C&amp;I % of Total</b>	<b>52.62%</b>	<b>11.07%</b>	<b>9.52%</b>	<b>43.96%</b>	<b>14.86%</b>	<b>6.98%</b>	<b>28.20%</b>	
<b>Total</b>	<b>58,345.82</b>	<b>\$52,779.74</b>	<b>84</b>	<b>722,159.26</b>	<b>\$514,453.75</b>	<b>630</b>	<b>\$495,637.52</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: FALMOUTH  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 12 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	16,547.79	\$3,342.15	9	147,709.34	\$44,181.70	59	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	40,581.60	\$14,646.24	37	\$0.00	0.00%
Residential Home Energy Services - Measures	106,650.80	\$186,934.94	178	1,143,603.74	\$1,691,175.27	1,189	\$2,068,345.64	81.76%
Residential Home Energy Services - RCS	0.00	\$18,825.00	95	0.00	\$211,314.15	750	\$265,692.19	79.53%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	21,149.60	\$14,786.50	38	227,326.50	\$143,625.50	332	\$0.00	0.00%
Residential Consumer Products	15,054.90	\$3,040.50	27	231,521.60	\$44,311.00	498	\$0.00	0.00%
Residential Lighting	417,073.40	\$39,088.37	2,722	5,559,876.60	\$463,701.95	28,544	\$0.00	0.00%
Residential HEAT Loan	0.00	\$32,477.59	33	0.00	\$177,754.06	142	\$0.00	0.00%
<b>Res Subtotal</b>	<b>576,476.49</b>	<b>\$298,495.05</b>	<b>3,102.00</b>	<b>7,350,619.38</b>	<b>\$2,790,709.87</b>	<b>31,551</b>	<b>\$2,334,037.83</b>	
<b>Res % of Total</b>	<b>55.01%</b>	<b>56.48%</b>	<b>98.29%</b>	<b>76.68%</b>	<b>71.36%</b>	<b>98.64%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	9,951.90	\$22,787.82	14	118,815.06	\$176,548.17	113	\$409,836.80	43.08%
Low-Income Multi-Family Retrofit	31,213.25	\$26,128.80	2	58,364.85	\$37,056.43	85	\$0.00	0.00%
<b>LI Subtotal</b>	<b>41,165.15</b>	<b>\$48,916.62</b>	<b>16.00</b>	<b>177,179.91</b>	<b>\$213,604.60</b>	<b>198</b>	<b>\$409,836.80</b>	
<b>LI % of Total</b>	<b>3.93%</b>	<b>9.26%</b>	<b>0.51%</b>	<b>1.85%</b>	<b>5.46%</b>	<b>0.62%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$300.00	1	182,467.00	\$61,958.00	4	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$53.50	1	0.00	\$2,559.50	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	9,566.00	\$3,366.66	3	47,842.00	\$15,566.66	5	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	10,542.00	\$4,200.00	2	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	98,591.51	\$25,720.82	5	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	263,333.00	\$122,117.66	3	653,092.80	\$198,828.52	9	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	6,739.00	\$6,673.46	3	201,325.05	\$107,046.79	14	\$281,419.55	38.04%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	144,380.23	\$124,234.58	4	\$0.00	0.00%
C&I Small Business	38,956.73	\$32,523.86	7	374,187.78	\$317,801.06	55	\$796,183.79	39.92%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$1,150.00	3	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	111,788.99	\$16,051.21	20	345,646.12	\$47,288.71	135	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>430,383.72</b>	<b>\$181,086.35</b>	<b>38.00</b>	<b>2,058,074.50</b>	<b>\$906,354.64</b>	<b>237</b>	<b>\$1,077,603.33</b>	
<b>C&amp;I % of Total</b>	<b>41.07%</b>	<b>34.26%</b>	<b>1.20%</b>	<b>21.47%</b>	<b>23.18%</b>	<b>0.74%</b>	<b>28.20%</b>	
<b>Total</b>	<b>1,048,025.36</b>	<b>\$528,498.02</b>	<b>3,156</b>	<b>9,585,873.78</b>	<b>\$3,910,669.11</b>	<b>31,986</b>	<b>\$3,821,477.96</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: HARWICH  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 13 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	2,452.21	\$1,746.82	2	16,529.07	\$14,165.74	10	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	64,549.80	\$64,903.95	25	\$0.00	0.00%
Residential Home Energy Services - Measures	46,415.60	\$85,224.51	70	598,110.70	\$939,372.74	588	\$803,255.82	116.95%
Residential Home Energy Services - RCS	0.00	\$7,985.00	38	0.00	\$107,067.13	367	\$103,183.33	103.76%
Residential Behavior/Feedback Program	5,800.20	\$969.00	1	5,800.20	\$969.00	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	21,533.60	\$10,905.00	26	100,444.40	\$70,785.50	165	\$0.00	0.00%
Residential Consumer Products	5,979.00	\$1,945.00	9	98,276.30	\$17,714.50	269	\$0.00	0.00%
Residential Lighting	31,473.10	\$2,573.16	100	571,692.40	\$43,375.41	1,776	\$0.00	0.00%
Residential HEAT Loan	0.00	\$35,273.33	28	0.00	\$129,988.78	95	\$0.00	0.00%
<b>Res Subtotal</b>	<b>113,653.71</b>	<b>\$146,621.82</b>	<b>274.00</b>	<b>1,455,402.87</b>	<b>\$1,388,342.75</b>	<b>3,296</b>	<b>\$906,439.16</b>	
<b>Res % of Total</b>	<b>54.50%</b>	<b>73.73%</b>	<b>91.64%</b>	<b>70.56%</b>	<b>77.10%</b>	<b>95.95%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	7,965.40	\$11,679.37	11	89,968.20	\$106,590.00	62	\$159,162.85	66.97%
Low-Income Multi-Family Retrofit	1,062.70	\$403.72	1	2,375.50	\$761.74	2	\$0.00	0.00%
<b>LI Subtotal</b>	<b>9,028.10</b>	<b>\$12,083.09</b>	<b>12.00</b>	<b>92,343.70</b>	<b>\$107,351.74</b>	<b>64</b>	<b>\$159,162.85</b>	
