



**2016-2018**

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**Massachusetts  
Joint Statewide Three-Year  
Electric and Gas Energy Efficiency Plan**

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**October 30, 2015**

<b>I. EXECUTIVE SUMMARY.....</b>	<b>8</b>
<b>A. Context for the Program Administrators’ Energy Efficiency Efforts Under the GCA.....</b>	<b>8</b>
<b>B. Moving Forward and Sustaining Excellence in 2016-2018 .....</b>	<b>13</b>
<b>C. Cost to Achieve .....</b>	<b>15</b>
<b>II. INTRODUCTION.....</b>	<b>17</b>
<b>A. Core Goals for 2016-2018 .....</b>	<b>19</b>
<b>B. Statutory Context .....</b>	<b>20</b>
1. Overview.....	20
2. The Green Communities Act.....	21
3. Department of Public Utilities .....	21
4. Energy Efficiency Advisory Council .....	23
<b>C. Reporting of Energy Efficiency Data .....</b>	<b>24</b>
<b>D. Overview of Green Communities Act Compliance .....</b>	<b>26</b>
1. The Sustained Acquisition of All Cost-Effective Resources.....	26
a. Reasonable Pace for Sustained Acquisition .....	26
b. Statewide Strategic Plan .....	27
2. Energy Efficiency Advisory Council .....	27
a. Introduction .....	27
b. Council Priorities.....	28
c. Council Workshops .....	28
d. Council Resolution of March 31, 2015.....	29
e. Council Resolution of July 21, 2015 .....	29
f. Term Sheet.....	30
g. Council Resolution of October 26, 2015 .....	30
3. Department of Public Utilities .....	30
a. Introduction .....	30
b. All Cost-Effective or Less Expensive than Supply.....	30
c. Program Cost-Effectiveness.....	31
d. Program Authorization and Delivery .....	31
e. Program Funding .....	31
i. Funding Sources .....	31
ii. Funding Allocation .....	32
iii. Funding Mechanism.....	32
<b>III. STATEWIDE PROGRAMS .....</b>	<b>33</b>
<b>A. Strategic Overview of Residential, Low-Income, and C&amp;I Programs .....</b>	<b>33</b>
<b>B. Sustainable Infrastructure.....</b>	<b>34</b>
<b>C. Mechanisms for Program Collaboration, Continuous Improvement, and Sharing and          Incorporation of Best Practices Information.....</b>	<b>34</b>
1. The Residential and C&I Management Committees .....	34
2. The Massachusetts Technology Assessment Committee.....	36
3. Ongoing Commitment to Innovation and Technology .....	36
<b>D. Engaging Third Party Stakeholders.....</b>	<b>37</b>
<b>E. Residential Programs .....</b>	<b>39</b>
1. Overview of Residential Programs – Whole House & Products .....	39

2.	Residential Highlights .....	40
3.	New and Innovative in 2016-2018.....	43
4.	Contractor Engagement .....	46
5.	Residential Program and Core Initiative Descriptions .....	47
a.	Residential Whole House: Residential New Construction .....	47
b.	Residential Whole House: Residential Multi-Family Retrofit.....	53
c.	Residential Whole House: Home Energy Services- Measures; Home Energy Services- RCS.....	61
d.	Residential Whole House: Behavioral/Feedback Initiatives .....	74
e.	Residential Products: Heating and Cooling (electric).....	76
f.	Residential Products: Heating and Cooling (gas) .....	81
g.	Residential Products: Residential Consumer Products .....	87
h.	Residential Products: Residential Lighting (electric).....	91
<b>F.</b>	<b>Low-Income Programs.....</b>	<b>97</b>
1.	Low-Income Program Descriptions .....	97
a.	Low-Income: Single Family .....	97
b.	Low-Income: Multi-Family .....	102
<b>G.</b>	<b>Commercial &amp; Industrial Programs .....</b>	<b>110</b>
1.	Overview of C&I Programs – New Construction & Retrofit.....	110
2.	Sharing Innovations in Program Design, Marketing, and Delivery .....	110
3.	Accomplishments During 2013-2015 Plan Term .....	113
4.	Highlights of 2016-2018 Enhancements.....	116
5.	Mechanisms for Program Collaboration, Continuous Improvement, Incorporating Emerging Technologies, and Sharing and Incorporating Best Practices Information .....	117
a.	Introduction .....	117
b.	In-house R&D.....	118
c.	Partnerships with MOU customers.....	119
d.	Cooperative relationships with similar technical bodies at other program administrators or regional efforts.....	120
e.	Supplier and manufacturer product submissions.....	120
6.	The Massachusetts Technology Assessment Committee.....	121
7.	C&I Program and Core Initiative Descriptions .....	122
a.	C&I New Construction: New Buildings & Major Renovations; Initial Purchase & End of Useful Life .....	122
b.	C&I Retrofit: Existing Building Retrofit, Small Business, Multi-family Retrofit, Upstream Lighting .....	142
c.	C&I Retrofit: Existing Building Retrofit.....	190
d.	C&I Retrofit: Small Business.....	193
e.	C&I Retrofit: C&I Multi-Family Retrofit.....	195
f.	C&I Retrofit: Upstream Lighting (electric) .....	196
<b>H.</b>	<b>Pilots, Hard-to-Measure Efforts, and Creative New Approaches .....</b>	<b>197</b>
1.	Pilots .....	197
2.	Hard-to-Measure Efforts .....	198
3.	Creative New Approaches .....	199
a.	Demand Savings.....	199
b.	Integration of Renewable Technologies .....	202
c.	Other Creative New Approaches .....	203
<b>I.</b>	<b>Marketing Plan and Activities.....</b>	<b>204</b>
1.	Introduction.....	204
2.	Marketing Plan Overview .....	205
3.	Mass Save® .....	206
4.	Marketing for 2016-2018 .....	206
5.	Maintenance of Complementary Individual Efforts .....	208

<b>J. Public Education .....</b>	<b>208</b>
<b>K. Community Engagement .....</b>	<b>210</b>
<b>L. PA-Specific Programming .....</b>	<b>212</b>
<b>IV. STATEWIDE BUDGETS, SAVINGS, AND BENEFITS .....</b>	<b>213</b>
<b>A. Development of Goals.....</b>	<b>213</b>
1. Introduction.....	213
2. Electric Statewide Budget, Lifetime Savings, Annual Savings, and Benefits.....	213
3. Gas Statewide Budget, Annual Savings, Lifetime Savings, and Benefits .....	215
4. Breakdown of Budget by Cost Category .....	217
5. Process to Determine Goals .....	218
a. Bottom-Up Planning .....	220
b. Top-Down Planning.....	220
c. Evaluation Results.....	221
d. Cost Drivers.....	222
e. Cost to Achieve Example.....	224
f. Unique Service Area Drivers .....	226
g. Conclusion.....	226
6. Common Assumptions.....	227
a. Overview .....	227
b. Participant Definitions .....	227
7. Updates to Tables .....	228
<b>B. Budget Cost Categories .....</b>	<b>230</b>
1. Overview.....	230
2. Budget Category Definitions.....	231
3. Salaries.....	232
4. Vendor-Related Costs .....	233
5. Identification of Any Costs That are Difficult to Assign to One of the Five Cost Categories .....	233
6. Continuous Improvement.....	233
<b>C. Performance Incentives.....</b>	<b>233</b>
<b>D. Bill Impacts.....</b>	<b>242</b>
<b>E. Evaluation, Measurement &amp; Verification .....</b>	<b>244</b>
1. EM&V Framework .....	244
2. Evaluation Management Committee .....	245
3. Descriptions of Research Areas .....	246
4. Evaluation Budgets .....	247
5. Types of Evaluation Functions .....	247
6. Evaluation Planning and Strategic Evaluation Plan .....	247
7. Evaluation Studies Completed in Advance of the 2016-2018 Plan.....	248
<b>F. Technical Reference Manual/Library .....</b>	<b>249</b>
<b>G. Core Benefits and Cost-Effectiveness .....</b>	<b>249</b>
1. Energy and Demand Savings.....	249
2. Environmental Benefits .....	250
3. Net Benefits and Cost-Effectiveness.....	252
a. Introduction .....	252
b. Avoided Energy Supply Cost Study .....	253
c. Net Savings .....	254
i. Non-Energy Impacts.....	254

ii.	Market Effects .....	254
4.	Additional Benefits .....	255
a.	Reduction in Peak Load.....	255
b.	Economic Development and Job Growth/Retention .....	255
c.	Supporting the Global Warming Solutions Act (“GWSA”) .....	257
i.	Energy Efficiency Under the GCA Supports the Goals of GWSA .....	257
ii.	More GHG Reductions Than Prior Plans .....	257
iii.	EM&V Study to Fully Quantify Energy Impacts that Result in Reductions in GHG Emissions and Environmental Benefits .....	260
iv.	Conclusion.....	261
<b>V.</b>	<b>GREEN COMMUNITIES ACT REQUIREMENTS AND GOALS .....</b>	<b>262</b>
<b>A.</b>	<b>All Cost-Effective or Less Expensive than Supply Resources .....</b>	<b>262</b>
1.	Introduction.....	262
2.	Experience in the Field .....	262
3.	Review of EM&V Results .....	263
4.	Potential Studies.....	263
a.	Introduction .....	263
b.	The Berkshire Gas Company, Liberty Utilities and Unutil .....	263
c.	Cape Light Compact .....	264
d.	National Grid.....	265
5.	Council Coordination .....	267
6.	Stakeholder Engagement .....	268
7.	Consultant Assessment .....	269
<b>B.</b>	<b>Key Challenges and Market Barriers .....</b>	<b>269</b>
1.	Market Barriers.....	270
2.	Policy Issues.....	271
3.	Assessing.....	272
<b>C.</b>	<b>Allocation of Funds for Low-Income Programs and Education.....</b>	<b>272</b>
<b>D.</b>	<b>Minimizing Administrative Cost.....</b>	<b>272</b>
<b>E.</b>	<b>Competitive Procurement .....</b>	<b>274</b>
<b>F.</b>	<b>Demand Response .....</b>	<b>274</b>
<b>VI.</b>	<b>COST RECOVERY, FUNDING SOURCES &amp; FINANCING INITIATIVES .....</b>	<b>276</b>
<b>A.</b>	<b>Cost Recovery .....</b>	<b>276</b>
<b>B.</b>	<b>Funding Sources.....</b>	<b>276</b>
1.	Introduction.....	276
2.	Non-EES Revenues.....	277
a.	System Benefit Charge (electric only).....	277
b.	Forward Capacity Market Proceeds (electric only).....	277
c.	Regional Greenhouse Gas Initiative Proceeds (electric only) .....	278
3.	EES Revenues.....	279
4.	Carryover Information .....	280
5.	Outside Funding Levels.....	280
6.	Financing Initiatives .....	280
<b>C.</b>	<b>Lost Base Revenues.....</b>	<b>282</b>
<b>VII.</b>	<b>MISCELLANEOUS .....</b>	<b>284</b>

<b>A.</b>	<b>Streamlining Processes to Reduce Costs for Customers .....</b>	<b>284</b>
<b>B.</b>	<b>Mid-Term Modifications.....</b>	<b>286</b>
1.	Introduction.....	286
2.	Purpose of MTMs .....	286
3.	The Exception Not the Rule .....	286
4.	The Guidelines Govern MTMs .....	286
5.	Category One MTMs.....	287
6.	Category Two MTMs.....	287
7.	2013-2015 MTMs .....	287
8.	MTMs Do Not Revise Department-Approved Budgets or Goals .....	288
<b>C.</b>	<b>Statewide Energy Efficiency Database .....</b>	<b>288</b>
1.	Database Development .....	288
2.	EEAC Database Process .....	289
3.	MSD Overview .....	290
4.	MSD – Purpose and Benefits .....	291
5.	MSD – Future Data Reporting and Considerations.....	292
6.	MSD – Budget .....	293
<b>D.</b>	<b>Effect of Carbon Docket, D.P.U. 14-86.....</b>	<b>294</b>
<b>E.</b>	<b>Effect of DOER’s proposed RCS Regulations .....</b>	<b>294</b>
<b>F.</b>	<b>Integration of Eversource Companies for Three-Year Plan .....</b>	<b>295</b>
<b>G.</b>	<b>Service of Blackstone Customers .....</b>	<b>299</b>
<b>VIII.</b>	<b>APPENDICES .....</b>	<b>301</b>
<b>A.</b>	<b>Glossary.....</b>	<b>302</b>
<b>B.</b>	<b>Regulatory Background and History.....</b>	<b>308</b>
<b>C.</b>	<b>Statewide Energy Efficiency Data Tables .....</b>	<b>309</b>
<b>D.</b>	<b>Term Sheet .....</b>	<b>310</b>
<b>E.</b>	<b>Council’s Resolution of March 31, 2015 .....</b>	<b>311</b>
<b>F.</b>	<b>PA Response Matrix to March Resolution .....</b>	<b>312</b>
<b>G.</b>	<b>Council’s Resolution of July 21, 2015 .....</b>	<b>313</b>
<b>H.</b>	<b>PA Response Matrix to July Resolution .....</b>	<b>314</b>
<b>I.</b>	<b>Council’s Resolution of October 26, 2015 .....</b>	<b>315</b>
<b>J.</b>	<b>Avoided Energy Supply Costs in New England: 2015 Report.....</b>	<b>316</b>
<b>K.</b>	<b>Examples of Demonstration Project Reports .....</b>	<b>317</b>
<b>L.</b>	<b>PA-Specific Programming .....</b>	<b>318</b>
<b>M.</b>	<b>Studies of Remaining Potential.....</b>	<b>319</b>
<b>N.</b>	<b>Maps of Service Areas.....</b>	<b>320</b>
<b>O.</b>	<b>Unique Service Area Challenges Presentations.....</b>	<b>321</b>
<b>P.</b>	<b>Participant Definitions .....</b>	<b>322</b>

<b>Q. Vendor Cost Categories .....</b>	<b>323</b>
<b>R. Performance Incentive Models .....</b>	<b>324</b>
<b>S. Strategic Evaluation Plan.....</b>	<b>325</b>
<b>T. Evaluation Study Summaries .....</b>	<b>326</b>
<b>U. Evaluation Studies .....</b>	<b>327</b>
<b>V. Technical Reference Manual .....</b>	<b>328</b>
<b>W. Database Background Materials .....</b>	<b>329</b>
<b>X. Responses and Roadmap to Department’s Additional Filing Requirements.....</b>	<b>330</b>

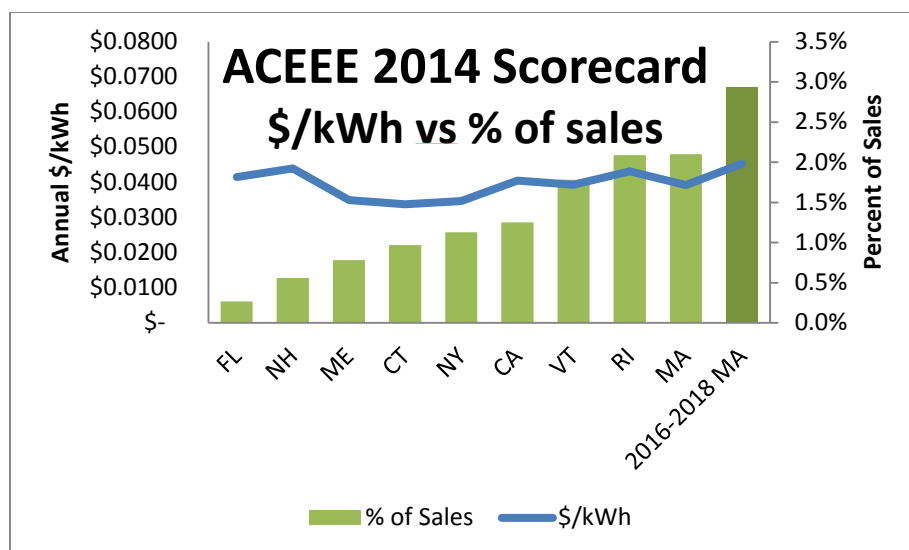
## 2016-2018 MASSACHUSETTS JOINT STATEWIDE THREE-YEAR ELECTRIC & GAS ENERGY EFFICIENCY PLAN

### I. EXECUTIVE SUMMARY

#### A. Context for the Program Administrators’ Energy Efficiency Efforts Under the GCA

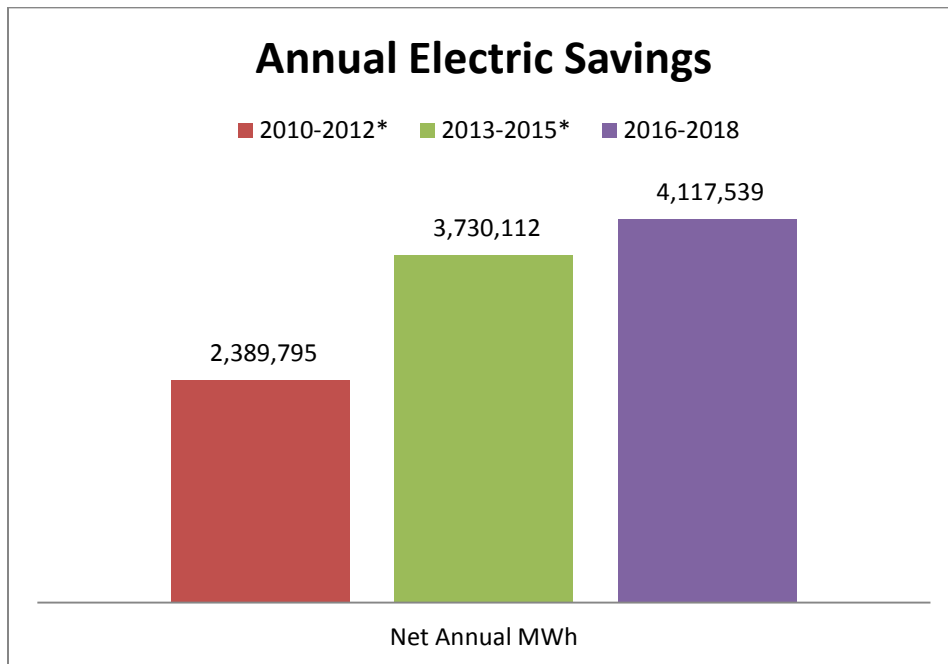
The Program Administrators’ energy efficiency efforts under the Green Communities Act reflect an unprecedented collaborative undertaking with long-lasting multi-billion dollar benefits for Massachusetts. The magnitude of the success and accomplishments of the Program Administrators in implementing energy efficiency programs and services, with the support and aid of the Energy Efficiency Advisory Council and stakeholders, can be hard to conceptualize. Energy efficiency benefits are not always visible to the naked eye, taking the form of insulation in walls, deferred construction of generating facilities, reduced greenhouse gas emissions and improved comfort or industry profitability. The energy savings and benefits of energy efficiency programs, however, are real and measurable. With rigorously quantified total dollar benefits of over \$12.5 billion since 2008 (many times greater than costs), energy efficiency under the Green Communities Act is truly a historic achievement, making Massachusetts a model of energy efficiency success for the rest of the nation.

The Program Administrators have increased their savings achievements significantly since the 2008 passage of the Green Communities Act, with electric savings almost tripling between 2008 and 2014. These achievements have resulted in Massachusetts continuing to be the Number 1 ranked state in the nation for energy efficiency by the American Council for an Energy Efficiency Economy (“ACEEE”). Additionally, Massachusetts attained a perfect score on the ACEEE 2015 State Energy Efficiency Scorecard for its program administrator-operated energy efficiency programs and its policies to support the development of combined heat and power (“CHP”) facilities.<sup>1</sup> In the 2016-2018 Plan, the PAs are proposing aggressive savings goals at levels even higher than the 2013-2015 Plan, despite increased challenges.

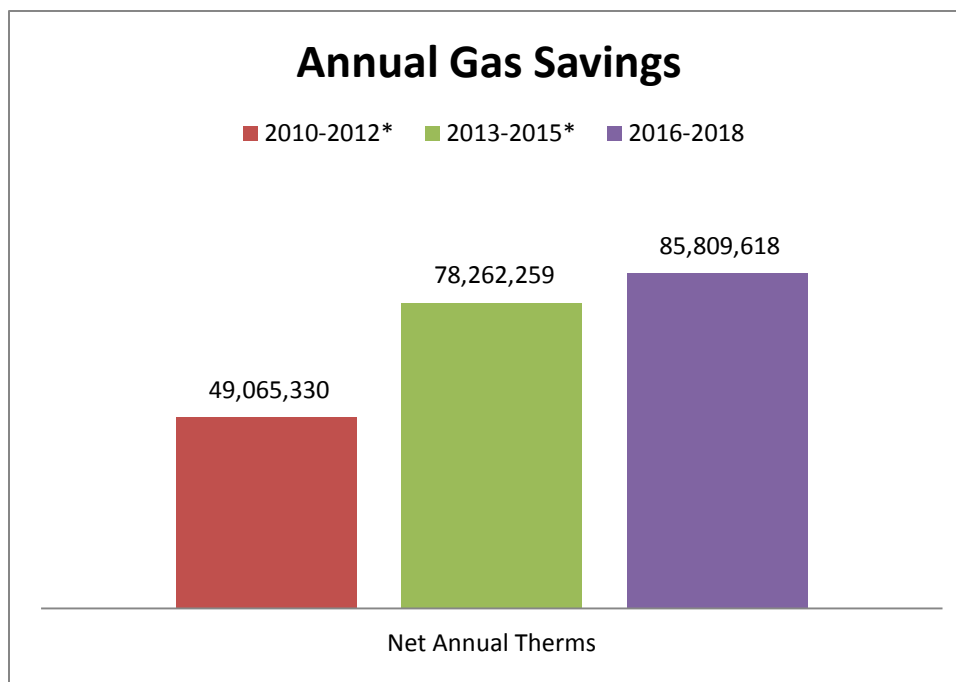


<sup>1</sup> ACEEE, “The 2015 State Energy Efficiency Scorecard,” October 2015, Report Number U1509.

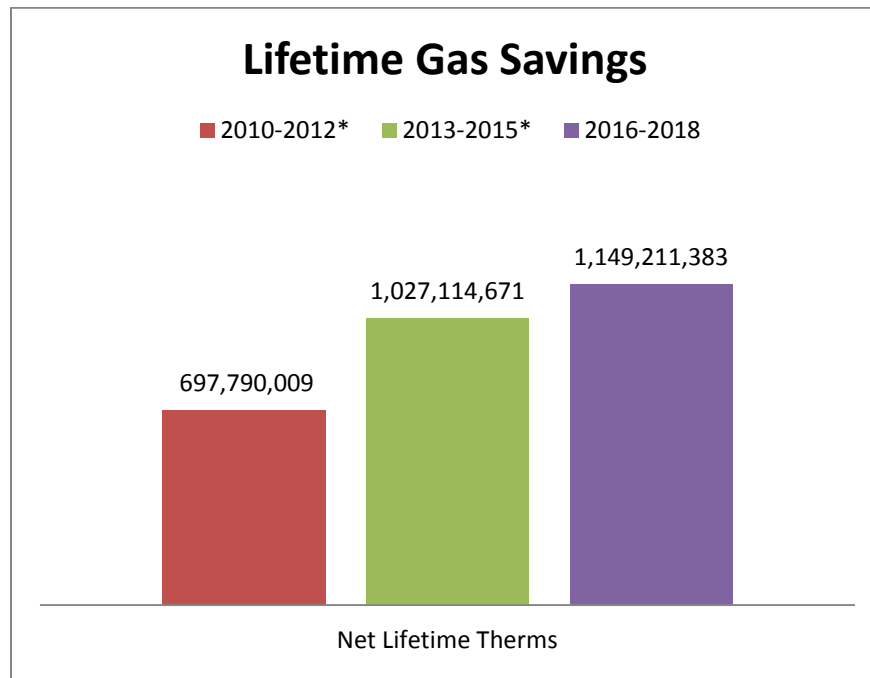
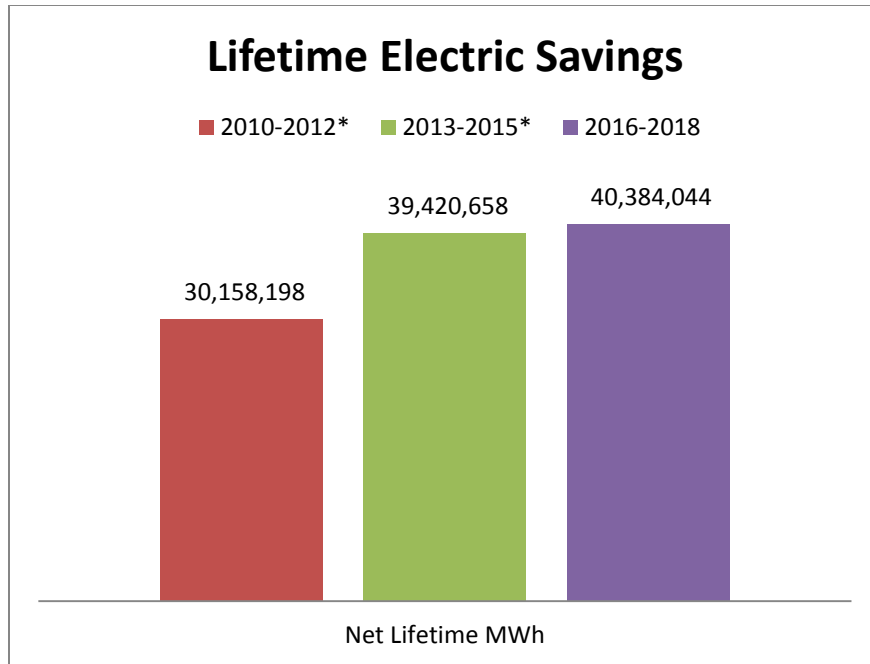




\* 2010 - 2014 represent actual savings; 2015 - 2018 represent planned.

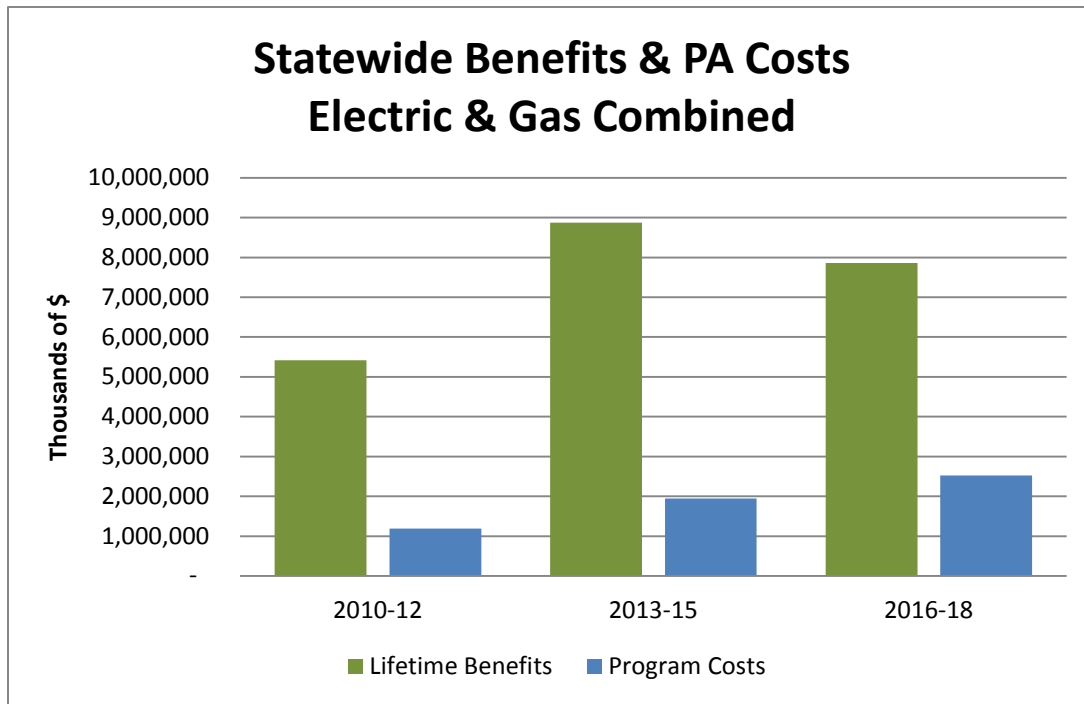


\* 2010 - 2014 represent actual savings; 2015 - 2018 represent planned.



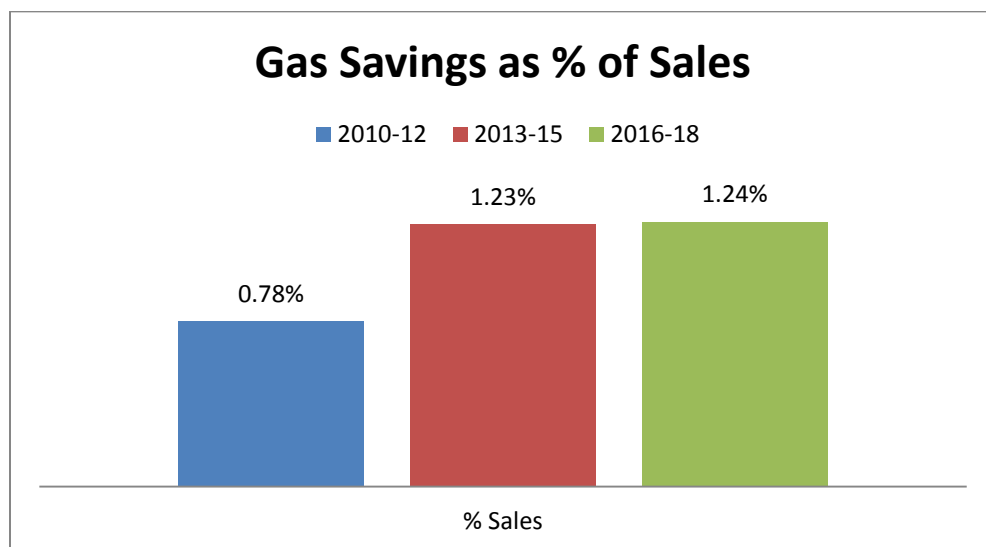
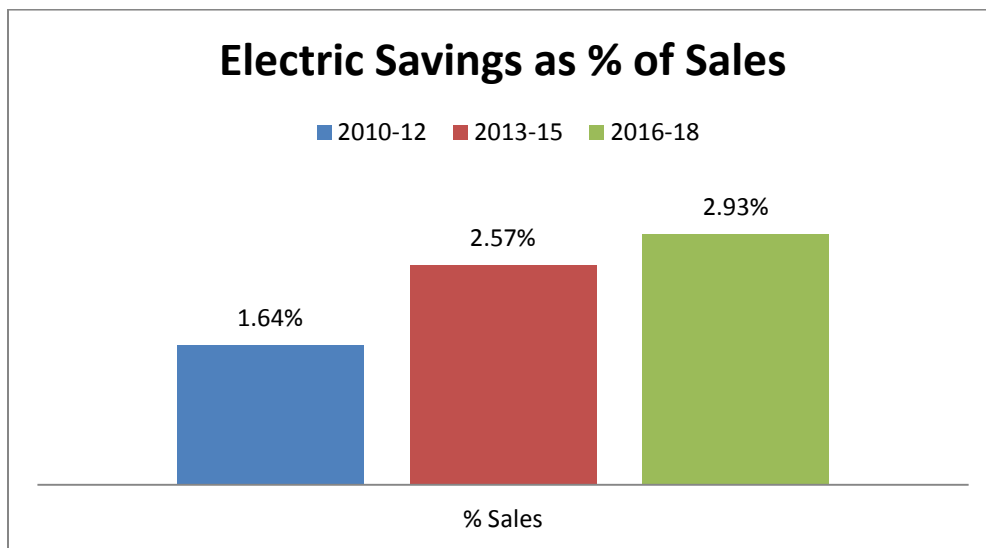
While delivering these unprecedented savings, the Program Administrators have carefully managed expenditures to keep costs as low as possible. The PAs strive to maximize the value of each dollar spent. The majority of energy efficiency expenditures are delivered to customers in the form of incentives that are intended to overcome the financial barrier to investment. For example, in the 2016-2018 Plan, approximately 74 percent of the electric budget and approximately 71 percent of the gas budget are dedicated to **participant incentives**, the biggest driver of savings. The next largest category of expenditures, approximately 15-18 percent, will go to payments for contractors, installers and training. Approximately 3 percent of the statewide

budget is dedicated to the rigorous Massachusetts Evaluation, Measurement and Verification process. Other administrative functions like Program Planning and Administration and Marketing and Advertising combined make up approximately 8-9 percent of the statewide budget. These percentages are in line with the budget allocations previously approved by the Department of Public Utilities, demonstrating that the Program Administrators have been able to provide direct benefits to customers and contractors and grow the energy efficiency portfolios while minimizing costs. Due to avoided costs declining, despite increasing savings, dollar benefits are lower in the 2016-2018 Plan than they were in 2013-2015 (but greenhouse gas reductions increase in the Plan).



The Plan being filed today fully reflects the provisions of the Term Sheet dated September 23, 2015 (supplemented on October 26, 2015) agreed upon by the Program Administrators, the Executive Office of Energy and Environmental Affairs, the Department of Energy Resources, and the Office of the Attorney General, which is included in Appendix D. The Term Sheet is the result of extensive collaboration among the agreeing parties following the PAs’ submission of their April 30, 2015 draft Plan and the July 27, 2015 Resolution of the Energy Efficiency Advisory Council. Further, the Plan gathered the broad support of the Energy Efficiency Advisory Council which led to the October 26, 2015 Resolution. The October 26<sup>th</sup> Resolution was approved by an overwhelming 14 to 1 vote of the Energy Efficiency Advisory Council, which is attached as Appendix I. In this Resolution, after extensive review and collaboration the Council respectfully requested that “the Commissioners of the Department of Public Utilities . . . approve the 2016-2018 Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Investment Plan and the Individual Plans of the [program administrators], to the degree that the Individual Plans are fully consistent with the Statewide Plan.”

The Plan provides for the most aggressive savings goals ever in the Commonwealth, and to the PAs' knowledge, in the United States. The Plan provides for an annual savings goal of 2.93 percent of retail sales (electric) and of 1.24 percent of retail sales (gas) at costs-to-achieve that are materially lower than those set forth in the April 30<sup>th</sup> draft. Moreover, the Plan prioritizes: (1) new demand reduction/peak reduction efforts; (2) continued commitment to innovation and technology; and (3) the creation of a new residential contractor engagement effort. All tables and values in this Plan are consistent with the Term Sheet. The PAs express their appreciation for the extensive efforts and diligent work of the Executive Office of Energy and Environmental Affairs, the Department of Energy Resources, the Office of the Attorney General, the Energy Efficiency Advisory Council, its consultants, and other interested stakeholders.



## B. Moving Forward and Sustaining Excellence in 2016-2018

This Plan represents the Program Administrators' collective efforts – informed by in-the-field Program Administrator experiences, Evaluation, Measurement and Verification results, and outstanding input from and collaboration with the Energy Efficiency Advisory Council and stakeholders – to build upon and sustain Massachusetts' historic effort. Going forward, a key challenge to navigate is the danger of “over-promising and under-delivering.” Sustaining very high savings goals becomes increasingly difficult in each subsequent year as markets become saturated, “easy” savings no longer exist, and rising baselines continue to reduce claimable savings. Over the next three years, the Program Administrators will need to find ways to mine savings from more difficult, costly, and challenging projects and market segments. Extensive details addressing these challenges are set forth in the multiple sections and tables contained in this Plan.

In order to meet this challenge, the PAs have developed a number of innovations for the 2016-2018 Plan:

### Residential and Low-Income

- 2016 initial implementation of an innovative new **Renter-Specific Offer**, including a special renter visit, installation of *instant savings measures* such as light bulbs, power strips, gas/water saving aerators and showerheads, and collection of information to use in following up with landlords.
- **Multi-family Initiative Enhancements**, creating a *project-level lead* to ensure optimal customer experience, tracking and reporting of commercial and residential meter savings *separately*.
- Continued driving of the **LED Revolution**, with LED offerings adapting to the changing lighting market.
- 2016 initial implementation of a new **Moderate-Income Offer**, with the Program Administrators working on a new *61-80 percent of median income opt-in approach* for those with weatherization opportunities.
- Continuation of the Program Administrators' historic **Low-Income Services Partnership with the Low-Income Energy Affordability Network (LEAN)** to ensure that the Commonwealth's most economically vulnerable citizens participate in specially tailored programs; PAs acknowledge and thank LEAN for its collaboration with the PAs and commitment to low-income populations across the Commonwealth.

### Commercial and Industrial

- Broadening the **Upstream Program Delivery Mechanism** to encompass additional, appropriate equipment types and end-uses for the purpose of advancing the ongoing market transformation effort; implementation of a new upstream approach targeting water heating technologies will begin in late 2015.
- **Segment-specific Outreach and Implementation Strategies** (marketing strategies and materials, partnerships, campaigns) to advance energy efficiency implementation and

customized to overcome unique participation barriers of each segment; this Plan provides more details on sector-specific areas of focus for each PA.

- Comprehensive review/analysis of the very successful **Small Business Initiative** to advance participation and comprehensiveness at all customer sizes and energy usage ranges.
- Deployment of an exciting new online incentive application portal, with a menu drive interface enabling the creation and submission of customer applications for incentives; this portal will materially enhance the overall customer experience, especially for mid-sized customers.

### **Evaluation, Measurement & Verification and Data**

- A high level **Strategic Evaluation Planning** document is included with this Plan. The development of this document was guided by an Evaluation Planning Summit held in February 2015. The Summit provided a forum for the PAs, Council consultants, and evaluation contractor teams to identify emerging evaluation topics and activities.
- A wealth of quantitative data is now readily available to stakeholders and the public ([www.masssavedata.com](http://www.masssavedata.com)). The **Mass Save Data** website has been developed to improve the transparency of and access to reported energy efficiency data. Currently this website includes data regarding program participation, annual and lifetime savings, benefits, cost to deliver, expenditures, greenhouse gas emissions reductions that result from energy efficiency efforts, and forecasted sales for the years 2010 through 2015. The PAs are also planning to add geographic and measure level data to the website, and will strive to continue to improve the functionality of this database while minimizing its costs.
- The Customer Profile Studies will provide **Customer Based Analysis**, including detailed geographic analysis across fuels and service territories. This information will also be used to populate the Mass Save Data geographic tab, which is under development.
- There will be renewed emphasis on enhancing the value of evaluation by producing **Real Time Evaluation Results** to the extent possible, shortening the feedback loop between evaluation and implementation, and making recommendations more actionable.
- Undertaking, through the Council's highly successful independent EM&V process, a new study to verify more precisely the emissions reductions resulting from the PAs' energy efficiency efforts, and potentially also looking at impacts from other efforts that interrelate with the PAs' efforts.

### **Marketing**

- Implementation of **Spanish and Portuguese versions of the comprehensive Mass Save® website**, helping to ensure even greater access for customers to energy efficiency programs.

### **Savings, Benefits and Infrastructure**

- Continuation of the **Aggressive Savings Goals** (2.93 percent of sales for electric and 1.24 percent of sales for gas). Based upon ACEEE data, the Program Administrators

believe that these are the most aggressive goals for an integrated gas and electric energy effort in the nation.<sup>2</sup>

- Consistent with the Term Sheet and in response to the Council’s comments, electric savings goals have increased from the April 30<sup>th</sup> draft by approximately 17 percent (annual) and 21 percent (lifetime). Gas savings have increased by 15 percent (annual) and 14 percent (lifetime); while savings have increased, per unit costs-to-achieve have decreased.
- Total Benefits of approximately **\$8 billion** for customers; Net Benefits of approximately **\$4.4 billion**.
- Clear and strong commitment to the support of the robust Massachusetts **Energy Efficiency Delivery Infrastructure and Contractor Network**, with a stable level of investment of over \$2.5 billion in energy efficiency in 2016-2018.
- Environmental benefits equivalent to removing 410,162 cars from the road through annual electric and gas savings in 2016-2018.

The PAs have also sought stakeholder input and insights in the preparation of this Plan. The PAs have received constructive input from Councilors, government officials, stakeholders, energy experts and consultants, and participants in the Council workshops. This 2016-2018 Plan has benefited from this extensive input. The PAs appreciate their team; every Program Administrator contributes, every Program Administrator leads, and every Program Administrator learns.

### C. Cost to Achieve

In addition to the challenges of meeting higher savings goals, PAs face increasing challenges to minimize increases in the cost to achieve these savings. The PAs have materially reduced their projected cost-to-achieve savings from the projections in the April 30<sup>th</sup> draft, as reflected in the Plan, with a reduction in electric cost-to-achieve per kWh of approximately 13 percent and in gas cost-to-achieve per therm of approximately 7 percent.

Cost to achieve looks at the PAs’ total costs per unit of net savings attributable to the programs. Market penetration, increasing costs for key measures, and decreasing levels of claimable savings due to changes in federal standards and the application of results from the impact evaluations are all significant factors that can drive up the cost per kWh or therm saved. Two areas that are particularly impacted by these factors in the 2016-2018 Plan are the Residential Lighting initiative and Low-Income programs.

- The Residential Lighting initiative is facing a number of concurrent challenges that are increasing the cost to achieve. Federal Energy Independence and Security Act (“EISA”) standards are eliminating inefficient bulbs from the market, raising the baseline and decreasing the savings that Program Administrators can claim. At the same time, programs are increasingly incentivizing a greater number of LEDs than CFLs, and the cost per kWh for an LED is significantly higher than that of a CFL. Additionally, recent

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<sup>2</sup> ACEEE, “The 2015 State Energy Efficiency Scorecard,” October 2015, Report Number U1509.

evaluation results have increased the free ridership rate for LEDs, further reducing the net savings that Program Administrators can claim. All of these factors have led to increases in the cost to achieve of 10 to 20 percent for the residential lighting initiative compared to previous three-year plans.

- Historically, the Program Administrators have partnered with the federal Weatherization Assistance Program to deliver programs to income-eligible customers and have been able to leverage federal funding. Going forward, however, the availability of federal funding will be sharply reduced due to national program cuts, and the Program Administrators will need to fund a greater portion of each project. For gas energy efficiency programs, the lack of available federal funding results in a greater than 50 percent increase in the cost per therm saved in the low-income sector. In addition, the Program Administrators must dedicate at least 20 percent of their gas budgets to low-income programs, which substantially impacts the portfolio cost to achieve. These costs have increased so significantly that if 2016-2018 costs were applied to 2014 programs, the cost per therm in 2014 would have been 20 percent higher. While the Program Administrators remain committed to finding efficiencies in program design and delivery and controlling costs to the maximum extent possible, these types of funding shifts are not the result of actual cost increases, are beyond the control of the Program Administrators, and must be taken into account when comparing across program years.

Despite these challenges, the Program Administrators have set aggressive goals (indeed, they believe, the most aggressive goals for any integrated gas and electric energy efficiency plan in the country) that are realistic, achievable and deliver unprecedented benefits to all customers. Setting unrealistic goals can reduce the PAs' flexibility to adjust to a changing market, risking missed targets and loss of the broad-based public support for energy efficiency that is a crucial component of the success achieved to date in Massachusetts. This Plan will allow the Program Administrators to achieve all cost-effective energy savings and continue to enjoy the broad-based public support for energy efficiency that will allow for continued success in delivering energy efficiency in Massachusetts.



## II. INTRODUCTION

Bay State Gas Company d/b/a Columbia Gas of Massachusetts (“CMA”), The Berkshire Gas Company (“Berkshire”), Blackstone Gas Company (“Blackstone”), Boston Gas Company, Colonial Gas Company, Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid (“National Grid”), Fitchburg Gas and Electric Light Company d/b/a Unitil (“Unitil”), Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty Utilities; (“Liberty”), Cape Light Compact (“Compact” or “CLC”),<sup>3</sup> and NSTAR Electric Company, NSTAR Gas Company and Western Massachusetts Electric Company, each d/b/a Eversource Energy (“Eversource”) (collectively, “Program Administrators” or “PAs”) developed and prepared this 2016-2018 Energy Efficiency Plan (“2016-2018 Plan” or “Plan”) pursuant to the mandates of An Act Relative to Green Communities, Acts of 2008, c. 169, codified at G.L. c. 25 §§ 19, 21-22 (“Green Communities Act” or “GCA”). The Program Administrators take great pride in planning and administering energy efficiency programs pursuant to the GCA’s statutory framework for energy efficiency, which has resulted in nation-leading, award-winning programs with savings goals and delivery that are unprecedented.

This Plan reflects an extensive collaborative effort among the PAs. The PAs express their appreciation for the work of all stakeholders and, in particular, the members of the Energy Efficiency Advisory Council (“Council” or “EEAC”), led by the Council chair, the Department of Energy Resources (“DOER”). This Plan has also benefitted from suggestions and discussions made during stakeholder workshops facilitated by Raab Associates, Ltd., on behalf of the Council in February, March and June of 2015. Since the filing of the initial draft plan on April 30, 2015 the PAs have engaged in positive and constructive dialogue with the Council on the 2016-2018 Plan, culminating with the Council passing a resolution in support of the Plan.

The GCA and Department of Public Utilities (“Department”)<sup>4</sup> precedent require that three-year energy efficiency plans, such as this 2016-2018 Plan, provide for the acquisition of all cost-effective energy efficiency resources in a manner that is sustainable and with consideration of short term customer bill impacts. In this Plan, the Program Administrators set aggressive, sustainable goals that: (1) capture all available cost-effective energy efficiency; (2) maximize net economic benefits; (3) achieve energy, capacity, climate, and environmental goals; and (4) consider both short-term customer bill impacts and longer-term benefits expected from proposed efforts. This Plan includes comprehensive energy efficiency services, large-scale marketing, and education campaigns, and extensive Evaluation, Measurement, and Verification (“EM&V”) efforts, all resulting in significant and proven energy savings to customers in the Commonwealth of Massachusetts (the “Commonwealth” or “Massachusetts”).

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<sup>3</sup> The Cape Light Compact is the only publicly funded, municipal aggregator (as defined by G.L. c. 164, § 134) energy efficiency program administrator in Massachusetts. Since it is a public entity consisting of twenty-one towns and two counties, it does not participate in performance incentives or collect lost-based revenues. As such, any discussion of these topics contained in the Three-Year Plan does not pertain to the Compact and general references to Program Administrators in these topic narratives do not include the Compact.

<sup>4</sup> The Department is a regulatory agency subject to G.L. c. 30A that is statutorily responsible for extensive oversight of the Program Administrators in Massachusetts.

The Program Administrators developed and refined the Plan in a collaborative, transparent, and year-long process with the Council, its consultants, the DOER, the Office of the Attorney General (the “Attorney General” or “AG”), the Low-Income Energy Affordability Network (“LEAN”), and other interested stakeholders. The Council guides the development and implementation of Three-Year Plans with monthly meetings of the full Council and its subcommittees.<sup>5</sup> The PAs are active participants in all of these meetings. In addition to its regular meetings noted above, in 2015, the Council conducted a number of sector-focused workshops to help inform the development of the 2016-2018 Plan. The PAs were partners in developing the workshop briefing materials.

In November 2015, after detailed review and input from the Council, the Department will begin an extensive review of the 2016-2018 Plan through a formal investigation that includes standards for filing, discovery, evidentiary hearings, briefing, and careful and extensive analysis informed by the Department’s technical expertise. The level of review, collaboration, transparency, and accountability of the current statutory framework ensures that customers are receiving beneficial and cost-effective services. Notably, the data demonstrating the costs and benefits to customers of these services is now more easily accessible to the public in a user-friendly database that provides a single source of both statewide and individual PA information.

In addition to the advice of the Council, the 2016-2018 Plan builds upon the experience of the Program Administrators in developing and implementing two Three-Year Plans pursuant to the GCA, specifically, the 2010-2012 Plan and the 2013-2015 Plan. The Program Administrators routinely share best practices and identify new and innovative strategies through their many working groups and management committees, including the Residential Management Committee (“RMC”), the Commercial & Industrial Management Committee (“C&IMC”), the Evaluation Management Committee (“EMC”), the Low-Income Best Practices committee, the Massachusetts Technical Advisory Committee (“MTAC”), the Planning and Analysis Group (“PAG”), and the Contractor Best Practices Working Group. To track their performance against their Three-Year Plans, each Program Administrator publicly files data tables and benefit-cost screening models that show information at the measure level with each plan and report submitted to the Department. The PAs also submit statewide quarterly reports and monthly data dashboards to the Council, along with many other ad hoc data requests. In 2014, the PAs developed an internet-based database to facilitate public access to statewide energy efficiency data in a more user friendly manner. Extensive planned and reported energy efficiency data for 2010 through 2015 is available at [www.MassSaveData.com](http://www.MassSaveData.com).

Finally, in advancing the objectives of the Green Communities Act, the 2016-2018 Plan also supports the Commonwealth’s broader policy objectives. In a series of legislation enacted in parallel with the GCA, the Commonwealth signaled its commitment to being a worldwide leader in developing a green economy through the Global Warming Solutions Act, St. 2008, c. 298 (“GWSA”), and the Green Jobs Act, St. 2008, c. 307. The GWSA calls for broad statewide

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<sup>5</sup> The Council holds monthly, publicly-noticed open meetings of the full Council, with regular presentations from the Program Administrators and the Council’s consultants, as well as public comment. The Council’s Executive Committee, which is comprised of a smaller group of councilors, conducts monthly meetings to facilitate the business of the Council and management of its consultants.

reductions of greenhouse gas (“GHG”) emissions in the Commonwealth, thus spurring innovation and promoting research and development in the area of clean energy. Enacted concurrently, the Green Jobs Act provides a robust funding source for the green technology industry, facilitating economic development and job growth in the clean energy sector. Taken together, these legislative enactments reflect the Commonwealth’s commitment to climate protection and its leadership in promoting clean and renewable energy. Reductions in GHG emissions and job creation are important results of energy efficiency programs implemented pursuant to the GCA. Like past plans, the 2016-2018 Plan will continue to fulfill the requirements of the GCA and support the goals of the GWSA and Green Jobs Act, with a focus on minimizing the cost of energy efficiency program design and implementation for the benefit of customers.

**A. Core Goals for 2016-2018**

In the 2016-2018 Plan, the Program Administrators seek to build on the lessons learned from their two previous Three-Year Plans, including both their successes and challenges, take advantage of new technologies and market opportunities, and continue to foster a sustainable energy efficiency infrastructure in the Commonwealth. The Program Administrators will pursue all available cost-effective energy efficiency, subject to reasonable short-term customer bill impacts, as mandated by the GCA, and will seek to maximize benefits to the Commonwealth and its citizens.

**Statewide Electric Summary**

	Units	2016	2016-2017	2016-2018
Forecasted Annual Retail Energy Sales	<i>MWh</i>	46,908,188	93,745,319	140,331,922
Average Annual Savings Over Three Years	<i>% of sales</i>	2.93%		
Cumulative Annual Savings Goals	<i>MWh</i>	1,371,584	2,744,075	4,117,539
Cumulative Lifetime Savings Goals	<i>MWh</i>	12,812,171	26,205,273	40,384,043
Cumulative Budget: Program Costs	<i>millions of \$</i>	\$ 598.8	\$ 1,220.0	\$ 1,857.6
Cost per Annual kWh Saved	<i>\$/kWh</i>	\$0.451		
Summer Demand Savings	<i>MW</i>	203	404	598
Winter Demand Savings	<i>MW</i>	222	440	649
Benefits	<i>millions of \$</i>	\$ 2,041.2	\$ 4,105.9	\$ 6,214.6
Cumulative Performance Incentive Pool at Design	<i>\$</i>			\$ 100,000,000
Performance Incentive Levels				
Threshold	<i>%</i>			75%
Design	<i>%</i>			100%
Exemplary - Cap	<i>%</i>			125%

## Statewide Gas Summary

	Units	2016	2016-2017	2016-2018
Forecasted Annual Retail Energy Sales	<i>Therms</i>	2,270,659,323	4,576,164,520	6,915,678,418
Average Annual Savings Over Three Years	<i>% of sales</i>	1.24%		
Cumulative Annual Savings Goals	<i>Therms</i>	28,094,852	56,599,232	85,809,618
Cumulative Lifetime Savings Goals	<i>Therms</i>	376,308,950	757,115,763	1,149,211,383
Cumulative Budget: Program Costs	<i>millions of \$</i>	\$ 216.9	\$ 438.0	\$ 665.6
Cost per Annual therm Saved	<i>\$/Therm</i>	\$7.76		
Benefits	<i>millions of \$</i>	\$ 546.1	\$ 1,091.3	\$ 1,646.7
Cumulative Performance Incentive Pool at Design	<i>\$</i>			\$ 18,000,000
Performance Incentive Levels				
Threshold	<i>%</i>			75%
Design	<i>%</i>			100%
Exemplary - Cap	<i>%</i>			125%

### B. Statutory Context

#### 1. Overview

Each PA is subject to the jurisdiction of the Department and individually bears responsibility for meeting the statutory mandate under the GCA to acquire all available cost-effective energy efficiency. The PAs are responsible for administering energy efficiency programs pursuant to the GCA. G.L. c. 25, § 19(a-b). The GCA also makes them *ex officio* members of the Council. G.L. c. 25, § 22(a).<sup>6</sup> This statutory construct appropriately recognizes that each PA is a distinct entity with a unique service territory, is owned by shareholders and/or governed by a municipal board of directors and has a deep knowledge of its businesses and customers and many years of experience implementing energy efficiency programs.

The GCA requires the PAs to jointly prepare, in coordination with the Council, an energy efficiency plan every three years. G.L. c. 25, § 21(b)(1). This plan “shall provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply and shall be prepared in coordination with the [Council].” G.L. c. 25, § 21(b)(1). As discussed in more detail in subsequent sections, a Three-Year Plan must include the elements set out in detail in the GCA. G.L. c. 25, § 21(b)(2). Every three years, the PAs must submit this plan to the Council for “approval and comment” and “review” on or before April 30. G.L. c. 25, § 21(c). The PAs “may make any changes or revisions to reflect the input of the [Council].” G.L. c. 25, § 21(c). The PAs must submit their plans, “together with the [Council]’s approval or comments and a statement of any unresolved issues, to the [Department] on or before October 31.” G.L. c. 25, § 21(d)(1). This statutory context is discussed in more detail below. For a detailed overview of energy efficiency’s regulatory background and Department history, please refer to the materials in Appendix B.

<sup>6</sup> The dictionary defines “*ex officio*” as meaning “by virtue of one’s position or status.” The Oxford English Dictionary (2013). *Ex-officio* members have exactly the same rights and privileges as do all other members, except as otherwise specified by statute. See <http://www.robertsrules.com/faq.html#2>.

## 2. The Green Communities Act

As noted above, energy efficiency in Massachusetts is governed by the statutory framework set out in the GCA. The GCA transformed and institutionalized past practice to achieving energy efficiency savings in Massachusetts. Energy efficiency programs have been offered in Massachusetts since the 1980s and stakeholder working groups and a consensus approach have been the foundation for achieving savings.<sup>7</sup> The enactment of the GCA expanded energy efficiency mandates by requiring the PAs to develop three-year energy efficiency plans that will “provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply.” G.L. c. 25, §§ 19(a), 21(a), 21(b)(1), 21(b)(2). It also institutionalized the collaborative, consensus approach to energy efficiency by creating a statewide stakeholder advisory body (the Council) to coordinate with the PAs and the Department on the development and implementation of three-year energy efficiency plans. G.L. c. 25, §§ 21-22.

In view of the GCA’s collaborative paradigm, it is important to understand how the Department, Council, and PAs each contribute to ensuring the acquisition of all cost-effective energy efficiency in Massachusetts. Under the GCA, the Department is responsible for approving individual PA Three-Year Plans and determining individual PA plan-related performance. The Department also appoints and convenes the Council. The Council is an advisory body that leverages the expertise of its diverse stakeholder membership and expert consultants to meet its statutory mandates “through a sustained and integrated statewide energy efficiency effort.” G.L. c. 25, § 22(b). By design, the Council provides valuable statewide advice and recommendations to the PAs and the Department on the development and implementation of Three-Year Plans. Finally, under the GCA, the PAs must coordinate with each other and the Council to develop Three-Year Plans. As discussed earlier, the PAs are also responsible for implementing Three-Year Plans and are subject to the regulatory authority of the Department.

To date, the GCA’s statewide collaborative approach has produced excellent results. The PAs and the Council have a proven track record of reaching consensus on numerous topics. This is a signature success of the efforts of multiple stakeholders in Massachusetts. The roles of the Department, Council and PAs are discussed in more detail below.

## 3. Department of Public Utilities

The Department is a quasi-judicial regulatory agency with extensive statutory authority over the Program Administrators.<sup>8</sup> The Department is responsible for ensuring that the electric

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<sup>7</sup> Energy efficiency programs have been offered by the electric and natural gas utilities since the 1980s and by the Compact since 2001. Prior to the GCA, the PAs each developed plans with limited budgets and relied on stakeholder working groups and a consensus approach to developing energy efficiency implementation.

<sup>8</sup> The Department’s authority extends beyond energy efficiency to all aspects of the operations of electric and gas distribution companies including, but not limited to, rate setting, service quality, customer care, and the operation of a safe and reliable utility. See G.L. c. 164, § 76. Since its establishment by the Legislature in 1919, the Department has comprehensively regulated the operations of electric and gas utility companies

and gas utilities provide safe, reliable, and least-cost service to Massachusetts customers.<sup>9</sup> Under the GCA, the Department is responsible for ensuring that electric and natural gas resource needs are first met through all cost-effective energy efficiency resources as a means to reduce energy costs for all customers. G.L. c. 25, § 21(a).

In expanding energy efficiency and requiring the PAs to coordinate with the Council, the GCA subjects both the Council and the PAs to the Department's jurisdiction with respect to final plan approval, cost-effectiveness, rates, and cost recovery. G.L. c. 25, §§ 19, 21-22. The GCA requires the Department to convene and appoint the members of the Council and to conduct the final review and approval of each Three-Year Plan.<sup>10</sup> The GCA also requires the Department to ensure that each PA acquires all cost-effective energy efficiency resources, delivers energy efficiency programs while minimizing administrative costs, and complies with the other requirements of the GCA.<sup>11</sup> If a PA has not reasonably complied with its Three-Year Plan, the Department may open an investigation into the PA's performance. G.L. c. 25, § 21(e).

In sum, pursuant to G.L. c. 164, and the GCA, the Department has oversight authority over the PAs and the Council and is responsible for final administrative review of energy efficiency determinations. G.L. c. 25, §§ 19, 21-22. The GCA's grant of authority to the Department is consistent with the Department's enabling and comprehensive statutory regulation of utility companies and municipal aggregators under c. 164 and particularly its regulatory supervisory authority over the electric and natural gas distribution companies pursuant to G.L. c. 164 § 76. Having the resources, technical expertise, and the statutory obligation to regulate in the public interest, the Department is uniquely structured to ensure that energy efficiency funds are spent cost-effectively, that customers are receiving energy efficiency services, and that energy savings are being achieved. The Department conducts its review of Three-Year Plans and PA performance through individual adjudicatory proceedings consistent

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in Massachusetts pursuant to General Laws Chapter 164 to ensure that electric and gas services are provided pursuant to just and reasonable rates.

<sup>9</sup> In exercising its authority, the Department does not micromanage utility decisions or substitute its judgment for that of utility management. See New England Telephone and Telegraph Company v. Department of Public Utilities, 327 Mass. 81, 90 (1950) (“a public regulatory board cannot assume the management of the company and cannot under the guise of rate making interfere in matters of business detail with the judgment of its officers reached in good faith and within the limits of a reasonable discretion”). Instead, the Department reviews company management under well-established administrative principles applicable to cost and rate recovery.

<sup>10</sup> The GCA sets out the requirements of the Department's review process. After the PAs file a proposed Three-Year Plan, the Department must conduct a public hearing and, within 90 days, “issue a decision on the plan which ensures that the [PAs] have identified and shall capture all energy efficiency and demand reduction resources that are cost effective or less expensive than supply.” G.L. c. 25, § 21(d). The Department “shall approve, modify and approve, or reject and require the resubmission of the plan accordingly.” G.L. c. 25, § 21(d).

<sup>11</sup> The GCA states that, in authorizing energy efficiency programs, the Department “shall ensure that they are delivered in a cost effective manner capturing all available efficiency opportunities, minimizing administrative costs to the fullest extent practicable and utilizing competitive procurement processes to the fullest extent practicable.” G.L. c. 25, § 19(a, b). In order to mitigate capacity and energy costs for all customers, the GCA also requires the Department to ensure that electric and natural gas resources are first met “through all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply.” G.L. c. 25, § 21(a).

with the Massachusetts Administrative Procedure Act, G.L. c. 30A, which requires the Department to maintain standards of fair procedure such as notice, an opportunity to be heard, and the ability to appeal decisions.<sup>12</sup>

#### 4. Energy Efficiency Advisory Council

The Department appoints and convenes the Council, which consists of 15 voting members of diverse backgrounds and expertise. G.L. c. 25, § 22(a). The Council's membership is comprised of governmental and non-governmental members, including representatives of DOER, the Department of Environmental Protection ("DEP"), the Attorney General, the environmental community, and residential, low-income and commercial and industrial customers. G.L. c. 25, § 22(a). The Council also includes one "non voting, ex-officio member" from each of the twelve Program Administrators (comprised of Massachusetts electric and natural gas distribution companies and municipal aggregators). G.L. c. 25, § 22(a). There is also one non-voting member from the heating oil industry, energy efficiency businesses, and Independent System Operator - New England ("ISO-NE"). G.L. c. 25, § 22(a).

Each Three-Year Plan must be prepared in coordination with the PAs and the Council. G.L. c. 25, § 21(b)(1). As part of the Department plan approval process, the Council is required in its advisory role to "seek to maximize net economic benefits through energy efficiency and load management resources and to achieve energy, capacity, climate and environmental goals through a sustained and integrated statewide energy efficiency effort." G.L. c. 25, § 22(b). In this role, the Council "shall review and approve demand resource program plans and budgets, work with program administrators in preparing energy resource assessments, determine the economic, system reliability, climate and air quality benefits of efficiency and load management resources, conduct and recommend relevant research, and recommend long term efficiency and load management goals to maximize economic savings and achieve environmental goals." G.L. c. 25, § 22(b). As part of its review of Three-Year Plans, the Council must approve "efficiency and demand resource plans and budgets" with a two-thirds majority vote. G.L. c. 25, § 22(b). In addition, the Council must "examine opportunities to offer joint programs providing similar efficiency measures that save more than one fuel resource or to coordinate programs targeted at saving more than one fuel resource," with costs for joint programs being allocated equitably. G.L. c. 25, § 22(b). After receipt of the April 30<sup>th</sup> draft plan, the Council has three months to review it and submit "approval or comments" to the PAs. G.L. c. 25, § 21(c).

The Council may retain energy efficiency experts provided they have no contractual relationship with the PAs or an affiliate. G.L. c. 25, § 22(c). The Department approves (and may modify) the level of funding required for the retention of experts and reasonable administrative costs. G.L. c. 25, § 22(c). The Council may ask the PAs for information as part of the development of the Three-Year Plan, and must provide an annual report to the Department

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<sup>12</sup> See G.L. c. 30A, §§ 5, 10-12, 14 (outlining adjudicatory proceedings and availability of judicial review). Additionally, to comply with c. 30A, the Department must maintain a record of its adjudicatory proceedings, afford parties the opportunity to present evidence and argument and issue decisions in writing or on the record with a statement of reasons. G.L. c. 30A, §§ 10-11. Finally, Department decisions are subject to appeal to the Supreme Judicial Court on the record formed during the c. 30A adjudicatory proceeding. G.L. c. 30A, § 5.

and the Legislature regarding the implementation of the PAs' statewide Three-Year Plan. G.L. c. 25, § 21(c). The Council must also periodically review program cost-effectiveness. G.L. c. 25, § 21(b)(3). To conduct its business, the Council holds meetings, which are subject to the open meeting law, typically on a monthly basis with the full Council and with its Executive Committee.

In sum, the Council is designed to engage the expertise of its diverse membership and consultants to provide strategic, objective advice to the PAs and the Department. The Council is uniquely positioned to coordinate energy efficiency information on a statewide basis. It provides a forum for coordinating a statewide view from different PAs and for similarly coordinating stakeholder feedback on a statewide basis.

### C. **Reporting of Energy Efficiency Data**

The Program Administrators provide extensive energy efficiency data sets in numerous public reports to the Department and the Council. This data is reported in a consistent and timely manner on a monthly, quarterly and annual basis. The D.P.U. 08-50 tables are one of the most comprehensive sources of reported PA data, providing quantitative data elements on numerous topics.<sup>13</sup> These tables were collaboratively developed by a diverse group of stakeholders.<sup>14</sup> In developing the table templates, the stakeholder working group sought "to serve the compatible but, not identical, requirements of both the Council and the Department." Energy Efficiency Guidelines, D.P.U. 08-50-B at 10 (2009). Each PA files detailed data tables as part of a

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<sup>13</sup> The D.P.U. 08-50 tables address the following topic areas (with some gas/electric variations):

(1) funding sources (summary, funding comparison between each Program Administrator's planned funding and the statewide total, SBC funds, FCM proceeds, RGGI proceeds, other funding if available, prior year carryover, energy efficiency surcharge funds); (2) budgets (summary, budget comparison between each Program Administrator's planned budget and the statewide total, budget comparison between the three-year plan's budget and previous year's budgets); (3) cost-effectiveness (summary, costs summary, costs comparison between each Program Administrator's planned costs and the statewide total, cost comparison between the three-year plan's costs and previous year's costs, benefits summary, benefits comparison between each Program Administrator's planned benefits and the statewide total, benefits comparison between the three-year plan's benefits and previous year's benefits, savings summary, savings comparison between the three-year plan's savings and previous year's savings, avoided cost factors summary, distribution and transmission avoided costs factors comparison between each Program Administrator's planned factors, distribution and transmission avoided costs factors comparison between the three-year plan's factors and previous year's factors); (4) monitoring and evaluation; (5) performance incentive; (6) cost recovery (LBR and energy efficiency surcharge); (7) low-income customer budget allocation; (8) outsourced services (summary, outsourced services comparison between each Program Administrator's planned outsourced services and the statewide total, outsourced services comparison between the Three-Year Plan's outsourced services and previous year's outsourced services); and (9) master summary. Energy Efficiency Guidelines, D.P.U. 08-50-B at 11-12 (2009).

<sup>14</sup> These tables were collaboratively developed in five months over 11 stakeholder meetings and were approved by the Department. D.P.U. 08-50-B at 10. Representatives from several entities actively participated in these meetings, including: Attorney General, DOER, the Council, Associated Industries of Massachusetts, Environment Northeast (n/k/a Acadia Center), Conservation Law Foundation, The Energy Consortium, LEAN, PAs, and Department staff. Id. at 9 & n.5.



Three-Year Plan, and annual and term performance reports.<sup>15</sup> The PAs have updated and enhanced the D.P.U. 08-50 tables for the 2016-2018 Plan and refer to them as the Energy Efficiency Data Tables (see Appendix C).

Program Administrators must provide quarterly reports to the Council on the implementation of their plans. G.L. c. 25, § 22(d). To be responsive to Council requests for additional data, the PAs voluntarily provide monthly data dashboards in months where no quarterly report is due to provide even greater transparency on their implementation efforts. The PAs developed the Council reporting formats in collaboration with the Council consultants. The PAs have been providing quarterly and annual reports since 2010 and monthly data dashboards since 2011. As part of this data reporting, the PAs provide preliminary numeric data on savings, costs, and participants to the Council on a monthly and quarterly basis. Since 2010, the PAs and the Council's consultants have together worked to expand and improve these reports in response to Council interests. PAs also provide large amounts of data with contextual analysis through the EM&V process, with all studies and executive summaries available on the Council's website after finalization, as well as filed with the Department as part of annual plan-year ("Plan-Year") and three-year term ("Term") Reports.

Final data is reported to the Department and Council in Plan-Year Reports and Term Reports. In order to provide final data, the PAs undertake an extensive process to ensure that the data is verified and reliable. Rigorous quality assurance/quality control ("QA/QC") of cost and savings information occurs throughout the year, and additional QA/QC of both cost and savings data is performed specifically for the final reports. PAs review invoices and take steps to quality check and correct any errors in PA tracking systems and review any outliers. They assess items such as participation, vendor savings, and measure categorization; review labor and vendor costs; and review competitively procured services. PAs prepare a report-version of the Technical Reference Manual for Estimating Savings from Energy Efficiency Measures ("TRM") and apply updated evaluation impacts to the data. Following this process, the PAs populate benefit-cost screening models to assess measure, program, sector, and portfolio cost-effectiveness as well as data tables for filing with the Department. This rigorous review process ensures that the data provided by the PAs and relied upon by the Department, Council, and other stakeholders, including ISO-NE, is accurate and of high quality.

Historically, reports to the Department and Council were made in writing, with the quarterly reports being provided in narrative and Excel formats. In order to increase accessibility, in 2014, the PAs developed a database to make energy efficiency data reported to the Department and the Council available in a user-friendly and accessible web-based platform. The public can access this information at [www.MassSaveData.com](http://www.MassSaveData.com) and export data to PDF or Excel formats. The data is available by individual PA and can also be aggregated statewide or for specified PAs. The information available on [www.MassSaveData.com](http://www.MassSaveData.com) replicates the data

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<sup>15</sup> Prior to 2013, the PAs would file D.P.U. 08-50 tables with mid-term modification filings. On January 30, 2013, the Department issued revised Energy Efficiency Guidelines as part of its streamlining docket in D.P.U. 11-120, which was focused on reducing regulatory burdens where possible. In finding that energy efficiency plans should be treated as true three-year plans and not three annual plans, the Department minimized the need for mid-term changes to the 08-50 tables. Energy Efficiency Guidelines, D.P.U. 11-120-A, Phase II (2013).

available in the Energy Efficiency Data Tables, except for those limited data points that do not lend themselves to quantitative roll-ups. The website currently replicates the data provided to the Council on a quarterly basis. The PAs recently released a monthly data tab that replicates the monthly data dashboard provided to the Council. The website also includes additional information, such as Home Energy Services (“HES”) closure rates, cost to deliver and greenhouse gas emission reductions stemming from energy efficiency. Because the data available on [www.MassSaveData.com](http://www.MassSaveData.com) is aggregated, it appropriately protects customer privacy and reduces the need for expensive data security measures, which are core database concerns of the PAs, Department, and stakeholders.<sup>16</sup>

In 2014, the PAs also began developing an electronic version of their specific inputs to the TRM, which documents impact factors and input assumptions used to calculate savings, with sources and references. This electronic version, known as the Technical Resource Library (“TRL”), reflects the effort of the PAs to align common measure naming across all PAs and will allow the public to access information from a central website. The TRL is currently in development, and is anticipated to be complete in 2016. The PAs provide a paper TRM in Appendix V of this 2016-2018 Plan and expect to supplement that document with the TRL when it is available.

#### D. Overview of Green Communities Act Compliance

##### 1. The Sustained Acquisition of All Cost-Effective Resources

###### *a. Reasonable Pace for Sustained Acquisition*

The GCA requires the PAs to acquire all cost-effective energy efficiency resources in their Three-Year Plans. The Department has determined that the acquisition of these resources, however, must be achieved through a sustained effort. 2013-2015 Energy Efficiency Plans, D.P.U. 12-100 through D.P.U. 12-111, at 37 (2013) (“2013-2015 Order”); 2010-2012 Gas Order, D.P.U. 09-121 through D.P.U. 09-128 (“2010-2012 Gas Order”), at 71 citing G.L. c. 25, § 22(b); 2010-2012 Electric Order, D.P.U. 09-116 through D.P.U. 09-120 (“2010-2012 Electric Order”), at 85. To determine the rate at which PAs must acquire these resources, the GCA requires the PAs, Council, and Department to consider a number of factors.

Determining a reasonable pace for a sustained acquisition requires the Program Administrators and the Council (in developing the Three-Year Plans) and the

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<sup>16</sup> In Massachusetts, the PAs strictly control access to sensitive customer-specific account information like customer names, account numbers, rate class, location, usage, and demand data. The PAs have each adopted strict corporate privacy policies and safeguards to protect customer information. These corporate privacy policies explicitly state that customers’ personal information will be safeguarded and only disclosed for a regulated PA business purpose. Each of the PAs maintains physical, electronic, and procedural safeguards to protect such sensitive data. Customer consent is necessary to permit third-party access to sensitive customer-specific account information outside the conduct of regulated PA business. Disclosure of customer information to a third-party without customer authorization would violate corporate privacy policies and expose a PA to liability under the Massachusetts Right to Privacy Act, M.G.L. c. 214, § 1B or Chapter 93A, Department precedent and directives to maintain customer confidentiality, and potentially other statutes.

Department (in reviewing the Three-Year Plans) to strike an appropriate balance between several factors, including: (1) identifying the potential level of cost-effective resource currently available; (2) exploring ways in which this level can be increased; (3) assessing the capability of the energy efficiency vendor and contractor industry to support increased program activity; and (4) assessing the capacity of the Program Administrators to administer increases in program activity efficiently and effectively. The Department must take into consideration an additional factor: the rate and bill impacts that result from increased program activity.

2010-2012 Gas Order, at 71-72 and 2010-2012 Electric Order at 85-86. Consistent with the Department's directives, the 2016-2018 Plan provides a strategy for acquiring all cost-effective energy efficiency resources at a reasonable pace during this three-year term.

#### *b. Statewide Strategic Plan*

Like its predecessors, the 2016-2018 Plan includes multiple parts that taken together as an integrated whole describe the PAs' strategy for acquiring all cost-effective energy efficiency resources through a sustained effort. The provisions of the entire Plan must be considered as a whole in order to fully appreciate and understand both the PAs' energy efficiency programs and their strategy for satisfying the mandates of the GCA over the next three years.

While detailed, a Three-Year Plan is a strategic plan, not an implementation guide. This strategic plan approach provides the PAs with the flexibility necessary to make implementation changes to meet changing circumstances in order to deliver on their Plan goals and satisfy the GCA. Each PA retains the flexibility during the implementation of a Three-Year Plan to make modifications without Department or Council approval. A PA may adjust spending, add or subtract program measures, and make ongoing revisions and enhancements after the adoption of the Three-Year Plan in order to reflect in-the-field conditions, technological advances, financing opportunities, and state-of-the-art new technologies. PAs will seek Department and Council review and approval for modifications requiring such approval as set forth in the Department's Guidelines, as revised in Energy Efficiency Guidelines, D.P.U. 11-120-A, Phase II (2013) ("Guidelines").

### 2. Energy Efficiency Advisory Council

#### *a. Introduction*

For each three-year term the Program Administrators are required to submit to the Council a statewide energy efficiency plan on or before April 30<sup>th</sup> of the year prior to implementation. The GCA specifies the contents of the plan and requires that the plan be prepared by the Program Administrators in coordination with the Council. G.L. c. 25, § 21(b)(1)-(2). As part of the plan approval process, the GCA requires the Council to maximize benefits and achieve its goals through "a sustained and integrated statewide energy efficiency effort." G.L. c. 25, § 22(b).

To meet these statutory requirements for the 2016-2018 Plan term, the Program Administrators worked collaboratively to prepare an integrated statewide Plan that represents the collective efforts and objectives of the Program Administrators. The PAs also coordinated with the Council, participating in the processes developed by the Council for providing input on the 2016-2018 Plan. On April 30, 2015, the Program Administrators submitted the initial draft 2016-2018 Plan for the Council's comment and approval. After receipt of the April 30<sup>th</sup> draft Plan, the Council had three months to review it and submit "approval or comments" to the PAs. G.L. c. 25, § 21(c). The Council approved a resolution on the April 30<sup>th</sup> draft Plan on July 21, 2015.

The PAs have been active and engaged participants in the Council process since its inception in 2009. Between 2009 and 2012, the PAs participated in at least 79 meetings of the full Council and/or its Executive Committee. From 2013 to the time of this Plan, the PAs have participated in at least 116 meetings of the full Council, its Executive Committee, its database subcommittee/working group, and/or planning workshops. In 2012, the Council membership was expanded, adding both voting and non-voting members. In 2015, membership in the Council's Executive Committee was also expanded by adding a Commercial and Industrial ("C&I") seat, replacing a low-income seat with a consolidated residential and low-income seat, and by formalizing a seat for the PAs. While these expansions have broadened the input on plan development and implementation, they have also increased the complexity of the Council dynamics and the time and effort the PAs must invest in responding to Council and individual councilor inquiries.

#### *b. Council Priorities*

In its January 13, 2015 Draft Priorities for 2015, the Council articulated a priority related to the 2016-2018 Plan, stating that the Council should "relay clear Council priorities and recommendations to the Program Administrators for inclusion in the 2016-2018 Three-Year Plans." The PAs worked with the Council on the 2016-2018 Plan and achieving all available cost-effective energy efficiency by maximizing net economic benefits through a sustained and integrated statewide energy efficiency effort, setting aggressive and achievable goals and addressing barriers to energy efficiency, while staying focused on bill impacts, cost efficiency and integrated program delivery.

#### *c. Council Workshops*

In February and March 2015, the Council conducted a number of sector-related workshops, facilitated by Raab Associates, Ltd., to assist in the development of the 2016-2018 Plan. The PAs were active and engaged partners in the development of meeting materials and in the workshops. There were three C&I workshops, three residential workshops, and one multi-family/low-income workshop. These workshops assisted the Council in developing recommendations for its Resolution dated March 31, 2015.

After the filing of the April 30<sup>th</sup> draft Plan, the Council held two follow-up workshops in June 2015 to allow for further stakeholder engagement and discussion of program designs. There was one residential/low-income workshop and one C&I workshop. The PAs provided

insights and answered questions at these workshops. These workshops assisted the Council in developing recommendations for its Resolution dated July 21, 2015.

*d. Council Resolution of March 31, 2015*

On March 31, 2015, the Council adopted a “Resolution Concerning Its Priorities for the Development, Implementation, and Evaluation of the 2016-2018 Three-Year Energy Efficiency Plans.” See Appendix E. This Resolution articulates the Council’s priorities for the 2016-2018 Plan and makes 150 specific recommendations based upon the Council workshops. The PAs closely reviewed these recommendations and incorporated many of the themes and comments into the program design for the April 30<sup>th</sup> draft Plan.<sup>17</sup> Many of the topics in the recommendations were discussed at the June Council workshops. While the PAs did not adopt each and every recommendation in the April 30<sup>th</sup> draft Plan, the recommendations were valuable to the PAs in developing program designs that they believe will keep Massachusetts at the forefront of energy efficiency design in the nation. Working with DOER and Raab Associates, the PAs developed a matrix that gives feedback on each of the Council’s 150 specific recommendations. See Appendix F (matrix dated May 25, 2015).

*e. Council Resolution of July 21, 2015*

In accordance with the GCA, “the [C]ouncil shall review the plan and any additional information and shall submit its approval or comments to the electric and natural gas distribution companies and municipal aggregators not later than 3 months after submission of the plan.” G.L. c. 25, § 21(c). On July 21, 2015, the Council adopted a resolution entitled “Comments regarding the April 30<sup>th</sup> draft 2016-2018 Energy Efficiency Plan.” See Appendix G. This Resolution articulates the Council’s priorities for the 2016-2018 Plan and makes over 100 specific recommendations and other comments based upon the comments from councilors, stakeholders, legislators, and Council consultants provided during various Council meetings, including two public comments sessions of the Council and nine Council workshops. Like the previous Council recommendations, the PAs have carefully reviewed the Council’s July 21<sup>st</sup> recommendations and incorporated many but not all of the themes and comments into the September draft plan.<sup>18</sup> The PAs appreciate the Council’s thoughtful feedback on the April plan and believe that, together with the Council’s input, they have developed comprehensive and innovative program designs that will continue to set the standard for the rest of the nation. For ease of reference, the PAs developed a matrix that provides feedback on each of the over 100 specific recommendations in the Council’s resolution. See Appendix H (matrix dated September 23, 2015). The PAs look forward to continuing to discuss the Council’s

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<sup>17</sup> As expressly stated in this Resolution, the Council developed “recommendations,” consistent with the Council’s advisory role under the GCA, but they were not a consensus view of the Council. See Minutes of March 31, 2015 Council Meeting.

<sup>18</sup> As expressly stated in this Resolution, the Council made “recommendations,” consistent with the Council’s advisory role under the GCA. In addition the Resolution makes clear that the recommendations are not a consensus view of the Council, stating that they “may not represent the opinion or position of every Councilor on certain issues, but on the whole, the Council has determined that the recommendations should be considered and addressed in the Revised Plan.” July 21, 2015 Resolution at 5; see also Minutes of July 21, 2015 Council Meeting.

recommendations in a collaborative and productive manner consistent with both the mandate of the GCA and the rich history of stakeholder discussions that are the hallmark of energy efficiency in Massachusetts.

*f. Term Sheet*

Following the July 21<sup>st</sup> Resolution of the Council, the PAs collaborated with the Council's consultants, along with the Executive Office of Energy and Environmental Affairs, DOER, and the Office of the Attorney General, to further discuss goals, budgets, and key priorities. As a result of these discussions, the PAs, DOER, and the Attorney General were able to agree upon the Term Sheet. See Appendix D (Term Sheet). The Term Sheet sets forth fundamental core goals for 2016-2018 that have served as a guide for the PAs in developing this Plan.

*g. Council Resolution of October 26, 2015*

In September and October 2015, the Programs Administrators continued to work collaboratively with the Council consultants and individual councilors to incorporate key priorities, and the goals and budgets reflected in the Term Sheet into the Plan. On October 26, 2015, the Council adopted, by a 14 to 1 super-majority vote, a Resolution commending the PAs, strongly supporting the 2016-2018 Plan, and respectfully requesting that the Department of Public Utilities approve the Plan. See Appendix I. The Program Administrators express their appreciation for the efforts of each councilor and the Council consultants. The ability to achieve such an overwhelming consensus on a Plan as complex and with as many moving parts as this one, reflects a signature achievement for the Commonwealth.

3. Department of Public Utilities

*a. Introduction*

In accordance with the GCA, the Program Administrators submit their 2016-2018 Plan "together with the [C]ouncil's approval or comments and a statement of any unresolved issues, to the [D]epartment," for approval no later than January 31, 2016. Since the Department reviews each PA's Three-Year Plan individually, these filings also include company-specific information. Additionally, for the 2016-2018 Plan the Department has requested that the PAs respond to certain questions set forth in the Department's Revised Additional Filing Requirements dated October 2, 2015. Responses to these questions are set forth in each PA's pre-filed testimony and in Appendix X.

*b. All Cost-Effective or Less Expensive than Supply*

In approving a Three-Year Plan, the Department is seeking to mitigate capacity and energy costs for all customers "through all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." G.L. c. 25, § 21(a). The Department is charged with ensuring that the PAs "have identified and shall capture all energy efficiency and demand reduction resources that are cost effective or less expensive than supply." G. L. c. 25, § 21(d)(2). To comply with the GCA, a Three-Year Plan must provide for the

acquisition of these resources “with the lowest reasonable customer contribution.” G.L. c. 25, § 21(b)(1).

In developing their 2016-2018 Plan, the PAs considered what an optimal pace is for acquiring all cost-effective energy efficiency resources for the period from 2016 to 2018, in order to ensure long-term sustainability for their energy efficiency program offerings. In developing savings goals for 2016-2018, the PAs took into consideration the four factors set forth in Section II.D.1.a, above, as well as rate and bill impacts on their customers. The PAs provide detailed information on the development of their goals in Section III, as well as their individual benefit/cost ratio (“BCR”) models, demonstrating that they are seeking to acquire all cost-effective energy efficiency resources for the 2016-2018 term.

*c. Program Cost-Effectiveness*

The GCA specifically requires cost-effectiveness screening for energy efficiency programs. G.L. c. 25, §§ 19(c), 21(b)(3).<sup>19</sup> The Department has determined that a Total Resource Cost (“TRC”) test that weighs the impact of societal benefits and costs associated with each program satisfies this requirement D.P.U. 08-50-A at 14; Guidelines § 3.4.3. The TRC test operates by weighing all program costs and benefits. Benefits calculations include the cost of energy supply that is avoided when energy efficiency efforts are utilized and therefore the TRC test satisfies the GCA’s requirement that energy efficiency programs be less expensive than supply. D.P.U. 08-50-A at 14-15.

For the 2016-2018 Plan, the PAs applied the results of the regional Avoided Energy Supply Costs in New England: 2015 Report (“2015 AESC”), which was completed on March 27, 2015 and revised on April 3, 2015, and is attached hereto at Appendix J.

*d. Program Authorization and Delivery*

In authorizing energy efficiency programs, the Department must ensure that the PAs are: “[1] deliver[ing] programs in a cost-effective manner capturing all available efficiency opportunities [2] minimizing administrative costs to the fullest extent practicable and [3] utilizing competitive procurement processes to the fullest extent practicable.” G.L. c. 25, § 19(a, b). The PAs have addressed each one of these issues throughout the Plan, and specifically in Sections V.A, V.D, and V.E, below.

*e. Program Funding*

*i. Funding Sources*

The PAs seek to leverage available funding sources and financing initiatives in order to increase the benefits of Three-Year Plans and minimize customer bill impacts. For electric PAs,

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<sup>19</sup> The GCA requires energy efficiency programs included in PAs’ Three-Year Plans to “be screened through cost effectiveness testing which compares the [economic] value of program benefits to the program costs to ensure that the program is designed to obtain energy savings and system benefits with value greater than the costs of the program.” G.L. c. 25, 21(b)(3).

the GCA identifies four specific funding sources for energy efficiency programs: (1) revenues collected from ratepayers through the System Benefit Charge (“SBC”); (2) proceeds from the PAs’ participation in the Forward Capacity Market (“FCM”); (3) proceeds from cap and trade pollution control programs, including but not limited to the Regional Greenhouse Gas Initiative (“RGGI”); and (4) other funding as approved by the Department, including revenues to be recovered from ratepayers through a fully reconciling funding mechanism (*i.e.*, an energy efficiency surcharge (“EES”)). G.L. c. 25, §§ 19(a); 21(b)(2)(vii). For gas PAs, the GCA does not identify multiple funding sources for energy efficiency programs and instead requires the gas PAs to include a fully reconciling funding mechanism to collect energy efficiency program costs from customers (*i.e.*, EES). G.L. c. 25, § 21(b)(2)(vii); see also G.L. c. 25, § 21(d)(2). For a detailed discussion of the funding sources and financing initiatives that are currently available to the PAs, please refer to Section VI, below.

#### ii. Funding Allocation

Consistent with the Department’s Guidelines, the Program Administrators allocate SBC, FCM, and RGGI revenues to each customer sector in proportion to the kWh consumption of each class. The low-income sector is allocated at least ten percent of the funds for electric energy efficiency programs and 20 percent of the funds for gas energy efficiency programs pursuant to G.L. c. 25, § 19(c).

#### iii. Funding Mechanism

The EES is a fully reconciling funding mechanism that the Department approves for funding the Three-Year Plans. G.L. c. 25, § 21(d)(2). Electric Program Administrators collect the EES through Energy Efficiency Reconciliation Factor (“EERF”) or Energy Efficiency Program Cost Adjustment (“EEPCA”) tariffs. Guidelines §§ 2(9), 3.2.1.6. For gas Program Administrators, the EES is collected through the local distribution adjustment clause (“LDAC”) tariff in accordance with established Department practice. Guidelines §§ 2(9), 3.2.2. The EERF/EEPCA and LDAC filings of the PAs are separate proceedings from the Three-Year Plan proceeding and are implemented on schedules that vary among the PAs.



### **III. STATEWIDE PROGRAMS**

#### **A. Strategic Overview of Residential, Low-Income, and C&I Programs**

The Commonwealth of Massachusetts has achieved national recognition for its leadership in energy efficiency policy and programming, ranked as the top state in the nation by American Council for an Energy-Efficient Economy (“ACEEE”) for the past five years running. The Program Administrators’ comprehensively designed and implemented energy efficiency programs operate day to day to deliver energy efficiency savings and benefits for Massachusetts businesses and consumers.

The PAs provide programs to three core sectors: Residential, Low-Income, and C&I. Within the residential sector, the PAs offer two programs: Whole House and Products, comprised of a total of seven core initiatives. PAs support the Low-Income sector with Whole House programming, delivered through two core initiatives targeting single family (1-4 unit) and multi-family buildings. The C&I sector is served by two programs, Retrofit and New Construction, with six tailored core initiatives within the programs. The Residential and C&I programs coordinate closely and are served by the Statewide Marketing and the Evaluation Management Committees. The Low-Income sector coordinates closely with LEAN.

The first Three-Year Plan (2010-2012) built upon a strong foundation of the efficiency programs that had been offered for years in the Commonwealth, but which revolutionized the scale and pace of efficiency programming. Lessons from that first Three-Year Plan led to significant expansion, including program re-design with multiple enhancements and additions. Those programming updates succeeded in broadening participation across sectors, increasing savings, and delivering unprecedented benefits for participants. In the second Three-Year Plan (2013-2015), the PAs continued to build on successful programs and strategies and make improvements to reach additional customers and seek deeper and broader energy efficiency opportunities. Over both terms, the PAs have consistently achieved record-setting levels of savings and participation, and in 2014 achieved greater than 100 percent of plan savings and benefits goals across gas and electric programs.

In reviewing the 2016-2018 Plan, it is critical that the energy efficiency community considers and celebrates the historic achievements of the PAs’ energy efficiency programs, and the contributions of multiple stakeholders, including the Council, the DOER, the Department, the Attorney General, and LEAN, to these achievements. At the same time, it is necessary to acknowledge that many market factors, including more stringent codes and standards, the saturation of certain markets, and lower avoided costs, will naturally lead to a leveling off of savings and higher costs to secure additional kilowatt hour and therm savings. Recognizing these pressures on costs, PAs remain ever-conscious of the trust invested in PAs to deliver solid efficiency investments without creating undue bill impacts. PAs also remain committed to maintaining the stability of the robust efficiency infrastructure that has been built; most critically the network of energy efficiency vendors, contractors, installers, distributors, and manufacturers which form the backbone of the PA program delivery.

To address these pressures and commitments, the PAs have focused this Three-Year Plan on optimizing program potential by balancing investments to maximize benefits against a

consistent, reasonably and moderately increased, funding scenario. This approach will require continued adaptation through market segmentation, effective targeting, streamlining, and improving access and program processes, along with ongoing review and inclusion of new efficiency technologies. PAs remain committed to continuously broadening and growing a competitive delivery workforce of participating vendors and contractors, and investigating and exploring program modifications through field tests and evaluations of novel approaches.

The 2016-2018 Plan also seeks to maintain the PAs' commitment to ensuring the highest quality customer experience. Ultimately, this customer experience is the cornerstone on which the programs must be built to ensure continued enthusiasm and support for securing energy efficiency as the Commonwealth's first and lowest cost fuel.

## **B. Sustainable Infrastructure**

The Massachusetts model of Program Administrator delivery of energy efficiency programming has proven highly successful in building a robust energy efficiency industry. According to the 2014 Massachusetts Clean Energy Industry report<sup>20</sup> there are 65,000 workers and more than 4,000 firms working in the Massachusetts energy efficiency industry, representing a 35.6 percent growth in the number of firms conducting energy efficiency work since 2013. Energy efficiency employment makes up half (50.9 percent) of jobs at startups working on pre-commercialized technologies. The PA programs have broadened the ability of market actors to participate in energy efficiency programming. Partners have been able to grow businesses and continue to invest in growth based on the confidence that they, and their customers, have in the energy efficiency regime. The continued strength and growth of this energy efficiency industry is reliant on consistency in programming and a stable budget; this Plan provides the necessary predictability and stability, consistent with multiple comments and suggestions from contractors, including those offered at the Council's January and May stakeholder input meetings. The PAs remain committed to supporting the Massachusetts energy efficiency infrastructure with continued rigorous program design, evaluation, and delivery, while avoiding large shifts in direction or budget. The PAs will continue to optimize systems and expand offerings while recognizing the key role that PA partners play.

## **C. Mechanisms for Program Collaboration, Continuous Improvement, and Sharing and Incorporation of Best Practices Information**

### **1. The Residential and C&I Management Committees**

A central theme running through each generation of Three-Year Plans has been the ongoing PA commitment to work collaboratively on a daily basis to ensure that: (a) all eligible customers in Massachusetts experience seamless programs, with common application procedures, incentives, and supportive educational and technical services; and (b) those programs are subject to continuous improvement in order to retain their status as among the best in North America.

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<sup>20</sup> Available at: <http://www.masscec.com/content/2014-clean-energy-industry-report>.

Before the first Three-Year Plan was submitted, the PAs developed informal working groups that brought together the respective residential and commercial program managers from every gas and electric company and energy efficiency service provider in the Commonwealth. Tasked with transitioning to an integrated statewide program portfolio, these working groups focused on producing the initial uniform administrative procedures, developing supporting materials for seamless program delivery across fuels and across service territories, and maintaining consistent messaging to customers, trade allies, manufacturers, market actors, and market channels.

However, managing and delivering a statewide portfolio of programs is an ongoing and dynamic exercise. Programs must evolve and respond in real-time to a myriad of forces, such as changing consumer dynamics and expectations, the appearance of new efficiency technologies in the market, price and baseline changes to existing technologies, as well as the impact of the general economy, which strongly influences the nature and degree of program participation. In order to facilitate efficient and timely program decision-making the successful informal structures of the working groups were formalized into a Residential Management Committee (“RMC”) and a C&I Management Committee (“C&IMC”). Each committee developed a formal written charter to ensure that the roles and responsibilities of the committee and its members were understood by all PAs. To ensure efficient resolution of issues that come before them, each PA has delegated decision-making authority to their committee representative. Each committee has a chair or lead, who speaks for the PAs collectively on program matters, and a coordinator to assist in organizing committee activities and performing administrative tasks, such as memorializing the record of committee decisions and ensuring that decisions that impact program delivery are disseminated to every PA.

The management committees may delegate some tasks to various expert technology teams, individual experts, the Massachusetts Technical Assessment Committee (“MTAC”), or any other ad-hoc or permanent subgroups they may establish. The committees may also use contractors to facilitate specific elements of their work where internal capacity or expertise is insufficient or where an independent view is valued.

Each management committee works to ensure that: (a) all PAs remain abreast of the key activities of other PAs; (b) implementation activities and efforts by all PAs are integrated and coordinated to the optimal extent; (c) statewide marketing and media campaigns are developed with easy-to-understand communications that serve eligible customers; (d) evaluation and market assessment studies are reviewed and program modifications are executed accordingly; (e) program policy and implementation issues are resolved collectively, and decisions are communicated to each PA’s staff to ensure uniform application; and (f) program best practices, technology innovations, and integration/coordination efforts in other jurisdictions are reviewed and incorporated as appropriate.

In addition to enhancements to existing programs and initiatives, new programs and initiatives are designed by the management committees, with input from the appropriate working

groups, internal subject matter experts, and a variety of “best practices” resources.<sup>21</sup>

With respect to low-income efforts, LEAN has convened the highly effective Low-Income Best Practices Group to coordinate practices across all PAs and agencies. The Low-Income Best Practices group continues to offer opportunities for various stakeholders to discuss program implementation, new measures, innovative strategies, and other matters related to the PAs’ low-income programs.

## 2. The Massachusetts Technology Assessment Committee

MTAC reviews new technologies that have the potential to cost-effectively save energy. MTAC is both a proactive and a reactive body, and consists of key technical staff from among the PAs. The committee addresses both residential and commercial/industrial technologies, drawing on the subject matter experts from the committee, PA staff, or outside expertise as necessary. It establishes and publishes threshold technical requirements that must be met to qualify products or processes as eligible for program incentives. It documents its findings in a standardized manner and disseminates them to the PA program managers, technical staff, account managers, and outside parties such as vendors, customers, and other interested parties, as appropriate.

The MTAC is the authority for consistent program interpretation of technical matters and provides information, documented technical interpretations, and technology assessments to the PAs. The committee has developed a set of protocols for the content of their review and procedures for documenting and disseminating their conclusions and technical interpretations. These protocols are publicly available on MassSave.com.<sup>22</sup> The MTAC meets as needed, either as a whole committee or in ad hoc technology or issue-specific subgroups, and more regularly during the annual program review and planning period.

In accordance with the October 26<sup>th</sup> Resolution, the Program Administrators commit to providing semi-annual updates to the Council on the PAs’ progress reviewing and implementing new technologies into programs.

## 3. Ongoing Commitment to Innovation and Technology

The Program Administrators have been national leaders in their commitment to innovation, and the development and deployment of cutting-edge new technologies. As part of the Term Sheet, the PAs, EEA, DOER, and the Attorney General have prioritized the importance of this commitment as follows:

The Council and the PAs agree on the importance of implementation of new technologies and program approaches. The PAs are committed to increasingly

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<sup>21</sup> Examples include the recent Retro-commissioning best practices study conducted in conjunction with the Council consultants, and a review of emerging program and technology trends conducted by E Source for both the C&IMC and the RMC.

<sup>22</sup> MTAC materials can be found here: <http://www.masssave.com/professionals/business-opportunities/assessment-of-new-efficiency-technologies>.

develop and deploy new technologies, delivery models and business strategies with performance-based results that are appropriate for the customers and that are proven to be cost-effective. The Plan will reflect a continuous commitment by the PAs to exploring and adopting cost-effective innovations and new technologies in the residential, low-income and C&I sectors. In addition to specific efforts identified in the Plan, the PAs commit to continuous collaboration on innovation, including appropriate program updates and evaluation efforts with the Council.

#### D. **Engaging Third Party Stakeholders**

The PAs are constantly engaged with a myriad of stakeholders. Every day the PAs hear from and respond to residential and commercial customers, program participants, contractors, service providers, equipment manufacturers and distributors, trade and professional associations, legislators and regulators, environmental and community advocates, civic leaders, business owners and organizations, and other interested parties. Every citizen and every business has an interest and a stake in the effectiveness of the portfolio of Massachusetts energy efficiency programs because energy costs touch and affect every person and business in the Commonwealth.

The energy efficiency programs are designed and administered by the public utilities and energy efficiency service providers, which are open to input from members of the public. Massachusetts citizens and other interested parties are able to voice their views through existing and established public oversight processes. The Council, which represents a broad spectrum of stakeholder interests, has facilitated additional organized venues for individual and organizational input specific to the content of the Three-Year Plan through a series of topic area-specific public workshops and a number of general public hearings. The DOER has also invited and received comment and plan suggestions from all the cities and towns in the Commonwealth. All of the comment and input collected from these various forums has been reviewed closely by the PAs, and much of it has been reflected in this plan document. An additional opportunity for stakeholder input exists after the plan has been reviewed by the Council and forwarded to the Department. The Department's regulatory processes are open to any interested parties.

On a continuing basis, there are a variety of other structured or semi-structured events, venues, or processes through which stakeholder input is encouraged. For example:

- **Annual open houses for trade allies/vendors.** Every year the PAs host several large statewide events for the express purpose of presenting and explaining program changes and updates to the business partners the PAs depend on to deliver their various programs to customers. Attendees have ample opportunity to network with each other and PA staff, and to engage in a dialog about program design and operations.
- **Best Practices Working Group.** This group is constituted of a subset of the HES contractors elected annually by their peers, as well as the PAs, and the Lead Vendors. The members meet monthly to provide continuous feedback for the improvement of the program across the state. Topics discussed have ranged from refining the QA/QC process, and adopting new measures such as spray foam to pricing and training.

- **The Proposal process.** The PAs provide a structured process by which any third-party organization can propose a program concept or proposal to supplement or enhance the PAs approved programs to the management committees. The criteria and two-step process for considering a proposal is clearly articulated. This process, while open, is rigorous and applicants must demonstrate that their concept can demonstrate and produce cost-effective and incremental savings beyond the approved program designs.<sup>23</sup>
- **The Massachusetts Technology Assessment Committee Process.** The clearly-articulated and open process by which MTAC reviews submitted technologies provides a level playing field. Any manufacturer or vendor of an emerging or newly-commercialized efficiency technology can make a science-based case for acceptance of their product into the PA incentive offerings.
- **Informal PA speakers' bureau.** PA representatives are regularly called upon to represent and explain the programs to trade and civic associations. Industry associations, like the Massachusetts Restaurant Association and the Massachusetts Lodging Association, seek knowledgeable speakers to explain how the programs can work for their members and provide relevant case study examples from their industry.
- **Proactively solicit input from customer and industry experts.** The PAs routinely seek input from key constituencies when they are considering program design changes or considering new product innovations. For example, Eversource recently completed a field trial of a new commercial laundry product in partnership with the product manufacturer and a customer – in this case, a hotel. The PA needed to establish that the product met the customer's priority need (*e.g.*, clean, white guest sheets and towels) before promoting the energy and water saving attributes.
- **Input and advice from peer programs.** The delivery of energy efficiency programs throughout the country is largely a collaborative and congenial business. PA program managers have come to know their peers in other leading jurisdictions around the country, and consider each other stakeholders in a shared mission of improving the efficiency of homes and businesses in the United States and reducing our collective carbon footprint. This means that emerging program ideas and best practices are freely shared. Massachusetts program managers test program concepts and share evaluation results and technical information with their counterparts, and receive feedback which is built into new program designs or improvements to existing ones.
- **Provide collateral materials for customer events.** Individual PAs routinely offer stakeholders significant volumes of program collateral for distribution at local community and trade association meetings.

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<sup>23</sup> The documents related to the proposal process are available at <http://www.massave.com/professionals/business-opportunities/process-for-managing-unsolicited-proposals>.

**E. Residential Programs**

**1. Overview of Residential Programs – Whole House & Products**

Massachusetts Program Administrators deliver the most comprehensive programs in the nation, with program and product offerings for every type of residential customer and every type of residential energy efficiency opportunity. The PAs’ residential programs are designed to provide cost-effective energy efficiency savings opportunities to Massachusetts residential electric and gas customers. The programs address a range of building types, including both the traditional free-standing single-family home and the wide variety of multi-unit residential structures, from the iconic “triple decker” to mixed-use high rises to townhouse developments. The residential programs serve new construction and retrofit markets, and are responsible for ensuring that services are available to all residential sectors, including low-income.<sup>24</sup> The PAs have been offering residential programs for over 20 years.

There are two programs, Residential Whole House and Residential Products. The Whole House program targets residential single-family and multi-family dwellings, comprehensively addressing energy efficiency opportunities in the entire home or facility. Multiple core initiatives (New Construction, Home Energy Services, Multi-Family Retrofit, and Behavioral/Feedback) fall under the Whole House program. These initiatives

Whole House Program Core Initiatives	Products Program Core Initiatives
New Construction	Heating & Cooling Equipment
Home Energy Services	Consumer Products
Multi-Family Retrofit	Lighting
Behavior/Feedback	
Low Income Whole House Program	
	Single Family
	Multi-Family

allow for variations in program delivery and marketing that address specific moments in building life cycle, customer type, or market demand. Together these initiatives ensure that the Whole House Program is available to all customers and building types with targeted yet comprehensive energy efficiency services.

The Products program complements the Whole House program by focusing on optimizing the efficiency of lighting, heating and cooling equipment, and energy-consuming products that are introduced to the residential consumer market, whether they are sold by contractors or sold directly to consumers through big box stores, hardware stores, wholesale clubs, discount chains, and other retailers. The high visibility of the Products program across all sales channels provides tremendous marketing value and ensures that customers who do not take advantage of in-home services are able to easily participate in Mass Save<sup>®</sup> energy savings opportunities. PAs work with retailers, manufacturers, distributors, and trade allies within each

<sup>24</sup> The Green Communities Act requires that low-income residential demand side management and education programs be implemented through LEAN.

of the Products program's core initiatives (Lighting, Consumer Products, and Heating and Cooling Equipment) to ensure the highest-quality energy-efficient products are introduced and promoted to the residential consumer market. The Whole House and Products programs are tightly coordinated to ensure that innovations in technology and market dynamics are shared and leveraged. The PAs also work to provide consistent messaging and easy access for customers through coordinated marketing and the Mass Save<sup>®</sup> website.

## 2. Residential Highlights

The residential programs have historically met or exceeded their targets for participation, savings, and benefits statewide. The Whole House program has deployed highly effective participation paths, particularly in the HES core initiative. The HES core initiative generates greater participation rates than any other whole-house program nationwide, while maintaining high savings-realization rates. The Products program provides a broad opportunity to serve all customers, touching any customer who has purchased an efficient bulb or appliance. The Products program successfully leverages a complex array of delivery channels and partners to encourage Massachusetts consumers to install high efficiency technologies, including lighting, consumer products, heating, cooling, and water heating.

Much of the success of the last three years is due to the strong partnerships the PAs have developed with their network of vendors, contractors, manufacturers, distributors, and stakeholders. This network works alongside PA program staff to help PAs better understand their markets, identify new ideas, and support innovation in technologies and delivery systems.

The Council structure has offered a rich forum for exploring ideas. Several key successes noted as highlights below stemmed from a shared commitment by PAs and the Council to expanding and deepening participation by all customer segments, growing the qualified energy efficiency workforce, and securing cost effective energy efficiency for Massachusetts energy consumers. These successes will be key building blocks on which the shared priorities of the PAs and Council can be realized while maintaining Massachusetts' leadership in bringing cutting edge technologies into program design, ensuring customer acceptance and maintaining cost effectiveness.

The deployment of the online assessment tool and the incredible success of the Mass Save<sup>®</sup> Facebook page (which currently has more likes than ENERGY STAR<sup>®</sup>) speaks to the on-going commitment of PAs to reach out broadly and provide effective and creative entry points for customers. The on-line assessment effectively provides customers with a no-cost home energy score card, tied directly to customer-specific actionable Mass Save<sup>®</sup> energy efficiency opportunities specific to the resident's circumstances, all from the comfort of their keyboard and at their leisure. The existing online assessment tool and resulting scorecard provides a cost-effective, customer-centric approach, and addresses the Council's interest in ensuring that customers have access to actionable home energy scorecards.



## Residential Highlights — 2013-2015

Customer Focus	Technology	Program Design
<ul style="list-style-type: none"> <li>✓ Increased customer awareness of programs</li> <li>✓ Social media outreach: over 110,000 Facebook fans (More than ENERGY STAR) and nearly 15,000 Twitter followers</li> <li>✓ Mass Save<sup>®</sup> Online Assessment with digital path to HES</li> <li>✓ Increased use of Multi-Family Market Integrator</li> <li>✓ Expansion of HEAT loan program</li> </ul>	<ul style="list-style-type: none"> <li>✓ LED testing</li> <li>✓ LED promotion through award winning marketing</li> <li>✓ LED bulbs installed per household realized through bulk procurement</li> <li>✓ Wireless-enabled thermostats</li> <li>✓ Behavioral programs</li> </ul>	<ul style="list-style-type: none"> <li>✓ HES redesign</li> <li>✓ Early boiler, furnace, and air-conditioning rebates</li> <li>✓ Low cost pre-weatherization</li> <li>✓ Deeper-energy savings incentives</li> <li>✓ Contractor Best Practices working group</li> <li>✓ Evaluation of Efficient Neighborhoods<sup>+</sup><sup>®</sup> and review of Renew Boston</li> <li>✓ Builder education on efficient building practices</li> <li>✓ Multi-Family High Rise path in new construction</li> </ul>

### *a. Customer Focus*

- Increased customer awareness of programs, with 77 percent of customers agreeing that Mass Save<sup>®</sup> communicates how to lower energy bills, and 83 percent finding the Mass Save<sup>®</sup> campaign messaging clear and relevant. A majority of residential customers report awareness of the Mass Save<sup>®</sup> website, and 30 percent report using the website more than once in the past year.
- Built a strong social media presence over the 2013-2015 term, with over 110,000 Facebook fans (<https://www.facebook.com/MassSavers>) and nearly 15,000 Twitter followers (<https://twitter.com/masssave>).
- Jointly procured an industry-leading online assessment solution and configured it to meet the unique needs of Massachusetts consumers. This included a first-in-the-nation approach to displaying appropriate PA-specific information while maintaining the Mass Save<sup>®</sup> branding and enabling effective data sharing across PAs.
- Implemented the online assessment to introduce a digital path to participation in the HES program, while identifying opportunities for customers who may not be best served via HES. This easy-to-use tool gives customers a better sense of whether their home can benefit from the initiative, provides a high-level estimate of the potential savings that can be achieved, and identifies other opportunities they can pursue, all from the comfort of their home (or connected device) in under ten minutes.

- Increased access and use of the central point of contact, Multi-Family Market Integrator (“MMI”) for customers of the Multi-Family Retrofit offerings. In 2012, there were 1,570 incoming calls to the MMI. In 2014, this number grew to 8,360. This increase in volume tracks the increased marketing with trade associations and coordination with account executives and other initiatives.
- Partnered with the local lending community to grow the Mass Save<sup>®</sup> HEAT loan initiative, the most successful initiative of its kind in the nation, growing from 532 loans in 2006 to over 11,000 loans in 2014 (annual). Since its inception, the Mass Save<sup>®</sup> HEAT loan has made over \$200,000,000 available to thousands of homeowners implementing home energy efficiency improvements.

*b. Technology*

- Maintained leadership in testing and promoting LED technology in residential applications. Since 2008, several PAs have worked with the Department of Energy to test high quality LEDs in homes in the Commonwealth. Learning from its experience in the early promotion of compact-fluorescent lamps (“CFLs”), the PAs focused on LED lumen output, color, and dimming, among other desirable qualities for residential applications.
- Maintained leadership in a lighting program that has exponentially increased the number of LED sales and the breadth of LED types offered.
- Increased penetration of LED lighting technology through award-winning marketing campaigns promoting aggressive markdowns and buy-downs in retail outlets.
- Released a request for proposals (“RFP”) to procure high-quality lighting through bulk purchase for Whole House initiatives. The effort dramatically reduced costs for the PAs while allowing them to install LEDs at a much more rapid pace than was originally planned.
- Offered rebates for wireless-enabled thermostats. The PAs completed a successful evaluation of the emerging wireless-enabled thermostats, becoming the first-in-the-nation energy-efficiency program to add a savings value to the TRM based on rigorous evaluated field results. Some PAs have begun to offer direct installation of wireless-enabled thermostats in the Whole House program; other PAs are exploring similar offers.
- Implemented one of the earliest and most comprehensive residential-behavioral programs in the country. Building off multiple early experimental designs, several PAs have been able to go to scale on behavioral program deployment, allowing for significant annual savings.

*c. Program Design*

- Implemented the redesigned HES program, expanding contractor participation in the program and supporting employment growth, contractor quality, and consumer value.

- Deployed early boiler, furnace, and air-conditioning rebates, demonstrating the ability to seamlessly integrate gas and electric initiatives.
- Offered special incentives to help customers overcome low-cost pre-weatherization barriers.
- Created the deeper-energy-measures offer to support customers seeking to super-insulate exterior walls, floors over a garage, or cathedral ceilings in retrofit applications.
- Convened the Contractor Best Practices working group forum to support regular communication between PAs, HES lead vendors, Independent Installation Contractors (“IICs”), and Home Performance Contractors (“HPCs”), resulting in several innovations and improvements, including a formal pricing-review process, support for training and marketing, and development of performance standards.
- Began evaluation of Efficient Neighborhoods +<sup>®</sup> and review of Renew Boston field trial to better understand how to increase access and secure savings for moderate-income residential customers and renters.
- Supported education of the builder market and promotion of efficient building practices, resulting in the average tier three (highest incentivized level) new construction homes achieving 50 percent savings, with some builders going all the way to net zero.
- Led the efficiency industry with deployment of the Multi-Family High Rise path in new construction, integrating Commercial and Industrial program expertise and Residential program expertise on the Joint Management Committee.

### 3. New and Innovative in 2016-2018

The focus for the residential programs in this next Three-Year Plan is to capitalize on growth and enhancements made in 2013-2015 through targeted optimization efforts for program delivery, marketing, and new technology deployments. The PAs are using the following six high-level principles to prioritize and deploy program innovations in the 2016-2018 Plan:

- Streamline the customer experience where possible.
- Maximize integration and cross-promotion between programs and among initiatives.
- Increase the use of technology and information tools to put customers in charge of their energy use.
- Adjust rebates and incentives to support energy savings, cost efficiency, and cost effectiveness goals.
- Increase customer awareness to continue increasing customer participation.
- Leverage and protect the robust energy-efficiency workforce built over the past two plan periods, while taking steps to grow the existing workforce via training/outreach.

Each program core initiative is described in detail below. For each core initiative “New Enhancements” are outlined in detail.

Carefully considering the wealth of interesting ideas brought forward—whether from internal PA processes, from EM&V studies, from the Council Workshops and the resulting recommendations, or from other stakeholders and partners—has resulted in a rich set of program enhancements.

This dialog during the planning year, combined with rigorous application of the six principles above, has spurred planning for the introduction of a possible breakthrough—a **renter-specific visit**. The PAs will offer a program enhancement that provides effective screening and direction of renters to a specially designed home visit that is tailored to renter opportunities and constraints. The PAs see the potential for a well-designed renter visit to increase participation of both renters and landlords in HES offerings. The renter visit will focus on installation of instant savings measures such as LED bulbs, advanced power strips, and water saving devices, and inform the customer of other appropriate opportunities for renters. In addition, the renter visit will allow for the collection of key information to help PAs follow up with landlords. The renter visit is detailed under the HES initiative description. The PAs will launch the effort in Q1 2016 and closely monitor, review and refine over the Plan term to ensure it succeeds in securing additional savings. The PAs believe the renter visit shows real promise and can present another opportunity for Massachusetts to be at the forefront of national efficiency program design.

New in 2016-2018
<ul style="list-style-type: none"> <li>➤ <b>Renter visit</b></li> <li>➤ <b>Moderate income offer</b></li> <li>➤ <b>New construction path to zero</b></li> <li>➤ <b>Performance path for high rise multi-family new construction</b></li> <li>➤ <b>Home automation field trials</b></li> <li>➤ <b>Multi-family project point of contact</b></li> </ul>
Enhancements in 2016-2018
<ul style="list-style-type: none"> <li>• Deep review of the customer experience, investigation of online/digital options</li> <li>• Broaden adoption of wireless enabled thermostats</li> <li>• Increase adoption of LEDs for phase out of CFLs</li> <li>• Exploration of behavioral initiatives leveraging near-real-time electric consumption feedback</li> <li>• Continued focus on market segmentation</li> <li>• Continued offer of training subsidies for HPCs and IICs</li> <li>• Continued review of upstream delivery models</li> </ul>

The renter visit is by no means the only enhancement to respond to the Council’s and PAs’ shared commitment to ensuring all customers are supported in realizing energy-savings opportunities. The Council workshops and resolutions helped to crystalize the need for continuity with the Low-Income programs and the need for a streamlined channel of entry and delivery for customers, regardless of income. PAs want to minimize customer confusion and avoid adding complicated layers and channels for program participation. The PAs are committed to optimizing the customer experience and connection points through the existing market rate HES initiative and the Low-Income program.

The PAs will offer a program enhancement to ensure that moderate income customers, from 61-80 percent of state median income, whose homes have weatherization opportunities, can be better supported. PAs are exploring an opt-in solution for an enhanced incentive for income qualified moderate income customers. This approach would ensure that customers remain in control of the process while targeting additional financial support to enable them to realize

energy-efficiency opportunities. PAs will work closely with LEAN and our Low-Income vendors to ensure that customers falling into this income band are served effectively. Customers who seek Low-Income services but are determined by the Low-Income program to be fall above the qualification limit will be able to use the documentation to qualify for the moderate income incentive.

The continued evolution and optimization of the Multi-Family Initiative is another example of a significant program enhancement envisioned for the 2016-2018 Plan where PA and Council priorities closely align. PAs share the Council's objective to improve the customer experience and specifically to provide customers with a single point of contact. For 2016-2018, the PAs are planning to assign a single project-level lead contact. Under the enhanced program design, customers will have a project point of contact ("PPC"). The PPC will be the designated agent or lead vendor identified by the PA responsible for efficiency measures for the primary heating fuel. The PPC will support customers through the full program delivery path, coordinating efficient delivery of applicable measures.

The PAs are also moving forward with the Council recommendation to track and report Multi-Family commercial and residential meter savings separately. The PAs look forward to seeing how this information may illuminate new understanding and opportunities for further program enhancements.

The PAs will continue to coordinate on the best tactical approaches for implementing these new enhancements. Much of the planning for these enhancements has been completed. The renter visit and the moderate income offer are set to be available to customers in Q1 2016. The addition of a clear project point of contact in the Multi-Family Retrofit core initiative will be integrated within the first half of 2016. Fully realizing the promise of these strategic enhancements will entail work that continues well into the future, in a cycle of continuous review and refinement.

Additional enhancement highlights include:

- Conduct a deep review of the customer experience to identify opportunities for increased streamlining, improved timing and simplified content of customer information to more effectively influence customers to take action. This will include investigating digital and online options for customers and exploring enhanced follow-up strategies to track and reach out to customers at key moments, helping them pursue deeper and/or additional measures.
- Explore the inclusion of home-automation technologies across residential programs. Deploy new construction field trials in the 2016-2018 Plan. Depending on results, integrate home-automation technologies into the residential new-construction program design.
- Evaluate PA opportunities to leverage home-automation technologies, including eligible wireless enabled thermostats and their associated communication tools, as well as other custom engagement tools for behavioral messaging. Continued review of opportunities to incorporate behavioral-science-based messaging into existing program marketing and customer-engagement efforts.

- Expand efforts to increase adoption of LED bulbs and fixtures into the marketplace and phase out CFL bulbs. PAs will also explore lighting controls as a possible initiative-expansion measure.
- Explore offering behavior initiatives that have the potential to provide near-real-time electric consumption feedback via a mobile-based application (in addition to traditional web-based or paper reporting). Some PAs may research what potential exists to tie in home automation and smart appliances and other controls where applicable.
- Promote value of net-zero and renewable-ready measures to builders through marketing, education, and training.
- Explore creation of a “Path to Zero” option for the top tiers of the Residential New Construction performance path.
- Shift to a performance path for the Residential New Construction high rise multifamily initiative.
- Continue to improve the multi-family customer’s single-point-of-contact experience, leveraging and expanding from the success of the MMI model to further support customers with project-level single-point coordination through a designated project point of contact (“PPC”).
- Continue to seek to understand and delineate moderate-income and renter markets and explore solutions for clearly defined segments.
- Offer a renter specific visit to HES customers beginning in Q1 2016. A Whole Building Incentive will be offered in parallel to encourage landlords to participate in building enrollment.
- Offer moderate income HES customers the opportunity to qualify for an increased incentive(s) when income is a barrier to proceeding with identified weatherization opportunities.
- Support the continued development of highly qualified HPCs and IICs by continuing to offer training subsidies for workforce-development needs such as technical skills, business skills, and sales trainings. PAs will also continue active dialogue with HPCs and IICs through the Contractor Best Practices working group to support program quality and growth.
- Continue to review and monitor opportunities for upstream program models. The PAs will continue to coordinate with C&I team and work with manufacturers and distributors to identify potential approaches.

#### 4. Contractor Engagement

The PAs are committed to working effectively with contractors, and to ensuring that contractors perform in accordance with rigorous quality and safety standards for the benefit of customers and deliver savings effectively. In accordance with the Term Sheet, the PAs will be active participants in a new contractor engagement effort. This effort is described in the Term Sheet as follows:

The Council and the PAs recognize that the successful implementation of the Three-Year Plan requires an engaged contractor community. The PAs and the Council will collaborate to identify opportunities to continue to maximize the impact of the contractor community in order to maintain high quality, cost-effective/efficient, high impact programs and increase penetration and success in new sectors. As part of this effort, the PAs will participate in a new Residential Contractor engagement effort to be convened by the DOER. PAs will participate in residential program related topics as appropriate, which may include how residential program contractors can be most effectively engaged in the programs, quality assurance/quality control related topics, appropriate data collection and analysis, and suggestions from the contractor community and the PAs for enhancements and improvements. This DOER effort is not in replacement of the ongoing contractor Best Practices group and does not constitute the formation of a new regulatory or adjudicatory body. The PAs will continue to have the right and responsibility to require contractor engagement and contract terms that protect customers consistent with their corporate/institutional quality and safety standards.

5. Residential Program and Core Initiative Descriptions

a. *Residential Whole House: Residential New Construction*

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL NEW CONSTRUCTION</b>
<b>Overview &amp; Key Objectives</b>	<p>The Residential New Construction core initiative strives to increase the construction of energy efficient homes that exceed the Massachusetts User Defined Reference Home (“UDRH”), a baseline determined by assessing the efficiency of homes across the state. Through support for builder and market acceptance of high efficiency design, the initiative has increased market penetration of high performance homes and residential technologies in the market.</p> <p><b>Target Market:</b></p> <p>All residential new construction projects in the Commonwealth are encouraged to participate in the initiative. The initiative has a Low Rise path targeting single and multi-family projects under three stories and a High Rise path designed for residential buildings of four stories and above.</p>
	<p><b>New Enhancements:</b></p> <ul style="list-style-type: none"> <li>• Explore the addition of home automation technologies in new construction. Deploy field trials in the 2016-2018 Plan.</li> </ul>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL NEW CONSTRUCTION</b>
	<p>Depending on results, integrate home automation technologies into the residential new construction program design.</p> <ul style="list-style-type: none"> <li>• Transition the High Rise path to a performance path in 2016.</li> <li>• Explore a “Path to Zero” option for the top tiers of the performance path.</li> <li>• Increase promotion of the value of net zero and renewable ready measures to builders through marketing, education and training.</li> <li>• Continue to examine “pay for savings” models as a strategy to promote builders pursuit of deeper incremental energy savings levels, beyond the current tiered performance path cut-offs.</li> </ul>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>Builders are encouraged to improve a building’s energy efficiency through enhanced envelope measures, energy efficient space and water heating, appropriately sized cooling equipment, wireless enabled programmable thermostats, ENERGY STAR® qualified appliances, WaterSense® plumbing fixtures, efficient lighting and controls, and proper mechanical ventilation. Builders are also encouraged to properly orient homes to take advantage of passive heating and cooling.</p> <p>The Low Rise option offers a prescriptive path with two bundles and a performance path with incentives tied to tiered savings levels. The prescriptive path for Low Rise supports savings achievements over the UDRH. The High Rise option has offered a prescriptive in-unit package, a whole building prescriptive package and a whole building custom option (performance path). PAs will transition the High Rise option to a performance path in 2016.</p> <p>All homes participating in the initiative are required to install efficient lighting products in appropriate hard wired sockets and pass a final verification inspection.</p> <p><b>Implementation Strategy:</b></p> <p>The Residential New Construction core initiative’s primary objectives are to provide builders and other allied professions with training, targeted incentives, and associated technical assistance to increase adoption of high efficiency technologies and construction practices in the residential market. PAs further support the adoption of efficient technologies and construction practices by broadly marketing the value</p>



<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL NEW CONSTRUCTION</b>
	<p>of high efficiency homes to consumers and other key decision makers and influencers in the residential new construction market.</p> <p>A recent program impact evaluation has confirmed the strength of the program’s approach, and identified the initiative as a market-leading program, which is defining best practices for the nation. The current core design elements have been demonstrated to be highly effective in gaining program participation and savings as well as more broadly driving efficient building practices. The evaluation also documented substantial spillover effects based on the initiative’s success in driving market adoption of efficient building practices in new residential construction beyond direct participants seeking program incentives.</p> <p>Massachusetts PAs are amongst the earliest to offer a comprehensive Residential New Construction initiative and recognized early the challenges in serving the larger multi-family and mixed-use new construction sector. The successful deployment and continued refinement of this pioneering path for high rise and mixed-use residential new construction was a highlight of the 2013-2015 Plan accomplishments. The initiative is recognized for leading the program design nationally for this sub-sector. The US Environmental Protection Agency, the Department of Energy Better Buildings Program, and multiple other state efficiency programs are currently engaged in efforts to promote or emulate this model. The PAs will transition to a performance only path for the High Rise buildings. This will include common statewide modeling software, outreach and training on the new path, and evaluation to provide a smooth transition in 2016.</p> <p>The PAs will explore a “Path to Zero” option for the top tiers of the performance paths. The enhancement is envisioned to recognize new construction homebuilders for achieving both a high energy efficiency standard as well as the potential incorporation of renewable energy building features.</p> <p>The PAs plan to continue to deliver in-depth trainings to builders, architects, and others engaged in new construction to support high efficiency new construction. Historically, trainings have included technical topics such as the fundamentals of building science, energy codes, and the latest emerging technologies. PAs also support workforce development efforts to help ensure a robust and well-trained community of partners.</p> <p>The combination of builder training, targeted incentives, associated</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL NEW CONSTRUCTION</b>
	<p>technical assistance, and targeted outreach all support enrollment in program offerings. Home Energy Rating System (“HERS”) raters play a critical role in recruiting builders to enroll projects in the Low Rise path. HERS raters have the ability to directly enroll projects into the program via an online intake tool. Account managers, from the lead vendor work directly with larger developers and builders to enroll them in the High Rise path.</p> <p>The PAs will strive to retain existing participating builders and recruit additional developers, homebuilders, and contractors. The PAs will continue to provide targeted trainings on critical technical topics and techniques for achieving high energy savings in quality durable housing.</p> <p>For the Low Rise path, the PAs will continue working with the HERS infrastructure. In the High Rise path, the Joint Management Committee (“JMC”), including residential and commercial new construction technical experts from PA staff and the lead vendor, will continue to assist in defining performance targets, including setting performance path tiers, establishing incentive structures, recruiting developers, completing energy analysis, and providing technical guidance on energy efficiency construction practices.</p>
<b>Delivery Mechanism</b>	<p>PAs administer the initiative through a joint, competitively bid, statewide implementation vendor. The PAs have a residential working group of residential sector experts from each PA to oversee the implementation strategy with the lead vendor. The JMC, comprised of PA staff from both the residential teams and the commercial and industrial teams, oversees the implementation of the High Rise path. The lead vendor provides the direct field implementation.</p> <p>The vendor is principally responsible for development and deployment of training, education, and outreach efforts as well as tracking and reporting program activity to each PA. The lead vendor also has principal responsibility for recruiting and enrolling projects. In addition, many PAs maintain additional account representative and field personnel that support project recruitment and maintain relationships with the target market and allies.</p> <p>HERS raters, as noted above, play a key role in the Low Rise path for recruiting and enrolling projects. Incentives are directly tied to a home’s modeled energy performance or installed prescriptive measures,</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL NEW CONSTRUCTION</b>
	<p>and all participating homes must pass a final verification inspection. The PAs will continue to work with the market-based network of trained contractors who offer energy efficiency and rating services to homebuilders.</p>
<b>Marketing Overview</b>	<p>The initiative markets to a wide variety of partners engaged in the residential new construction process. The primary target of outreach is to the homebuilders, developers, and contractors who directly participate in program offerings. PAs also provide outreach to the associated market actors that interact with program participants, such as architects, designers, and trade allies. A third critical focus on initiative marketing is directed at key decision makers and influencers in the residential real estate market including homebuyers, realtors, code officials, appraisers, and mortgage bankers. This multi-pronged strategy guarantees that at each touch point in the new home construction and delivery process, PAs build awareness and demand for high efficiency homes and provide potential participants clear and easy access the residential new construction offerings.</p> <p>The new construction market is continuously evolving. The PAs are therefore continuously monitoring the market for key opportunities to engage market actors and promote efficient building practices. PAs have utilized multiple routes to engage key market actors including trade shows, builder trainings, lumber yard outreach, and strategic partnerships with targeted regional and national associations including the Home Builder Associations, Massachusetts Chapter of the US Green Building Council, The Boston Society of Architects, Youth Build and Northeast Sustainable Energy Association. The HERS rater community also continues to be a strong partner in helping to engage and educate builders about the programs.</p> <p>Recent work with the City of Boston and through the PAs’ codes and standards efforts has offered additional opportunities to explore partnering with local building departments and other municipal programs to market offerings at critical moments when new construction is in a planning or permitting stage.</p> <p>Although not a requirement for participation, the initiative promotes participation in the national ENERGY STAR<sup>®</sup> Homes program and as a partner benefits from the regional, as well as national, advertising efforts that ENERGY STAR<sup>®</sup> Homes implements.</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL NEW CONSTRUCTION</b>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>For the 2016-2018 term, the program will concentrate on continuous improvement to processes and exploration of targeted additions. The Residential New Construction initiative will continue to pursue efforts that aim to achieve both deeper savings and gain broader market penetration. A critical focus will be on ensuring the breadth and depth of the initiative’s reach into the developer and builder communities with high quality trainings and an optimized experience for builders and home owners participating in program offerings.</p> <p>In 2013-2015, the program continued to see increased participation in the Low Rise tiered performance path and a corresponding decrease in participants utilizing the prescriptive path. In addition, it was noted, participants in the performance path kept closely to the tiered savings markers. Although the tiered approach is successful, the PAs continue to explore whether a “pay for savings” initiative might capture additional savings.</p> <p>PAs have begun evaluation of modeling software to allow full transition of the High Rise path to a tiered performance path and anticipate a smooth transition in 2016.</p> <p>Another success of the performance path has been that multiple builders in the highest performance tier are including renewable ready elements along with super-efficient designs and construction resulting in homes that achieve net zero or net zero ready status. The PAs have already begun to share these success stories and promote the approaches used in training and education offerings and through marketing. PAs will review these successes as they explore offering a “Path to Zero”.</p> <p>The Residential New Construction core initiative plans, as early as possible, to include advances in high efficiency home measures determined to be cost effective. Field trials for home automation technologies will be a focus of exploration, with an eye toward potential inclusion of proven measures.</p> <p>The Residential New Construction core initiative will continue to review the participant experience and identify mechanisms for increasing the ease and fluidity of the system. The program is continuing to explore how to leverage information technology to increase ease of access to technical information and support for partners and customers.</p>

*b. Residential Whole House: Residential Multi-Family Retrofit*

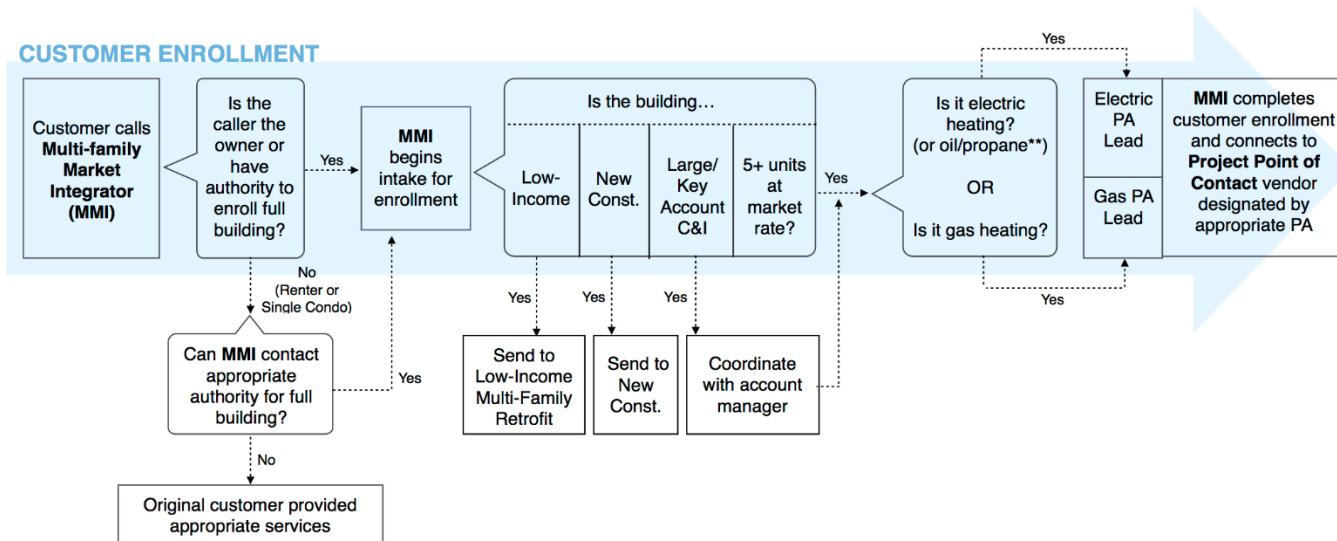
<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
<p><b>Overview and Key Objectives</b></p>	<p>The Multi-Family Retrofit core initiative provides comprehensive energy efficiency services to market rate* properties with five or more dwelling units. The initiative offers energy assessments that identify energy savings opportunities throughout the facility. An Energy Action Plan (“EAP”) is developed for each facility, identifying all energy efficiency opportunities regardless of fuel source. Historically, this initiative has provided incentives for cost effective gas and electric measures. The PAs anticipate the addition of oil measures and other deliverable fuels, pending issuance of updated RCS regulations. Incentives include (but are not limited to) lighting, shell improvements, heating, cooling, and water heating equipment and controls. The Multi-Family Retrofit core initiative is part of an emerging set of relatively new efficiency program designs across the nation working to serve this unique building sector. The Massachusetts program is a leading national model that meets a majority of the best practices outlined by ACEEE. The PAs plan to continue to refine the initiative through significant new enhancements in the 2016-2018 term. A program impact evaluation is currently in progress, which will influence PAs ultimate program enhancement and design adjustments.</p> <p><b>Target Market:</b></p> <p>The target market for this initiative is market rate residential multi-family facilities with five or more dwelling units on a property. The Multi-Family Retrofit core initiative can address unique circumstances associated with mixed-use buildings. The low-income multi-family market is served through the Low-Income Multi-Family Retrofit core initiative.</p> <p>*(i.e., 50 percent or more of units are market rate)</p> <p><b>New Enhancements:</b></p> <p>Massachusetts has pioneered a dedicated approach to the multi-family sector and has engaged in continuous improvements over the past two three-year planning cycles. During the 2010-2012 term, the PAs established the Multi-Family working group, integrated gas and electric measures, and introduced the MMI, a vendor supported call center which supports customer enrollment in connection to PA multi-family offerings. During the 2013-2015 term, the PAs added C&amp;I representation to the Multi-Family working group, expanded HEAT</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
	<p>Loan availability to residentially metered condominium owners, and successfully added in-unit direct install measures. The PAs rolled out the Multi-Family EAP in January 2014, further integrating all efficiency opportunities into a comprehensive customer-facing document. For the 2016-2018 cycle, the PAs will continue to focus on enhancing measure offerings and streamlining customer experience.</p> <p>Strategies to achieve deeper savings include:</p> <ul style="list-style-type: none"> <li>• Provide a single point of contact for measure delivery. The designated PPC will aid in streamlining the customers experience on the delivery side of the process, building off the success of the MMI model. In most cases, the PPC will be the designated agent or lead vendor identified by the PA responsible for the efficiency measures for the primary heating fuel.*</li> <li>• Incorporate additional emerging technologies. Ongoing throughout program years 2016-2018.</li> <li>• Continue to improve multi-family target marketing and education through groups such as landlords, building management, building operator trade associations, landlord associations, condominium associations, and other organizations and professionals involved in regular interaction with this unique hybrid market. Ongoing throughout program years 2016-2018.</li> <li>• Continue to focus on coordinating the residential multi-family and commercial initiatives through the joint participation on the Multi-Family working group of Residential and C&amp;I program management staff and vendors, working together to streamline delivery of packaged, comprehensive energy efficiency services to the multi-family sector.</li> </ul> <p>*(For very large multifamily buildings PAs may continue to utilize Account Executives as the PPC.)</p>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>The measures available to each property vary based on unique building characteristics/constraints but may include:</p> <ul style="list-style-type: none"> <li>• Insulation for attic, wall, basement, pipe, rim joist (in-unit, common areas)</li> </ul>

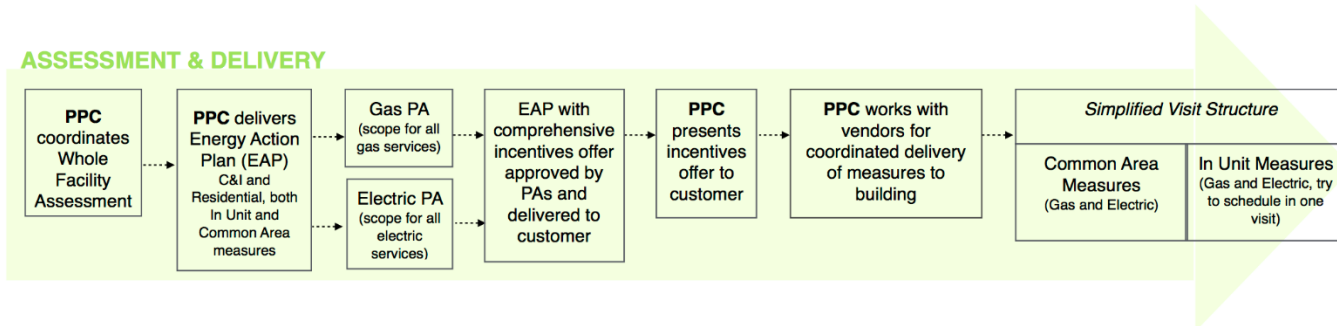
<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
	<ul style="list-style-type: none"> <li>• Air sealing</li> <li>• Domestic hot water equipment (in-unit)</li> <li>• Heating equipment (in-unit)</li> <li>• Light fixtures (common area/exterior)</li> <li>• Instant savings measures (in-unit) typically include:               <ul style="list-style-type: none"> <li>○ Energy efficient light bulbs and nightlights</li> <li>○ Light fixtures</li> <li>○ Programmable and wireless enabled thermostats</li> <li>○ Faucet aerators</li> <li>○ Low-flow showerheads</li> <li>○ Smart strips</li> </ul> </li> </ul> <p>Because multi-family buildings may contain residential and/or commercial metering, and include building level systems more traditionally found in commercial facilities, there are a number of measures more commonly found in the C&amp;I Retrofit program. These C&amp;I measures may include:</p> <ul style="list-style-type: none"> <li>• HVAC high efficiency equipment upgrades and controls</li> <li>• Variable speed drives, motors</li> <li>• Chillers</li> <li>• Air compressors</li> <li>• Water heating equipment</li> <li>• Energy management systems</li> <li>• Custom measures</li> </ul> <p>The Multi-Family Retrofit core initiative offers the residential 0% HEAT Loan to residentially metered condominium owners residing in facilities with five or more dwelling units on the property.</p> <p><b>Implementation Strategy:</b></p> <p>The PAs strive to deliver a comprehensive energy efficiency offering to participants, regardless of fuel type, service territory, or rate class. An integral part of the initiative’s design involves the services of the MMI, who provides a single point of contact at intake. The newly created role</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
	<p>of PPC will be responsible for managing the program delivery path, coordinating efficient delivery of applicable measures, and clearly tracking all measures and incentives regardless of meter type. The goal is to provide a seamless customer experience, mitigate potential customer confusion, and minimize or eliminate lost opportunities.</p>

**CUSTOMER ENROLLMENT**



**ASSESSMENT & DELIVERY**



\*\*conditional on approval of RCS regulations.



RESIDENTIAL WHOLE HOUSE	<u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT
<p><b>Core Initiative Design, cont.</b></p>	<p><u>Enrollment:</u></p> <p>The diversity of facility types, ownership, and management structures within the multi-family market, and the variety of actors involved, requires multiple points of entry for intake into the initiative. Participants may enroll via telephone or their request for services may be initiated by other market actors, such as a PA’s Account Executive, or a referral from another PA initiative, contractor, consultant, or engineer. Regardless of point of entry, all participants will only need to contact one party to avail themselves of comprehensive services. Once the MMI is made aware of a project (either via telephone or lead from another market actor), he or she reviews the information provided, makes the initial contact with the customer, and collects further information, as needed, to complete screening and enrollment.</p> <p><u>Participant Screening:</u></p> <p>The MMI uses a screening process to obtain key information to identify projects and optimally dispatch resources to support customer participation in the initiative.</p> <p>During the initial discussion with the potential participant, the MMI will gain a better understanding of the end uses available for treatment and the motivations that drove the potential participant to solicit energy efficiency services. The MMI will explain the initiative’s offer of an assessment to identify all energy saving opportunities and the value of the resulting EAP. Once the MMI has ascertained that the potential participant fits the parameters to enroll in the initiative, the MMI will record the heating source type (electric, gas, or pending RCS regulation approval, oil or propane) and connect the participant with the PPC assigned by the appropriate lead vendor.</p> <p><u>Whole Facility Assessment</u></p> <p>The assigned PPC will proceed to coordinate the Whole Facility Assessment. Based on the outcome of the enrollment and screening process, the appropriate technical resources will be assigned by the PPC to conduct a whole facility, fuel blind assessment. The MMI will attempt, through the screening process, to identify all resources required for the assessment. In the majority of cases the PPC will be able to deliver all assessment activities. However, there may be instances where additional expertise is required and additional custom technical</p>

RESIDENTIAL WHOLE HOUSE	<u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT
	<p>assessments, benchmarking, and engineering studies will be coordinated.</p> <p><u>Proposal for Energy Efficiency Services</u></p> <p>Using the findings from the site-specific assessment, the PPC will draft an EAP, including all applicable energy efficiency opportunities, both residential and commercial (in-unit and common area measures). The EAP can provide participants with a road map to implement energy efficiency upgrades. The PPC will present the comprehensive offer to the customer, outlining all measures and services eligible and approved by both the gas and electric PAs for incentives, and assist the customer in fully understanding the opportunities. The customer then selects which measures they wish to implement.</p> <p><u>Delivery of Measures and Services</u></p> <p>The PPC will coordinate the delivery of the measures and services requested and agreed to by the customer. To the extent possible, all dwelling unit measures will be installed in a single visit to minimize disruption for the tenants; however, multiple visits may be required for the installation. The Multi-Family Retrofit core initiative will continue to integrate with the C&amp;I initiatives for applicable measures and services for seamless delivery to the customer.</p> <p><u>Quality Assurance</u></p> <p>PAs contract with a third-party Quality Assurance/Quality Control (“QA/QC”) vendor to perform inspections on a select percentage of projects. The QA/QC vendor provides valuable information and feedback on successes and identifies areas of possible program improvement. These inspections are complementary to the final inspections performed by the implementation vendors of their subcontractors.</p> <p><u>Additional Core Initiative Design Elements</u></p> <p>A link to the current EPA Benchmarking tool (Portfolio Manager) is included on the website page(s) associated with the Multi-Family Retrofit core initiative. This supports building owners/managers in assessing the energy efficiency of their buildings against comparable facilities. EPA Portfolio Manager is a publicly available and free tool accessible to all property owners. PAs have supported data upload</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
	<p>through the green button initiative and have extensively coordinated with disclosure efforts such as the Boston Energy Reporting and Disclosure Ordinance to support customers’ ease of access to benchmarking and compliance with reporting requirements.</p> <p>The PAs recognize that proper training for building operators and maintenance staff is a key factor in ensuring that expected savings are realized initially and persist over time. The PAs’ C&amp;I offerings include building-operator training to support customers in maintaining their efficiency gains through proper operations and maintenance. The PAs plan to explore expanding training events and opportunities as appropriate</p>
<b>Delivery Mechanism</b>	<p>The initiative will be administered cooperatively by the gas and electric PAs. Each PA is represented in the Multi-Family working group, which will continue to be responsible for oversight of the initiative and promote continuous improvement/best practices with regard to the multi-family market.</p> <p>The MMI, jointly contracted by all PAs, remains the key to the delivery of this fully integrated statewide Multi-Family Retrofit core initiative. The MMI, as described above under program implementation, is responsible for ensuring all customers are properly enrolled and directed to the appropriate program resources, including connection to the designated PPC.</p> <p>PPCs will be designated by each gas and electric PA. Individual PAs have contracts with lead vendors for services to multi-family facilities, contracts with additional specialty vendors and access to a variety of supplemental engineering and other services. The MMI helps ensure smooth coordination to optimize the services for each participating facility. PAs have revised their BCR models and internal tracking to provide distinct gas and electric Residential and C&amp;I Multi-family measure lines.</p>
<b>Marketing Overview</b>	<p><b>Strategy:</b></p> <ul style="list-style-type: none"> <li>• Target market and industry actors. Messages may focus on, but are not limited to: lower energy and maintenance costs, more durable and comfortable building, enhanced property value, generous financial incentives, tenant retention, and</li> </ul>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
	<p>environmental benefits for the community.</p> <ul style="list-style-type: none"> <li>• Continue to promote case studies for print and online media to help educate and market to facility owners.</li> <li>• Target landlord, building management, building operator trade associations, design professionals, and other organizations and professionals involved in regular interaction with multi-family facilities.</li> <li>• Continue to enhance the online user experience.</li> <li>• Continue to build on the MMI relationship with larger property managers to enroll complete portfolios of eligible sites.</li> <li>• Explore opportunities in industry newsletters to educate market actors such as engineers, realtors, landlord associations, architects, and/or property managers. Participate, as appropriate, in trade ally shows, such as realtor and multi-family property manager conferences.</li> </ul>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>The Multi-Family working group will continue to coordinate efforts through the MMI and incorporate the PPC, to ensure consistent implementation across the Commonwealth for the next three years. The Multi-Family working group will continually review and evaluate new applicable measures and technologies.</p> <p>PAs have already identified and broken out for tracking measures both by meter type (Commercial/Residential) and fuel type (Gas/Electric) in preparation for the coordination efforts to be led by the PPCs. The integration of PPC services into the Multi-Family Retrofit core initiative is set to roll out in the first half of 2016. The Multi-Family working group will continue to coordinate with the Residential and C&amp;I Management Committees and the Low-Income Best Practices working group, while working across the residential and commercial sectors, to ensure consistency and support for an integrated initiative. Results of the current Multi-Family evaluation will also influence the program evolution in the coming plan years.</p> <p>PAs welcome continued dialogue with Massachusetts affordable housing stakeholders to evaluate opportunities to maximize the opportunity for capturing energy efficiency savings at the time of financing and refinancing of affordable housing properties. PAs have committed to engaging with these stakeholders to jointly explore and scope these opportunities via planning meetings. The PAs are excited</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL MULTI-FAMILY RETROFIT</b>
	<p>to learn from the experts within the Massachusetts Housing community about the timing, scope and processes of affordable housing finance and refinance, to share the PAs’ technical resources and understanding on efficiency programming, and to work together to identify critical moments of potential opportunity in the finance and refinance process to secure additional savings. The PAs look forward to receiving additional and more specific information from the Massachusetts affordable housing stakeholders so that the PAs can explore opportunities to incorporate program design and implementation refinements that result from these dialogues within the 2016-2018 Plan term.</p> <p>In accordance with the Resolution, the PAs will continue to work with the Commonwealth’s housing financing agencies and LEAN (with mutual expectations and deliverables) to develop and implement enhanced approaches to leverage multi-family refinancing events to maximize retrofit potential. The parties will specifically consider performance-based retrofit products. The PAs will present the results of these efforts and specific proposals derived from them by the close of Q1 2016.</p>
<b>Special Notes</b>	

*c. Residential Whole House: Home Energy Services- Measures; Home Energy Services- RCS*

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>
<b>Overview and Key Objectives</b>	<p>The Home Energy Services (“HES”) core initiative provides residential customers, living in single family (1-4 unit) homes, energy efficiency recommendations and incentives that enable customers to identify and implement cost effective energy efficiency improvements. The initiative uses incentives, financing, outreach and education to make it easy, clear and compelling for customers to participate in residential energy efficiency programs. HES is a flagship initiative for the residential programs, and exemplifies a systems approach where all components work together to support customers in achieving deeper</p>

<p><b>RESIDENTIAL WHOLE HOUSE</b></p>	<p><b><u>CORE INITIATIVE</u></b>  <b>RESIDENTIAL HOME ENERGY SERVICES – MEASURES</b>  <b>RESIDENTIAL HOME ENERGY SERVICES – RCS</b></p>
	<p>energy savings. HES is fuel blind.</p> <p>Massachusetts’s HES is a mature program with over 20 years of program delivery experience, including many refinements and expansions. The core initiative consistently delivers strong fuel blind energy savings while maintaining broad participation. The Massachusetts HES core initiative has the greatest reach of any whole home program in the nation, serving over 80,000 participants statewide in 2014 and continuing to grow.</p> <p><b>Target Market:</b></p> <p>HES targets all residents (home owners and renters) in single family and two to four unit buildings on a single property. HES is a market rate program serving non-low income residential customers. Low income customers (those under 60 percent SMI) are referred to appropriate low income programs.</p>
	<p><b>New Enhancements:</b></p> <p>The 2013-2015 Plan rolled out multiple new elements gradually over the three-year plan term, many of which are currently under evaluation. In the 2016-2018 Plan, PAs are focused on refining and expanding the successful elements begun in the 2013-2015 Plan, while avoiding elements or program redesigns that add complexity for customers and contractors. PAs plan to:</p> <ul style="list-style-type: none"> <li>• Conduct a deep review of the customer experience to identify opportunities for increased streamlining, simplifying and better targeting time and content of customer information to maximize the opportunity to influence customers taking action. This will include investigating digital and online options that improve the customer experience, and exploration of enhanced customer follow-up strategies that continue to track and reach out to customers at key moments, helping them pursue deeper measures and stay on track with open recommendations from their Home Energy Assessment (“HEA”). This is an ongoing effort.</li> <li>• Continue to seek to understand and delineate moderate income and renter markets and explore solutions for clearly defined segments. Beginning in Q1 2016, the PAs will trial a renter</li> </ul>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>
	<p>visit and a moderate income offer enhancement, detailed below.</p> <ul style="list-style-type: none"> <li>• Support renter participation with a renter-specific visit beginning in Q1 2016. Customers will continue to be screened at intake, and an update is planned for the on-line audit tool to provide a clear path for renters. Customers for whom a full HEA may not be appropriate can schedule a renter visit. The renter visit will focus on installation of instant savings measures, high level screening for deeper measures, and follow up with landlords and other interested tenants. A Whole Building Incentive will be offered in parallel to encourage landlords to participate in building enrollment.</li> <li>• Offer moderate income HES customers the opportunity to be “qualified” for an increased incentive(s) when income is a barrier. The initial enhanced incentive is anticipated to apply to insulation, covering 90 percent of costs up to \$3000. PAs will explore additional enhanced incentives, potentially including targeted appliance rebates and pre-weatherization barrier remediation, appropriate for qualifying customers. Each PA will monitor spending, customer interest, and savings from this trial offer in 2016, and adjust implementation accordingly for 2017-2018.</li> <li>• Investigate incorporation of additional cost effective new technologies and measures, including sealing and insulation for ducts, early clothes-washer turn-in rebates, and broader implementation of Wi-Fi thermostat installations. PAs will work with the evaluation team to review mechanisms to reduce the time between technology review and deployment.</li> <li>• Support the continued development of highly qualified HPCs and IICs by continuing to offer training subsidies for workforce development needs such as technical skills, business skills, and sales trainings. PAs will also continue active dialogue with HPCs and IICs through the Contractor Best Practices working group to support program quality and growth.</li> <li>• Explore improvements in tracking across programs for measure implementation originating from an HEA.</li> </ul>

<p><b>RESIDENTIAL WHOLE HOUSE</b></p>	<p><b><u>CORE INITIATIVE</u></b>  <b>RESIDENTIAL HOME ENERGY SERVICES – MEASURES</b>  <b>RESIDENTIAL HOME ENERGY SERVICES – RCS</b></p>
<p><b>Core Initiative Design</b></p>	<p><b>Measures Promoted:</b></p> <p>Customers receive a <i>Home Energy Assessment (“HEA”)</i>, an in-home visit. During the HEA, the Energy Specialist will:</p> <ul style="list-style-type: none"> <li>• Install instant energy saving measures at no cost to the customer, which may include <i>LED bulbs, compact fluorescent light bulbs, faucet aerators and showerheads, programmable thermostats, and advanced power strips.</i></li> <li>• Provide recommendations on <i>weatherization, including air sealing and insulation</i>, qualifying customers for instant incentives for these measures delivered by HPCs or IICs.</li> <li>• Provide recommendations and connections to <i>heating, cooling, water heating equipment, and other qualified efficient product rebates</i>).</li> <li>• Provide connections to the HEAT Loan offers zero percent interest financing of loans from \$500-\$25,000 with terms from 2 to 7 years to approved customers for qualified measures</li> </ul> <p>PAs will work with the MTAC to include new measures or technologies as appropriate.</p> <p>For the renter-specific visit, the PAs plan to provide:</p> <ul style="list-style-type: none"> <li>• Installation of instant energy savings measures at no cost to the customer, identical to instant savings measures offered through an HEA.</li> <li>• Refrigerator screening, high-level visual inspection of possible weatherization opportunities, and review the heating system for potential rebates.</li> <li>• Information on deeper measures that could be installed with landlord approval. PAs plan to develop marketing materials specifically tailored to renters.</li> </ul> <p><b>Implementation strategy:</b></p> <p><u>The HEA Visit:</u></p> <p>The primary entry into HES is the HEA, an in-home visit that includes a variety of diagnostic testing and offers installation of instant energy savings measures. The HEA also provides education and direction on additional energy saving opportunities, rebates, and connection to</p>



<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>
	<p>appropriate service providers.</p> <p>Customers schedule an HEA through a dedicated statewide toll free number. The Mass Save<sup>®</sup> marketing collateral and website, including the recent addition of the online energy assessment portal, supports customers accessing an HEA. The online assessment tool also helps any customers who may not benefit from an in-home visit to follow up with additional appropriate offerings.</p> <p>The HEA is a single comprehensive in home assessment. The HEA allows customization at the household level, ensuring the program delivers cost effective personalized energy saving recommendations on incentives while serving a broad market of customers in a variety of housing types. The HEA provides customers with specific energy efficiency education and identifies their unique opportunities for energy saving installations. With the customer’s permission, efficient lighting is installed at no cost in all appropriate locations, as are the other instant savings measures (as needed and qualified). The instant energy savings from directly installed measures during the HEA are intended, on average, to exceed the expected average cost to deliver this visit. The HEA may include a variety of diagnostic techniques such as infrared scanning (temperature permitting) and combustion safety testing. A critical focus is to identify opportunities for thermal savings from air sealing and insulation. The HEA will include scoping of air-sealing and insulation work and support customers’ to pursue implementation of measures. This support includes connection to appropriate contractors and information on the HEAT loan.</p> <p>At this stage of the HEA, customers with identified weatherization opportunities will be presented with information on the potential to qualify for an enhanced incentive if income is a barrier to completing weatherization savings measures. The Energy Specialist will provide direction to customers on how to verify that they meet moderate income criteria (61-80 percent SMI). Customers referred to the HES program from the Low-Income program, due to incomes above the low-income threshold, will be able to use the Low-Income program screening to document qualification for the moderate income enhanced incentive (to the extent that their screening documents income in the moderate income range) and not require further income verification.</p> <p>Two groups of participating contractors, HPCs and IICs provide installation of weatherization measures. A more detailed description of</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>
	<p>the differing roles of each type of contractor is provided under Delivery Mechanism, below. Customers are always free to choose their preferred qualified participating contractor.</p> <p>Regardless of weatherization contractor type, full installation of targeted cost-effective air sealing is provided at no cost to the customer. Insulation work is similarly provided with an instant incentive; however, there is a customer co-pay and incentive cap. The enhanced moderate income incentive increases the amount of the incentive, reduces the co-pay, and increases the incentive cap for qualifying customers</p> <p>When the customer elects the fully subsidized air sealing offer or insulation installation, a blower door test and combustion safety test will be performed pre and post installation to measure air leakage reduction and ensure combustion safety standards. If specific energy efficient improvements require professional contractors, the Energy Specialist explains the contractor services required to install recommended measures. If the improvements require a customer contribution, the Energy Specialist provides information on available incentives and rebates.</p> <p><u>Special Visits:</u></p> <p>A special home visit may be scheduled for those customers interested in screening to determine incentive eligibility, a targeted visit such as a boiler screening, or in response to a specific request/concern. An Energy Specialist will perform an assessment of the home addressing the specific concern and/or screening a specific measure (e.g., boiler) and install instant savings measures (where appropriate). A customer may be scheduled for a special home visit as determined during the initial intake process.</p> <p><u>The Renter Visit:</u></p> <p>The PAs will trial a renter visit, which is a modified HEA, offering a level of service better tailored to renters. Many renters are not in a position to participate in or influence adoption of weatherization measures for their units. The renter visit will focus on installation of instant savings measures and provide information on rebate opportunities appropriate for renters. The renter visit will be shortened by exclusion of the many diagnostic tests and inspection elements of the</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>
	<p>full HEA. The renter visits allows a more streamlined delivery system to provide instant savings measures to renters.</p> <p>PAs see the potential for a well-designed renter visit to increase both renter and landlord participation in HES offerings. The renter visit will allow collection of key information for follow up with landlords, including a refrigerator screening, a high level visual inspection of possible weatherization opportunities and review of the heating systems for potential rebates. Energy specialists delivering the renter visit will also seek to collect landlord and other interested tenant information (if not already provided through intake or the online audit tool). PAs hope that renters with positive experiences can help secure the participation of their landlord and fellow tenants. The site specific information on potential opportunities provided by the high level visual screening for weatherization and heating system opportunities will help tailor messages for landlord enrollment in HES offerings. PAs are also planning to add a Whole Building Incentive for additional support for 2-4 unit building owners to move forward with full weatherization of the entire property.</p> <p>Deployment of a renter visit may also help to increase cost effective program delivery by providing the right level of service at a reduced delivery time and cost. Triaging customers in this way may also help vendors providing HEAs to effectively concentrate on customers who can convert to deeper measures.</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>												
	<p>The Program Administrators plan to offer the following (as appropriate).</p> <table border="1"> <thead> <tr> <th></th> <th>Renter Visit</th> <th>HEA Visit</th> </tr> </thead> <tbody> <tr> <td><i>Instant Savings Measures</i></td> <td> <ul style="list-style-type: none"> <li>• LEDs</li> <li>• Low flow showerheads</li> <li>• Faucet aerators</li> <li>• Smart strips</li> <li>• Programmable thermostats</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• LEDs</li> <li>• Low flow showerheads</li> <li>• Faucet aerators</li> <li>• Smart strips</li> <li>• Programmable thermostats</li> </ul> </td> </tr> <tr> <td><i>Assessment</i></td> <td> <ul style="list-style-type: none"> <li>• Refrigerator screening</li> <li>• High-level visual inspection for weatherization opportunities</li> <li>• Quick review of heating system</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• Infrared scanning</li> <li>• Combustion safety testing</li> <li>• Identify weatherization opportunities (air sealing and insulation)</li> <li>• Recommendations for heating, cooling, water heating equipment</li> </ul> </td> </tr> <tr> <td><i>Collateral</i></td> <td> <ul style="list-style-type: none"> <li>• Renter specific rebates</li> <li>• Tailored collateral</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• Rebates</li> <li>• HEAT Loan information</li> <li>• Standard collateral</li> </ul> </td> </tr> </tbody> </table> <p><u>Quality Assurance Visits:</u></p> <p>A quality assurance visit allows weatherization work to be inspected to ensure the work is completed to the core initiative’s standards. This may be done through a combination of methods, including a phone survey, postcard, email, or actual site visit by the lead vendor and/or a third party PA-approved vendor. Quality inspections are performed to ensure that contractor installed measures are accurate, professional, and safely and properly installed based on statewide material and installation initiative standards, as well as to ensure savings. On site</p>		Renter Visit	HEA Visit	<i>Instant Savings Measures</i>	<ul style="list-style-type: none"> <li>• LEDs</li> <li>• Low flow showerheads</li> <li>• Faucet aerators</li> <li>• Smart strips</li> <li>• Programmable thermostats</li> </ul>	<ul style="list-style-type: none"> <li>• LEDs</li> <li>• Low flow showerheads</li> <li>• Faucet aerators</li> <li>• Smart strips</li> <li>• Programmable thermostats</li> </ul>	<i>Assessment</i>	<ul style="list-style-type: none"> <li>• Refrigerator screening</li> <li>• High-level visual inspection for weatherization opportunities</li> <li>• Quick review of heating system</li> </ul>	<ul style="list-style-type: none"> <li>• Infrared scanning</li> <li>• Combustion safety testing</li> <li>• Identify weatherization opportunities (air sealing and insulation)</li> <li>• Recommendations for heating, cooling, water heating equipment</li> </ul>	<i>Collateral</i>	<ul style="list-style-type: none"> <li>• Renter specific rebates</li> <li>• Tailored collateral</li> </ul>	<ul style="list-style-type: none"> <li>• Rebates</li> <li>• HEAT Loan information</li> <li>• Standard collateral</li> </ul>
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	<p>quality inspections are crucial to sustaining the impressive saving realization rates Massachusetts has experienced. The quality inspection visits provide valuable peace of mind for participants, as well as create the objective feedback loops that allow participating contractors to provide their employees with the training that assures continued high quality service delivery for Massachusetts rate consumers.</p>
<p><b>Delivery Mechanism</b></p>	<p>The program is delivered by PA-specific lead vendors selected through a competitive procurement process. Lead vendors are available, and required by contract, to provide services to any eligible customer. This ensures that all eligible Massachusetts customers, regardless of PA territory will have access to HES services. Lead vendors are also responsible for a multitude of program delivery elements including managing and training participating contractors such as the participating IICs and HPCs. Additional lead vendor responsibilities include intake via the statewide toll free number, customer eligibility screening, customer education, recruitment and follow-up, customer satisfaction and achievement of aggressive savings, administration of the HEAT loan, development and deployment of consistent statewide training, data invoicing, tracking and reporting, licensing approved energy modeling software at no cost to participating HPCs, developing and enforcing quality control standards for all participating contractors, scheduling requirements, maintenance of and reporting on health and safety information, technical assistance to customers, participating contractors and other market actors, management of multiple contractual relationships with IICs and HPCs, assistance in evaluation studies, management of performance rating systems for IICs and HPCs, and participation and collaboration in the Best Practices working group.</p> <p>In the original HES model, the lead vendor provided the HEA and coordinated comprehensive delivery of weatherization measures through direct sub-contractors. The new model requires lead vendors to enter into participation agreements with any qualified IIC and distribute weatherization projects via a merit based allocation system. HPCs were phased into the program in the 2013-2015 three-year plan. The promise of including the HPC track which can independently recruit customers, provide HEAs, and implement weatherization measures, was to open the market to additional providers who could drive more and different customers into the program.</p> <p>In order to receive incentives or rebates, customers are required to have</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS</b>
	<p>an HEA through either the PAs’ lead vendor or via a participating HPC to identify and prioritize all cost effective energy efficiency upgrades. The initiative continues to implement “set” pricing, developed in conjunction with the Council and the Council consultants. The set pricing model provides certainty regarding <i>cost effective</i> energy efficiency upgrades for customers, contractors, and PAs alike. This prevents claims of price gouging by customers, provides ease of participation (<i>e.g.</i>, no requirement of the customer to solicit multiple bids) and helps generate and support further business within the market. Set pricing also allows contractors and PAs to plan more efficiently and ensure the total resource costs remains cost effective. Without set pricing the HEA could not result in the production of an executable weatherization contract for the customer, which is a very unique and valuable program design within the Massachusetts HES core initiative.</p> <p>All participating contractors must meet program eligibility requirements. HPCs independently recruit customers of their choice, provide the HEA, and implement weatherization measures. HPCs also have the opportunity to engage the customers they serve in additional turnkey energy efficiency services offered by their respective company (<i>e.g.</i>, heating upgrades, etc.) as ancillary services. IICs provide installation of weatherization measures for those customers who received an HEA from the lead vendor. IICs also have the opportunity to independently recruit customers who have identified weatherization opportunities and refer them to the lead vendor for the HEA.</p> <p>If an Energy Specialist from the HES lead vendor performs the HEA, the customer will be directed to a participating qualified IIC to complete the work. If a program IIC refers the customer to the HEA, the program will assign that IIC to complete the weatherization measures. Customers are always free to choose their preferred qualified participating HPC or IIC.</p> <p>Insulation work, whether performed by an HPC or IIC, may be selected to have a quality control inspection performed by the lead vendor or third party vendor when the work is complete. IICs are provided with merit-based allocation of work determined through several factors including documented work quality. This ensures that high quality is maintained and installations meet the Mass Save<sup>®</sup> Materials and Installation Standards. Through a competitive bidding process, the PAs contract with a third-party Quality Control (“QC”) vendor to perform QC inspections of program implementation vendors, including PA lead</p>