<b>LI % of Total</b>	<b>4.33%</b>	<b>6.08%</b>	<b>4.01%</b>	<b>4.48%</b>	<b>5.96%</b>	<b>1.86%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	58,656.00	\$25,603.00	1	58,656.00	\$32,222.75	1	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$1,016.50	1	0.00	\$7,887.50	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	3,609.35	\$1,540.01	1	24,693.85	\$6,726.17	4	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	85,314.00	\$17,062.80	1	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$275.00	1	23,284.20	\$16,503.79	4	\$109,291.16	15.10%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	29,376.48	\$26,365.64	5	\$0.00	0.00%
C&I Small Business	19,726.88	\$11,090.60	6	222,036.56	\$182,370.04	35	\$309,203.28	58.98%
C&I Multifamily Retrofit	0.00	\$0.00	0	17,444.00	\$9,056.11	1	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	3,880.95	\$630.00	3	53,962.03	\$6,727.28	23	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>85,873.18</b>	<b>\$40,155.11</b>	<b>13.00</b>	<b>514,767.12</b>	<b>\$304,922.08</b>	<b>75</b>	<b>\$418,494.44</b>	
<b>C&amp;I % of Total</b>	<b>41.18%</b>	<b>20.19%</b>	<b>4.35%</b>	<b>24.96%</b>	<b>16.93%</b>	<b>2.18%</b>	<b>28.20%</b>	
<b>Total</b>	<b>208,554.99</b>	<b>\$198,860.02</b>	<b>299</b>	<b>2,062,513.69</b>	<b>\$1,800,616.57</b>	<b>3,435</b>	<b>\$1,484,096.45</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: Martha's Vineyard  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 14 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	170,648.21	\$227,381.26	33	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	62,577.10	\$115,413.44	108	698,709.00	\$1,073,942.85	630	\$1,080,661.06	99.38%
Residential Home Energy Services - RCS	0.00	\$14,035.00	62	0.00	\$142,605.00	504	\$138,817.80	102.73%
Residential Behavior/Feedback Program	4,692.10	\$739.50	1	4,692.10	\$739.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	18,629.10	\$10,537.00	27	110,079.90	\$59,756.50	116	\$0.00	0.00%
Residential Consumer Products	4,429.10	\$970.97	11	122,658.10	\$42,737.09	159	\$0.00	0.00%
Residential Lighting	182,199.40	\$22,173.90	1,905	1,203,472.00	\$113,348.48	5,947	\$0.00	0.00%
Residential HEAT Loan	0.00	\$9,534.53	10	0.00	\$69,672.82	43	\$0.00	0.00%
<b>Res Subtotal</b>	<b>272,526.80</b>	<b>\$173,404.34</b>	<b>2,124.00</b>	<b>2,310,259.31</b>	<b>\$1,730,183.50</b>	<b>7,433</b>	<b>\$1,219,478.87</b>	
<b>Res % of Total</b>	<b>64.47%</b>	<b>80.95%</b>	<b>98.97%</b>	<b>72.93%</b>	<b>83.65%</b>	<b>97.35%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	5,194.50	\$10,557.76	5	58,814.66	\$65,999.99	44	\$214,129.91	30.82%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	1,832.70	\$3,836.32	3	\$0.00	0.00%
<b>LI Subtotal</b>	<b>5,194.50</b>	<b>\$10,557.76</b>	<b>5.00</b>	<b>60,647.36</b>	<b>\$69,836.31</b>	<b>47</b>	<b>\$214,129.91</b>	
<b>LI % of Total</b>	<b>1.23%</b>	<b>4.93%</b>	<b>0.23%</b>	<b>1.91%</b>	<b>3.38%</b>	<b>0.62%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	96,371.00	\$22,480.25	2	96,371.00	\$37,792.25	2	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$5,735.50	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	18,007.08	\$7,155.00	1	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	63,327.87	\$17,203.01	17	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	9,292.08	\$1,875.00	3	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	9,149.44	\$2,869.25	2	185,499.99	\$35,179.01	7	\$147,034.97	23.93%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	40,176.71	\$35,235.12	9	\$0.00	0.00%
C&I Small Business	0.00	\$275.00	1	166,144.05	\$102,932.69	50	\$415,986.96	24.74%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	39,497.30	\$4,629.00	12	218,234.43	\$25,203.86	65	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>145,017.74</b>	<b>\$30,253.50</b>	<b>17.00</b>	<b>797,053.21</b>	<b>\$268,311.44</b>	<b>155</b>	<b>\$563,021.93</b>	
<b>C&amp;I % of Total</b>	<b>34.30%</b>	<b>14.12%</b>	<b>0.79%</b>	<b>25.16%</b>	<b>12.97%</b>	<b>2.03%</b>	<b>28.20%</b>	
<b>Total</b>	<b>422,739.04</b>	<b>\$214,215.60</b>	<b>2,146</b>	<b>3,167,959.88</b>	<b>\$2,068,331.25</b>	<b>7,635</b>	<b>\$1,996,630.71</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: MASHPEE  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 15 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	9,927.85	\$2,269.49	4	217,127.12	\$59,559.65	53	\$0.00	0.00%
Residential Multi-Family Retrofit	36,257.70	\$32,082.86	17	123,227.90	\$61,227.40	81	\$0.00	0.00%
Residential Home Energy Services - Measures	53,389.10	\$47,956.53	70	587,792.20	\$481,996.05	506	\$919,095.37	52.44%
Residential Home Energy Services - RCS	0.00	\$6,380.00	29	0.00	\$71,891.49	262	\$118,063.66	60.89%
Residential Behavior/Feedback Program	144.90	\$25.50	1	144.90	\$25.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	18,693.20	\$21,996.00	40	93,596.70	\$88,233.50	181	\$0.00	0.00%
Residential Consumer Products	5,662.00	\$1,145.00	15	104,997.80	\$25,092.00	229	\$0.00	0.00%
Residential Lighting	70,661.40	\$5,789.45	229	383,375.40	\$32,731.50	1,299	\$0.00	0.00%
Residential HEAT Loan	0.00	\$31,665.25	32	0.00	\$127,627.62	101	\$0.00	0.00%
<b>Res Subtotal</b>	<b>194,736.15</b>	<b>\$149,310.08</b>	<b>437.00</b>	<b>1,510,262.02</b>	<b>\$948,384.71</b>	<b>2,713</b>	<b>\$1,037,159.04</b>	
<b>Res % of Total</b>	<b>64.07%</b>	<b>57.57%</b>	<b>94.38%</b>	<b>72.34%</b>	<b>72.73%</b>	<b>95.03%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	12,780.90	\$16,675.39	13	84,829.28	\$80,509.16	51	\$182,116.13	44.21%
Low-Income Multi-Family Retrofit	710.70	\$325.72	1	17,006.70	\$11,457.70	13	\$0.00	0.00%
<b>LI Subtotal</b>	<b>13,491.60</b>	<b>\$17,001.11</b>	<b>14.00</b>	<b>101,835.98</b>	<b>\$91,966.86</b>	<b>64</b>	<b>\$182,116.13</b>	
<b>LI % of Total</b>	<b>4.44%</b>	<b>6.56%</b>	<b>3.02%</b>	<b>4.88%</b>	<b>7.05%</b>	<b>2.24%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	1,977.24	\$825.00	2	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	30,822.00	\$10,010.23	1	45,774.08	\$18,771.52	6	\$125,052.31	15.01%
C&I Existing Building Retrofit - Municipal	21,526.92	\$68,964.16	2	66,225.23	\$113,271.54	6	\$0.00	0.00%
C&I Small Business	27,267.02	\$9,687.38	5	221,611.84	\$110,711.97	34	\$353,794.27	31.29%
C&I Multifamily Retrofit	0.00	\$350.00	1	847.00	\$453.37	2	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	16,098.54	\$4,015.00	3	139,164.54	\$19,585.40	28	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>95,714.48</b>	<b>\$93,026.77</b>	<b>12.00</b>	<b>475,599.93</b>	<b>\$263,618.80</b>	<b>78</b>	<b>\$478,846.58</b>	
<b>C&amp;I % of Total</b>	<b>31.49%</b>	<b>35.87%</b>	<b>2.59%</b>	<b>22.78%</b>	<b>20.22%</b>	<b>2.73%</b>	<b>28.20%</b>	
<b>Total</b>	<b>303,942.23</b>	<b>\$259,337.96</b>	<b>463</b>	<b>2,087,697.93</b>	<b>\$1,303,970.37</b>	<b>2,855</b>	<b>\$1,698,121.75</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: OAK BLUFFS  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 16 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	22,005.12	\$12,315.12	2	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	9,983.30	\$23,507.20	23	150,392.00	\$228,983.18	146	\$297,219.90	77.04%
Residential Home Energy Services - RCS	0.00	\$3,650.00	15	0.00	\$34,330.00	122	\$38,179.79	89.92%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	1,420.00	\$912.00	3	25,131.00	\$12,801.00	23	\$0.00	0.00%
Residential Consumer Products	772.00	\$82.50	2	11,885.00	\$2,550.00	28	\$0.00	0.00%
Residential Lighting	4,171.20	\$207.40	11	83,742.80	\$6,910.60	248	\$0.00	0.00%
Residential HEAT Loan	0.00	\$0.00	0	0.00	\$23,765.66	14	\$0.00	0.00%
<b>Res Subtotal</b>	<b>16,346.50</b>	<b>\$28,359.10</b>	<b>54.00</b>	<b>293,155.92</b>	<b>\$321,655.56</b>	<b>583</b>	<b>\$335,399.69</b>	
<b>Res % of Total</b>	<b>81.25%</b>	<b>95.29%</b>	<b>94.74%</b>	<b>72.92%</b>	<b>83.88%</b>	<b>93.58%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	875.00	\$1,116.00	1	12,231.40	\$13,225.76	10	\$58,893.28	22.46%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>875.00</b>	<b>\$1,116.00</b>	<b>1.00</b>	<b>12,231.40</b>	<b>\$13,225.76</b>	<b>10</b>	<b>\$58,893.28</b>	
<b>LI % of Total</b>	<b>4.35%</b>	<b>3.75%</b>	<b>1.75%</b>	<b>3.04%</b>	<b>3.45%</b>	<b>1.61%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	18,007.08	\$7,155.00	1	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	10,347.90	\$4,171.00	7	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	20,774.87	\$13,977.85	2	\$40,439.80	34.56%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	23,145.80	\$12,121.74	1	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	10,794.00	\$9,134.08	5	\$114,411.08	7.98%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	2,897.16	\$285.00	2	13,589.10	\$2,026.56	14	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>2,897.16</b>	<b>\$285.00</b>	<b>2.00</b>	<b>96,658.75</b>	<b>\$48,586.23</b>	<b>30</b>	<b>\$154,850.88</b>	
<b>C&amp;I % of Total</b>	<b>14.40%</b>	<b>0.96%</b>	<b>3.51%</b>	<b>24.04%</b>	<b>12.67%</b>	<b>4.82%</b>	<b>28.20%</b>	
<b>Total</b>	<b>20,118.66</b>	<b>\$29,760.10</b>	<b>57</b>	<b>402,046.07</b>	<b>\$383,467.55</b>	<b>623</b>	<b>\$549,143.85</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: ORLEANS  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 17 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	17,324.06	\$7,174.05	1	34,251.68	\$15,885.27	5	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	25,285.70	\$20,122.98	9	\$0.00	0.00%
Residential Home Energy Services - Measures	29,809.80	\$90,724.77	65	440,069.90	\$765,936.77	380	\$385,623.76	198.62%
Residential Home Energy Services - RCS	0.00	\$7,860.00	41	0.00	\$78,838.83	279	\$49,535.83	159.16%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	8,854.00	\$5,077.50	10	66,572.20	\$42,525.50	96	\$0.00	0.00%
Residential Consumer Products	10,816.00	\$5,595.00	3	78,389.00	\$23,878.09	143	\$0.00	0.00%
Residential Lighting	40,515.10	\$4,204.40	183	641,382.50	\$64,307.58	2,582	\$0.00	0.00%