<p><b>RESIDENTIAL WHOLE HOUSE</b></p>	<p><b><u>CORE INITIATIVE</u></b>  <b>RESIDENTIAL HOME ENERGY SERVICES – MEASURES</b>  <b>RESIDENTIAL HOME ENERGY SERVICES – RCS</b></p>
	<p>vendors and participating contractors. The QC vendor provides valuable information and feedback to the PAs on successes and identifies areas of possible improvement.</p> <p>The PAs are working together toward a best practices approach to provide more coordinated statewide training to reinforce quality installation techniques in HES. Recent evaluation results have found differences in realization rates when comparing lead vendor completed work versus HPC work. PAs will continue to review this third party research and explore if program changes are warranted to ensure whole house treatment is consistently implemented and customers are receiving the highest level of savings. It is expected that training requirements will increase over time in order for contractors to retain their status as an HES participating contractor. Additionally, contractors must maintain a high level of customer satisfaction to continue participating in the initiative. Most PAs have adopted a rating system to help contractors understand their performance in a holistic manner. These systems award work and/or financial bonuses based on performance.</p> <p>The PAs strive to maximize energy savings realized by promoting and supporting contractor training and education in an effort to establish a broader workforce knowledgeable and skilled in proper installation techniques. The goal is to have a sustainable and experienced workforce focused on achieving maximum energy savings and ready and able to meet customer demand. The contractors’ ability to deliver high quality work that results in high realization rates is critical to delivering energy savings.</p>
<p><b>Marketing Overview</b></p>	<p>The HES initiative is marketed to all non-low income residential customers living in single-family houses or one-to-four unit buildings that are not part of a larger site where an association exists (such as a condominium association with multiple four unit buildings).</p> <p>Marketing efforts are designed to meet the objectives of reaching more customers (going broader into the customer base) and maximizing energy savings opportunities (going deeper into each home to find ways to save energy).</p> <p>The successful inclusion of a common online assessment tool that funnels interested customers to the HEA provides a model for</p>

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	<p>identifying low cost/high touch digital enhancements that streamline and improve customer experience.</p> <p>The PAs will continue market segmentation work to identify and strategically target customers with the most opportunity to increase the rate of audits that result in energy efficiency measure recommendations. The PAs will work closely with IICs and HPCs as a means to increase participation, satisfaction and energy savings. Further, the PAs will continue to seek new ways to identify, educate and reach segments such as landlords, renters and moderate income home owners. Efforts may include targeted marketing based on identified key demographics to overcome identified awareness and access barriers for specific customers. Different PAs are planning to explore partnerships and opportunities that respond to their service territories and will share learning as successful models emerge.</p> <p>The initiative will build off of the Mass Save<sup>®</sup> multi-media outreach campaign that focuses on partnerships with local media outlets or affiliates such as radio, print advertising, web-based marketing through various social media sites, and through <a href="http://www.Masssave.com">www.Masssave.com</a>.</p> <p>Current forms of multi-media outreach include the Mass Save<sup>®</sup> website, bill inserts, radio, print, and visual media advertising, digital media advertising (advanced online options), and targeted outreach through strategic partnerships with community organizations, municipalities, and other allies. PAs use timed marketing techniques to help support customers entry and deeper participation in program offerings. PAs will continue and explore enhancing the use of limited time “spiffs” during slower participation seasons as well as engage in follow up campaigns to participants known to have remaining opportunities.</p> <p>Individual PAs conduct additional marketing, such as behavior feedback mechanisms, and may ramp their marketing up or down as needed to meet participation and budget goals. This marketing targets specific measures/customer segments and is conducted strategically to meet initiative savings goals.</p>
<p><b>Three-Year Deployment Strategy/Roadmap</b></p>	<p>The goal of new enhancements in the 2016-2018 term is to refine and optimize the initiative, minimizing radical shifts in program design or delivery. PA efforts will focus on streamlining and enhancing the</p>



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	<p>customer experience while supporting a sustainable and robust delivery infrastructure. This focus will ensure the network of energy efficiency vendors and contractors meet the highest standards, and support delivery of highly cost effective deep savings.</p> <p>The PAs have worked over the Plan development year (2015) to be able to roll out, in accordance with the Resolution:</p> <ul style="list-style-type: none"> <li>• A renter-specific initiative to be rolled out in Q1 2016, including semi-annual PA reports to the Council that will include timely rental visit metrics including participation levels and conversion rates by renters and their landlords by PA, and qualitative information on any barriers encountered and plans to address them;</li> <li>• A moderate income initiative beginning in Q1 2016, including semi-annual PA reports to the Council on participation rates by PA.</li> </ul> <p>The PAs anticipate learning from the trials and adjusting and refining these new enhancements over the three-year plan term.</p> <p>The PAs are planning for increased installation of LEDs and expanded access to wireless enabled thermostats. PAs are also planning to explore sealing and insulation for ducts and offering a rebate for early clothes-washer turn-in. The PAs anticipate exploring similar technology advancements, particularly in home automation and control technologies, within the next three year cycle and aim to incorporate new technologies in HES as they are demonstrated to be cost effective and meet consumer performance expectations and acceptance.</p> <p>The key to new enhancements and field trials will be to research and test theories, program design changes, and new measures before broad application. PAs are also keenly attuned to balancing introduction of new enhancements with maintaining and responsibly growing opportunities for their delivery partners. Avoiding cycles of boom or bust are critical to maintaining a skilled and capable workforce and ensuring high customer satisfaction.</p>

*d. Residential Whole House: Behavioral/Feedback Initiatives*

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL BEHAVIORAL/FEEDBACK INITIATIVES</b>
<b>Overview and Key Objectives</b>	<p>The primary goal of the Behavioral core initiative is to encourage customer level behavioral change to conserve energy. Behavioral initiatives seek to identify the motivational factors that cause residential customers to actively employ personal energy saving actions and/or participate in energy efficiency programs. The PAs are continuously exploring opportunities to leverage behavioral science in the service of securing energy efficiency.</p> <p>Several PAs introduced and evaluated behavior based initiatives within their respective territories in previous plan periods. These initiatives varied in size and scope and include different implementation mechanisms along with a mix of vendors. One program, the Home Energy Report (“HER”), has moved from trial to full implementation by the largest PAs and is described more fully under implementation.</p> <p><b>Target Market:</b></p> <p>All residential customers</p> <p><b>New Enhancements:</b></p> <ul style="list-style-type: none"> <li>• Continued review of opportunities in the marketplace, new vendor offers, and opportunities to incorporate behavioral science based messaging into existing program marketing and customer engagement efforts.</li> <li>• Some PAs may explore offering behavior initiatives that have the ability to provide near real time electric consumption feedback, and have that ability to offer a mobile based application in addition to traditional web based or paper reporting. Some PAs may also look to see what potential exists to tie in home automation and smart appliances and other controls where applicable. Some electric PAs may leverage funding from their Grid Modernization Plan in areas where energy efficiency and grid modernization cross over.</li> <li>• Continue to evaluate and explore PA opportunities to leverage home automation technologies including eligible wireless enabled thermostats and their associated communication tools as well as other custom engagement tools for behavioral messaging.</li> </ul>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL BEHAVIORAL/FEEDBACK INITIATIVES</b>
<p><b>Core Initiative Design</b></p>	<p><b>Measures Promoted:</b></p> <p>Behavioral initiatives focus on motivating energy-conserving actions that residents can control, such as programming thermostats, monitoring and adjusting home temperatures via wireless-enabled thermostats or turning off or down power using equipment and electronics. Behavioral initiatives also cross-promote participation in other initiatives with specific measures including HES, lighting, and products offerings.</p> <p><b>Implementation Strategy:</b></p> <p>The most prevalent behavioral initiative currently deployed by multiple PAs is the HER program. PAs assign participants to the program and participants are offered an opt-out option.</p> <p>The HER program assigns qualifying customers to treatment and control groups. The treatment groups receive mailer-based reports on an ongoing basis and have access to an online portal. Control groups are retained for the purposes of evaluation. Customers are treated as a group indefinitely, or until the PAs decide to stop treating customers.</p> <p>The HER program prompts energy savings through two primary paths:</p> <ul style="list-style-type: none"> <li>• Educational reports;</li> <li>• Educational reports <i>and</i> customer interaction with their online platform.</li> </ul> <p>The HER details and benchmarks customers’ energy usage against their past usage and against similar homes in the area. Customers also have the option of opting-in to an online platform to gain greater feedback on their energy usage.</p>
<p><b>Delivery Mechanism</b></p>	<p>The HER model is individually contracted by each participating PA with a single vendor. The vendor works with each participating PA individually to define the treatment group within the PAs customer group, the treatment periodicity, engagement mechanisms (generally mail, email and web portal) and content from a limited number of vendor designed options.</p>

<b>RESIDENTIAL WHOLE HOUSE</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL BEHAVIORAL/FEEDBACK INITIATIVES</b>
<b>Marketing Overview</b>	The current initiative uses an opt-out model, therefore does not employ additional marketing beyond direct offerings to selected customers.
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>PAs actively deploying HER initiatives intend to continue. PAs intend to continue to monitor opportunities for amendments to the current HER model and new behavioral initiative opportunities. The field of behavioral energy efficiency is evolving, with new product offers from vendors as well as new opportunities created by technology and engagement tools.</p> <p>The behavioral arena is ripe for experimentation. A benefit of the Massachusetts efficiency program regime is having multiple creative Program Administrators with varied territories where a variety of approaches can be explored and tested in the field. The Cape Light Compact already deploys an alternate behavioral approach and pioneered early learning in the field. In the 2016-2018 term many PAs will be exploring how the emergence of home automation and smart appliances and other controls may be tied into behavioral efforts. Some PAs may explore offering behavioral initiatives that have the ability to provide near real time electric consumption feedback, and/ or have the ability to offer a mobile based application in addition to traditional web based or paper reporting.</p>
<b>Special Notes</b>	

*e. Residential Products: Heating and Cooling (electric)*

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING AND COOLING - Electric</b>
<b>Overview and Key Objectives</b>	<p>The primary objective of the Residential Heating and Cooling core initiative is to encourage consumers to purchase the most efficient heating, ventilation and air condition (“HVAC”) and heat pump water heating technologies available when replacing older, less efficient equipment, and when considering equipment in new construction. The initiative also seeks to encourage contractors who service and install residential central air conditioning (“CAC”) equipment and air source heat pumps to follow installation best practices.</p> <p>The PAs began offering rebates for residential CACs and heat pumps in</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING AND COOLING - Electric</b>
	<p>2004. Originally called the ENERGY STAR<sup>®</sup> HVAC Program, COOL SMART<sup>®</sup> was re-branded and designed to increase consumer awareness and the market share of ENERGY STAR certified CAC units, air-source heat pumps, and ductless mini-splits, and to promote quality cooling installations by HVAC technicians and contractors. With over ten years of implementation experience the program is considered mature.</p> <p><b>Target Market:</b></p> <p>Residential electric customers.</p> <p><b>New Enhancements:</b></p> <p>The PAs will explore the following proposed enhancements:</p> <ul style="list-style-type: none"> <li>• Explore emerging technologies, ongoing effort.</li> <li>• Continue to review and monitor opportunities for upstream program models. The PAs will continue to coordinate with C&amp;I team and work with manufacturers and distributors to identify potential approaches.</li> <li>• Explore offering an online training for contractors in order to expand their participation in the program while reducing costs.</li> <li>• Explore protocols for installation and best practices for ductless mini-split heat pumps.</li> </ul>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>High efficiency CAC, ducted air source heat pumps, ductless mini-split heat pumps (for heating and cooling), heat pump water heaters, ECM furnace fans, ECM circulator pumps.</p> <p>There are incentives provided to appropriate contractors for following installation best practices. COOL SMART<sup>®</sup> trained contractors earn an incentive for performing the proper testing to check and adjust system air flow and refrigerant charge using third-party verification. Other incentivized measures include duct testing and sealing and downsizing of replacement equipment.</p> <p>Additionally, customers may utilize the 0% HEAT loan to finance</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING AND COOLING - Electric</b>
	<p>eligible HVAC equipment purchases.</p> <p><b>Implementation Strategy:</b></p> <p>This core initiative provides rebates for the installation of qualified HVAC equipment, provides installation best practices training to residential heating and cooling contractors who install rebate eligible equipment, and provides upstream incentives on ECM circulator pumps.</p> <p>PAs use a third-party verification process for their quality installation verification offerings for all residential HVAC installations and tune-ups, including existing systems, retrofit, and new installations.</p> <p>The Residential Heating and Cooling - Electric core initiative will continue to work with the Residential Heating and Cooling – Natural Gas core initiative (GasNetworks<sup>®</sup>) on joint offerings; marketing, contractor training, and trade ally outreach including circuit rider.</p> <p>By collaborating, the PAs offer a near seamless integration of the gas and electric energy efficiency programs. The PAs will continue their work with HVAC distributors, and where possible, develop upstream opportunities.</p> <p>In addition, the PAs will continue to work with industry partners to promote best installation practices, awareness, education, and training for HVAC contractors, such as:</p> <ul style="list-style-type: none"> <li>• ENERGY STAR<sup>®</sup> HVAC Quality Installation program (EPA)</li> <li>• Consortium for Energy Efficiency</li> <li>• Air Conditioning Contractors of America</li> </ul> <p>The Residential Heating and Cooling - Electric core initiative will continue to promote the North American Technician Excellence (“NATE”) in HVAC contractor and customer educational materials. This strategy is designed to promote the value of NATE certification in the HVAC community and support installation best practices, education, and training for HVAC technicians and contractors</p>
<b>Delivery Mechanism</b>	<p>The Residential Heating and Cooling - Electric core initiative will be administered by the electric PAs in each service territory. Delivery is</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING AND COOLING - Electric</b>
	<p>through a common vendor selected through a competitive RFP. Whenever possible, there is coordination with the Residential Heating and Cooling – Natural Gas core initiative. These initiatives will continue to use a single, joint circuit rider in the field.</p> <p>The Residential Heating and Cooling - Electric initiative coordinates with Residential Whole House Program initiatives (Residential New Construction, HES, and Multi-Family Retrofit) to support comprehensive customer and contractor access to program offerings. The initiatives ensure participating residential new construction builders and their HVAC contractors are made aware of the Residential Heating and Cooling training. Whenever appropriate, these trainings are provided jointly with the Residential Heating and Cooling – Natural Gas core initiative. HES and qualifying Multi-Family Retrofit participants are also provided appropriate information and referral to ensure they can access appropriate rebates.</p> <p>Quality control/follow-up inspections are performed by independent inspectors on up to 10 percent of installations to verify equipment installation.</p> <p>The initiative continues to use equipment distributors to sell high-efficiency equipment and quality installation related technology, and to provide indoor training labs for HVAC contractors.</p>
<b>Marketing Overview</b>	<p>The Residential Heating and Cooling - Electric core initiative is designed to promote the purchase and proper installation of energy efficient residential central air conditioning and air source heat pump systems at multiple levels and therefore must design marketing and outreach to reach each of these levels. The marketing activities aim to reach several target markets:</p> <ul style="list-style-type: none"> <li>• New systems in existing and new homes (new systems)</li> <li>• Replacement systems in existing homes (new equipment/old systems), including the early retirement of existing equipment</li> <li>• Improvements in operational systems in existing homes (new equipment/old systems)</li> </ul> <p>Marketing strategies are developed for educating and promoting efficient choices to residential customers directly as well as working with other key decision makers such as new construction builder, renovation contractors, distributors, and retailers to ensure key</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING AND COOLING - Electric</b>
	<p>decisions makers and influencers are all aligned to promote efficient equipment adoption.</p> <p>In addition, the initiative marketing increasingly emphasizes the importance of proper installation and sizing practices as well as the promotion of duct sealing and enhanced air distribution system efficiency. The Residential Heating and Cooling – Electric core initiative will continue to collaborate with the Residential Heating and Cooling – Natural Gas core initiative to develop and implement joint marketing activities whenever feasible. The initiative also leverages relationships with HVAC professionals allowing them to market the advantages of supported products directly to their customers, thereby increasing the opportunity to sell energy efficient units while helping the PAs to achieve their energy saving goals.</p> <p>Marketing activities will continue to emphasize outreach to HVAC professionals (contractors and distributors, including gas contractors).</p> <p>The PAs will continue to build an integrated marketing and branding approach incorporating key elements such as contractor and distributor outreach and training, the Mass Save<sup>®</sup> website, collateral updates, email blasts, bill inserts, as well as other activities. In 2016-2018 the marketing strategy will utilize effective contractor and customer education messaging to meet the initiative goals and provide essential opportunities for HVAC professionals in coordination with all Residential Whole House core initiatives.</p> <p>A joint circuit rider will continue to provide outreach services, education, and support in the field through visits and calls to HVAC distributors, supply houses, and contractors. The circuit rider also participates in training, trade shows, and related industry events. The initiative tracks and provides targeted outreach to large HVAC contractors previously inactive in the program. The PAs plan to continue use of contractor competitions and awards programs, including an annual recognition celebration for contractors to maintain and improve program participation from existing HVAC partners and to recruit more contractors.</p> <p>The PAs will also work with the ENERGY STAR<sup>®</sup> HVAC Quality Installation program team, the CEE HVAC Committee, and other industry partners to promote best installation practices, awareness, education, and training for HVAC contractors.</p>



<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING AND COOLING - Electric</b>
	<p>The PAs plan to review cooperative (upstream) promotions with the HVAC industry, in coordination with C&amp;I where feasible.</p> <p>The PAs will use print and media advertising targeting consumers, contractors, and distributors (including information on the website, participation at trade shows, articles in trade publications, and mailings to distributors, contractor, and non-participants). The PAs will collect and use consumer testimonials affirming the benefits of program measures. These efforts will be in conjunction with the Residential Heating and Cooling – Natural Gas core initiative, where possible.</p> <p>The PAs will continue to leverage manufacturer/distributor level marketing and training infrastructure as a platform to educate contractors and wholesalers at a regional level. These will be in conjunction with the Residential Heating and Cooling - Natural Gas core initiative, where possible.</p> <p>PAs will market and leverage all available federal tax credits where applicable as well as all supplemental consumer incentives (<i>e.g.</i>, equipment manufacturers) as a means to increase consumer purchases of high efficiency central air conditioning and heat pump systems.</p>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>A mini-split evaluation currently underway and due in the summer of 2016 will influence incentive deployment in the 2016-2018 plan term. Consumer interest in cold climate heat pump technology and its application in Massachusetts is also likely to lead to additional PA exploration and testing of different heat pump technologies and applications.</p>
<b>Special Notes</b>	

*f. Residential Products: Heating and Cooling (gas)*

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
<b>Overview and Key Objectives</b>	<p>The primary objective of the Residential Heating and Cooling - Natural Gas core initiative is to overcome market barriers and increase market awareness and penetration of high efficiency gas heating (hot water boilers and warm air furnaces), water heating equipment, and associated</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
	<p>controls including wireless programmable thermostats and outdoor reset controls. This initiative is administered by the Gas PAs. Heating and water heating systems fueled with oil, propane, or solar (in the case of CLC) have been supported through the HES core initiative by electric PAs.</p> <p>A major focus of program activity is to provide support to plumbing and heating contractors and the full supply chain (manufacturers, distributors and suppliers) to ensure availability, promotion, and quality installation of the highest efficiency equipment. Program rebates are provided to customers to help offset the higher cost of their investments in high-efficiency heating and water heating equipment.</p> <p>Massachusetts PAs were amongst the earliest sponsors of gas efficiency programs, offering gas high efficiency heating and water heating rebates for over 15 years. While the core program design is considered mature, the PAs continue to innovate and lead the nation in program refinement. The PAs' concentration of incentives on the highest efficiency models and concurrent reduction or elimination of incentives on lower efficiency models has had a demonstrable effect in increasing the availability, promotion, and acceptance of the highest efficiency equipment by Massachusetts residential gas customers.</p> <p><b>Target Market:</b></p> <p>All residential gas customers.</p> <hr/> <p><b>New Enhancements:</b></p> <p>The PAs anticipate the following initiative enhancements for the three year planning term of 2016-2018:</p> <ul style="list-style-type: none"> <li>• Continue to expand trade ally awareness and strengthen existing partnerships, including deploying use of the redesigned website for contractors, implementing seasonal or year-round contractor incentive promotions, and new technology training initiatives. These efforts will be ongoing throughout the Three-Year Plan.</li> <li>• Continue to focus on streamlining customer and contractor transactions with tools such as online rebate fulfillment and increased leveraging of data from the GasNetworks<sup>®</sup> website to design additional targeted marketing as well as increase use of digital marketing.</li> </ul>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>The Residential Heating and Cooling – Natural Gas core initiative promotes high efficiency products and installation best practices for hot water boilers, warm air furnaces (with electronically Commutated Motor or equivalent advanced furnace fan systems), select heating system controls including after-market boiler rest controls, programmable and wireless enabled thermostats, gas water heating equipment, and heat recovery ventilator equipment (“HRV”).</p> <p><b>Implementation Strategy:</b></p> <p>The Residential Heating and Cooling – Natural Gas core initiative is designed to overcome market barriers and increase awareness among consumers, plumbing/heating contractors, and home builders/developers. The initiative utilizes a combination of marketing and customer rebates to help build demand and acceptance of high efficiency natural gas equipment.</p> <p>The purchase and installation of heating and water heating equipment is heavily influenced by the installing contractors and the supply chain behind them. For this reason, a major focus of this initiative is the market actors who strongly influence the purchase and placement of efficient options. These include :</p> <ul style="list-style-type: none"> <li>• Plumbing and HVAC contractors and technicians</li> <li>• Manufacturers, distributors, and suppliers of high efficiency heating and water heating equipment and related parts/accessories</li> <li>• New home builders and remodeling contractors</li> <li>• Home designers, architects, and engineers.</li> <li>• Building Inspectors and industry affiliate organizations including the Massachusetts Building Inspectors, <i>i.e.</i>, Southeastern Massachusetts Building Officials Association (“SEMBOA”), Plumbing, Heating and Cooling Contractors of MA (“PHCC of MA”), International Association of Plumbing and Mechanical Officials (“IAPMO”)</li> <li>• Residential home owners and multi-family property owners (residentially metered) with natural gas heating and water heating equipment or in the market to purchase equipment.</li> </ul>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
	<p>The initiative maintains a contractor facing GasNetworks<sup>®</sup> website that was recently completely refreshed. The site is tied to the Mass Save<sup>®</sup> website but allows for more in depth and targeted information for the target market actors.</p> <p>The initiative keeps current on emerging trends and technologies, works closely with manufacturers and distributors, as well as coordinates with supply houses to ensure awareness of the highest efficiency equipment availability and benefits. Equipment stocking must be done well in advance of the season and has significant impact on what contractors will offer and promote. The initiative includes regular visits with supply houses and big box stores to educate partners and to support optimal stocking practices. These regular visits can also leverage the relationships for training and promotions targeted at the installation contractors.</p> <p>The initiative depends significantly on high quality training opportunities as a mechanism to connect with installation contractors and influence installation practices. GasNetworks<sup>®</sup> has run numerous training events as well as a highly effective annual conference for over 15 years. The initiative also works with vocational school faculty to reach emerging professionals.</p> <p>The initiative offers customer rebates to offset the higher cost of purchasing qualifying gas heating, water heating equipment, and controls in the new construction and replacement market. In collaboration with the Residential Heating and Cooling - Electric core initiative, the Residential Heating and Cooling – Natural Gas core initiative also offers a dual electric/natural gas rebate incentive for high-efficiency furnaces equipped with Electronically Commutated Motor (“ECM”) or equivalent advanced furnace fan systems. The initiative offers customer incentives for energy efficient water heating equipment. In addition to heating and water heating equipment, customer incentives are also offered for select heating system controls, such as programmable and Wi-Fi thermostats, boiler reset controls, and heat recovery ventilator units.</p> <p>The initiative will continue to support the early replacement boiler/furnace promotion, integrated with the HES core initiative, which provides an incentive to replace old, inefficient, but still operating, heating equipment with new high efficiency equipment.</p> <p>Gas PAs consistently monitor this initiative and evaluate free-ridership</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
	<p>in order to drive customers to go deeper and achieve the highest level of efficiency available.</p>
<b>Delivery Mechanism</b>	<p>The initiative is administered by gas PAs. Given the complex nature and critical importance of the supply chain and installation contractors in reaching end customers the residential Heating and Cooling – Natural Gas core initiative uses three complimentary delivery support vendors.</p> <p>PAs jointly contract with a competitively bid primary delivery vendor. This vendor is responsible for direct communication and education of all key trade allies, in particular manufacturers, distributors, supply houses, heating and water heating contractors, and vocational school faculty members. This vendor monitors the website interface, helps connect PA partners to the website and offers suggestions for content. The vendor maintains primary circuit riding responsibilities to supply houses. PAs have also leveraged the circuit rider secured by the Residential Lighting and Products core initiatives to provide field visits and sales training through the distribution of point-of-purchase rebate materials to big box stores and other applicable retail outlets.</p> <p>PAs jointly contract with a rebate processing vendor. This vendor is secured to review, process, and deliver valid rebate claims to customers. This vendor is also responsible for tracking and reporting program activity to gas and electric PAs as well as providing verification of a percentage of installed qualified equipment across PAs.</p> <p>PAs own the GasNetworks® website. PAs jointly contracted with the vendor who had supported the Massave.com site for a complete site refresh. This vendor is continuing to provide support to PAs for website interface and functionality related updates to the website and to support digital marketing opportunities.</p>
<b>Marketing Overview</b>	<p>The initiative will be promoted through a variety of marketing and educational campaigns including, but not limited to: upstream outreach, direct mail, bill inserts, sponsorships and trade ally circuit-rider visits, and other training events. The GasNetworks® annual conference is a signature event with over 400 attendees annually and a key opportunity to connect with installation contractors, manufactures and distributors of high efficiency technologies. The initiative has been particularly successful utilizing a direct vendor outreach marketing approach to gas equipment suppliers and installation contractors. The</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
	<p>PAs will continue to implement this approach in 2016-2018.</p> <p>PAs have also built strong relationships with building inspectors and industry affiliate organizations including the Massachusetts Building Inspectors, <i>i.e.</i>, SEMBOA, PHCC of MA, IAPMO and will continue to promote initiative offerings through these strategic relationships.</p> <p>The PAs will continue to enhance their outreach to customers in collaboration with the other PA working groups. PAs will also enhance awareness through successful targeted techniques involving website and email. In addition to direct rebate offers to customers, PAs offer strategic seasonal or year-round contractor incentives to further encourage the installation of high efficiency heating equipment. PAs also market and leverage all available federal tax credits where applicable and other consumer incentives as a means to increase consumer sales of high efficiency heating and water heating equipment.</p>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>PAs will continue to explore cost-effective offerings, such as seasonal incentives to contractors or special promotion resources to trade allies and other market actors, which assist with the stocking, sales, and installation of high efficiency heating and water heating equipment.</p> <p>The March 2015 High Efficiency Heating Equipment Impact Evaluation has raised some concerns over the installation of condensing boilers. The high efficiency of condensing boilers relies on a low boiler return water temperature, which means that differences in installation practices that impact return water temperature have a large impact on savings. PAs remain enthusiastic about the savings potential of this technology and will focus on additional study and experimentation to overcome these issues in installation practice.</p> <p>PAs will continue to leverage the GasNetworks<sup>®</sup> website. The refreshed website offers new analytics on who and what partners are searching for and allows new opportunities for increased targeting and digital marketing.</p> <p>The PAs will continue to enhance integration and cross-promotion efforts with the Residential Heating &amp; Cooling – Electric and HES core initiatives. In addition, PAs will review emerging technologies for cost-effectiveness and will continue to explore an upstream program model.</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u></b> <b>RESIDENTIAL HEATING &amp; COOLING - Natural Gas</b>
<b>Special Notes</b>	Increasing product standards and significant volatility of the avoided cost of natural gas are putting increased pressure on this program to deliver cost effective savings.

*g. Residential Products: Residential Consumer Products*

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u></b> <b>RESIDENTIAL CONSUMER PRODUCTS</b>
<b>Overview and Key Objectives</b>	<p>The objective of the Residential Consumer Products core initiative is to increase consumer awareness of the importance and benefits of purchasing or ENERGY STAR<sup>®</sup> certified appliances and electronic products. It also seeks to expand the availability, consumer acceptance, and use of high-quality energy-efficient technologies. This initiative also promotes the recycling of certain older, less efficient appliances. The initiative utilizes upstream incentives, mail-in rebates, and an on-line catalog to deliver lower product costs to customers and drive increased customer acceptance and sales.</p> <p>Increasing product standards combined with the success and maturity of Program Administrator programs have limited the savings opportunities in several appliance product categories. PAs continue to explore emerging technologies and innovative program design to drive market penetration of the most efficient products. This is accomplished through increasing the balance of upstream and midstream incentive placement and alternative or bundled incentive/rebate structures and placement.</p> <p>The Products initiative has successfully leveraged creative marketing, including significant social media, affinity marketing, retail partnerships and point of purchase promotions.</p> <p><b>Target Market:</b></p> <p>All residential electric customers</p>
	<p><b>New Enhancements:</b></p> <p>PAs are exploring various methods to streamline incentive delivery</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL CONSUMER PRODUCTS</b>
	<p>methods to the consumer (<i>e.g.</i>, midstream/upstream) and to address the rapidly changing appliance and electronics marketplace. This is an ongoing effort.</p>
<p><b>Core Initiative Design</b></p>	<p><b>Measures Promoted:</b></p> <p>Incentives are provided for qualifying consumer products. The list is continuously updated and frequently changes. It has included certain refrigerators, freezers, air cleaners, clothes dryers, advanced power strips, televisions, desktop computers, pool pumps, dehumidifiers, water saving products and refrigerator/freezer recycling.</p> <p><b>Implementation Strategy:</b></p> <p>The Residential Consumer Products core initiative educates consumers about the benefits of ENERGY STAR<sup>®</sup> certified products to increase consumer acceptance of products and to encourage them to look for and purchase ENERGY STAR<sup>®</sup> certified models when they shop.</p> <p>The initiative promotes select ENERGY STAR<sup>®</sup> certified consumer products at the point of sale by providing promotional literature and displays to retailers, working with sales staffs to ensure they understand and can accurately market the benefits of these products, and providing labels to identify models that meet ENERGY STAR<sup>®</sup> standards.</p> <p>The initiative actively participates in national ENERGY STAR<sup>®</sup> awareness campaigns and in efforts to keep ENERGY STAR<sup>®</sup> specifications up to date and relevant.</p> <p>The Residential Consumer Products core initiative primarily focuses on customer rebates, which can be completed on line or mailed in. The initiative is tightly interwoven with the Lighting initiative and leverages many of the same access points as the Lighting program including:</p> <ul style="list-style-type: none"> <li>• Upstream incentives/negotiated promotions which can provide instant price discount to the consumer for qualified products. Along with the price reductions provided by rebates, incentives and promotions makes products more attractive to the customers, which in turn increases the number of retail outlets willing to carry these products.</li> <li>• Partnerships with local and national retailers with joint</li> </ul>



<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL CONSUMER PRODUCTS</b>
	<p>promotions and coordinated point of purchase promotional materials and support. Retailers are also provided training and additional support to ensure they can be one-on-one consumer educators and effective champions for the energy efficient appliances and electronics.</p> <ul style="list-style-type: none"> <li>• Social media outlets, like Facebook and Twitter, offer the ability to launch creative campaigns promoting energy efficient products and package with lighting offers.</li> <li>• “Pop-up” retail allows the PAs to offer smaller products such as advanced power strips (“APS”), a product that’s benefits typically need to be explained to consumers, along with lighting in temporary retail locations, such as mall kiosks, corporate, and public events. This brings the technology and education about the technology directly to the consumer.</li> </ul>
<b>Delivery Mechanism</b>	<p>PAs jointly contract with a <i>manufacturer/retailer outreach contractor</i>, often called a “circuit rider”. This contractor recruits and train retailers (including discount retail outlets) to participate in the incentive program, places point of purchase materials in participating retail stores, and acts as a liaison for PAs, manufacturers, and retailers. This vendor is also responsible for supporting and tracking midstream incentive efforts.</p> <p>The Residential Consumer Products core initiative utilizes the same competitively bid <i>rebate fulfillment contractor</i> used in the Residential Lighting initiative to process both mail in and online rebates. This vendor also collects data and payment requests from consumers, manufacturers, and retailers. In addition, they will process reimbursement requests from customers and NCP partners. The contractor provides documentation to the PAs for program tracking and evaluation purposes.</p> <p>The Consumer Products initiative is also able to share the <i>internet/mail-order sales channel contractor</i> used in the Residential Lighting Initiative. This vendor maintains stock of products offered through the catalog and the Mass Save<sup>®</sup> website, staffs a toll-free line for customers, and processes catalog and website purchases.</p> <p>The temporary “pop-up” retail kiosks described under implementation, done in conjunction with the Residential Lighting initiative, create an opportunity to promote a small number of consumer products, currently the APS and Shower Start products. To the extent that smaller</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL CONSUMER PRODUCTS</b>
	<p>electronics or other efficiency technologies appropriate to a retail kiosk are added to the program they may be deployed in this way. This involves an additional specialized vendor jointly contracted by the PAs for this offering.</p>
<b>Marketing Overview</b>	<p>The Consumer Products initiative provides significant opportunity to market the Mass Save<sup>®</sup> brand, by placing the brand and efficient products firmly in the consumer market place. The value of end cap displays in major retail outlets with direct access to Massachusetts customers brings efficiency into the daily lives of many who may otherwise never encounter the efficiency messages. Relationships with product manufacturers also offer unique opportunities for “prizes” and special promotions like the Super Bowl efficient TV sweepstakes that can broaden PA reach and tap new market segments with efficiency messages. Even as the Consumer Products category becomes more challenging as a sector for savings, its value to overall efficiency marketing and Mass Save<sup>®</sup> brand should not be underestimated.</p> <p>In the appliance and electronics category, marketing initiatives will be designed to leverage new product specifications being rolled out in several product categories and the emergence of new high efficiency technologies. Key marketing strategies will aim to build awareness and demand for new, high efficiency products, as well as consumer education to help customers take advantage of these technologies.</p> <p>Consumer education tactics will continue to employ retail point of purchase materials, sales promotions, consumer engagement events, social media, email, and other best practice marketing tactics to drive sales of qualified energy efficient appliances and electronics.</p> <p>Efforts will continue to monitor the market for energy efficient "smart" technologies in appliances and consumer electronics to inform future program planning and marketing opportunities. Go-to-market strategies will be explored to introduce new connected smart appliances and plug load controlling electronics into the marketplace as the PAs better understand their value in securing energy efficiency benefits for their customers.</p> <p>Tactics to support these efforts will include consumer education via social media channels, consumer events, and retail promotions and point of sale materials to educate and motivate consumers to use these new technologies.</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL CONSUMER PRODUCTS</b>
	<p>As in lighting, product marketing will continue to leverage the strong social media presence built over the 2013-2015 term.</p>
<p><b>Three-Year Deployment Strategy/Roadmap</b></p>	<p>For consumer products, efforts to broaden categories as well as allow consumers the opportunity to increase the savings in their homes with new technologies provide unique challenges for the PAs. Increasing standards and market saturation will continue to decrease electric savings for some energy efficient products, forcing the PAs to adapt and explore avenues of program deployment that are new and possibly untested.</p> <p>PAs will continue to explore expanding the products included in upstream efforts in an attempt to duplicate the successes with lighting.</p> <p>As standards became more stringent during the 2013-2015 term, the PAs successfully developed tools and techniques for promoting more efficient products to consumers, such as the higher CEE Tiers, and the newer higher tier of ENERGY STAR® “Most Efficient” categories. The PAs plan to continue to use these tools and techniques to continue to support the consumer awareness and adoption of highest efficiency appliances.</p> <p>The PAs will also explore tactics to support deeper savings through education, promotion, and possibly higher incentive offerings, if appropriate.</p>
<p><b>Special Notes</b></p>	

*h. Residential Products: Residential Lighting (electric)*

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
<p><b>Overview and Key Objectives</b></p>	<p>The objective of the Residential Lighting core initiative is to increase consumer awareness of the importance and benefits of purchasing ENERGY STAR® qualified lighting products and expand the availability, consumer acceptance, and use of high quality energy efficient lighting technologies and controls. Residential lighting provides 54 percent of the annual electric savings for the residential and low income sectors. There are increasing pressures on these savings</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
	<p>from increased standards/baselines and higher prices for the newer energy efficient technologies. However, lighting remains a critical driver of residential savings.</p> <p>The initiative utilizes a combination of upstream incentives at the manufacturer and retail level, and an online catalog channel to deliver lower product costs to customers and drive increased customer acceptance and sales. The Lighting initiative has successfully leveraged creative marketing, including significant social media, affinity marketing, retail partnerships and point of purchase promotions. Lighting technology has evolved rapidly from the basic compact fluorescent spirals to multiple specialty bulbs, fixtures, and light emitting diodes (“LEDs”) applications.</p> <p>PAs saw rapid expansion of the LED market in 2013-present through aggressive upstream incentives enabling more affordable pricing by manufacturers and retailers.</p> <p><b>Target Market:</b></p> <p>All residential electric customers.</p> <hr/> <p><b>New Enhancements:</b></p> <p>PAs will continue to explore approaches that support additional savings. This is an ongoing effort.</p> <ul style="list-style-type: none"> <li>• PAs plan further expansion and focus on introducing LED bulbs and fixtures into the marketplace and phasing out CFL bulbs.</li> <li>• PAs will explore lighting controls as a possible initiative expansion measure. PAs will coordinate with other research and development efforts.</li> </ul>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>The Residential Lighting core initiative promotes ENERGY STAR certified light bulbs and fixtures. Current offerings include CFL and LED bulbs, with a continuing emphasis on expanding LEDs while phasing out CFL bulbs.</p> <p><b>Implementation Strategy:</b></p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
	<p>The Residential Lighting program strategy depends on a fluid mixture of:</p> <ul style="list-style-type: none"> <li>• Advanced market knowledge and data of efficient lighting technology and products</li> <li>• Sophisticated incentive structure that includes incentive placement at the manufacturer (upstream) and at retail purchase points (midstream)</li> <li>• Cutting edge marketing and educational strategies to support customer adoption of the most efficient technologies</li> </ul> <p>To achieve this complex mixture, PAs invest strongly in staying up to date on overall residential lighting market conditions, product availability, market share, and pricing. This allows PAs to adapt initiative offerings, as needed, to introduce new cost effective savings technologies, target incentives, and marketing to build customer acceptance and adoption. This ultimately increases the market share of energy efficient lighting products.</p> <p>The Residential Lighting core initiative includes several components and entry points designed to educate consumers about the benefits of ENERGY STAR<sup>®</sup> qualified lighting products and to make these products more affordable and easily available:</p> <ul style="list-style-type: none"> <li>• Upstream incentives/negotiated promotions provide instant price discounts to the consumer for qualified products. The price reductions provided by incentives and promotions makes lighting products more attractive and affordable to the customers, which in turn increases the number of retail outlets willing to carry these products.</li> <li>• Partnerships with local and national retailers with joint promotions and coordinated point of purchase promotional materials and support. Retailers are provided training and additional support to ensure they can be one-on-one consumer educators and effective champions for the energy efficient lighting technologies. The initiative partners with retailers for end cap space for display and with point of purchase marketing putting high efficiency lighting prominently in consumer’s path. The initiative’s field service vendor will also set up educational tables to promote the program at various times throughout the year.</li> <li>• Special attention and increased incentives to retail outlets</li> </ul>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
	<p>designated to serve hard to reach customers, to ensure equal access to affordable efficient lighting for all customers.</p> <ul style="list-style-type: none"> <li>• An internet/mail-order sales channel offers education, rebates, and introductions to new products that may not be available at most retailers, as well as access to a variety of hard to find replacement bulbs. PAs are working on improvements to the internet/mail-order website, increasing its functionality as an educational tool for consumers. PAs have enhanced the products pages of the Mass Save<sup>®</sup> website helping guide customers to the online store and to local retailers with promotional activity.</li> <li>• Social media outlets, like Facebook and Twitter, offer the ability to launch creative campaigns promoting energy efficient lighting as well as other products. Social media campaigns and contests provide an exciting way to leverage PA customers as brand ambassadors and greatly expand the initiative’s reach.</li> <li>• Affinity marketing has been added to the mix of promotional strategies. Similar to social marketing, affinity marketing allows a reach into a broader consumer demographic while continuing to build brand awareness. It offers additional community benefits through the significant charity donation raised. PAs are continuing to explore additional affinity marketing opportunities.</li> <li>• “Pop-up” retail allows the PAs to offer efficient lighting products to consumers in temporary retail locations, such as mall kiosks, corporate, and public events. This brings the technology and education directly to the consumer.</li> <li>• Some PAs provide a school fundraising offer which allows PAs the opportunity to educate students on the benefits of energy efficiency, while helping schools to raise funds through the sale of lighting products.</li> </ul>
<b>Delivery Mechanism</b>	<p>With the multiple points of entry for customers and the multilayered incentive and marketing strategy, the Lighting and Products programs have a complex set of delivery vendor partners. PAs engage vendors to support manufacturer and retail recruitment, on-going partnership training and promotion activity, as a marketing vendor partner, and a rebate and on-line store vendor. To ensure a consistent and smooth customer experience as well as greater ease for manufacturers and retailers to engage with the program, PAs have worked effectively to coordinate and jointly contract services with common vendors.</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
	<p>PAs jointly contract with a <i>manufacturer/retailer outreach contractor</i>, often called a circuit rider. This contractor recruits and train retailers (including discount retail outlets) to participate in the incentive program, places point of purchase materials in participating retail stores, oversee the Negotiated Cooperative Promotions (“NCP”) process, attends in-store events on behalf of the PAs to further promote the programs, and acts as a liaison for PAs, manufacturers, and retailers.</p> <p>A <i>rebate fulfillment contractor</i> collects data and payment requests from manufacturers, retailers, and consumers. In addition, they will process reimbursement requests from NCP partners and provide documentation to the PAs for program tracking and evaluation purposes.</p> <p>The <i>internet/mail-order sales channel contractor</i> will purchase and stock products offered through the catalog and the Mass Save® website, staff a toll-free line for customers, and process catalog and website purchases.</p> <p>PAs employ temporary “pop-up” retail kiosks at key events and locations as described under implementation. This involves an additional specialized vendor jointly contracted by the PAs for this offering.</p>
<b>Marketing Overview</b>	<p><b>Strategy:</b></p> <p>As lighting technology rapidly expands with new LED replacement bulbs and fixtures, and we explore lighting control options increasingly introduced into the market, marketing initiatives may include support for consumer trial through the use of discounted products and special manufacturer/retailer promotions. A key to growing market share for LEDs will be to shift consumer perception of lighting from a commodity product to a more considered purchase. It remains critical for marketing to support customers understanding of each lighting product's application and benefits. This will be accomplished through strategic use of educational advertising, in-store displays, social media outreach, and other point of sale communications.</p> <p>It is critical to roll out products that have proven performance and clearly communicate to customers the appropriate application to ensure their optimal experience with the new technologies. PAs remain ever cautious of the potential for customer rejection of new technology</p>

<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
	<p>classes due to the experience of continued customer perception of CFL applications from early sub optimal customer product experience. PAs remain vigilant in managing introduction of technologies at optimal product evolution stage and doing so with strong communication about best applications.</p> <p>The marketing team has designed highly effective campaigns that help focus consumers on appropriate end uses or applications for specific lighting technology, <i>e.g.</i>, LED BR 30. For example, few customers have any idea what a LED BR 30 is and its shape is somewhat unfamiliar as it is meant for use in recessed can fixtures rather than traditional lamp application. To take the mystery out of a specialty bulb like BR30s marketing works to offer promotions and marketing that help consumers connect the lighting to a specific room or use, like a “kitchen 3 pack” in the case of BR30s.</p> <p>The Residential Lighting initiative has seen tremendous success and intends to expand its affinity marketing activity. In the 2013-2015 term, the Residential Lighting initiative launched a promotion with our manufacturers and retailers supporting the Ellie Fund, described more fully under the implementation section above. The PAs will explore other affinity marketing opportunities to expand the reach to new market segments while offering the added benefit of supporting our community beyond energy efficiency.</p>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>The Residential Lighting core initiative continues to face challenges in the upcoming three-year term. The per unit annual savings for CFLs and LEDs will continue to decline to account for the anticipated multi-year phase out of incandescent bulbs due to EISA standards. In addition, both the per unit lifetime savings and the per unit measure lives have been reduced in this plan to estimate the post 2020 EISA code change may have on savings for both CFLs and LEDs. PAs plan to continue to increase penetration of LEDs and roll out new LED bulb types and fixtures based on estimates of future product availability and price. While LED technology is evolving very rapidly and becoming more cost competitive, the bulb price is still markedly higher than for equivalent energy saving CFLs. Even when longer life is included in savings, the shift to an increasing mix of LEDs will impact the cost of savings. PAs will be balancing the phase in of LEDs to maximize provision of high performance lighting that offers customers a positive experience and builds continued acceptance with a focus on responsible investment of efficiency dollars to continue to achieve savings targets</p>



<b>RESIDENTIAL PRODUCTS</b>	<b><u>CORE INITIATIVE</u> RESIDENTIAL LIGHTING</b>
	<p>within responsible budgets.</p> <p>For the three-year deployment, the PAs will focus on:</p> <ul style="list-style-type: none"> <li>• Expanding the mix of energy efficient lighting products available in retail</li> <li>• Increased focus on LED products to reach “deeper” savings for each customer with more options for each socket</li> <li>• Continuous offerings over longer horizon periods at retail to ensure year-round product availability to consumers</li> <li>• Innovative approaches to community and corporate events including areas with high percentages of renters or moderate income households.</li> <li>• Phasing in of qualified products for new technologies that require new entrants and implementation strategies.</li> </ul>
<b>Special Notes</b>	Specialty CFL bulb incentives will phase out in 2016.

F. **Low-Income Programs**

1. **Low-Income Program Descriptions**

a. *Low-Income: Single Family*

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u> SINGLE FAMILY</b>
<b>Overview and Key Objectives</b>	<p>The Low-Income Single Family core initiative implements cost-effective, energy efficiency products and services directly for residential customers living in one to four unit dwellings in which at least 50 percent of the occupants are at or below 60 percent of the state median income level. The initiative is implemented by local Community Action Program (“CAP”) Agencies and integrated with the Department of Housing and Community Development (“DHCD”) Weatherization Assistance Program (“WAP”). All applicable revenue streams from each program are leveraged and offered jointly to income eligible residents. This approach provides a seamless, integrated experience for the participants with deeper efficiency penetration consistent with a whole house approach generally with no co-payment</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>SINGLE FAMILY</b>
	<p>required from participating customers.</p> <p><b>Target Market:</b></p> <p>Residential customers living in one to four unit dwellings who are at or below 60 percent of the state median income level or who are qualified to receive fuel assistance and/or utility discount rates. For two to four unit dwellings, 50 percent of the occupants must qualify as low-income in order to be served by the Low-Income Single Family core initiative.</p> <p>Any changes to eligibility criteria will be addressed collectively between the PAs, LEAN, DHCD, lead vendor (where applicable) and CAP agencies.</p> <p><b>New Enhancements:</b></p> <ul style="list-style-type: none"> <li>• The PAs will continue to work with the Low-Income Best Practices working group to identify new cost-effective energy efficiency services, measures and technologies that are appropriate to offer to low-income customers. In 2014, the PAs collectively went out to bid for the fulfillment distributor of High Efficiency Lighting Products for all residential and low-income, direct install programs. Through this process, the PAs have realized significant cost savings and are in the process of transitioning the bulb offer to allow for more installations of LED bulbs within low-income customer homes. As new LED technology continues to emerge and pricing continues to decline, the PAs will look to transition to LED technology over the next three years exclusively as applicable and dependent upon PA budgets.</li> <li>• PAs will work with LEAN, state organizations such as the DHCD, lead vendor, and CAP agencies to increase qualified contractor participation in the initiative through training and workforce development. The PAs also plan to continue to support contractor and auditor training as needed, throughout the 2016-2018 program years.</li> </ul>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>Measures are provided at no cost to the customer with established caps, where applicable. The measures available to each low-income single family property include:</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>SINGLE FAMILY</b>
	<ul style="list-style-type: none"> <li>• Insulation (attic, wall, pipe, and duct)</li> <li>• Air sealing</li> <li>• Heating system repair and replacement</li> <li>• Programmable thermostats</li> <li>• Domestic water heating, including low-flow showerheads, faucet aerators, pipe wrap, heat pump water heater (electric)</li> <li>• Lighting, including LEDs, CFLs, lighting fixtures, and torchieres</li> <li>• Appliances, including refrigerator and freezer replacement, second refrigerator removal, advanced power strips, window air conditioner replacement</li> <li>• Weatherization repairs (electrical, roofs, etc.)</li> <li>• Health and safety</li> </ul> <p>In coordination with LEAN, the PAs will work with the MTAC to include new measures or technologies as appropriate</p> <p><b>Implementation Strategy:</b></p> <p>Once customers are deemed eligible, they will receive an in-home energy assessment from their local CAP agency. The assessment evaluates the building shell, efficiency, and (for electric PAs only), the appliance conditions. All assessments include an evaluation of home health and safety. The lead vendor/CAP agency will then arrange for all applicable measures and services to be installed by a qualified contractor.</p> <p>The initiative piggybacks on the current DHCD WAP. All applicable revenue streams available are leveraged to enhance services consistent with a whole-house approach. PA funding will primarily be used to address more items on the cost-effective priority list, including approved weatherization-related repairs. Federal money will primarily be used to address health and safety issues, as well as repairs, to allow for cost-effective energy efficient measures to be installed.</p> <p>As mandated by DHCD for all projects that receive Department of Energy (“DOE”) funding, the CAP agencies perform 100 percent post-installation quality assurance inspection of projects to ensure that all work is performed to the program guidelines. The CAP agencies also perform a minimum of 50 percent in-process inspection of projects.</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>SINGLE FAMILY</b>
	<p>Because the PA initiative piggybacks on the DHCD program, many jobs are multi-funded; therefore, quality control is completed for both DOE and PA-funded projects at the same time. DHCD performs another level of visual inspection for 20 percent of all DOE-funded projects. During these inspections, DHCD reviews both DOE and PA-funded work. Additionally, the PAs have an independent third-party vendor perform quality assurance inspections for an additional level of quality control. PAs require 5 percent of all jobs that are exclusively funded by the PAs to be inspected by a third party quality control vendor.</p> <p>Energy efficiency education and information is provided to all participating customers. The primary form of energy education is verbal communication between the auditor and the client along with leave-behind materials. In 2013, the PAs collaborated with the Low-Income Best Practices working group and developed common, statewide educational materials. Educational materials will continue to be updated and provided to customers as applicable. The PAs will work in collaboration with the Low-Income Best Practices working group, including LEAN, DHCD, lead vendors (where applicable), and CAP agencies to coordinate statewide on all aspects of the Low-Income Single Family core initiative, including but not limited to planning, delivery, implementation, education, marketing, training, cost-effectiveness, evaluation, and quality assurance.</p>
<b>Delivery Mechanism</b>	<p>PAs, when appropriate, use lead vendors to administer the initiative. The PAs work closely with their lead vendors and/or respective CAP agencies on all aspects of the initiative design and implementation. The lead vendors/CAP agencies are responsible for providing coordination of energy efficiency services to the customer. The lead vendors/CAP agencies work with installation contractors to ensure that the proper initiative guidelines are enforced. These agencies are also responsible for ensuring that the customer meets the eligibility requirements for initiative participation and providing the lead vendors and/or PA with the required documentation of all work performed. Quality assurance is completed by the lead vendor/CAP agencies, DHCD, as well as by a PA-funded independent third party vendor.</p>
<b>Marketing Overview</b>	<p><b>Strategy:</b></p> <p>Marketing outreach designed to reach more income-eligible customers</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>SINGLE FAMILY</b>
	<p>and maximize energy savings opportunities will continue to expand through the 2016-2018 Low-Income Single Family core initiative (where applicable). PAs, in collaboration with lead vendors (where applicable) and CAP agencies, will continue to engage in targeted, localized outreach efforts to notify customers of the availability and value of energy efficiency services. Marketing consists of contacting qualified income-eligible customers subscribing to the discount rate who have not received prior energy efficiency services. Telemarketing, direct mail, bill inserts, and literature distributed through social services agencies, government offices, and other networks when appropriate are also used to market the initiative. In addition, PAs are participating in statewide marketing efforts to encourage all customers to participate in energy efficiency initiatives. Those efforts will assist in driving income-eligible customers to take advantage of not only energy efficiency programs but also discount rates, fuel assistance, and other social programs. Awareness of the initiative is also gained through participation in local community events such as job fairs, senior centers, and employee presentations, which may include case studies.</p> <p>Outreach and marketing efforts, as well as PA collaboration, will be expanded as needed. Approaches may include building relationships with unemployment centers, medical service providers, and other venues that could reach potential income-eligible customers. PAs will continue to examine other potential service providers and venues that could reach income-eligible customers.</p>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>The PAs will coordinate efforts through the existing low-income weatherization and fuel assistance program via LEAN to ensure consistent implementation throughout the state and retain the advantages of the existing infrastructure of central coordination while avoiding the creation of a new or central entity. Training and workforce development will be accomplished by the PAs working with LEAN, DHCD, lead vendors, and CAP agencies to increase the number of qualified contractors, energy auditors, and administrative staff. The PAs in conjunction with LEAN, the lead vendors and the CAP agencies will continually review and evaluate new measures and technologies. All applicable revenue streams available will be leveraged to enhance services. Through marketing and outreach efforts, the PAs will attempt to broaden initiative participation. PAs will attempt to deepen efficiency penetration consistent with a comprehensive, whole house approach.</p>

*b. Low-Income: Multi-Family*

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
<b>Overview and Key Objectives</b>	<p>The Low-Income Multi-Family Retrofit core initiative provides cost-effective, residential energy efficiency improvements that benefit income-eligible occupants and owners of multi-family buildings. Energy efficiency products and services are implemented within the common areas as well as directly in the dwellings of residential, income eligible customers living in multi-family facilities (with 5 or more attached units), in which at least 50 percent of the occupants are at or below 60 percent of the state median income level. The Program Administrators will provide up to 100 percent of the funding for cost-effective projects with established caps based on projected savings.</p> <p><b>Target Market:</b></p> <p>Low-Income Multi-Family properties owned by public housing authorities, non-profit organizations as well as for-profit organizations are eligible to participate. The initiative targets residential customers on the discount rate and/or customers living in multi-family facilities with five or more dwelling units in which at least 50 percent of the occupants are at or below 60 percent of the state median income level in addition to the landlords and property managers of these buildings.</p> <p>Any changes to eligibility criteria will be addressed collectively between the PAs, LEAN, lead agencies and CAP agencies.</p> <p><b>New Enhancements:</b></p> <ul style="list-style-type: none"> <li>• In 2012, the funding of the Low-Income Multi-Family core initiative and Low-Income Single Family core initiative was proposed to be combined. The PAs continue to combine funding for the Low-Income Multi-Family and Single Family core initiatives in 2016-2018 to offer more flexibility in servicing the greatest potential number of income-eligible customers if demand for one initiative surpasses the other. Additionally, the PAs and LEAN will explore ways to address the disproportionate electric and gas Multi-Family budgets. Ongoing throughout program years 2016-2018.</li> <li>• The PAs will continue to work with the Best Practices working group to identify new cost-effective energy efficiency services, measures, and technologies that are appropriate to offer to income-eligible customers. Common area lighting controls</li> </ul>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
	<p>provide an excellent opportunity to reduce wasted lighting energy in common-area applications such as stairwells and hallways when the area is unoccupied. In 2014, the PAs collectively went out to bid for the fulfillment distributor of High Efficiency Lighting Products for all residential and low-income, direct install programs. Through this process, the PAs have realized significant cost savings and are in the process of transitioning the bulb offer to allow for more installations of LED bulbs within income eligible customer homes. As new LED technology continues to emerge and pricing continues to decline, the PAs will look to transition to LED technology over the next three years exclusively as applicable and dependent upon PA budgets.</p> <ul style="list-style-type: none"> <li>• As a new initiative in 2010, the Low-Income Multi-Family core initiative focused on multi-family properties that were non-institutional dwellings owned or operated by non-profit entities or public housing authorities. In 2012, based upon available funding, some PAs also served for-profit properties under the same guidelines in which at least 50 percent of the occupants were at or below 60 percent of the state median income level. The Low-Income Multi-Family core initiative will continue to serve all three types of properties. Currently each type of property represents approximately one third of properties served, and PAs will continue to balance by type of property and by geography. Ongoing throughout the program years 2016-2018</li> <li>• PAs will work with LEAN, the Low-Income Multi-Family Advisory Committee, state organizations such as the DHCD, and CAP agencies to increase qualified contractor participation in the initiative through training and workforce development. The PAs also plan to continue to support contractor and auditor training as needed. Ongoing throughout program years 2016-2018.</li> <li>• Currently, the Low-Income Multi-Family core initiative serves properties that are heated by gas and electricity. Historically, this initiative has provided incentives for cost effective gas and electric measures. PAs anticipate the addition of oil measures and potentially other deliverable fuels, if allowed by RCS regulations.</li> </ul>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
<b>Core Initiative Design</b>	<p><b>Measures Promoted:</b></p> <p>PAs will pay up to 100 percent of the project cost with established dollar caps where applicable. Larger capital investment projects will be screened for cost-effectiveness (with the Low-Income Multi-Family Advisory Group). The measures available to each low-income multi-family property include:</p> <ul style="list-style-type: none"> <li>• Insulation (attic, wall, pipe, and duct)</li> <li>• Air sealing</li> <li>• Heating system repair and replacement</li> <li>• Programmable thermostats</li> <li>• Domestic water heating, including low-flow showerheads, faucet aerators, pipe wrap, water heating equipment, heat pump water heater (electric)</li> <li>• Lighting, including LEDs, CFLs, lighting fixtures, common area (interior and exterior) lighting upgrades and controls, torchieres</li> <li>• Appliances, including refrigerator and freezer replacement, ENERGY STAR<sup>®</sup> clothes washer replacement, power smart strips, window air conditioner replacement</li> <li>• HVAC/mechanical systems, including Energy Management System (“EMS”), motors and drives, chillers, air compressors, ventilation system repair adjustment or replacement, heat recovery ventilation/energy recovery ventilation, redistribution systems, temperature building controls</li> <li>• Weatherization repairs (electrical, repairs, roofs, etc.)</li> <li>• Health and safety</li> </ul> <p>The PAs will work with the MTAC to include new measures or technologies, as appropriate, and in coordination with LEAN’s other efforts.</p>
	<p><b>Implementation Strategy:</b></p> <p>The Low-Income Multi-Family core initiative services properties that have five or more units in which at least 50 percent of the occupants are at or below 60 percent of the state median income level, owned by public housing authorities, non-profit organizations as well as for-profit</p>



<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
	<p>organizations. Eligibility for the initiative measures and services will be based on the established cost-effectiveness test, which includes agreed upon non-energy benefits, and will not be restricted, to the greatest extent possible, by rate class associated with the meter(s) for the facility. Eligible projects involve efficiency upgrades for buildings with currently high energy consumption and require that applicants participate in benchmarking their building’s energy usage post-improvements. The Low-Income Multi-Family building inventory has been an innovative component of this initiative to both help identify potential participants and help determine usage patterns in this sector.</p> <p>The PAs will work in collaboration with the Low-Income Best Practices working group including LEAN, the Low-Income Multi-Family Advisory Committee, DHCD, lead vendors, and CAP agencies to collaborate and coordinate statewide on all aspects of the Low-Income Multi-Family core initiative, including but not limited to planning, delivery, implementation, education, marketing, training, cost-effectiveness, evaluation, and quality assurance. When topics to be discussed apply to both market-rate customers and low-income customers, PAs will further coordinate between initiatives as needed.</p> <p>The initiative will be structured to ensure that participants are provided with a whole building, fully integrated offering that targets both gas and electric end users. Once a property is deemed eligible, it will receive an energy assessment through a lead vendor or local CAP agency. The assessment evaluates the building shell, efficiency, and (for electric PAs only), the appliance conditions. All assessments include an evaluation of home health and safety. The CAP agency will then arrange for all applicable measures and services to be installed by a qualified contractor. Savings will be deepened by installing additional efficiency measures; to the extent the overall project remains cost-effective.</p> <p>The initiative piggybacks on the current DHCD low-income energy efficiency programs and all other eligible funding sources (<i>i.e.</i>, federal and state) to enhance services consistent with a whole-building approach. PAs will use a lead vendor or local CAP agency to administer the initiative. Sub-contracting will be appropriate due to the complexity of the work required. Low-income customer inquiries will be referred to the lead vendor/CAP agency, the Low-Income Multi-Family Advisory Committee, or PA by the MMI, as defined in the Multi-Family Retrofit Core Initiative. Low-income customers may also apply directly to the initiative via the Low Income Multi Family Energy Retrofits website, their PA and/or local CAP agency. An essential</p>

<p><b>LOW-INCOME</b></p>	<p><b><u>CORE INITIATIVE</u></b>  <b>MULTI-FAMILY</b></p>
	<p>element of this initiative is that interested customers also have the option, at their discretion; of electing to participate in the Multi-Family Retrofit core initiative. This approach helps ensure that there are multiple paths to participation in energy efficiency initiatives in this unique market sector that has also been served over many years by skilled contractors and engineering firms. These firms will continue to be eligible to provide services in this sector, both through the Multi-Family Retrofit core initiative (and its terms and conditions) and, where qualified, as providers for the Low-Income Multi-Family core initiative under the terms and conditions of this initiative.</p> <p><u>Customer Education</u></p> <p>Energy efficiency education and information are included in all PAs energy efficiency initiatives. The primary forms of energy education are benchmarking building inventories, verbal communication between the auditor and the participants, as well as leave-behind materials. In 2013, the PAs collaborated with the Low-Income Best Practices working group and developed common, statewide educational materials. Educational materials will continue to be updated and provided to customers as applicable. The Low-Income Multi-Family core initiative plans to develop/improve education materials that will include education for landlords, property managers, building occupants, and property management personnel as well as development of case studies as applicable.</p>
<p><b>Delivery Mechanism</b></p>	<p>The initiative will be administered cooperatively by the gas and the electric PAs in conjunction with interested stakeholders.</p> <p><u>Enrollment</u></p> <p>Participants for this initiative may enroll through a local CAP agency, statewide website, the multi-family statewide toll free number, PA(s), the Low-Income Multi-Family website or other venue (use of the low-income multi-family website is required in most cases).</p> <p><u>Participant Screening</u></p> <p>Currently, the Low-Income Multi-Family Advisory Committee composed of LEAN, Community Development Corporations (“CDCs”), other non-profit owners of low-income non-institutional multi-family housing, and Public Housing Authorities (“PHAs”) are tasked with prioritizing low-income multi-family projects for each PA.</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
	<p>The advisory committee integrates flexibility into their planning to handle unique needs of PAs and their customers or potential participants. The Low-Income Multi-Family Advisory Committee may include representatives of other sectors.</p> <p>Due to the nature of this market segment, most leads will be generated through the Low-Income Multi-Family Advisory Committee. However, leads coming in via other venues will be screened by the MMI and forwarded to the Low-Income Multi-Family Advisory Committee for eligibility confirmation.</p> <p>Upon confirmation of a project, the lead vendor or CAP agency is responsible for coordinating the appropriate parties to address the project needs based on protocols agreed to by the specific PA(s) and in consultation with the specific PA(s) to move the project forward.</p> <p><u>Whole Building Assessment</u></p> <p>Based on the outcome of the screening process, the appropriate technical resources will be assigned to conduct a whole building (fuel blind) assessment. The lead vendor or local CAP agency will attempt, through the screening process, to identify all resources required for the assessment. However, there may be instances where additional expertise is required and therefore more than one site visit is necessary. Technical assessments and engineering studies will be conducted as needed. At the time of the assessment, education will be provided to participants and instant saving measures will be installed, as appropriate.</p> <p><u>Integrated Proposal for Energy Efficiency Services</u></p> <p>Using the findings from the site-specific assessment, the appropriate parties will draft a project proposal that will include gas and electric cost-effective measure opportunities and other available services where applicable. Where appropriate, the project proposal will be forwarded to the appropriate PA(s) for approval. Once the comprehensive offer has received PA approval (if necessary), it will be presented to the participant by the parties required to help the customer fully understand the offering.</p> <p><u>Delivery of Measures and Services</u></p> <p>The lead vendor or CAP agency will coordinate the delivery of the measures and services. The installation contractors will strive to have</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
	<p>all dwelling unit measures installed in a single visit to minimize disruption for the tenants; however, multiple visits may be required for the installation of common area measures. All installations are coordinated with the owners, property managers and the tenants.</p> <p><u>Quality Assurance/Quality Control</u></p> <p>Quality assurance will be performed in support of this initiative. Quality assurance is completed by the CAP agencies, as well as by a PA-funded independent third party vendor.</p> <p>The delivery mechanism serves to minimize lost opportunities and encourage deeper savings in the following ways:</p> <ul style="list-style-type: none"> <li>• The increased incentive amounts may allow for achieving energy savings that would not be possible if this customer sector had to provide a significant co-payment.</li> <li>• Having the PHAs and CDCs and other owners of non-institutional low-income multi-family housing involved in the process helps facilitate access to the tenant spaces, which has been traditionally cited as a potential barrier in the multi-family market.</li> </ul>
<b>Marketing Overview</b>	<p>Demand for the Low-Income Multi-Family core initiative will be managed jointly by the PAs and the Multi-Family Advisory Committee.</p> <p>The PAs will engage in outreach efforts to notify customers of the availability and value of energy efficiency services to stimulate interest in the initiative and operate within budgets. Marketing will consist of contacting landlords or property managers of income-eligible tenants as needed. Direct mail, bill inserts, case studies and literature distributed through social service agencies, housing funders, government offices, community outreach, and other networks can also be used to market the initiative. PAs will use their relationship with PHAs, CDCs, community based outreach and other income-eligible property managers to market the benefits of the initiative.</p> <p>In addition, PAs are participating in statewide marketing efforts to encourage all customers to participate in energy efficiency initiatives. Those efforts will assist in driving income-eligible customers to take advantage of not only energy efficiency programs but also discount rates, fuel assistance, and other social programs when appropriate.</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
<b>Three-Year Deployment Strategy/Roadmap</b>	<p>The PAs will coordinate efforts via LEAN to ensure consistent implementation throughout the state and retain the advantages of the existing infrastructure of central coordination while avoiding the creation of a new or central entity. Participants may enroll through a CAP agency, statewide website, low-income multi-family website, multi-family statewide toll free number, PAs or other venue. Many leads will be generated through the Low-Income Multi-Family Advisory Committee; however, leads coming in via other venues will be screened by the MMI and/or the PAs and forwarded to the lead vendor/CAP agency for eligibility confirmation. Once eligibility has been confirmed, the Low-Income Multi-Family Advisory Committee prioritizes the low-income multi-family projects for each PA as needed. Training and workforce development will be accomplished by the PAs working with LEAN, DHCD, and CAP agencies to increase the number of qualified contractors, energy auditors, and administrative staff. The PAs in conjunction with LEAN and the CAP agencies will continually review and evaluate new measures and technologies. Through marketing and outreach efforts, the PAs will attempt to broaden participation. PAs will attempt to deepen efficiency penetration consistent with a comprehensive, whole building approach.</p> <p>PAs welcome continued dialogue with Massachusetts affordable housing stakeholders to evaluate opportunities to maximize the opportunity for capturing energy efficiency savings at the time of financing and refinancing of affordable housing properties. PAs have committed to engaging with these stakeholders to jointly explore and scope these opportunities via planning meetings. The PAs are excited to learn from the experts within the Massachusetts Housing community about the timing, scope and processes of affordable housing finance and refinance, to share the PAs technical resources and understanding on efficiency programming, and to work together to identify critical moments of potential opportunity in the finance and refinance process to secure additional savings. The PAs look forward to receiving additional and more specific information from the MA affordable housing stakeholders so that the PAs can explore opportunities to incorporate program design and implementation refinements that result from these dialogues within the 2016-2018 Plan term.</p> <p>In accordance with the Resolution, the PAs will continue to work with the Commonwealth’s housing financing agencies and LEAN (with mutual expectations and deliverables) to develop and implement enhanced approaches to leverage multi-family refinancing events to maximize retrofit potential. The parties will specifically consider</p>

<b>LOW-INCOME</b>	<b><u>CORE INITIATIVE</u></b> <b>MULTI-FAMILY</b>
	performance-based retrofit products. The PAs will present the results of these efforts and specific proposals derived from them by the close of Q1 2016.
<b>Special Notes</b>	

**G. Commercial & Industrial Programs**

1. Overview of C&I Programs – New Construction & Retrofit

As discussed in greater detail below, the Program Administrators organize their programs, and the outreach and marketing that support them, according to the way the non-residential marketplace is organized – *i.e.*, there is the built environment and the environment being built or renovated. The built environment encompasses existing buildings and the market actors that own, service and occupy them and includes property owners and managers, facility managers, the manufacturers and vendors of products and services that address building or occupant needs, and the occupants and tenants who work in the space. In the environment being built or renovated the key actors include developers (for both owner occupancy and tenancy), architects, engineers, equipment specifiers, equipment suppliers, and many others who serve specialized niches.

The two umbrella programs that serve these markets, Retrofit and New Construction, are mature and well developed. Their lineage extends as far back as the mid-1980s. They were among the first utility-based energy efficiency programs in the country. The design, organization, and delivery structure of the Massachusetts programs have served as models for most of the other non-residential energy efficiency programs developed throughout North America today.

While these programs have been, and continue to be, highly successful, the PAs continually seek ways to improve delivery of the services they offer, to enhance program reach into relatively under-served markets, and to engage customers they have served in the past with new offerings and technologies to further increase the efficiency and performance of their buildings. Examples of sources for program improvement concepts are described below.

2. Sharing Innovations in Program Design, Marketing, and Delivery

The C&I Management Committee (“C&IMC”) serves as the ongoing venue for sharing individual PA innovations in program design, marketing, and delivery. The C&IMC regularly reviews its processes and operations in order to continuously optimize the balance between innovation and consistency and will continue these efforts throughout 2016-2018.

Consistency in offerings, eligibility and incentives is fundamental to all PA program design and delivery. Consistency assures customers that they will receive uniform services no matter where their facilities are located in the Commonwealth and ensures that the benefits of ratepayer funded programs are distributed both widely and equitably. That said, it is important to recognize that innovation by individual PAs in program design and delivery is equally important. The flexibility of individual innovation allows PAs to respond to the variations of local markets and market conditions, but more importantly it is through this experimentation – be it in program design, product promotion, or a unique focus on distinct market segments of local importance – that concepts that might have statewide applicability can be tested and evaluated in a limited low-risk/low-cost environment, with the results then shared and scaled up statewide as appropriate and practicable.

- *Independent Evaluations of our own Programs:* For many years, third-party evaluations, both process and impact, have been conducted on many of the key components of the Massachusetts C&I programs. The results and recommendations from these evaluations are reviewed and, when appropriate, incorporated into PA programs going forward.
- *Evaluations of Programs in Other Jurisdictions:* Due to the fact that efficiency program designs in other leading jurisdictions (such as California, Oregon, New York) are so similar to Massachusetts programs, PA staff often review evaluations from programs in these states to glean improvement concepts that could be applied locally.
- *Review of Industry Best Practices and Other Studies and Conferenced Proceedings:* Organizations like the ACEEE produce a wealth of useful studies and industry best practice reviews, and also publish and archive professional papers and presentations from their numerous conferences and study sessions. Similar studies are available from the Department of Energy's network of national research laboratories, regional efficiency organizations, such as the Northwest Energy Efficiency Alliance, and industry collaborations like the Consortium for Energy Efficiency. Additional sources of thought leadership and information include the Rocky Mountain Institute, the Institute for Market Transformation, the New Buildings Institute, and E Source.
- *Peer Networks:* Energy efficiency programs do not compete with each other; therefore, there is a culture of collaboration among the staff and managers of these programs across the country. PA staff members know many of their counterparts, and there is a regular exchange of information and advice among peers for the mutual benefit of the industry.
- *The EEAC and Other Stakeholder Input:* The PAs are active and engaged participants in Council proceedings and in various Council-facilitated public participation processes. PA staff has participated in over 100 Council-related public meetings since 2013. Further, PA staff have invited Councilors, as individuals and small groups, to participate informally in C&IMC meetings and other internal team meetings in order for them to develop a fuller understanding of how the PAs work together to administer and advance the programs.

The PAs have benefitted from both the formal Council and stakeholder input processes and the informal exchange of ideas and concepts that comes from this form of continuing close

engagement. Many of the concepts advanced in these venues and exchanges are reflected in the detailed program designs that follow.

Going forward, the PAs are fully committed to continuing this dialogue and communication regarding program developments and progress towards goals throughout the entire Three-Year Plan term, including, in accordance with the Resolution, regular and specific updates to the Council on C&I program progress and penetration (including segment specific approaches - especially for challenging subsectors such as small and mid-size commercial, small hospitals, non-profits, and multifamily - measures such as street lighting and LED costs and conversion, and innovations such as strategic energy management) through semi-annual presentations to the Council. The PAs will collaborate with DOER by the end of 2015 to consider how best to present this information (*e.g.*, potential use of roundtables, webinars, etc.) and to develop a schedule for updates on specific topics. Also, in accordance with the Resolution, the PAs will demonstrate a clear commitment to Combined Heat and Power (“CHP”) installations, and tracking CHP project savings and expenditures (subject to customer confidentiality requirements) against PA’s CHP Plan projections in semi-annual presentations to the Council and in data sets provided on Mass Save Data. The PAs are also committed to providing, in accordance with the Resolution, more detail about the PA’s Massachusetts Technology Assessment Committee, and semi-annual updates to the Council on progress reviewing and implementing new technologies into programs.

The PAs believe this thoughtful, prioritized, and systematic approach will ultimately result in a greater visibility into the programs and their progress and at the same time will be respectful of the valuable time resources of all parties and provide the Council with considerably greater appreciation and understanding of the major program developments and drivers.

Over the course of the development of this plan, PA staff accessed, or re-accessed, many of these sources of program innovation. In addition, the PAs contracted with a highly-respected independent consultancy, E Source, to conduct targeted research on best practices and emerging trends and technologies in areas of particular importance to the Council and the PAs. E Source also provided independent verifications that the PAs internal research and conclusions did, indeed, reflect the most current assessments of industry best practice.

Lastly, it is important to recognize that the process of program improvement and adjustment of delivery to incorporate new technologies, new delivery modes, and changing market and economic conditions is continuous and ongoing. In that context, a Three-Year Plan is, by necessity and practicality, a strategic document. In discussing our commercial and industrial programs, the PAs attempt to outline a reasoned and balanced path forward into the future in an industry where technologies and programs are evolving at an exponential pace. In areas where there exists reasonable certainty about the precise nature and timing of the program enhancements being proposed, the plan sets forth that detail. In other areas, the necessity or desirability for program changes are identified and discussed along with a proposed path forward, but the exact details and schedule, of necessity, require more investigation and planning. The PAs take the position that a well-conceived strategic plan is one that captures future program details and schedules when those can be confidently stated, and lays out the scope of the issue and the plan of attack when they cannot. For example, the last three-year plan



had no discussion of “big data” because no one in 2012 – PAs or stakeholders – could have imagined its 2015 implications regarding program design and delivery, market segmentation, evaluation, behavior tracking, etc. Undoubtedly, three years from now the drafters of the 2019-2021 Three-Year Plan will be discussing in some detail program concepts and technologies that are unknown to us today.

### 3. Accomplishments During 2013-2015 Plan Term

The program plans for 2016-2018 rest on the solid foundation constructed during the previous three-year planning cycles. At the macro level, key C&I accomplishments during the 2013-2015 Plan Term (through the end of 2014) include the following:

- *Energy Savings*
  - 9.5 Million therms per year – equivalent to the usage of roughly 10,000 residential homes
  - 720 Thousand MWh per year – equivalent to the usage of roughly 100,000 residential homes
- *Benefits*
  - 40 percent increase in gas benefits to \$200 Million
  - 16 percent increase in electric benefits to over \$1.4 Billion
- *Participation*
  - 88 percent increase in gas participation – equivalent to roughly 4,500 additional businesses
  - 27 percent increase in electric participation – equivalent to roughly 3,800 additional businesses
  - 25-30,000 total C&I customers participating annually
- *Green House Gases*
  - Reduction in CO<sub>2</sub> emissions equivalent to the removal of nearly 115,000 automobiles from Massachusetts roads

In addition, the PAs have successfully evolved their C&I programs and produced many notable achievements including:

- Economy and weather adjusted statewide C&I electricity sales have declined and are projected to continue declining over the three consecutive years of this plan, for the first time ever;<sup>25</sup>
- Conducted 20 code compliance training sessions, attended by almost 700 code officials, architects, and contractors;

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<sup>25</sup> US Energy Information Agency and ISO-New England.

- Completed a redesign and rewriting of the C&I section of Mass Save<sup>®</sup> website, improving organization, navigation, and customer-oriented language;
- Grew C&I customer awareness of Mass Save<sup>®</sup> precipitously to its highest point ever (66 percent); and likewise grew C&I customer use of the Mass Save<sup>®</sup> website nearly tripling traffic over the last two years (from 13 percent to 34 percent).<sup>26</sup> Brand awareness among C&I customers even outpaced that of residential customers (66 percent to 54 percent);<sup>27</sup>
- Drove explosive growth of the LED lighting market – broadening and deepening penetration in virtually every end use principally as a result of the upstream approach to lighting initially launched in 2012. The PAs success has been documented in the recent LED market effects evaluation<sup>28</sup> which found that as of 2014, 63 percent of Massachusetts commercial customers reported having installed at least one type of LED lighting in their facilities versus just 46 percent in California. Similarly, 42 percent of Massachusetts commercial customers reported installing screw-based LEDs versus only 12 percent of their counterparts in California;
- Developed a new delivery mechanism – the Upstream Approach – that reaches and engages significantly more customers and influences manufacturers to produce more of their premium efficiency products and distributors to stock and promote them;
- Achieved substantial growth in the number of CHP participants, driven by rapid uptake of smaller customers identified and prescreened by the PAs as good candidates for the technology. In addition, positive realization rates and comparatively low rates of free-ridership have both fostered a favorable environment for CHP expansion and proven that the programs are meeting customers' needs and achieving desired results;
- Expanded the Upstream portfolio to include additional lighting products and technologies, as well as HVAC and water heating equipment – with a tremendous increase in participation and savings;
- Completed a significant body of best practices research – in Commercial Real Estate, Retro-commissioning, etc. – some successfully conducted in collaboration with EEAC Consultants and others including involvement from various PAs, third party subject matter experts, and external stakeholders;
- Consolidated Residential & C&I MTAC into a single entity and the addition of Connecticut representation to increase efficiencies, improve coordination, and expand reach;
- Added many cutting-edge measures/technologies to the portfolio of offerings – including ductless fume hoods, green cooling towers, drain water heat recovery, pump coatings, window glaze, diaphragm pump control, polymer bead laundry, etc.;
- Statewide implementation of a standardized approach to serving Municipal customers;

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<sup>26</sup> 2014 Massachusetts Statewide Marketing Campaign, Post-Campaign Report, Opinion Dynamics February, 2015, at 2.

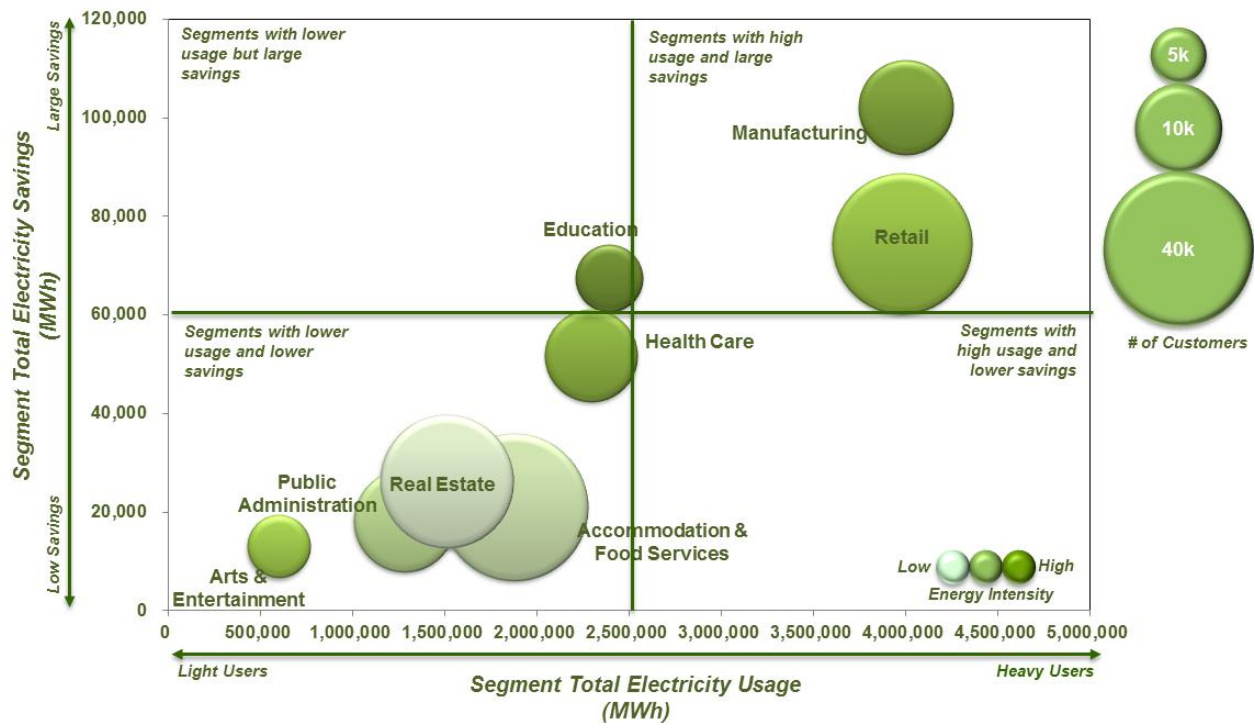
<sup>27</sup> Id. at 16.

<sup>28</sup> Final Draft Report of Massachusetts LED Market Effects: Baseline Characterization, DNV GL, March 1, 2015.

- Delivered specialized best practices in EE sales training through a nationally-recognized firm to improve the level of commercial excellence both among PA sales staff and trade allies including manufacturers, distributors, and contractors;
- Launch of the Sustainable Office Design initiative to capture greater market share in leased office space;
- Developed a number of segment-specific approaches to serving customers – grocers, municipalities, offices, etc.;
- Collaborated with DCAMM to dramatically increase penetration of high efficiency equipment in state owned/operated buildings.

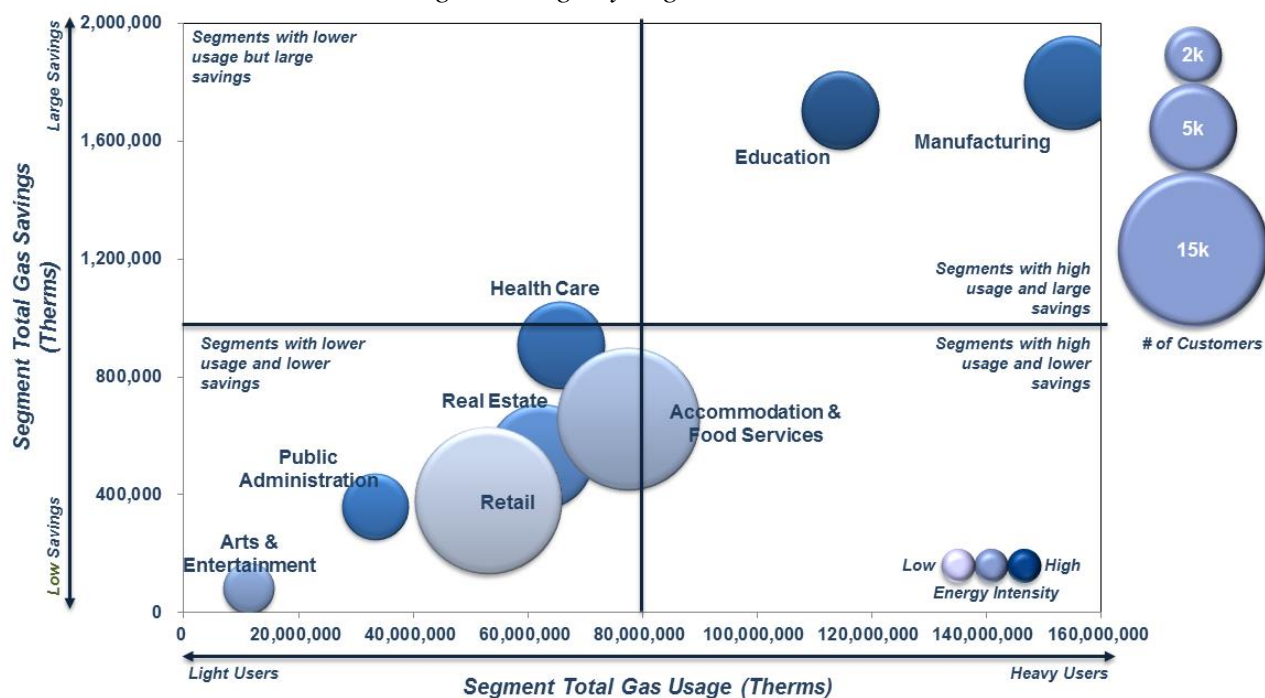
For reference purposes, the following exhibits provide a high level snapshot of the composition of the statewide C&I customer base including the size of each customer segment in terms of customer counts and usage as well as the gas and electric savings generated from each segment historically.

a. C&I Electric Savings & Usage by Segment: Historical Overview



Source: 2013 Commercial & Industrial Customer Profile Report, DNV GL, March 27, 2015

*b. C&I Gas Savings & Usage by Segment: Historical Overview*



Source: 2013 Commercial & Industrial Customer Profile Report, DNV GL, March 27, 2015

4. Highlights of 2016-2018 Enhancements

The sections below provide descriptions of a number of new initiatives or improvements the PAs plan to implement over the next three years. The level of detail varies as some elements are more conceptual in nature at this juncture and are planned for introduction in the out years of the Plan. In those cases further study and/or evaluations of field testing (either in Massachusetts or in another jurisdiction) may be warranted before the enhancement is introduced as a full program element.

The following is a representative listing of some of the proposed program or administrative enhancements discussed in further detail in the sections following, or elsewhere in the plan:

- An online incentive application portal with a menu driven interface enabling the creation and submission of customer applications for incentives. This will reduce application errors, accelerate the review process, and greatly enhance the overall customer experience. The PAs expect that this added functionality will be particularly helpful for mid-sized customers, as studies often conclude they lack the technical expertise to fill out the current application forms. This menu based, all-in-one system will make it easy for anyone to fill out and submit an application for incentives.
- A thorough analysis of the current Small Business program model. This long-standing program is regularly cited as a best-in-class model and is now widely copied by other program administrators around the country. Here in Massachusetts, it continues to be highly successful in reaching small business customers, and evaluations repeatedly show that these

customers are very satisfied with the services they receive. However, the PAs recognize that in order to continue with this success they will need to anticipate the ever-changing needs of small commercial customers and assure that new technologies and new delivery options are available to address these needs.

- Expansion of the portfolio of upstream offerings where appropriate – including water heating technologies, beginning in fall of 2015.
- Staged revisions to retro-commissioning services based on the findings of the joint PA/EEAC consultant best practices study.
- Encouragement of Net Zero Buildings as the premium option in the Whole Building path in the New Construction Program.
- Improved comprehensiveness in mid-sized new construction buildings through the use of Advanced Buildings and other tools. Broader application of Sustainable Office Design as a means of delivering integrated and comprehensive technical solutions to the leased commercial office market.
- Increased focus on gathering early intelligence on the efficacy and cost-effectiveness of emergent energy efficient technologies – both as they enter the market and earlier when they are in the market readiness testing mode.
- Evolving formal and informal cooperation within the region and beyond through joint R&D and cooperative exchange of information regarding emerging technologies.
- Expanded segment-based delivery approaches to broaden participation, increase comprehensiveness and depth of savings, and enhance the customer experience.
- A broader menu of training offerings for customers, trade allies, vendors, and PA staff and contractors that provides services to the PAs, as well as the use of new modalities for delivering trainings.
- A reorganized and refreshed Mass Save<sup>®</sup> website that better directs customers to information specific to their needs in their business segment. The new design will focus less on technologies and programs and more on customers and their end uses. It will also feature new materials directed to specific segments and their needs.

5. Mechanisms for Program Collaboration, Continuous Improvement, Incorporating Emerging Technologies, and Sharing and Incorporating Best Practices Information

*a. Introduction*

The vital feedstock for PA program advancement is a continuing stream of new energy-efficient technologies that can produce demonstrable, repeatable, verifiable, and cost-effective savings. A robust process to identify and screen candidate technologies is not only critical to meeting savings goals, it also facilitates innovation, provides a platform for technological development, and addresses customer expectations that the PAs will rigorously and impartially vet manufacturer and vendor savings claims on their behalf. And, over time, it transforms the market.

The PAs identify prospective new technologies through multiple sources and streams of information including the following.

*b. In-house R&D*

Many of the PAs provide efficiency services in several states, each of which has a similar need for a pipeline of new efficiency measures. These PAs have in-house staff of technical and engineering professionals with expertise in such areas as energy codes and standards, building energy simulation tools, lighting technology and controls, assessment of energy efficiency products, and product development who are dedicated to new technology research and, in collaboration with their evaluation colleagues, savings verification. Examples of products in various stages of vetting by individual PA technical staff include the following:

- Air source and water source gas engine driven heat pumps;
- Several proprietary gas fired heat pumps with variable refrigerant flows;
- Removable jackets for valves, fittings and specialty piping in boiler rooms and other mechanical spaces;
- Advanced rooftop unit controllers that may have application in big box stores;
- A pipe, valve and tank insulation tool that can be used to calculate savings for insulating steam or hot water piping, valves and tanks for customers with usage of less than 50,000 therms per year;
- Distributed refrigeration that can reduce the pounds of refrigerant used and increase usable floor space in supermarket applications;
- Electrically commutated ,motors for pumping applications;
- Drain water heat recovery;
- Heat pump dryers;
- Automatic temperature control which provides thermostat optimization, load shifting and demand response control as well as communication and bill estimation capabilities;
- Thermal storage optimization control strategies to shift hot water load;
- A boiler QI tool which optimizes the heating system performance and boiler sizing;
- Smart communicating appliances which allow communication and utility control of appliances;
- Advanced buildings net energy optimizer (NEO) building energy modeling;
- Analytics to assess post construction zero energy building performance;
- Existing building HVAC retrofit controls;
- Emerging HVAC technologies;
- Automated window shades;

- Exterior performance lighting;
- Existing space performance lighting;
- LED integrated control logic;
- Smart grid controlled street lighting;
- A variety of emerging lighting technologies
- Window glazing;
- Highly efficiency filtered fume hoods;
- Smart plugs;
- Ozone laundry;
- Air operated double diaphragm (AODD) pump control;
- Washing with polymer beads;
- Hand dryers;
- Building insulation;
- Energy recovery filters.

The companies also cross-pollinate information gathered from research and field testing between the states they serve. For example, National Grid in Rhode Island is engaged in piloting several commercial sector behavior initiatives the results of which will be made available for review and consideration in Massachusetts. The synergies generated by this multi-jurisdictional sharing of information reduce R&D costs for the Commonwealth, and for the other states.

*c. Partnerships with MOU customers*

In 2013, as a byproduct of its confidential MOU relationship with Proctor & Gamble (“P&G”), Eversource learned that P&G was in the process of developing a new cold water washing product for commercial applications that had potential for significant gas and water savings for customers with large laundry operations, such as hotels, institutions, assisted living, etc. In 2014, Eversource partnered with P&G to test the product in a controlled setting with an Eversource lodging customer, using both gas and water metering equipment. When the product’s savings were proven and quantified, the PAs could add the product as an approved measure, and P&G could promote nationally that the savings value of its new product, the Tide® Professional Coldwater System, had been verified by a highly-credible independent authority on efficiency – Eversource. In another case, National Grid and Eversource are helping EMC Corporation (a joint MOU customer) develop an RFP to select a monitoring-based commissioning (“MBCx”) contractor to implement MBCx across its entire U.S. real estate portfolio. EMC Corporation will apply the lessons from its Massachusetts experience in their North Carolina and California facilities.

*d. Cooperative relationships with similar technical bodies at other program administrators or regional efforts*

The PAs have established formal and informal working relationships with such organizations as the Consortium for Energy Efficiency (“CEE”), the Northwest Energy Efficiency Alliance (“NEEA”), the California Emerging Technologies Coordinating Council (“ETCC”), the Northwest Regional Technical Forum (“RTF”), NYSERDA’s Emerging Technologies Accelerated Commercialization initiative, Southern California Edison’s Lighting Research Program, the Fraunhofer Center for Sustainable Energy Systems, the Food Service Technology Center, several of the Department of Energy’s National Research Laboratories, etc. These relationships can involve a continuum of activities from simple information exchange to participation in jointly funded and managed research, technology assessments, or field tests.

For example, the development of the Sustainable Office Design (“SOD”) initiative started as a joint project to develop technical specifications for energy-consuming office spaces initiated by Eversource, National Grid, and Southern California Edison, and ultimately involved several other West Coast utilities. Also, the PA-sponsored training delivered to the Massachusetts Water and Wastewater facility operators by faculty from the University of Wisconsin (“UW”) originated in training developed by UW for the Wisconsin program administrators. Additionally, Eversource and National Grid co-sponsored new insulation research at the Fraunhofer Center for Sustainable Energy Systems with the goal of reducing barriers to insulating older building types in the Northeast.

As a forward-looking example, in 2016 the PAs will convene a meeting between peer leading energy efficiency program administrators, both regionally and nationally, and a select group of lighting industry experts for the purposes of: (1) identifying LED technologies that are market ready (*i.e.*, reliable and cost-effective) or will be in the near term; and (2) exploring potential common approaches to integrating these technologies into efficiency programs in a manner that simultaneously aligns with policy objectives and serves the best interests of customers. In addition to the obvious value of sharing implementation experience between jurisdictions, the PAs believe there is potential benefit in developing common messaging about program expectations to the lighting industry.

Many PA engineers are also involved as technical experts on regional and national committees (*e.g.*, establishing national standards for commercial kitchen equipment, designing an Advanced Roof Top Unit Controllers program, etc.). National Grid staff in New York collaborate with NYSERDA staff in the latter’s emerging technologies program, and the two have collaborated in a sustainability and efficiency program for hospitals, the lessons from which will be shared with Massachusetts. Eversource recently participated in CEE’s Connected Committee to develop a coordinated national response to the new ENERGY STAR<sup>®</sup> Program Requirements for Connected Thermostat Products specification.

*e. Supplier and manufacturer product submissions*

Manufacturers and distributors of energy-consuming equipment regularly submit product information, and accompanying savings claims, to the PAs and petition to qualify them for

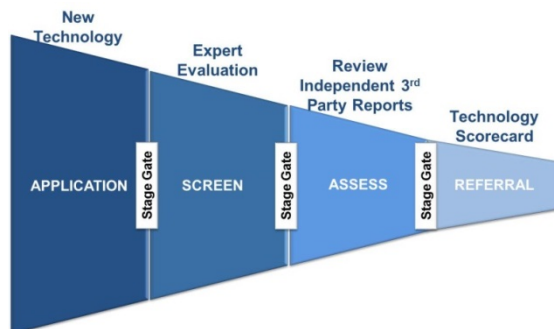


program eligibility and incentives. All such requests are referred to the MTAC, as described below.

## 6. The Massachusetts Technology Assessment Committee

MTAC consists of key technical and evaluation staff from each of the PAs. A Project Manager designated by the PAs coordinates the work of the Committee. Also, the chair of the Connecticut Joint Utility RD&D Program attends monthly MTAC meetings for the purpose of sharing information about ongoing technology research, tests, and results from that state.<sup>29</sup>

The Committee addresses both residential and commercial/industrial technologies, drawing on the subject matter experts on the Committee, other subject matter experts at the various PAs, and outside expertise as necessary. MTAC meets monthly while a variety of ad hoc technology or issue-specific subgroups meet as required.



MTAC is both a proactive and a reactive body. It proactively identifies emerging technologies that may have proven savings, are reliable, and generally available and market ready to include in the programs. It does so by keeping abreast of industry literature and by coordinating and networking with groups around North America who have missions similar to that of MTAC. It also manages inbound requests for consideration of a new or unfamiliar technology that come from manufacturers, vendors or customers. These requests are generally made to an individual PA and then forwarded to the Committee, or are received through a process accessible via the Mass Save<sup>®</sup> website.

MTAC establishes and publishes threshold eligibility requirements that must be met to qualify products or processes as program-eligible. MTAC documents its findings in a standardized manner and disseminates them to the PA program managers, technical staff, account managers, and outside parties such as vendors, customers, and other program administrators beyond Massachusetts, as appropriate. After MTAC qualifies a product or process, the appropriate PA subcommittee (lighting, non-lighting electric, or gas) then leads efforts to determine how to actually integrate it into the program (incentive levels, application requirements, quality control, etc.) offerings. Documentation of recently reviewed technologies is always posted on the Mass Save<sup>®</sup> website at:

<http://www.masssave.com/en/professionals/business-opportunities/assessment-of-new-efficiency-technologies>

<sup>29</sup>

The Connecticut Joint Utility RD&D Program reviews technologies submitted to the Connecticut Energy Efficiency Board for potential inclusion in programs in that state. The RD&D group meets monthly for application review with a Policy Working Group (“PWG”) comprised of professionals from the energy efficiency, science and technology, economic development and legal communities.

MTAC provides quarterly status updates to internal stakeholders such as the C&I and Residential Management Committees as well as the Energy Efficiency Advisory Council along with semiannual updates to other external stakeholders.

MTAC has the following principal functions:

- It provides information, documented technical interpretations and technology assessments to the PAs and is the authority for consistent program interpretation of technical matters;
- The Committee reviews candidate technologies according to industry-standard protocols, documents its decisions in a consistent and unbiased manner and disseminates its conclusions and technical interpretations in a standard format;
- It determines whether a specific new technology is program-eligible, and then refers it to the appropriate PA subcommittee to develop implementation requirements;
- When appropriate and directed by the PAs, it develops common program implementation materials or procedures including: technical specifications, technical study/commissioning protocols, equipment baseline reference sheets, inspection forms, and other technical and administrative support materials, for use by PA staff and contractors;
- It coordinates its work with the EM&V staff at each PA in order to support the determination of program savings values;
- It responds to inquiries from third parties, primarily vendors and manufacturers, who wish to have their products considered as incentive-eligible through the Massachusetts programs.

Over the next three years the PAs will continue to build upon the technology identification and vetting systems and cooperative alliances discussed above. The PAs will seek opportunities to both expand collaboration with existing partner organizations where the sharing of expense and/or technical expertise has added value for Massachusetts ratepayers, as well as seek out new opportunities for collaboration with other program administrators, government and university research laboratories, and regional technology development organization.

## 7. C&I Program and Core Initiative Descriptions

### *a. C&I New Construction: New Buildings & Major Renovations; Initial Purchase & End of Useful Life*

<b>C&amp;I NEW CONSTRUCTION</b>	<b><u>CORE INITIATIVES</u> NEW BUILDINGS &amp; MAJOR RENOVATIONS INITIAL PURCHASE &amp; END OF USEFUL LIFE</b>
<b>Overview &amp;</b>	The New Construction Program has two core initiatives. The objective of the first – New Buildings & Major Renovations – is to offer developers

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>NEW BUILDINGS &amp; MAJOR RENOVATIONS</b>  <b>INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
<p><b>Key Objectives</b></p>	<p>of new buildings, and the owners of existing buildings that are undergoing major renovations or additions, a menu of efficiency services and incentives that are tailored to complement their unique ownership objectives and investment criteria, and can add value no matter where their building is along the design and construction continuum and can do so without impacting the design/build schedule. The second – Initial Purchase &amp; End of Useful Life – encourages customers purchasing new energy-consuming equipment, or replacing equipment that has reached end of useful life or failed, to opt for the most efficient choice within each product category.</p> <p>When new buildings are designed and constructed, and when existing ones are renovated or expanded, there is a window of time to increase the efficiency and reduce the demand profile of the project dramatically at relatively modest incremental cost. The greatest potential to achieve savings, and to add value to the customer, occurs when PA new construction representatives, and the team of pre-screened energy design experts at their disposal, can engage with designers and their projects in the initial conceptual phase. Here the project can be examined comprehensively, allowing for design assistance, scenario modeling, and whole building equipment specification. At this early stage measures that can commonly be considered include orientation and site considerations, envelope improvements (<i>e.g.</i>, insulation above code), motors and drives, HVAC equipment and system design, and lighting design and controls, including daylighting. These fundamental early design decisions can shape the energy and demand costs of a building for its entire life, which in New England can be a hundred years or more.<sup>30</sup></p> <p>Similarly, initial equipment choices may establish energy consumption patterns for decades, until that equipment fails and must be replaced, or until a more costly retrofit project is proposed. If this narrow and fleeting window of opportunity to influence building design and equipment specification is missed, it is not hyperbole to say that it is lost for a lifetime. The services provided through the New Construction program help lower building operating and maintenance costs throughout its entire life cycle while increasing comfort, health, and productivity for building occupants. If the design process is well underway when program representatives engage, a more prescriptive approach to individual measures, or a custom approach to discrete building systems, can still</p>

<sup>30</sup> Approximately 70% of the building stock in Massachusetts is more than thirty years old.

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u> NEW BUILDINGS &amp; MAJOR RENOVATIONS INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>capture considerable efficiency, again at relatively modest expense.</p> <p>The objective of the New Construction program is to offer building owners and designers a menu of efficiency services and incentives that are tailored to complement each customer’s ownership objectives and investment criteria, can add value no matter where their building is along the design and construction continuum, and can do so without impacting the design/build schedule.</p> <p>The PAs aggressively seek out and recruit owners and designers involved in the construction or major renovation of all non-residential buildings. This process requires multi-faceted strategies, because development is, by its nature, a competitive process that largely takes place out of the public eye, often until a construction trailer and fence appears on site. The challenge is to gain market intelligence – from a myriad of sources – so that program representatives can intersect with customers as early as possible in their process, preferably at the time when the fundamental design decisions that most impact future energy use are being made.</p> <p>PA services range from a package of expert design and engineering assistance and incentives at the level of the whole building (when the project is in early design), to similar assistance within discrete facility systems, components, or processes in cases where the project is more advanced, to prescriptive incentives for a large menu of pre-selected premium performance lighting, HVAC, and other mechanical measures – or a mix of all of these options. For many participants, the value of this program is not just in the incentives, but also for the opportunity to access the expert, impartial, unbiased technical assistance provided by PA staff and through the stable of technical experts with whom they collaborate.</p> <p>Thousands of similar, but smaller, time-dependent opportunities occur whenever energy-consuming equipment fails in existing buildings. Just as in new construction, there is a brief window of opportunity for the program to intervene to present a more efficient option when the customer is focused on purchasing replacement equipment quickly and returning their facility to full operation. In these cases, the PAs work with equipment vendors and suppliers – often using an upstream approach – to ensure that premium alternatives are available and promoted in that brief window.</p>

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>NEW BUILDINGS &amp; MAJOR RENOVATIONS</b>  <b>INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p><b>Target Market</b></p> <p>Program staff aggressively attempt to identify and influence decisions affecting all non-residential new construction, renovation, and addition projects in the Commonwealth, as well as businesses replacing outmoded or failed equipment outside of a more comprehensive construction or upgrade project.</p> <p><b>New Enhancements</b></p> <p>The New Construction program is a mature and successful offering with broad market recognition, understanding, and acceptance. Nonetheless, the PAs constantly monitor peer programs in other jurisdictions (many of which are duplicates of the Massachusetts program model) in search of ideas for delivery or administrative improvements. Among the areas the PAs will consider for inclusion in their New Construction program during the coming plan term are the following:</p> <p><u>Net Zero Buildings</u></p> <p>Massachusetts, California, the Pacific Northwest, and New York are the leading jurisdictions advancing Net Zero – the vision that a building could have no energy impact on its environment; that is, a building can be designed to consume dramatically less energy than current practice, and then produce its reduced requirements on site using renewable sources.</p> <p>There are many challenges to achieving this vision, as set forth in the report of the Massachusetts Zero Net Energy Task Force.<sup>31</sup> Nevertheless, the path to a visionary goal almost always consists of numerous incremental steps – steps that change building design and technology, owner and developer investment approaches, government regulation and tax policy, etc. Because each of these steps towards Net Zero is likely to introduce technologies, concepts, and policies that carry the potential to make all new buildings (and renovations of existing ones) incrementally more efficient, even for the vast majority of owners who are not driven to achieve Net Zero, the PAs have an interest in staying closely engaged in the Net Zero movement. This engagement will take place on several fronts.</p>

<sup>31</sup> *Getting to Zero Final Report of the Massachusetts Zero Net Energy Buildings Task Force*, March 11, 2009.

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u> NEW BUILDINGS &amp; MAJOR RENOVATIONS INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>First, the PAs will continue to closely monitor developments in Massachusetts with the DCAMM/DOER ZNE Advisory Council and Working Group, as well as in other states, like New York, which have recently evaluated ZNE pilots and may sponsor further building science/NZE research and demonstration projects going forward.</p> <p>Second, the PAs will assess opportunities for joint NZE R&amp;D efforts with other jurisdictions or program administrators, particularly where Massachusetts participation can be used to leverage additional resources from these entities, or in government research investments.</p> <p>Lastly, for the prospective owner or a developer who wishes to take up the Net Zero challenge, the PAs will continue to provide, as they have historically, technical and modeling assistance and incentives for all the efficiency measures towards Net Zero Ready that are cost-effective through the Whole Building Path of the New Construction Program. This path is explicitly designed for the purpose of promoting high performance buildings with lower energy use intensities (“EUIs”) and ongoing operational costs than code compliant buildings. Indeed, the PAs view a Net Zero Ready (“NZR”) Building as the ultimate expression of this path – driving the energy use intensity of the building to the lowest practical and cost-effective level before considering renewables. This concept of “rightsizing” the building is very similar to the efficiency services proved by the PAs for facilities considering CHP, because energy efficiency measures will always cost the customer less than another increment of generation capacity. The PAs will also help customers with the necessary coordination with the Clean Energy Center in order to qualify for renewables incentives and inform them of the interconnection process to move the final step to Net Zero.</p> <p>It is important to consider NZE efforts within the perspective of overall efforts of the PAs to reduce energy consumption and greenhouse gas emissions. The actual number of market-based and cost-effective non-residential Net Zero buildings constructed in the Commonwealth over the coming three years is likely to be exceedingly small, and those that are undertaken are likely to be quite modest in size, if historic patterns persist.<sup>32</sup> However a larger cohort may be interested in pursuing</p>

<sup>32</sup> A recent national survey of Net Zero buildings by the New Buildings Institute found a total of 39 Net Zero buildings have been verified since 2000; 14 of these are in temperate climate zones in California. Thirty-two are less than 25,000 square feet. It appears that only 6 are private sector buildings; the

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>NEW BUILDINGS &amp; MAJOR RENOVATIONS</b>  <b>INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>Near Net Zero, or highly efficient, status. The overall goal of the PAs in this arena is to establish a basis of technical knowledge and expertise, and develop a framework for program support, for projects that wish to aspire to a ranking anywhere along the NZE continuum.</p> <p><u>Expanding Upstream Offerings</u></p> <p>The upstream delivery model leverages existing distributor and manufacturer networks and infrastructure to influence the thousands of equipment purchasing decisions that customers and contractors make every day.</p> <p>To date, the PAs have offered an upstream approach for select lighting and HVAC products, with considerable success. As described in greater detail below, the PAs are researching other products that might fit the special set of unique circumstances that are required for an upstream approach to succeed. The PAs plan to add a variety of products to their overall upstream portfolio such as water heating equipment as well as a number of other equipment categories including boilers, furnaces, circulator pumps, some component motors in HVAC systems, and some commercial kitchen equipment.</p> <p><u>Improved Comprehensiveness in Small/Midsized Buildings</u></p> <p>All of the PAs have developed streamlined approaches to encourage comprehensiveness in smaller (&lt;100,000 square feet) buildings where: (a) full-scale scenario modeling is often cost-prohibitive, and/or (b) where building systems are often less complex. It is important for the PAs to focus efforts on comprehensiveness on this segment of new construction as 95 percent of the US non-residential building stock is less than 50,000 square feet.<sup>33</sup> National Grid and Cape Light Compact use the Advanced Buildings (“AB”) approach in this market. AB was designed by the New Building Institute (“NBI”) as a comprehensive, prescriptive program for small commercial new construction in the 10,000–100,000 square foot range. Eversource has developed its own approach using engineering</p>

remaining 33 are either public buildings or buildings in the non-profit/philanthropic/higher education sectors.

<sup>33</sup> *Industry Research and Recommendations for Small Buildings and Small Portfolios*, Langner, et al, National Renewable Energy Laboratory and Huppert, et al, Preservation Green Lab, National Trust for Historic Preservation, December, 2013.

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>NEW BUILDINGS &amp; MAJOR RENOVATIONS</b>  <b>INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>assumptions and an analysis approach that are very similar to those used by NBI. Under both models, the customer receives a set of recommendations that guides them to a more comprehensive approach to their building project without the necessity of a complex and often expensive modeling process.</p> <p>The gas PAs have adopted these models as well, which has reduced overall program administrative costs, due to the sharing of resources. In the future, the PAs plan to streamline these approaches and strive to adopt a single approach statewide.</p> <p>The PAs will increase their focus on the building types that are most amenable to this approach; specifically, small office, retail, public assembly, and school/preschool applications.<sup>34</sup></p> <p><u>Sustainable Office Design</u></p> <p>National Grid and Eversource have introduced a new offering called Sustainable Office Design (“SOD”) as a means of delivering integrated technical solutions to the leased commercial office market.<sup>35</sup></p> <p>The goal is to capture the energy savings and demand reduction potential that becomes available in the period when office space is vacated by one tenant and refitted for occupancy by a new one (the tenant improvement, or TI, process) or when a new office building, constructed for tenant occupancy, is in the initial leasing phase (tenant fit-out). At least 20 percent of all energy used in commercial buildings is in office space and estimates show that the average commercial office building could reduce its energy use by 20 percent.<sup>36</sup></p> <p>During the TI/fit-out process, the office space is typically vacant and decisions are made regarding lighting fixture selection and a design to fit the needs of the new occupants. This creates an opportunity to significantly influence energy and demand elements of a building, as well as enhance aesthetics of a space and increase the likelihood of higher levels of comfort and productivity for future occupants, in that unique</p>

<sup>34</sup> The economics of both approaches are based on buildings with central mechanical cooling systems.

<sup>35</sup> The smaller PAs will consider adoption to the degree applicable once experience with the larger PA effort has produced results for consideration.

<sup>36</sup> *Office Real Estate Value Proposition*, Northwest Energy Efficiency Alliance.



<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u> NEW BUILDINGS &amp; MAJOR RENOVATIONS INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>moment when both the tenant and owner are actively thinking about both the space and the financial considerations around it while the space is vacant and the parties already assume and accept some level of construction disruption in their planning.</p> <p>Owners typically have a set-aside for TI, which is negotiable based on market conditions, lease terms, or plans for general property improvements or market repositioning.<sup>37</sup> Tenants can contribute funding to the TI process as well, either in cash, increased rent, or longer lease terms, to ensure that the space is suitable for their needs. In other words, there is both a financial negotiation and space design process in play, which creates an opportunity to get deeper energy savings without the typical owner/tenant “split incentive issue” dominating the financial discussion and with minimal construction-related disruption to the occupants.</p> <p>The SOD offering provides enhanced services to building owners and prospective tenants, aligning on the market-based TI/initial fit-up opportunity. SOD provides both technical assistance and incentives designed to motivate the parties to think beyond simple lamp and ballast replacements to consider function-based integrated lighting and controls solutions, designed for the specific proposed occupancy activity. This approach offers a predictable incentive at \$1.00 per square foot of leased space (net of common areas) for qualifying light fixtures and controls projects, with a guaranteed fast-track timeline for application review and approval.</p> <p>SOD combines aspects of the prescriptive and performance lighting options to promote thoughtful, innovative, and controls-rich lighting designs. The effective lighting power density (“LPD”) of SOD qualifying projects will be significantly below code requirements, which can make important contributions toward obtaining critical LEED energy credits and Energy Star® certification.</p> <p>Key elements of SOD include:</p> <ul style="list-style-type: none"> <li>• Lighting solutions that emphasize efficiency and occupant comfort and productivity;</li> <li>• Low Lighting Power Density;</li> </ul>

<sup>37</sup> According to a GSA survey, allowances can range from \$2/SF for paint only to \$50/SF for extensive TI.

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	<ul style="list-style-type: none"> <li>• Exceptional lighting energy savings (&gt;2 kWh/square foot, on average);</li> <li>• Thoughtful, integrated application of lighting controls (<i>i.e.</i>, programmable sweep, tuning, vacancy, etc.); and</li> <li>• Daylight harvesting, where possible.</li> </ul>																												
<p><b>Program Design</b></p>	<p><b>Participation Options</b></p> <p>The New Construction program has multiple participation options, depending both on where the building is in its construction or renovation schedule and the owner’s investment criteria and goals for the project. Assistance can range from simple plan review and efficiency upgrade recommendations to complete technical assistance studies performed by leading energy engineering firms.</p> <div> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="4" style="text-align: center;"><b>Program</b></td> </tr> <tr> <td colspan="4" style="text-align: center;"><b>New Buildings &amp; Major Renovations</b></td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>Approach</b></td> <td colspan="2" style="text-align: center;"><b>Approach</b></td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>Systems</b></td> <td colspan="2" style="text-align: center;"><b>Whole Building</b></td> </tr> <tr> <td colspan="4" style="text-align: center;"><b>Pathway</b></td> </tr> <tr> <td style="text-align: center;">Prescriptive</td> <td style="text-align: center;">Custom</td> <td style="text-align: center;">Advanced Bldg or Similar</td> <td style="text-align: center;">Integrated Design</td> </tr> <tr> <td style="text-align: center;">Single simple measures</td> <td style="text-align: center;">Single or multiple measures</td> <td style="text-align: center;">10-100k Sq Ft select bldg types</td> <td style="text-align: center;">&gt; 15% above code</td> </tr> </table> </div> <ul style="list-style-type: none"> <li>• <i>The Whole Building Approach</i> allows the customer, the design team, and program-supported experts to work together from the conceptual design stage of a new construction or substantial renovation project to consider holistic design and equipment options that will improve the overall efficiency of an entire building and its operating systems. This path is explicitly designed for the purpose of promoting high performance buildings with lower energy use intensities and ongoing operational costs than code compliant buildings. Under this path customers can elect to pursue cost-effective options that drive the energy use intensity of their building to the lowest practical level</li> </ul>	<b>Program</b>				<b>New Buildings &amp; Major Renovations</b>				<b>Approach</b>		<b>Approach</b>		<b>Systems</b>		<b>Whole Building</b>		<b>Pathway</b>				Prescriptive	Custom	Advanced Bldg or Similar	Integrated Design	Single simple measures	Single or multiple measures	10-100k Sq Ft select bldg types	> 15% above code
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	<p>possible – including going all the way to a NZR building.</p> <p>Eligible customers may take advantage of both program-sponsored technical assistance to help define and quantify cost efficiency options, as well as reimbursement to the customer’s own design team for additional design work or analysis necessary to accommodate program recommendations. The customer’s financial incentive is calculated to help offset increased design interaction and potential costs of construction and is awarded based on an analysis of the entire project design and the interrelationship between the various building energy-consuming systems. In order to encourage such a comprehensive approach, incentives are usually calculated at a significant percentage of incremental cost.</p> <p>The Whole Building Approach provides technical support and incentives which allow building owners and their design teams to aggressively pursue high efficiency options that fully integrate building envelope, lighting and mechanical systems to produce a building that is as efficient as current technology and design techniques allow. The combination of technical consultation and incentives provided by the program will cover a significant portion of the additional design, modeling, and equipment costs required to turn an average building into an exemplary one.</p> <ul style="list-style-type: none"> <li>• <i>The Systems Approach</i> focuses on one or two aspects of a building’s energy systems during new construction, a remodel, or a change in space use. Program experts encourage customers to think broadly as systems are frequently interrelated and may be more economical to install when walls and ceilings are open or down, or large equipment is being installed. Customers who select the Systems Approach will receive Prescriptive incentives for each measure for which one exists, or Custom incentives for site or use-specific measures.</li> <li>• The <i>Custom</i> path is designed to facilitate creative and deeper energy savings in systems of a new construction or major renovation project. Custom projects rely on engineering calculations to estimate energy savings and evaluate whether or not a project is cost effective and, as a result, eligible for financial incentives. The custom path is designed to encourage non-standard energy efficiency measures and allows customers to request a technical assessment of measures of their own choosing that are not on the prescriptive list. This option allows for a</li> </ul>

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	<p>more comprehensive and creative consideration of projects that are more complex than the prescriptive option allows, but involve less than a whole building design. It also encourages and rewards customer initiative and creativity. Often the savings generated by these measures are site and end use-specific, and thus a detailed analysis is required to qualify them for incentives. Project viability, eligibility and incentives are assessed on a case-by-case basis, and are determined by a technical study, which details energy and demand savings, and project costs. The study is conducted according to program specified procedures and is subject to review and approval by PA technical staff. The baseline standard practice against which each proposal is judged is determined on a case-by-case basis, using such resources as: current baseline studies and other market research, program experience with similar projects, as well as utility or public program experience from other comparable jurisdictions. The measures eligible for the custom path include, but are not limited to, lighting and lighting systems, HVAC systems, water heating, motor systems, building envelope and refrigeration measures, and a variety of industrial process end uses. Incentives are related to a number of site or use-specific variables, total project costs, and associated savings.</p> <ul style="list-style-type: none"> <li>• The <i>Prescriptive</i> path is a standardized, streamlined approach for energy efficiency incentive delivery. It allows customers to choose equipment from a prequalified list of measures and receive an incentive that covers a significant percentage of incremental cost (adjusted for consideration of market barriers, baseline construction practices and market transformation objectives). This path is designed for customers who have projects that are beyond the design phase, and perhaps are in actual construction, and can include new construction, renovation, remodeling, and equipment replacement projects. Prescriptive measures are available for those technologies for which energy savings can be predicted with reasonable accuracy across all applications (as compared to counterpart technologies of lesser efficiency). These technologies include: lighting equipment and controls, unitary HVAC equipment, water heating equipment, chillers, motors, and variable speed drives, as well as food service equipment. This path often serves as the customer’s initial exposure to the program and, following an initial experience, customers may choose the more sophisticated comprehensive or custom paths for subsequent projects.</li> </ul>

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	<p><b>Component and Ancillary Services</b></p> <p><u>Technical Assistance (“TA”) Services</u></p> <p>Providing high-quality, independent technical advisory services to customers and their design teams in a timely manner is essential to achieving comprehensive savings in new construction as well as system-based savings in industrial or process-related projects or in discrete building systems such as HVAC or lighting. In this market, time is money, and any perception that program participation will cause delay is a deal-breaker.</p> <p>TA Services provides technical support, and a technical support services provider, that is matched to the specific requirements of each project and the needs of each design team. Service can range from comprehensive and detailed energy modeling of the performance of an entire proposed building, using various configurations of design and equipment, to targeted studies and recommendations for specific building components or systems, or specialized technical studies, such as proposed industrial process improvements and compressed air projects.</p> <p>In general, study proposals are referred to TA consultants who have been pre-screened by the PAs. TA consultants are assigned to a project based on an assessment of their expertise and experience with the technologies under consideration. It is vital to program credibility that the customer has confidence that the TA provider assigned to their project is truly an expert whose recommendations will add value (and, conversely, will not introduce risk and delay) to their project. Customers can also elect to use a TA provider of their own choosing, subject to the co-funding PA’s approval of the firm’s qualifications and cost estimate. Non-preferred vendors must comply with the same level of detail and quality in their TA studies as pre-screened vendors.</p> <p>In many instances, customers have both gas and electric equipment options that require analysis. In these cases the gas and electric PA will co-fund the TA studies, and gas and electric program staff will work as a team to implement the recommendations.</p> <p><u>Performance Lighting</u></p> <p>The PAs promote high performance lighting technologies and design</p>

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	<p>practices that are either more efficient than standard practice and/or the requirements of the Massachusetts Building Energy Code through incentives for better lighting design. The Performance Lighting option promotes the thoughtful combinations of energy efficient lighting fixtures and lighting controls in site-specific lighting designs that produce quality lighting using lower watts per square foot than the current code. By encouraging, and rewarding, the market to move away from simple prescriptive incentives that reward customers for simply substituting one piece of hardware for another the PAs hope to shift the focus to using more efficient equipment (with controls) within the context of a more thoughtful and efficient lighting design that actually utilizes the full potential of the technology to achieve lighting that reflects the functional requirements of occupants in their workspaces. Thus, Performance Lighting is both a resource acquisition and a market transformation initiative.</p> <p><u>Building Energy Codes and Appliance Standards</u></p> <p>Incorporating high levels of efficiency in buildings during design and construction is the least expensive and most practical and equitable way to achieve broad scale energy efficiency in the built environment.</p> <p>The PAs will continue to focus on both advancing adoption of progressive energy codes, including voluntary stretch codes, and improving levels of compliance with these codes in new construction and major rehabilitation, through training and technical assistance.</p> <p>Sound energy codes are practical and cost-effective because the additional time and expense to produce an efficient building design, and to specify efficient equipment for it, is negligible when compared to the cost and inconvenience of retrofitting an inefficient building once it is in place. Also, most of the fundamental design decisions that dictate a building’s efficiency are irreversible, and the costs of a non-code compliant building can burden future owners throughout the life of the structure. Strong energy codes that are uniformly enforced are also equitable because they establish a high standard for all construction. In a competitive building market, particularly when space is designed for a speculative building for tenant occupancy, efficient design and specification of efficient equipment can take a back seat to first cost, and default to code minimum requirements. Value engineering can also squeeze out efficiency options that may reward over time, but have a</p>

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	<p>higher first cost. A progressive energy code ensures that at least the floor requirements for efficiency are high.</p> <p>It should be noted that PA programs also indirectly support code advancements. The programs serve to introduce new technologies into the marketplace and lower their cost through volume sales. The PAs also help introduce the building design community and specifiers to new technologies and, by endorsing and incentivizing them, instill confidence that they are reliable and actually save energy. Education and incentives bring about large-scale adoption and subsequently lower product incremental costs. When advanced technologies achieve broad market acceptance and become common practice, they can be codified and PA attention and incentives can be redirected to the next emerging technology.</p> <p>Massachusetts is considered a leading state for advanced energy codes, and a model for cooperation between PAs and government to improve code compliance in commercial and residential construction. However, recent baseline studies have shown that code compliance rates remain well below 100 percent in the Commonwealth. Efforts to improve compliance rates were increased in 2014 with the Energy Code Technical Support effort. The effort supports training for building code officials and for the building design and construction communities. It also offers circuit rider technical assistance to increase on-the-ground compliance to the code in actual underway building projects.</p> <p>The PAs organize and offer code training sessions throughout the state in partnership with the DOER and the Department of Public Safety, with the training directed to both design professionals and local code officials. In 2014, the program reached 174 percent of its target attendance goal and has received high marks with attendees in post-session evaluations.</p> <p>The PA supported circuit riders provide technical assistance to building design professionals on energy codes and energy efficient building design and best practices. They help interpret and explain code requirements and serve as liaisons between designers, builders, contractors and public code officials. By helping building industry professionals interpret and apply the code to the actual day to day projects they have in front of them, circuit riders help instill the understanding necessary to apply the requirements to the next project, when the circuit rider will not be there. Circuit riders cover the entire state and can provide on-call technical</p>

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	<p>assistance to project teams, as well as to local code officials.</p> <p>The PAs will continue to support DOER’s efforts to encourage more Massachusetts cities and towns to adopt the stretch code, and provide education and training on compliance. In addition, the PAs plan to work with the DOER and other stakeholders to develop the technical and economic case for a variety of proposed state level appliance standards. In addition to progressive energy codes, well-targeted increased efficiency standards on widely used appliances represent a significant low-cost energy efficiency source for the Commonwealth, and for the citizens who occupy its buildings and use appliances sold in the state.</p>
<p><b>Delivery Mechanisms</b></p>	<p>The portfolio of program services and incentives to new building construction, renovation, and expansion market actors – owners, developers, architects, engineers, equipment specifiers – is marketed and delivered by PA staff and contractors. This includes account managers and, in the case of the larger PAs, dedicated new construction program professionals. Responsibilities include identifying and capturing construction leads, and then identifying and managing delivery of the mix of participation options and core and ancillary services that best fits the customer’s business needs, project type, and development schedule. Products eligible for the upstream approach are marketed and delivered through a statewide network of equipment distributors, supply houses, and manufacturer’s representatives.</p> <p>For the upstream delivery model to succeed, a special, and limited, set of special circumstances are required: (a) The premium equipment must be suited for either one-for-one replacement for a less efficient measure in a failed equipment scenario or in new construction; (b) the equipment purchase decision must be almost entirely driven by first cost, with no real amenity or reliability distinctions between the products; (c) the substitute premium equipment must be stocked and available at distributors at the time of the purchase decision; and (d) there must be no, or minimal, additional or unique installation requirements that distinguish it from the product for which it is substituted. That is, it must be “plug-and-play.”</p> <p>The upstream model leverages existing distributor networks and infrastructure to influence the thousands of equipment purchasing decisions that customers and contractors make every day. Under the upstream model, the PAs provide incentives directly to distributors and</p>



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	<p>manufacturers rather than end users, with the end users benefiting from the significant reductions in retail product costs that this enables. The incentives are structured to entirely remove the price premium between conventional and premium products at the point of purchase, thereby placing premium product in direct competition with the conventional product on the basis of attributes of quality and efficiency alone – with the assumption that the purchaser will make the wise choice.</p>
<p><b>Marketing Overview</b></p>	<p>The target market for the New Construction program is all “time-dependent” gas and electric energy efficiency opportunities in the non-residential sector, which includes commercial, industrial, institutional, and governmental customers and their buildings. Time dependent opportunities exist when new buildings are being designed and constructed, and when existing ones are expanded, remodeled, or renovated. Time dependent opportunities are also available when existing equipment fails, and must be quickly replaced to restore the building to full functionality. In the new construction market key market actors include architects, engineers, equipment specifiers, manufacturers, distributors, suppliers, commissioning agents and the owners or developers of new buildings. In the replacement market key decision-makers include building owners or managers, facility staff, and equipment supply houses.</p> <p>The non-residential development process has a number of characteristics that make it difficult to influence from the outside. First and foremost, with the exception of government or institutional projects, or very large projects that require some form of planning body approval, most of the process occurs in an environment that is outside of public view. Decisions to develop particular buildings on particular sites, and subsequent agreements for financing, real estate purchase, design and construction services, and, ultimately, sale or rental are, after all, private business. The participants do not reveal that a development is even contemplated because they do not wish to alert potential competitors to their intentions or because there is simply no need or requirement to do so.</p> <p>Also, the process itself often does not proceed along a seamless continuum. Development can be an episodic process, with flurries of activity around securing permitting or financing for example, followed by periods of dormancy until the next hurdle is addressed. And with many hurdles, a significant number of projects never move from the conceptual</p>

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	<p>stage to actual completion, and from all the projects that are proposed, it is often difficult to determine which proposed projects will materialize, particularly at the earliest conceptual phase.</p> <p>Yet it is at the conceptual phase, when all plans are fluid that the greatest potential exists to influence the project in the direction of a comprehensive, holistic energy efficient design. When earth gets moved, the plans have long since been functionally complete and all attention is then and from that point forward on the projected completion and occupancy date. Millions of dollars have been borrowed and no revenue is generated to repay these loans until the tenants or owners move in. A change to incorporate efficiency, or any change for that matter, is perceived to mean delay, and delay costs money.</p> <p>Additionally, it is estimated that between 40 and 50 percent of small commercial buildings are built for tenant occupancy. This creates two very daunting barriers to the consideration of more efficient design or equipment. First, the typical lease model (the so-called “triple net” lease) flows all operating costs, including utility bills, through to the tenant. Sometimes this is accomplished through direct metering of the tenant premises as in a freestanding retail space. In other cases, there is a master meter with a pro-ration of costs to all tenants as in the case of a strip-mall or a small office building. In neither case does the tenant have the incentive to upgrade the landlord’s property except in the limited instances where the payback term is significantly less than the remaining life of the lease. Thus, lowest first cost often rules the day in the development process. If there is additional money to be spent on building systems, the developer and his design engineer will often invest it to oversize HVAC equipment and over-light spaces as a shield against future tenant complaints or litigation.</p> <p>A retrofit project typically involves a turn-key vendor selling a project specifically on efficiency attributes. By contrast, in the new construction market, products are specified in the design process, not sold. Among the market actors whose interests must be considered are:</p> <ul style="list-style-type: none"> <li>• Owner/occupants, who expect to be long term tenants in their own buildings, and therefore are more likely to be receptive to the concept of life-cycle costing and to longer payback measures, or to an “inspiring” design;</li> <li>• Larger architectural and engineering firms, who tend to design</li> </ul>

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	<p>from a library of “typical” building packages. Once their template design and equipment specifications are modified, they will be reapplied in numerous similar buildings in the future;</p> <ul style="list-style-type: none"> <li>• Leading design firms who tend to establish the new market standards that are then followed by more conventional firms;</li> <li>• Chain and franchise owners, who often use one design template, which can be varied according to site requirements, and who often use in-house architects and engineers;</li> <li>• Public sector owners, who often have regulatory requirements that include life-cycle costing and legislated goals for energy efficiency;</li> <li>• Environmentally conscious owners, who wish to promote their building as an extension of their corporate ethic;</li> <li>• Speculative developers to the extent they can be persuaded that a low-energy-cost building has a promotion value to attract tenants;</li> <li>• Equipment manufacturers and suppliers who need to be persuaded to stock energy efficient equipment so that it will be available to meet program-generated demand.</li> </ul> <p>Specific outreach strategies are designed for each of these groups, but for all, one-on-one communication is the primary approach that has produced results over time. Building relationships by partnering on an initial successful project and showing added value, leading-edge technical expertise and rapid response to the client’s needs puts the program top-of-mind when the next project comes along. This direct marketing is facilitated and supplemented through other channels including brown bag educational seminars, formal training seminars and webinars particularly when they qualify for continuing education unit credits, case studies, open houses, etc.</p> <p>For time-dependent projects involving replacement of failed or end-of-life equipment, the PA’s marketing efforts focus on customers and their facility managers and on equipment vendors, again using extensive one-on-one communications. This communication is supported by case studies and other promotional pieces, participation in a variety of trade shows and industry conferences, breakfast meetings, and other customer and vendor focused training seminars. The PAs continually engage with equipment distributors and installers to help them promote</p>

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>NEW BUILDINGS &amp; MAJOR RENOVATIONS</b>  <b>INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>energy-efficient equipment and systems to their customers and to explore innovative ways to work together to mutual advantage.</p> <p>With specific regard to the upstream delivery approaches, the existing distributor networks and infrastructure are leveraged to influence the thousands of equipment purchasing decisions that customers and contractors make every day. Under the upstream model, the PAs provide incentives directly to distributors and manufacturers rather than end users. The incentives are structured to entirely remove the price premium between conventional and premium products at the point of purchase, thereby placing premium product in direct competition with the conventional product on the basis of attributes of quality and efficiency alone, with the assumption that the purchaser will make the wise choice.</p> <p>Removing the price premium is critical because, without explicit direction to the contrary, equipment specifiers in new construction or renovation projects and building maintenance personnel when replacing failed equipment will usually select the lowest cost option that can fulfill code requirements. Similarly, the trades that compete on construction or equipment replacement work are under market pressure to offer the lowest cost bid.</p> <p>For lighting products, the target markets are: (a) electrical contractors ordering commercial lighting products or purchasing them over the counter; (b) facility managers ordering commercial lighting products or purchasing them over the counter; and (c) engineers and other specifiers who dictate commercial lighting product specifications in new construction. For HVAC products, delivery is primarily through the contractor network that replaces failed equipment in existing facilities and installs new equipment in construction projects.</p>
<p><b>Three-Year Deployment Strategy/Roadmap</b></p>	<p>For the 2016-2018 term, the program will concentrate on continuous improvement and refinement to core program elements and expansion of more customized services into relatively underserved markets such as the tenant fit-up/TI processes and deeper savings in small and medium building markets as described above. The PAs will examine market data to determine if additional segments can be identified that would benefit from discreet, targeted approaches such as the potential opportunity that</p>

<p><b>C&amp;I NEW CONSTRUCTION</b></p>	<p><b><u>CORE INITIATIVES</u> NEW BUILDINGS &amp; MAJOR RENOVATIONS INITIAL PURCHASE &amp; END OF USEFUL LIFE</b></p>
	<p>exists when hotels are either rebranded or “refreshed” to keep customer amenities current and competitive.<sup>38</sup></p> <p>With the recession now largely behind us, forecasters are seeing tightening vacancy rates in the large commercial markets of Eastern Massachusetts. This means new construction starts, at least in the Eastern part of the state, will continue to accelerate, with a mix of both build-to-suit and speculative office space, as well as a growing laboratory/life sciences presence.<sup>39</sup> One recent respected study placed Metro Boston as the number nine (of 75) U.S. Markets to Watch for real estate development prospects.<sup>40</sup> The study advises investors to particularly focus on opportunities in the lodging, retail, and office markets, with an eye to the growing life sciences/laboratory market as well. National-level analysis ranks the strongest overall development prospects in warehousing and limited-service hotels. This forecast serves as a good guide to priorities for PA focus in the Commonwealth’s largest commercial market area for the intermediate term.</p> <p>With regard to the upstream delivery model, the PAs have achieved considerable success with lighting and HVAC equipment. The PAs have, and will continue to, research additional products that might fit the special set of unique circumstances that are required for an upstream approach to succeed. In addition to water heating equipment, which will be offered during or before the start of this Plan term, potential candidates include: boilers, furnaces, circulator pumps, some component motors in HVAC systems, and some commercial kitchen equipment measures.</p>

<sup>38</sup> National Grid in Rhode Island and Southern California Edison are engaged in a joint research project to better understand the hotel renovation/refreshment market dynamic, and the potential to present efficiency options to customers when they are about engage in a renovation/refreshment project.

<sup>39</sup> New England Market Outlook 2015, CB Richard Ellis New England Partners

<sup>40</sup> *Emerging Trends in Real Estate United States and Canada 2015*, the Urban Land Institute and PwC, October 2014.

*b. C&I Retrofit: Existing Building Retrofit, Small Business, Multi-family Retrofit, Upstream Lighting*

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u> EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>
<p><b>Overview &amp; Key Objectives</b></p>	<p>The Retrofit Program consists of two sets of core initiatives. The first consists of Existing Building Retrofit, serving all non-residential customers, along with two additional specialized initiatives -- Small Business and Multi-family Retrofit – each of which serves specific subsets of non-residential customers. The second, Upstream Lighting, is primarily a marketing channel approach, but is presented here separately primarily for accounting purposes, as it has provided a large share of the commercial lighting savings in recent years, and is expected to continue doing so in the coming plan term.</p> <p><u>Existing Building Retrofit</u></p> <p>This broad core initiative promotes a menu of equipment incentives and technical services to encourage building owners to replace functioning, but outdated and inefficient equipment with premium efficiency counterparts. Because this program accounts for a significant share of C&amp;I savings, the PAs continuously monitor its performance and refine delivery approaches, the product mix, and incentive levels to reflect changing market expectations and evolving technologies.</p> <p>As the program has matured and customers have become more aware of the variety of energy-saving investment opportunities available to them, the PAs have encouraged a transition away from episodic equipment-based retrofit events to engaging customers in a thoughtful series of building upgrades that move their property towards a “building renewal”. Mature efficiency programs, those that have harvested the easiest and less expensive savings opportunities and have established trusted relationships with customers, are often characterized by a preponderance of more sophisticated custom projects and a lesser number of simpler prescriptive ones. The Massachusetts C&amp;I Retrofit program fits this mature program profile.</p> <p>The program offers prescriptive incentives for widely-applicable electric and gas technologies, and a custom approach which focuses on unique opportunities that are customer, site, or process specific.</p> <p>Prescriptive incentives are offered for measures that provide predictable energy savings in virtually all applications where they replace a similar technology of lesser efficiency. These incentives are available for a long</p>

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u></b> <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>
	<p>list of electric and gas technologies such as lighting equipment and controls, HVAC controls, chillers, motors and drives, spray valves and steam traps, etc. This commodity-based path often serves as the customer’s initial exposure to the program and may lead to more complex custom projects.</p> <p>To identify and quantify custom opportunities, the PAs provide customers with expert technical assistance, using both their own technical staff and subject matter experts drawn from a pool of prequalified expert private sector engineering consultants. To move customers to action once opportunities have been identified, the PAs offer financial incentives that are calibrated to match customer investment criteria. The overarching goal is to instill customer confidence in projections of project savings and the reliability of equipment performance, in order to make the financial investment attractive, and to provide a delivery process that makes the upgrade process as simple and seamless as possible.</p> <p>In addition to periodic equipment upgrades, the PAs offer a suite of ongoing services to business customers, including subsidized training for building operations and maintenance tasks and access to retro-commissioning (“RCx”) services to ensure that energy-consuming equipment operates as designed, and that all low-cost/no-cost opportunities for energy and electrical demand savings are fully exploited.</p> <p><u>Small Business</u></p> <p>Small businesses<sup>41</sup> account for about 45 percent of the energy consumed in Massachusetts, but that potential for savings is scattered in small segments located in over 330,000 facilities scattered across every community in the Commonwealth. Moreover, small businesses have many well-documented barriers that impede their investment in efficiency: the landlord/tenant split incentive, lack of capital, short planning horizons, lack of awareness/expertise, perceived complexity of the technology and mistrust of savings claims, etc.</p> <p>Small Business customers can access any of the incentive and service options available to all C&amp;I customers depending on their needs and</p>

<sup>41</sup> The “Small Business” category also includes a majority of the non-profits and houses of worship in the Commonwealth. These entities can – and do – fully participate in all of the program offerings described under this heading.

<p><b>C&amp;I RETROFIT</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b></p>																		
	<p>preferences. In addition, they have a unique ability to access the Small Business core initiative, which has features that are explicitly designed to address the unique barriers and limitations in this market.</p> <p>Small business customers will continue to have full access to the custom and prescription offerings of both the New Construction program and Existing Building Retrofit Initiative. Small businesses also often access new technologies through the upstream channel for lighting, HVAC or water heating equipment. Thus, as the graphic below illustrates, the turnkey delivery model that underpins the Small Business core initiative should be seen as but one of the multiple means by which small business customers in the Commonwealth are supported by the PAs in their efforts to improve the efficiency and productivity of their buildings and businesses.</p> <div> <thead> <tr> <th></th> <th colspan="2">New Construction</th> <th colspan="3">Retrofit</th> </tr> </thead> <tbody> <tr> <th>Core Initiative</th> <td>New Buildings &amp; Major Renovations</td> <td>Initial Purchase &amp; End of Useful Life</td> <td>Existing Building Retrofit</td> <td>Small Business</td> <td>Upstream Lighting</td> </tr> <tr> <th>Pathway</th> <td>Prescriptive/ Custom Applications</td> <td>Upstream HVAC/Water Heaters</td> <td>Prescriptive/ Custom Applications</td> <td>Turnkey Services</td> <td>Distributor Delivery</td> </tr> </tbody> </div>		New Construction		Retrofit			Core Initiative	New Buildings & Major Renovations	Initial Purchase & End of Useful Life	Existing Building Retrofit	Small Business	Upstream Lighting	Pathway	Prescriptive/ Custom Applications	Upstream HVAC/Water Heaters	Prescriptive/ Custom Applications	Turnkey Services	Distributor Delivery
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<sup>42</sup>

The Small Business core initiative is simply a subset of the Retrofit Program. In addition to this specialized service, Small business customers can also participate in the full range of other retrofit options, including custom electric and gas measures. In addition, small business customers can receive incentives to upgrade to the most efficient option when they replace furnaces, boilers, water heaters, kitchen equipment, etc.



<p><b>C&amp;I RETROFIT</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b></p>
	<p>Massachusetts delivery model has been widely imitated and is accepted as an industry best practice program delivery model for small business customers. Delivery to this market segment through this initiative will continue uninterrupted, with refinements identified through the program review process incorporated into delivery as soon as practical. There will be increased attention on streamlined services to micro-businesses and customized offerings to market sectors with unique business needs and measure opportunities.</p> <p><u>Multi-family Retrofit</u></p> <p>As described in greater detail in the Residential Section of this Plan, Section III.E, because multi-family buildings may contain residential and commercial metering and, as a result, technologies more associated with commercial buildings, services and incentives are also provided to this sector through the C&amp;I Retrofit Program.</p> <p>However, as the beneficiaries of the Multi-Family Retrofit core initiative are primarily the residents of individual units, and the measures and services associated with this core initiative are primarily residential in nature, the PAs residential program managers have taken a leadership role in delivering the cross-sector Initiative. The MMI assures that cross-sector services are delivered seamlessly to customers, including services provided by commercial sector service providers. The commercial sector services are then attributed to commercial sector budgets and goals at each PA.</p> <p>These C&amp;I measures may include:</p> <ul style="list-style-type: none"> <li>• HVAC high efficiency equipment upgrades and controls;</li> <li>• Variable speed drives, motors;</li> <li>• Chillers;</li> <li>• Air compressors;</li> <li>• Water heating equipment;</li> <li>• Energy management systems;</li> <li>• Building envelope measures; and</li> <li>• Custom measures.</li> </ul>

<p><b>C&amp;I RETROFIT</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b></p>
	<p><b>Target Market</b></p> <p>The potential market for the C&amp;I Retrofit Program is the entire non-residential built market in the Commonwealth. In addition to typical commercial office buildings, this includes schools (K-12 and colleges and universities); public and institutional buildings and facilities (state and municipal buildings, water and wastewater facilities, hospitals, and a variety of not-for-profit enterprises); and industrial facilities (including factories, warehousing, agriculture, storage and processing, etc.), as well as common area spaces in multi-family buildings. For submarkets of special interest, beyond small business and multi-family, there are added participation services or features in addition to the core program offering.</p> <p><b>New Enhancements</b></p> <p><u>Further Market Segmented Delivery</u></p> <p>Market segmentation is the process of defining and subdividing the class of C&amp;I customers into identifiable segments that have similar needs, wants, or usage and demand characteristics, who are likely to respond to similar program approaches and marketing or outreach messaging. The process is a means to an end for the PAs: to inform design and delivery of a mix of program offerings, with appropriately tailored outreach and delivery that will resonate with and match the expectations of customers in the targeted segment, and will motivate them to action.</p> <p>PA markets can be defined by business type (<i>e.g.</i>, health care, education, government, agriculture, industrial, hospitality, etc.), building type (<i>e.g.</i>, hospital, university, retail, hotel, factory, etc.), by geography, size (of energy use or demand), by ownership type, or any of a number of ways. The PAs segment their customers according to the unique mix of customers of each PA service territory. For example, National Grid has a large number of industrial customers, so the company has developed the organizational and technical capacity to serve industrial needs and investment horizons. It further subdivides manufacturing into process, fabrication, food and heavy industry in order to better target its services to the different needs of each of these sub-segments. Eversource has a heavier concentration of commercial real estate, and organizes its delivery to effectively serve that market. Likewise, Cape Light Compact has a large number of hospitality customers and thus is targeting segment-specific services to them.</p>

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u> EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>
	<p>The PAs continue to evolve customized approaches for these and other markets, making use of local EM&amp;V studies, the experience of peer programs around the country, and data reported in studies and program evaluations from other jurisdictions.</p> <p>For example, the “Mid-Size Customer Needs Assessment”<sup>43</sup> which looked at a snapshot of customers in the 300-750 kW range in a single year found that these customers require more complex solutions than are customarily available through the Small Business core initiative alone, and yet may require different financial incentives and application requirements than they experience in the C&amp;I Retrofit Program as a whole. That study was followed by the <i>2013 C&amp;I Customer Profile Report</i> which looked at customer trends longitudinally. The study revealed that on average these customers comprised about 23 percent of both statewide electricity usage and statewide savings in 2012 and 2013.</p> <p>The PAs will continue to develop a more detailed understanding of the various sub-sectors contained within this mid-sized sector in order to develop marketing and delivery strategies that will resonate with customers who have similar energy use, business requirements, and investment criteria. This will also involve reviewing the definition of mid-sized customers across all PAs and develop more contractors who are trained in providing comprehensive solutions to this midmarket, including providing more comprehensive leads to the current pool of preferred trade ally contractors.</p> <p>An example of a specific submarket sector analysis is the profile of small and medium sized food stores conducted in 2014.<sup>44</sup> This study reported the results of interviews with key decision-makers in this market with the goal of providing more and better information about this customer segment to inform PA program design and delivery. The PAs plan to incorporate recommendations from this study during the 2016-18 Plan term.</p> <p>The chart below is illustrative of the energy using characteristics as well as the motivations and barriers with regard to efficiency investments experienced by key PA customer segments:</p>

<sup>43</sup> Final Report Mid-size Customer Needs Assessment, for the Council Consultants and Massachusetts Energy Efficiency Program Administrators, KEMA, December 22, 2013.

<sup>44</sup> Market Sector Profile: Small and Medium-Sized Food Stores – Final, for the Massachusetts Program Administrators and EEAC Consultants, DNV GL, September 26, 2014.

<b>C&amp;I RETROFIT</b>		<b>CORE INITIATIVES</b>																					
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<b>NOTABLE SEGMENTS</b>		Education	CRE / Office	Grocery	Houses of Worship	Lodging	Municipal	Restaurant															
<b>Metrics</b>	Avg Bldng Size (Sqft)	45,644	25,020	11,704	17,588	37,296	24,643	4,710															
	Electric Usage per Sqft (KBtu)	58.0	60.4	204.4	5.1	41.3	48.8	45.4															
	Electric Usage per Building (KBtu)	7,902,069	770,842	1,581,889	70,703	1,865,726	601,164	168,259															
	Gas Usage per Sqft (KBtu)	1.0	38.1	4.2	6.0	35.9	1.9	18.4															
	Gas Usage per Building (KBtu)	479,471	1,658,321	109,941	275,209	5,545,605	81,158	231,344															
<b>Drivers</b>	Energy Intensity																						
	Cost Conscious																						
	Personnel Productivity																						
	Customer Satisfaction																						
	Brand Value																						
	Property Value																						
<b>Barriers</b>	Lack of Available Capital																						
	Limited Resource Availability																						
	Landlord / Tenant Split Incentives																						
	Limited Opportunity Awareness																						
	Lack of Technical Expertise																						
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<p><b>Source: 2003 Commercial Building Energy Consumption Survey (CBECS), U.S. Department of Energy</b></p> <p>The above drivers, barriers and metrics are all taken into consideration, in conjunction with information about purchasing behavior and procurement practices, supply chain dynamics and past efficiency investment patterns when developing a customized strategic approach to serving these, or any other, segment of C&amp;I customers. These factors underpin the PAs choices regarding a wide range of design and implementation elements such as product/technology offerings, incentive levels and structure, marketing and messaging mix, channel selection and engagement, staffing, etc.</p> <p>Using this thoughtful, strategic, holistic approach to serving C&amp;I customers can lead to considerable improvements in participation rates, comprehensiveness and depth of savings, and improved customer experience and associated satisfaction. The PAs, individually and/or</p>																							

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u> EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>																																							
	<p>collectively have actively pursued, or are developing plans to pursue, such strategies targeted to a number of C&amp;I customer segments including grocery, hotel, restaurant, local and state government, houses of worship, industrial, lodging, offices, tenants, and medium commercial customers in general. The chart below is illustrative of the market segmented approaches that have been and will continue to be deployed by the PAs or are in active development for deployment in the 2016-2018 Plan term.</p>																																							
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<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u> EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>				
	Columbia Gas	Office spaces	Confirming if there is truly a potential in this segment or not	Existing	Full
	Columbia Gas	Customers in moratorium areas	Policy and regulatory	New	Full
	Unitil	Municipal	Have unique budgeting process and require one on one attention from the PA.	Existing	Full
	Unitil	State	Have unique budgeting process and require one on one attention from the PA.	Existing	Full
	Unitil	Medium Customers (< 300 kW)	Could benefit from one on one approach	Existing	Full
	Liberty Utilities	Grocery	Common measures, business model and barriers, can benefit from provision of industry expert technical assistance. Economies of scale in marketing and delivery with electric utility	Existing	Full
	Liberty Utilities	State	Have unique budgeting process and require one on one attention from the PA.	Existing	Full
	Berkshire Gas	Grocery	Common measures, business model and barriers, can benefit from provision of industry expert technical assistance. Economies of scale in marketing and delivery with electric utility	Existing	Full
	Berkshire Gas	State	Have unique budgeting process and require one on one attention from the PA.	Existing	Full

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u> EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>				
	National Grid	Grocery	Very energy intensive, very sensitive to costs, very homogenous and concentrated usage requiring specialized technical expertise, scalable because of centralized decision making	Extension of Existing	Full
	National Grid	Municipal	Have unique budgeting process and require one on one attention from the PA.	Existing	Full
	National Grid	Industrial	Very energy intensive, very heterogeneous requiring specialized technical expertise, large customer base with high savings potential	Existing	Full
	National Grid	Restaurant	Extremely energy intensive, very sensitive to costs, very homogenous, large customer base, scalable because of centralized decision making	New	Full
	National Grid	Houses of Worship	Awareness, technical expertise, resource availability, and access to capital all limited. Many different building types which cross residential & C&I, gas & electric requires strong program knowledge.	New	Test
	Eversource	Healthcare	Very energy intensive, very sensitive to costs, scalable to other customer of varying sizes.	Expansion of existing	Full
	Eversource	College & University / Biotech / Healthcare	Very energy intensive. Green Labs- maximizing savings in high energy intensity buildings. Reduce EUI and maintain safety	New	Full

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u></b> <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>				
	Eversource	University / College	Common business models, energy intensive, capable of cross fertilization and learning forums, sustainability	New	Full
	Eversource	Small Business	Sub-segment targeted approach	Expansion of existing	Full
	Eversource	Commercial Real Estate	BERDO/BEUDO - Access to tenant space and helping class B/C property owners	New	Full
	Eversource	Municipal	Have unique budgeting process and require one on one attention from the PA to overcome barriers.	Expansion of existing	Full
	Eversource	Grocery	Very energy intensive, very sensitive to costs, concentrated usage. All quartiles	New	Full
<p>During the course of the Plan term, the PAs will continue to identify additional segments that may best lend themselves to these more targeted approaches.</p> <p><u>Expand Strategic Energy Management</u></p> <p>The concept of Strategic Energy Management (“SEM”) is fluid and evolving, and can encompass a number of interconnected and mutually reinforcing activities. A common definition of SEM is that it is “a comprehensive set of business practices that establish energy management as a standard operating procedure.”<sup>45</sup> While there are different variations in SEM programs, they all focus on business practice change - shifting how organizations get things done, improving their capacity to reduce energy waste, and reducing energy intensity throughout the entire organization.</p> <p>Within the Massachusetts programs, activities that contribute to Strategic Energy Management include:</p> <ul style="list-style-type: none"> <li>• Retro-commissioning;</li> <li>• A variety of broadly-available and ongoing facility owner,</li> </ul>					

<sup>45</sup>

<http://neea.org/docs/default-source/default-document-library/nw-industrial-sem-collaborative-overview.pdf?sfvrsn=2>



<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVES</u></b> <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>
	<p>manager, and operator training and education opportunities; and</p> <ul style="list-style-type: none"> <li>• Customized process and behavioral approaches within the broader context of a customer-specific MOU/Strategic Energy Management Plan (“SEMP”)</li> </ul> <p>Over the 2016-2018 Plan term, the PAs plan to refine and expand these existing approaches, as well as examining methods to expand SEM to a broader market as the concept becomes a more familiar model in the business community. Additional areas to be explored to support and reinforce SEM activities include the use of benchmarking and the variety of proprietary tools known as remote or “virtual” or “no-touch” audits.</p> <p><u>Retro-commissioning (“RCx”)</u></p> <p>The majority of buildings in Massachusetts are more than 30 years old, and many are much older.<sup>46</sup> Since being built, most have changed in occupancy and function. Also, over time, HVAC and electrical systems have become less efficient in operation, often because of outdated operational approaches, lack of maintenance, and changes to equipment that do not integrate well with existing systems. To address this inevitable process of degradation by building systems left unattended, the PAs offer an RCx service within the C&amp;I Retrofit Program.</p> <p>RCx is defined as “the process of applying a rigorous testing, verification, and upgrade protocol to an existing building control system to identify and correct operational inefficiencies.”<sup>47</sup> RCx can be coupled with a monitoring system which uses metering and software to provide ongoing energy performance feedback directly to building operators and/or the PAs. RCx that is facilitated by such a monitoring system is called monitoring based commissioning (“MBCx”).<sup>48</sup> Generally, RCx consists of identifying (through an RCx study) a number of no-cost/low-cost maintenance or operational improvements that can, when systematically implemented in a facility, produce improved performance and energy savings without significant capital investment.<sup>49</sup></p>

<sup>46</sup> National Grid’s data indicates that almost a third of their building stock (31%) predates 1940.

<sup>47</sup> *Retro-commissioning Best Practice Study*, Revised Draft for C&IMC Review, May 22, 2014.

<sup>48</sup> Id.

<sup>49</sup> As well as identifying promising capital measures that can be implemented through regular program channels.

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	<p>Historically, delivery of RCx services in Massachusetts has been relatively expensive and persistence of savings has been low. For these reasons the PAs supported undertaking a best practice study to learn of improvements that could be made, based on the experiences of other program administrators.</p> <p>In 2013-2014, a joint team of PA technical staff and EEAC consultants conducted a “Retro-commissioning Best Practice Study.” The study produced recommendations for consideration to revise the current structure of Massachusetts’ programs. These recommendations were based on the design features and actual performance results of a number of industry leaders (primarily Pacific Gas and Electric, BC Hydro, and Commonwealth Edison). Based on the experience of the studied programs, the PAs expect that implementing many of the recommended modifications to current efforts will result in more savings through RCx in the Commonwealth and that savings persistence will increase.</p> <p>The final RCx report identified five “programs and elements that should be investigated for applicability in the Massachusetts existing building market.” These were elements that were common to most of the leading RCx programs examined. The report also recognized that “(b)ecause there is an existing program being delivered, the process and timeline for program changes will need to be managed by the PAs to limit market disruptions.”<sup>50</sup></p> <p>The following summarizes the report recommendations around each of the five “elements”, as rank ordered in the report, and planned PA actions in response:</p> <p style="padding-left: 40px;">(1) “RCx provider gives on-going support through implementation and operation including: commissioning for measures implemented as a result of the RCx study; M&amp;V; and building operator training.”</p> <p>The PAs expect to implement these recommendations, commencing with new RCx projects. As noted in the Training discussion elsewhere in this section of the Plan, several programs in other regions have integrated the Building Operator Certification (“BOC”) training into their retro-commissioning services offering, and the PAs will examine this</p>

<sup>50</sup> Id. at 4.

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	<p>experience to date for Massachusetts application.</p> <p>(2) “Savings estimates (are) developed by RCx providers using a consistent statewide set of approved tools; reviewed by program administrator and validated through M&amp;V provided by RCx provider.”</p> <p>The detailed recommendation in the Best Practices report was to explore adopting and/or adapting the suite of tools developed for the California Commissioning Collaborative, with the hope that using or revising these existing tools would be relatively less expensive than creating them anew for Massachusetts. However, this appears unlikely to be the case,<sup>51</sup> and the PAs will need to develop an alternative plan, which is expected to involve development of a proposal for a competitive procurement of services tailored to Massachusetts needs.</p> <p>(3) “Control costs of RCx study with an in-house budgeting tool and a joint scoping exercise with the customer, PA, RCx provider and controls contractor.”</p> <p>The PAs exercise many of these controls now, but expect to implement all of those suggested in the Best Practices study. RCx contractors will work under contract to the PAs, so scope of work and budget will be directly manageable. The PAs will either develop an in-house budgeting tool or investigate the possibility of purchasing and adapting a proven existing tool from another program administrator.</p> <p>(4) “Aggressive screening of potential participants to reduce risk, combined with up front incentives covering study cost.”</p> <p>The PAs are implementing the former already, and will test application of the latter before making a full implementation decision.</p> <p>(5) “Energy Management Information System (“EMIS”)/interval meters directly funded by PA. Ongoing support to assure savings and measure persistence.”</p> <p>The PAs recognize that maintaining the outcomes of the RCx process over time is critical to cost-effectiveness, customer confidence, and</p>

<sup>51</sup> The estimate provided to the PAs by the firm which maintains the California Commissioning Collaborative materials and website on behalf of the cooperating utilities was in the range of \$250,000.

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	<p>achieving verifiable savings throughout the projected measure lives for the actions taken. The PAs plan to develop a methodology for integrated delivery of RCx services and post-service follow-up and follow-through that addresses the issue of maintaining persistence of savings.</p> <p>In addition to the Best Practices study, the PAs reviewed a very similar study conducted by E Source during the same time period. The study was even more comprehensive, looking at a total of 15 RCx programs. E Source reached very similar conclusions and recommendations regarding best practices, to: “(1) offer generous study incentives; (2) get commitments from customers; (3) cultivate qualified commissioning providers; (4) keep program messaging simple; and (5) expand the participant universe.”<sup>52</sup></p> <p>Since both studies were issued, the PAs have engaged in RCx market tests that are consistent with their findings. For example, some of the PAs are now delivering a consistent experimental RCx approach to the hospital segment, applying many of the recommendations of the study. The enrollment eligibility period for this test was the first half of 2015. Any hospital of 100,000 square feet or greater using at least 2,000,000 kWh or 150,000 therms per year and equipped with a DDC Energy Management System was eligible, provided that the facility also: (a) had access to sufficient funding to implement agreed RCx measures within 12 months; and (b) had an internal “champion” who could ensure timely decision making and access to needed systems and data.</p> <p>These PAs provided no-cost engineering resources (capped at a value of \$5,000 per site) from a PA selected and pre-approved Technical Assessment (“TA”) vendor to perform scoping studies to identify and analyze potential energy savings from RCx measures. The PAs also agreed to pay incentives based on annual energy savings at the rate of \$0.12 per kWh and \$1.20 per therm with scoping studies required to be completed between January 1 and June 30, 2015. Uptake thus far has been relatively modest and the PAs are discussing possible modifications or alternatives to this approach.</p> <p>In addition, National Grid is testing three different turnkey RCx services provided by three different companies. One firm is targeting medium and large buildings using whole building and system level analytics that</p>

<sup>52</sup> *Retro-commissioning Programs, Five Tips for Boosting Participation*, E Source Focus Report, Merson, et al, December 9, 2013.

<p><b>C&amp;I RETROFIT</b></p>	<p><b><u>CORE INITIATIVES</u></b>  <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b></p>
	<p>enables targeting and implementation; one is targeting small and medium buildings using whole building level analytics and training building operators (this test has behavioral aspects); and one is targeting medium and large buildings using whole building level analytics and trade ally expertise. The Company is examining additional options with other firms, but will await initial results from the first three tests.</p> <p>The PAs are also testing an “RCx lite” concept, targeting smaller buildings and the firms that currently provide EMS services to these buildings. The objectives were to: (a) reach a smaller set of buildings with a streamlined set of high-value services that could be delivered cost-effectively; and (b) attempt to expose smaller, traditional EMS firms to a potential new line of service offerings – a potential market expansion/market transformation exercise. National Grid found many of these providers were reluctant to step out of their traditional business models, and that many of their systems had operational or functional limitations that inhibited their value for even limited RCx applications.</p> <p><u>Education and Training for Customers, Trade Allies, and PA Staff and Contractors</u></p> <p><i>Customer Education</i></p> <p>Every year the PAs sponsor and participate in hundreds of training or educational events around the Commonwealth to reach and influence all the parties who own, manage, or operate and staff buildings in Massachusetts. Some of these events provide customers with a broad exposure to a number of energy-savings technologies and service providers, such as the annual PA-sponsored Vendor Open Houses, while others are more focused and specialized, such as presentations to meetings of the local ASHRAE and IES chapters.</p> <p>The following are examples of local organizations with which the PAs have regularly partnered and collaborated in the past, and expect to continue to do so in the future, to deliver educational and training content that fits the unique energy concerns of their members and constituents:</p> <ul style="list-style-type: none"> <li>• Advanced Manufacturing Collaborative (“AMC”)</li> <li>• American Society of Heating, Refrigerating, and Air-Conditioning Engineers (“ASHRAE”)</li> </ul>

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	<ul style="list-style-type: none"> <li>• Association of Energy Engineers (“AEE”)</li> <li>• BOMA – Boston, the Greater Boston Real Estate Board</li> <li>• Boston Green Ribbon Commission</li> <li>• Boston Green Tourism</li> <li>• Boston Society of Architects (“AIA”)</li> <li>• Boston Redevelopment Authority</li> <li>• Illuminating Engineering Society (“IES”), Boston and Rhode Island Section</li> <li>• International Facility Management Association (“IFMA”), Boston Chapter</li> <li>• Massachusetts Clean Energy Center (“CEC”)</li> <li>• Massachusetts Lodging Association</li> <li>• Massachusetts Restaurant Association</li> <li>• Municipal Solid-State Street Lighting Consortium (“MSSLC”)</li> <li>• Northeast Sustainable Energy Association</li> <li>• U.S. Green Building Council (“USGBC”), Massachusetts Chapter</li> </ul> <p>At the local level, the PAs give countless program presentations – both general and specific to specialized audiences. For example, in a given year, Cape Light Compact:</p> <ul style="list-style-type: none"> <li>• Strives to make at least one general C&amp;I program presentation each month, with the goal of reaching every town or regional chamber on Cape Cod each year;</li> <li>• Makes specialized segment-relevant presentations at both the Cape Code Chamber and at the Martha’s Vineyard Chamber;</li> <li>• Makes one or two presentations at the Lower Cape Community Development Partnership as part of their Cape &amp; Islands Green classes for Cape Cod businesses;</li> <li>• Presents periodically to town Energy Committees, as well as to Boards of Selectmen, and in particular when rolling out Three-Year Plans or other new initiatives;</li> </ul>

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	<ul style="list-style-type: none"> <li>• Presents at the annual Massachusetts Facilities Managers when it takes place on the Cape; and</li> <li>• Has a booth at Cape and Plymouth Business Connect trade show; and at many other regional events, trade shows and town meetings, where program staff have the opportunity to interact with local officials, business owners and employees, as well as residential ratepayers.</li> </ul> <p>The CLC listing is offered as an illustrative example -- a full composite list of all PA activity would be too voluminous for this document. However, just like CLC, each of the PAs is constantly on the lookout for opportunities to reach potential new business program participants, or remind past participants that there are always new options for participation, so each maintains a presentation or public speaking schedule that is similar to CLC's.</p> <p><u><i>Vendor, Trade Ally, External Energy Professional and PA Staff Training</i></u></p> <p>The PAs offer regular specialized training sessions for all their trade allies, other energy professionals who support or participate in the programs, and for their own program and technical staff as well. For example, over the course of the current Three-Year Plan, National Grid has held dozens of such sessions, with a total attendance of over 3,200 individuals. Common formats include webinars and live presentations at multiple sites around the service territory. Subjects have included:</p> <ul style="list-style-type: none"> <li>• Trade Ally &amp; PA Staff Sales Training (by EEFG/Mark Jewell);</li> <li>• Changing technology and Energy Efficiency in Data Centers;</li> <li>• Laboratory safety and EE can work together to reduce cost;</li> <li>• Changing opportunities in exterior lighting as technology rapidly advances;</li> <li>• CHP opportunities and advances;</li> <li>• High Efficiency water heating solutions;</li> <li>• Impact of steam system O&amp;M on energy expense and often overlooked EE opportunities;</li> <li>• Advances in lighting control technology;</li> <li>• New accelerated pre-inspection service;</li> </ul>

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	<ul style="list-style-type: none"> <li>• Energy Management Systems as a tool to improve building environment;</li> <li>• Hospitality industry efficiency day event;</li> <li>• Often overlooked opportunities to save energy in C&amp;I heating systems;</li> <li>• Commercial leased space rapid project turnaround – advanced lighting system and technology incentives;</li> <li>• VFD opportunities on HVAC systems;</li> <li>• Introduction to scope of New Construction services;</li> <li>• Introduction to National Grid energy saving solutions and incentives; and</li> <li>• National Grid Customer &amp; Partner Summit.</li> </ul> <p>Similarly, the gas PAs, using a contractor retained through GasNetworks<sup>®</sup>, conducted 79 training events, often technology-specific and co-hosted by a vendor/trade ally and located at their site.</p> <p><i><u>End Use-Specific Training</u></i></p> <p>In addition, the PAs offer very specialized training to the operators of commercial facilities and specialized industrial equipment. Like any complex machine, a commercial building, or wastewater plant, or a compressed air system, requires constant regular attention to run well and serve the needs of its owners and the occupants or users that rely on them every day. According to E Source, “providing trade allies and contractors with training and certifications can serve as a powerful marketing and outreach tool, and help ensure program standards are met.”<sup>53</sup></p> <p>Examples of specific PA-sponsored targeted training, each of which has been a long-standing component of the PA menu of service offerings, include those listed below. Each offering is regularly updated and refreshed by their sponsoring organizations to meet the needs of a changing workforce and updates to technology.</p>

<sup>53</sup> *Best and Emerging Practices and Technologies in Energy Efficiency Program Delivery: Phase One Findings*, Memo to the Massachusetts Program Administrators, March 20, 2015.