Residential HEAT Loan	0.00	\$6,071.53	7	0.00	\$28,096.17	23	\$0.00	0.00%
<b>Res Subtotal</b>	<b>107,318.96</b>	<b>\$126,707.25</b>	<b>310.00</b>	<b>1,285,950.98</b>	<b>\$1,039,591.19</b>	<b>3,517</b>	<b>\$435,159.60</b>	
<b>Res % of Total</b>	<b>38.30%</b>	<b>59.90%</b>	<b>95.38%</b>	<b>52.84%</b>	<b>64.70%</b>	<b>97.24%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	2,414.50	\$4,434.89	2	16,836.00	\$25,669.53	13	\$76,410.25	33.59%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	1,604.90	\$1,305.32	3	\$0.00	0.00%
<b>LI Subtotal</b>	<b>2,414.50</b>	<b>\$4,434.89</b>	<b>2.00</b>	<b>18,440.90</b>	<b>\$26,974.85</b>	<b>16</b>	<b>\$76,410.25</b>	
<b>LI % of Total</b>	<b>0.86%</b>	<b>2.10%</b>	<b>0.62%</b>	<b>0.76%</b>	<b>1.68%</b>	<b>0.44%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$3,921.00	1	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	145,802.00	\$34,511.60	3	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	18,728.00	\$11,158.00	2	18,728.00	\$11,158.00	2	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	761.51	\$150.00	1	14,975.18	\$4,308.33	5	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	90,797.00	\$18,250.00	1	256,405.00	\$53,027.68	2	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	20,365.19	\$10,154.50	1	138,456.92	\$76,811.23	4	\$52,468.05	146.40%
C&I Existing Building Retrofit - Municipal	14,833.00	\$20,079.00	1	305,043.59	\$209,289.31	17	\$0.00	0.00%
C&I Small Business	19,098.04	\$19,327.80	3	207,857.18	\$140,788.04	29	\$148,441.05	94.84%
C&I Multifamily Retrofit	0.00	\$0.00	0	4,310.00	\$677.43	2	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	5,862.94	\$1,256.00	4	37,686.31	\$5,836.35	19	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>170,445.69</b>	<b>\$80,375.30</b>	<b>13.00</b>	<b>1,129,264.19</b>	<b>\$540,328.97</b>	<b>84</b>	<b>\$200,909.10</b>	
<b>C&amp;I % of Total</b>	<b>60.83%</b>	<b>38.00%</b>	<b>4.00%</b>	<b>46.40%</b>	<b>33.63%</b>	<b>2.32%</b>	<b>28.20%</b>	
<b>Total</b>	<b>280,179.14</b>	<b>\$211,517.44</b>	<b>325</b>	<b>2,433,656.07</b>	<b>\$1,606,895.01</b>	<b>3,617</b>	<b>\$712,478.94</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: PROVNTOWN  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 18 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	11,369.74	\$14,322.41	8	42,920.83	\$36,563.70	20	\$0.00	0.00%
Residential Multi-Family Retrofit	168.00	\$1,899.50	3	2,500.10	\$6,535.59	17	\$0.00	0.00%
Residential Home Energy Services - Measures	6,062.00	\$23,865.44	23	106,072.10	\$213,519.03	205	\$193,573.98	110.30%
Residential Home Energy Services - RCS	0.00	\$2,080.00	11	0.00	\$36,328.83	130	\$24,865.81	146.10%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	8,179.00	\$5,250.00	10	37,753.40	\$23,162.00	62	\$0.00	0.00%
Residential Consumer Products	2,602.00	\$1,165.00	3	17,058.00	\$4,952.50	36	\$0.00	0.00%
Residential Lighting	72,442.60	\$7,492.40	374	289,596.10	\$23,879.79	1,089	\$0.00	0.00%
Residential HEAT Loan	0.00	\$2,878.77	4	0.00	\$10,476.05	12	\$0.00	0.00%
<b>Res Subtotal</b>	<b>100,823.34</b>	<b>\$58,953.52</b>	<b>436.00</b>	<b>495,900.53</b>	<b>\$355,417.49</b>	<b>1,571</b>	<b>\$218,439.80</b>	
<b>Res % of Total</b>	<b>54.18%</b>	<b>41.22%</b>	<b>83.69%</b>	<b>55.89%</b>	<b>62.74%</b>	<b>92.09%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	0.00	\$0.00	0	6,924.70	\$13,101.73	6	\$38,356.13	34.16%
Low-Income Multi-Family Retrofit	12,260.60	\$8,080.15	75	18,035.40	\$13,571.93	80	\$0.00	0.00%
<b>LI Subtotal</b>	<b>12,260.60</b>	<b>\$8,080.15</b>	<b>75.00</b>	<b>24,960.10</b>	<b>\$26,673.66</b>	<b>86</b>	<b>\$38,356.13</b>	
<b>LI % of Total</b>	<b>6.59%</b>	<b>5.65%</b>	<b>14.40%</b>	<b>2.81%</b>	<b>4.71%</b>	<b>5.04%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	2,664.72	\$549.99	2	5,993.36	\$1,816.66	3	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	119,570.52	\$19,922.93	2	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	31,732.58	\$18,379.36	1	103,166.14	\$54,817.98	6	\$26,337.72	208.13%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Small Business	37,708.32	\$43,184.56	2	73,187.30	\$72,898.23	14	\$74,513.88	97.83%
C&I Multifamily Retrofit	0.00	\$13,795.61	3	2,407.00	\$27,511.54	7	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	888.89	\$87.00	2	62,066.03	\$7,405.00	17	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>72,994.51</b>	<b>\$75,996.52</b>	<b>10.00</b>	<b>366,390.34</b>	<b>\$184,372.34</b>	<b>49</b>	<b>\$100,851.60</b>	
<b>C&amp;I % of Total</b>	<b>39.23%</b>	<b>53.13%</b>	<b>1.92%</b>	<b>41.30%</b>	<b>32.55%</b>	<b>2.87%</b>	<b>28.20%</b>	
<b>Total</b>	<b>186,078.45</b>	<b>\$143,030.19</b>	<b>521</b>	<b>887,250.97</b>	<b>\$566,463.49</b>	<b>1,706</b>	<b>\$357,647.53</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: SANDWICH  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 19 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	7,112.47	\$2,810.27	3	22,216.59	\$9,526.56	8	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	2,314.20	\$1,195.64	5	\$0.00	0.00%
Residential Home Energy Services - Measures	68,590.30	\$99,918.62	132	704,436.30	\$1,043,502.77	764	\$1,356,542.09	76.92%
Residential Home Energy Services - RCS	0.00	\$11,305.00	60	0.00	\$135,450.00	499	\$174,256.48	77.73%
Residential Behavior/Feedback Program	24,112.90	\$4,105.50	1	24,112.90	\$4,105.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	20,752.80	\$12,327.50	28	128,333.60	\$90,962.00	188	\$0.00	0.00%
Residential Consumer Products	4,520.20	\$684.44	16	116,142.70	\$23,825.29	296	\$0.00	0.00%
Residential Lighting	50,707.70	\$4,713.10	206	1,056,204.10	\$90,091.13	4,042	\$0.00	0.00%
Residential HEAT Loan	0.00	\$63,516.91	38	0.00	\$189,129.90	150	\$0.00	0.00%
<b>Res Subtotal</b>	<b>175,796.37</b>	<b>\$199,381.34</b>	<b>484.00</b>	<b>2,053,760.39</b>	<b>\$1,587,788.79</b>	<b>5,953</b>	<b>\$1,530,798.58</b>	
<b>Res % of Total</b>	<b>57.86%</b>	<b>81.06%</b>	<b>93.80%</b>	<b>73.78%</b>	<b>77.58%</b>	<b>97.77%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	11,431.70	\$12,508.14	13	75,818.32	\$99,155.02	55	\$268,794.95	36.89%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>11,431.70</b>	<b>\$12,508.14</b>	<b>13.00</b>	<b>75,818.32</b>	<b>\$99,155.02</b>	<b>55</b>	<b>\$268,794.95</b>	
<b>LI % of Total</b>	<b>3.76%</b>	<b>5.09%</b>	<b>2.52%</b>	<b>2.72%</b>	<b>4.84%</b>	<b>0.90%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$4,955.00	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	1,791.00	\$407.00	1	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	14,499.28	\$3,995.83	2	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	61,285.51	\$26,623.62	4	91,179.51	\$42,024.27	9	\$184,571.40	22.77%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	164,481.14	\$171,302.81	4	\$0.00	0.00%
C&I Small Business	22,180.42	\$4,384.68	7	197,336.79	\$113,504.44	36	\$522,183.92	21.74%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	33,123.99	\$3,061.00	8	184,777.66	\$23,575.04	28	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>116,589.91</b>	<b>\$34,069.30</b>	<b>19.00</b>	<b>654,065.38</b>	<b>\$359,764.39</b>	<b>81</b>	<b>\$706,755.32</b>	
<b>C&amp;I % of Total</b>	<b>38.37%</b>	<b>13.85%</b>	<b>3.68%</b>	<b>23.50%</b>	<b>17.58%</b>	<b>1.33%</b>	<b>28.20%</b>	
<b>Total</b>	<b>303,817.98</b>	<b>\$245,958.78</b>	<b>516</b>	<b>2,783,644.09</b>	<b>\$2,046,708.20</b>	<b>6,089</b>	<b>\$2,506,348.85</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: TISBURY  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 20 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	25,983.33	\$17,008.86	9	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	10,344.60	\$19,717.34	17	137,153.00	\$270,248.29	140	\$259,114.78	104.30%
Residential Home Energy Services - RCS	0.00	\$2,505.00	13	0.00	\$33,510.00	118	\$33,284.95	100.68%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	3,808.30	\$1,869.50	6	19,412.30	\$9,126.50	19	\$0.00	0.00%
Residential Consumer Products	1,925.00	\$150.00	3	17,648.00	\$3,378.62	36	\$0.00	0.00%
Residential Lighting	177,822.50	\$22,009.10	1,903	1,273,065.10	\$118,796.78	6,195	\$0.00	0.00%
Residential HEAT Loan	0.00	\$0.00	0	0.00	\$14,333.05	7	\$0.00	0.00%
<b>Res Subtotal</b>	<b>193,900.40</b>	<b>\$46,250.94</b>	<b>1,942.00</b>	<b>1,473,261.73</b>	<b>\$466,402.10</b>	<b>6,524</b>	<b>\$292,399.73</b>	
<b>Res % of Total</b>	<b>94.34%</b>	<b>87.09%</b>	<b>99.69%</b>	<b>87.79%</b>	<b>81.43%</b>	<b>98.98%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	2,398.00	\$5,665.76	1	14,889.80	\$18,978.14	11	\$51,342.86	36.96%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	1,832.70	\$3,836.32	3	\$0.00	0.00%
<b>LI Subtotal</b>	<b>2,398.00</b>	<b>\$5,665.76</b>	<b>1.00</b>	<b>16,722.50</b>	<b>\$22,814.46</b>	<b>14</b>	<b>\$51,342.86</b>	
<b>LI % of Total</b>	<b>1.17%</b>	<b>10.67%</b>	<b>0.05%</b>	<b>1.00%</b>	<b>3.98%</b>	<b>0.21%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$5,735.50	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	6,811.50	\$1,541.67	3	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	9,292.08	\$1,875.00	1	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	53,859.94	\$6,039.20	2	\$35,255.21	17.13%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	14,556.12	\$17,887.90	3	\$0.00	0.00%
C&I Small Business	0.00	\$275.00	1	74,921.36	\$47,882.42	23	\$99,743.00	48.01%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	9,243.86	\$917.00	4	28,702.50	\$2,558.00	20	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>9,243.86</b>	<b>\$1,192.00</b>	<b>5.00</b>	<b>188,143.50</b>	<b>\$83,519.69</b>	<b>53</b>	<b>\$134,998.21</b>	
<b>C&amp;I % of Total</b>	<b>4.50%</b>	<b>2.24%</b>	<b>0.26%</b>	<b>11.21%</b>	<b>14.58%</b>	<b>0.80%</b>	<b>28.20%</b>	
<b>Total</b>	<b>205,542.26</b>	<b>\$53,108.70</b>	<b>1,948</b>	<b>1,678,127.73</b>	<b>\$572,736.25</b>	<b>6,591</b>	<b>\$478,740.79</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## Energy Efficiency Program Activity by Town