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	<ul style="list-style-type: none"> <li> <p><i>Building Operator Certification</i> (“BOC”) is a nationally recognized, competency-based training and certification program.<sup>54</sup> It is designed to give facility staff practical skills and knowledge that they can apply to make their buildings more comfortable, energy-efficient, and environmentally friendly. BOC credentials are recognized by employers across the country. BOC courses are delivered throughout New England using locally-based instructors approved by the parent organization.<sup>55</sup> Building operators earn certification by attending training classes on a variety of topics, including electrical lighting systems, HVAC, indoor air quality, sustainability, and energy efficiency. Classroom instruction is combined with required hands-on projects in the students’ own facilities, making the experience more relevant and practical. There are two sequential certifications: BOC Level I and Level II. The Level I course series offers eight one-day classes and Level II offers seven one-day classes. In most cases, the sponsoring PA has one class day to brief participants on the features, requirements, and procedures of the energy efficiency programs and services specific to their area. Both series include classroom training and project assignments to be completed at the participant’s facility. The PAs actively recruit BOC participants and some provide partial tuition reimbursement upon course completion and certification. In many instances PAs provide an additional incentive for submitting a proposed energy efficiency project within a year of certification.</p> <p>The PAs work with the national sponsoring organization, the Northwest Energy Efficiency Council (“NEEC”), to continually update BOC training and materials to ensure that they are relevant to local Massachusetts conditions and also incorporate the latest advancements in the industry. In addition, the national BOC administrator conducts an annual curriculum review to ensure that all materials reflect the latest technologies and practice innovations.</p> <p>In recent years NEEC has made significant updates to the Level I and II. In 2013, almost 40 percent of the content was updated or replaced. The new content focuses on low-cost opportunities to</p> </li> </ul>

<sup>54</sup> <http://www.theboc.info/index.html>

<sup>55</sup> <http://www.theboc.info/>

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	<p>improve energy performance, building scoping and tune up, retro-commissioning, high performance HVAC systems, energy diagnostics using data loggers and BAS, selling efficiency projects, occupant engagement, and water conservation.<sup>56</sup> Additional new products include:</p> <ul style="list-style-type: none"> <li>• A six-part continuing education webinar series to help BOC operators maintain their certification. Maintenance of certification (MOC) increases persistence of BOC savings based on third party impact evaluations;</li> <li>• One day MOC events provided in partnership with sponsoring utilities for BOC certified operators in their service areas; and</li> <li>• A blended, online Level I course offering a mix of classroom and online training to earn the BOC Level I credential.</li> </ul> <p>NEEC has also developed sector-focused BOC collateral which targets commercial offices and is preparing collateral targeting the Healthcare sector. Several utility sponsors in other regions have fully integrated BOC with core programs such as retro-commissioning and SEM, and the PAs will examine those options as well.</p> <p>BOC was the subject of a very recent evaluation in Massachusetts.<sup>57</sup> The evaluation suggests that the PAs can best promote BOC enrollment and increase the savings attributable to BOC by:</p> <ul style="list-style-type: none"> <li>• Employing multiple channels to promote BOC - e-blasts to eligible customers, direct outreach by account executives promotion of BOC at trade events, etc.</li> <li>• Working with NEEC to ensure that the program collateral, website, and registration systems serving the Northeast are clear to prospective Massachusetts participants.</li> <li>• Crafting messaging that conveys the value proposition of</li> </ul>

<sup>56</sup> Detailed curriculum outlines are at: <http://www.theboc.info/h-course-descriptions.html>.

<sup>57</sup> *Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification*, Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council, Navigant Consulting, June 19, 2015.

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	<p>certification and maintenance of certification to high-level managers, who must authorize staff training. The value proposition should include that energy savings will offset the training cost and that additional benefits accrue as well, such as reduced emergency failures and more effective use of maintenance contractors, and these benefits are documented in BOC evaluations,</p> <ul style="list-style-type: none"> <li>• Promoting and explaining to participants the benefits of all the other energy efficiency programs offered by the PAs.<sup>58</sup></li> </ul> <p>The findings also suggest that the level of effort put into promoting BOC affects training uptake.<sup>59</sup> Some PA sponsors currently provide tuition reimbursement upon course completion and certification. In other instances the PAs provide an additional incentive for submitting a proposed energy efficiency project within a year of certification. The PAs will be guided by the above findings and recommendations when sponsoring BOC or its derivative options over the next three years.</p> <ul style="list-style-type: none"> <li>• <i>Compressed Air Challenge</i> training has also been offered by the PAs for a number of years. The Compressed Air Challenge is a voluntary collaboration of industrial users, manufacturers, distributors and their associations, consultants, state research and development agencies, energy efficiency organizations, and utilities.<sup>60</sup> Training is led by subject matter experts who provide facility managers with strategies for proper configuration of a compressed air system, system operation, maintenance requirements, and user accountability. Instructors also help participants develop a compressed air system management action plan for the unique processes in their home plant.</li> </ul> <p>CAC regularly updates its Best Practices for Compressed Air Systems manual, and its Level 2 Revision Working Group is finalizing a next phase of revisions to the Advanced Management of Compressed Air Systems training. Also, its New Training Working Group continues work on a new one-day “strategies”</p>

<sup>58</sup> Sponsoring PAs currently use one class day to brief participants on the features, requirements, and procedures of the energy efficiency programs and services specific to their area.

<sup>59</sup> Id. at 2.

<sup>60</sup> <https://www.compressedairchallenge.org/>

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	<p>course. Two Massachusetts PAs, Eversource and National Grid, sit on the CAC Board of Directors, so Massachusetts experience with the program, and expectations for the future, are integrated into this planning.</p> <ul style="list-style-type: none"> <li> <p><i>Water/Wastewater Plant Operator Training:</i> Every year since 2010 the PAs have partnered with the nationally-known experts in water and wastewater at the University of Wisconsin – Madison to deliver annually-updated best practices training for water and wastewater plant operators, tailored to the needs and conditions of the Commonwealth. The course combines engineering principles, best practices, case studies, and current technologies to help plant personnel manage their energy budget and improve energy efficiencies in water and wastewater treatment plants and pumping systems.</p> <p>The curriculum for this training is tailored to Massachusetts self-identified needs, as reflected in past participant evaluations and through direct communications between the PAs and the UW faculty. In turn, UW brings its expertise to the table, suggesting content revisions to reflect the latest technologies and techniques they encounter in their research and practice.</p> </li> <li> <p><i>Building Owners and Managers Association High-Performance Sustainable Building Principles:</i> BOMA has recently launched this new course, which provides a comprehensive treatment of high-performance sustainable buildings and exposes learners to the critical components of sustainability – “where building systems and the ecosystem intersect.”<sup>61</sup> The course is taught both on-line and in a classroom setting and covers such issues as identifying and overcoming the hurdles to achieving true high-performance, attaining full organizational buy-in for sustainable building initiatives, resource management concepts, benchmarking value and standards for design review, integrated systems and commissioning concepts (HVAC, lighting, and electrical), water and wastewater system considerations, renovation and tenant improvement guidelines, sustainable contracting and vendor management principles (maintenance and purchasing), finance/portfolio considerations, etc. The course has not yet been offered in the Northeast, and the PAs have contacted</p> </li> </ul>

<sup>61</sup>

<http://www.bomi.org/Courses/High-Performance-Sustainable-Building-Principles>

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	<p>BOMA to explore development of a partnership to do so in 2016 and beyond.</p> <ul style="list-style-type: none"> <li>• <i>California Advanced Lighting Controls Training Program</i> (“CALCTP”): was developed by Southern California Edison and has now been adopted by all the California utilities, as well as program administrators in other jurisdictions. CALCTP provides electrical contractors and electricians with training and a certification in Advanced Lighting Controls (ALC). The curriculum covers the proper programming, testing, installation, commissioning and maintenance of advanced lighting control systems, including dimmers, occupancy sensors, photo-sensors, relay modules and communication-based control devices. CALCTP graduates receive certification that permits them to work on ALC projects, which are then eligible for incentive programs.</li> <li>• <i>Site-Based Facility Management Initiative</i>: The PAs are exploring development of an on-site facility tune-up and operator training concept. The idea would be to work with a facility’s on site staff and existing equipment and maintenance support contractors to identify opportunities for low-cost/no-cost system improvements, undertake those improvements, and then follow up at intervals to ensure that enhancements do not degrade and that facility staff continue to implement identified operational improvement procedures.</li> </ul> <p><u><i>Memoranda of Understanding/Strategic Energy Management Planning - Based Training</i></u></p> <p>Some PAs offer MOUs or SEMP’s, which contain behavioral and process improvement components, with incentives awarded for verifiable reductions in energy use that can be attributed to each action. Each agreement is customer-specific and structured through an exchange of ideas between the PA and customer staff. It is dependent on the nature of each of the customer’s facilities and the demographics of their users/occupants. For example, the operational improvement opportunities and the customer tolerance for deviation from the current operational norms are very different between a university and a critical care hospital. Similarly, the “customers” of these buildings – students and faculty in the former and medical staff and patients in the latter – will likely respond differently to the behavioral strategies and prompts. Submetering will</p>

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	<p>always be incorporated into these agreements when, in the judgment of the principals, it will help identify and prioritize opportunities at the outset of the relationship and it will lead to customer action. Submetering will also be offered to other customers when, in the judgment of the PA, it can be cost-justified because it will help identify and prioritize opportunities and it will lead to customer action. In addition, submetering is integral to the EM&amp;V process, particularly when attribution and verification of behavior-based savings must be established.</p> <p>When considering expanding SEM efforts, much as with retro-commissioning, it will be critical for the success of recruitment efforts to understand what individual customer characteristics or categories of customers can be identified that will identify them as those who are most likely to see a value proposition in SEM. As the PAs consider SEM expansion opportunities (both in number and in kind) they will integrate the growing body of knowledge from their own local MOU/SEMP experiences and engage with SEM early adopter jurisdictions and their allies (such as the Pacific Northwest and the Northwest Industrial Strategic Energy Management Collaborative<sup>62</sup>), and incorporate the results of their research activities and field experience.<sup>63</sup></p> <p><i><u>Increased Use of Interactive and Web-Based Learning</u></i></p> <p>Training in the energy efficiency domain, as in society at large, has moved more and more into the mode of distance learning. The advantages for participants are obvious: convenience and flexibility as well as avoided travel and time away from the facility. For the PA’s distance learning can more effectively reach busy facility operators and allows for creation of niche-specific training modules that would be too expensive to deliver to a limited audience in the conventional classroom /instructor model. During the last Plan term the PAs moved aggressively into multiple new modes of education and training. During the 2016-2018 Plan term the PAs will investigate and implement even more distance learning training techniques – from scheduled webinars to on-demand materials that can be archived and accessed online.</p>

<sup>62</sup> <http://neea.org/get-involved/northwest-industrial-sem-collaborative>

<sup>63</sup> For example, *NW Strategic Energy Management: Guide to SEM Customer Segmentation*, Northwest Industrial Strategic Energy Management Collaborative, Market Analysis and Planning Team, December 2014

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	<p>As a part of the planned Mass Save<sup>®</sup> website upgrade, a calendar feature will be added that shows all scheduled trainings, and provides contact information to register or participate.</p> <p><u>Small Business Core Initiative</u></p> <p>The Small Business Core Initiative, often referred to as the direct install or turnkey program, is a long-standing PA offering, and one of the most successful in the nation, with very high rates of customer uptake and satisfaction.<sup>64</sup> In Massachusetts, each PA began offering some kind of specialized efficiency services for small business customers roughly 25 years ago. The turnkey model was first offered by National Grid in 1990 for customers 50 kW and smaller. It was subsequently adopted by all the PAs and, with experience, it has evolved, expanded, and improved over time, with the addition of gas measures specifically and more measures generally. The core initiative is regularly cited by independent industry organizations, such as ACEEE, as the most successful program directed to the small business sector in in the country<sup>65</sup>, and it has served as the template for dozens of imitators in other states and provinces. In 2013, 4,646 customers statewide participated in this program, saving, on average, 17.3 percent of their prior electric consumption and 5 percent of gas consumption.<sup>66</sup> Since its initial introduction, over 50,000 small businesses in Massachusetts have taken advantage of the Small Business offerings.<sup>67</sup></p> <p>Its success notwithstanding, the PAs have jointly embarked on a thorough review of every aspect of the program – administration and delivery, target markets, measures, marketing, etc. – with no preconceived notions or limits as to outcomes. Many of the options under consideration by the</p>

<sup>64</sup> 87 percent of program participants are satisfied with program overall. *DI Process Evaluation: Final Report for the Massachusetts Program Administrators*, DMV.GL, February 2015, at 51.

<sup>65</sup> Exemplary Program Award in the Small Business category: National Grid Small Business Services, *Leaders of the Pack ACEEE’s Third National Review of Exemplary Energy Efficiency Programs*, York, et al, June 2013. The program also received Exemplary awards in the First and Second ACEEE national reviews of program.

<sup>66</sup> Id. at 59.

<sup>67</sup> As conservative estimate, as National Grid’s participate count can only be traced back to 2003, and the predecessor companies – New England Electric and Massachusetts Electric – had offered the program since 1990.

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	<p>PAs were also subsequently raised by the EEAC consultants in their briefing memo to the Council.<sup>68</sup> The recent process evaluation of the program pointed to some potential process and delivery improvements that will also be explored.<sup>69</sup> Examples of the options under consideration include: addition of more gas measures, including thermal measures; better and more referral follow-up services for measures not amenable to the direct install delivery model (such as thermal measures and heating systems, for example, so that deeper treatments can be undertaken); further segmentation to reach the smallest of the small customers through consideration of web portals, self-service delivery concepts, further development of the Main Streets or other geographically-focused delivery models, adaptation of successful residential delivery models such as HES, and more targeted marketing and measure mixes by business type.</p> <p>Examples of the tests currently underway and continuing into the next Plan term or targeted to begin in 2016 are:</p> <ul style="list-style-type: none"> <li>• Eversource will be working in the greater Boston area to test ways to increase tenant space improvements, particularly those tenants who are located in buildings that fall under the scope of the Boston Building Energy Reporting and Disclosure Ordinance (“BERDO”) and the Cambridge Building Energy Use Disclosure Ordinance (“BEUDO”). The test will involve local turnkey contractors, working in coordination with Eversource’s C&amp;I teams to engage property management customers. For purposes of this test, the initial audit will be done by a firm that is independent of the turnkey contractor, who will focus on comprehensive recommendations, with particular focus on lighting controls. The post-audit will also be conducted by this independent firm or an Eversource internal auditor. Incentives are to be delivered through the usual turnkey process.</li> <li>• In a second test, focused on Cambridge and Framingham, Eversource will focus on getting more customers to adopt more controls-enabled retrofit kits and fixtures. Customer installation will include LED lighting retrofit kits or fixtures, enabled with controls (daylight, dimming, occupancy sensors, etc.). Installation will be performed by product vendors with standard program</li> </ul>

<sup>68</sup> *Effective Practices for the Small Business Sector*, February 11, 2015

<sup>69</sup> Small Business Program Process Evaluation Final Report, DNV GL, March 23, 2015.



C&I RETROFIT	<b><u>CORE INITIATIVES</u></b> <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>
	<p>incentives. Post installation will be conducted by an independent firm or an Eversource internal auditor.</p> <ul style="list-style-type: none"> <li>• National Grid plans to experiment with the EnergySavvy<sup>70</sup> platform as an online portal to guide small and medium businesses to the program offerings applicable to their business. EnergySavvy walks customers through a five to ten minute online assessment whereby they learn what is available/applicable to them from the full C&amp;I menu, and National Grid learns a bit about them and their needs. Theoretically, this should allow for more efficient and targeted deployment of resources. The experiment will move from improved customer experience in the lead intake phase, to a greater awareness of the range of options available, to conversion of this customer interest into additional tangible projects and savings.</li> <li>• To better serve the smallest customers and niche customers, National Grid will also continue to experiment with variations of the “Main Street” delivery model.</li> <li>• Cape Light Compact is launching a new effort for its smallest and most numerous C&amp;I customers – those using less than 100,000 kWh annually. The new initiative will be modeled after the HES program and will include a BEA (Business Energy Audit) and a core offering of deemed savings measures, many of which can be installed in the first visit.</li> </ul> <p>Factors that must be balanced when considering the results of these or other tests in any redesign include:</p> <ul style="list-style-type: none"> <li>• <i>Cost of delivery:</i> The transaction costs of serving small customers are high relative to the savings potential contained in their facilities. Small Business has been successful because of the mix of incentives. Financing, on-bill repayment (where technically available), and turnkey delivery make it easy for customers to say yes, thereby creating the cost advantages of a high sales closure rate and commoditized delivery at scale. Some of the proposals to reach more and smaller customers, and achieve deeper savings, are likely to increase the cost of acquisition;</li> <li>• <i>Equity:</i> All business customers, including the smallest of</li> </ul>

<sup>70</sup>

<http://www.energysavvy.com/>

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	<p>businesses, contribute to the efficiency fund, and thus all should have easy access to measures and services that will lower their gas and electric bills, and improve comfort for them and their customers.</p> <p>In order to open the discussion to the widest range of ideas, the PAs are conducting an ongoing national best practices inquiry to identify any creative features in other small business programs, as well as additional gas or electric measures beyond those currently offered in Massachusetts. In addition to research elements, the PAs are also discussing operational and delivery insights with their peer program administrators around the country. This inquiry may produce recommendations for a series of incremental program improvements that can be incorporated serially into the existing delivery structure through amendments to existing contracts with delivery contractors. Any larger modifications would likely be incorporated in the contractor rebid process.</p> <p><u>Further Engage the Commercial Real Estate Sector</u></p> <p>In the last Plan, the PAs committed to engage in a stakeholder process with the goal of better identifying any unique barriers that could inhibit full participation by the Commercial Real Estate (“CRE”) community in the Massachusetts programs. In 2013, a representative Commercial Real Estate Working Group was convened and conducted primary and secondary research throughout 2013 and 2014.<sup>71</sup> This research led to the development of several tentative strategy proposals to broaden and deepen CRE program participation, which were then vetted in late 2014 in a series of roundtable discussions involving representatives of owners of large buildings and their tenants, as well as later interviews with small building owners. The strategies explored included: turnkey service delivery to small and mid-size customers, pre-packaged prescriptive options that could be quickly implemented, “energy dashboards”, and promotion of “Green Leases.”</p> <p>The research and subsequent discussions revealed that in the most common lease structures energy costs are passed through to tenants, creating the classic split-incentive problem. Owners are generally the</p>

<sup>71</sup> Secondary research included: C&I Customer Profiles & Market Sector Profiles, Mid-Size Customer Needs Assessments, A Better City Reports, NEEA - Existing Building Renewal/Commercial Real Estate Research.

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	<p>primary decision-makers with regard to energy matters, and the majority do track their energy use and compare it to peer buildings. However, as with most non-core business issues they face, owners lack the time, knowledge, and resources to pursue strategies to increase the efficiency in their facilities comprehensively and effectively.</p> <p>To the extent that efficiency upgrades are considered, the best opportunity is when office space is fitted out for initial occupancy or when existing space is in transition from one tenant to another. These tenant fit-up/refit decisions occur rapidly, and the window of opportunity to consider energy efficiency improvement opportunities is very narrow. The research also found that CRE firms are open to more regular contact from the PAs, and some owners do have an interest in more complex solutions, and PA assistance in assessing and executing them.</p> <p>The PAs plan to pursue the following potential strategies due to the considerable interest received from industry representatives:</p> <ul style="list-style-type: none"> <li>• <i>Tenant build-out/refit offerings:</i> Clearly, the best time to install efficiency measures is during the build-out for new tenants or the refit when old tenants depart and the new ones have yet to arrive. The Sustainable Office Design (“SOD”) initiative, discussed in a preceding section of this Plan, was launched by Eversource and National Grid to address just this market-driven opportunity. As the SOD initiative is further developed, and is adopted by other PAs, it could be augmented with additional enhancements recommended by the industry such as:       <ul style="list-style-type: none"> <li>○ Packages of lighting, space conditioning, refrigeration and commercial cooking offerings. This could also include bonus incentives for installing multiple measures in the package, which was of interest to both owners and tenants.</li> <li>○ Offerings could also be provided on a tiered – good, better, best – basis to cater to firms’ varying interests, needs and budgets, and overall expectations for the building’s aesthetics and operations. This approach was viewed favorably by both owners and tenants with tenants also suggesting the addition of plug load monitoring and controls.</li> <li>○ Packages could also vary according to the space types,</li> </ul> </li> </ul>

C&I RETROFIT	<b>CORE INITIATIVES</b> <b>EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING</b>
	<p>particularly in market sectors where CRE firms are more prominently represented, such as retail and hospitality.<sup>72</sup></p> <ul style="list-style-type: none"> <li>• <i>Turnkey-delivery models for CRE customers:</i> With research showing that much of the CRE property in Massachusetts is small – on average half the size of non-CRE property<sup>73</sup>-- and as a result having limited resources to identify potential improvements and keep track of available incentives, the turnkey approach would reduce cost and the time and resources required for CRE customers to benefit from energy efficiency. To be successful, however, the PAs need to train vendors, particularly their small business vendors, to better identify, understand, and capture CRE specific opportunities such as fast-moving fit-up opportunities.<sup>74</sup></li> <li>• <i>Dashboards and building labeling:</i> Roundtable participants indicated that displaying energy usage at the tenant and building level through dashboards can contribute to energy efficiency and real-time tracking can improve occupants' awareness of energy use and behaviors.       <ul style="list-style-type: none"> <li>○ There are a variety of tools in this area, more appearing on the market with regularity, and the PAs will experiment and compare the effectiveness of some of the most promising.<sup>75</sup></li> <li>○ Most feel that Boston's benchmarking requirement has been successful. It has allowed consumers to track the heretofore untrackable, provided enlightening comparisons between buildings. PA support of benchmarking will become increasingly important, particularly as a number of communities beyond Boston are adopting commercial building energy disclosure ordinances. At a minimum, it heightens awareness and sets the stage for action.</li> <li>○ Presenting consumption in terms of end use intensity ("EUI") and usage per square foot (kWh/sf and/or</li> </ul> </li> </ul>

<sup>72</sup> "Massachusetts Commercial Real Estate Survey Analysis-Final Report", DNV-GL, March 18th, 2015, p. 4.

<sup>73</sup> Id. at 5.

<sup>74</sup> The CRE Report suggested partnering with key trade associations, such as BOMA and NAIOP that are active in this marketplace.

<sup>75</sup> <http://www.linkcycle.com/review-of-top-energy-management-software/>

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	<p>KBTU/sf) metrics is most useful, as are peer level benchmarking comparisons.</p> <ul style="list-style-type: none"> <li>• <i>Additional program improvements</i> <ul style="list-style-type: none"> <li>○ Process improvement – CRE customers would like reduced paperwork and streamlined application processes. The PAs will be implementing online incentive applications to address this need.</li> <li>○ Collaboration with building operators – in order to build awareness and expertise, the PAs will continue to support a variety of training offerings such as building operator certification (“BOC”) and seek opportunities to expand and/or augment the array of trainings available.</li> </ul> </li> </ul> <p>In general, the specific elements and approaches of a successful CRE strategy include:</p> <ul style="list-style-type: none"> <li>• Developing marketing strategies that resonate with the distinct submarkets within CRE;</li> <li>• Developing unique technical solution sets for each distinct building type in CRE, with accompanying financial incentives that are both sufficient and presented in a manner that make them attractive to subsector decision-makers;</li> <li>• Streamlining PA paperwork and decision making to meet the pace of decisions being made in the sector;</li> <li>• Delivering better CRE training for all channel partners, particularly Small Business contractors.</li> </ul> <p><i>Additional Planning Input</i></p> <p>The NEEA also released an assessment of the CRE Market this year.<sup>76</sup> The Northwest research plan also involved extensive interviews: 21 executives representing 18 CRE firms and 17 representatives from five CRE-related trade associations. This study reached substantially the same conclusions as the Massachusetts report, with the additional caveat that “The primary market motivations to invest in energy efficiency vary greatly based on the business structure of the firm. When it comes to the</p>

<sup>76</sup> “Commercial Real Estate (CRE) Market Test Assessment: Understanding Delivery, Partnership Strategies and Program Channels”, New Buildings Institute for NEEA, March 16, 2015

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	<p>promotion of energy efficiency we believe it to be beneficial to tailor strategies and approaches to the following three types of firms: (1) Larger Investor/Owners and Real Estate Investment Trusts (“REITs“); (2) Third-Party Property Managers; and (3) Smaller Independents.”</p> <p>Perhaps most significant for the Massachusetts programs, our neighbors at NYSERDA in New York have recently announced that as a part of their Commission-ordered program redirection they will “(p)artner with large commercial portfolio owners and receptive tenants, service providers, industry trade and research associations, and governmental organizations to pilot standardized tenant energy efficiency packages.”<sup>77</sup></p> <p>In 2016-2018, NYSERDA will develop and conduct a set of replicable pilot studies of efficiency packages in key building types and market segments. The objective of these pilots will be to acquire building data for analysis and to conduct M&amp;V studies to provide insights into the actual performance of these packages. Results will be used to produce case studies that will be shared with the efficiency industry.</p> <p>Also in 2016-2018, NYSERDA will partner with large portfolio owners in key building segments (CRE, medical centers, colleges/universities, etc.) and providers of various Real Time Energy Management (“RTEM”) service providers to conduct a set of replicable pilots using a variety of these tools that monitor data and use analytics to identify where, when, and how energy is being used in a building. In addition to the direct technical and financial support to the participants, NYSERDA will acquire building data for analysis and will conduct M&amp;V and persistence studies “to provide insights into the technical/operational underpinnings of RTEM and to develop credible models and case studies to support a clear value proposition for owners of similar buildings.”<sup>78</sup></p> <p>The PAs will discuss with NYSERDA management the potential for collaboration in these two test areas, and potentially others as well. These discussions will be led by National Grid, as the PA whose operations span both jurisdictions. At a minimum, the PAs own test designs can be informed by NYSERDA experience.</p>

<sup>77</sup> NY PUC Case 14-M-0094, “Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Clean Energy Fund Information Supplement”, submitted by the New York State Energy Research and Development Authority, June 25, 2015, at 46.

<sup>78</sup> Id. at 50.

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	<p><u>Maintain/Improve Services for Financing Energy Efficiency Investment</u></p> <p>The PAs have partnered with the Massachusetts Bankers Association to make available heavily subsidized financing for business, multi-family, and non-profit commercial customers who need capital beyond the value of the PA incentive to implement a project. Loans can range from \$5,000 to \$500,000, and can extend to 7 years. For the PAs, the ability to link customers to capital where that is the barrier to project execution is an invaluable sales tool. For participating lenders, the partnership opens up a new market to attract new customers, with the assurance of receiving a market rate interest payment from the PAs.</p> <p>Mass Save<sup>®</sup> Financing for Business has had a modest uptake, and is best viewed as a useful, but niche, tool in the energy efficiency sales toolkit. To many observers, the importance of making additional outside financing available for energy efficiency investments seems intuitive: even when investments in retrofits and new equipment pay off in future energy savings, the up-front expenditure is often substantial. It would seem that many building owners would welcome financing. However, larger sized businesses in the Commonwealth have indicated that access to outside capital financing is not a primary barrier to program participation.<sup>79</sup> As the 2012 “Massachusetts Large Commercial &amp; Industrial Process Evaluation” concluded: “Lack of financing activity appears to be due mostly to very few organizations relying on outside financing in general.”<sup>80</sup></p> <p>A PA review of recent studies of financing programs revealed two trends. First, the Massachusetts experience is consistent with the financing experience of most other program administrators.<sup>81</sup> Second, because of</p>

<sup>79</sup> In 2012, KEMA surveyed 354 companies or organizations who were recent program participants (2010 or 2011). 68% of respondents reported they “never” or “rarely” depend on outside financing. Only 2% said capital availability was a barrier, and only 6% said they always or most of the time rely on outside financing. Massachusetts Large Commercial & Industrial Process Evaluation, DNV KEMA, Inc., May 17, 2012

<sup>80</sup> Id. at 3-17

<sup>81</sup> Borrowing to Save Energy: An Assessment of Energy-Efficiency Financing Programs, Karen Palmer, Margaret Walls, Todd Gerarden, Resources for the Future, April, 2012

“In our experience examining efficiency programs across the country, lack of financing is seldom the primary reason that efficiency projects do not happen. Financing is only useful once the “product” has been sold to the customer, just as a car loan can only be appealing once you want a car (and then only if there are no better payment options

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	<p>this disappointing performance there is a new surge of interest in investigating alternative and creative financing vehicles, such as commercial PACE.<sup>82</sup> New financing options may have the potential to improve customer uptake of project financing and reach more customers who heretofore may not have participated in energy efficiency programs due to capital constraints. The PAs will continue to review new studies and proposed mechanisms as they emerge and participate in financing policy forums.<sup>83</sup> They will also closely watch financing pilots and initiatives being conducted in other jurisdictions to determine which emerging models, if any, show promise for replication in the Commonwealth.<sup>84</sup></p> <p><u>More Tools for Customer Engagement</u></p> <p>Surveys indicate that consumers have tremendous expectations that they will have an abundance of choices in energy services in the future.<sup>85</sup> However, the surveys also indicate that consumers are also largely unaware that they will need to take a more active role in managing energy decisions for their expectations to become a reality.<sup>86</sup> In many cases, business consumers lack essential knowledge of how they use energy and what steps they can undertake to use it more efficiently to accomplish their same business objectives. The PAs fully understand the value of expanding the channels of information transfer to customers, and building and deploying communications tools that allow for a more interactive experience between customers and their suppliers of energy and energy efficiency services. While evaluations have indicated high levels of</p>

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available.”, The Limits of Financing for Energy Efficiency, Borgeson, Zimring, and Goldman, Lawrence Berkeley National Laboratory, 2012 ACEEE Summer Study

<sup>82</sup> A unique, and potentially attractive, feature of the PACE model is that allows for longer terms – potentially up to 20 years, which allows more opportunity for a positive cash flow on capital-intensive or long payback measures.

<sup>83</sup> Leading policy forums include: the Yale Center for Business and the Environment, “Blueprint for Efficiency Project”, the ACEEE Energy Efficiency Financing Forum, PACE Now, etc.

<sup>84</sup> *E.g.*, The Connecticut Green Bank, various public and private PACE finance programs (YGreen Energy Fund, the Florida PACE Funding Agency Program, Energize New York Finance, etc.).

<sup>85</sup> “Knowledge is Power: Driving Smarter Energy Usage Through Consumer Education”, IBM Institute for Business Value, January 2012.

<sup>86</sup> Id.



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	<p>satisfaction among Massachusetts businesses that have participated in Massachusetts programs,<sup>87</sup> and that customers view the PAs as trusted sources of information,<sup>88</sup> it is also clear that more customers need to be engaged. Customers that have participated on a project-by-project basis must be engaged on a more continuing and comprehensive basis in order to fully realize the efficiency capabilities in their properties.</p> <p>All of the PAs are examining ways to connect the power of data and data analysis with the increasingly interactive capabilities of their customer website portals. An illustrative example here is the Eversource Customer Engagement Platform that is being implemented in phases across all of its operating companies. This platform will provide tools that will enable Eversource to more efficiently identify, target, and reach all customer segments and provide each customer with customized energy efficiency recommendations. Eversource is implementing three customer-facing tools: Residential, for all residential customers; Commercial, for micro, small, and medium business customers; and Enterprise, for the largest customers. The project plan calls for a phased roll-out of these portals, with full functionality in place in the first year of the Plan, 2016.</p> <p>An example of the platform’s capabilities is the online tool, <i>Energy Savings Plan</i>. <i>Energy Savings Plan</i> is an interactive tool within Eversource.com that enables residential and business customers to learn how they currently use energy, how they compare to other similar customers, and, most importantly, practical steps they can take to reduce their energy consumption and costs. <i>Energy Savings Plan</i> utilizes the customer’s usage data, collects additional information through a series of easy-to-answer profile questions, and then makes customized, actionable energy efficiency recommendations. Features of the online tool include potential savings estimates, “learn more” case studies, and links to solution resources.</p> <p>In addition to the foregoing, the PAs will also be building an entirely new capability for customers, or their agents, to create and submit project</p>

<sup>87</sup> 89 percent of participants gave the PAs a four or a five on five-point scale for overall satisfaction. “Massachusetts Large Commercial & Industrial Process Evaluation”, KEMA, May 17, 2012.

<sup>88</sup> When asked about trust in a variety of different sources of information, from community and business organizations to the press and other media, 78 percent of Renew Boston Business program participants had the greatest level of trust in NSTAR/National Grid – second only to the City itself. “Massachusetts Special and Cross-Sector Studies Community-Based Partnerships 2011 Evaluation, Final Report”, Opinion Dynamics Corporation, July 2012, at 56.

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	<p>applications using an on-line or web-based incentive application portal. This portal will not only greatly enhance and simplify the user experience but will also increase the likelihood that more applications would be submitted while increasing the satisfaction of those that submit applications. Beyond the potential benefits to customers, and their contractors, the PAs expect the application portal will also result in considerable efficiencies in terms of reviewing, approving and performing data entry on the roughly 10,000 gas and electric applications that are processed each year.</p> <p><u>Combined Heat and Power</u></p> <p>During the 2016-2018 Plan term the PAs will aggressively explore more ways to increase CHP installations in Massachusetts while maintaining the high standards for project screening, qualification, and performance for which PA programs are known. The PAs will initiate this process by commissioning a best practices review of other programs nationally and a reassessment of the CHP market in Massachusetts in 2016.<sup>89</sup> Among the areas that the latter investigation must consider are the following: (a) are there barriers to doing more CHP projects with customers of each size; (b) are the barriers technical, policy, financial, legislative, or market issues; (c) can potential solutions to overcome the barriers be identified; and (d) is it feasible and cost-effective for the PAs to implement the solutions. The PAs have developed a network of over 50 vendors, developers, and installers who want to sell CHP in the Commonwealth. As a result, the issue-identification process can be initiated by the PAs in advance of contracting for studies, and this conversation will help shape the study directions. Initial areas for investigation include: (a) the challenges posed by natural gas availability and volatility in fuel prices for installing CHP systems and potential programmatic approaches to mitigating those risks; and (b) continued work to seek ways to safely install CHP in urban settings.<sup>90</sup></p> <p>Lastly, the PAs will enhance the education campaign for CHP technology, including providing technical assistance on determining cost-effectiveness and navigating the DEP permitting process, when applicable. Customers will receive information on the efficiency of the</p>

<sup>89</sup> The last assessment was conducted in 2009.

<sup>90</sup> CHP on spot networks has been resolved in NY, Chicago, and San Francisco., but remains a concern in New England. The Institute of Electrical and Electronics Engineers (IEEE) has had a standard under development, but it has not been finalized.

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	<p>systems, carbon reduction, payback formulas, and incentives.</p>
<p><b>Program Design</b></p>	<p>The Retrofit Program targets customers who have functioning, but inefficient, equipment in their facility, or their older building’s performance is not code compliant and can be upgraded to higher efficiency without undergoing major renovation. The program uses a variety of sales and delivery strategies to educate customers about the true cost of continuing to operate inefficient equipment, including the “cost” of reduced customer or employee satisfaction with the building environment they experience. The program provides customers with information on the cost saving and ancillary additional benefits of a more efficient building and/or equipment, and then provides an easy path to the upgrade, including streamlined incentives and direction to a skilled contractor who can perform the work. In some cases all of these services are provided through turnkey service providers working under contract to and supervision by the PAs, as with trade allies and Small Business delivery firms. In other cases, particularly with larger customers or property management firms, the outreach, sales, and service coordination is conducted by PA Account Managers.</p> <p>The core elements of the program are the Prescriptive and Custom path options. The Prescriptive path offers fixed incentives for purchase and installation of a broad menu of prescriptive measures. Prescriptive measures are those for which the energy savings can be predictably assumed in a wide variety of building types and business environments. Many are lighting and lighting control measures, but there are also prescriptive incentives available for variable speed drives (“VSDs”), HVAC controls, spray valves, steam traps, etc.</p> <p>Some of the richest sources of energy savings potential are found in equipment or processes that are unique to a customer’s premises and/or operational requirements. These unique, or custom, opportunities require a site-specific engineering analysis to determine costs and benefits. Custom opportunities account for a large share of PA savings. When a promising efficiency opportunity has been identified, often by a PA Account Manager, an appropriate technical expert, drawn from a pool of pre-qualified engineering consultants selected as preferred vendors through a competitive procurement process and matched to the specific needs and capabilities of the customer, is assigned to further define and quantify the potential. These highly skilled, unbiased, and independent</p>

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	<p>technical experts can conduct walk-through audits, perform detailed energy-efficiency studies of whole buildings systems or building components, or conduct specialized technical studies, such as studies of industrial or manufacturing processes. TA consultants are assigned based on their recognized expertise with the technology area under consideration. Customers can also elect to use their own TA consultant provided that the partnering PA approves of the firm’s qualifications and cost estimate. Non-preferred vendors must comply with the same level of detail and quality as preferred vendors.</p> <p>Often customers will have both gas and electric savings opportunities. In these instances the relevant gas and electric PA will instruct the TA consultant to examine all savings potentials. The two PAs share the study costs and coordinate delivery of the recommended improvements.</p>
<p><b>Delivery Mechanism</b></p>	<p>The Retrofit program is largely delivered through a mature and growing network of trade allies. These include contractors providing retrofit services directly under contract to the PAs, such as the Small Business and preferred trade ally contractors, and the hundreds of independent lighting and HVAC contractors, supply houses, electric and gas equipment vendors, RCx service providers, etc., who service their customers’ needs and, in the process, assure that those customers install the best possible equipment and facilitate program participation on their behalf.</p>
<p><b>Marketing Overview</b></p>	<p>Collectively, the PAs serve approximately 350,000 electric and 154,000 gas C&amp;I customers. These run the gamut from the one-chair barbershop and corner bodega to massive manufacturing, health care, and educational facilities. Serving this diverse and large population of business customers effectively requires an understanding of their unique attributes. Based on that understanding, the PAs have designed and implemented a number of marketing strategies specifically targeted to various sub-segments of C&amp;I customers. Examples of current strategies to serve the diversity of submarkets, and some proposed enhancements are detailed below.</p> <p><u>Segments of Special Interest</u></p> <p><u>Large Customers</u></p> <p>In Massachusetts, as in most states, a relatively small number of customers account for a disproportionately large share of the state’s energy consumption. These customers – hospitals, universities, industrial</p>

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	<p>complexes, owners of building portfolios, etc. – often present more opportunity for efficiency, but usually these opportunities are found in more complex systems that require unique analysis and customized solutions. The conventional trade ally-driven approach of a mix of prescriptive and custom equipment-based incentives, designed for a volume-based mass market, does not adequately address the needs of these customers, nor is it equipped to systemically harvest the vast saving potential that exists in these facilities.</p> <p>From the PA perspective, large customers also have many beneficial attributes that make them ideal long-term partners. They generally have sophisticated in-house engineering and facility staff and sophisticated financial analysis capabilities. They also tend to have longer term planning and investment horizons. For the very small subset of customers with this combination of high savings potential and sophisticated in-house technical and financial resources, the investment of more program technical and financial resources can be warranted and, where there is owner or corporate commitment, the PAs will invest significant staff and consultant technical expertise, as well as financial incentives, to execute multi-year arrangements that meet the business needs of both parties.</p> <p>An MOU or SEMP partnership is the culmination of a process that begins with discussions between senior level decision makers from the customer and the PA. Over the course of these discussions PA management develops an understanding of the customer’s intermediate and long-term business intentions, motivations, and limitations. The customer, in turn, comes to a better understanding of what technical and financial resources are potentially available to that match their objectives. When there are sufficient commonalities of interest and an accompanying willingness to dedicate staff and financial resources, both parties ultimately capture their commitments and objectives in an MOU. This document details with specificity the commitments and actions required of each party to achieve the agreed efficiency resource goals. The PAs will only move forward when there is a match between their acquisition requirements and a clear customer commitment to engage their resources as well.</p> <p>Early in the process a joint team of customer and PA subject matter experts is convened. This team must include a representative from the customer’s organization who is both committed to the effort and has the appropriate stature to represent it to his/her upper management. The team may also include finance, sales, technical, implementation, procurement,</p>

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	<p>corporate/public relations, or any other internal stakeholders deemed critical to ensure success. This joint team should be small enough to remain functional and be empowered to make decisions, including engaging third party expertise when necessary. The team is responsible for designing the details of the MOU/SEMP partnership, establishing the implementation framework, and managing progress towards established goals.</p> <p>Depending on the maturity of the customer/PA relationship, it may take from three to 12 months to establish the terms of an MOU agreement. From agreement forward, the implementation progress is tracked monthly at the project level. This frequent reporting encourages progress and momentum and flags roadblocks or loss of momentum quickly. These partnerships are significant undertakings and require very real ongoing commitment by both parties. However, the experience so far is that significant energy/cost savings can and will be achieved – often on the order of 20-30 percent – and achieved at a lower cost to both parties, as compared to traditional implementation methods. In addition, these partnerships often have intangible but valuable benefits to the customer, such as positive public visibility as an environmental steward. These intangibles help maintain lasting relationships between PAs and customers.</p> <p>By way of example, past MOUs/SEMPs have included such features as:</p> <ul style="list-style-type: none"> <li>• Customer access to utility equipment procurement processes to achieve volume pricing;</li> <li>• Turnkey installation services using PA contractors, pre-selected for price and competence;</li> <li>• Joint engineering reviews and installation inspections, eliminating duplication and costs;</li> <li>• Simplified incentives, such as \$/kWh saved;</li> <li>• Tiered incentives for higher, deeper savings;</li> <li>• Expansion of eligible technologies/strategies beyond the common portfolio;</li> <li>• Support for staff behavioral efforts;</li> <li>• Facility staff and user training;</li> <li>• Joint application for outside federal and state funding/grants;</li> </ul>

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	<ul style="list-style-type: none"> <li>• Sharing of company-specific expertise; and</li> <li>• Test bed for new technologies and promotions.</li> </ul> <p>Based on their respective organizational commitments and internal resources, PAs may incorporate other components to address customers' energy needs and interests, and broaden the scope of these partnerships beyond energy efficiency. For example, these components may include technical assistance for on-site renewables and alternative fuel vehicles, with the idea of bringing integrated energy solutions to customers, with energy efficiency as the foundation.</p> <p><i>Cities, Towns and Special Purpose Districts</i></p> <p>Local public bodies have unique challenges and opportunities with regard to efficiency investment. The needs, opportunities, and capabilities vary widely across the Commonwealth's 351 cities and towns, 400 hundred school districts, and 350 water/wastewater treatment plants. Very often they have staffing and capital limitations as well as statutory restrictions on how they can raise capital and contract for delivery of efficiency services. Historically, these restrictions had limited the ability of governmental units to participate in PA programs that were primarily vendor-driven and designed to meet the requirements and expectations of private sector decision-makers. Until recent years, this had resulted in lower public sector program participation, with the result that many public facilities had very antiquated building energy systems in place. In recognition of these special barriers, the PAs developed a tailored approach that includes a single point of contact within each PA's staff<sup>91</sup> funding for engineering assessments of opportunities, and financial assistance structured to meet their needs and constraints.<sup>92</sup> Services can be tailored to the needs of individual municipalities, and services are delivered through a group of installation contractors who are experienced in navigating state law regarding municipal procurement.</p> <p>The long-standing working partnership between the Program Administrators and DOER has been invaluable for the implementation of these services. PA and DOER's Green Communities Division staff meet</p>

<sup>91</sup> The larger PAs, with many municipal accounts, coordinate these resources through a fully dedicated municipal account manager.

<sup>92</sup> Reporting data indicates that municipalities and other public entities now receive at least their fair share of funding.

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	<p>regularly to discuss issues of common concern and to leverage the unique resources of each partner on an ongoing basis. On an ongoing basis, DOER’s resources can also be accessed through their team of Green Communities Regional Coordinators, who work in close coordination with their PA counterparts. In addition, the PAs maintain a regular routine outreach schedule with municipalities, schools, and water treatment facilities to keep PA efficiency services top of mind with municipal leaders and to develop and implement projects as local resources and priorities allow.</p> <p>A statutory change to the municipal procurement process contained in the Green Communities Act has greatly expedited the process of delivering efficiency services to government entities. Because the PAs select their contractors through a competitive procurement, cities and towns can avoid a redundant competitive process and sole-source efficiency projects to a PA or the PA’s delivery contractors if the project is less than \$100,000. By providing this upfront competitive bidding, enhanced financial incentives, and additional financing options, including on-bill payment in some cases, the PAs have been able to provide a turnkey service with incentives structured to create positive cash flow and encourage comprehensive municipal projects.</p> <p>Water and wastewater facilities are a unique public sector market segment because the energy savings potential exists in measures that are more industrial in nature – motors, drives, pumps, fans, etc. These plants are very energy-intensive. A wastewater treatment plant can spend as much as 30 percent of its operational budget on electricity. Since 2006, the PAs have collaborated on almost 350 distinct water/wastewater facility improvement projects in 120 towns, and with the MWRA on more than thirty projects. They have awarded nearly \$10 million in incentives to save municipal ratepayers almost 37 million kWh, and \$4 million in costs, annually.</p> <p>In this market, DEP is the PA’s key public-sector ally. The PAs work with DEP to conduct equipment screening of facilities aeration and pumping system assets in order to identify potential energy-saving opportunities in high electric use areas. Facilities with opportunities are eligible for incentives and technical assistance, as well as preferential scoring when applying to the State Revolving Loan Fund to finance proposed energy efficiency project components, making efficiency-related proposals more competitive in the selection process.</p>



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	<p>The PAs stay current in the water/wastewater area by monitoring other best practices programs nationally<sup>93</sup> and by routinely reviewing emerging technologies and refinements to existing technologies.<sup>94</sup> Also, PA staff who advise facility operators are expected to know both the state of the art and the state of the shelf. Eversource staff, for example, has received annual water/wastewater training updates every year since 2010. The PAs also provides best practices training to facility operators, using recognized industry experts, such as the University of Wisconsin School of Engineering.</p> <p><i><u>Industrial</u></i></p> <p>There are almost always a wide variety of cost effective energy efficiency investment opportunities present in industrial facilities, and industrial participation in PA programs is consistent and strong.<sup>95</sup> Industrial energy use is usually tied closely to the production process itself. As such, it is generally a significant cost and tied closely to profitability. Facility managers must always balance the potential cost savings advantages of equipment improvements against the risk, of disruption to the production process itself.</p> <p>To provide the highest level of confidence in their recommendations the PAs seek out skilled TA service providers who are recognized as subject matter experts, and thus trusted, by the industrial decision-makers in their service territories. The PAs engage these expert service providers to compressively examine all the savings opportunities in a facility and quantify the potential electric and/or gas savings streams in each.</p> <p>To support deeper savings with industrial processes, the PAs also help customers reduce operation and maintenance costs, improve productivity, equipment reliability, asset value, throughput, and profitability while managing their carbon footprint. When the potential savings warrant it, and there is customer commitment, a MOU/SEMP approach (as detailed</p>

<sup>93</sup> E.g., Wisconsin Focus on Energy, Energy Trust of Oregon, NYSERDA.

<sup>94</sup> E.g., the PAs commissioned an E Source “Best Practices” review in 2013, and PA staff regularly review reports and activity from the Northwest Energy Efficiency Alliance (NEEA), EPA, the California utilities. A recent example is the “California “Water/Wastewater Market Characterization Study” (for PG&E and SCE), KEMA, January 2012.

<sup>95</sup> “Manufacturing Savings are consistently high year-over-year....As in past years, Manufacturing contributed the largest proportion of participant savings in 2013.” 2013 Commercial & Industrial Customer Profile Report, at 22 and 26.

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	<p>above) may be appropriate. Typical industrial projects may incorporate lighting, compressed air, HVAC, and process heating or cooling, as well as industry specific measures, such as injection molding measures for plastic molding manufacturers. When they are present, non-gas/electric energy benefits are quantified and their costs and benefits estimated. Examples can include savings in raw material inputs, scrap economies, increased through-put efficiencies, and potential water and/or wastewater savings.</p> <p>As noted above, the PAs also offer a range of training programs specific to the needs of the industrial and manufacturing sectors. In addition, they collaborate with organizations focused on improving industrial efficiency and productivity, such as Massachusetts Energy Efficiency Partnership (“MAEEP”). The PAs also collaborate with their peer efficiency programs around the country, and incorporate the best practices experiences of others. In addition, National Grid, which has a large industrial sector, is testing a targeted effort for medium and large industrial customers (&gt; 500 kW) to augment their core industrial efficiency services. The effort funds a team of “industrial energy advisors,” available at no cost to the customers, to provide industrial subject matter expertise and help explore energy-savings as well as process improvement opportunities. This team then assists the customers in following through with the identified opportunities by offering a range of support activities such as technical support, assessments, basic project management support, or simply helping navigate through the programs. It also facilitates continuous strategic energy management as a tool to influence a culture change with regard to energy use in the customer’s facility. Additionally, for customers where known energy projects are stalled due to lack of staffing resources, National Grid offers a co-pay to fund a staff position to oversee the implementation of such projects. The results of this effort will be shared with all PAs, and depending on an assessment of its effectiveness, it may be expanded statewide.</p> <p><u>Commercial Non-Profits</u></p> <p>Non-profit commercial customers are unique in that the barriers to being effectively served can be quite different than typical commercial customers. Lack of awareness, limited time and resources, insufficient in-house technical expertise, and limited access to capital are all barriers that must be addressed to successfully serve non-profits.</p> <p>Drawing on delivery models from other programs and initiatives such as</p>

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	<p>multi-family and the residential home energy services effort, as well as experiences of other PAs around the country, National Grid is developing a prototype approach for serving a particular subset of non-profit commercial customers – houses of worship. That prototype will be developed and tested within National Grid’s own service territory using a phased approach over a number of months. The results of that effort will be analyzed and shared, as are all such efforts, with the other PAs as an approach that could possibly be extended and adopted statewide.</p> <p><u>Combined Heat and Power</u></p> <p>During the 2013-2015 Three-Year Plan term, CHP continued to expand, both in number of participants and in realized savings. Massachusetts continues to have one of the most successful CHP offerings in the country. In each of the last five years, ACEEE has ranked Massachusetts as first in the nation for CHP policies and implementation success.<sup>96</sup> That success is largely attributable to a fair but rigorous screening process that gives customers the information necessary to make an informed decision regarding CHP and energy efficiency investments in their own individual and unique circumstances. The PA’s CHP Guidebook provides clear and complete information that delineates the process to achieve a successful CHP project and qualify for an incentive.</p> <p>CHP projects can produce dramatic savings and can have a significant positive impact on overall PA goals and savings results, with a low cost per kWh. Thus, a good CHP installation is highly desirable. Despite the potential for significant savings and generally very favorable economics, CHP projects often do not move forward. Recent market research indicates that the majority of commercial customers will not move forward with CHP projects having a simple payback of three years or more, and, surprisingly, almost 40 percent of surveyed customers would not accept paybacks of just one year.<sup>97</sup></p> <p>At the same time, CHP systems typically have a benefit cost ratio between 1.0 and 1.5, which means that it is critical that potential opportunities identified are impartially qualified and that installations are properly engineered. A number of key lessons have emerged from the</p>

<sup>96</sup> ACEEE, “The 2014 State Energy Efficiency Scorecard,” October 2014, Report Number 01408.

<sup>97</sup> Combined Heat and Power: Policy Analysis and 2011-2030 Market Assessment. ICF International. February 2012.

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	<p>past six years of experience in implementing CHP projects. These include:</p> <ul style="list-style-type: none"> <li>• Good CHP candidates have a year-round thermal load requirement in excess of 5,000 hours annually to ensure cost-effectiveness. Good candidates include facilities with significant daily laundry requirements like hospitals, nursing homes and some hotels, as well as others with thermal process requirements like food processors and other manufacturers.</li> <li>• CHP projects require significant customer investments in time, engineering planning, and capital commitment. Thus they require greater customer attention and involvement than more common energy efficiency projects. PA account executives play a vital role in enabling CHP projects, as they can help guide informed customer choices and maintain customer momentum through the several stages of the CHP process, which are: (a) initial identification and quantification of the CHP opportunities; (b) advocacy for the appropriate CHP projects for the customers circumstance and needs; and (c) managing the customer through the process to successful conclusion, including interconnection. PA involvement has been designed to assist the customer throughout the process (see below).</li> <li>• Proper sizing of CHP systems is essential to cost-effectiveness; which requires that virtually all thermal output be used by the facility. Key to correct sizing and assuring that any significant opportunities to reduce load through energy efficiency is identified and pursued prior to final sizing of the CHP system. Absent this step, the customer may install an oversized system that produces excess heat, and thus will not be cost-effective. Accordingly, the PAs emphasize to the customers that prior to conducting a CHP engineering study, they should first implement electric and thermal energy efficiency measures as their first priority, as efficiency is by far the more cost-effective savings opportunity and will reduce the size and cost of the CHP system.</li> </ul> <p>Through this experience the CHP offering has evolved to ensure more successful targeting, quantification, and completion of CHP installations. The PAs survey customers for CHP potential and offer significant technical assistance where appropriate. The process begins with an initial scoping assessment of electric and thermal loads and where reasonable potential exists, the customer is offered a co-funded in-depth engineering</p>

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	<p>analysis. The PAs’ staffs provide continuous active assistance and are objective and unbiased partners to the customer throughout the process.</p> <p><u>LED Street Lighting</u></p> <p>During the last Plan term the PAs worked with a number of cities and towns to facilitate a transfer of ownership of the street lighting in their communities and convert it to LED technologies. For example, in 2014, the Cape Light Compact converted almost 16,000 municipally-owned street lights in 20 towns. Similarly, Eversource and National Grid worked with the Metropolitan Area Planning Council Conversion Program to convert 58,000 lamps in 21 municipalities.</p> <p>The PAs remain committed to providing their municipal customers with the most up-to-date street lighting technology options – including lighting and controls – as well as providing options for them to assume ownership and maintenance of lighting where it is cost-effective and they so desire. More than 75 of the Commonwealth’s 351 cities and towns have purchased their streetlights from their local utility and others are in process.</p> <p>The PAs are also committed to working with any community wishing to explore the process of conversion to municipal ownership. Experience to date has indicated that the municipal process for consideration, analysis, decision-making, and actual conversion can be quite extended, and that the local conditions and priorities of the local governing body in each unique city or town will control the rate at which the conversion can be accomplished for the Commonwealth.<sup>98</sup></p> <p>Conversion of utility-owned street lighting to LED is inherently a more complex topic than many realize. First and foremost, it requires a new tariff, approved by the regulators, to be in place that allows the utility to account for and recapture its existing capital investment. For the actual conversions themselves to take place, multiple utility departments – engineering, operations, billing, purchasing, and inventory/stocking – must establish procedures and coordinate so that the conversions take place in a manner that is safe, fiscally responsible, and seamless to a public that depends on adequate street lighting for safety and</p>

<sup>98</sup> The City of Boston’s conversion has been underway for five years.

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	<p>security. Further, all of the costs of the process must be tracked and accounted for in a manner that satisfies regulatory requirements. Both National Grid and Eversource will be proposing rate cases during the Plan term that will allow all these issues to be considered and addressed, and rate policies to be established by the Department that will facilitate and expedite the conversion process.</p> <p>The PAs have always given high priority to serving the needs of their municipal customers, have staff and/or account managers dedicated to cities and towns, and will continue to keep these customers advised of new developments such as the implementation of new street lighting tariffs that result in opportunities to convert streetlights to more efficient LED technologies. The PAs will also continue to collaborate with the field staff of DOER’s Green Communities Division to support these efforts.</p>
<b>Three-Year Deployment Strategy/Roadmap</b>	For the 2016-2018 Plan term, the program will concentrate on continuous improvement to our processes and exploration of targeted additions.

*c. C&I Retrofit: Existing Building Retrofit*

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u></b> <b>EXISTING BUILDING RETROFIT</b>
<b>Overview &amp; Key Objectives</b>	<p>This broad core initiative promotes a menu of equipment incentives and technical services, along with associated financial incentives, to encourage building owners to replace functioning, but outdated and inefficient equipment with premium efficiency counterparts. Because it accounts for a significant share of C&amp;I savings, the PAs continuously monitor its performance and refine delivery approaches, the product mix, and incentive levels to reflect changing market expectations and evolving technologies.</p> <p>As this core initiative has matured and customers have become more aware of the variety of energy-saving investment opportunities available to them, the PAs have encouraged a transition away from episodic equipment-based retrofit events to engaging customers in a thoughtful series of building upgrades that move their property towards a “building</p>

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u> EXISTING BUILDING RETROFIT</b>
	<p>renewal”. Mature efficiency programs, those that have harvested the easiest and less expensive savings opportunities and have established trusted relationships with customers, are often characterized by a preponderance of more sophisticated custom projects and a lesser number of simpler prescriptive ones. The C&amp;I Retrofit Program generally, and this Existing Building Retrofit core initiative specifically, fits this mature profile.</p> <p>This core initiative offers prescriptive incentives for widely-applicable electric and gas technologies, and a custom approach which focuses on unique opportunities that are customer, site, or process specific. Prescriptive incentives are offered for measures that provide predictable energy savings in virtually all applications where they replace a similar technology of lesser efficiency. These incentives are available for a long list of electric and gas technologies such as lighting equipment and controls, HVAC controls, chillers, motors and drives, spray valves and steam traps, etc. This commodity-based path often serves as the customer’s initial exposure to energy efficiency and may lead to more complex custom projects.</p> <p>To identify and quantify custom opportunities, the PAs provide customers with expert technical assistance, using both their own technical staff and subject matter experts drawn from a pool of prequalified expert private sector engineering consultants. To move customers to action once opportunities have been identified, the PAs offer financial incentives that are calibrated to match customer investment criteria. The overarching goal is to instill customer confidence in projections of project savings and the reliability of equipment performance, in order to make the financial investment attractive, and to provide a delivery process that makes the upgrade process as simple and seamless as possible.</p> <p>In addition to periodic equipment upgrades, the PAs offer a suite of ongoing services to business customers, including subsidized training for building operations and maintenance tasks and access to RCx services to ensure that energy-consuming equipment operates as designed, and that all low-cost/no-cost opportunities for energy and electrical demand savings are fully exploited.</p>
<b>Design and Delivery Mechanism</b>	<p>The Existing Building Retrofit core initiative targets customers who have functioning, but inefficient, equipment in their facility, or their older building’s performance is not code compliant and can be upgraded to higher efficiency without undergoing major renovation. The core initiative uses a variety of sales and delivery strategies to educate</p>

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u></b> <b>EXISTING BUILDING RETROFIT</b>
	<p>customers about the true cost of continuing to operate inefficient equipment, including the “cost” of reduced customer or employee satisfaction with the building environment they experience. It also provides customers with information on the cost saving and ancillary additional benefits of a more efficient building and/or equipment, and then provides an easy path to the upgrade, including streamlined incentives and direction to a skilled contractor who can perform the work. In some cases all of these services are provided through turnkey service providers working under contract to, and supervision by, the PAs. In other cases, particularly with larger customers or property management firms, the outreach, sales, and service coordination is conducted by PA Account Managers.</p> <p>The core elements of this core initiative are the Prescriptive and Custom path options. The Prescriptive path offers fixed incentives for purchase and installation of a broad menu of prescriptive measures. Prescriptive measures are those for which the energy savings can be predictably assumed in a wide variety of building types and business environments. Many are lighting and lighting control measures, but there are also prescriptive incentives available for VSDs, HVAC controls, spray valves, steam traps, etc.</p> <p>Some of the richest sources of energy savings potential are found in equipment or processes that are unique to a customer’s premises and/or operational requirements. These unique, or custom, opportunities require a site-specific engineering analysis to determine costs and benefits. Custom opportunities account for a large share of PA savings. When a promising efficiency opportunity has been identified, often by a PA Account Manager, an appropriate technical expert, drawn from a pool of pre-qualified engineering consultants selected as preferred vendors through a competitive procurement process and matched to the specific needs and capabilities of the customer, is assigned to further define and quantify the potential. These highly-skilled, unbiased, and independent technical experts can conduct walk-through audits, perform detailed energy-efficiency studies of whole buildings systems or building components, or conduct specialized technical studies, such as studies of industrial or manufacturing processes. TA consultants are assigned based on their recognized expertise with the technology area under consideration. Customers can also elect to use their own TA consultant provided that the partnering PA approves of the firm’s qualifications and cost-estimate. Non-preferred vendors must comply with the same level of detail and quality as preferred vendors.</p>



<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u></b> <b>EXISTING BUILDING RETROFIT</b>
	<p>Often customers will have both gas and electric savings opportunities. In these instances the relevant gas and electric PA will instruct the TA consultant to examine all savings potentials. The two companies share the study costs and coordinate delivery of the recommended improvements.</p> <p>The Existing Building Retrofit core initiative is largely delivered through a mature and growing network of trade allies. These include the contractors providing retrofit services directly under contract to the PAs as well as the hundreds of independent lighting and HVAC contractors, supply houses, electric and gas equipment vendors, RCx service providers, etc., who service their customers' needs and, in the process, assure that those customers install the best possible equipment and facilitate participation on their behalf.</p>
<b>Marketing Overview</b>	<p>Collectively, the PAs serve approximately 350,000 electric and 154,000 gas C&amp;I customers. These run the gamut from the one-chair barbershop and corner bodega to massive manufacturing, health care, and educational facilities. Serving this diverse and large population of business customers effectively requires an understanding of their unique attributes. Based on that understanding, the PAs have designed and implemented a number of marketing strategies specifically targeted to various sub-segments of C&amp;I customers. Examples of current strategies to serve the diversity of submarkets, and some proposed enhancements are detailed earlier in the Retrofit Program description.</p>
<b>Three-Year Strategy/Roadmap</b>	<p>For the 2016-2018 Plan term, the Existing Building Retrofit core initiative will concentrate on continuous improvement to our processes and exploration of targeted additions.</p>

*d. C&I Retrofit: Small Business*

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u></b> <b>SMALL BUSINESS</b>
<b>Overview &amp; Key Objectives</b>	<p>Many small businesses have low energy consumption and are tenant occupied. In rental situations there is little incentive for landlords to improve the energy efficiency of their buildings because the tenants pay utility costs. In instances when the small business is owner-occupied, there is little incentive for energy service companies or other vendors to target these businesses because individual building savings opportunities are small, potential customers have little discretionary capital, and transaction costs are high. As a consequence small business customers frequently</p>

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u></b> <b>SMALL BUSINESS</b>
	<p>have outdated energy consuming systems and are effectively excluded from any market-based opportunity to correct the situation. However, from a Program Administrator perspective, while energy use in each of these businesses is modest, there are tens of thousands of these customers in Massachusetts, each pays into the energy efficiency fund, and in aggregate their savings potential is significant. The Small Business core initiative provides a simple, streamlined path for these customers to reduce their energy use, and for the Commonwealth to acquire the energy savings cost-effectively.<sup>99</sup></p>
<b>Design and Delivery Mechanism</b>	<p>The core initiative is designed to provide seamless full service delivery for small business customers from opportunity identification (the “audit”) to turnkey installation of measures, to financing of the customer’s share of the project cost.</p> <p>Because of the low savings potential per transaction, the program model has been refined over the years to take full advantage of economies of scale. Installation costs are reduced by the competitive procurement of vendors who specialize in comprehensive service delivery to small customers. These vendors keep costs low by mastering the art of streamlined service delivery through repetitive installation of similar measures and the ability to purchase competitively priced equipment due to their high volume purchasing power. Assigned franchise sales territories and the ability to market large PA incentives (with attractive financing and, where available, on-bill repayment options for the customer portion) reduce marketing costs and produce high sales closure rates, further reducing overheads.</p>
<b>Marketing Overview</b>	<p>Vendors can choose marketing options that they find the most successful and are suited to their business model. These include direct mail, cold calling, and word-of-mouth referrals. The ability to identify themselves as agents of the Program Administrators elevates their credibility and provides customers assurance that the assessments of opportunities and estimates of project costs will be objective and fair, that the installations will be quality-controlled, and that there will be recourse if there are subsequent performance issues.</p>
<b>Three-Year Strategy/Roadmap</b>	<p>As described in greater detail above, the PAs have begun a thorough review of the Initiative. Many of the opportunities under consideration by the PAs include those identified in recent evaluations. In addition to basic</p>

<sup>99</sup> Small business customers are fully eligible for all of the services and incentives available through the Retrofit Program in addition to the targeted services described here.

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u> SMALL BUSINESS</b>
	<p>delivery improvements and economies, the PAs hope to identify additional gas measures and processes to encourage better identification of, and referral follow-up services for, measures not amenable to the direct install delivery model (such as thermal measures and heating systems, for example) so that deeper treatments can be undertaken. They will also conduct further segmentation to reach the smallest of the small customers through consideration of web portals, self-service delivery concepts, further development of the Main Streets or other geographically-focused delivery models, adaptation of successful residential delivery models such as HES, etc. and more targeted marketing and measure mixes by business type.</p>

*e. C&I Retrofit: C&I Multi-Family Retrofit*

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u> C&amp;I MULTI-FAMILY RETROFIT</b>
<p><b>Overview &amp; Key Objectives</b></p>	<p>As more fully described in the Residential section of this Plan, the Multi-Family Retrofit core initiative provides comprehensive energy efficiency services to market rate properties with five or more dwelling units, including the common area spaces of these properties. The core initiative offers energy assessments which identify energy savings opportunities throughout the facility. An EAP is developed for each facility, identifying all energy efficiency opportunities regardless of fuel source. Because multi-family buildings may contain both residential and commercial meters, residential services and incentives are supplemented by applicable commercial program services and incentives. However, because the primary beneficiaries of the services of this offering are the occupants of the units within the building, and both the measures and services are predominately residential, oversight and management is assigned to the residential program managers at each PA, with appropriate commercial services provided at the direction of a contracted MMI.</p>
<p><b>Design and Delivery Mechanism</b></p>	<p>The PAs strive to deliver a fully integrated offering to participants, regardless of fuel type, service territory, or rate class. An integral part of the core initiative’s design involves the services of the MMI, who provides a single point of contact at intake, guides participants, and coordinates delivery of resources, including both residential and commercial-sector services, through the effort’s phases. The goal is to provide a seamless customer experience, mitigate the potential for customer confusion, and minimize or eliminate lost opportunities.</p> <p>Commercial Retrofit measures may include:</p>

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u> C&amp;I MULTI-FAMILY RETROFIT</b>
	<ul style="list-style-type: none"> <li>• HVAC high efficiency equipment upgrades and controls;</li> <li>• Variable speed drives, motors;</li> <li>• Chillers;</li> <li>• Air compressors;</li> <li>• Water heating equipment;</li> <li>• Energy management systems (“EMS”);</li> <li>• Building envelope measures; and</li> <li>• Custom measures.</li> </ul> <p>A commercial sector PA representative fully participates in the joint PA committee assigned to plan and oversee the delivery of the core initiative. This process is more fully described in the Residential section of this Plan.</p>
<b>Marketing Overview</b>	Please refer to Residential Multi-Family Retrofit core initiative description.
<b>Three-Year Strategy/Roadmap</b>	Please refer to Residential Multi-Family Retrofit core initiative description.

*f. C&I Retrofit: Upstream Lighting (electric)*

<b>C&amp;I RETROFIT</b>	<b><u>CORE INITIATIVE</u> UPSTREAM LIGHTING (Electric Only)</b>
<b>Overview &amp; Key Objectives</b>	As noted in the description of the Initial Purchase and End of Useful Life core initiative description earlier in this Plan, the upstream delivery approach was initially designed to influence the purchase decision for replacement of standard efficiency fluorescent bulbs. Monitoring of the progress of that Initiative indicates that the upstream approach not only impacted market-driven equipment purchases, but the favorable economics of the improved equipment efficiency, coupled with an incentive, drove substantial purchases for retrofit purposes ( <i>e.g.</i> , replacement of functioning, but less efficient lamps) as well.
<b>Design and Delivery Mechanism</b>	A special, and limited, set of circumstances are required for an upstream lighting approach to succeed. That is: (a) the premium equipment must be suited for one-for-one replacement for the less efficient product; (b) the equipment purchase decision must be driven by first cost, with no real amenity or reliability distinctions between the products; (c) the substitute premium efficiency equipment must be stocked and available at distributors at the time of the purchase decision; and (d) there must be no additional or unique installation requirements that distinguish it from the

	product for which it is substituted. That is, it must be “plug-and-play.”
<b>Marketing Overview</b>	<p>The upstream lighting incentive model leverages existing distributor networks and infrastructure to influence the thousands of equipment purchasing decisions that customers and contractors make every day. Under the upstream model, the PAs provide incentives directly to distributors rather than end users. The incentives are structured to entirely remove the price premium between conventional and premium products at the point of purchase, thereby placing premium product in direct competition with the conventional product on the basis of attributes of quality and efficiency alone – with the assumption that the purchaser will make the wise choice.</p> <p>For lighting products in a retrofit scenario the target markets are facility or maintenance managers and operators.</p>
<b>Three-Year Strategy/Roadmap</b>	To date, the PAs have offered an upstream approach for select lighting products including premium efficiency linear fluorescent lamps, LED screw-ins, and an assortment of LED fixtures and downlights. As the lighting market evolves, particularly as LEDs become more cost-competitive and available for a wider range of end uses, the list of eligible products will expand.

## H. Pilots, Hard-to-Measure Efforts, and Creative New Approaches

### 1. Pilots

The Program Administrators are not proposing any new pilot programs or initiatives for the 2016-2018 Plan term. The PAs will continue to explore new efforts to determine if a pilot would be a useful tool for studying a new effort. A key goal of any pilot is to ensure that data is collected to help determine if the approach explored in the pilot should be implemented on a larger, statewide scale, as a full program, or an element of a program. While the PAs are not proposing to conduct formal “pilots,” there is a strong focus on conducting demonstration projects. These demonstration projects are regularly deployed to assess new technologies and strategies, with PAs using the resulting findings to improve upon their existing program offerings. The current approach of focusing on broad “umbrella” programs creates the opportunity to refine efforts quickly based on the lessons learned during the demonstration project. Below is a sample list of technologies studied by National Grid and Eversource through demonstration projects. These reports are included in Appendix K.

Research & Development and Demonstration Studies	
Report 1	Evaluation of 2013–2014 Smart Thermostat Pilots: Home Energy Monitoring, Automatic Temperature Control, Demand Response
Report 2	Heat Pump Clothes Dryer Technical Demonstration
Report 3	Technical Assistance Study - Vacuum Steam Heating
Report 4	Wi-Fi Thermostat Assessment

## 2. Hard-to-Measure Efforts

- *Statewide Marketing (Residential, C&I)*

The budget in the Statewide Marketing hard-to-measure effort is used to support statewide marketing efforts, as described in in Section III below.

- *Statewide Database (Residential, Low-Income, C&I)*

The PAs have allocated a statewide total of approximately \$1.5 million to support database and data review and sharing efforts in 2016-2018, as described in Section III. Database efforts will affect all sectors, with funds budgeted for each sector.

- *DOER Assessment (Residential, Low-Income, C&I)*

The DOER Assessment represents an annual budget for DOER that is assessed per G.L. 25A §11H.

- *Council Consultants (Residential, C&I)*

The Council Consultants budget is collected by DOER and used to support the retention of expert consultants by the Council and reasonable administrative costs, in accordance with G.L. c. 25, § 22(c). The Council must annually submit to the Department a proposed budget for the “retention of expert consultants and reasonable administrative costs.” G.L. c. 25, § 22(c). The cost for Council consultants allocated to the electric PAs is taken directly out of RGGI revenue that would have been distributed to PAs by DOER. As a result, the electric PAs do not collect this expenditure through the energy efficiency surcharge. The gas PAs, however, do recover these costs through their energy efficiency surcharges.

- *Sponsorships & Subscriptions (Residential, Low-Income, C&I)*

The budget for Sponsorships & Subscriptions is PA-specific and is made up of administrative costs such as membership fees to key associations within the industry (*i.e.*, ACEEE and the Association of Energy Service Professionals) and sponsorships at industry events. These sponsorships and subscriptions support information sharing with others involved in energy efficiency, education, and training.

- *Residential HEAT Loan (Residential)*

HEAT Loans are available to help customers finance the purchase and installation of qualified energy efficiency measures. The Residential HEAT Loan budget includes costs to buy down the interest due on the loan and the cost to administer the loans. Any savings or costs associated with installing energy efficiency measures due to availability of the HEAT Loan are included in the core initiative under which the measure was installed, for example, in HES - Measures.

- *Workforce Development (Residential, C&I)*

The PAs continue to monitor and contribute to trainings in order to:

- Educate new or promoted employees in topics such as marketing, building science, energy efficient new construction, heating and cooling technologies and techniques;
- Contribute to building a qualified workforce that will meet the demand for energy efficiency; and
- Promote cross training across different areas of expertise.

The PAs plan to look for collaborative ways to improve the delivery of trainings to address the demands of the market. This effort is ongoing within the respective management groups and best practices group, as exemplified by the Low-Income Best Practices Working Group chaired by LEAN, and the Contractor Best Practices Working Group, as well as through ongoing communication with key trade allies.

- *R&D and Demonstration (Residential, C&I)*

In the continued efforts to explore new technologies and measures through the MTAC, as well as proactive research and development into areas of interest, the PAs propose a consolidated research and development (“R&D”) effort to (a) support the work of the MTAC, and (b) pursue technologies of interest in order to remain at the top of the “innovation curve.” For residential innovations/enhancements within a planned initiative, please refer to the initiative enhancement sections within each program.

- *Education (Residential)*

The budget in the Education hard-to-measure effort is used to support public education efforts, as described in in Section III.J below.

- *Low-Income Energy Affordability Network (Low-Income)*

LEAN works with the Program Administrators to comprehensively serve low-income households. LEAN delivers low-income energy programs and represents low-income PA customers in legislative discussions and regulatory proceedings. The LEAN budget is used to pay for administrative and personnel costs.

### 3. Creative New Approaches

#### a. *Demand Savings*

Achievement of demand savings in 2016-2018 is a key goal shared by the PAs and the Council. In its March 31, 2015 Resolution on priorities, the fifth articulated priority of the Council is to “realize electric demand savings to significantly mitigate peak demand costs to the electric sector.” In that same Resolution, Council Cross Cutting Recommendation #2 recommends that the PAs “support products and practices that reduce winter and summer

peak.” Demand savings have been a point of particular emphasis at the Council for ISO-NE and in the stakeholder workshops.

Issues relating to demand savings can be complex, and it is important to design efforts that take into account unintended negative consequences, such as increased energy usage (which, for example, can be an unintended result of subsidizing ice storage plants that reduce demand).

The PAs have formed an *ad hoc* group that is discussing these matters informally with the Council’s consulting team. These discussions are expected to continue into the 2016-2018 term. The Term Sheet set forth at Appendix D provides for the continuation and expansion of this ad hoc group as follows:

The PAs and the Council recognize the growing economic importance of achieving demand reduction goals and mitigating winter and summer peaks. The Term Sheet does not include targets for potential new statewide summer and winter demand peak reduction initiatives, and does not reflect costs, benefits or incentives associated with such initiatives. Subject to open meeting law requirements, PA representatives will work with a small Demand Savings Group that includes the DOER, the Attorney General’s Office, the Low-Income Energy Affordability Network, interested expert and qualified stakeholders and the Council’s consultants to explore approaches to cost-effective new demand reduction/peak reduction electric and gas initiatives. This Demand Savings Group will be addressing challenging and important matters, and all parties are committed to the successful development and actual implementation in-the-field during the 2016-2018 Plan term of new demand/peak reduction initiatives. To ensure that this in-the-field implementation goal is reached, the PAs will provide a report to the Council setting forth the specific scope, tasks, and detailed timelines for this group by the end of Q1 2016. This report will also provide an anticipated, high-level in-the-field deployment schedule for 2016-2018 based upon the then most current information. Deployment in-the-field will be subject to approval by the Department of Public Utilities and confirmation of cost-effectiveness. The PAs will also provide a report to the Council on the ongoing “super peak” avoided cost study on or before December 31, 2015 (if that study is delayed, this PA deliverable date will be appropriately adjusted).<sup>100</sup>

Demand savings opportunities can be divided into four categories with different strategies/approaches. The four categories are described below.

- 1. Demand Savings from Traditional Energy Efficiency.** Excellent progress and results have been achieved in this essential category. The PAs’ traditional energy efficiency efforts, historically and as proposed for 2016-2018, result in substantial demand savings. The 2016-2018 Plan projects electric demand savings of 592,375 kW (summer) and 620,992 kW (winter). In 2010-2014, the PAs achieved over 650,000 kW of summer

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<sup>100</sup> CLC reserves its right to raise issues at any time with either the Demand Savings Group or the Council generally regarding its unique role as a municipal aggregator that may affect its ability to fully participate in the development and implementation of demand/peak reduction initiatives.



capacity savings. These substantial demand savings are a core element of the success of energy efficiency in Massachusetts and will continue to be important in 2016-2018. The PAs will continue to promote and prioritize energy efficiency measures that contribute both energy savings and demand savings, as well as explore adding technologies that have the potential for additional demand savings such as dimmable/“daylight dimming” LED lighting technologies (that, when installed in large enough scale, can be used for demand response efforts as well), tailored behavioral programs with a focus on achieving demand savings, and Wi-Fi thermostats and home automation technologies.

2. **Demand Response.** The Green Communities Act calls for PAs to “provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply.” G.L. c. 25, §§ 19(a), 21(a), 21(b)(1), 21(b)(2). Demand savings through demand response (peak shaving and load shifting efforts) can contribute benefits such as reducing prices and price volatility for consumers, avoiding or deferring future generation, transmission and distribution investments, and reducing environmental impacts from electric generation. Demand response is a flexible, low-carbon resource that can also be used to help integrate renewable resources as they come onto the electric grid. Viable demand response strategies, combined with planned aggressive energy efficiency efforts, will contribute to the Commonwealth’s economic and environmental sustainability goals.

Keeping in mind the goals and objectives described above, PAs are seeking ways to understand both the costs and benefits of demand response in a way that will inform full scale deployment where benefits are expected to exceed costs. In order to contribute to this goal, individual PAs have developed or are working on developing individual or joint demonstration projects to gain a better understanding of costs and benefits of demand response in the context of the energy efficiency portfolio of programs. PAs will share the results of demonstration projects in order to gain insight, develop best practices, and utilize demand response strategies where appropriate going forward. Following the implementation of demonstration projects and related evaluation, PAs will use the results, along with related research and analysis, to guide the deployment of larger scale demand response initiatives in the latter years of this Three-Year Plan and beyond.

Current avoided costs are not designed to assess cost-effectiveness for demand response initiatives. The PAs are working regionally to expand the scope of work completed by the avoided cost study contractor in order to derive the value of demand reductions from demand response efforts. These avoided cost values will be focused on the “super peak” period of highest demand, rather than the broader summer and winter peak periods that are currently considered when assessing demand savings from energy efficiency efforts.

For PA-specific descriptions of demand response efforts, please see PA-specific materials at Appendix L.

3. **Load Shifting.** Similar to demand response, the PAs are examining the possible role of load shifting initiatives. Some efforts designed to shift load, such as time-of-use rates, are outside the scope of energy efficiency plans under the GCA. However, PAs are

reviewing storage technologies as a potentially appropriate focus in the energy efficiency Plan. In addition, behavioral programs and messaging may be used to drive load shifting. The PAs are continuing to review these possible strategies.

4. **Geo-Targeting.** The PAs are exploring whether the strategic investment of energy efficiency in specific geographic locations can yield additional benefits to customers and the energy network, particularly in regions that are subject to gas constraints, or as a strategy to help defer the need for infrastructure investments. The PAs are actively reviewing geo-targeting strategies and will deploy some geo-targeting demonstration projects in 2016-2018 to develop information, test strategies and drive demand savings.

The hypothesis for implementing geo-targeting is that, if locations with projected high congestion and/or future planned infrastructure investments are targeted with incentives and/or concentrated marketing tactics, the resulting increase of energy efficiency and other demand reduction efforts in those areas may be able to alleviate the congestion or defer the need for infrastructure investments. Such results may have cost savings associated with them that are incremental to those counted in the current set of avoided costs.

While increased energy efficiency alone will not solve capacity issues, it can be part of an overall plan to address capacity and gas deliverability, save energy, and provide benefits to customers. Berkshire and CMA are reviewing these matters at this time given capacity constraints in areas of their systems.

As set forth in more detail in Appendix L containing National Grid specific materials, an example of geo-targeting for an electric PA is National Grid's ongoing Nantucket based initiative. National Grid is actively engaged in geo-targeting on Nantucket as one component of a comprehensive "non-wires alternative" ("NWA") project aimed at deferring the long term need for a third undersea cable to serve the island's electric load. In 2015, implementation began on an initial plan, primarily comprised of energy efficiency, to reduce almost 5 MW of load on the island by the end of 2019. The project's overall load reduction targets are approximately 18 MW over 17 years. If successful, the efforts could defer construction of the third cable for at least five years. The NWA project will combine geo-targeted energy efficiency with other technologies, such as renewables, energy storage, demand response, and potentially time varying rates to achieve the necessary load reduction during peak hours.

The PAs look forward to continuing to review potential demand savings approaches for 2016-2018.

#### *b. Integration of Renewable Technologies*

In its March 31, 2015 and July 21, 2015 Resolutions the recommended that the PAs proactively promote renewable thermal technologies and identify appropriate incentives for renewable thermal technologies. Exploring and deploying renewable thermal technologies was also a theme that was developed and discussed in the stakeholder workshops facilitated by Raab Associates, Ltd. More broadly, a point of interest for the PAs is exploring ways to leverage the

powerful energy efficiency delivery infrastructure that the PAs have developed (working with many stakeholders, including the DOER and the program delivery contractor network) in order to provide increased benefits to customers and the Commonwealth.

The PAs have not fully developed strategies for addressing renewable thermal savings in 2016-2018, but are reviewing these matters, and seeking to ensure that they are addressed in the most appropriate forum. Core question to be addressed is exactly what technologies are contemplated by Councilors, what is their applicability in a three-year energy efficiency plan under the GCA and is implementation of some of these efforts perhaps more appropriately handled in other contexts or proceedings, *e.g.*, grid modernization. More specifically, some essential elements and questions in the PAs' review are:

- Are there cost-effective measures/strategies that are appropriately delivered as energy efficiency measures, as opposed to renewable supply side measures?
- What funding sources are potentially available to fund the measures/strategies, *e.g.*, energy efficiency funds under the GCA, Massachusetts Clean Energy Center ("MassCEC") grants, tax credits, HEAT Loan expansion (funding sources could vary by measure)?
- What energy savings and other quantifiable benefits can be claimed for incentivizing these measures, and can they be quantified and claimed under the TRC test as required for energy efficiency efforts under the GCA?
- What, if any, are the most promising potential technologies and, if applicable, how should deployment of these technologies be prioritized?

As with demand savings, issues related to renewables are complex, and it is important that any design efforts are carefully cost-justified and that appropriate funding sources are used. The PAs and Council do not have these issues resolved at this time, but efforts are continuing and the PAs will remain engaged with the Council on these matters.

### *c. Other Creative New Approaches*

This Plan sets forth the highest goals ever established in the Commonwealth and, based upon the best information currently available to the PAs, in the United States. In order to achieve these high goals over time, the PAs will need to develop and incorporate creative new approaches to servicing customers and locating untapped or underserved opportunities. In its July Resolution, the Council has expressly supported the exploration in 2016-2018 of creative new approaches and testing new technologies and ideas. The PAs are relying on the Council's support of new approaches in adopting the bold goals set forth in this Plan.

The PAs need the flexibility to pursue these creative new approaches and untapped opportunities to continue to keep Massachusetts as a national leader in energy efficiency. The PAs will look to implement efforts targeting new, niche opportunities that must meet three core tests: (1) serving the opportunity must result in cost-effective savings using the Department's cost-effectiveness screening standards; (2) any resulting savings are not being funded and counted in the context of another mandated activity, for example, grid modernization, provided that the PAs have the ability to provide additional or incremental activities that are

complementary or supplemental to these activities being taken pursuant to another mandated activity; and (3) the opportunity is not otherwise being addressed in other capital improvement projects funded through other rate mechanisms (*e.g.*, capital expenditures to reduce gas leaks), again with the understanding that the PAs will have the ability to provide additional or incremental activities that are complementary or supplemental to these capital improvement projects. A possible example of such an effort might be replacing inefficient lighting at a substation with new LED lights, or upgrading utility-owned streetlights.

Another niche opportunity the PAs seek to address in the term of this Plan would be providing services for a limited number of state or federal government agencies that are currently wholesale customers, in way that is consistent with Department directives and regulatory requirements. The PAs believe there may be some unique opportunities to address inefficient facilities within this sector, with benefits for all customers within the service area that are contributing to the payment of utility bills of such agencies through taxes or assessments. The PAs would only explore these opportunities for existing wholesale government customers and must be able to demonstrate the cost-effectiveness of the project and that the approach for a specific project was consistent with Department directives and applicable regulatory requirements.

Looking forward, and with no specific current proposals in this Plan, the PAs would like to explore creative ways in which they can engage new customer segments. For example, there may be opportunities to assist generators in becoming more efficient, enhancing their productivity and decreasing greenhouse gas emissions. Another opportunity that the PAs could explore is providing services to municipalities that do not currently offer energy efficiency services or do not offer the comprehensive suite of energy efficiency services offered by the PAs. As part of their R&D efforts, the PAs want to explore and examine these unique opportunities that, if properly implemented, could increase the efficiency of energy usage for new populations in the Commonwealth and materially assist the Commonwealth in greenhouse gas reduction efforts.

## **I. Marketing Plan and Activities**

### **1. Introduction**

The Program Administrators plan to continue to use public education and marketing as key tools to support a culture of sustainability in Massachusetts. By creating powerful, engaging and motivating education and marketing strategies, PAs can continue to increase awareness of the benefits of energy efficiency and drive increased participation in the available energy efficiency programs and services. Proposed public education and marketing strategies will take into account the unique motivational differences between residential and non-residential customers.

**Support of the Mass Save<sup>®</sup> mark and statewide brand remains a key priority.** The PAs commit to statewide marketing efforts that include the prominent integration and placement of the Mass Save<sup>®</sup> mark as the statewide brand. PAs will include the Mass Save<sup>®</sup> mark on statewide program, outreach, and marketing materials. In addition, PAs will include a link to the Mass Save<sup>®</sup> website on the portion of their company's website that is focused on energy

efficiency services in Massachusetts.<sup>101</sup> PAs continuously review and evaluate the effectiveness of all joint statewide branding efforts, and engage in on-going refinements to ensure that such brands support clear, consistent, and recognizable messages that help promote program awareness.

**Building on the success of digital and social marketing platforms will be a key focus of effort.** The Mass Save<sup>®</sup> website has become a critical focal point in the comprehensive marketing program, providing a consolidated one stop shop for residents and businesses to learn about energy efficiency, program offerings and opportunities. The Mass Save<sup>®</sup> website and strategies that drive customers to the website will continue to be refined to ensure the highest quality customer experience. Marketing will continue to leverage the strong social media presence built over the 2013-2015 term. With over 110,000 Facebook fans (<https://www.facebook.com/MassSavers>) and nearly 15,000 Twitter followers (<https://twitter.com/masssave>), PA marketing and education is able to reach an ever broadening audience. The social media platforms support effective peer to peer marketing, allowing customers to become brand ambassadors.

**Reaching out to customers who haven't participated in Mass Save<sup>®</sup> branded programs remains a fundamental commitment.** Under this Plan the Mass Save<sup>®</sup> website will be translated into additional languages, starting with Spanish and Portuguese, to continue to expand access to diverse linguistic populations. The PAs will explore affinity marketing opportunities to expand the reach to new market segments while offering the added benefit of supporting the community beyond energy efficiency.

The refinements to current strategies and messages developed for statewide energy efficiency education, outreach, and marketing will augment the efforts already in use and will attempt to complement and leverage program-specific marketing and individual PA efforts across the Commonwealth.

## 2. Marketing Plan Overview

The ultimate goal of all educational, community outreach, and marketing efforts is to develop an effective system of communication with Massachusetts residents and businesses. This system is a critical tool to support customer awareness, understanding and participation in the PAs' comprehensive energy efficiency programs. Independent evaluation studies and a review of the marketing activities over the course of the first two plans (*i.e.*, 2010-2015) illustrate the extraordinary growth and success of the coordinated marketing efforts among the PAs and provide a path for PAs to better understand where improvements can be made.

For the 2016-2018 Plan, core objectives of the PAs' public education and promotion campaign include:

- Maximizing reach to ensure *all* residential and business customers are provided access to information and connection to resources.

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<sup>101</sup> Except where expressly limited by internal corporate website policies.

- Providing compelling and accessible messages, which clearly describe the benefits of energy efficiency without excess jargon or overly technical language.
- Exploring and deploying targeted marketing to unique or specific communities throughout the state (including communities where English is not the primary language).
- Utilizing diverse media (*e.g.*, internet, bill inserts, radio, billboards, public transit, social media) to disseminate consistent and clear messages.
- Ensuring that the various strategies work together to ultimately achieve deeper and broader savings.

Through an extensive array of effective messages and an all-inclusive media strategy, the PAs commit to engaging with the broadest cross section of residential and business customers with tailored, targeted, and actionable information.

The careful balancing of breadth, depth, and understanding of customer motivation in the campaigns will drive value to customers and support obtaining the aggressive energy efficiency goals set forth in this Plan.

### 3. Mass Save<sup>®</sup>

In 2010, the PAs joined together to bring energy efficiency programs to the Commonwealth through a statewide PA brand. As sponsors of the Mass Save<sup>®</sup> word service mark, the intent of the PAs was to complement their individual PA brands when communicating with residential and C&I customers about energy efficiency programs.

The PAs are the owners of the Mass Save<sup>®</sup> word service mark. A trademark or service mark identifies goods and services as originating from a single source. Trademarks, in effect, represent the goodwill that a business has built up through its history of offering quality goods and services. A word mark is the most common form of trademark and simply consists of a word or group of words. The PAs have rights to the word mark Mass Save<sup>®</sup>, having obtained federal registration of it on August 29, 2006.

Under trademark law, the PAs must monitor and control the use of their marks in order to maintain them and to prevent inferior energy efficiency services from diminishing them. Throughout the past two plan periods, the PAs have overseen significant monitoring efforts with respect to the Mass Save<sup>®</sup> mark to identify unauthorized uses of the service mark. Legal measures have been successful to stop such unauthorized uses and thus the integrity of the mark has been protected.

### 4. Marketing for 2016-2018

During the term of the first Three-Year Plan (2010-2012), the PAs joined together to market energy efficiency services on a statewide basis through use of the Mass Save<sup>®</sup> service and design marks. In 2013-2015, a single website was created as a central repository to educate customers and provide access to energy efficiency program information and participation. The

launch of this statewide website was a major and unprecedented undertaking satisfying a core Council priority. The existence and operation of this website demonstrates the commitment of the PAs to working together for the benefit of customers throughout the Commonwealth.

The PAs continued the Mass Save<sup>®</sup> Awareness Campaign during the 2013-2015 Plan term to increase awareness of energy efficiency and Mass Save<sup>®</sup> across the Commonwealth. The campaign continues to work across many forms of media, including radio, internet banner ads, social media, smartphone and tablet ads, and print ads. The Statewide Marketing team selected a new vendor for marketing and website services for the 2015 campaign. With the new vendor on board, the PAs completed a full audit of marketing materials used for outreach events and recruitment in Residential New Construction. As a result of this audit, a forward-looking plan for marketing materials was developed.

Additional notable highlights from 2013-2015 include: (1) a redesigned and refreshed the GasNetworks.com site; (2) customer-facing videos on the Mass Save<sup>®</sup> website that provide information on ductless mini split heat pump and heat pump water heater technologies; (3) successful leveraging of social media outlets, like Facebook and Twitter, to launch creative campaigns; and (4) the addition of Affinity marketing to the mix of promotional strategies.

The PAs also executed a pre-campaign awareness study and a post campaign study, now conducted annually, which allows the PAs to benchmark and evaluate the effectiveness of their messaging and media planning. The PAs will take into consideration the results of this study to develop their marketing campaign for the 2016-2018 Plan. Key findings from the study include: (1) awareness of Mass Save<sup>®</sup> has increased significantly since December 2013; (2) customer awareness of MassSave.com and self-reported website usage increased in 2014; (3) efforts to drive web traffic have been successful among those who are aware of the Mass Save<sup>®</sup> website; (4) campaign messaging was clear and resonated with residential and commercial customers; (5) self-reported exposure to Mass Save<sup>®</sup> messaging increased significantly among residential and commercial customers; and (6) depth of knowledge for program offerings is also increasing among residential and commercial customers.

In January 2015, the PAs began making several significant changes for the 2015 campaign and beyond. Specifically, the new marketing vendor, KSV, now manages the Mass Save<sup>®</sup> website in addition to serving as the campaign implementer. As part of this transition, KSV will develop new website content and seek to improve the website user experience. In addition to changes to the website, Mass Save<sup>®</sup> will use new campaign messaging in 2015 and beyond, focused on emphasizing how simple and easy it is for customers to save money on their energy bills.

MassSave.com will continue to be evaluated for content and usability and improvements made. The PAs' focus on total customer experience recognizes the entry of the customer through the website as a critical component of that experience. The website provides the PAs an opportunity to offer streamlined information, including assessment tools such as the online home energy assessment, and on line rebate processing which offer substantial customer experience benefits. The PAs will continue to feature all the PAs' brands in conjunction with the Mass

Save<sup>®</sup> marks per the findings from the Massachusetts Statewide Marketing Campaign Evaluation Report and consistent with their goal to convey who and what Mass Save<sup>®</sup> is.

The key themes for the Statewide Marketing efforts for the 2016-2018 planning cycle are as follows:

- Define who and what Mass Save<sup>®</sup> is and what it means to the customer.
- Increase the message that associates Mass Save<sup>®</sup> with “A way to lower your energy bills” to both residential and C&I customers.
- Message and graphically tie in the PA Brand Logos with the Mass Save<sup>®</sup> mark to create a strong association and clarity of message.
- Utilize the segmentation work identified by the RMC and C&IMC so PAs can better and more consistently target customers from a program and statewide awareness level.
- Create awareness and understanding of Mass Save<sup>®</sup> as a trusted statewide resource for all customers’ energy efficiency needs.
- Educate customers about the opportunities to save energy and motivate them to take action.

During the 2016-2018 Plan term, the Statewide Marketing Committee will continue to meet monthly and update DOER, through informal discussions, on any new developments concerning the PAs’ statewide marketing efforts. From a market research perspective, the PAs will continue to conduct pre/post campaign studies and track their campaign effectiveness in terms of driving customers to the website and refreshing content.

#### 5. Maintenance of Complementary Individual Efforts

While working diligently on the statewide public education efforts, the PAs will also continue to maintain customer awareness, satisfaction, and participation goals and accordingly, the PAs will also continue outreach efforts utilizing customer representatives and account executives (who enjoy one-on-one/person-to-person relationships that are especially important in the C&I sector) and PA-specific efforts that complement and are consistent with statewide efforts and the findings of the 2014 Marketing Report.

#### J. Public Education

The key objective of the Residential Education initiative is to offer an array of K-12+ educational outreach programs and enhanced consumer education. Several Program Administrators collaborate with the National Energy Education Development (“NEED”) Project, bringing energy efficiency curriculum and training to teachers in Massachusetts. An addition to teacher trainings in 2016-2018, some PAs will implement an energy-efficiency take-home initiative involving kits, which will contain instant-savings measures such as light bulbs, showerheads, and faucet aerators, as well as educational materials (budgeted through HES). After in-class lessons about energy-efficiency, students will bring the kits home and report back on which measures their families install. In this way, the PAs can capture additional savings and expand the reach of the education programs beyond teachers and students, to parents, as well.



The PAs' support of educators, students, and parents through program opportunities, curriculum, and materials on energy efficiency and conservation is a critical component in fostering an energy literate society.

Additional efforts directed at consumers focus on educating customers on the benefits of investing in energy efficiency products and services and the multitude of energy efficiency initiatives available to them. Collaborative efforts for consumer education in 2013-2015 included the Energy Savvy online energy assessment tool on the Mass Save<sup>®</sup> website (budgeted through HES) and kits containing "Kill A Watt" meters available through libraries. This outreach will be continued in 2016-2018.

Some PAs also conduct additional direct outreach and provide additional in-school programming to schools in their service territories. These programs will continue to evolve and expand to reach more students. Many of these programs have earned local and national awards for energy education programs.

The PAs plan to work with DOER, educational institutions, the statewide marketing working group, and PA education and/or marketing departments to develop educational and promotional strategies. Efforts for school-aged education will continue to focus on expanding the existing, in many cases award-winning, PA school programs. Educational outreach strategies for 2016-2018 may include:

- Sponsor energy efficiency related classroom presentations and activities to K-12+ schools.
- Direct educators and children to online educational resources to help educate children about energy safety and conservation.
- Sponsor science fairs, teacher training workshops, and other elementary and secondary educational opportunities in collaboration with DOER, Massachusetts Department of Education, and schools throughout the Commonwealth.
- Encourage schools and informal education programs to participate in the annual NEED Project's Youth Awards Program held in April of each year, with follow-up awards program and ceremony in June in Washington, D.C.
- Explore the program development for youth group summer camps promoting energy conservation and behavioral change.
- Partner with communities to educate and promote energy efficiency through energy fairs, sponsorships, and community-specific outreach.
- Participate in various energy-efficiency employee awareness events.
- Conduct school fundraisers promoting energy-efficient technologies (budgeted through Lighting).
- Offer prompt-based contests for students to showcase their energy and energy efficiency knowledge.

- Direct customers to online calculators and web tools to learn more about home energy usage and to offer energy saving recommendations, including information on available energy-efficiency incentives.

The PAs will work to develop energy efficiency marketing messages aimed at residential customers, educators, students, parent/teacher organizations, and community groups. Proposed collateral will highlight the many benefits of investing in energy efficiency, savings that can be generated by individual efficiency measure upgrades, behavioral changes, and testimonials from past program participants. The PAs will employ a variety of media sources for messaging, which may include bill inserts, bill messages, customer newsletters, [www.masssave.com](http://www.masssave.com), direct mail, employee and business partnerships, newspapers, social media outlets, and educator workshops.

#### K. **Community Engagement**

Over the course of the prior Three-Year Plans, the Program Administrators have worked on a variety of community-based outreach and marketing initiatives throughout the Commonwealth. These efforts included collaboration with local community advocates and leaders from various communities, with PAs providing project management and technical support. The PAs continue to view community-based engagement activities as a component of overall marketing and outreach strategies. The PAs consider engagement with entire communities where appropriate, as well as engagement at a smaller scale based on the particular needs of a local municipality or neighborhood. The PAs appreciate the continuing efforts of their dedicated colleagues in community engagement initiatives and their desire to find the best ways to serve harder to reach constituencies.

Program Administrators recognize that the effective delivery of energy efficiency programs is highly dependent on building confidence among customers, as well as an extensive network of service providers. The programs and services offered by the PAs represent wise investments – investments that contribute positively to the well-being of homes, businesses and communities. In 2016-2018, the PAs plan to continue building on the successful relationships they have fostered with a diverse network of outside organizations in order to communicate the many benefits of saving energy.

In the residential programs, the PAs engage with local trade allies, municipalities, community organizations and other appropriate and highly visible outside organizations to deliver information about program opportunities, and to target specific customer segments. PAs establish these relationships, both on a statewide-level and as individual entities working within their communities, to ensure the visibility and success of their programs.

PAs partner with local trade allies such as the Building Performance Institute (“BPI”), Northeast HERS Alliance, Southern Middlesex Opportunity Council’s (“SMOC”) Green Jobs Academy, Plumbing – Heating – Cooling Contractors Association (“PHCC”), International Association of Plumbing and Mechanical Officials (“IAPMO”) and Air Conditioning Contractors of America (“ACCA”). PAs communicate with these trade allies by hosting, attending, and presenting at trade ally conferences and events, through the distribution of direct emails and newsletters, by advertising in trade publications, and through direct conversations

with PA program managers and/or service delivery vendors. For example, the PAs' annual GasNetworks® conference attracts hundreds of trade allies from the heating and cooling industry; the 2015 GasNetworks Conference was attended by nearly 400 contractors and industry representatives.

The PAs also actively collaborate with municipalities for geographic specific efforts such as Renew Boston, various municipal-specific Memoranda of Understanding and grant programs, the Nantucket Non-Wires Alternative effort, and partnerships with city and town planning boards and redevelopment authorities.

PAs collaborate with community organizations to ensure energy efficiency is being talked about where people gather in their daily lives. The community action agencies that administer the PAs' income-eligible energy efficiency programs work with multiple community organizations to create partnerships that ensure the success of programming for low-income families. The specific organizations vary from town-to-town; however, typical alliances include the local United Way, Goodwill, Salvation Army, veterans groups, school districts, fuel assistance providers, civic associations, food pantries, shelters, and community development corporations. Community action agencies, by design, engage local resources to increase awareness among qualifying members of their communities of the various program offerings, including the PAs' income eligible programs. Additionally, each year the PAs participate in statewide social service agency meetings, typically held in October, to present to several hundred social service providers to inform them of program offerings.

The residential education fundraisers held in dozens of Massachusetts public and private schools each year help schools raise funds while teaching students about energy efficiency and conservation. Schools receive free educational materials, hands on demonstrations, and support from fundraising coordinators. PAs also answer the needs of their local schools in additional ways, such as in-classroom educational opportunities that educate students on saving energy while promoting the programs to parents.

The PAs also attend and/or sponsor events relevant to their individual communities in an effort to educate people on the programs and energy efficiency in general. Examples include collaborations with local farmer's markets, community centers, civic associations, hospitals, fire-stations, Earth Day and sustainability celebrations, city and county fairs, seasonal festivals, home shows, real estate organizations, media outlets, colleges and universities, hazardous waste/appliance turn in events, and youth baseball teams.

In the commercial programs, the PAs have found that delivery is enhanced when they partner with a variety of organizations that serve, and are respected by, various business actors. For example, the PAs have partnered with the Massachusetts Lodging Association to promote LED room and common area lighting, and the Massachusetts Bankers Association to promote financing for efficiency programs. A listing of the organizations where the PAs have engaged members, either through training and education or joint promotions, in recent years includes BOMA/Boston, the Greater Boston Real Estate Board, the Boston Green Ribbon Commission, Boston Green Tourism, the International Facility Management Association ("IFMA"), Boston

Chapter, Massachusetts Restaurant Association, Municipal Solid-State Street Lighting Consortium (“MSSLC”), and the Northeast Sustainable Energy Association (“NESEA”).

In addition, PAs constantly engage in outreach to local community business groups – chambers of commerce, downtown business alliances, and local economic development and revitalization organizations – to advise them of programs and services available to their constituencies. For more information on C&I engagement strategies, please see the section titled “Education and Training for Customers, Trade Allies, and PA Staff and Contractors” in the C&I Retrofit program description in Section III of the Plan.

#### L. **PA-Specific Programming**

The PAs strive for consistency in program offerings with the goal that customers across the Commonwealth can take advantage of comprehensive energy efficiency services. In some instances, however, individual PAs may provide additional services or unique incentive structures that are specific to their territory. These offerings may be specifically related to the unique characteristics of a service area, or may be developed based on unique conditions in that territory, such as gas constraints or reduction in expense related to very large capital improvement projects. They may also be based on the governing structure of a PA, such as the Compact, which has a distinct role as a municipal aggregator. Finally, these efforts may be run as a test case by one PA, with the idea that the programming could be rolled out across PAs if proven successful and cost-effective. Please see Appendix L for information on PA-specific initiatives.

The PA-specific initiatives set forth in Appendix L represent proposals of only the Program Administrator making the proposal. They do not constitute proposals that have been reviewed and agreed to by all PAs, and PAs may have divergent views on the materials contained therein. All PAs reserve their right to comment on these proposals in the future, and the inclusion of these materials does not constitute the consent of any PA to any other PA’s specific initiatives or proposals.

#### IV. STATEWIDE BUDGETS, SAVINGS, AND BENEFITS

##### A. Development of Goals

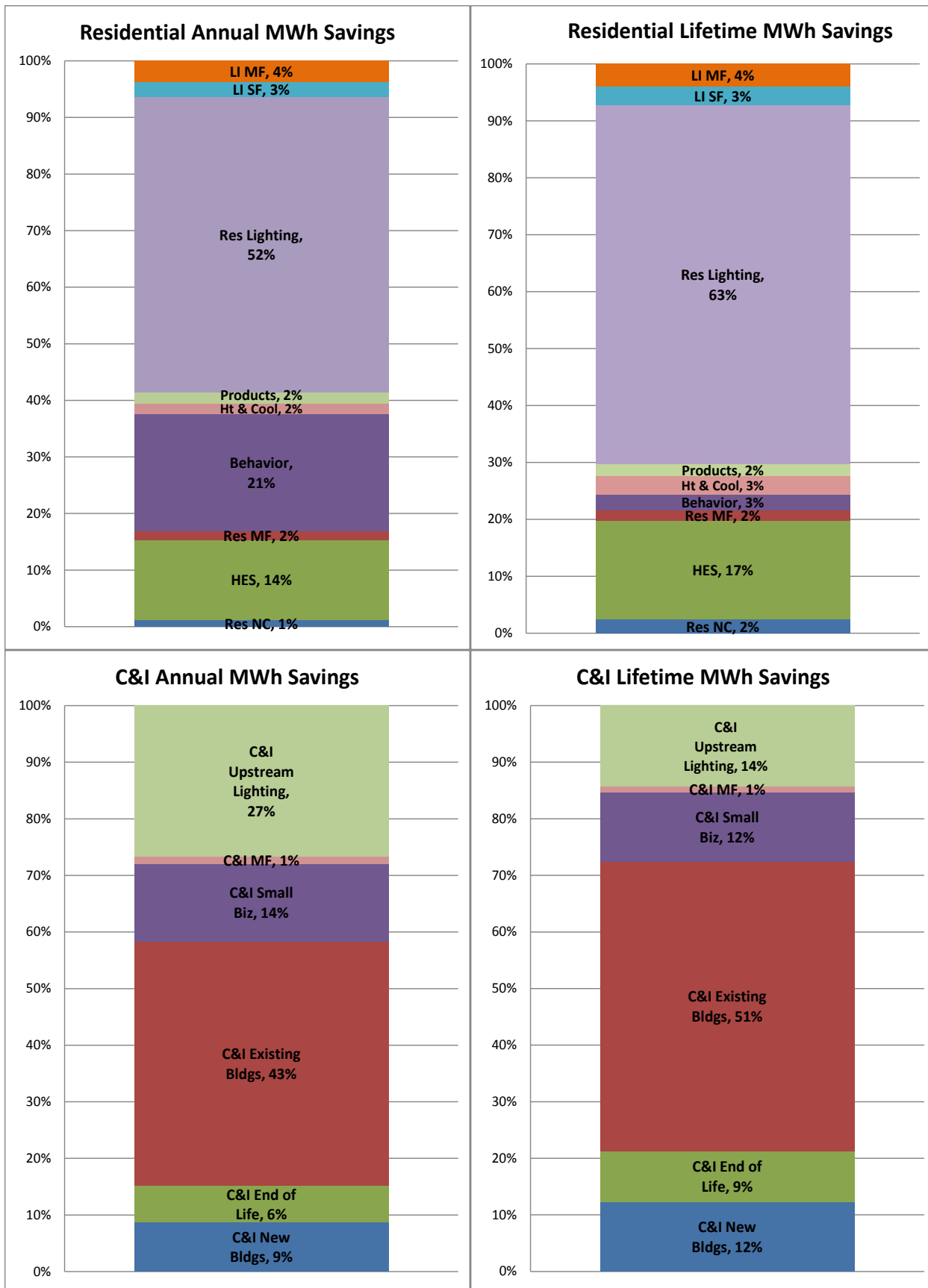
###### 1. Introduction

The PAs engage in a highly collaborative and detailed planning process for setting savings goals and budgets. Programmatic decisions that inform savings goals and budgets are made both at the individual PA level and at the statewide level, including work by the respective management committees, which facilitate ongoing stakeholder input, continuous sharing of best practices, and consistency of offerings among the Program Administrators. While ultimately the results associated with development of a PA's plan are PA-specific and the planning process for savings varies for each program and initiative, certain common processes apply to instruct the development and to facilitate regulatory review.

###### 2. Electric Statewide Budget, Lifetime Savings, Annual Savings, and Benefits

STATEWIDE ELECTRIC BUDGETS (\$)	2016	2016-2017	2016-2018
Residential	\$ 261,977,427	\$ 532,392,444	\$ 807,639,970
Low-Income	\$ 67,526,840	\$ 135,506,340	\$ 203,237,116
Commercial & Industrial	\$ 269,276,486	\$ 552,122,527	\$ 846,699,254
Total	\$ 598,782,770	\$ 1,220,021,310	\$ 1,857,576,341
Annual Savings (MWh)	2016	2016-2017	2016-2018
Residential	627,236	1,211,113	1,739,994
Low-Income	40,615	79,837	118,051
Commercial & Industrial	703,733	1,453,127	2,259,494
Total	1,373,600	2,744,076	4,117,539
Lifetime Savings (MWh)	2016	2016-2017	2016-2018
Residential	4,691,711	9,166,815	13,319,806
Low-Income	354,457	695,416	1,040,323
Commercial & Industrial	7,766,005	16,343,042	26,023,915
Total	12,814,189	26,205,274	40,384,044
Benefits (\$)	2016	2016-2017	2016-2018
Residential	\$ 834,455,777	\$ 1,646,070,369	\$ 2,428,670,457
Low-Income	\$ 114,662,979	\$ 229,332,149	\$ 344,859,874
Commercial & Industrial	\$ 1,092,059,160	\$ 2,230,507,497	\$ 3,441,099,805
Total	\$ 2,041,179,932	\$ 4,105,910,016	\$ 6,214,630,136

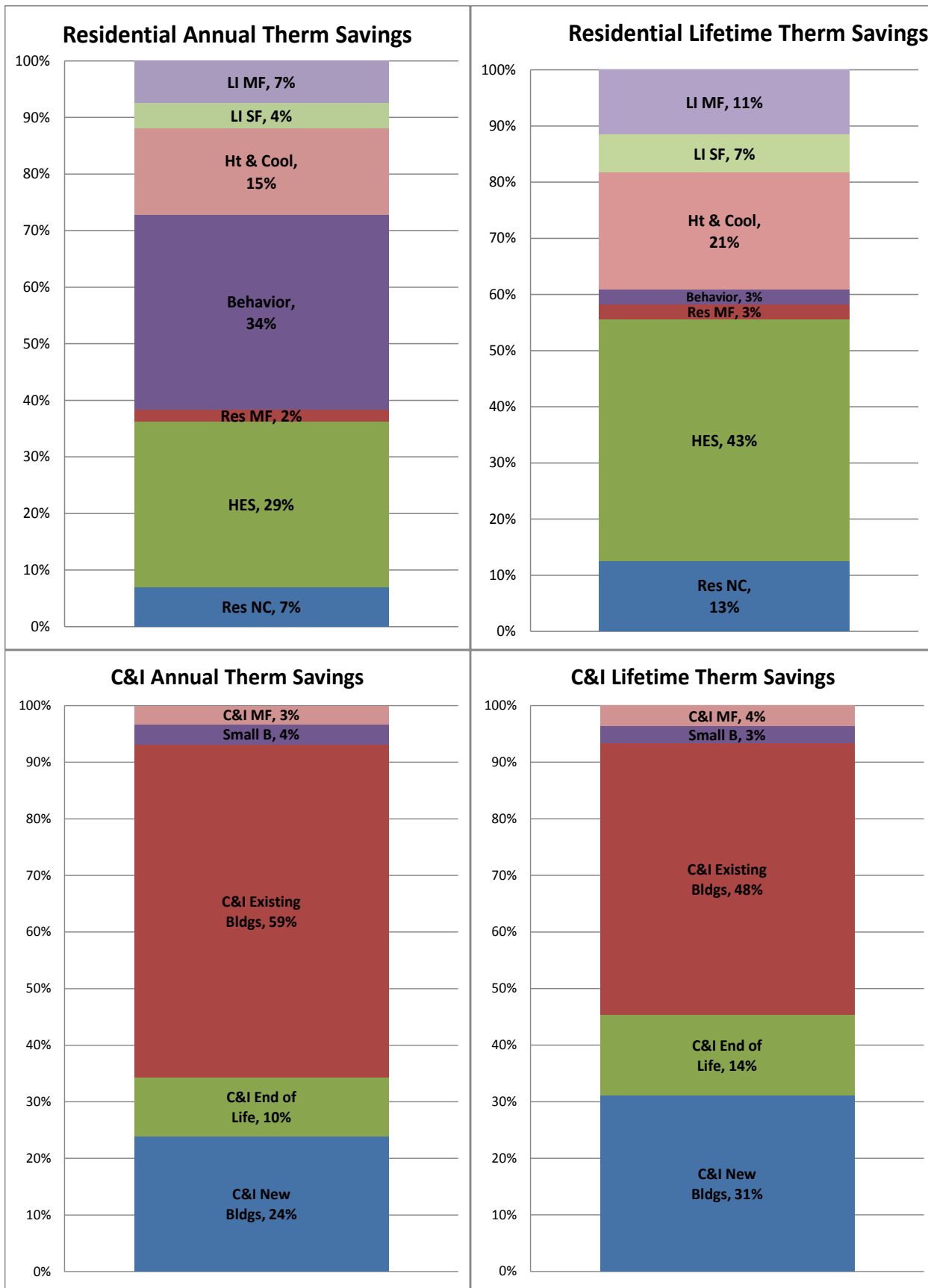
Statewide tables reflect aggregated proposals of the individual Program Administrators.



3. Gas Statewide Budget, Annual Savings, Lifetime Savings, and Benefits

STATEWIDE GAS BUDGETS (\$)	2016	2016-2017	2016-2018
Residential	\$ 128,380,576	\$ 259,637,085	\$ 395,105,545
Low-Income	\$ 44,552,694	\$ 89,541,179	\$ 135,176,393
Commercial & Industrial	\$ 43,935,544	\$ 88,828,956	\$ 135,271,340
Total	\$ 216,870,831	\$ 438,007,220	\$ 665,553,278
Annual Savings (therms)	2016	2016-2017	2016-2018
Residential	15,104,655	30,290,057	45,811,092
Low-Income	2,054,911	4,116,576	6,192,807
Commercial & Industrial	10,935,286	22,192,599	33,805,720
Total	28,096,868	56,599,232	85,809,618
Lifetime Savings (therms)	2016	2016-2017	2016-2018
Residential	179,262,960	360,874,385	549,588,369
Low-Income	40,776,119	81,679,742	122,879,250
Commercial & Industrial	156,269,870	314,561,637	476,743,765
Total	376,310,966	757,115,763	1,149,211,383
Benefits (\$)	2016	2016-2017	2016-2018
Residential	\$ 303,860,365	\$ 607,629,997	\$ 919,013,200
Low-Income	\$ 78,097,881	\$ 156,091,236	\$ 234,635,623
Commercial & Industrial	\$ 164,170,127	\$ 327,545,874	\$ 493,018,107
Total	\$ 546,130,390	\$ 1,091,267,106	\$ 1,646,666,930

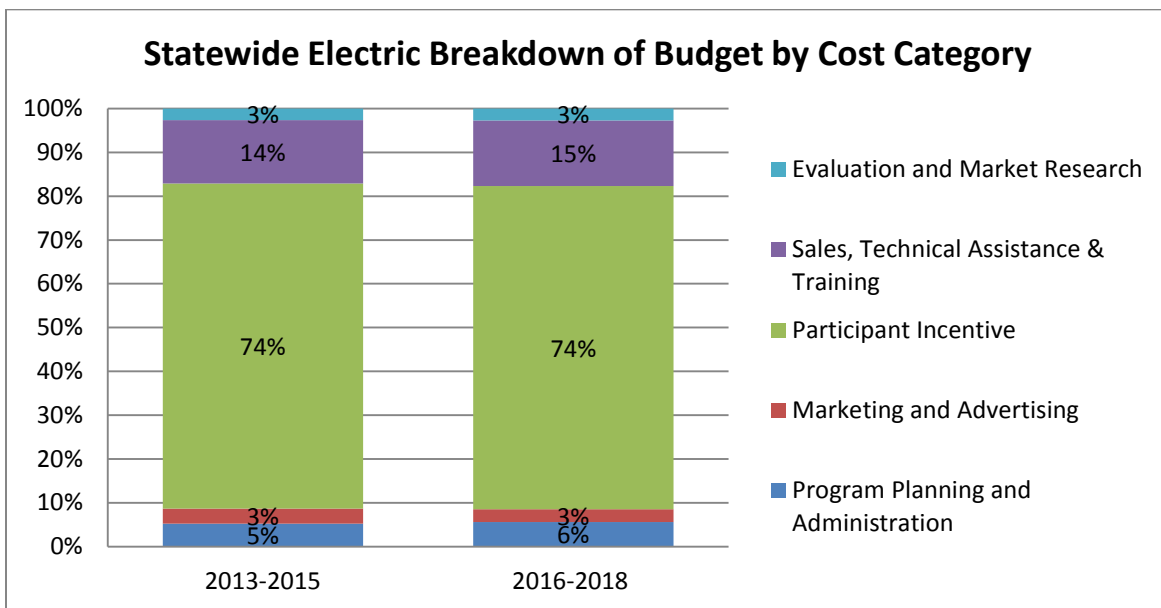
Statewide tables reflect aggregated proposals of the individual Program Administrators.

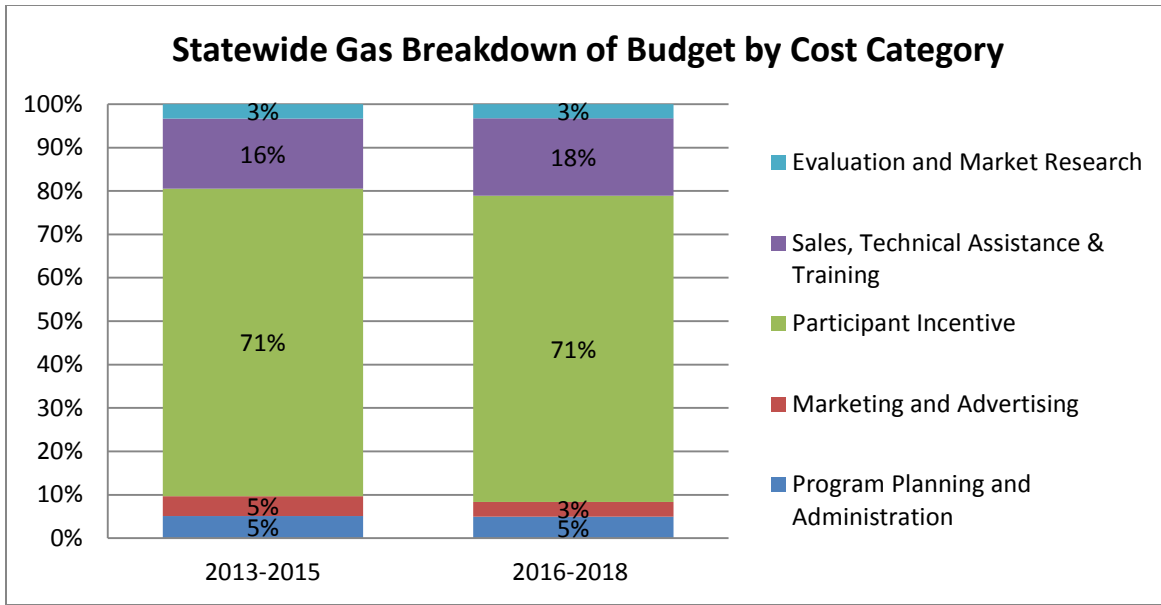




#### 4. Breakdown of Budget by Cost Category

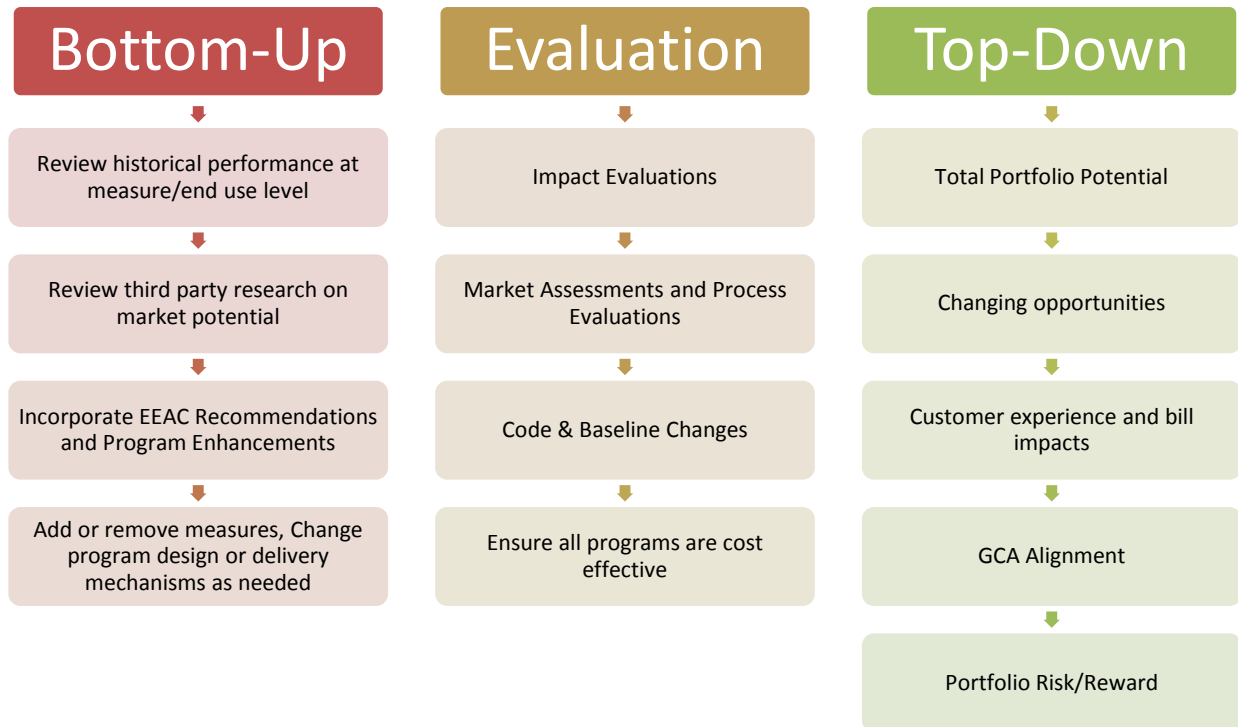
The majority of energy efficiency budgets are delivered directly to customers in the form of incentives that are intended to overcome the financial barrier to investment. In the 2016-2018 Plan, 74 percent of the electric and 71 percent of the gas budget is delivered directly to customers through use of participant incentives. These incentives drive customers to participate and are one of the underlying reasons the programs have been able to achieve historic savings levels. Approximately 15-18 percent of the PAs' costs are budgeted in the Sales, Technical Assistance & Training cost category, supporting the activities of vendors, contractors and other industry professionals. These investments are driving job creation and the evolution of a green economy in the Commonwealth. Approximately 3 percent of the statewide budget is dedicated to the rigorous Massachusetts Evaluation, Measurement and Verification process. Other administrative functions, like Program Planning and Administration and Marketing and Advertising, make up approximately 8-9 percent of the statewide budget. These percentages are in line with historical averages, demonstrating that the Program Administrators have been able to significantly grow their energy efficiency portfolios while keeping administrative costs low and maximizing the value of the programs for participating customers.





#### 5. Process to Determine Goals

The development and determination of the proposed statewide and Program Administrator-specific savings goals takes into account an assessment of savings opportunities in individual PA service areas (bottom-up), consideration of evaluation study findings, and a collaborative consideration of statewide policy objectives that balances savings goals and the consideration of high level energy efficiency costs that are deemed acceptable (top-down). The bottom-up process involves determining savings by measure, including projected quantities and customer incentive amounts for every piece of equipment, type of technology or program service. The top-down process looks at the portfolio as a whole, evaluating the potential for achieving higher goals given markets in which the programs are operating, subject to overall cost. The impact of evaluation results are considered in both bottom-up and top-down planning and may drive other adjustments. The process to determine goals must be and is fluid, flexible and iterative, taking into account information that the PAs learn throughout the planning process related to program design, evaluation, costs and other factors.



The 2016-2018 Plan seeks to capture all available cost-effective energy efficiency for the three-year period beginning January 1, 2016, taking into account many competing considerations, including, but not limited to, bill impacts, cost-efficiency, integrated program delivery, economic and environmental benefits, efforts focused on innovation, and the need to establish as “integrated” effort that can be “sustained” over time, as laid out in the Green Communities Act. G.L. c. 25, § 22(b). Determining sustainability requires the PAs to examine the capability of vendors and contractors as well as that of the PAs themselves to respond to expanded programs, retain a capable workforce over time, and avoid large fluctuations in bill impacts.

The PAs also engaged in detailed discussions with stakeholders to help determine the appropriate budgets and goals for 2016-2018. Following the July 21<sup>st</sup> Resolution of the Council, the PAs collaborated with the Executive Office of Energy and Environmental Affairs (“EEA”), the DOER and the Attorney General, along with the Council’s consultants, to further discuss goals, budgets, and key priorities. As a result of these discussions, the PAs, EEA, DOER, and the Attorney General were able to agree upon the Term Sheet. See Appendix D. The Term Sheet sets forth fundamental core goals for 2016-2018 that have served as a guide for the PAs in developing this Plan. The Term Sheet was developed and agreed to after extensive information sharing between these parties, and a general acknowledgement that there is no exact formula for determining all available cost-effective energy efficiency, that the Department must consider bill impacts, and that the GCA encourages consensus building among the PAs and the Council. Following feedback from the Council on the Term Sheet, the PAs revised electric annual savings to include an upward trajectory, taking into account the Council’s desire to set a national example of continued commitment to energy efficiency in Massachusetts, while recognizing that overall results across the entire three-year period will be the measure of success.

The final statewide and PA-specific goals set forth in the Plan represent the effort of each PA over many months reviewing available measures and technologies, efficiency standards, avoided costs, past performance, evaluation studies, potential studies, cost drivers, and many other elements and considerations that go into planning, as well as extensive discussions and consensus-building with stakeholders and the Council to reach goals that represent all cost-effective energy efficiency, taking into account sustainability and bill impacts in accordance with the GCA.

*a. Bottom-Up Planning*

The planning process varies for each program and initiative. For example, the budgeting process for the core initiatives contained in the Residential Products program is measure-specific and driven by the number of rebates expected to be issued. Other initiatives take a whole-house approach with planning by projected audits, homes, or customer sites. Regardless of the approach, the PAs typically begin each planning process by examining historical data to gain insight into participation trends, savings achieved, and costs to achieve these savings. The PAs also examine any forward-looking data, such as new federal efficiency standards, third-party research on consumer adoption of new technology, and new avoided costs determined through a regional Avoided Energy Supply Cost study. See Appendix J. The PAs then collaborate to decide what changes, if any, need to be made to program offerings. For example, the PAs may decide to discontinue measures that have become standard efficiency practice, or to add new measures and services in response to improved technologies or identified consumer needs, subject to consideration of cost-effectiveness.

These types of overarching decisions are done at the statewide level at the respective management committees, ensuring input from all stakeholders and continuous sharing of best practices, and facilitating consistency of offerings among the Program Administrators. Each PA uses this information to develop a forecast of sustainable delivery in its unique service territory. PAs also consult their vendors to support or augment their forecasts based on field experience and what is in the vendor's queue, as well as talk to manufacturers and contractors for insight into workforce and technology availability and limitations.

*b. Top-Down Planning*

While bottom-up planning focuses on what is reasonable for each individual measure, top-down looks at what is reasonable and achievable for the portfolio as a whole. This includes examining impacts to the overall markets that the programs are targeting as well as cost implications to customers.

One of the tools that Program Administrators use in top-down planning is potential studies, which help PAs to better understand the long-term availability of energy efficiency savings within their territory and give insight into three key pieces of information.

- *Technical Potential* is defined as the *complete* penetration of all measures that are feasible given current technology limitations without consideration of cost or likely consumer acceptance.

- *Economic Potential* refers to the subset of *technical potential* that is cost-effective when compared to supply-side alternatives.
- *Achievable Potential* refers to the amount of savings potential that is attainable given actual program infrastructure and societal and market limitations.<sup>102</sup>

The PAs use the results of potential studies to understand the achievable, cost-effective potential opportunity over a period of years. This information helps the PAs to set savings goals in the Plan that are sustainable in the long run, and take into account not only what is available and cost-effective, but also how willing and able customers are to adopt energy efficiency measures. Several PAs have performed new potential studies in advance of the 2016-2018 Plan. The results of those studies, and the lessons learned, have been shared among all PAs so that each PA can learn from these studies.

### c. *Evaluation Results*

As noted above, PAs also look at EM&V results to inform proposed goals. As part of the statewide EM&V framework, the PAs collectively conduct many different types of evaluation studies. Each type of study serves a different purpose in the planning process, as outlined below.

- *Impact Evaluation* refers to the measurement of net or gross savings achieved within overall program populations. Results from these studies typically show impacts at a detailed measure or end-use level and assist the Program Administrators with their bottom-up approach to planning.
- *Market Evaluation* refers to the measurement of the effects that programs have on the structure and functioning of their target markets. This type of evaluation is useful in top-down planning and in consideration of projected net-to-gross ratios used to derive net savings.
- *Process Evaluation* refers to the systematic assessment of programs for the purpose of documenting their operations and developing recommendations to improve their effectiveness. This evaluation can be useful for both bottom-up and top-down planning.
- *Market Characterization or Assessment* refers to the systematic assessment of energy efficiency markets for the purpose of improving the effectiveness of programs targeting those markets. These types of evaluation studies are most often used to guide implementation strategy. For example, the results from a market evaluation study may help the PAs understand that the market for certain technologies is saturated and that the PAs need to plan to incentivize newer technologies to meet the needs of an evolving market. Again, this evaluation can be useful for both bottom-up and top-down planning.
- *Evaluation of Pilots* refers to EM&V activities intended to assess the effectiveness of pilot programs and demonstration projects, determine their potential for full-scale implementation, and develop recommendations for any changes in program approach.

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<sup>102</sup> Potential definitions are based on ACEEE definitions available at <http://aceee.org/topics/efficiency-potential-and-market-analysis>.

In advance of the 2016-2018 Plan, the PAs completed 25 new studies, in addition to other studies that have been filed in previous Plan-Year Reports. These new studies include a wide range of evaluation topics in the residential, low-income, C&I, and cross-sector evaluation areas. A summary of each of these studies is included in the Plan at Appendix T, and the full set of studies is available at Appendix U.

*d. Cost Drivers*

A final step in goal setting is to assess the cost impact of the programs in support of “right sizing” proposed budgets. The Program Administrators’ statewide energy efficiency programs have evolved significantly since the development of the first Three-Year Plan in 2009. In part as a result of their success, the Program Administrators are currently facing a new series of challenges – changes in projected program costs and the hurdles associated with achieving historically high savings levels on a sustained basis after having already had notable success in penetrating markets.

To address these challenges and deliver the most cost-effective energy efficiency programs to their gas and electric customers, the Program Administrators seek to develop a thorough understanding of current and future cost drivers and savings levels for their proposed energy efficiency programs. Each Program Administrator is affected differently by each cost driver, and variations in savings goals and the cost to achieve these goals are to be expected due to unique characteristics in service territories. Building demographics, income types, fuel type, economic conditions, and population demographics vary widely across each PA’s service territory and influence how each PA plans to set and achieve its goals.

From 2009-2011, the cost to achieve savings for electric energy efficiency programs throughout the state was trending down.<sup>103</sup> During that same period, the cost to achieve savings for gas programs was trending upwards. From 2012-2014, the cost to achieve savings for electric and gas energy efficiency programs throughout the state has been relatively stable with a modest increase for gas programs. The PAs project the cost trend for 2016-2018 will be upwards.<sup>104</sup> This trend reflects continued market penetration and the expectation that savings per participant are expected to decline. That means that although the number of customers to be served in 2016-2018 is likely to be greater than the number served in 2013-2015, the average savings per participant will be lower in 2016-2018 when compared to 2013-2015. These trends are also influenced by increasing costs due to a shift to a more expensive measure mix (*e.g.*, moving from rebating inexpensive CFLs to more expensive LEDs), by decreasing levels of savings due to changes in codes and standards, and by impact evaluation findings that have

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<sup>103</sup> The PAs note that the costs and savings of large, one-time projects can skew the historical costs to achieve savings, often making the costs appear lower than the average. Because large projects are not typical or replicable, they should not be included in the planning process to estimate budgets or savings, or when calculating costs to achieve savings, without careful analysis and appropriate adjustments. For example, some PAs had large CHP projects in 2011, making the cost per kWh appear to decrease in 2011 compared to previous years. When excluded, however, costs were relatively flat.

<sup>104</sup> “Cost to achieve” is typically discussed in terms of net savings. Net to gross factors are only updated at the beginning of a three-year term and their impact may therefore be more pronounced when looking at differences between two different Three-Year Plans.

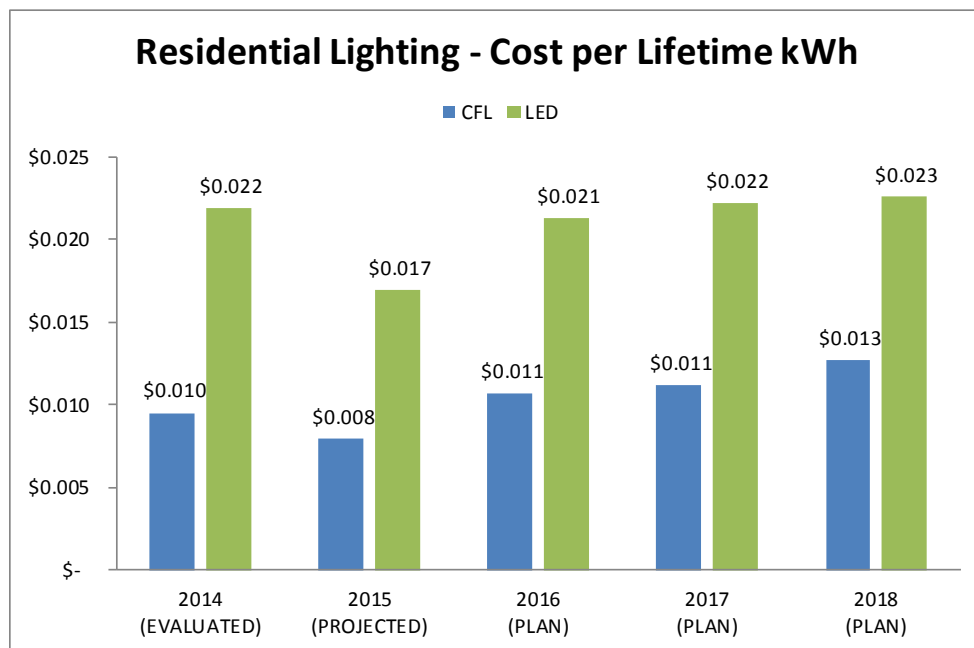
caused the PAs to temper their expectations about savings achievable in some initiatives. Additional details on key cost driver considerations include the following:

- **Codes and Standards** – As federal and state codes and standards become increasingly rigorous, the amount of incremental savings from installing energy efficiency measures decreases (unless the efficiency of the program measures rise as well). This decrease in savings results in a higher cost per unit of savings. Codes and standards that are posing a pronounced challenge to program savings include EISA lighting standards, federal water heater standards, a new 2015 User Defined Reference Home, adoption of the 2015 International Energy Conservation Code for new building construction and renovation, and federal heat pump standards, all of which raise baselines and reduce the savings the PAs can claim.
- **Going Deeper and Broader** – Another factor that is impacting the cost to achieve in this Plan is the need for new approaches to drive customer participation. As certain programs begin to saturate markets, PAs must find ways to encourage participation in more difficult, and often more expensive to reach, markets. New approaches for 2016-2018 include enhanced focus on encouraging renters to participate in the HES core initiatives, offering augmented incentives to consumers whose income is 61-80 percent of the statewide median, planning for weatherization jobs for oil-heated multi-family participants in the Residential Whole House program and the Low-Income Whole House program, which can lead to an increase in benefits for electric PAs (but do not increase electric savings).
- **Cost-Effectiveness Limitations** – The 2015 Avoided Cost Study found that with declining natural gas prices, the benefit of gas savings was reduced throughout the Commonwealth. Lower benefits can make it more challenging for measures to be cost-effective; as a result, some measures, and even entire initiatives, may have to be discontinued to retain program cost-effectiveness. The result is that PAs have fewer options available to them to attain savings, and this reduction in flexibility and program reach increases the cost to achieve savings.
- **Low-Income Funding** – Historically, the Program Administrators have partnered with the Community Action Agencies that receive funding from the federal Weatherization Assistance Program (“WAP”) to deliver programs to income-eligible customers. Going forward, however, the availability of WAP funding will be sharply reduced due to national program cuts, and the Program Administrators will need to fund a greater portion of each project when providing services to this important sector.
- **Unique Service Area Drivers** – Despite consistent program offerings, some variations among PAs in savings goals and costs to achieve are appropriate due to the unique characteristics of each PA’s service territory and the goal of fostering creativity among PAs. Each PA has a distinct mix of customers and sectors, which affects energy efficiency programs in different ways. Each PA has unique demographics, with different mixes of building types, income types, fuel types, fuel constraints, economic conditions, and population density. Reasonable variances among PAs are appropriate, consistent with sound regulatory policy, the GCA, and previous recognition of PA differences.

*e. Cost to Achieve Example*

One initiative that is experiencing multiple simultaneous impact challenges is Residential Lighting. Historically, this initiative, an upstream buy-down delivery model, has been a relatively low-cost opportunity to achieve energy savings. However, a combination of factors, including continued implementation of federal EISA standards, a shift from rebating inexpensive compact fluorescent bulbs to more expensive LEDs, and an anticipated increase in free-ridership in each of the three plan years, has put significant upward pressure on the cost to achieve savings.

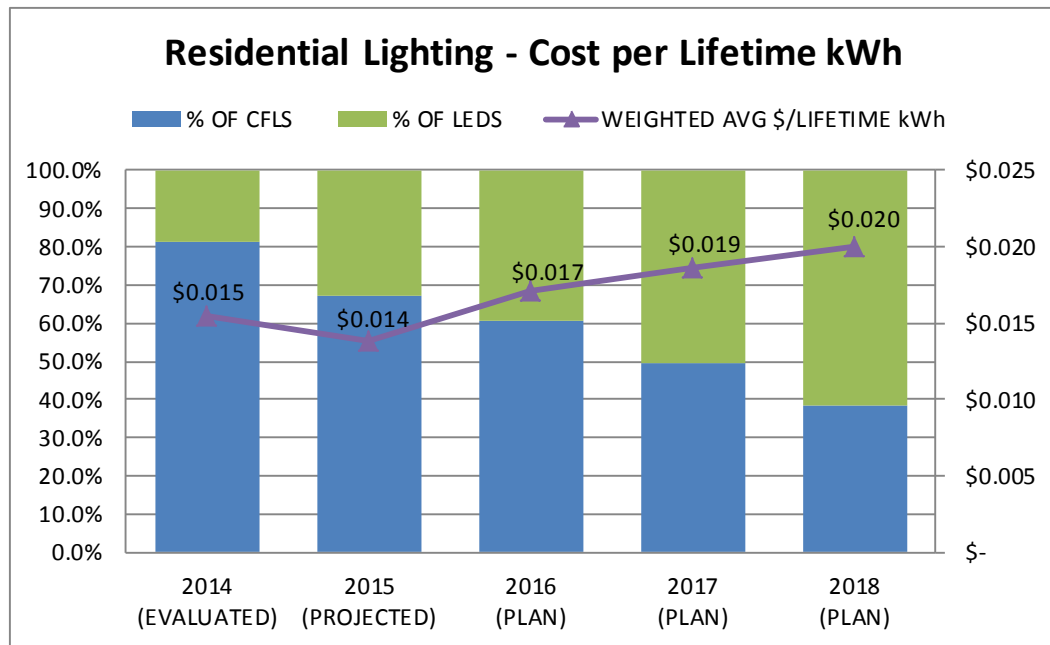
The first graph below shows the comparison in rebate cost per lifetime kWh saved between CFL lamps and LED lamps that are being impacted by code changes in the Residential Lighting initiative. While PAs have anticipated and planned for declining CFL and LED costs in each year, the net lifetime savings for each type of bulb are also decreasing in each year. LEDs remain nearly twice as expensive per lifetime kWh saved as CFLs.<sup>105</sup> The second graph below shows the statewide allocation between CFLs and LEDs, and the significant shift to LEDs in each year.<sup>106</sup> In 2014, LEDs made up approximately 19 percent of total lamps rebated in this initiative. By 2018, PAs anticipate that LEDs will make up over 60 percent of this total.



<sup>105</sup> Note that the 2015 projections use the 2014 evaluation factors as an estimate for this example. The evaluation factors that will ultimately be applied to 2015 will differ from both the 2014 evaluation factors and the assumptions made for the 2016-2018 Plan.

<sup>106</sup> The numbers in the graphs reflect the estimated amount of A-Line CFL and LED bulbs that are expected to be sold over the term.





- Adoption of EISA Standards:** In 2014, the average lifetime of LEDs and CFLs was eleven and six years, respectively per the Massachusetts TRM. In the 2016-2018 Plan, the average lifetime of LEDs and CFLs drops to eight and four years, respectively. In the graph above, the impact is shown most clearly in the decrease in lifetime savings between 2014 and 2016.
- Market Shift:** The market is shifting away from CFLs toward LEDs. However, as shown in the graph above, LEDs yield approximately twice the lifetime savings as CFLs but at worst (the constant scenario) cost over six times as much per lifetime kWh and at best (the decline scenario) cost nearly twice as much per lifetime kWh. Both scenarios show a marked increase over the 2014 cost of savings.
- Net-to-Gross Ratios:** As residential LEDs transition from a specialty application into a commercialized product, the PAs expect that free ridership will grow. Those customers who would have purchased LEDs whether or not the PA programs offered an incentive must be subtracted from the calculation of savings PAs claim from the lighting program. The PAs planned for 2016-2018 with an assumption that free-ridership for LED purchases within the lighting program would be 10 percent in 2016 and increase 10 percent each year through 2018. In the graph above, the impact is shown in the decrease in lifetime savings from 2016 to 2018.
- Combined Impact:** Considering all the factors listed above, by 2018, the PAs will need to rebate 2.7 times the number of LEDs and 1.25 times the CFLs just to equal the lifetime savings achieved in 2014.

This example shows the interplay of just two measures in a single initiative. While these are particularly sensitive measures, changes like this are becoming more common across dozens of measures within the PAs' portfolios. The PAs must continually refine cost and savings

assumptions throughout the planning process, working to balance innovation and deeper savings with cost increases.

*f. Unique Service Area Drivers*

The Program Administrators have successfully worked together to provide comprehensive, statewide programs that are available for all customers across service territories. Despite these consistent program offerings, some variations among PAs in savings goals and costs to achieve are appropriate due to the unique characteristics of each PA's service territory.

Each PA has a distinct mix of customers and sectors, which affects energy efficiency programs in different ways. Each PA has unique demographics, with different mixes of building types, income types, fuel types, fuel constraints and population density. For example, the service territory of one PA may have a smaller percentage of commercial customers than the statewide average, and thus may not be able to benefit from the higher savings opportunities that tend to correspond with that customer segment. Similarly, a PA may serve a lower-income population, which is more expensive to serve. In setting their goals, each PA has used their knowledge of their unique service territory to design programs that best meet the needs of their customers, and all PAs are committed to achieving all available cost-effective energy efficiency in accordance with the GCA. The Council and the Department should continue to support reasonable variances among PAs, consistent with sound regulatory policy, the GCA, and previous recognition of PA differences.

Several PAs have conducted potential studies to look at the unique characteristics of their territories and customers. Those studies have confirmed the existence of real and reasonable variances among PAs, and are attached at Appendix M. Maps reflecting the service territories of each PA are attached at Appendix N.

In this Plan, Berkshire, Liberty, Unitil and Cape Light Compact are proposing aggressive savings goals that are tailored to the conditions within, and the characteristics of, their service areas in compliance with the GCA's mandate to acquire all cost-effective and sustainable energy efficiency. Some PAs have included presentations outlining the unique challenge in their specific service territories that justify variations from statewide targets in Appendix O. The Term Sheet recognizes the need for PAs with unique service territory characteristics to have flexibility from statewide targets and have determined their goals are appropriate. Reasonable variances in savings and goals that reflect the unique strengths and challenges among service areas are entirely appropriate.

*g. Conclusion*

The development of the proposed statewide and Program Administrator-specific savings goals involved a detailed review of energy efficiency opportunities and costs from all angles. This analysis included a bottom-up approach to assess savings opportunities by measure, a top-down look at savings potential and costs, consideration of evaluation study findings and other market changes, and statewide policy objectives. Additionally, development of goals for 2016-2018 was influenced by collaborative discussions with EEA, the DOER, the Attorney General, and the Council's consultants to better understand key savings and costs drivers across

the Commonwealth, taking into account sustainability of delivery efforts and bill impacts. Using all of these methods, the Program Administrators were able to develop and determine savings goals to achieve all available cost-effective energy efficiency that have ultimately received the approval and support of the Council.

## 6. Common Assumptions

### *a. Overview*

By reviewing all assumptions included in the development of this Plan and harmonizing them to the greatest extent practicable, the PAs have been able to reduce variances among themselves. This review has allowed the PAs to collectively provide the best available data in the most consistent manner.

The Program Administrators have common program designs, and continuously work together to develop assumptions and apply those assumptions in the RMC, C&IMC, low-income best practices, Evaluation Management Committee, common assumptions working group, and other PA working groups and discussions. Additionally, PAs have worked to harmonize assumptions related to the calculation of savings and benefits. They have developed a set of definition guidelines that guide each PA's participant calculation in order to be able to review participants in a consistent manner.

The PAs have confirmed common approaches to various cost and savings data and have determined collectively the manner by which evaluation results are applied, including non-energy impacts. Specific program assumptions have been accounted for uniformly, and algorithms will be applied in the same manner across PAs, with such assumptions set forth in the TRM. The PAs have also reviewed the 2015 AESC study in order to ensure that all avoided costs are applied in the same manner. Transmission and distribution costs have been updated and inflated consistently.

Additionally, PA cost categories are now consistent as described in more detail in Section III.B.

### *b. Participant Definitions*

Participant definitions are common for all electric and gas PAs. These definitions are designed to more accurately reflect unique participants in each program and core initiative, and continue to be refined over time. The definitions that the PAs have used for participants in this Plan are set forth in Appendix P. Using these common definitions, the PAs have worked together to determine how best to apply them to estimate the number of participants for this Plan in a consistent manner. In some instances, variances in participant numbers or table columns such as costs per participant may not reflect true differences. This is because the definitions of participants require some assumptions, which may have been chosen for a particular reason, but may not make as much sense for another purpose. For instance, in HES - Measures, the definition is "Unique Account Number for a customer with at least one major measure installed." At this point in time, "major measure" only includes air sealing and insulation for most PAs. This definition was chosen to help approximate HES closure rates. However, many other

measures, such as upgraded heating systems, early replacements of boilers, duct sealing, and Wi-Fi thermostats have material savings and costs and thus may be considered to be “major.” Without these included, at first glance it appears that the cost per major measure is high, but the reality is that many other measures are installed for additional customers.

The category of participants reflects an approximation of customers who participate in individual core initiatives. If an individual customer participates in more than one program or core initiative, that customer will be counted as a participant in each core initiative. Therefore, the number of participants does not correspond directly to the number of unique customers participating in any program for a particular PA or across PAs. This is complicated by overlap between PA territories and by program delivery models, such as upstream, which do not get delivered to a customer, but rather work through manufacturers and distributors. The PAs are using Customer Profile Studies to better understand customers participating in energy efficiency programs across core initiatives, fuels, and PAs. See Appendix T, Appendix U, and Appendix X for more information on Customer Profile Studies.

## 7. Updates to Tables

In preparation for the filing of the first Three-Year Plan, the Department convened a working group in D.P.U. 08-50 to review, among other things, draft data tables to be filed with the Three-Year Plan. The content and format of the tables were developed collaboratively through the course of many productive sessions convened by the D.P.U. 08-50 Working Group. The working group intended for the tables to serve as a quantitative anchor for the review of the ambitious programs set forth in the Three-Year Plan. The D.P.U. 08-50 tables have continued to provide useful data to the Department, Council, and stakeholders. In preparation for the 2016-2018 Plan, the PAs have reviewed these tables, along with the comments and suggestions made by stakeholders over the years, and have made revisions to the tables. The data tables prepared by each PA and attached hereto as statewide roll-ups at Appendix C reflect the updates and revisions that improve upon the D.P.U. 08-50 comprehensive tables. These updates clarify certain data points, and are presented in pivot table format to allow stakeholders to create various outputs using the data. Made in the spirit of the original D.P.U. 08-50 Working Group mandate, the changes take into account lessons learned since 2009. Specific changes to the tables include:

- Added a Master Data tab
  - This tab allows the PAs to input their data for use in the pivot tables.
  - Includes data for 2010-2014 (evaluated), and 2015-2018 (planned). Includes all gas and electric PAs.
  - Includes lifetime savings for other fuels, as well as gross savings for some types of savings.
- Added a Master Sector tab
  - This tab is similar to the Master Data tab, but only includes sector-level data that is needed for sales, outsourced costs, and historical comparisons.

- Added an Additional Sources tab
  - This tab serves as an introduction to the tables, and directs reviewers to where they can find additional information as well as information that is no longer included in the plan tables.
- Funding Tables
  - Removed the Other Funding table and added that information to the Additional Sources tab because the electric PAs assume no other funding sources for 2016-2018.
  - SBC: Removed columns indicating how SBC collections were allocated to each sector because, consistent with the EE Guidelines, SBC collections are allocated to each customer sector consistent with how the funds are collected from each customer sector. Therefore, the removed columns were redundant.
  - FCM: Edited the annual tables to be more flexible and therefore more accurate for each PA, because each PA adopts different FCM bidding strategies. Further, the previous version of the FCM table did not clearly indicate the kW bid and the clearing prices associated with each auction, so the edited version of the table is more transparent in this regard.
  - RGGI: Edited to better reflect: (a) the allowances and prices associated with auctions in each year, (b) the actual expected proceeds available for energy efficiency after accounting for other costs, and (c) the PA's annual receipt of RGGI proceeds from each auction.
  - Carryover: Edited to be the three years in total, rather than just 2015, to be consistent with streamlining efforts to view the plan in the three-year term construct.
  - EERF: Removed columns indicating how the low-income costs are subsidized by residential and C&I because each PA applies a different approach consistent with their PA-specific rate cases.
- Avoided Costs
  - Removed the Avoided Cost table and added that information to the Additional Sources tab because the PA-specific Benefit-Cost Screening Models better provide this information.
- Low-Income Allocation
  - Removed the columns that provided a comparison to the SBC, to better focus the reviewer on the GCA's requirement for low-income spending, which is unrelated to SBC collections.
- Competitive Procurement
  - This data is now presented for the total budget at the sector level, instead of by program and budget category. This done to better review the PA's procurement processes at a higher level.

- GHG
  - Added a table for greenhouse gas reductions, consistent with the 2013-2015 Term-Report Template.
- Master Sum
  - Removed the DRIPE column. Broke out Gas separately from other Resources. Removed lifetime capacity savings. Added propane, oil, and water savings instead of one sum of the three. Only shows annual savings.
- Other, Unused Savings/Benefits
  - Deleted columns for No. 4 Oil, Kerosene, and Wood, as well as lifetime kW and the summer and winter peak/off peak energy breakouts in the tables that they appeared in, because the PAs determined that these columns were either consistently unused or were no longer useful.
- Cost-Effectiveness
  - Combined the TRC Cost Summary table and the Cost-Effectiveness table into one table to streamline the data, because the two previous tables were providing similar information.
- Historical Comparison
  - Historical comparisons are reformatted based on how Pivot Tables can present data. The information included in the tables is consistent with previous table formats.
  - Revamped the historical benefits tables to match the edits in the benefits table and to streamline the reviewer's analysis of historical benefits.
  - Competitive procurement data is now presented for the total budget at the sector level, instead of by program and budget category. This done to better review the PA's procurement processes at a higher level.
- General Formatting
  - The table numbering (*e.g.*, IV.B.1) has been maintained from previous table formats even though some tables have been removed. This is to better allow comparisons to historical tables.
- Additional Filing Requirements
  - This tab includes the additional information requested in Question 2 of the Hearing Officer Memorandum regarding Additional Filing Requirements (10-2-2015). See Appendix X.

## B. **Budget Cost Categories**

### 1. Overview

Since the establishment of the GCA, the PAs have worked to develop common assumptions and definitions with respect to implementation of their energy efficiency programs.

Historically, due to their varying sizes and business models, the PAs have managed their programs in different ways. In the 2013-2015 Order, the Department directed the PAs to develop consistent definitions and methods of assigning costs across all five program implementation cost categories. 2013-2015 Order at 74. With respect to salaries, the Department directed PAs to report all non-administrative employee costs in the cost category that applies to the employee's job description. Id. With respect to vendor costs, the Department directed the PAs to develop uniform practices to the extent possible (noting tracking system differences), and, where limitations exist, to adopt reasonable alternative allocation methods based on cost-causation principles (actual factors underlying the incurrence of costs). Id. In accordance with the 2013-2015 Order, the PAs submitted a report on their progress towards meeting these requirements on July 31, 2014. In that report, the PAs noted that changes would be made for the 2016-2018 Plan.

## 2. Budget Category Definitions

PAs have refined the budget category definitions developed over the last several years in order to clarify certain details and to include additional details within the definitions. The statewide definitions used by all Program Administrators in this Plan are as follows.

**Program Planning and Administration** ("PP&A") - includes costs associated with developing program plans, including market transformation plans, R&D (excluding R&D assigned to Evaluation and Market Research), day-to-day program administration, including labor, benefits, expenses, materials, supplies, overhead costs, any regulatory costs associated with energy efficiency activities, database/data repository development and maintenance, sponsorships and subscriptions, and energy efficiency services contracted to non-affiliated companies, *e.g.*, outside consultants used to prepare plans, screen programs, improve databases and perform legal services. This category also includes internal salaries for administrative employees/ tasks, including program managers who do not have direct sales and technical assistance contact with customers.

**Marketing and Advertising** - includes costs for the development and implementation of marketing strategies and costs to advertise – through television, radio, billboards, brochures, telemarketing, web-sites and mailings – regarding the existence and availability of energy efficiency programs or technologies, and to induce customers or trade allies to participate in energy efficiency programs. These costs include internal salaries for employee functions related to marketing and advertising.

**Participant Incentives** - includes funds paid by the reporting Program Administrator to or on behalf of customers or trade allies as rebates or in other forms. Participant incentives includes costs that directly benefit customers, including permit fees, pre-weatherization expenses, repairs, and interest buy-down.

**Sales, Technical Assistance & Training** ("STAT") - includes administration, sales technical assistance and training costs to motivate: (1) customers to install

energy efficiency products and services; (2) retailers to stock energy efficiency products; (3) trade professionals to offer energy efficiency services; (4) manufactures to make energy efficiency products; and (5) use of vendor services and suppliers that demonstrate benefits of energy efficiency. This category also includes costs not directly tied to savings, including residential assessments, technical assistance studies, contractor fees and performance bonuses, vendor cost of money; lead vendor fees and internal salaries for employees with direct customer sales and technical assistance contact.

**Evaluation and Market Research** - includes costs associated with evaluation activities: costs related to cost-effectiveness evaluation, market research (*e.g.*, baseline studies, market assessments and surveys), impact and process evaluation reports, tracking and reporting program inputs and outputs, funding studies, and other costs clearly associated with evaluating the program. This category also includes internal salaries for employee functions related to evaluating the programs.

Costs are assigned to the relevant category within the relevant program, core initiative, or hard-to-measure program. For example, HES assessments are assigned to STAT in the HES-RCS core initiative in the Whole House program; similarly, all training is assigned to STAT in Workforce Development. Costs that cannot be assigned directly to a program are allocated among relevant programs on an appropriate basis and tracked accordingly.

### 3. Salaries

For the 2013-2015 Plan, Berkshire, CMA, Liberty, and NSTAR Gas assigned all salaries to PP&A, while National Grid Electric, National Grid Gas, NSTAR Electric, Western Massachusetts Electric Company, Unitol, and Compact reported all non-administrative employee costs in the cost category that applied to the employee's job description. In accordance with the 2013-2015 Order, all PAs have developed allocation methods based upon cost causation principles to assign expenses to the appropriate non-administrative budget category.

For PA staff performing multiple functions, which is a common practice for smaller PAs, employee salaries have been allocated across the appropriate budget categories based on the percentage of employee time spent on various functions within energy efficiency. Beginning with the 2016-2018 Plan, all PAs will treat salaries as follows: (1) assign salaries of staff performing a single function to the appropriate cost category in the appropriate program/sector (*e.g.*, the salary of an employee specializing solely in residential evaluation will be assigned to the Evaluation and Market Research category in all residential programs); and (2) assign salaries of staff performing multiple functions to multiple cost categories in multiple programs/sectors, as appropriate, based on an allocation for each employee in accordance with assigned job tasks.

One specific area in which PAs were not previously consistent was allocation of salaries for program managers. PAs have reviewed these differences and have determined that salaries of program managers with direct sales and technical assistance customer contact are appropriately allocated to STAT, while salaries of program managers without direct contact are more appropriately allocated to PP&A. For example, the salary of a C&I program manager who



works directly with customers will be allocated to STAT, while the salary of a residential program manager who does not deal directly with customers due to the lead vendor model will be allocated to PP&A.

#### 4. Vendor-Related Costs

The PAs have performed a detailed review of vendor costs and related cost categories to determine changes that need to be made in order to achieve consistency. PAs have developed a chart, attached at Appendix Q, showing vendor cost types and the related cost category to support consistency and serve as a guide going forward.

#### 5. Identification of Any Costs That are Difficult to Assign to One of the Five Cost Categories

At this time, the PAs have not encountered any costs that are difficult to assign to one of the five cost categories. All costs have been assigned based on type and function. The PAs will continue to review current and new costs as they come into the programs and assign appropriate cost categories.

#### 6. Continuous Improvement

The PAs recognize that there may be instances in which differences in cost categorization are discovered in the future, but are committed to consistency and continued improvement. The PAs have established consistent budget cost category definitions, determined methods for allocating salaries across cost categories, and harmonized vendor cost categorization, and are committed to continuing to review new costs and to seek and maintain consistency across PAs throughout the Plan term.

### C. Performance Incentives

On January 28, 2010, the Department issued the 2010-2012 Electric Order and 2010-2012 Gas Order (“2010-2012 Orders”) on the first Three-Year Plans. The 2010-2012 Orders approved most aspects of the performance incentive mechanism proposed by the Program Administrators in their 2010-2012 Plans.<sup>107</sup> However, for certain aspects of the proposal regarding the allocation method of the statewide pool and performance metrics, the Department ordered the Program Administrators to work further with the Council and re-file these components with the Department for its review and approval. For 2011, the Program Administrators worked closely with the Council in order to update the allocation method in compliance with the 2010-2012 Orders, as well as to propose updated performance metrics. As a result of this effort, a comprehensive settlement was achieved on this and other matters, which was filed on April 15, 2011. Similarly, for 2012, the Program Administrators used the extensively reviewed 2011 method and performance incentive model as a basis for 2012 performance incentive allocations and updated performance metrics. Performance incentive proposals applicable to 2012 efforts were filed with the Department on October 28, 2011. The

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<sup>107</sup> See 2010-2012 Electric Order at 93-125, 165, and 168-169; 2010-2012 Gas Order at 79-115, 168-169, and 172-173.

Department approved the 2011 and 2012 proposals on November 26, 2014, including the proposed method of allocating statewide incentives to each Program Administrator and all but one of the proposed performance metrics, the 2012 Cost Efficiency Metric. See 2011 Mid-Term Modification for Energy Efficiency Programs, D.P.U. 10-140 through D.P.U. 10-150 (2014); 2012 Mid-Term Modification for Energy Efficiency Programs, D.P.U. 11-106 through D.P.U. 11-116 (2014). For the 2013-2015 Plan, the Program Administrators retained the performance incentive model that included the Savings Mechanism, the Value Mechanism, and Performance Metrics. 2013-2015 Performance Metrics, D.P.U. 13-67 (2014). In its review of that proposal, the Department determined that Performance Metrics were no longer needed and directed the Program Administrators to reallocate the funds that had been allocated to that component of the incentive mechanism to the Savings and Value Mechanisms. Id.

For the 2016-2018 Plan, the Program Administrators have retained the focus on benefits through the Savings Mechanism and on net benefits through the Value Mechanism. In this discussion, the Program Administrators summarize the 2016-2018 performance incentive amounts in the following manners: statewide, by component, and by Program Administrator. Performance incentive models are attached at Appendix R.

#### **I. Summary of the Orders on Performance Incentives in the 2010-2012 Plan.**

In the 2010-2012 Orders, the Department noted its support of the following elements of the proposed incentive design:

1. The proposed statewide incentive pool.
  - a. The electric statewide incentive pool goals equal \$22 million in 2011 and \$25.5 million in 2012, assuming that goals on a statewide basis are equal to the goals established by the Council. 2010-2012 Electric Order at 93. The actual incentive pool can be adjusted up or down according to actual goals. Id. at 111. The Department approved the statewide goals. Id. at 112.
  - b. The gas statewide incentive pool goals equal \$4.5 million in 2011 and \$5.5 million in 2012, assuming that goals on a statewide basis are equal to the goals established by the Council. The actual incentive pool can be adjusted up or down according to actual goals. 2010-2012 Gas Order at 100. The Department approved the statewide goals. Id. at 101.
2. The structure of the proposed incentive mechanism includes three components: the Savings Mechanism (focusing on the dollar value of benefits); the Value Mechanism (focusing on the dollar value of net benefits); and Other Performance Metrics.
  - a. The three-pronged structure of the incentive mechanism was approved in the 2010-2012 Electric Order at 113, 124 and the 2010-2012 Gas Order at 101-102, 114. The Department noted that similar mechanisms have been approved in the past.
3. Common payout amounts under both the Savings and Value Mechanisms.
  - a. The approval for common payout rates in the 2010-2012 Electric Order is found on pages 113-114 with reference to Table D at 96.

- b. The approval for common payout rates in the 2010-2012 Gas Order is found on pages 102-103 with reference to Table C at 83.
  4. The proposed allocation of the statewide incentive pool to each Program Administrator for 2010 but not for 2011 or 2012.
    - a. The allocation of the statewide electric incentive pool to each Program Administrator was based on that Program Administrator's contribution to the statewide savings goals as expressed in MWh. However, the allocation for each of the three components was not consistent among the Program Administrators; the savings component amount was allocated on the basis of the dollar value of savings, the value component amount was allocated on the basis of the dollar value of net benefits, and the performance metrics component was derived to total the overall allocation method based on savings goals. Although the Department approved the allocation of the components for 2010, the Program Administrators were directed to revise the allocation method for 2011 and 2012 so that, to the extent possible, the revised allocation method would result in (1) uniform statewide payout rates for the savings and value components, and (2) an allocation of incentive dollars across the three components for each Program Administrator that, on a percentage basis, approximates the statewide allocation across the three components, as endorsed by the Council and approved by the Department. See 2010-2012 Electric Order at 114-116.
    - b. The allocation of the statewide gas incentive pool to each Program Administrator was based on a similar methodology. This methodology produced some anomalous results for certain Program Administrators that required special adjustments. Similar to the electric side, the Department approved the gas Program Administrators' component allocation for 2010, but the Program Administrators were ordered to revise the allocation methodology in 2011 and 2012. See 2010-2012 Gas Order at 103-105.
    - c. A revised allocation methodology was proposed in the 2011 Mid-Term Modifications settlement proposal. The revised methodology was created following extensive discussions with the Council, and addressed the concerns of the Department, as noted in the Orders.
  5. Specific limitations on how EM&V results would be used to determine performance for both the electric and gas Program Administrators. 2010-2012 Electric Order at 124; 2010-2012 Gas Order at 114.