Town Name: TRURO  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 21 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	171.65	\$1,906.39	1	37,723.79	\$30,896.31	14	\$0.00	0.00%
Residential Multi-Family Retrofit	900.00	\$1,439.87	2	6,735.80	\$10,651.35	9	\$0.00	0.00%
Residential Home Energy Services - Measures	18,802.90	\$25,636.88	26	208,834.00	\$325,431.24	175	\$131,081.60	248.27%
Residential Home Energy Services - RCS	0.00	\$4,365.00	20	0.00	\$43,425.00	152	\$16,838.27	257.89%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	6,250.00	\$3,071.50	7	54,442.90	\$26,878.50	53	\$0.00	0.00%
Residential Consumer Products	1,222.00	\$602.50	2	17,401.20	\$3,639.44	41	\$0.00	0.00%
Residential Lighting	0.00	\$0.00	0	10,443.00	\$776.29	0	\$0.00	0.00%
Residential HEAT Loan	0.00	\$35.00	1	0.00	\$3,048.13	6	\$0.00	0.00%
<b>Res Subtotal</b>	<b>27,346.55</b>	<b>\$37,057.14</b>	<b>59.00</b>	<b>335,580.69</b>	<b>\$444,746.26</b>	<b>450</b>	<b>\$147,919.86</b>	
<b>Res % of Total</b>	<b>97.68%</b>	<b>95.58%</b>	<b>98.33%</b>	<b>88.03%</b>	<b>95.05%</b>	<b>95.54%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	0.00	\$0.00	0	9,164.20	\$7,702.40	5	\$25,973.44	29.65%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>0.00</b>	<b>\$0.00</b>	<b>0.00</b>	<b>9,164.20</b>	<b>\$7,702.40</b>	<b>5</b>	<b>\$25,973.44</b>	
<b>LI % of Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>2.40%</b>	<b>1.65%</b>	<b>1.06%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	13,100.00	\$3,550.00	1	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	0.00	\$0.00	0	\$17,834.99	0.00%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	5,067.40	\$6,826.48	7	\$50,458.22	13.53%
C&I Multifamily Retrofit	649.00	\$1,711.80	1	649.00	\$1,711.80	1	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	0.00	\$0.00	0	17,628.92	\$3,381.42	7	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>649.00</b>	<b>\$1,711.80</b>	<b>1.00</b>	<b>36,445.32</b>	<b>\$15,469.70</b>	<b>16</b>	<b>\$68,293.21</b>	
<b>C&amp;I % of Total</b>	<b>2.32%</b>	<b>4.42%</b>	<b>1.67%</b>	<b>9.56%</b>	<b>3.31%</b>	<b>3.40%</b>	<b>28.20%</b>	
<b>Total</b>	<b>27,995.55</b>	<b>\$38,768.94</b>	<b>60</b>	<b>381,190.21</b>	<b>\$467,918.36</b>	<b>471</b>	<b>\$242,186.52</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: WELLFLEET  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 22 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	11,572.43	\$7,910.22	2	37,943.51	\$23,950.52	8	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	1,623.70	\$3,255.73	5	\$0.00	0.00%
Residential Home Energy Services - Measures	25,448.80	\$32,864.16	41	262,043.70	\$364,185.46	284	\$179,856.14	202.49%
Residential Home Energy Services - RCS	0.00	\$5,355.00	26	0.00	\$66,175.00	237	\$23,103.67	286.43%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	17,240.00	\$8,909.00	13	85,167.30	\$46,505.50	89	\$0.00	0.00%
Residential Consumer Products	1,758.00	\$600.00	2	27,759.00	\$5,157.50	68	\$0.00	0.00%
Residential Lighting	0.00	\$0.00	0	45,492.60	\$4,503.60	254	\$0.00	0.00%
Residential HEAT Loan	0.00	\$14,718.09	6	0.00	\$40,733.43	18	\$0.00	0.00%
<b>Res Subtotal</b>	<b>56,019.23</b>	<b>\$70,356.47</b>	<b>90.00</b>	<b>460,029.81</b>	<b>\$554,466.74</b>	<b>963</b>	<b>\$202,959.81</b>	
<b>Res % of Total</b>	<b>81.97%</b>	<b>94.87%</b>	<b>90.91%</b>	<b>61.28%</b>	<b>76.75%</b>	<b>95.44%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	2,367.50	\$2,006.24	5	29,899.30	\$31,338.52	23	\$35,637.98	87.94%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>2,367.50</b>	<b>\$2,006.24</b>	<b>5.00</b>	<b>29,899.30</b>	<b>\$31,338.52</b>	<b>23</b>	<b>\$35,637.98</b>	