However, the Department did not accept: (1) the proposed allocation method for 2011 and 2012 as mentioned above; or (2) the proposed performance metrics for 2010. The Department stated that it did not accept an EM&V "Omnibus Metric," and directed the Program Administrators to include a financing and funding metric.<sup>108</sup> The Department further ordered that a cap on the earned incentive mechanism apply both in total and by component. The cap by

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<sup>108</sup> In response to the 2010-2012 Orders, the Program Administrators filed a revised performance metric proposal on March 12, 2010. The Department subsequently approved the revised performance metrics on August 10, 2010 with the exception of the Deeper Savings metric. On September 14, 2010 the Program Administrators filed a compliance filing in regard to changing the baseline year of that metric.

component and overall has been set at 125 percent of design level performance.<sup>109</sup>

## **II. Summary of the Orders on Performance Incentives in the 2013-2015 Plan.**

In the 2013-2015 Order, the Department approved the 2013-2015 Plan statewide incentive pool structure of the PI mechanism, as revised, for the savings and value components (metrics were reviewed separately), calculation of the savings and value payout rates, and adjusted threshold levels (the slightly different mechanism for PAs with goals that exceed Council targets). The Department directed the PAs to recalculate the threshold levels to be consistent over the three years and provided the calculation method in the appendix to the Order.

The Department reviewed the performance incentives in light of the D.P.U. 11-120-A, Phase II Order, which among other things, creates a true three-year PI structure. The D.P.U. 11-120-A, Phase II Order requires PAs to calculate design-level incentive payments based on projections of performance for the entire three-year term, not based on annual projections, and directs both electric and gas PAs to collect performance incentives in the EES at the design level during the three-year term. The Department will review PI at the end of the three-year term.

Citing previous approvals of PI pools that were a greater percent of budget than proposed in the 2013-2015 Plan, the Department approved the PI pool. Additionally, the Department approved the full increase to the statewide PI pool, as set forth in the updated tables, noting the link between the statewide incentive pool and projected savings. The Department found that the PAs had kept performance incentive funds as low as possible consistent with the Guidelines.

The Department had previously approved the PI mechanism and its components, and the Council had endorsed the components and allocation of incentive dollars to each component. For these reasons, the Department found the savings and value components to be reasonable and consistent with the GCA and precedent and approved the PI mechanism, with the exception of the metrics which were reviewed in a separate docket.

The Department found that the application of uniform statewide payout rates for the savings and value components was consistent with the goals of the GCA and Department precedent, and, because the rates do not vary by year, found that the payout rates were consistent with the D.P.U. 11-120-A, Phase II Order. The Department approved the method used to calculate the statewide savings and value components payout rates. The Department approved the PAs' adjusted threshold levels for the savings and value components of the PI mechanism for those PAs with savings targets in excess of the Council's goals.

The Department found that the PI mechanism must be revised to be consistent with the D.P.U. 11-120-A, Phase II Order. Mid-term or annual adjustments that result in payout rates that vary over the three-year term are inconsistent with the D.P.U. 11-120-A, Phase II Order. The Department addressed the issue of updates to the Avoided Energy Supply Costs and stated that they will be reviewed in the context of streamlining working groups. The Department reviewed

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<sup>109</sup> The Program Administrator proposals had thresholds for the savings and value incentive mechanisms of 75 percent of design or target level performance.

the one-year nature of metrics in a separate proceeding on metrics. With respect to the threshold levels proposed by the PAs, because they varied in the third year, the Department noted that they are inconsistent with the D.P.U. 11-120-A, Phase II Order, and directed the PAs to recalculate the threshold as described in the appendix and as shown for each PA in the Order. The Department directed the PAs to implement a revised PI model with one combined threshold level for the entire three-year term. On or before February 21, 2013, each PA filed a compliance filing with a revised PI model, including all tables, using the revised thresholds.

In D.P.U. 13-67, the Department concluded that performance metrics are no longer a necessary component of the PAs' performance incentive mechanism and, therefore, did not approve the metrics for 2013. As noted in this Order and the 2013-2015 Order, the portion of the statewide incentive pool allocated to performance metrics will be reallocated to the savings and value components of the performance incentive mechanism. Therefore, the PI pool will remain intact and PAs retain the ability to earn the total amount of PI allocated to them.

In D.P.U. 13-67, the Department stated that metrics were originally intended to incentivize specific activities, but now that the GCA requires all available cost-effective energy efficiency, metrics would only seek to incentivize activities that are already required. The Department also stated that the PAs do not need the guidance traditionally provided by metrics, noting that the "Program Administrators, in conjunction with the Council and other stakeholders, have developed a comprehensive infrastructure to promote statewide energy efficiency program integration and continuous improvement in program delivery." D.P.U. 13-67, at 11. The Department specifically noted that the Management Committees and low-income best practices address program implementation barriers and foster communication with the Council and other stakeholders. The Department also found that "[n]egotiating, satisfying, and documenting performance metrics is costly and time consuming." *Id.* at 13, n.25. The Department found that such an investment of time and resources solely for the purpose of verifying metric performance is out of proportion with the potential benefit of metrics. Further, verifying performance of these metrics would divert PA and stakeholders focus from the successful implementation of the Three-Year Plans and is inconsistent with the Department's obligation to fulfill its oversight responsibilities in an administratively efficient and effective manner.

### **III. Allocation Proposal for 2016 – 2018**

Based upon the well-developed principles and precedent described above, the Program Administrators propose an incentive mechanism for 2016-2018 that is comprised of a Savings Mechanism and a Value Mechanism with common payout rates in each component applicable to the electric and gas Program Administrators, respectively with performance assessed at the portfolio level using cumulative three-year results. In 2016-2018, the statewide incentives for the savings component of the incentive pool are allocated on the basis of the dollar value of benefits using common payout rates as approved by the Department. The statewide incentives for the value component of the incentive pool are allocated on the basis of the dollar value of net benefits using common payout rates as approved by the Department. The total incentive is the sum of the two components. This methodology was followed for allocating the incentive dollars among Program Administrators, as well as to each sector and to each program.

This proposed allocation model results in a similar distribution of each Program Administrator's incentives among the two components. The proposed payout rates for 2016-2018 remain constant for all Program Administrators and for each year in the Plan, consistent with the focus on the comprehensive three-year effort as a single Plan.

Distribution of Performance Incentive for Electric Program Administrators in 2016-2018:

<b>Percent of Total Incentive</b>				
<b>State</b>	Residential	Low Income	C&I	Total
Savings	23.5%	3.3%	34.8%	61.5%
Value	14.3%	1.3%	22.9%	38.5%
Total	37.7%	4.6%	57.7%	100.0%
<b>National Grid</b>	Residential	Low Income	C&I	Total
Savings	27.2%	3.9%	31.4%	62.5%
Value	16.2%	1.7%	19.6%	37.5%
Total	43.4%	5.6%	51.0%	100.0%
<b>Eversource</b>	Residential	Low Income	C&I	Total
Savings	20.3%	2.7%	37.7%	60.8%
Value	12.6%	1.0%	25.6%	39.2%
Total	32.9%	3.7%	63.3%	100.0%
<b>Unitil</b>	Residential	Low Income	C&I	Total
Savings	17.0%	4.0%	35.5%	56.4%
Value	12.9%	2.2%	28.4%	43.6%
Total	29.9%	6.2%	63.9%	100.0%

Distribution of Performance Incentive for Gas Program Administrators in 2016-2018:

**Percent of Total Incentive**

<b>State</b>	Residential	Low Income	C&I	Total
Savings	34.3%	8.8%	18.4%	61.5%
Value	18.6%	4.8%	15.1%	38.5%
Total	52.9%	13.6%	33.5%	100.0%
<b>National Grid</b>	Residential	Low Income	C&I	Total
Savings	37.9%	10.5%	16.7%	65.1%
Value	16.2%	6.0%	12.7%	34.9%
Total	54.1%	16.5%	29.4%	100.0%
<b>Eversource</b>	Residential	Low Income	C&I	Total
Savings	28.4%	8.4%	24.5%	61.4%
Value	13.6%	4.8%	20.2%	38.6%
Total	42.0%	13.2%	44.7%	100.0%
<b>Columbia</b>	Residential	Low Income	C&I	Total
Savings	33.4%	5.5%	14.8%	53.7%
Value	29.8%	2.5%	14.1%	46.3%
Total	63.2%	7.9%	28.9%	100.0%
<b>Unitil</b>	Residential	Low Income	C&I	Total
Savings	24.2%	8.3%	23.2%	55.7%
Value	17.5%	4.7%	22.1%	44.3%
Total	41.7%	13.0%	45.4%	100.0%
<b>Berkshire</b>	Residential	Low Income	C&I	Total
Savings	28.8%	7.9%	27.3%	64.0%
Value	10.8%	3.7%	21.5%	36.0%
Total	39.6%	11.5%	48.8%	100.0%
<b>Liberty</b>	Residential	Low Income	C&I	Total
Savings	34.8%	9.5%	19.6%	63.8%
Value	19.4%	3.7%	13.1%	36.2%
Total	54.2%	13.1%	32.7%	100.0%

**IV. Statewide Incentive Pool for 2016-2018**

Statewide, the design level incentive is set at \$100 million for electric efforts and \$18 million for gas efforts. These amounts reflect the challenge of continuing to adopt aggressive savings goals in 2016-2018 in light of achievements to date, the remaining savings opportunities identified in each service territory, and the success the Program Administrators are cultivating as markets are transformed. In addition, these electric and gas incentive pools are consistent with the Term Sheet that has been supported by DOER, the AG, and the PAs, attached hereto at

Appendix D. The statewide incentive pool will not change as a result of changes to avoided costs that may occur during the term of this Plan.<sup>110</sup>

## **V. Summary of 2016-2018 Incentives**

The models set forth as Appendix R – Part 1 (Electric) and Appendix R – Part 2 (Gas) provide calculations of the 2016-2018 incentives based on the Three-Year Plan proposals of each of the Program Administrators for electric and gas, respectively. For the electric Program Administrators this is a 19 page exhibit and for the gas Program Administrators this is a 25 page exhibit. The calculations are described below. Additionally, a summary of the 2016-2018 incentives is provided below.

### **A. Calculation Exhibits**

Appendix R – Part 1 (Electric) provides the derivation of the 2016-2018 electric incentives at the design level of performance. Similarly, Appendix R – Part 2 (Gas) provides the derivation of the 2016-2018 gas incentives at the design level of performance.

Pages 1 and 2 of both Appendix R - Part 1 (Electric) and Part 2 (Gas) are input pages that summarize each Program Administrator's 2016-2018 goals, benefits and costs (excluding performance incentives and demand reduction-related costs).

Page 3 in both Appendix R - Part 1 (Electric) and Part 2 (Gas) derives the common payout rates used to calculate projected design level incentives under the Savings and Value Mechanisms given the electric and gas statewide incentive pools. The Program Administrators note that if avoided costs change compared to what has been used here, either as a result of orders issued by the Department in D.P.U. 11-120 or due to a study where avoided costs are updated, the common payout rates applicable under the savings and value components will need to be updated. However, these changes would not impact the size of the incentive pool or PA-specific design-level incentives. At a statewide level for both electric and gas, 61.5 percent of the incentive has been allocated to the Savings Mechanism and 38.5 percent to the Value Mechanism. To determine the payout rate under the Savings Mechanism, the electric or gas statewide incentive pool is multiplied by 61.5 percent, the portion of the statewide performance incentives allocated to the savings component, and the resulting amount is divided by the projected dollar value of benefits statewide from proposed electric or gas efforts. Similarly, to determine the payout rate under the Value Mechanism, the electric or gas statewide incentive pool is multiplied by 38.5 percent, the portion of the statewide performance incentives allocated to the value component, and the resulting amount is then divided by the projected dollar value of net benefits statewide from proposed electric or gas efforts.

Pages 4-11 of Appendix R – Part 1 (Electric) and pages 4-17 of Appendix R – Part 2 (Gas) provide the calculation of potential design level incentives under the savings mechanism and the value mechanism on a statewide basis and for each individual Program Administrator. Lines 1 through 3 determine the savings amount by multiplying the dollar value of benefits by

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<sup>110</sup> The PAs do not currently anticipate updating avoided costs applicable to 2016-2018 efforts at this time.



the savings mechanism payout rate. Lines 4 through 6 determine potential design level incentives under the value mechanism by multiplying the dollar value of net benefits by the value mechanism payout rate. Line 7 provides the total performance incentive.

Pages 12 - 15 of Appendix R – Part 1 (Electric) and pages 18 - 21 of Appendix R – Part 2 (Gas) provide summary information about performance incentives by sector and by component of the incentive mechanism in real dollars (\$2016). Pages 16-19 of Appendix R – Part 1 (Electric) and pages 22 – 25 of Appendix R – Part 2 (Gas) provide the same information in current year (nominal) dollars.

Appendix R – Part 1 (Electric) and Appendix R – Part 2 (Gas) do not show how the performance incentives are further allocated to specific programs for benefit/cost screening purposes. Rather, the program allocation assumptions are summarized below:

- The savings component amount is allocated to programs on the basis of program dollar of benefits.
- The value component amount is allocated to programs on the basis of program dollar of net benefits.
- Any programs with negative allocations (efforts with projected costs without identified projected savings) are reallocated to other programs within the sector.

## B. Summary

A summary of the threshold, design, and exemplary performance incentive amounts by component of the proposed incentive mechanism for 2016-2018 is provided for each electric and gas Program Administrator, below. The threshold level is set at 75 percent of the design level incentive while the exemplary level is set at 125 percent of the design level incentive.

### Electric:

Summary of 2016 - 2018 Performance Incentives by Program Administrator (\$2016)

<b>National Grid</b>		Threshold	Design	Exemplary
	Savings	\$21,499,886	\$28,666,515	\$35,833,144
	Value	\$12,917,889	\$17,223,852	\$21,529,815
	Total	\$34,417,775	\$45,890,367	\$57,362,958
<b>Eversource</b>		Threshold	Design	Exemplary
	Savings	\$24,183,684	\$32,244,913	\$40,306,141
	Value	\$15,616,431	\$20,821,908	\$26,027,385
	Total	\$39,800,116	\$53,066,821	\$66,333,526
<b>Unitil</b>		Threshold	Design	Exemplary
	Savings	\$441,429	\$588,573	\$735,716
	Value	\$340,680	\$454,240	\$567,800
	Total	\$782,109	\$1,042,812	\$1,303,516

**Gas:**

Summary of 2016 - 2018 Performance Incentives by Program Administrator (\$2016)

<b>Program Administrator</b>		<b>Threshold</b>	<b>Design</b>	<b>Exemplary</b>
<b>National Grid</b>	Savings	\$4,368,695	\$5,824,927	\$7,281,159
	Value	\$2,346,539	\$3,128,719	\$3,910,898
	Total	\$6,715,234	\$8,953,646	\$11,192,057
<b>Eversource</b>	Savings	\$1,908,900	\$2,545,200	\$3,181,500
	Value	\$1,201,365	\$1,601,820	\$2,002,274
	Total	\$3,110,265	\$4,147,020	\$5,183,775
<b>Columbia</b>	Savings	\$1,627,631	\$2,170,174	\$2,712,718
	Value	\$1,405,513	\$1,874,018	\$2,342,522
	Total	\$3,033,144	\$4,044,192	\$5,055,240
<b>Unitil</b>	Savings	\$86,646	\$115,528	\$144,411
	Value	\$68,827	\$91,769	\$114,712
	Total	\$155,473	\$207,298	\$259,122
<b>Berkshire</b>	Savings	\$181,043	\$241,390	\$301,738
	Value	\$101,725	\$135,633	\$169,541
	Total	\$282,767	\$377,023	\$471,279
<b>Liberty</b>	Savings	\$129,585	\$172,780	\$215,974
	Value	\$73,531	\$98,041	\$122,552
	Total	\$203,116	\$270,821	\$338,526

**D. Bill Impacts**

Consistent with directives of the GCA and the goal of the 2016-2018 Plan to provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply, the Program Administrators sought to develop a statewide energy efficiency plan that acquires these resources with the lowest reasonable customer contribution. G.L. c. 25, § 21(b). Additionally, the Program Administrators worked collaboratively to review and analyze the rate and bill impacts associated with the implementation of the 2016-2018 Plan in order to ensure compliance with the requirements of the GCA, the Department's Orders in D.P.U. 08-50-A and D.P.U. 11-120-A, Phase II and with the Department's ratemaking precedent. The PAs have sought to balance the value of the long-term benefits expected from proposed energy efficiency efforts with short-term customer bill

impacts. Proposed budgets reflect these considerations along with a focus on the equitable distribution of costs and benefits for customers.

The Department convened a technical session on August 16, 2012, at which the Department reviewed the history of bill impacts, implementation of D.P.U. 08-50, the GCA requirements, the Department's goals with respect to rate continuity, and different aspects of the traditional bill impact models as well as the Department-developed D.P.U. 08-50 bill impact models. Ultimately, the Department explained that the short-term information provided in traditional bill impact models satisfies the GCA requirement that the Department consider the effect of any rate increases on residential and commercial customer bills before approving ratepayer funding of energy efficiency programs. See G.L. c. 25, § 19(a).

On October 19, 2012, the Department issued its order acknowledging the efforts of the Bill Impact Working Group, but declining to adopt the bill impact models under discussion. D.P.U. 08-50-D; see also Section III.L, supra. Instead, the Department directed the PAs to submit traditional bill impacts for non-participants under the following scenarios:

1. the current (*e.g.*, 2012) energy efficiency surcharge (“EES”) to the proposed EES for the first year of the three-year plan (*e.g.*, 2013);
2. the EES from the first year of the three-year plan (*e.g.*, 2013) to the proposed EES for the second year of the three-year plan (*e.g.*, 2014);
3. the EES from the second year of the three-year plan (*e.g.*, 2014) to the proposed EES for the third year of the three-year plan (*e.g.*, 2015);
4. the current EES (*e.g.*, 2012) to the proposed EES for the third year of the three-year plan (*e.g.*, 2015).

D.P.U. 08-50-D at 12. The Department also directed the PAs to submit bill impacts for participants, “where consumption is reduced for three levels of savings -- low, medium, and high -- and [to] provide a description of how these savings levels were determined.” Id. The Department later clarified the bill impact requirements for non-participants by providing a spreadsheet to the PAs, directing them to use average monthly usage levels under the first and fourth scenarios listed above.

Accordingly, to calculate bill impacts for participants, the PAs will populate the Department's spreadsheet (with peak and off-peak rates on separate sheets), using the average monthly kWh and/or therm usage for non-participants for each rate class, and the percentages set forth in the table below. To best approximate low, medium and high annual savings consistent with the Department's directive in D.P.U. 08-50-D, the PAs collaborated on appropriate assumptions for residential, low-income and C&I programs to develop statewide percentages that best approximate savings for those types of participants. The PAs determined that the percentages in the table below will provide directional information on the bill impacts that a residential, low-income or C&I participant may experience.

The PAs determined that there is no low, medium and high savings scenario for low-income participants. These participants typically receive a comprehensive “whole house” energy efficiency approach, meaning potential measures are installed in most cases (the work that can be

done is done). Similarly, the PAs determined that there is no low, medium and high savings scenario for residential and low-income gas non-heating participants and street lighting. Accordingly, the PAs determined that the percentages in the table below best approximate savings for those types of participants.

	<b>Low</b>	<b>Medium</b>	<b>High</b>
Residential- Electric:	2%	10%	30%
Residential- Gas:	2%	15%	30%
Residential Gas Non-Heating:	2%		
Low-Income Gas Non-Heating:	2%		
Low-Income:	25%		
Street Lighting:	10%		
C&I- Electric:	1%	10%	20%
C&I- Gas:	1%	10%	20%

Each PA has provided traditional bill impacts for all rate classes in each individual PA's filing.

**E. Evaluation, Measurement & Verification**

**1. EM&V Framework**

Consistent with past Three-Year Plans and the Council's September 8, 2009 EM&V Resolution, the PAs propose to continue the evaluation framework that has successfully allowed the PAs to engage in high quality third-party EM&V efforts. The Council and the PAs find that it is critical that the programs be evaluated, measured, and verified in a way that provides confidence to the public at large that the savings are real and in a way that enables the Program Administrators to report those savings to the Department with full confidence. Additionally, the Council stated that there is a need to ensure both the reality and the perception of the independence and objectivity of EM&V activities, as well as the need to help ensure consistency, timeliness, and credibility of the results. Accordingly, the Council will continue to have an oversight role over the EM&V activities of the Program Administrators to ensure the objectivity and independence of those activities, and the perception of such, and to help ensure consistency, timeliness, and credibility. The Council's oversight role will be accomplished through the Council's EM&V consultant ("EM&V Consultant"), a third-party expert consultant who has primary responsibility for working with the PAs to plan and implement high-quality EM&V in Massachusetts.

While PAs and the EM&V Consultant will continue to work diligently to reach a consensus on evaluation issues, where there are areas of difference that may arise that cannot be resolved through consensus during the on-going interactive process between the EM&V Consultant and the PA evaluation staff, authority for decision-making will reside with the EM&V Consultant and the Council.

To enable the Program Administrators to fulfill their responsibility to report program savings to the Department with full confidence, an appeals process has been established, through

which the PAs may bring decisions made by the EM&V Consultant or the Council for review and resolution. This process will be implemented through the formation of an evaluation appeals committee (“Appeals Committee”) of the Council, whose responsibility in this area will be to hear the matter under dispute and rule so that the study may proceed in a timely way. In general, it is expected that this review process will be completed within 72 hours once an issue is elevated to the Appeals Committee. This Appeals Committee will consist of three voting members of the Council, including DOER. Consistent with general Council proceedings, the Appeals Committee will include and consult with, in both deliberations and decision-making, a representative of both the PAs and the Council’s consultant team, neither of whom shall have a vote in the standing committee. The Appeals Committee will review the issues related to the disputed matter, hear from the PA evaluation staff and EM&V Consultant, and make a determination on the outcome of the matter. The decision will be recorded, along with a description of the applicable issues. The participants in the appeal will sign the record of the decision, indicating their acceptance of, the representation of the issues and of the decision. In exceptional cases, where the PAs perceive there to be significant risk to their ability to manage the energy efficiency programs in the near term, the PAs will note their disagreement with the decision of the Appeals Committee on the record of the decision and reserve the right to immediately petition the Department on the Appeal’s Committee’s decision. The PAs shall be able to submit any such documents to the Department in conjunction with the filing of the Three-Year Plans, mid-term modifications, and term reports. The Department will be able to review the record of this decision in its review of Three-Year Plans, mid-term modifications, plan-year reports, and term reports.

To date, the EM&V Consultant and PA Evaluation staff have been able to resolve all areas of differences without proceeding to the Appeals Committee (as defined in this Section IV.E.1.). This is a testament to the hard work and collaborative engagement of the PAs and the EM&V Consultant.

The PAs will maintain a statewide focus to the maximum extent possible, will review EM&V budgets with the EM&V Consultant, and will integrate electric and gas evaluation efforts to the maximum extent possible. The Program Administrators will be the main mechanism for contracting with the independent evaluation contractors, and will work with evaluation contractors to maintain privacy of customer data.

## 2. Evaluation Management Committee

The PAs and the EM&V Consultant established the EMC to be similar to other management committees. The EMC serves as a steering committee for statewide evaluation issues, providing guidance and direction to each of the evaluation research areas. The EMC works to plan, prioritize and delineate the research studies to be undertaken over the Three-Year Plan term.

The Program Administrators and the EM&V consultant have worked to consistently improve the EM&V process over time. As issues arise, the EMC has established working groups to review and address new topics, areas of concern, or disagreement. In 2014, the PAs and the EM&V Consultant determined that the current research into baselines associated with energy efficiency measures was not clearly defined. Due to the lack of definition, disagreements arose surrounding the way to apply evaluation results to baseline parameters. In response to those

issues, the EMC formed a Baseline Working Group, and established guidelines to handle such concerns in the future. The EMC will continue to establish appropriate working groups to address issues as they arise and keep the EM&V process running transparently, efficiently, and effectively.

### 3. Descriptions of Research Areas

Consistent with the experience since the establishment of the GCA, the EMC worked collaboratively to develop and refine three market research areas. These research areas are organized primarily by target markets, which design is intended to help maximize the statewide effectiveness of EM&V, while presenting minimal overlap among areas. The research areas identified are as follows:

#### a) **Residential**

Originally, this research area consisted of three separate categories: Residential Retrofit and Low-Income, Residential Retail Products, and Residential New Construction. Residential still includes these categories, but as a single overarching research area. As currently defined, the residential research area will include all residential and low-income core initiatives.

#### b) **Commercial & Industrial**

This research area previously consisted of two separate categories: Non-Residential Large Retrofit and New Construction and Non-Residential Small Retrofit. C&I still includes these categories, but as a single overarching research area. As currently defined, the C&I research area will include all C&I core initiatives.

#### c) **Special and Cross-Sector Studies**

This research area reflects the fact that not all studies will fall into the two market categories above, and some studies may be cross-sector in nature. Some types of studies in this research area can include: cross-sector free ridership and spillover studies, non-energy impacts, behavioral programs, community-based pilots, and marketing, public education, and outreach activities.

The research areas were consolidated to improve administrative efficiency and cross-sector coordination. Cross-sector coordination has been an area that the EMC has been working to consistently improve in order to leverage data and research done by the various research teams to improve depth and quality of research, while lowering cost. More details regarding these research areas and specific research topics can be found in the Strategic Evaluation Plan, which is attached at Appendix S.

#### 4. Evaluation Budgets

The EM&V budget available to the research areas for the 2016-2018 Plan is projected to be in line with historical program budget levels. Twenty percent of each sector's available evaluation budget is allocated to the Cross-Cutting research area. The remaining evaluation budget in the residential and low-income sector is allocated to the Residential research area; the remaining evaluation budget in the C&I sector is allocated to the Non-Residential research area. Total evaluation budgets for the 2016-2018 Plan term are expected to be \$18.7 million for gas programs and \$41.3 million for electric programs.<sup>111</sup>

#### 5. Types of Evaluation Functions

EM&V refers to the systematic collection and analysis of information to document the impacts of energy efficiency programs and improve the effectiveness of these programs. EM&V includes the following types of studies:

- *Impact Evaluation* refers to the measurement of net or gross savings achieved within overall program populations.
- *Market Effects Evaluation* refers to the measurement of the effects that programs have on the structure and functioning of their target markets.
- *Process Evaluation* refers to the systematic assessment of programs for the purpose of documenting their operations and developing recommendations to improve their effectiveness.
- *Market Characterization or Assessment* refers to the systematic assessment of energy efficiency markets for the purpose of improving the effectiveness of programs targeting those markets.
- *Evaluation of Pilots* refers to EM&V activities intended to assess the effectiveness of pilot programs, determine their potential for full-scale implementation, and develop recommendations for any changes in program approach.

#### 6. Evaluation Planning and Strategic Evaluation Plan

The EMC has sought to establish a long-term strategic view of EM&V for the 2016-2018 Plan, including developing evaluation strategy and determining priorities that the EMC expects to research during the three-year term. These priorities were developed based on the findings of current research, a three-day Strategic Evaluation Planning Summit in February 2015, and discussions in the EMC and with Councilors and other stakeholders. The Strategic Evaluation Plan expands upon and prioritizes the important research topics that were discussed and established at the summit and during EMC and other discussions. These details and priorities are attached at Appendix S.

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<sup>111</sup> It is noted that since evaluation activities typically occur after program implementation activities, evaluation costs can lag up to several years.

## 7. Evaluation Studies Completed in Advance of the 2016-2018 Plan

Twenty-five studies were completed in advance of the 2016-2018 Plan that were not previously filed with the Department as follows:

STUDY NAME	STUDY LOCATION AND NUMBER	FUEL
<b>Residential Program Studies</b>		
Massachusetts Residential Lighting Cross-Sector Sales Research	App. U, Study 1	Electric
Multistage Lighting Net-to-Gross Assessment: Overall Report	App. U, Study 2	Electric
Lighting Market Assessment and Saturation Stagnation Overall Report	App. U, Study 3	Electric
Baseline Sensitivity Analysis 2016 - 2018	App. U, Study 4	Electric/Gas
Lighting Interactive Effects Study Preliminary Results	App. U, Study 5	Electric/Gas
Program Assessment Tube TV Recycling	App. U, Study 6	Electric
Cool Smart Incremental Cost Study	App. U, Study 7	Electric
Home Energy Services Initiative and HEAT Loan Delivery Assessment	App. U, Study 8	Electric/Gas
Residential Customer Profile Study	App. U, Study 9	Electric/Gas
Multifamily Impact Findings Memo	App. U, Study 10	Electric/Gas
Ductless Mini-Split Heat Pump (DMSHP) Final Heating Season Results	App. U, Study 11	Electric
Ductless Mini-Split Heat Pump (DMSHP) Baseline Determination	App. U, Study 12	Electric
<b>Low-Income</b>		
Massachusetts Low-Income Multifamily Initiative Impact Evaluation	App. U, Study 13	Electric/Gas
<b>Special &amp; Cross Sector Studies</b>		
Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification	App. U, Study 14	Electric/Gas
Comprehensive Review of Behavior and Education Programs	App. U, Study 15	Electric/Gas
Massachusetts Behavioral Programs Process Evaluation	App. U, Study 16	Electric/Gas
2014-2015 Commercial and Industrial Natural Gas Programs Free-ridership and Spillover Study	App. U, Study 17	Gas
Efficient Neighborhoods + Incremental Cost Assessment	App. U, Study 18	Electric/Gas
<b>Commercial &amp; Industrial Program Studies</b>		
Prescriptive Gas Impact Evaluation - Steam Trap Evaluation Phase 1	App. U, Study 19	Gas
Prescriptive Programmable Thermostats	App. U, Study 20	Gas
Impact Evaluation of PY2013 Custom Gas Installations	App. U, Study 21	Gas
Massachusetts Commercial New Construction Energy Code Compliance Follow-Up Study	App. U, Study 22	Electric/Gas
Massachusetts LED Spillover Analysis	App. U, Study 23	Electric
Impact Evaluation of Prescriptive Chiller and Compressed Air Installations	App. U, Study 24	Electric
Impact Evaluation of 2012 Custom HVAC Installations	App. U, Study 25	Electric



Summaries of these evaluations are attached at Appendix T and full copies are available at Appendix U. Additionally, all currently completed studies are available on the Council's website at: <http://ma-eeac.org/studies/>.

#### **F. Technical Reference Manual/Library**

The 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 TRM, which did not exist until the PAs developed their initial Three-Year Plan, is an excellent example of how the PAs work together, share data and best practices and work to develop common assumptions that reflect state-of-the-art EM&V results. The complete TRM is available at Appendix V.

In 2014, the PAs also began developing an electronic version of their TRM, which documents impact factors and input assumptions, with sources and references. This electronic version is still under development and will be available during the term of the Plan, but was not complete in time for this filing. In recent years, the PAs have developed and provide a paper copy of the TRM for each Three-Year Plan and annual performance report filed with the Department. The PAs provided a paper copy of the TRM in Appendix V of this Plan, and will supplement it with the electronic version, when it is complete and usable.

The electronic product associated with the development of the TRM will be known as the Technical Reference Library ("TRL"), and will allow the public to access information from a central website. The development of this product is a collaborative effort of the PAs. The TRL will reflect the efforts of the PAs to align common measure naming across all PAs, where appropriate. The PAs have been working diligently on developing the TRL, but development has been more complex than anticipated; the PAs expect that the TRL will be complete in 2016.

#### **G. Core Benefits and Cost-Effectiveness**

##### **1. Energy and Demand Savings**

The savings goals and program budgets set forth in this Plan are presented on an aggregate, statewide basis by program. In the Energy Efficiency Data tables, each Program Administrator provides its individual recommended savings and budget levels for the three-year term commencing January 1, 2016, consistent with the overall goals and budgets developed in the statewide Plan review process, which are included as supplemental enclosures with this Plan. The statewide Plan review process is a phased process that first requires the filing of a joint statewide plan by all Program Administrators in April, followed in October by individual PA-specific plans, after the conclusion of the review process of the statewide plan at the Council. G.L. c. 25, §§ 21(b)-21(d).

In developing the proposed statewide goals and budgets in this Plan, the Program Administrators first submit an initial Plan on April 30, 2015, and file a final Plan with the Department by October 30, 2015. In advance of these filings, the Program Administrators

engage in intensive internal and statewide discussions regarding savings goals, budgets, benefits, and incentives. The PAs also participate in Council meetings and workshops related to 2016-2018 planning and engage in discussion with the Council consultants, individual Councilors and other interested stakeholders. The savings goals and budgets presented on a statewide basis by the Program Administrators in this Plan represent the results of that collaborative process.

Following historic aggregate three-year savings levels, this Plan reflects the current market after years of energy efficiency in Massachusetts, the unique characteristics of each Program Administrator's service area, and the specific needs of its customers as appropriate for 2016-2018. The Program Administrators developed PA-specific filings that are consistent with, and flow out of, the overall goals developed in the statewide Plan review process.<sup>112</sup> Please see Section IV.A for the annual savings goals proposed by the Program Administrators in this Plan, on a per sector basis, by year and in total. Please also see Appendix C for statewide Energy Efficiency Data Tables for budgets, savings, benefits, and cost-effectiveness.

## 2. Environmental Benefits

The reduction in the amount of electricity and natural gas required to run the Commonwealth's economy through energy efficiency program development brings significant environmental benefits to Massachusetts and the region. Benefits include reduced air pollution, improved air quality and additional resource benefits, such as oil and water savings. Decreasing energy consumption results in less demand for energy from fossil fuel power plants and natural gas pipelines. Reduced plant operating time can lessen air pollutants and greenhouse gas emissions.

Generating electricity or heat from non-renewable fossil fuels (*e.g.*, coal, oil, or natural gas) produces nitrogen and sulfur oxides - two of the six "criteria pollutants" defined by the Clean Air Act and identified as air quality indicators by the U.S. Environmental Protection Agency. Nitrogen oxides are precursors to ozone, a primary component of summer smog and exacerbate public health problems, such as asthma, and contribute to acid rain. Reducing the amount of fossil fuel needed to operate our homes and businesses through the adoption of energy efficiency improvements reduces these impacts both in Massachusetts and in neighboring states. One particularly impactful measure is the conversion of customers from old, often oil-fired, heating equipment to new, high-efficiency units, which can significantly reduce local pollution levels.

Water resources also benefit from energy efficiency. With fewer pollutants in the air and acid rain abatement, fresh water resources have less opportunity for particulate contamination or potential acidification. Additionally, some energy efficiency measures offer the co-benefit of providing water savings. For example, aerators reduce the volume of water flowing from a faucet, thus lessening the energy needed to heat the smaller volume of water. Reducing water




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<sup>112</sup> Program Administrators are not required to make all changes or revisions recommended by the Council in their October filing to the Department. G.L. c. 25, § 21(c)-(d)(1). Each Program Administrator supports the statewide Plan and their PA-specific filings are built upon and consistent with the statewide Plan and the best interests of their customers.

usage limits stress on reservoirs and water treatment facilities. The 2016-2018 Plan projects saving over 470 million gallons of water annually and approximately 4 billion gallons over the lifetime of installed measures.

In addition to providing cleaner air and water for Massachusetts, the 2016-2018 Plan’s programs provide climate benefits in the form of reduced emissions of nitrogen oxide, sulfur dioxide and carbon dioxide. Information on the reductions in these emissions from energy efficiency is available on the GHG Reductions tab of Mass Save Data, the PAs’ energy efficiency database. This tab can be accessed at <http://www.masssavedata.com/Public/GreenHouseGases.aspx>. The GHG Reductions tab allows for conversions between metric and short tons and displays conversion factors and sources.

Collectively, the programs contained in the 2016-2018 Plan are expected to provide three-year adjusted gross electric annual savings of 4,512,325 MWh, and three-year adjusted gross gas annual savings of 61,280,092 therms. Over the three years of this Plan, these savings equate to the following:

<b>2016-2018 Annual Savings</b>	
	<b>410,162</b>
<b><i>Number of cars removed from the road through electric and gas savings</i></b>	
	<b>601,643</b>
<b><i>Number of homes powered through electric savings</i></b>	
	<b>64,710</b>
<b><i>Number of homes heated through gas savings</i></b>	

Information from the table above will be available on Mass Save Data for 2016-2018. This information is currently available for 2010-2015.

For reference, as of 2010, there were 272,481 homes in Boston and 2,802,254 homes in Massachusetts. Using the combined number of homes powered through electric and gas savings, the 2016-2018 Plan allows the state to power 24 percent of its homes through energy savings.

Investment in energy efficiency is recognized as the most effective cost-containment and climate protection tool of the Commonwealth under climate cap and trade programs such as RGGI, other climate regulation such as the Clean Power Plan proposed by the Environmental Protection Agency, and the Commonwealth's climate change initiatives under the GWSA. Energy efficiency lowers energy consumption, which reduces GHG emissions and the demand for allowances. The result is a lower price for carbon allowances and lower overall cost of the cap and trade program.

### 3. Net Benefits and Cost-Effectiveness

#### *a. Introduction*

The Program Administrators have projected the expected benefits and costs associated with this statewide 2016-2018 Plan consistent with the requirements of the Guidelines and D.P.U. 08-50-A, in which the Department reaffirmed that “the Total Resource Cost test is the appropriate test for evaluation of the cost-effectiveness of ratepayer-funded energy efficiency programs.” D.P.U. 08-50-A at 14. To conduct the TRC test, the Program Administrators routinely update their benefit/cost screening models to reflect new assumptions relating to program costs and benefits, the discount rate, the general rate of inflation, and avoided costs. In general, the benefit categories in the TRC test include the value of energy savings, gas and electric system benefits, and other measurable benefits (*e.g.*, participant resource benefits, participant non-resource benefits and benefits due to measurable market effects).

Costs included in the TRC test include all PA costs and program participant costs. PA costs include program implementation expenses, evaluation costs, proposed performance incentives, and tax liability for performance incentives. Program-participant costs include initial costs incurred by customers as a result of their participation in the program.

The benefit/cost screening model uses this data to calculate the present value of the program benefits and costs, and then calculates ratios of these values to produce BCRs for the TRC test. The present value of costs and benefits is calculated over the expected duration of the useful life of the measures installed in the program.

The tables below summarize the expected benefits, costs, and BCRs at the sector level for the portfolio of programs the Program Administrators propose to implement over the three-year term.

STATEWIDE ELECTRIC BENEFIT RATIOS	2016	2017	2018	2016-2018
Residential	2.37	2.33	2.30	2.34
Low-Income	1.65	1.68	1.73	1.68
Commercial & Industrial	2.58	2.59	2.63	2.60
Total	2.42	2.41	2.43	2.42

STATEWIDE GAS BENEFIT RATIOS	2016	2017	2018	2016-2018
Residential	1.63	1.62	1.63	1.63
Low-Income	1.71	1.74	1.77	1.74
Commercial & Industrial	2.61	2.58	2.56	2.58
Total	1.85	1.84	1.85	1.85

*b. Avoided Energy Supply Cost Study*

To develop avoided supply costs, the PAs participate in the AESC study process, which is a well-established regional and collaborative process.<sup>113</sup> The AESC study determines projections of marginal energy supply costs that will be avoided due to reductions in the use of electricity, natural gas, and other fuels resulting from energy efficiency programs. The AESC study is prepared for the AESC study group, which is comprised of the PAs, as well as utilities throughout New England and other interested non-utility parties. Historically, the AESC study has been developed every two years, but beginning with the 2015 AESC, will move to a three-year cycle.

In order to inform the initial draft of the 2016-2018 Plan, which must be filed with the Council by April 30, 2015, the 2015 AESC study was completed on March 27, 2015, as revised on April 3, 2015. Unlike previous studies, the 2015 AESC study is designed to be updated in synch with the three-year planning cycle of energy efficiency plans required by the GCA. A three-year cycle for the AESC study is consistent with the Department’s focus on the three-year planning and performance construct envisioned by the GCA. D.P.U. 11-120-A, Phase II at 2.

The AESC study provides projections of avoided costs of energy in each New England state for a hypothetical future, the “Base Case,” in which no new energy efficiency programs are implemented in New England. The 2015 AESC study provides an updated assessment of avoided electricity and natural gas costs using a model that simulates the operation of the New England wholesale energy and capacity markets in an iterative, integrated manner. In the 2015 AESC, there were several factors that changed significantly from the previous study. One significant difference from the 2013 AESC is an increase in the quantity of shale gas production at correspondingly low production costs, resulting in lower avoided gas supply and electric

<sup>113</sup> While the PAs are aware of, and have participated at some varying levels in, the ongoing avoided cost of carbon proceeding currently before the Department in D.P.U. 14-86, no final determinations were made in that docket in time to instruct the development of the 2015 AESC study for this Plan.

energy costs. Estimates of electricity costs, natural gas costs, and cross-fuel Demand Reduction Induced Price Effects (“DRIPE”) are all lower than estimated in the 2013 Study as well. However, the avoided costs for electric capacity are higher than in the 2013 Study due to changes in generation retirements and costs of new capacity additions. The reduced avoided costs in the 2015 AESC tend to decrease benefits and cost-effectiveness relative to the previous Plan term, making goals harder to achieve. The 2015 AESC is available at Appendix J.

*c. Net Savings*

*i. Non-Energy Impacts*

A Non-Energy Impact (“NEI”) is an additional benefit (positive or negative) for participants in energy efficiency beyond the energy savings gained from installing energy efficient measures. NEIs include benefits such as reduced costs for operation and maintenance associated with efficient equipment or practices, or reduced environmental and safety costs. In the 2010-2012 Orders, the Department instructed the PAs to undertake studies that evaluate NEIs to ensure that updated and reliable values would be developed in time for inclusion in the cost-effectiveness analyses in their subsequent Three-Year Plans. See 2010-2012 Electric Order at 130-131 (called non electric benefits); 2010-2012 Gas Order at 121 (and 48-51) (called non-resource benefits). In the 2013-2015 Order, the Department stated that NEIs are “a well established component of the program cost-effectiveness analyses conducted by the Program Administrators” and noted that many of the NEIs included in the 2013-2015 Plan were the result of studies that the Program Administrators took to comply with this directive. 2013-2015 Order at 61. Finding that the benefits of the NEIs are quantifiable and flow to Massachusetts ratepayers, subject to a few exceptions, the Department approved the NEIs as proposed in the Three-Year Plan. In addition to Department Orders, the Guidelines also specifically state that non-resource benefits should be included in cost-effectiveness. Guidelines at §3.4.4.1, §3.4.4.2.

In accordance with prior Orders and the Guidelines, the PAs have included NEIs in this Plan that are supported by evaluation studies. The PAs have included the benefits established in these studies in the benefit cost testing that determined program cost-effectiveness.

*ii. Market Effects*

The PAs have sought to study both direct and indirect effects of the energy efficiency programs. Market effects studies look at whether the energy efficiency programs have successfully reduced market barriers and transformed markets. Market effects capture a moment in time. To quantify program impacts that have translated to market effects, first a baseline must be established, and then changes from the assumed baseline can be determined to be program induced. Only then can the market effects be counted in net savings. In this Plan, the PAs have specifically studied market effects related to the Residential New Construction Program and Commercial LED impacts. The PAs note that the methods used to study market effects and claim benefits do not imply that those values can be counted in perpetuity. Current values from market effects may change due to non-program induced shifts in the market, which may be applicable to additional market effects that are determined in the future.

#### 4. Additional Benefits

##### *a. Reduction in Peak Load*

Energy efficiency efforts often provide capacity savings in addition to energy savings. These capacity savings and benefits are reflected under the cost-effectiveness screening efforts described in Section III.G.

##### *b. Economic Development and Job Growth/Retention*

Another positive effect of the energy efficiency programs in Massachusetts has been job growth. The Massachusetts Clean Energy Center (“MassCEC”) has tracked the growth of the Commonwealth’s clean energy economy on an annual basis. The 2014 Clean Energy Industry Report looks at Massachusetts-wide employment of people in a broad category of energy efficiency.<sup>114</sup> MassCEC’s most recent report from 2014 provides the following information on full time employees (“FTE”) in energy efficiency related fields.

<b>Energy Efficiency Technology</b>	<b>FTE Estimate</b>
HVAC and Building Controls	17,764
Lighting	10,937
Energy Efficient Appliances	10,318
Energy Efficient Processes and Machinery	5,799
Weatherization Services	5,762
Energy Efficient Building Materials	5,656
Other	3,115
Smart Grid	1,868
Water and Wastewater Technologies	1,535
Demand Response Services	1,256
Energy Storage	1,173

<sup>114</sup> <http://www.masscec.com/content/2014-clean-energy-industry-report>

MassCEC developed these employment numbers through an in-depth survey effort based on the following methodology:

- The primary data included in this study are derived from a comprehensive survey of business establishments in Massachusetts.
- Surveys were administered online and by telephone to a list of known employers as well as to a representative, clustered sample of companies from the North American Industry Classification System (“NAICS”) identified by the Bureau of Labor Statistics (“BLS”) and BW Research Partnership.
- The research team placed 36,782 telephone calls and sent 3,793 emails to employers.
- The survey effort, with a combined margin of error of approximately +/-2.23 percent at a 95 percent confidence interval, yielded 1,891 survey responses.
- Survey respondents were asked to select the technology to which their firm’s work is most closely associated, from a list including renewable energy, energy efficiency, alternative transportation, or greenhouse gas emissions accounting and sequestration.

In addition to the MassCEC, the Northeast Energy Efficiency Council (“NEEC”) issued a report on the impact of the GCA on the energy efficiency industry in Massachusetts. The report states:

Since the passage of the [GCA], Massachusetts has achieved nation-leading energy efficiency success. . . [E]ach year of program activity produce lifetime savings of more than 13 million MWh of electricity and 300 million therms of natural gas. . . The engine behind this achievement has been the state’s energy efficiency industry: small, medium, and large companies that deliver, or support the delivery of, energy efficiency-related products and services. Since 2008, this industry has evolved from a small circle of specialty firms to an open, market-driven ecosystem of companies that compete with each other for a piece of the action. . . While program funding increased 335% from 2008-2014, the number of companies participating in the programs increased by even more. We identified more than 7,000 companies participating in the Massachusetts energy efficiency industry today. What’s more, the majority of those companies are not energy efficiency-focused companies, but rather are companies that have added energy efficiency to an existing line of business.<sup>115</sup>

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<sup>115</sup> *An Industry Transformed: The Impact of the Green Communities Act of 2008 on the Energy Efficiency Industry in Massachusetts*, Northeast Energy Efficiency Council (October 2015), available at: [http://www.neec.org/wp-content/uploads/2015/10/NEEC\\_IndustryReport\\_102715.pdf](http://www.neec.org/wp-content/uploads/2015/10/NEEC_IndustryReport_102715.pdf)



c. *Supporting the Global Warming Solutions Act (“GWSA”)*

i. Energy Efficiency Under the GCA Supports the Goals of GWSA

One purpose of the Global Warming Solutions Act (“GWSA”) is to reduce Greenhouse Gas (“GHG”) emissions within Massachusetts 25 percent below 1990 levels by 2020.<sup>116</sup> Energy efficiency programs implemented pursuant to the Green Communities Act (“GCA”) support the goals of the GWSA because reduction of GHG emissions is an important result of the programs. As discussed further below, by delivering on the goals in their Three-Year Plans, the PAs are materially contributing to GHG emissions reductions in the Commonwealth, and each Three-Year Plan to date has reduced more GHG emissions than the one before it. Although the GWSA does not govern the PAs,<sup>117</sup> the PAs remain committed to achieving reductions in GHG emissions through implementation of their Three-Year Plans.

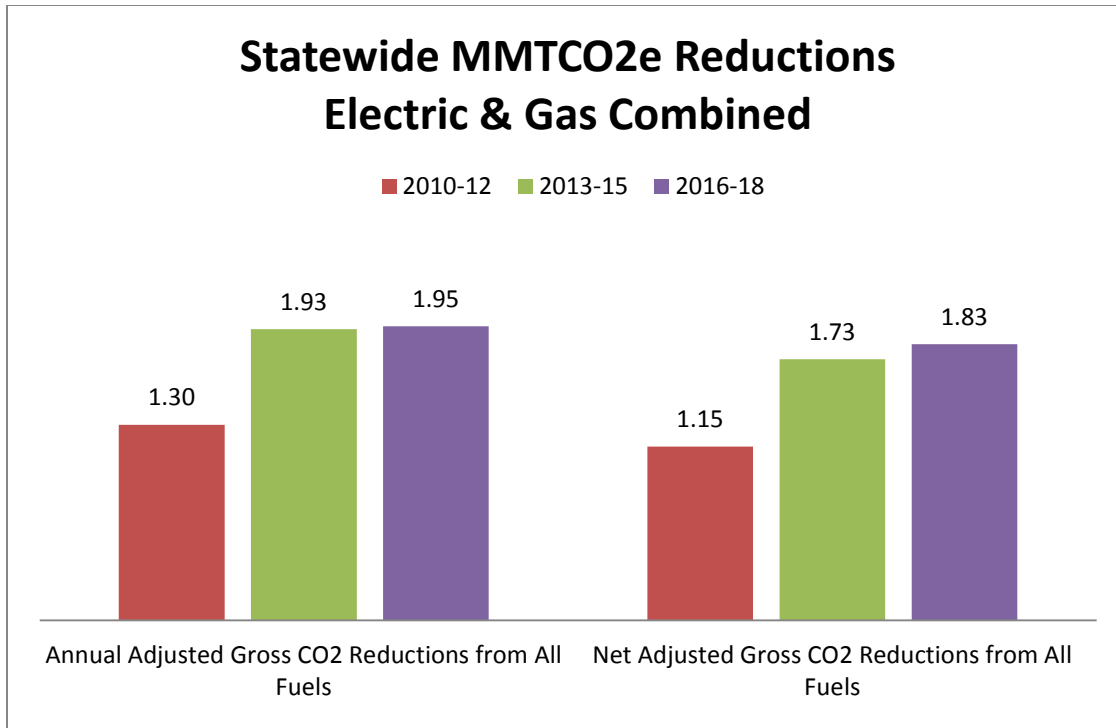
ii. More GHG Reductions Than Prior Plans

The PAs are substantially contributing to GHG emissions reductions in the Commonwealth. In fact, as demonstrated in the graph below, the 2016-2018 Plan will deliver more reductions in GHG emissions than prior plans.

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<sup>116</sup> The GWSA, which was enacted in 2008, identifies broad statewide GHG reduction goals for the Commonwealth to achieve. G.L. c. 21N. The GWSA requires DEP to “monitor and regulate emissions of greenhouse gases *with the goal of reducing those emissions.*” G.L. c. 21N, § 2(a) (emphasis added). The GWSA seeks to encourage early action to reduce GHG emissions. See G.L. c. 21N, § 3(b) (requiring EEA to develop plans to meet limits; § 5(i) (requiring EEA to report on reduction measures, their benefits and whether they encourage early action).

<sup>117</sup> The GCA governs the PAs’ energy efficiency efforts and requires them to seek to acquire all available cost-effective energy efficiency and demand management resources. The specified purpose of energy efficiency under the GCA is to encourage the efficient use of energy. St. 2008, c. 169 § 11; G. L. c. 164, § 1. The GWSA does not supersede or abrogate the Department’s regulatory authority or the Council’s role with respect to Three-Year Plans under the GCA. For a more detailed discussion of these issues, please refer to the initial and reply briefs filed by PAs in Method for Calculating Avoided Costs of Complying with Global Warming Solutions Act, D.P.U. 14-86, which is pending before the Department.



\*MMTCO<sub>2</sub>e = million metric tons of carbon dioxide equivalents

To further demonstrate the contribution of energy efficiency to the Commonwealth’s GWSA goals over time, the PAs provide a table below that is based upon adjusted gross annual savings. This table is provided to depict how energy efficiency contributes to reductions in GHG emissions in a snapshot annual view. Please note that the GHG emissions calculations for the electric PAs take into account non-electric savings, such as gas and oil savings in addition to electric savings. Similarly, the GHG emissions calculations for the gas PAs take into account non-gas savings such as electric savings that are not claimed by the electric PAs.




Adjusted gross savings are the actual savings achieved due to the installation of energy efficiency measures, as adjusted by impact factors but without factors related to program attribution. Attribution factors determine whether savings are attributable to the efforts of the PA programs pursuant to their Three-Year Plans and in compliance with their GCA mandate to reduce energy use. Attribution looks at free-ridership (*i.e.*, someone would have implemented energy efficiency measures without the program) and spillover factors (*i.e.*, savings resulting from program existence outside of program efforts). While these factors are appropriate for use with the GCA, which seeks to determine which savings resulted from PA program efforts (net savings), the GWSA seeks to quantify all energy efficiency GHG reductions without regard to PA program attribution. Consequently, calculating GHG reductions based upon net savings would undervalue the contribution of energy efficiency to GHG emission reductions.<sup>118</sup>

<sup>118</sup> Adjusted gross savings represent reliable energy efficiency savings that are used for other reporting purposes but not for the GCA. For example, ISO-NE relies on adjusted gross savings for all capacity and reliability purposes related to competitive wholesale energy markets.

Finally, the PAs used the most current emission factors provided by DEP to convert savings to GHG emission reductions. These factors are available on the GHG Reductions tab of Mass Save Data, the PAs' energy efficiency database. To access the factors, go to <http://www.masssavedata.com/Public/GreenHouseGases.aspx> and look for "Click here to view Emissions Factors used" in the table labeled "Total CO2 Reductions from All Fuels." The PAs used 2014 factors to estimate the reductions for years 2015-2018. The PAs recognize that these are backward-looking factors and that there is ongoing work related to emissions factors. When more accurate forward-looking factors become available, the PAs will apply them for reporting and on Mass Save Data.

<b>Adjusted Gross Annual Savings and CO2 Reductions (2010 - 2018)</b>				
<b>Year</b>	<b>Electric Energy Savings (MWh)</b>	<b>Gas Savings (Therms)</b>	<b>Oil Savings (MMBTU)</b>	<b>Annual CO2 Reductions (Short Tons)</b>
2010	631,568	11,162,323	208,500	363,613
2011	891,117	10,407,225	335,727	461,667
2012	1,226,549	29,562,657	396,068	679,035
2013	1,300,824	26,301,689	433,180	699,358
2014	1,490,550	28,277,668	454,099	787,068
2015	1,450,312	21,225,598	370,033	723,237
2016	1,484,266	22,021,736	42,636	714,802
2017	1,502,951	20,571,227	70,735	715,917
2018	1,525,109	18,687,129	111,489	716,880
<b>Total (2010 - 2018)</b>	<b>11,503,246</b>	<b>188,217,252</b>	<b>2,422,467</b>	<b>5,861,578</b>

To place these reductions in context, the PAs have converted their reductions in GHG emissions from 2010-2018 into the equivalent number of (1) cars removed from the road through electric and gas savings; (2) homes powered through electric savings; and (3) homes heated through gas savings.

<b>2010-2018 Annual Savings</b>	
	<b>1,119,481</b>
<b><i>Number of cars removed from the road through electric and gas savings</i></b>	
	<b>1,533,766</b>
<b><i>Number of homes powered through electric savings</i></b>	
	<b>198,751</b>
<b><i>Number of homes heated through gas savings</i></b>	

In making these calculations, the PAs used recent GHG conversion factors from the Energy Information Administration and/or the federal Environmental Protection Agency’s Greenhouse Gas Equivalencies. Please note that the information contained in the tables and the conversions to cars and homes is available for 2010-2015 on Mass Save Data at <http://www.masssavedata.com/Public/GreenHouseGases.aspx>. Data for 2016-2018 will be available after the October 30 filing with the Department. The GHG Reductions tab allows for conversions between metric and short tons and displays both the emissions and conversion factors.

iii. EM&V Study to Fully Quantify Energy Impacts that Result in Reductions in GHG Emissions and Environmental Benefits

As discussed above, energy efficiency under the GCA supports the goals of the GWSA. The plain language of the GWSA makes it clear that all GHG emissions reductions that “are real, permanent, quantifiable, verifiable and enforceable” should be counted.<sup>119</sup> The PAs can, to a large extent, reliably quantify how energy efficiency savings as reported under the GCA contribute to GHG reductions. They are concerned, however, that their quantification does not account for all verifiable GHG reductions resulting from program activity. For example, while the PAs quantify the incremental savings that result from incenting a natural gas customer to purchase a new high-efficiency furnace rather than a new standard-efficiency furnace, the PAs do not quantify the energy savings or emissions reductions related to that customer transitioning from their old furnace to a new furnace. And in the case where the old furnace was oil fired

<sup>119</sup> G.L. c. 21N, § 5(ix); see also G.L. c. 21N, § 2(a)(6) (ensure rigorous and consistent accounting of emissions); G.L. c. 21N, § 4(d) (use “the best available economic models, emissions estimation techniques and other scientific methods”).

rather than gas, the emissions savings are even higher and are not counted. Quantifying environmental benefits is a specific goal of the GCA and an important goal of the Commonwealth. Accordingly, the PAs will explore efforts through EM&V activities, with the support of the Council's independent EM&V experts and planning consultants, as well as DEP and DOER, to better quantify both the energy impacts used to determine climate and air quality benefits, and the estimates of other environmental benefits.

The implication for PA research differs depending on the scale at which EE impacts would be analyzed. For example, a gross savings analysis may look at the Gas Heating and Cooling program. While the PAs quantify the incremental savings that result from incenting a natural gas customer to purchase a new high-efficiency furnace rather than a new standard-efficiency furnace, the PAs do not quantify the emissions reductions related to that customer transitioning from their old oil furnace to a new gas furnace. While those savings may or may not be attributable to energy efficiency efforts, the savings are not being counted in other areas and estimating the savings can help better quantify the impact of the Massachusetts energy efficiency efforts on reduction of GHG emissions.

If a larger scale view is preferred, other research, such as investigating impacts from a top-down<sup>120</sup> approach, may be needed. In addition to the question of scale, research may need to extend beyond the traditional bounds of the utility system. Quantifying environmental benefits is a specific goal of the GCA and an important goal of the Commonwealth. This study could allow the Commonwealth to reassess the accounting of the GHG emission reductions attributable to energy efficiency. The PAs propose to complete this study before the filing of their 2019-2021 Plan.

#### iv. Conclusion

In sum, the PAs are proud to be material actors in helping the Commonwealth achieve its GHG emission reduction goals, and to be proposing savings goal for the 2016-2018 Plan that will support the Commonwealth's obligations under the GWSA. To better understand the GHG benefits that result from energy efficiency, the PAs propose to quantify the full suite of GHG reductions and benefits through an EM&V study to be completed before the next three-year plan. The PAs expect that this study will identify additional GHG emissions reductions that result from energy efficiency. In the meantime, the PAs have developed and launched a GHG Reductions tab on Mass Save Data, which provides transparency into the PAs' current calculations as to the effect of energy efficiency on GHG emissions reductions in Massachusetts.

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<sup>120</sup> Top-Down methods employ aggregate consumption and macro-economic data to measure reductions in energy use resulting from energy efficiency efforts.

## V. GREEN COMMUNITIES ACT REQUIREMENTS AND GOALS

### A. All Cost-Effective or Less Expensive than Supply Resources

#### 1. Introduction

Pursuant to G.L. c. 25, § 21 (b)(1), the 2016-2018 Plan seeks to capture all available cost-effective energy efficiency for the three-year term beginning January 1, 2016, taking into account many requisite competing considerations, including, but not limited to, bill impacts, cost efficiency, integrated program delivery, economic and environmental benefits, and the need for sustainability. The GCA does not define “all available” cost-effective energy efficiency, and thus developing related values requires a reasonable level of judgment. There is no single study or planning tool that can reliably set forth such a value. Rather, a multifaceted approach is necessarily employed and multiple reference points are considered. As discussed in Section II.D.1, the Department requires the PAs to consider and strike an appropriate balance among six factors in order to determine a reasonable pace for the sustained acquisition of all cost-effective energy efficiency.

In determining the level of savings for 2016-2018 necessary to satisfy the GCA’s mandate and the Department’s directives, the Program Administrators considered and weighed multiple factors, including: (1) the plain language of the GCA; (2) the input and recommendations of the Council and other stakeholders; (3) the Department’s energy efficiency Orders, including those (a) approving previous Three-Year Plans, Mid-Term Modifications (“MTMs”) and Annual Reports; (b) in D.P.U. 08-50-A and D.P.U. 08-50-D (bill impact considerations); (c) in D.P.U. 11-120-A Phase I (net savings and application of evaluation results) and D.P.U. 11-120-A, Phase II (revised Guidelines); and (d) in D.P.U. 13-67 (performance metrics); (4) assessments of all available cost-effective energy efficiency; (5) multiple studies and reports, including extensive EM&V results; and (6) the PAs’ experience in implementing nationally-recognized energy efficiency programs for over three decades. The Program Administrators met collaboratively on a frequent basis to determine the appropriate savings goals and budgets to propose in this Plan. The Program Administrators also participated in the Council’s planning activities and engaged in numerous discussions with Councilors, their Consultants, and other stakeholders.

#### 2. Experience in the Field

First and foremost, the Plan has been developed based on the in-depth experience of the Program Administrators in designing and implementing energy efficiency programs over more than 30 years, and, more specifically, in the course of implementing the Three-Year Plans for the periods 2010-2012 and 2013-2015. This experience includes (1) understanding of the customers’ circumstances and the cost of implementing aggressive programs over a sustained period and (2) knowledge that the PAs can successfully deliver impressive savings levels in the field. This experience also informs the PAs that as energy efficiency efforts yielding high savings become more difficult to identify and achieve, and as market penetration increases, there will be challenges in achieving additional savings. Importantly, the Program Administrators are factoring in upward pressures on the cost to achieve energy efficiency savings, especially as EM&V results, the level of CHP projects currently foreseen, and increased efficiency codes and

standards make the achievement of incremental efficiencies through PA-sponsored programs more difficult. In short, the PAs' experience in the field provides valuable lessons that inform this planning process in a unique and important way.

### 3. Review of EM&V Results

Working together and with the Council, the Program Administrators have undertaken extensive EM&V efforts designed to ensure accuracy and accountability in program planning and implementation and to guide the PAs as they focus on improving energy efficiency program efforts. Section III.E of the 2016-2018 Plan includes information regarding the comprehensive EM&V efforts that have been undertaken to date and which have informed program design and savings goals for 2016-2018. EM&V efforts will continue throughout the term of the 2016-2018 Plan, pursuant to the EM&V strategic plan. EM&V results have been used by the Program Administrators to more accurately forecast the actual savings resulting from their energy efficiency activities, in particular, net savings resulting from these activities. EM&V results indicate that strong savings are occurring as a result of the Program Administrators' efforts, but that savings, in particular for several gas programs, are not as high as originally forecasted. This is an important factor in looking to establish goals for 2016 -2018.

### 4. Potential Studies

#### *a. Introduction*

In the Department's Order in the 2013-2015 Plan proceeding, the Department directed "[t]he Program Administrators with an aggregate three-year savings goal of greater than 20 percent below the statewide three-year aggregate goal [to] conduct a study, either jointly or individually, during the upcoming three-year term to document the penetration of energy efficiency within its service territory and the remaining cost-effective energy efficiency opportunities available." 2013-2015 Energy Efficiency Plans, D.P.U. 12-100 through D.P.U. 12-111 at 18-19, 40 (2013). In compliance with this directive from the Department, The Berkshire Gas Company, Liberty Utilities, Unitil, and the Cape Light Compact each completed an assessment of the penetration of energy efficiency in their respective service territories and then used the results of that analysis to inform proposed savings goals and budgets in 2016-2018. In addition, although not directed by the Department to complete a potential study, National Grid completed an assessment of the remaining achievable electric and gas savings that could be secured in the C&I sector to help it to propose appropriate goals in that sector.

#### *b. The Berkshire Gas Company, Liberty Utilities and Unitil*

In 2014, Berkshire, Liberty, and Unitil (individually, "Company," collectively "Companies") each retained GDS Associates, Inc., to prepare Remaining Potential Assessments ("Assessments") in accordance with the 2013-2015 Order at 18-19, 40 (2013). The Department directed "[t]he Program Administrators with an aggregate three-year savings goal of greater than 20 percent below the statewide three-year aggregate goal [to] conduct a study, either jointly or individually, during the upcoming three-year term to document the penetration of energy efficiency within its service territory and the remaining cost-effective energy efficiency opportunities available." Id. at 18-19. The Companies also worked with the Council's

consultants on the scope of these Assessments. GDS was tasked with performing a program-specific assessment focused on what each Company's current energy efficiency programs had achieved (penetration and savings to date) and what remaining opportunities could likely be achieved within each Company's programs over the 2016-2018 term. The Assessments are available at Appendix M.

In early February 2015, GDS delivered these Assessments to the Companies. The Assessments encompass the demographics, market conditions, and customer attitudes in each Company's service territory. The Assessments also provided Company-specific information regarding savings potential that each Company has used in conjunction with other planning tools to build ambitious and achievable cost-effective energy efficiency goals for the 2016-2018 timeframe. The Assessments were conducted over approximately six months and relied on primary research in the Companies' territories as well as a review of historical data (2013 data was the most recent data available at the time GDS performed its studies). The Assessments estimated remaining potential based on actual in-service territory baseline data collection (phone surveys and site visits) and review of participant and non-participant customer feedback, which revealed a broader assessment of potential that is not solely based on any single year's performance.

The Assessments looked at past performance to set minimum levels of participation that could be achieved over the 2016-2018 term. The high-case potential scenario does not include budget constraints on the part of either customers or the Companies, nor does it take into consideration any territory-specific economic conditions, customer behaviors (as measured by the telephone and in-person surveys), or any physical barriers to measure installation. In determining goals for 2016-2018, the Companies considered these penetration constraining elements as well as the bill impacts that are likely to occur given the funding needed to reach the proposed level of savings.

While the Companies considered 2014 performance in developing goals for 2016-2018, they do not view 2014 performance as the only predictor of future potential. The tendency on the part of the Companies to experience swings in performance from one year to the next has been acknowledged in multiple evaluations, and should be taken into account when making projections for the 2016-2018 cycle. Using results from any given year in isolation, including the associated single-year payback, or cost to achieve savings, cannot in isolation produce a reliable projection of future potential; it is not possible to draw a line estimating any trajectory with a single data point. While considering two or more data points in relation to each other mathematically allows one to estimate a trend, the actual variance in performance is influenced by far too many non-linear variables to produce a reliable forecast of future performance.

*c. Cape Light Compact*

Consistent with the Department's directive on potential studies, the Compact retained Opinion Dynamics Corporation and Dunskey Energy Consulting to prepare the 2014 Cape Light Compact Penetration, Potential, and Program Opportunity Study (the "Study"). See 2013-2015 Order at 18-19. Prior to finalizing the scope of the Study, the Compact requested that the Council's consultants provide feedback on the proposed scope.



The goal of the Study was to determine the remaining achievable potential from electric measures among residential, low-income, and C&I customers for the six-year period 2016-2021 and to inform Compact's program planning efforts. The results of the Study are based on extensive primary and secondary data collection. The primary data collection activities for the residential and low-income sectors included a mail survey with 2,785 customers, in-home visits at 169 homes, and a telephone survey with 144 customers. The primary data collection activities for the commercial & industrial sector included a telephone survey with 448 customers and on-site visits at 150 facilities. In-depth interviews with a small number of local contractors to inform assumptions for the potential model were also conducted.

The Study identifies the average achievable energy savings representing 1.98 percent of Compact annual sales for the six-year Study period. To achieve the Study savings, it would cost the Compact \$220 million (incentive and non-incentive program costs), an average of \$37 million per year. The total cost (including the participants' net cost) amounts to \$246 million for the six-year period. Total cost to achieve increases over the 2013-2015 planning period, however, all of the 2016-2021 proposed investments are cost-effective, with a Total Resource Cost ratio of 3.6 and a Program Administrator Cost ratio of 2.8. For the 2016-2018 Plan, the Compact Governing Board is considering a higher goal than the 1.98 percent of sales because it is considering the adoption of several new measures that were not addressed as part of the Study.

The Study also affirms the unique service territory of the Compact relative to serving seasonal residential and seasonal commercial customers. Serving seasonal residential and commercial customers is challenging and may require the Compact to consider exploring adjustments to the statewide benefits and savings assumptions.

The Study is available at Appendix M.

*d. National Grid*

In advance of the 2016-2018 Plan, National Grid engaged DNV GL to assess the potential for electric and natural gas energy and electric demand savings from company-sponsored commercial and industrial demand side management (DSM) programs. The method used for estimating potential is a "bottom-up" approach, in which energy efficiency costs and savings are assessed at the customer segment and energy efficiency measure level. For cost-effective measures (based on the Total Resource Cost (TRC) test), achievable savings potential is estimated as a function of measure economics, rebate levels, and program marketing and education efforts. The modeling approach was implemented using a National Grid specific Excel model which allows for efficient integration of large quantities of measure, building, and economic data to determine energy efficiency potential. The Company focused explicitly on the C&I sector because the Company had greater uncertainty about remaining potential in this sector due to the maturity of the Company's programs.

In order to conduct its assessment of technical potential, DNV GL used National Grid specific data as inputs to its model. The model was populated with data collected from National Grid customers through Wave 1 and a portion of Wave 2 of the Massachusetts Existing Building Market Characterization C&I Customer On-site Assessments (study to be completed in 2016), previous state-wide and National Grid specific evaluation efforts, the Massachusetts Technical

Reference Manual, National Grid's internal documents and tracking data and other secondary sources.

In this study, DNV GL looked at the potential available under three scenarios - a business-as-usual (BAU) scenario where overall incentives levels paid in 2015 are used going forward as well as two additional funding scenarios: 25 percent increase over those BAU levels (25 Percent Plus scenario) and a 75 percent increase (75 Percent Plus scenario). DNV GL first provided preliminary results in May 2015. DNV GL revised these estimates in August 2015, taking into account information from completing additional site visits, revisions to the model to more closely represent the Company's programs, and updates to the savings and costs assumptions. DNV GL provided its final report to the Company on October 26, 2015. While the point estimates of achievable potential changed slightly between the drafts, two key factors that impacted the results of DNV GL's assessment of C&I technical potential emerged.

1. The maturity of National Grid's energy efficiency programs causes awareness among the participant population to be already quite high. Put more simply, much of the "low hanging fruit" is gone in National Grid's territory, while simultaneously there is not an anticipated disruptive change (either in new technology or program design) during the 2016-2018 time frame.<sup>121</sup>
2. The saturation of retrofit upgrades during earlier years of the model result in a noted decline over time in the annual energy savings. Put another way, as retrofits are completed, there are fewer opportunities going forward.<sup>122</sup>

The study identified the average achievable energy savings representing cumulative savings of six to seven percent of National Grid's 2018 C&I electric annual sales (averaging between 2 and 2.3 percent each year) and cumulative savings of two to three percent of National Grid's 2018 C&I gas annual sales (averaging between 0.7 and 1 percent in each year) for the 2016-2018 Plan term.

The Company used the results of this potential analysis as one of many pieces to help inform National Grid's proposed savings goals. The Company used additional information as well, including, but not limited to, reviewing historical performance, intelligence from field personnel, savings attributable to measures not included in the scope of this study (*i.e.*, CHP), and expectations for new technologies to become available and to be cost-effective. Taking these additional factors into account, the Company has proposed savings goals higher than the average results from the potential study, at 2.35 percent of annual sales and 0.90 percent of annual sales for its C&I electric and gas sectors, respectively.

The potential assessed by DNV GL is consistent with other technical potential studies in areas with mature energy efficiency programs, as shown in the table below.

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<sup>121</sup> *National Grid Massachusetts Energy Efficiency Potential Study*, DNV GL, October 2015, p.14

<sup>122</sup> *National Grid Massachusetts Energy Efficiency Potential Study*, DNV GL, October 2015, p.14

**10-Year Achievable Scenarios (percent of base) from other recent Potential Studies**

Study	BAU	Low-Case	High-Case
<i>Electric Results</i>			
National Grid 2015 Potential Study	13%	14%	16%
CPUC 2015 Potential Study <sup>123</sup>	9%	NA	NA
Vermont Public Service 2013 Potential Study <sup>124</sup>	NA	NA	19%
Xcel Energy 2012 Potential Study <sup>125</sup>	9%	10%	11%
Idaho Power 2012 Potential Study (Comm'l) <sup>126</sup>	9%	NA	NA
Idaho Power 2012 Potential Study (Ind'l) <sup>127</sup>	9%	NA	NA
<i>Natural Gas Results</i>			
National Grid 2015 Potential Study	5%	6%	7%
CPUC 2015 Potential Study <sup>128</sup>	3%	NA	NA
Xcel Colorado DSM Market Potential (Gas results) <sup>129</sup>	NA	3%	7%

For the complete report provided by DNV GL, please see Appendix M.

5. Council Coordination

The Program Administrators have also considered presentations at Council meetings by the Councilors, their consultants, industry stakeholders and the general public. The level of interest and commitment evidenced by these presentations affirms that opportunities for energy efficiency remain in Massachusetts because its citizens embrace a culture of energy efficiency

<sup>123</sup> *Energy Efficiency Potential and Goals Study for 2015 and Beyond, Stage 1 Public Draft Report.* Navigant Consulting May 2015.  
<http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Goals+and+Potential+Studies.htm>

<sup>124</sup> *2013 Vermont Energy Efficiency Potential Study Update, Final Report.* GDS Associates, Inc., March 2014.  
[http://publicservice.vermont.gov/sites/psd/files/Topics/Energy\\_Efficiency/2013%20VT%20Energy%20Efficiency%20Potential%20Study%20Update\\_FINAL\\_03-28-2014.pdf](http://publicservice.vermont.gov/sites/psd/files/Topics/Energy_Efficiency/2013%20VT%20Energy%20Efficiency%20Potential%20Study%20Update_FINAL_03-28-2014.pdf)

<sup>125</sup> *Xcel Energy Minnesota DSM Market Potential Assessment, Final Report.* KEMA, Inc., April 2012.  
<http://www.xcelenergy.com/staticfiles/xcel/Regulatory/Regulatory%20PDFs/MN-DSM/MN-DSM-Market-Potential-Assessment-Vol-1.pdf>

<sup>126</sup> *Idaho Power Energy Efficiency Potential Study,* EnerNOC, February 2012.  
<https://www.idahopower.com/pdfs/EnergyEfficiency/Reports/2012PotentialStudyReport.pdf>

<sup>127</sup> Ibid.

<sup>128</sup> *Energy Efficiency Potential and Goals Study for 2015 and Beyond, Stage 1 Public Draft Report.* Navigant Consulting May 2015.  
<http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Goals+and+Potential+Studies.htm>

<sup>129</sup> *Colorado DSM Market Potential Assessment.* Kema Consulting March 2010.  
<http://www.xcelenergy.com/staticfiles/xcel/Regulatory/Regulatory%20PDFs/CODSM-Report.pdf>

and sustainability. Presentations and comments at Council meetings have suggested, among other things, program design enhancements to target and achieve new savings in 2016-2018.

As discussed in Section II.D.2, the PAs were active and engaged participants in the Council planning process and have worked collaboratively with the Council and its consultants in the development of the 2016-2018 Plan. The Council conducted a number of sector-related workshops, facilitated by Raab Associates, Ltd., to assist in the development of the 2016-2018 Plan. The PAs were active and engaged partners in the development of meeting materials and in the workshops. In February and March 2015, there were three C&I workshops, three residential workshops and one multi-family/low-income workshop. In June 2015, there was one residential/low-income workshop and one C&I workshop.

As discussed in Section II.D.2, the PAs have carefully reviewed the Council's priorities and resolutions that relate to the development of the 2016-2018 Plan. The PAs appreciate the Council's thoughtful feedback on the April plan and their participation in the workshops and planning process. Together with the Council's input,<sup>130</sup> the PAs have developed comprehensive and innovative program designs that they believe will continue to set the standard for the rest of the nation. For ease of reference please refer to the following matrices responding to the Council's recommendations: Appendix F (matrix dated May 25, 2015 responsive to the 150 recommendations contained in the Council's March 31, 2015 Resolution); Appendix H (matrix dated September 23, 2015 responsive to the over 100 recommendations in the Council's July 21, 2015 Resolution). The PAs appreciate working with the Council in a collaborative and productive manner to develop energy efficiency programs for customers that will continue to deliver historic and nation leading savings and benefits.

## 6. Stakeholder Engagement

The PAs interact with a broad range of stakeholders on a regular basis in order to capture all good ideas and optimize program development and delivery. The breadth of stakeholders with whom the PAs interact on a regular basis spans the entire supply chain, including manufacturers, equipment distributors, contractors and service providers, trade associations, policy makers, community advocates, civic leaders, and customers. Each of these groups, individually and collectively, has an interest in, and is affected by, the energy efficiency plans designed and implemented by the PAs. The legislature recognized this significant scope of interested parties when it created the Council, the formal entity responsible for stakeholder input. The PAs recognize that both formal and informal interactions can yield program benefits, and therefore participate in and lead a multitude of activities and forums to foster this interaction, including: Council meetings, subcommittees, and the workshops facilitated by Raab Associates, Ltd.; MTAC; establishing the Process for Managing Proposals by Stakeholders and Interested Parties; open house meetings for trade allies and vendors; PA speakers for trade associations and meetings; providing collateral materials for customer events; and various ad hoc discussions with Councilors, government agencies, trade groups, and stakeholders. Additionally, the PAs seek

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<sup>130</sup> The PAs have incorporated many but not all of the Council's recommendations for the 2016-2018 Plan. Each Resolution clearly stated they contained "recommendations," consistent with the Council's advisory role under the GCA, but they were not a consensus view of the Council. See Section I.F.2 and related footnotes.

and benefit from long term, close relationships with their customers, allowing for continual feedback and program refinement.

## 7. Consultant Assessment

In developing the 2016-2018 Plan, the Program Administrators reviewed analyses of the Council's consultants and worked collaboratively with them to narrow differences of opinion on the assessment of potential for 2016-2018. The PAs appreciate both the efforts of the consultants in analyzing the assessment of potential for 2016-2018 and their willingness to engage in collaborative and productive discussions to refine that assessment. As discussed above and in Section V.A, there are many factors to consider in determining goals, including: potential, costs, bill impacts, AESC study results, EM&V results, changing costs and baselines, new technologies, and performance incentives. These factors interrelate and should be considered together in iterative discussions and through a progressive refinement process.

The PAs specifically considered the following reports from the Council's consultants: (a) report dated March 5, 2015 and entitled "Preliminary Assessment of Potential for 2016-2018," which was presented at the March 10, 2015 Council meeting ("Preliminary Assessment"); (b) report dated April 30, 2015 and entitled "Draft 2016-2018 Energy Efficiency Plan," which was presented at the April 23, 2015 Council meeting ("Draft Plan Goals"); (c) report dated May 12, 2015 and entitled "Comparison of PA 2016-2018 Plan with Consultant Team Goal Framework Analysis, which was presented at the May 19, 2015 Council meeting ("Comparison"); and (d) report dated July 14, 2015 and entitled "2016-2018 Planning Assumptions for Key Driver Update – DRAFT," which was presented at the July 14, 2015 Council meeting ("Key Driver Update"). Having reviewed the consultants' analyses, the PAs provided comments on the written reports of the consultants.

Over the course of the summer and into early fall 2015, the PAs and the consulting team engaged in continued and extensive collaborative discussions, with all parties looking to understand positions better, review data, and narrow gaps in respective analyses of key drivers of costs and savings. In large part, these collaborative efforts helped the PAs, EEA, DOER, and the Attorney General come to common understandings that resulted in the Term Sheet described in this Plan and set forth in Appendix D.

### B. Key Challenges and Market Barriers

As with the 2010-2012 Plan and the 2013-2015 Plan, the 2016-2018 Plan seeks to acquire all available cost-effective energy efficiency in a sustainable manner. In assessing the level of energy efficiency savings that is possible and sustainable for 2016-2018, the PAs took into account a number of factors. These factors include: (1) quality of program implementation; (2) customer economic conditions; (3) market conditions/seasonality for various measures; (4) lower gas costs relative to recent history; (5) landlord/tenant barriers; (6) other market barriers; (7) equity concerns; (8) the need to avoid "stops/starts" that send negative messages to the contractor community; (9) the need to provide consistency over time to be able to capture time-dependent opportunities such as renovations and new construction; and (10) the need to accommodate new technologies over time. The PAs describe below the key market and policy

issues they considered and their approach to assessing the sustainable acquisition of all available energy efficiency resources for 2016-2018.

### 1. Market Barriers

As in past plans, the 2016-2018 Plan is designed to address significant market barriers. To deliver energy efficiency successfully, the programs must bridge the five major market barriers of awareness, availability, accessibility, affordability, and aversion to risk. These barriers affect customers' adoption of energy efficiency measures and the ability of PAs to achieve savings. This Plan outlines the initiatives that PAs believe are critical in bridging the five major market barriers.

- a) **Awareness** is a barrier that historically was not confronted on a large scale, given capped budgets, marketing, and outreach. The 2016-2018 Plan recognizes that continued strong public education, marketing, and outreach, including community-based efforts, are needed to achieve deeper and broader penetration. Deeper penetration refers to the promotion of additional cost-effective technologies and strategies to capture comprehensive, whole-building savings among the traditional base of expected program participants. Deeper penetration requires raising participant awareness and understanding of the value of investing in additional measures that create increased savings. Broader penetration can include outreach to traditionally hard-to-reach customer groups, including economically marginalized communities and groups where English is not the first language.
- b) **Availability** is a barrier when manufacturers either do not produce or do not effectively market sufficient quantities of energy efficient products and services. Availability may also be constrained by limited workforce or delivery mechanisms. The challenge for manufacturers in the energy efficiency sector is to respond not only to the Commonwealth's demand for more efficient products, but also to demands on a national or even global scale. This challenge is compounded by economic pressures which reduce the willingness of manufacturers to make additional investments. From a workforce perspective, PAs recognize that continued workforce training and deployment is required to effectively deliver the programs. This is not an insignificant barrier.
- c) **Accessibility** is a barrier that refers to customer access to the product. To mitigate this barrier, PAs must continue to connect with mid-stream market actors, such as distributors, to ensure that products are displayed and stocked in sufficient quantity. The program descriptions set forth in this Plan provide for continued work with key market actors, and include campaigns for training and marketing, as well as proposed community mobilization outreach strategies.
- d) **Affordability** is a major market barrier resulting from the initial cost of energy efficiency solutions. PAs are concerned that affordability is more difficult to predict as customer buying patterns have changed dramatically with the advent of limited credit. The Plan attempts to mitigate this barrier through the use of incentives, new delivery models for economically challenged neighborhoods, and broadly accessible financing. In some cases, particularly with respect to gas energy efficiency efforts, the PAs propose to

increase incentives for measures so that the low commodity cost of natural gas does not impede investments in cost-effective gas energy efficiency measures and services.