<b>LI % of Total</b>	<b>3.46%</b>	<b>2.71%</b>	<b>5.05%</b>	<b>3.98%</b>	<b>4.34%</b>	<b>2.28%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	107,024.00	\$24,195.76	1	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	7,900.00	\$5,230.02	1	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	1,661.00	\$550.00	1	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	1,668.00	\$800.00	1	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$2,766.00	1	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	0.00	\$0.00	0	\$24,471.26	0.00%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	67,532.04	\$64,581.95	1	\$0.00	0.00%
C&I Small Business	1,072.40	\$877.30	2	55,181.06	\$35,946.28	12	\$69,233.37	51.92%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$305.00	1	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	8,884.08	\$924.00	2	19,851.33	\$2,228.00	4	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>9,956.48</b>	<b>\$1,801.30</b>	<b>4.00</b>	<b>260,817.43</b>	<b>\$136,603.01</b>	<b>23</b>	<b>\$93,704.64</b>	
<b>C&amp;I % of Total</b>	<b>14.57%</b>	<b>2.43%</b>	<b>4.04%</b>	<b>34.74%</b>	<b>18.91%</b>	<b>2.28%</b>	<b>28.20%</b>	
<b>Total</b>	<b>68,343.21</b>	<b>\$74,164.01</b>	<b>99</b>	<b>750,746.54</b>	<b>\$722,408.27</b>	<b>1,009</b>	<b>\$332,302.43</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: WEST TISBURY  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 23 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	0.00	\$0.00	0	67,373.75	\$169,303.81	16	\$0.00	0.00%
Residential Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Home Energy Services - Measures	13,251.50	\$20,651.65	18	106,239.40	\$185,086.46	104	\$179,856.14	102.91%
Residential Home Energy Services - RCS	0.00	\$2,290.00	10	0.00	\$24,700.00	85	\$23,103.67	106.91%
Residential Behavior/Feedback Program	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential Heating & Cooling Equipment	2,610.80	\$1,439.00	4	8,047.80	\$4,763.50	13	\$0.00	0.00%
Residential Consumer Products	160.00	\$52.50	1	18,167.00	\$5,727.50	26	\$0.00	0.00%
Residential Lighting	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
Residential HEAT Loan	0.00	\$3,222.09	5	0.00	\$11,486.76	10	\$0.00	0.00%
<b>Res Subtotal</b>	<b>16,022.30</b>	<b>\$27,655.24</b>	<b>38.00</b>	<b>199,827.95</b>	<b>\$401,068.03</b>	<b>254</b>	<b>\$202,959.81</b>	
<b>Res % of Total</b>	<b>13.34%</b>	<b>50.87%</b>	<b>88.37%</b>	<b>49.92%</b>	<b>85.10%</b>	<b>90.39%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	1,921.50	\$3,776.00	3	17,573.70	\$17,539.83	12	\$35,637.98	49.22%
Low-Income Multi-Family Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
<b>LI Subtotal</b>	<b>1,921.50</b>	<b>\$3,776.00</b>	<b>3.00</b>	<b>17,573.70</b>	<b>\$17,539.83</b>	<b>12</b>	<b>\$35,637.98</b>	
<b>LI % of Total</b>	<b>1.60%</b>	<b>6.95%</b>	<b>6.98%</b>	<b>4.39%</b>	<b>3.72%</b>	<b>4.27%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	96,371.00	\$22,335.25	1	96,371.00	\$24,122.50	1	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	41,710.25	\$9,198.67	2	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	\$0.00	0	0.00	\$0.00	0	\$24,471.26	0.00%
C&I Existing Building Retrofit - Municipal	0.00	\$0.00	0	2,474.78	\$4,750.48	4	\$0.00	0.00%
C&I Small Business	0.00	\$0.00	0	31,802.45	\$13,587.35	6	\$69,233.37	19.63%
C&I Multifamily Retrofit	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	5,804.00	\$600.00	1	10,532.00	\$1,020.00	2	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>102,175.00</b>	<b>\$22,935.25</b>	<b>2.00</b>	<b>182,890.48</b>	<b>\$52,679.00</b>	<b>15</b>	<b>\$93,704.64</b>	
<b>C&amp;I % of Total</b>	<b>85.06%</b>	<b>42.19%</b>	<b>4.65%</b>	<b>45.69%</b>	<b>11.18%</b>	<b>5.34%</b>	<b>28.20%</b>	
<b>Total</b>	<b>120,118.80</b>	<b>\$54,366.49</b>	<b>43</b>	<b>400,292.13</b>	<b>\$471,286.86</b>	<b>281</b>	<b>\$332,302.43</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

\*\*All information presented is preliminary and subject to change.

## Energy Efficiency Program Activity by Town

Town Name: YARMOUTH  
 Program Period: 2018  
 Current Dates: 12/1/2018 - 12/31/2018  
 Cumulative Dates: 1/1/2018 - 12/31/2018

Cape Light Compact JPE  
 D.P.U. 19-96  
 2016-2018 Energy Efficiency Term Report  
 August 1, 2019  
 Appendix CLC-1, Page 24 of 24

Program Initiative	Current Period			Cumulative Period				
	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	27.45	\$13.91	1	33,957.51	\$13,880.71	11	\$0.00	0.00%
Residential Multi-Family Retrofit	1,303.10	\$673.40	2	78,026.10	\$66,682.28	94	\$0.00	0.00%
Residential Home Energy Services - Measures	86,471.80	\$230,714.19	144	859,196.00	\$1,560,072.41	1,004	\$1,560,785.51	99.95%
Residential Home Energy Services - RCS	0.00	\$16,018.83	85	0.00	\$167,307.77	594	\$200,492.85	83.45%
Residential Behavior/Feedback Program	144.90	\$25.50	1	144.90	\$25.50	1	\$0.00	0.00%
Residential Heating & Cooling Equipment	23,095.60	\$23,222.00	44	130,803.60	\$110,626.50	243	\$0.00	0.00%
Residential Consumer Products	6,901.40	\$1,776.00	16	171,970.70	\$30,380.50	477	\$0.00	0.00%
Residential Lighting	681,712.70	\$71,461.05	5,055	4,479,360.00	\$392,271.94	22,155	\$0.00	0.00%
Residential HEAT Loan	0.00	\$59,687.54	49	0.00	\$219,843.14	194	\$0.00	0.00%
<b>Res Subtotal</b>	<b>799,656.95</b>	<b>\$403,592.42</b>	<b>5,397.00</b>	<b>5,753,458.81</b>	<b>\$2,561,090.75</b>	<b>24,773</b>	<b>\$1,761,278.36</b>	
<b>Res % of Total</b>	<b>83.17%</b>	<b>83.74%</b>	<b>99.26%</b>	<b>78.02%</b>	<b>74.94%</b>	<b>98.17%</b>	<b>61.08%</b>	
Low-Income Single Family Retrofit	18,110.70	\$20,721.44	23	147,888.12	\$151,513.30	133	\$309,265.20	48.99%
Low-Income Multi-Family Retrofit	1,243.20	\$2,496.10	2	44,388.60	\$20,814.10	120	\$0.00	0.00%
<b>LI Subtotal</b>	<b>19,353.90</b>	<b>\$23,217.54</b>	<b>25.00</b>	<b>192,276.72</b>	<b>\$172,327.40</b>	<b>253</b>	<b>\$309,265.20</b>	
<b>LI % of Total</b>	<b>2.01%</b>	<b>4.82%</b>	<b>0.46%</b>	<b>2.61%</b>	<b>5.04%</b>	<b>1.00%</b>	<b>10.72%</b>	
C&I New Buildings & Major Renovations	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	\$0.00	0	16,999.10	\$800.00	14	\$0.00	0.00%
C&I Upstream Food Services	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream HVAC	0.00	\$0.00	0	3,317.15	\$1,196.66	4	\$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	\$0.00	0	103,248.40	\$21,860.50	2	\$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	26,623.69	\$14,852.86	1	237,314.90	\$137,284.12	23	\$212,360.81	64.65%
C&I Existing Building Retrofit - Municipal	20,307.00	\$5,675.00	1	20,307.00	\$14,075.00	15	\$0.00	0.00%
C&I Small Business	52,311.53	\$31,563.77	8	501,776.76	\$360,763.05	86	\$600,804.86	60.05%
C&I Multifamily Retrofit	0.00	\$0.00	0	132,227.00	\$103,445.40	1	\$0.00	0.00%
C&I Multifamily - Municipal	0.00	\$0.00	0	0.00	\$0.00	0	\$0.00	0.00%
C&I Upstream Lighting	43,208.68	\$3,062.00	5	413,238.80	\$44,690.36	65	\$0.00	0.00%
<b>C&amp;I Subtotal</b>	<b>142,450.90</b>	<b>\$55,153.63</b>	<b>15.00</b>	<b>1,428,429.12</b>	<b>\$684,115.09</b>	<b>210</b>	<b>\$813,165.67</b>	
<b>C&amp;I % of Total</b>	<b>14.82%</b>	<b>11.44%</b>	<b>0.28%</b>	<b>19.37%</b>	<b>20.02%</b>	<b>0.83%</b>	<b>28.20%</b>	
<b>Total</b>	<b>961,461.75</b>	<b>\$481,963.59</b>	<b>5,437</b>	<b>7,374,164.64</b>	<b>\$3,417,533.24</b>	<b>25,236</b>	<b>\$2,883,709.24</b>	

\*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month

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## **APPENDIX CLC-2 CAPE LIGHT COMPACT ENERGY EDUCATION OUTREACH ACTIVITIES**

The Compact is committed to energy education outreach within its community and continues to be a regionally and nationally recognized leader in the design and implementation of its energy education programs. As a municipal aggregator with a unique service territory, the Compact supports the community's efforts to develop a deeper and broader knowledge of energy efficiency technology and practices, moving towards an energy-literate society.

Highlights from 2018 include:

- The Compact participated in energy education-based presentations and all-school Energy Carnivals, through which students learn the basic lessons of energy efficiency, energy forms, and energy sources in a first-hand, fun, and engaging way. Over 2,000 students and teachers were reached through these efforts in 2018.
- The Compact participated in Cape Cod and Martha's Vineyard-wide science education festivals, demonstrating the science of energy, building energy efficiency, and renewable energy resources.

2018 saw the continuation of the Compact's energy efficiency education program Be Energy Efficient Smart ("BEES"), which includes both a classroom lesson and take-home student kit and survey. Within this initiative, the Compact trained teachers and engaged the following schools:

- Eastham Elementary
- Monomoy Middle School
- Mattacheese Middle School
- Sandwich STEM Academy
- Mashpee High School
- Barnstable Middle School
- Edgartown School

Within BEES, a total of 1,100 students received kits to install energy saving measures in their homes. Of those students, 36 percent completed and returned their surveys, resulting in net annual savings of 26.9 MWh with a six-year measure life. Savings from the 2018 BEES initiative are summarized in the following table.

<b>Primary Fuel</b>	<b>Kits Installed</b>	<b>Net Annual MWh Saved</b>	<b>Net Annual MMBtu Saved</b>
Electricity	31	4.8	
Natural Gas	191	11.8	231.1
Oil	95	5.8	74.6
Propane	73	4.5	21.5
<b>Total</b>	<b>390</b>	<b>26.9</b>	<b>327.2</b>

The Compact’s greatest successes continue with the “kids as teachers” model, where students are trained, conduct studies, and present information on energy efficiency, renewable energy, and related topics to younger students and community members. With the addition of BEES, this effort has now successfully reached into the home. Schools have fully adopted energy education into their yearly schedule of classroom activities, as evidenced by their repeated requests for energy education programs from the Compact. As a result, the Compact and the schools it works with continue to reach teachers, students, and families every year.

The Compact continues to use updated and innovative energy education materials from local and national energy education-based resources. Using a model for science-based facts and local science, technology, engineering and math (“STEM”) initiatives, the Compact designs and uses curriculum materials that align with Massachusetts’ standards for science and technology, allowing teachers to introduce lesson plans discussing energy efficiency, innovation, and conservation.