- e) **Aversion to Risk** is a market barrier that describes customers who are unwilling to take a chance on technologies that they perceive to be unproven. To address this barrier, the PAs seek to provide detailed, clear information to customers about the direct benefits of energy efficiency measures. In some cases, this information will be provided to customers in the form of a case study highlighting the performance of proposed measures, which will help reduce the perceived risk associated with energy efficient measures and practices.

## 2. Policy Issues

As in past plans, the 2016-2018 Plan also takes into account policy issues, including economic, sustainability, and regulatory issues.

- a) **Economic** obstacles continue to be relevant in today's environment. The PAs recognize the 2016-2018 Plan's tremendous value, but must also consider the impact of short-term rate increases related to the ramp-up of these programs. The 2016-2018 Plan discusses the associated preliminary expected bill impacts of program implementation. As noted above, traditional incremental bill impact analyses, as well as participant analyses will be provided for each PA in the PA-specific filings later this year. The detailed bill impact analyses for each PA using traditional bill impact models that will be provided with each PA's Plan will contain the information required by the Department's Orders in D.P.U. 08-50-D.
- b) **Sustainability** of the programs is an important consideration for the Three-Year Plan and an expressly repeated priority of the Council. Many advocates, including the Program Administrators and the Attorney General, stress that in achieving all available energy efficiency, the annual efforts must also strive to be sustainable for the long term. This sustainability is vital to support the health of the economy, and the growth of the workforce and infrastructure needed to ensure the long-term benefits of these efforts.
- c) **Regulatory Guidance** includes the support of strong regulatory frameworks that complement the Program Administrators' ramp-up of programs. These frameworks create a healthy regulatory infrastructure by which PAs can confidently advance programs knowing that there is clarity in the regulatory rules and process and the opportunity to align shareholder objectives with public policy objectives. The Department's investigation in D.P.U. 11-120 is an example of the strong commitment to regulatory guidance in Massachusetts, which has streamlined energy efficiency regulatory filings and clarified the three-year nature of energy efficiency plans under the GCA.

### 3. Assessing

As discussed in Section V, the Program Administrators used multiple resources to build a robust understanding of the potential for all available cost-effective energy efficiency and demand reduction resources. These efforts are grounded in the definition of “Technical Potential” as the complete penetration of all measures analyzed in applications where they are deemed technically feasible from an engineering perspective. Technical Potential does not necessarily take into account cost-effectiveness, budget constraints, or whether homeowners or businesses are willing to undertake energy saving actions or investments

“Economically achievable energy efficiency potential” is defined as that portion of the technical potential that is cost-effective. Like past plans, the 2016-2018 Plan aggressively targets all available cost-effective energy-efficiency resources, while taking into account market and policy barriers that can constrain program implementation. In addressing these barriers, the 2016-2018 Plan seeks to allow for sustained energy efficiency efforts that do not create insupportable bill impacts, consistent with the GCA, Department precedent and the PAs’ public service obligation to their customers.

Assessing potential takes into account impediments to program implementation, including financial, political, and regulatory barriers that are likely to limit the amount of savings that might be achieved through energy efficiency and demand response programs. This assessment, therefore, recognizes both the market and policy barriers. After more than three decades of successfully implementing energy efficiency programs, the PAs understand these barriers and are able to integrate this knowledge of both market and policy concerns to inform this Plan. The program incentive design, delivery models, and support infrastructure developed by the PAs and discussed throughout this Plan are informed by a careful review of different types of potential.

#### C. Allocation of Funds for Low-Income Programs and Education

Energy efficiency funds shall be allocated to customer classes in proportion to their contributions to those funds, and, “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 shall be spent on comprehensive low-income residential demand side management and education programs.” G.L. c. 25, § 19(c). Based on the budget figures set forth in this Plan, for electric Program Administrators, 10.9 percent of the total budget will be allocated to the electric low-income residential sector for 2016-2018. Based on the budget figures set forth in this Plan, for gas Program Administrators, approximately 20.3 percent of the total budget will be allocated to the gas low-income residential sector for 2016-2018.

#### D. Minimizing Administrative Cost

In accordance with the GCA, the PAs seek to minimize administrative costs to the fullest extent practicable. Administrative costs, also commonly referred to as PP&A costs, include costs associated with:



- Developing program plans, including market transformation plans, research and development (“R&D”) activities (excluding R&D assigned to Evaluation and Market Research).
- Day-to-day program administration, including labor, benefits, expenses, materials, supplies, and overhead costs.
- Any regulatory costs associated with energy efficiency activities.
- Costs for energy efficiency services contracted to non-affiliated companies such as outside consultants used to prepare plans, screen programs, improve databases, and perform legal services.
- Internal salaries for administrative employees/tasks, including program managers that do not have direct sales and technical assistance contact with customers.

For the 2016-2018 Plan, approximately 15-18 percent of the PAs’ costs are budgeted in the Sales, Technical Assistance & Training cost category, supporting the activities of vendors, contractors and other industry professionals. Approximately 3 percent of the statewide budget is dedicated to the rigorous Massachusetts Evaluation, Measurement and Verification process. Other administrative functions, like Program Planning and Administration and Marketing and Advertising, make up approximately 5 percent of the statewide budget. Importantly, the majority of energy efficiency budgets are returned to customers in the form of incentives that are intended to overcome the financial barrier to investment. In the 2016-2018 Plan, 71 percent of the gas budget and 74 percent of the electric is returned directly to customers through use of participant incentives, which drive customers to participate. These percentages are in line with the budget allocations approved by the Department historically, demonstrating that the Program Administrators have been able to provide direct benefits to customers and contractors and grow the energy efficiency portfolios while minimizing costs.

The most significant factor in the PA approach to minimizing administrative costs is the statewide collaborative process, which is used by the Program Administrators to coordinate planning, the adoption of consistent programs and processes, program design, EM&V studies, statewide marketing, regulatory proceedings, and the development and sharing of all best practices. Sharing of these costs, which would otherwise be borne by each Program Administrator individually, results in economies of scale that reduce the cost for each Program Administrator. For example, joint releases of RFPs lead to minimization of administrative costs in that the cost for preparation and release of the RFP are shared by the PAs. The Program Administrators also minimize administrative costs by coordinating energy efficiency program delivery, where appropriate, with other customer service activities such as customer acquisition, key account management and trade ally relationships.

Notwithstanding any appropriate coordination with other customer service departments, it is necessary and appropriate for all Program Administrators to maintain a skilled and dedicated administrative staff in order to ensure successful delivery of programs, compliance with the GCA, timely responses to the requests of the Council, Department, and DOER, and documentation and achievement of substantial savings. The Program Administrators seek to balance the need to minimize administrative costs to the extent prudent with the need to

maximize program quality and oversight. Councilors have emphasized the need to devote sufficient administrative resources to successfully implement the aggressive programs called for in the Three-Year Plans.

While the economies of scale and other steps taken by the PAs to minimize costs are effective, and administrative costs incurred by the PAs are transparent, exact quantification of the minimization of administrative costs is not possible in a meaningful way. This is because the continuous scaling up and evolution of the plans make it impractical to establish a solid baseline for a comparison. When the variables are constantly (and necessarily) shifting, there is no opportunity to make a meaningful quantitative comparison. Further, a direct quantitative comparison would not be useful because it would only provide a comparison of two points in time. The mandate of the GCA is to seek administrative efficiencies, which is a continuous process that evolves along with energy efficiency planning and programming. Program needs and opportunities for administrative efficiency are always changing. The Program Administrators seek to minimize costs at all available opportunities, and not just from one point in time to another. By collaborating, creating consistent programming, and optimizing staffing needs, the PAs are able to minimize administrative costs to the extent practicable while providing quality energy efficiency services for customers.

E. **Competitive Procurement**

The Program Administrators utilize competitive procurement processes to engage and retain contractors and vendors to perform activities including, but not limited to: (1) audit delivery; (2) quality control; (3) monitoring and evaluation; (4) marketing; and (5) website design. The PAs are committed to continuing to utilize competitive procurement practices to the fullest extent practicable throughout the implementation of the Plan. Therefore, consistent with past practice, the PAs anticipate that they will continue to issue RFPs to engage appropriate third-party vendors to provide energy efficiency services; consider the input of the Council with respect to the retention of necessary consultants; and, where necessary, work collaboratively to ensure that energy efficiency services have been procured in a manner that minimizes costs to ratepayers, while maximizing the associated benefits of those investments. In order to build upon the progress made in prior plans, the PAs will continue to seek to expand the pool of qualified program vendors, promote the entry of new market actors into contractor and subcontractor roles, and ensure the transparency of the contractor bidding process and selection criteria used to evaluate proposals.

F. **Demand Response**

Achievement of demand savings in 2016-2018 is a key goal shared by the PAs and the Council. Demand savings through demand response (peak shaving and load shifting efforts) can contribute benefits such as reducing prices and price volatility for consumers, avoiding or deferring future generation, transmission and distribution investments, and reducing environmental impacts from electric generation. Demand response is a flexible, low-carbon resource that can also be used to help integrate renewable resources as more renewables come onto the electric system. Viable demand response strategies, combined with planned aggressive energy efficiency efforts, will contribute to the Commonwealth's economic and environmental sustainability goals.

PAs are seeking ways to understand both the costs and benefits of demand response in a way that will inform full scale deployment where benefits are expected to exceed costs. PAs are exploring ways to augment demand response provided by other market actors and explore opportunities to partner with such actors, where appropriate. In order to better understand the costs and benefits of demand response, individual PAs have developed or are working on developing individual or joint demonstration projects to gain a better understanding of costs and benefits of demand response. PAs will share the results of demonstration projects in order to gain insight, develop best practices, and utilize demand response strategies where appropriate going forward. Following the implementation of demonstration projects and related evaluation, PAs will use the results, along with related research and analysis, to guide the deployment of larger scale demand response initiatives in the latter years of this Three-Year Plan and going forward.

For PA-specific descriptions of these demonstration projects, please see Appendix L.

## **VI. COST RECOVERY, FUNDING SOURCES & FINANCING INITIATIVES**

### **A. Cost Recovery**

Cost recovery is a critical element of this Plan. Cost recovery associated with the implementation of energy efficiency programs includes the recovery of a performance incentive,<sup>131</sup> and, for those PAs without a Department-approved decoupling mechanism,<sup>132</sup> the replacement of revenues that support system operating costs. In order for the Program Administrators to pursue the aggressive goals set forth in this Plan, it is essential that the Plan provide a full and fair opportunity for the Program Administrators to be made economically whole for aggressively pursuing sales-reducing energy efficiency efforts and to earn a reasonable return on this investment based upon their performance and achievement. Although Department approval of the proposed Plan should ensure cost-recovery of Plan-related costs, lost base revenues (“LBR”), and performance incentives, the details related to individual PA cost-recovery mechanisms will be addressed in separate Department proceedings.

Pursuant to the GCA, for electric PAs, the Plan must include a fully reconciling funding mechanism that may include, but which shall not be limited to, a statutorily authorized mandatory SBC of 2.5 mills per kilowatt hour for all consumers, except those served by a municipal lighting plan. G.L. c. 25, §§ 19(a); 21(b)(2)(vii). In addition to this mandatory charge, the fully reconciling funding mechanisms shall be comprised of the funding sources listed in Section VI.B., herein, and other funding sources approved by the Department. G.L. c. 25, § 19(a). For gas PAs, the Plan must include a fully reconciling funding mechanism to collect costs from customers. G.L. c. 25, §§ 19(b); 21(b)(2)(vii).

The Department must approve such fully reconciling funding mechanisms if, after reviewing a Program Administrator’s proposed Plan, it determines that the Plan ensures that the PA has identified and shall capture all energy efficiency and demand reduction resources that are cost-effective or less expensive than supply. G.L. c. 25, § 21(d)(2). As part of this determination, the Department must approve recovery of all expenditures for the Program Administrator’s energy efficiency programs that are screened through the cost-effectiveness test described herein in Section IV.G. G.L. c. 25, § 21(d)(2). Therefore, in reviewing a Program Administrator’s proposed Plan, the Department must assure that the Program Administrator is able to implement all Plan offerings that are found to be cost-effective, even if the costs associated with providing those offerings are in excess of the established funding sources provided for in the statutorily-authorized energy efficiency charge through other sources, as discussed further below. G.L. c. 25, § 19.

### **B. Funding Sources**

#### **1. Introduction**

The Program Administrators seek to leverage available funding sources and financing initiatives in order to increase the benefits of Three-Year Plans and minimize customer bill

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<sup>131</sup> For a discussion of performance incentives, please see supra Section IV.C.

<sup>132</sup> As of January 1, 2016.

impacts. For electric Program Administrators, the GCA identifies four specific funding sources for energy efficiency programs: (1) revenues collected from ratepayers through the SBC; (2) proceeds from the Program Administrators' participation in the FCM; (3) proceeds from cap and trade pollution control programs, including but not limited to the RGGI; and (4) other funding as approved by the Department, including revenues to be recovered from ratepayers through a fully reconciling funding mechanism (*i.e.*, an EES). G.L. c. 25, §§ 19(a); 21(b)(2)(vii). Consistent with the Department's Guidelines, the Program Administrators allocate SBC, FCM, and RGGI revenues to each customer sector in proportion to the kWh consumption of each class.<sup>133</sup> In approving other funding for electric Program Administrators, the Department must consider: (1) the availability of other private or public funds; (2) whether past programs have lowered the cost of electricity to customers; and (3) the effect of any rate increases on customers. G.L. c. 25, § 19(a).

For gas Program Administrators, the GCA does not identify multiple funding sources for energy efficiency programs and instead requires the gas PAs to include a fully reconciling funding mechanism to collect energy efficiency program costs from customers (*i.e.*, EES). G.L. c. 25, § 21(b)(2)(vii); see also G.L. c. 25, § 21(d)(2). In approving funding for gas Program Administrators, the Department considers the effect of any rate increases on customers. Guidelines § 3.2.2.2.

The following funding sources and financing initiatives are currently available to the Program Administrators.

## 2. Non-EES Revenues

### *a. System Benefit Charge (electric only)*

The SBC is calculated consistent with G.L. c. 25, § 19(a) which states: "The [D]epartment shall require a mandatory charge of 2.5 mills per kilowatt-hour for all customers, except those served by a municipal lighting plant, to fund energy efficiency programs including, but not limited to, demand side management programs." Specifically, each electric PA calculates projected SBC revenues as the product of the statutorily mandated SBC of \$0.0025 per kWh and projected sales for the applicable year.

### *b. Forward Capacity Market Proceeds (electric only)*

Pursuant to G.L. c. 25, § 19(a), the Three-Year Plans of electric Program Administrators shall be funded in part by "amounts generated by the distribution companies and municipal aggregators under the Forward Capacity Market program administered by ISO-NE, as defined in section 1 of chapter 164." Specifically, each PA calculates projected FCM revenues as the product of the clearing prices of the FCM in the applicable year and the energy efficiency capacity that is designated by ISO-NE as an FCM capacity resource for the year. The Program Administrators propose to apply all net proceeds from the FCM to energy efficiency programs.

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<sup>133</sup> The low-income sector is allocated at least ten percent of the funds for electric energy efficiency programs and 20 percent of the funds for gas energy efficiency programs pursuant to G.L. c. 25, § 19(c).

To minimize ratepayer funding for energy efficiency efforts, each electric Program Administrator seeks to maximize FCM revenues for its customers. FCM bidding strategies are designed to strike an appropriate balance between maximizing revenues through participation in the FCM and avoiding the risks associated with FCM penalties for failure to deliver their capacity-supply obligations. Each PA employs its own individual strategy in bidding capacity into the FCM. For more information on PA bidding strategy see each electric PA's testimony.

The Department has recognized the challenges PAs face in projecting with precision over the term of a Three-Year Plan the level of planned energy efficiency resources that will be installed before and during each FCM commitment period. 2013-2015 Order at 119. One of these challenges is driven by the timing of the FCM auction cycles, which are conducted three years ahead and begin with a "show-of-interest" submission almost four years before the capacity-delivery period. Another is that there are financial penalties for failing to deliver on FCM supply obligations. However, each PA takes all reasonable steps to maximize FCM revenues during the term of a Three-Year Plan by adjusting, if appropriate, their FCM bids.

In developing a bid, each PA uses the best information available at the time. Each PA takes into account historic achieved annual peak period MW reductions from their energy efficiency programs, as well as ongoing studies and evaluations that may affect savings. Given the difficulty in estimating the actual energy efficiency savings that will be eligible to participate in the FCM and potential penalties, however, PAs do not bid into the FCM the total amount of energy efficiency savings they expect to achieve in their Three-Year Plans. In making conservative FCM bids, the PAs avoid compromising system reliability. In addition, the reconciling nature of the EES ensures that customers are made whole if PA FCM revenue projections are overly conservative and the PAs ultimately collect additional FCM revenues.

As noted above, a portion of the funding for energy efficiency efforts, including customer incentives, is derived through participation in the FCM. Although limited, there are some unique opportunities to further benefit customers and increase savings, as well as the region's capacity requirements. The PAs will provide FCM-supported energy efficiency services to electric customers who are not currently eligible for services due to other factors. For these customers, incentives would be limited to the value of the lifetime revenue stream associated with the demand savings from the project less any administrative expenses that are associated with the project.

*c. Regional Greenhouse Gas Initiative Proceeds (electric only)*

Pursuant to G.L. c. 25, § 19(a), the Three-Year Plans of electric Program Administrators shall be funded in part by "not less than 80 per cent of amounts generated by the carbon dioxide allowance trading mechanism established under the Regional Greenhouse Gas Initiative Memorandum of Understanding, as defined in subsection (a) of section 22 of chapter 21A, and the NOx Allowance Trading Program." As described further below, the electric Program Administrators typically calculate projected RGGI revenues by multiplying projected RGGI clearing prices by a projection of allowances sales in each RGGI auction, with 80 percent of the revenues allocated to electric efficiency programs. RGGI allowances prices are derived from the Avoided Energy Supply Cost Study. See Appendix J.

The electric Program Administrators consulted with DOER about how best to forecast RGGI proceeds for the 2016-2018 Plan. DOER recommended using a forecast developed using RGGI’s Integrated Planning Model (“IPM”), which was developed by ICF International. Specifically, the PAs have used “Scenario 2 - IPM 91 Cap” in developing their budgets based upon DOER’s recommendation, as set out below.

State	2015	2016	2017	2018
<b>Scenario 2 - IPM 91 Cap</b>				
MA Remaining Balance	7,925,075	10,218,385	10,062,297	9,709,729
Forward Price	\$5.44	\$6.76	\$7.52	\$7.52
Remaining Value	\$43,112,408	\$69,076,283	\$75,668,473	\$73,017,162
CCR Value	\$0	\$0	\$0	\$0
<b>Total Value</b>	<b>\$57,403,962</b>	<b>\$69,076,283</b>	<b>\$75,668,473</b>	<b>\$73,017,162</b>

DOER has clarified that there are administrative and other costs that reduce the full value option values of these RGGI forecasts. After discussions with DOER, for the 2016-2018 Plan, the PAs are forecasting that they will receive 75 percent of the RGGI proceeds.

The electric PAs have confirmed that DOER will continue to pay their share of the costs of the Council’s consultants retained pursuant to G.L. c. 25, §22(c) out of the 75 percent of RGGI auction proceeds that are allocated to the PAs. In forecasting RGGI revenues, the PAs have reduced their expected RGGI proceeds by the amount payable to the consultants. Because the consultant fees will be paid by DOER directly out of the RGGI proceeds, the electric PAs’ proposed budgets do not include separate expense amounts for Council consultant costs.

Projections also take into account anticipated lags between when RGGI auctions occur and when DOER is able to transfer funds to each electric PA. The Program Administrators have worked with DOER to develop a forecast that more accurately projects receipt of funds from DOER. The PAs expect to receive RGGI funds from DOER within 90 days or less of an auction.

### 3. EES Revenues<sup>134</sup>

The EES is a fully reconciling funding mechanism that the Department approves for funding the Three-Year Plans. G.L. c. 25, § 21(d)(2). Electric Program Administrators collect the EES through EERF or EEPCA tariffs. Guidelines §§ 2(9), 3.2.1.6. The electric PAs recover and reconcile energy efficiency costs pursuant to their EERF/EEPCA tariffs<sup>135</sup> for each year of the three-year term as the difference between: (1) the projected budget for the particular year and (2) projected revenues from non-EES funding sources for that year (*e.g.*, funding from SBC, FCM, RGGI and outside sources). For gas PAs, the EES is collected through the LDAC tariff in

<sup>134</sup> The PAs collect funds related to the RCS Act through their EESs. 220 C.M.R. § 7.00 *et seq.* The Department reviews the reconciliation of any over and under collections of RCS funds in the LDAC filings for the gas PAs and in the EERF/EEPCA tariff filings for the electric PAs.

<sup>135</sup> With the exception of the Compact, EERF/EEPCA filings are made coincident with each PAs’ residential basic service rate change, creating a lag between energy efficiency program spending and collection. The Compact’s rates are effective January 1 of each year, consistent with the 2013-2015 Order at 125, n.106.

accordance with established Department practice. Guidelines §§ 2(9), 3.2.2. The EERF/EEPCA and LDAC filings of the PAs are separate proceedings from the Three-Year Plan proceeding and are implemented on schedules that vary among the PAs.<sup>136</sup>

#### 4. Carryover Information

In determining its EES, a Program Administrator takes into account funds carried over from the previous year's program, whether positive or negative. These "fund balances" are used to adjust projected funding levels in the Plan.

#### 5. Outside Funding Levels

The 2016-2018 Plan does not contain outside funding assumptions at this time given the absence of material viable funding sources. The Program Administrators, as well as Councilors and government agencies, all actively continue to seek new sources of outside funding. The Program Administrators' approach in this regard reflects lessons learned over the course of two prior Three-Year Plans (2010-2012 Plan; 2013-2015 Plan). There continues to be a low likelihood that a major new federal "cap and trade" program will be implemented in the foreseeable future as had been anticipated when the 2010-2012 Plan was initially developed and approved by the Council.

#### 6. Financing Initiatives

During the first two Three-Year Plans, the Program Administrators developed, deployed, and offered customers several financial products in conjunction with the Massachusetts Bankers Association and Credit Unions - with over 60 financial institutions participating in this initiative. The Program Administrators expect to have enough capital infusion from the diverse Massachusetts lending community to meet customer demand for financing in the next three years. The Program Administrators' collaboratively-developed financing initiatives reflect both the strong coordination among the PAs, as well as the Program Administrators' responsiveness to comments and suggestions from Councilors. Program implementers in other states have frequently contacted the Program Administrators to learn from the Massachusetts experience in development of a state-of-the-art lending initiative that leverages the experience of local banks.

The highly successful Mass Save<sup>®</sup> HEAT Loan offers zero percent interest financing for qualified energy efficient home improvements. Customers may qualify for loans up to \$25,000

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<sup>136</sup> In 2014, NSTAR Electric and NSTAR Gas agreed pursuant to a Department-approved settlement agreement with the Attorney General to recover energy efficiency-related pension/ post-retirement benefits other than pensions ("PBOP") costs through their respective pension adjustment factors for the term of the 2016-2018 Plan. See D.P.U. 14-151, at 7. National Grid (electric) also recovers its energy-efficiency related pension/PBOP costs through its pension adjustment factor. The remaining PAs collect such costs through their EES charges. To the extent that NSTAR Electric, NSTAR Gas, and/or National Grid (electric) propose to collect energy efficiency-related pension/PBOP costs through the pension adjustment factor ("PAF") for plan year 2016 and beyond, the company seeking such rate treatment will include pre-filed testimony and exhibits in its 2016-2018 Plan filing to support why collecting such costs through the PAF and not the EES is consistent with G.L. c. 25, §§ 19, 21 and otherwise appropriate. See D.P.U. 14-151, at 13, n.6.

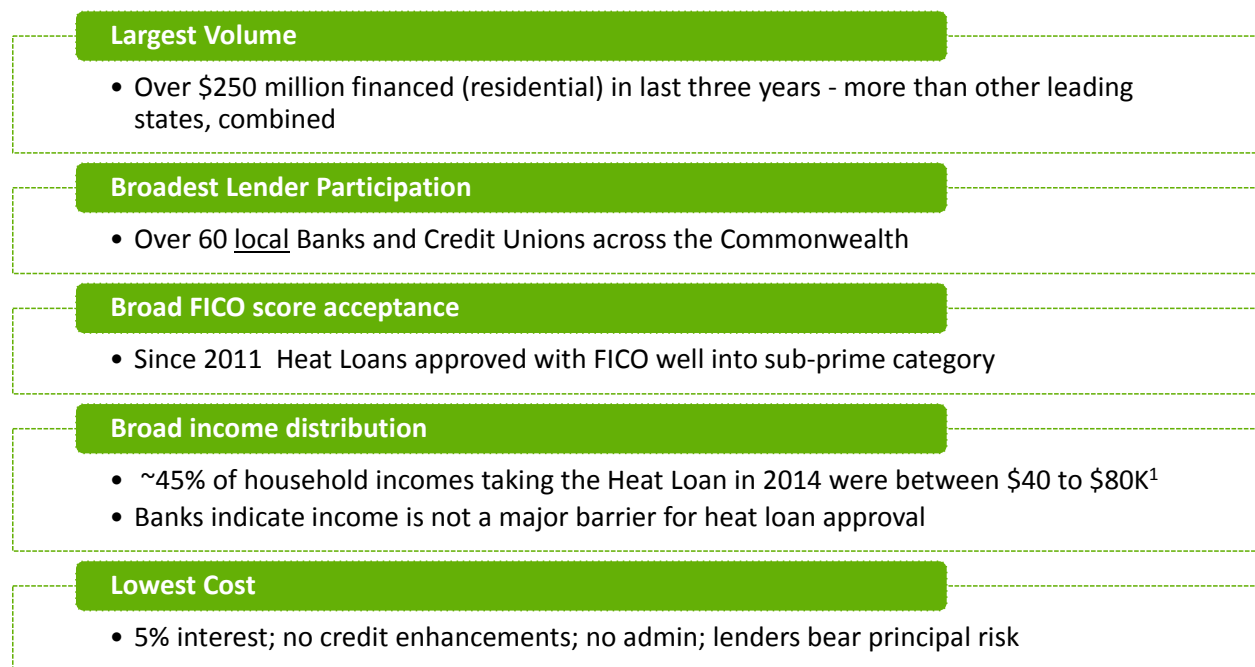


with terms up to 7 years, depending on the PA and the loan provider. Examples of improvements that may be financed with a HEAT Loan include:

- Attic, Wall, and Basement Insulation
- High Efficiency Heating Systems
- Central Air Conditioning/ Air Source Heat Pumps
- Ductless Mini Split Heat Pumps
- High Efficiency Domestic Hot Water Systems
- Solar Hot Water Systems
- 7-Day Digital & Wi Fi Thermostats
- ENERGY STAR<sup>®</sup> Qualified Replacement Windows

Additionally, with the express support of DOER and the Council, a portion of the HEAT Loan may be used to finance the mitigation of barriers preventing the installation of energy efficient measures (*i.e.*, pre-weatherization measures).

The Mass Save<sup>®</sup> HEAT Loan initiative is the most successful initiative of its kind in the nation, growing from 532 loans in 2006 to over 11,000 loans in 2014 (annual). Since inception, the Mass Save<sup>®</sup> HEAT Loan has made over \$200,000,000 available to thousands of homeowners implementing home energy efficiency improvements. The following chart shows information supporting the HEAT Loan's great success in Massachusetts.



1. Annual Lender Survey and Home Energy Services Initiative and HEAT Loan Delivery Assessment.

Massachusetts is a leader in the nation for financing of energy efficiency projects, with a larger quantity of cumulative loans than New York and California combined.

State	Category	Program	Total # of Loans (cumulative)	Total Amount Financed since 2011 <sup>2</sup>	2014 Population (est)
NY	Green bank	Green Jobs New York	6,690	\$66 million	19 Million
CA	PACE	HERO Pace <sup>1</sup>	11,250 <sup>3</sup>	\$135 million <sup>3</sup>	38 Million
MA	Utility / 3 <sup>rd</sup> Party	HEAT Loan	29,080	\$290 million	7 Million

1. HERO Pace accounts for 95 percent of residential PACE market in US.
2. MA Heat Loan operative since 2006; however numbers only show since 2011; CA and NY active since 2011.
3. Actual cumulative total through 2014 is \$432 million; data in table assumes energy efficiency projects represent 45 percent of amount financed and amount of projects with the remainder going to solar projects.

In this Plan, similar to the 2013-2015 Plan, certain gas PAs are proposing to allocate additional budgetary dollars in the Residential Home Energy Services initiative to make the HEAT Loan available in support of gas energy efficiency efforts in service territories where electricity is supplied by a municipal light plant. Customers of electric PAs will receive the HEAT Loan applications. Gas PAs that have municipal electric companies within their territories will offer the HEAT Loan to those natural gas/municipal electric customers. Therefore, all customers that pay into the SBC funds will be able to access the HEAT Loan. The gas PAs that have no line-item budget for the HEAT Loan have no municipal electric customers within their respective territories.

Financing allows customers, who may not be able to raise enough capital to pay for their customer contribution, to borrow funds in order to invest in energy efficiency. To the extent that access to low-cost capital is a barrier for certain customers, financing can alleviate that and encourage energy efficiency investments. The Program Administrators are continuing their efforts to understand the nature of barriers for different customer segments, which may be related to accessing capital, and to explore financing products/solutions to address them.

### C. Lost Base Revenues

The Department stated in D.P.U. 10-170-B that LBR, like revenue decoupling, removes the disincentive for companies to fully pursue all cost-effective energy efficiency and demand-side resources, so long as such activities occur within a company's own programs. D.P.U. 10-170-B at 45. Although the Department has expressed its preference for full decoupling in both D.P.U. 07-50-A and D.P.U. 10-170, as a transition to full decoupling, the Department determined in D.P.U. 07-50-A that, electric and gas distribution companies would be

allowed to recover LBR resulting from their incremental efficiency savings, until they begin operating under a decoupling plan. D.P.U. 07-50A at 83-84, n.24.<sup>137</sup>

In D.P.U. 07-50-A, the Department stated that electric distribution companies seeking to recover LBR must support such request with full documentation and explanation of: (1) how incremental energy efficiency savings will be achieved and accounted for, and (2) the proposed LBR calculation, in their then-upcoming 2010-2012 Plan. D.P.U. 07-50-A at 83. Gas companies then recovering LBR were allowed to continue to do so through the term of their initial Three-Year Plans consistent with then-existing LBR recovery methods. *Id.* at 83-84. As of the proposed effective date of the present three year plan (*i.e.*, January 1, 2016), the PAs without Department-approved decoupling mechanisms are NSTAR Electric and Berkshire.<sup>138</sup> As such, each of these PAs intends to seek Department approval of LBR recovery in connection with this Three-Year Plan, supported by evidence of how incremental energy efficiency savings will be achieved and accounted for and a calculation of the LBR requested for approval. Information regarding NSTAR Electric and Berkshire LBR is included those PAs' Energy Efficiency Data Tables.

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<sup>137</sup> The Department approved LBR recovery for NSTAR Electric for the years 2009-2011 pursuant to the rate settlement filed in D.P.U. 14-151, and for the years 2012-2015 pursuant to the rate settlement filed in D.P.U. 10-170. The LBR recovery approved for NSTAR Electric for 2012-2015 was a settlement-specific methodology applicable to NSTAR Electric only. In connection with the 2016-2018 Plan (or until the Department approves a decoupling proposal for NSTAR Electric or Berkshire), NSTAR Electric and Berkshire intend to seek LBR recovery consistent with the Department's established methodology for LBR recovery articulated in D.P.U. 07-50-A at 83 and D.P.U. 07-50-B at 30-31. See also EERF Filings, D.P.U. 10-07-A/D.P.U. 10-08-A/D.P.U. 10-09-A.

<sup>138</sup> Assuming Department approval of NSTAR Gas Company d/b/a Eversource Energy's petition to approve a decoupling plan in D.P.U. 14-150.

## VII. MISCELLANEOUS

### A. Streamlining Processes to Reduce Costs for Customers

In conjunction with approving the 2013-2015 Plan, the Department also streamlined regulatory processes, which allowed the PAs to focus more on successful implementation of their energy efficiency plans. In D.P.U. 11-120-A, Phase II, the Department created a true three-year paradigm for implementing energy efficiency plans and adopted revised Guidelines. Treating Three-Year Plans as a three-year term rather than three separate one-year plans reduced the potential need for MTMs and recurring revisions. In addition, starting with the 2013-2015 Plan, the Department reviews the performance of the PAs at the end of each three-year term in adjudicatory processes rather than every calendar year. Instead, the PAs provide Plan-Year reports for informational purposes only. The Department may investigate a PA's performance on its own motion or if the Council requests such an investigation.

In addition, the Department recently determined that performance metrics were no longer necessary to incentivize the PAs' energy efficiency efforts. The Department found that "[n]egotiating, satisfying, and documenting performance metrics is costly and time consuming." Performance Metrics, D.P.U. 13-67 at 13, n.25 (2014). The Department found that "such an investment of time and resources solely for the purpose of verifying metric performance is out of proportion with the potential benefit of metrics." Id. The Department concluded that verifying performance of these metrics would divert the focus of PAs and stakeholders "from the successful implementation of the three-year plans and is inconsistent with the Department's obligation to fulfill its oversight responsibilities in an administratively efficient and effective manner." Id.

The PAs appreciate the streamlining leadership of the Department and, during the 2016-2018 Plan, the PAs will build on the streamlining improvements that benefitted implementation of the 2013-2015 Plan and will continue to seek to improve administrative efficiencies and minimize costs where possible. One important streamlining improvement the PAs have implemented for the 2016-2018 Plan is aligning the AESC study process with the development of a Three-Year Plan. Historically, the AESC study process was conducted every two years. Starting with the 2015 AESC study, which was completed in time to inform the April 30<sup>th</sup> draft Three-Year Plan, the study will be conducted every three years. Aligning the AESC study process with the Three-Year Plan development should reduce the potential for MTMs and other mid-term updates to the PAs' energy efficiency filings.

Another process improvement the PAs have made is expanding the stakeholder proposal process, which was successfully employed during the 2013-2015 Plan. This process applies to proposals, inquiries and ideas from stakeholders, private companies or individuals, non-profits, community groups, associations, local government, state government, and others that require significant PA commitment of funds or personnel. The improved proposal process will better manage proposals from stakeholders and interested parties to the RMC and C&IMC. This process is not intended to address general inquiries or suggestions or general notices of funding opportunities. To qualify for consideration by the management committees, proposals are expected to have the appropriate level of proponent research conducted and expertise articulated.

The process outlines the criteria for evaluation and the timeline and process expectations. Documents related to the proposal process are available publicly on MassSave.com.<sup>139</sup>

The PAs will continue to identify streamlining and efficiency opportunities for the 2016-2018 Plan. One potential area of opportunity is to consider ways to improve the efficiency of the Council process in general, as discussed in the Assessment of Massachusetts Energy Efficiency Advisory Council conducted by Dr. Jonathan Raab, Raab Associates, Ltd. with Pat Field, CBI, which was completed on December 1, 2014 (“Assessment”). As noted in the Assessment, while the role of the Council in developing a Three-Year Plan is clear, its role during implementation is not as clear, and has led to some frustrations on the part of the Council and the PAs. The PAs remain committed to being actively and productively engaged with the Council in a collaborative manner consistent with the GCA. The PAs appreciate that Council meetings are an important tool in planning for and implementing Three-Year Plans and that they require an investment of time and resources by all Councilors. As the third Three-Year Plan begins, the Program Administrators will have: (1) six years of GCA-related energy efficiency experience with more mature programs, which will inform future efforts to achieve energy efficiency cost-effectively; (2) a better understanding of the concerns and interests of the Councilors and an effective means of continuing dialogue with them (through Council resolutions and other Council documents, Council Executive Committee meetings and individual communications as well as consultant communications); and (3) an established means of reporting data to the Council (through monthly, quarterly and annual reports).

Given the success and experience with this construct, the Program Administrators will seek additional ways to streamline processes in 2016-2018, including ways to spend more time with customers seeking savings, such as fewer Council meetings during implementation years. The PAs appreciate and recognize the work and time invested by Councilors in preparing for Council meetings to ensure the mandates of the GCA are being achieved. The Program Administrators devote time and attention to being as well prepared as possible for each meeting, and respond to Councilors’ concerns during and after Council meetings. The Program Administrators continue to strongly support the role of the Council established in the GCA and recognize that their energy efficiency programs have benefitted from the many excellent suggestions of Councilors. The PAs will seek Councilor input on ways to streamline processes and reduce meetings, especially during implementation years, while maintaining transparency and providing the optimal amount of information to the Councilors.<sup>140</sup> The Program Administrators are seeking to leverage collective experience, identify possible efficiencies and

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<sup>139</sup> The documents related to the proposal process are available at <http://www.masssave.com/professionals/business-opportunities/process-for-managing-unsolicited-proposals>.

<sup>140</sup> According to the Assessment, “the majority of interviewees thought fewer meetings might be justified during implementation years, especially if meetings are run more efficiently and some work is done in Subcommittees or in more focused, topical meetings. Some felt that a move to a quarterly or every other month Council meeting is appropriate during the implementation phase.” Assessment at 18. The Assessment recommended that “[d]uring implementation of the three-year plan, the EEAC can probably meet less frequently (*e.g.*, every other month or quarterly), but with ExCom still meeting monthly, and with the ability to form subcommittees for ongoing topics/issues or focused work sessions on specific topics, and call special meetings of the EEAC, if necessary.” Assessment at 19.

optimize all stakeholders' time given the experience gained through the first two Three-Year Plans.

## B. Mid-Term Modifications

### 1. Introduction

Mid-Term Modifications (“MTMs”) are significant adjustments of specified categories made by PAs during the term of a three-year plan. MTMs are not required and PAs submit such filings based on specific triggers as laid out in the Department’s Energy Efficiency Guidelines.

### 2. Purpose of MTMs

The Department has stated that “the primary purpose of a mid-term modification should be to improve upon how a three-year plan provides for the acquisition of all available cost-effective energy efficiency resources.” Energy Efficiency Guidelines, D.P.U. 11-120-A, Phase II at 27 (2013). “In establishing guidelines for the review and approval of proposed mid-term modifications, the Department sought to provide Program Administrators with the flexibility to respond to changing circumstance, while ensuring that they implement their plans in a manner consistent with the Department-approved plan.” Id., citing D.P.U. 08-50-A at 63-64.

### 3. The Exception Not the Rule

The Department issued revised MTM guidelines as part of its streamlining docket in D.P.U. 11-120, which was focused on reducing regulatory burdens where possible. In finding that energy efficiency plans should be treated as true Three-Year Plans and not three annual plans, the Department minimized (but did not eliminate) the potential for mid-term changes to the PAs’ Department-approved goals. Energy Efficiency Guidelines, D.P.U. 11-120-A, Phase II (2013). Given this context, and the stated purpose of MTMs, the PAs consider MTMs to be the exception and not the rule. Accordingly, the PAs develop Three-Year Plans with the best available information and without an expectation that they will require MTMs.<sup>141</sup> MTMs are important tools to provide flexibility to address changing circumstances while implementing Department-approved plans.

### 4. The Guidelines Govern MTMs

MTMs are governed by § 3.8 of the revised Energy Efficiency Guidelines approved by the Department on January 30, 2013 in D.P.U. 11-120-A, Phase II. The Guidelines provide for Category One modifications (Council support only required) and Category Two Modifications

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<sup>141</sup> This is especially true for Cape Light Compact (“Compact”), which, for example, could not operate on the expectation that MTMs will provide further funding. As a municipal aggregator, the Compact does not have capital reserves to float the shortfalls in revenue that can occur as a result of energy efficiency program spending and collection. Unlike other PAs, the Compact cannot rely on working capital to make up revenue shortfalls and has no authority to issue municipal bonds. 2013-2015 Order at n.106. In view of its unique circumstances, the Department allowed the Compact to make a proposal to collecting energy efficiency revenues on a calendar-year basis. Id.

(Department approval required). The Guidelines include detailed appeal rights to the Department.

#### 5. Category One MTMs

The Department created “Category One MTMs.” Pursuant to § 3.8.1 of the Guidelines, a Category One MTM is a significant modification, as described below, to a PA’s Department-approved Energy Efficiency Plan, which must be submitted to the Council for review:

- 1) the addition of a Hard-to-Measure Energy Efficiency Program;
- 2) the termination of an existing Energy Efficiency Program or Hard-to-Measure Energy Efficiency Program;
- 3) a change in the three-year term budget of an Energy Efficiency Program or Hard-to-Measure Energy Efficiency Program of greater than (1) 20 percent, or (2) a dollar value to be specified by the Department; or
- 4) a modification to the design of an Energy Efficiency Program that is projected to result in a decrease in program benefits over the three-year term that is greater than 20 percent.

Pursuant to § 3.8.1.1, if the Council passes a resolution supporting the proposed modification, the Program Administrator may implement the modification.

#### 6. Category Two MTMs

The Department also created a “Category Two MTM.” Pursuant to § 3.8.2 of the Guidelines, a Category Two MTM is a significant modification, as described below, to a PA’s Department-approved Energy Efficiency Plan, which must be submitted first for review by the Council, and then for review and approval by the Department:

- 1) the addition of a new Energy Efficiency Program;
- 2) the transition of a Hard-to-Measure Energy Efficiency Program to an Energy Efficiency Program; or
- 3) a change in the three-year term budget of a customer sector that would require a cents per kilowatt-hour (calculated using the method described in § 3.2.1.6) or cents per therm charge for the sector that, if it were to replace the Department-approved Energy Efficiency Surcharge for the applicable year, would result in a bill increase for an average customer in the sector exceeding two percent.

The Program Administrator may not implement the modification pending review and approval by the Department.

#### 7. 2013-2015 MTMs

During implementation of the 2013-2015 Plan, the PAs proposed both Category One and Category Two MTMs. The Council approved Category One MTMs in resolutions adopted on: (1) October 15, 2014; (2) March 31, 2015; (3) May 19, 2015; (4) June 29, 2015; and (5) July 14, 2015. The Council also approved Category Two MTMs in resolutions adopted on

March 31, 2015 and July 14, 2015. The Council did not support or oppose MTMs seeking to decrease budgets in certain C&I programs. See Resolutions dated March 31, 2015 and July 14, 2015. As required by the Guidelines, the PAs also filed their Category Two MTMs with the Department for approval.

The MTMs proposed by the PAs during implementation of the 2013-2015 Plan were done sparingly in order to meet changing circumstances such as meeting unexpected customer demand or to satisfy certain triggers in the Department's revised Guidelines. The majority of the MTMs seeking to increase program budgets in order to meet customer demand for program products and services were also expected to result in increased savings.

#### 8. MTMs Do Not Revise Department-Approved Budgets or Goals

In proposing MTMs pursuant to the Department's revised Energy Efficiency Guidelines, the PAs have not revised the goals approved by the Department in their 2013-2015 Plan. The PAs have proposed that all reporting on the 2013-2015 Plan, including the Plan-Year Reports and Term Report, will report and compare actual results to the Department-approved budgets and goals. The PAs will submit the resolutions of the Council to the Department to support any variance explanations related to the MTMs in Plan-Year Reports and Term Reports. In addition, the performance incentive model filed in D.P.U. 14-05 remains unchanged (there is no increase or decrease to the performance incentive pool or any change to the payout rates derived in the performance incentive model).

Historically, as shown in more detail in Appendix B (describing regulatory background), the PAs filed MTMs to adjust certain goals in their 2010-2012 Plans. In those MTM filings, the PAs provided revisions to their Department-approved 2010-2012 Plan goals to reflect the proposed MTMs. These filings led to confusion about what baseline to use in assessing PA performance. It is important to avoid such confusion in the future, while providing transparency into factors affecting the PAs' performance. The PAs believe that their treatment of MTMs for the 2013-2015 Plan strikes an appropriate balance between transparency and simplicity. The PAs will report and compare actual results against the Department-approved goals and explain any variances related to MTMs with supporting documentation from the Council.

### C. Statewide Energy Efficiency Database

#### 1. Database Development

The Council has identified the development of a comprehensive, accessible, secure statewide energy efficiency database as a priority. See Resolution of the Council Regarding its Priorities for 2014 (February 25, 2014); Draft Council Priorities for 2015; see also Resolution of the Council Regarding its Priorities for 2013 (February 12, 2013). The Department has also encouraged the development of a "uniform energy efficiency program data tracking system that is efficient, reliable, and useful to all parties." Massachusetts Electric Company, D.P.U. 10-98, at 16 (2011); Western Massachusetts Electric Company, D.P.U. 10-90, at 21 (2011); Fitchburg Gas and Electric Light Company, d/b/a Unitil, D.P.U. 10-89 at 17 (2011).



In compliance with the Department's Order approving the 2013-2015 Plan and the development of a database, the PAs developed an initial statewide energy efficiency database, which became available for use during the second year of the 2013-2015 Plan. Specifically, in 2014, the PAs developed, implemented, maintained and improved a number of initial tabs on Mass Save Data ("MSD"), their publicly accessible energy efficiency database, which is live at <http://www.MassSaveData.com>. MSD provides quantitative data similar to that in the PAs' public reports, including information related to participants, expenditures, annual and lifetime savings, electric capacity savings, and benefits. MSD provides data on both a PA-specific and statewide basis and allows the public to download data to Excel or PDF formats. The platform can continue to grow and provide accessible, meaningful information to customers and stakeholders over time. The PAs understand that database matters are important and that stakeholders have varying views on the best path forward. The PAs submit that MSD is the most effective approach and is already providing significant benefits for users. MSD can be enhanced and added to over time.

The development of MSD is a direct result of database discussions with stakeholders that began in 2011 and continued throughout much of 2014. See 2013-2015 Plan at III.N & App. I; 2016-2018 Plan Appendix W (chart of database events). Although these discussions included a range of views on the purpose of a statewide database, there was consensus that the extensive data already contained in individual and statewide public reports of the PAs should be more easily accessible. In November 2013, the PAs jointly hired a vendor who had previously developed a similar energy efficiency database project in Connecticut. Cost-effectively building on its prior work, the vendor proposed a scope of work for the initial phase of MSD. The PAs held demonstrations for stakeholders in May 2014 to preview the expected functionality of this database and continued to provide updates to stakeholders throughout 2014 and 2015.

## 2. EEAC Database Process

After the Department approved the development of a statewide database in 2013, the PAs continued to actively participate in stakeholder database discussions. See Appendix W (chart of database events). As reflected in Appendix W, the PAs participated in 17 EEAC-related database meetings between April 8, 2013 and April 28, 2014. The PAs participated in both EEAC Database Subcommittee and Working Group meetings, which met separately but discussed the same issues. The PAs also met with the consultant hired by the EEAC to develop database specifications.

The PAs, along with other stakeholders, actively participated in the EEAC-related database meetings. The PAs expressed strong support for a statewide database that improves access to the extensive data that the PAs already report. The PAs also provided extensive written feedback to the EEAC on December 23, 2013 with respect to the consultant's conceptual proposal. On April 2, 2014, the PAs provided written comments explaining in more detail the customer privacy issues at issue in the conceptual proposal. On April 15, 2014, the PAs provided detailed comments on a database vision statement and database specifications. See Appendix W.

The PAs were not the only participants with concerns about the proposed database specifications. Indeed, notwithstanding diligent efforts and work by all parties involved, there

was not consensus among the participants in the EEAC Database Subcommittee and Working Group about the purpose or contents of a statewide energy efficiency database. This lack of consensus was reflected in the database resolution adopted by the EEAC on May 13, 2014. As stated in the resolution, “A *Massachusetts Statewide Energy Efficiency Database System Specification* and a *Massachusetts Statewide Energy Efficiency Database System Cost and Schedule Estimate* were completed pursuant to the EEAC Database Subcommittee process where there was not full consensus.” See Appendix W (database resolution).

Historically, stakeholder working groups and a consensus approach have been the hallmark of energy efficiency programming in Massachusetts. It was through a stakeholder working group that the D.P.U. 08-50 tables, and the data needed to support them, were developed, agreed to, and ultimately, approved by the Department. Energy Efficiency Guidelines, D.P.U. 08-50-B (2009); Energy Efficiency Guidelines, D.P.U. 08-50-C (2011); Energy Efficiency Guidelines, D.P.U. 11-120-A, Phase II (2013).<sup>142</sup> However, consensus is not always possible, notwithstanding good faith efforts by all. For a general discussion of the PAs’ perspective and approach to developing a database, please see the PAs’ database comments and Appendix W.<sup>143</sup>

Because the EEAC database process did not reach consensus, the EEAC submitted its database resolution to the Department seeking assistance. On December 1, 2014, the Department issued an order in D.P.U. 14-141 in response to the EEAC’s database resolution. On December 22, 2014, the PAs jointly filed a motion asking the Department to reconsider its order on various grounds, and filed an informal database update report on March 5, 2015. As reflected in the Hearing Officer’s ruling dated February 20, 2015, “[t]he substance of the Program Administrators’ Joint Motion is currently pending before the Commission.” Consequently, the Hearing Officer stayed the compliance filing ordered by the Department “until such time as the Commission rules on the substance of the Joint Motion.” This matter is currently pending before the Department.

### 3. MSD Overview

The MSD tabs currently available for the public are the following: home page, portfolio overview, sector overview, performance details, HES activity, GHG reductions, sales and savings, cost to deliver, monthly reporting, and glossary.<sup>144</sup> All of these tabs were developed and deployed in 2014 and 2015. The website is populated with 2010-2012 data (plan and evaluated); 2013-2014 data (plan, preliminary and evaluated), and 2015 plan, quarterly and monthly data. After the October plan filing, the website will display all plan data for 2016 to

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<sup>142</sup> The Department has defined stakeholder consensus as those “decisions and documents adopted by the group [that] were acceptable to all members, even if there was not 100 percent agreement about every item.” Energy Efficiency Guidelines, D.P.U. 08-50-B at 10 (2009).

<sup>143</sup> Although the Department afforded DOER “a” leadership role in the development of a statewide database, the PAs necessarily played an important leadership role in developing a database since they must comply with the requirements of the GCA, answer to the Department on expenditures of customer funds, and have a fiduciary duty to customers.

<sup>144</sup> The PAs are working on displaying additional data on MSD and are currently developing measure, regulatory reporting and geographic tabs.

2018. The PAs will update the 2016-2018 plan data to comply with the Department's final Order in January 2016. Since launching the website, the PAs have continued to improve MSD by enhancing the home page; providing external links to MassSave.com, evaluations studies, and the websites for the Council and Department; and updating the look and feel to be more user friendly and consistent with [www.MassSave.com](http://www.MassSave.com). The PAs continue to identify other needed improvements as they work with the data in MSD.

#### 4. MSD – Purpose and Benefits

MSD is an online statewide database that improves public and stakeholder access to the extensive data already reported by PAs. It provides a single, reliable and timely data source for currently reported data on an individual PA and statewide basis that can be accessed at any time. MSD enables users to export data to spreadsheets for further analysis and queries. The PAs designed MSD to export data easily for those stakeholders like the Council and DOER who file data-driven reports on energy efficiency and, at the same time, to display data in a user-friendly, understandable manner for those users who prefer charts and graphs. MSD has been implemented in a manner that is cost efficient, protects customer privacy and is compatible with (but not duplicative of) PA tracking systems. The PAs were able to deploy the initial phase of MSD in a cost efficient manner by leveraging similar work the vendor had performed in another state.

One of the primary benefits of MSD is as a single source for the most current data reported by the PAs, both individually and in statewide roll ups. It provides access to the most up-to-date reported initiative-level PA data in easy-to-understand formats and automates the statewide view from eleven individual PAs.<sup>145</sup> As discussed in the Section II.C, the PAs provide monthly, quarterly, annual and term energy efficiency reports, which document their performance in implementing energy efficiency programs. MSD provides one source for the quantitative data contained in these public reports.

In addition, MSD appropriately protects customer privacy and reduces the need for expensive data security measures because the website is populated with aggregated and not customer-specific energy efficiency data.<sup>146</sup> Protecting customer data is a core database concern of the Department, PAs and stakeholders. Safeguarding the confidentiality of sensitive customer-specific account data is both a legal obligation and an important corporate responsibility for the PAs.<sup>147</sup>

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<sup>145</sup> Data related to Blackstone customers will be reported as part of National Grid gas data.

<sup>146</sup> In Massachusetts, the PAs strictly control access to sensitive customer-specific account information like customer names, account numbers, rate class, location, usage and demand data. Customer consent is necessary to permit third-party access to sensitive customer-specific account information outside the conduct of regulated PA business. Disclosure of customer information to a third-party without customer authorization would violate corporate privacy policies and expose a PA to liability under the Massachusetts Right to Privacy Act, M.G.L. c. 214, § 1B or Chapter 93A, and potentially other statutes.

<sup>147</sup> The PAs have each adopted strict corporate privacy policies and safeguards to protect sensitive customer-specific account information. These corporate privacy policies explicitly state that customers' personal information will be safeguarded and only disclosed for a regulated PA business purpose.

## 5. MSD – Future Data Reporting and Considerations

During the 2016-2018 Plan term, the PAs will continue to collaborate with the Council and stakeholders to ensure that MSD is efficient, reliable, and useful. The PAs expect to develop and implement additional MSD tabs as well as update, improve and maintain the existing tabs. Currently, the PAs are working to provide geographic information, with appropriate aggregation to protect customer privacy. The PAs are also working on providing measure level information on Mass Save Data for 2016-2018. These important new enhancements, which are directly responsive to specific Councilor requests, are under development by the PAs. The core focus for the next plan term will be to: (1) ensure that MSD continues to provide accurate statewide data; (2) enhance the usability of the tabs; and (3) improve the user experience and visual presentation, all within the context of enhancing the understanding of energy efficiency and its benefits and costs over time.

The PAs understand that stakeholders have found MSD to be a useful resource for energy efficiency data as part of planning for 2016-2018. The PAs look forward to additional stakeholder feedback to help identify reporting improvements that are cost-efficient and serve a statewide energy efficiency purpose. Additional data reporting on MSD will benefit from clearly identifying: (1) the purpose of the new data; (2) the value of the new data; and (3) whether the benefits of the new data justify the cost. Given cost considerations and the PAs' obligation to protect customer privacy, a statewide database will not be able to answer every possible question or provide all data points possible. Reporting of new data will be prioritized based on the cost and the benefit that can be achieved through the data collection and disclosure. The PAs must also consider the deep wealth of data already tracked and available (including through the extensive EM&V process), while being mindful of cost, customer privacy issues, and differences in individual PA tracking systems when reviewing requests for new or additional data on MSD. All efforts will be taken to minimize costs, consider alternative ways to acquire new data and avoid excessive and redundant data collection, which is a barrier to customer participation. Consideration of these issues will facilitate productive stakeholder discussions and identify meaningful data reporting that can be implemented cost-efficiently and with consideration of administrative costs, consistent with the PAs' statutory obligations.

MSD will also focus on reporting aggregate data that is combined in a manner that leaves individual customers unidentifiable.<sup>148</sup> Disclosure of aggregate data reduces customer privacy risks while still enabling trend analysis.<sup>149</sup> Individual, customer-level account, measure and

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<sup>148</sup> Limited data such as customer name and address information or aggregate data that is combined in a manner that leaves individual customers unidentifiable is generally not considered sensitive, is not required to be under strict PA controls, and is not subject to customer consent requirements.

<sup>149</sup> Customers have a reasonable expectation of privacy in their sensitive customer account data and, particularly, their energy usage information, which provides insight into their behavior. In Massachusetts, customer consent is required for third-party access to such information when disclosure is not related to a PA regulated business purpose. The Department has recognized the right to confidentiality of sensitive customer account data, including usage, even in the context of promoting policies mandated by the Legislature. See 220 C.M.R. § 11.04; 220 C.M.R. § 14.03; Low Income Discount Rate Enrollment, D.T.E. 01-106-A at 11-12 (2003) (customer authorization in context of legislative directive to participate in low-income discount matching program); Competitive Market Initiatives, D.T.E. 01-54-A (2001)

usage data is of limited use for analysis of trends or program improvement unless it is studied within the larger context of other customers' data. The EM&V efforts of the PAs, under the supervision of the Council, already provide that necessary context and include robust mechanisms for gathering, aggregating and verifying data.

As part of the PAs' EM&V work, two separate databases have been developed to support two Customer Profile Studies.<sup>150</sup> Direct access by stakeholders to these databases is not possible because of the need for customer consent for access to sensitive customer account and usage information.<sup>151</sup> The PAs will accept Council requests to query the data in these databases and will prioritize these requests based on the cost of providing answers, the purpose and benefit of the data query and the timing of the request relative to study cycles.<sup>152</sup>

## 6. MSD – Budget

The PAs have collectively budgeted approximately \$500,000 in each year for a total statewide database budget of approximately \$1.5 million over the term of the 2016-2018 Plan. These funds will be used to improve, add to and maintain MSD. The statewide database budget covers both direct statewide expenses as well as individual PA costs incurred to comply with statewide database reporting.<sup>153</sup> The PAs have invested significant time and resources to develop, test and populate the tabs in the initial phases of MSD. They have not, however, incurred costs to change their current data systems and processes because MSD is consistent with the PAs' internal tracking systems.<sup>154</sup> Direct statewide expenditures for development of the initial phase of MSD have been less than \$400,000. The PAs were able to deploy the initial phase cost efficiently by leveraging similar work the vendor had performed in another state.

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(customer authorization in context of legislative directive to develop competitive choice under Restructuring Act).

<sup>150</sup> These databases support the 2011-2013 C&I Customer Profile Studies and the Residential Profile Study. The creation of these databases was an enormous and expensive undertaking from both a PA resource and vendor cost perspective. There was time and effort required to obtain the data needed to populate the databases from each PA's rate operations, which is separate and distinct from each PA's energy efficiency operations. In addition, the vendor had to clean, estimate, prorate gaps and outliers and otherwise normalize the data from 11 distinct PAs.

<sup>151</sup> Neither database is accessible by the public or by the PAs because they contain private customer billing and usage data. Each EM&V vendor secures and controls the data pursuant to strict, legally enforceable, nondisclosure agreements and other important terms and conditions. PA vendors must meet certain privacy, insurance, and security requirements in order to receive sensitive customer-specific data. The contractual terms and conditions imposed on PA vendors require them to, among other things, indemnify the PAs, employ industry standard data system security measures and maintain certain types and levels of insurance.

<sup>152</sup> The PAs will obtain estimates from their vendors for running the queries and would anticipate charging the costs to the budget for the statewide database. The PAs reserve the right to limit the scope and number of data queries from the Council in order to preserve their ability to maintain and work on MSD and to prioritize the work of their EM&V vendors.

<sup>153</sup> As discussed in the previous section, the PAs anticipate charging certain Council-requested data queries against the budget for the statewide database.

<sup>154</sup> The PAs have invested significant customer funds in their tracking systems. These systems have been developed to support PA business purposes, are integrated into other PA business systems, and were designed to comply with Department regulation.

Future phases of MSD, however, are unlikely to be achieved with such economy. Even if PA tracking systems do not require updates, vendor costs are likely to increase as the PAs develop tabs that are specific to Massachusetts and thus new to the vendor.

**D. Effect of Carbon Docket, D.P.U. 14-86**

On May 16, 2014, the DOER and DEP (collectively “Petitioners”) filed a joint petition requesting that the Department adopt a value for the avoided cost of complying with the GWSA calculated using a marginal abatement cost curve method. Method for Calculating Avoided Costs of Complying with Global Warming Solutions Act, D.P.U. 14-86. Following the filing of pre-filed testimony and discovery responses, evidentiary hearings were held on December 8<sup>th</sup> and 10<sup>th</sup> 2014. Intervenors filed initial briefs on December 31, 2014, and the Petitioners, after seeking an extension, filed their initial brief on January 23, 2015. Intervenors filed reply briefs on February 13, 2015. The PAs (except for the Compact and Blackstone Gas) filed a joint reply brief asking the Department to deny the petition on the grounds that the GWSA does not impose costs on the PAs or their customers, the petitioners did not sufficiently quantify the proposed GWSA compliance value and GHG reductions are an important byproduct, but are not a specific requirement, of energy efficiency programs implemented pursuant to the GCA. The Department later permitted additional discovery on the Petitioners with respect to a record request update filed with their initial brief. Briefs related to this issue were filed on April 10, 2015.

The outcome of this docket may affect the PAs’ final 2016-2018 Plan. Approval of the petition may necessitate changes in the avoided costs that are used to assess the cost effectiveness of Plan efforts. Specifically, the Department may approve a GHG emissions add-on to the results of the AESC study. The AESC study process includes, among many other attributes of avoided costs, an assessment of GHG emission costs potentially incurred and reflected in customers’ rates absent additional energy efficiency efforts. In order to inform the initial draft of the 2016-2018 Plan, required to be filed with the Council by April 30, 2015, the 2015 AESC was completed on March 27, 2015, and revised on April 3, 2015. The 2015 AESC quantified the reasonably foreseeable effect of carbon dioxide regulations under RGGI through 2020 and under the Clean Power Plan proposed by the Environmental Protection Agency between 2021 and 2030. The PAs have relied on the 2015 AESC in developing the 2016-2018 Plan. Accordingly, changes in the final 2016-2018 Plan may be necessary to either comply with the Department’s decision in D.P.U. 14-86, or to implement any final 2016-2018 Plan approved by the Department prior to its order in D.P.U. 14-86.

**E. Effect of DOER’s proposed RCS Regulations**

On January 16, 2015, DOER proposed updates to its RCS regulations set forth at 225 CMR § 4.00. The purpose of these proposed regulations, as articulated by DOER, is to encourage broader consumer reach and better consumer protections, update and streamline the regulation, better integrate efficiency and renewable energy opportunities, and provide more consistent, comprehensive services to Massachusetts residents regardless of the fuel being used to heat a building or the number of units in a building. The proposed updates are comprehensive and have been issued for a public comment period that closed on March 31, 2015. The PAs and other stakeholders provided comments on the proposed amendments. The outcome of these updates may affect the PAs’ final 2016-2018 Plan, including the savings goals and budgets.

## F. **Integration of Eversource Companies for Three-Year Plan**

For the 2016-2018 term, NSTAR Electric Company (“NSTAR Electric”) and Western Massachusetts Electric Company (“WMECo”), each d/b/a Eversource Energy (together, “Eversource” or the “Companies”) are seeking approval from the Department of a single electric energy efficiency plan for the 2016-2018 Plan.

The Companies previously requested that the Department approve a single integrated Three-Year Plan for 2013-2015 in D.P.U. 12-110 and D.P.U. 12-111.<sup>155</sup> In support of their request, the Companies filed their D.P.U. 08-50 tables and all other documents relating to the Department’s review of the Companies’ Three-Year Plans for 2013-2015 both jointly and separately. The Companies specifically requested approval of: (1) common program design and implementation activities; (2) separate energy efficiency surcharges; (3) an aggregate program budget; (4) review of program cost-effectiveness on a combined basis; (5) a common performance incentive mechanism; and (6) aggregate common savings goals. See D.P.U. 12-110, Exh. DPU-NSTAR-2-59; see also D.P.U. 12-111, Exh. DPU-WMECO-2-39.

The Department approved the Companies’ request with the following exceptions: (1) the Companies were directed to submit all energy efficiency filings related to the 2013-2015 Three-Year Plans, including tables, in a combined and separate format; (2) the Companies were directed to meet their low-income spending obligations on an individual company-specific basis; and (3) the Companies were directed not to include any costs associated with integrating their energy efficiency tracking systems into the 2013-2015 Plan. See 2013-2015 Order at 137-139. In addition, the Department noted that it would: (1) review the Companies’ performance to assess whether their energy efficiency programs, as implemented, are cost-effective on both an individual and combined basis; (2) review performance with respect to savings goals on an individual basis; and (3) review performance incentives on an individual PA basis. See id. at 142. The Companies submitted revised D.P.U. 08-50 tables and performance incentive tables for NSTAR Electric and WMECo consistent with these directives on March 22, 2013. In addition, the Companies have submitted all subsequent filings related to the 2013-2015 Plan, including tables, in individual and combined format for the Department’s review.

These filings, submitted in individual and combined format, have provided the Department sufficient documentation in support of approving the Companies request to submit a single, integrated Three-Year Plan.

Below is a brief overview of the Eversource energy efficiency proposal to integrate key aspects of energy efficiency program implementation including: Savings Goals; Program/Pilot Design and Implementation; Program Budgets/Spending; Cost Effectiveness; Funding; Performance Incentives; EM&V; and MTMs.

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<sup>155</sup> On April 4, 2012, the Department approved a merger between Northeast Utilities, parent company for WMECo, and NSTAR, parent company for NSTAR Electric and NSTAR Gas in D.P.U. 10-170. On February 2, 2015 all Northeast Utilities companies, including WMECo and NSTAR Electric, began doing business as Eversource.

## 1. Savings Goals

The Settlement Agreement between NSTAR Electric, NSTAR Gas Company, WMECo and the DOER approved by the Department in D.P.U. 10-170 required NSTAR Electric and WMECo to increase their aggregate energy efficiency savings target as of January 1, 2013 to at least 2.5 percent of retail sales annually through energy efficiency, so long as there is no material change in the framework for assessing the success of the program and associated incentives, or providing for program funding. NSTAR/NU Merger, (NSTAR/WMECo/DOER Settlement Agreement at Article 2.3, NSTAR/WMECo/DOER/AG Settlement Agreement at Articles 2(3)(Base Rate Freeze) and 2.7 (Lost Base Revenues)). This annual commitment ends at the expiration of the Base-Rate Freeze period (*i.e.*, January 1, 2016). However, the Companies are committed to proposing and achieving a common savings goal for both Eversource electric distribution companies during the 2016-2018 term. Accordingly, pursuing this common savings goal through a single plan is reasonable, and is consistent with the Companies' commitments during the 2013-2015 term.

## 2. Program/Pilot Design and Implementation

The 2013-2015 Plan contemplated uniform electric energy efficiency programs across Massachusetts. The Companies expect that the statewide electric 2016-2018 Three-Year Plan will similarly include uniform energy efficiency programs. Accordingly consistent with the Department's approval of a single Eversource electric energy efficiency plan in D.P.U. 12-101 through 12-111, at 137-139 for purposes of pursuing common program/pilot designs and implementation, the Companies request approval of a single Eversource electric energy efficiency Plan for the 2016-2018 term.

## 3. Program Budgets/Spending

The Eversource electric energy efficiency budgets for 2013-2015 were structurally identical. The Companies similarly propose to submit energy efficiency budgets that are structurally identical for the 2016-2018 term. Maintaining separate budgets through separate energy efficiency plans presents unnecessary administrative and regulatory burdens on the Companies that could be eliminated through an integrated budget and plan and streamlined regulatory review. Spending for each operating company for the 2016-2018 term will continue to be tracked separately in each operating company's respective accounting systems.

With respect to low-income energy efficiency programs, the Companies will maintain their spending on such programs at a minimum of 10 percent of the integrated budget, as required by law, with an apportioned low-income budget directly allocated to each company. Operational differences in the low-income programs will be reconciled in cooperation with LEAN.

## 4. Program Cost-Effectiveness

The Companies' respective energy efficiency programs are designed to be cost-effective, as measured by the Department's Total Resource Cost test. The Companies' 2013 and 2014 Plan



Year reports demonstrated that their energy efficiency programs are also cost-effective if integrated. See D.P.U. 14-87 (2013 NU Electric Plan Year Report at PDF page 32 of 46, citing evaluated cost-benefit ratios) and D.P.U. 15-49 (Eversource Electric 2014 EE Plan-Year Report at PDF page 32 of 46). Based on the foregoing, the Companies request approval for the 2016-2018 term to submit one, integrated cost-effectiveness analysis for the Eversource electric companies, and have their programs reviewed for cost-effectiveness on that basis.

## 5. Funding/Cost Recovery

### *a. Funding*

Given that the GCA makes funding sources for energy efficiency programs uniform for electric PAs, as demonstrated by the Companies during the 2013-2015 term, an integrated electric energy efficiency plan does not present any issues with respect to the structure and sources of program funding. First, a statewide formula exists for allocating RGGI proceeds to individual PAs. Second, forward capacity auctions applicable to the 2016-2018 term have occurred already, and the proceeds from such auctions will be based on the individual PA's energy efficiency assets and how they are bid into forward capacity auctions. Finally, although the carryover amounts for NSTAR Electric and WMECo differ, as noted previously, the Companies will track and allocate funds appropriately. As directed by the Department in D.P.U. 12-100 through D.P.U. 12-111, the Companies tracked all funding separately with respect to the 2013-2015 term without issue. Thus, funding does not present a barrier to the Department's approval of an integrated energy efficiency plan.

### *b. Cost Recovery*

Although the Companies' plan will integrate key aspects of energy efficiency goals outlined above, the Companies are not proposing at this time to consolidate energy efficiency cost recovery tariffs. LBR recovery will be based on cost recovery proposals specific to NSTAR Electric Company. Lost revenues associated with WMECo's energy efficiency programs are recovered through WMECo's decoupling mechanism.

### *c. Avoidance of Cross Subsidization*

The Companies have demonstrated in their 2013 and 2014 Plan Year Reports that they have served each of the NSTAR Electric and WMECO service territories by maximizing benefits and minimizing overall costs to the extent possible, while being cognizant of the separate funding sources provided by customers in each service area in the form of the NSTAR Electric EERF and the WMECO EEPKA. Each service territory was served within the bounds of their approved budgets, with costs tracked separately, as reported in each service territory's distinct Plan Year Report filing.

## 6. Bill Impacts

In recognition of the fact that the acquisition of all cost-effective energy efficiency could require funding above that provided through existing funding sources (*i.e.*, the SBC, FCM, and RGGI), the GCA provides that PAs may collect additional revenue from ratepayers through a

mechanism such as the EES. G.L. c. 25, § 19(a). Given that the energy efficiency cost recovery tariffs for the Companies are not proposed at this time to be integrated, the Companies do not anticipate adverse bill impact issues arising in the context of plan integration.

#### 7. Performance Incentives

The GCA provides that the Statewide Plan shall include a proposed mechanism that provides incentives to PAs based on their success in meeting or exceeding the goals in the plan. G.L. c. 25, § 21(b)(2). The Companies will follow the performance incentive mechanism ultimately developed by the electric PAs and the Council. Filings submitted to the Department in D.P.U. 12-110 and D.P.U. 12-111, and in subsequent Plan Year reports demonstrated that the Companies have independently satisfied their performance commitments without issue and there is thus no reason to continue to require the Companies to calculate and report performance incentives on an individual basis. Because of the Companies satisfaction of all performance commitments there is no risk that integration would result in using one company's stellar performance to mask the other's subpar performance.

#### 8. EM&V

The Department's Guidelines require each Three-Year Plan to include an evaluation plan describing how the PA will evaluate energy efficiency programs during the course of its plan. Guidelines § 3.5. The Department's Guidelines are intended to create a collaboratively-developed (between the Council and the PAs), statewide EM&V strategy. The Companies will use the same EM&V strategy and apply EM&V results similarly during the 2016-2018 term. Accordingly, EM&V strategy and application will not be affected by plan integration.

#### 9. MTMs

In D.P.U. 08-50-A and the D.P.U. 08-50-B Guidelines, the Department directed the PAs to seek Department approval for certain specified MTMs, including adding or terminating a program, and changes in a program budget, savings goals, or performance incentives of greater than 20 percent. D.P.U. 08-50-A at 64; D.P.U. 08-50-B Guidelines at § 3.8.2. Subsequent to D.P.U. 08-50-A and B, the Department provided further guidance regarding the need for Department approval of proposed mid-term program modifications. Specifically, in Cape Light Compact, D.P.U. 10-106 (2011), the Department clarified that PAs are required to seek Department approval only for a program budget modification that is 20 percent greater than the program's three-year budget.

The Department modified the D.P.U. 08-50 Guidelines with respect to MTM filings in D.P.U. 11-120-A, Phase II. The Department established two categories of MTMs, Category One and Category Two. D.P.U. 11-120-A, Phase II at 28; see also Final Revised Guidelines, §§ 3.8.1 and 3.8.2. A Category One MTM includes (1) addition of a Hard-to-Measure energy efficiency Program; (2) termination of an existing energy efficiency program or Hard-to-Measure energy efficiency program; (3) program budget modifications that are a 20 percent deviation from the Department approved program budget or modifications that are a change to the program-budget greater than a dollar amount specified by the Department; or (4) a modification to an energy

efficiency program that is projected to decrease program benefits by greater than 20 percent. See D.P.U. 11-120-A, Phase II at 28; see also Final Revised Guidelines, § 3.8.1. A Category Two modification is (1) the addition of a new energy efficiency program; (2) the transition of a Hard-to-Measure energy efficiency program to an energy efficiency program; or (3) a change in the three-year term budget of a customer sector that would result in a bill increase for an average customer in the sector exceeding two percent. Final Revised Guidelines, § 3.8.2. Category Two modifications require Department approval, while Category One modifications require only a Council resolution. D.P.U. 11-120-A, Phase II, at 28-29; Final Revised Guidelines, §§ 3.8.1, 3.8.2.

Under an integrated plan, the Companies intend to apply the Department's MTM Guidelines to the integrated budgets, savings and performance incentives of the two Companies, and with respect to the addition or termination of an integrated program. The Companies will continue to apply the Department's MTM Guidelines with respect to bill impacts to NSTAR Electric Company and WMECO individually, given their separate energy efficiency cost recovery mechanisms. And, the two-tiered review and approval process set forth in the Final Revised Guidelines ensures that the Department and Council remain apprised of any changes to the Companies' plan.

#### 10. Conclusion

Based on the foregoing, the Companies are requesting that the Department: (1) permit the Companies to submit a single, fully integrated Three Year Plan for the Eversource electric companies as outlined above; and (2) review the Companies' compliance with G.L. c. 25, §§ 19(c) and 21(d) based on their combined performance against their integrated Three Year Plan. NSTAR Electric and WMECo will continue to individually track their energy efficiency costs and savings (and provide such information upon request), and file individual energy efficiency reconciliation factors with the Department for review and approval. The Companies are confident that implementing energy efficiency programs through a single plan will not only fulfill each company's energy efficiency obligations, but also provide the potential for administrative and regulatory efficiencies over time, while imposing no adverse impacts on the customers of either company.

#### G. Service of Blackstone Customers

In the 2013-2015 Order, the Department stated, "with the Council's help and support, we encourage Blackstone Gas to pursue an agreement with another Program Administrator to deliver energy efficiency services in its service territory." 2013-2015 Order at 155. In accordance with that direction, Blackstone entered into discussions with National Grid, the electric Program Administrator that provides electric distribution services to Blackstone's gas customers, to determine an appropriate manner in which National Grid may provide comprehensive electric and gas energy efficiency services for Blackstone's customers. Following agreement in principle on an arrangement through which National Grid would provide gas energy efficiency services to all Blackstone customers, under the same terms and conditions as it provides energy efficiency services to its native load customers, on March 31, 2015, the Council voted to approve the proposal. In June 2015, Blackstone and National Grid entered into a formal agreement to implement the proposed service arrangement, and filed a joint petition for

approval of the arrangement with the Department, docketed as D.P.U. 15-79. On October 7, 2015 the Department approved the service arrangement commencing on January 1, 2016. Blackstone Gas Company, and Boston Gas Company and Colonial Gas Company, each d/b/a National Grid, D.P.U. 15-79, at 3 (2015).

In summary, National Grid and Blackstone have agreed to an arrangement under which National Grid, commencing with the 2016-2018 Energy Efficiency Plan, will provide gas energy efficiency services to all Blackstone customers under the same terms and conditions as it provides energy efficiency services to its native load customers. Blackstone's customers and all related budgets, savings, and performance incentives will be fully integrated into National Grid's gas territory and filings, with no separate goals, tracking, or reporting related to Blackstone's customers to be required of National Grid as a result of this arrangement. This integration will allow Blackstone's customers to take full advantage of all the energy efficiency programs that are available in Massachusetts without placing any additional burdens on National Grid's customers. This agreement would also provide Blackstone's customers with representation at the Council through National Grid.

Accordingly, National Grid has included bill impacts for Blackstone's customers in its Three-Year Plan filing pursuant to the Department's directive. Id.

## **VIII. APPENDICES**

A. **Glossary**

## GLOSSARY OF TERMS AND ABBREVIATIONS

<b>2012-2012 Electric Plan</b>	2010-2012 Electric Three-Year Energy Efficiency Plan, D.P.U. 09-116 through D.P.U. 09-120
<b>2010-2012 Gas Plan</b>	2010-2012 Gas Three-Year Energy Efficiency Plan, D.P.U. 09-121 through D.P.U. 09-128
<b>2010-2012 Orders</b>	Orders issued by the Department on January 28, 2010 for the 2010-2012 Plans in dockets D.P.U. 09-121 through D.P.U. 09-128 and D.P.U. 09-116 through D.P.U. 09-120
<b>2010-2012 Plans</b>	2010-2012 Electric Plan and 2010-2012 Gas Plan
<b>2013-2015 Order</b>	Order issued by the Department on January 31, 2013 for the 2013-2015 Plans in dockets D.P.U.12-100 through 12-111
<b>2013-2015 Plan</b>	2013-2015 Three-Year Energy Efficiency Plan, D.P.U. 12-100 through D.P.U. 12-111
<b>2015 AESC</b>	Avoided Energy Supply Cost in New England: 2015 Report
<b>2016-2018 Plan</b>	2016-2018 Three-Year Energy Efficiency Plan
<b>AB</b>	Advanced Buildings
<b>ABCD</b>	Action for Boston Community Development
<b>ACEEE</b>	American Council for an Energy-Efficient Economy
<b>Act Relative to Competitively Priced Electricity in the Commonwealth</b>	Chapter 209 of the Acts of 2012. Signed into law on August 23, 2012.
<b>AE</b>	Account Executive
<b>AESC</b>	Avoided Energy Supply Costs
<b>AESP</b>	Association of Energy Service Professionals
<b>AFUE</b>	Annual Fuel Utilization Efficiency
<b>AG</b>	Office of the Attorney General of Massachusetts
<b>AIA</b>	American Institute of Architects
<b>AIM</b>	Associated Industries of Massachusetts
<b>ARRA</b>	American Recovery and Reinvestment Act
<b>BBRS</b>	Board of Building Regulations and Standards
<b>BCR</b>	Benefit/Cost Ratio
<b>BPI</b>	Building Performance Institute
<b>C&amp;F</b>	Chain & Franchise
<b>C&amp;I</b>	Commercial and Industrial
<b>C&amp;IMC</b>	Commercial and Industrial Management Committee
<b>CAP</b>	Community Action Program
<b>CDA</b>	Comprehensive Design Approach
<b>CECP</b>	Massachusetts Clean Energy and Climate Plan for 2020
<b>CFL</b>	Compact Fluorescent Lightbulb

<b>CHP</b>	Combined Heat and Power
<b>CMI</b>	Community Mobilization Initiatives
<b>Consultants</b>	Consultants employed by the Energy Efficiency Advisory Council
<b>Council</b>	Energy Efficiency Advisory Council
<b>Department</b>	Massachusetts Department of Public Utilities
<b>DEP</b>	Massachusetts Department of Environmental Protection
<b>DER</b>	Deep Energy Retrofit
<b>DHCD</b>	Massachusetts Department of Housing and Community Development
<b>DOE</b>	Department of Energy
<b>DOER</b>	Massachusetts Department of Energy Resources
<b>DPU</b>	Massachusetts Department of Public Utilities
<b>D.P.U. 08-50</b>	<u>Energy Efficiency Guidelines</u> , D.P.U. 08-50 (2008)
<b>D.P.U. 08-50-B Guidelines</b>	Energy efficiency guidelines established in D.P.U. 08-50-B (2009)
<b>D.T.E. 98-100 Guidelines</b>	Energy efficiency guidelines established in <u>Investigation to Establish Methods and Procedures to Evaluate and Approve Energy Efficiency Programs</u> , D.T.E. 98-100 (2000)
<b>D.P.U. 11-120 Guidelines</b>	Energy efficiency guidelines established in D.P.U. 11-120-A, Phase II (2013)
<b>DSM</b>	Demand-Side Management
<b>ECM</b>	Electronically Commutated Motor
<b>EEAC</b>	Energy Efficiency Advisory Council
<b>EEPCA</b>	Energy Efficiency Program Cost Adjustment
<b>EERF</b>	Energy Efficiency Reconciliation Factor
<b>EES</b>	Energy Efficiency Surcharge
<b>EISA</b>	Energy Independence and Security Act
<b>Energy Act of 2012</b>	Act Relative to Competitively Priced Electricity in the Commonwealth
<b>EMC</b>	Evaluation Management Committee
<b>EM&amp;V</b>	Evaluation, Measurement and Verification
<b>EM&amp;V Consultant</b>	A third-party expert consultant who has primary responsibility for working with the PAs to plan and implement high-quality EM&V in Massachusetts.
<b>ENERGY STAR<sup>®</sup></b>	Brand name for the voluntary energy efficiency labeling initiative sponsored by the U.S. Environmental Protection Agency and Department of Energy.
<b>EPA</b>	U.S. Environmental Protection Agency
<b>FCM</b>	Forward Capacity Market
<b>FR</b>	Free Rider



<b>Free Riders</b>	Customers who participate in an energy efficiency program but would have installed the same measure(s) on their own if the program had not been available.
<b>Free-Ridership Rate</b>	The percent of savings attributable to Free Riders.
<b>FTE</b>	Full-Time Equivalent.
<b>GCA</b>	Green Communities Act
<b>GHG</b>	Greenhouse Gas
<b>Green Communities Act</b>	An Act Relative to Green Communities, Chapter 169 of the Acts of 2008. Signed into law on July 2, 2008.
<b>Guidelines</b>	Department's D.P.U. 11-120 Guidelines
<b>GWSA</b>	Global Warming Solutions Act, St. 2008, c. 298
<b>HEHE</b>	High Efficiency Heating and Water Heating
<b>HERS</b>	Home Energy Rating System
<b>HES</b>	Home Energy Services
<b>HPCs</b>	Home Performance Contractors
<b>HVAC</b>	Heating, Ventilation, and Air Conditioning
<b>IECC</b>	International Energy Conservation Code
<b>IIC</b>	Independent Installation Contractors
<b>Impact Factor</b>	Generic term for persistence, realization rates, in-service rates, non-coincident connected demand factors, etc., developed during the evaluation of energy efficiency programs and used to calculate net savings.
<b>ISO-NE</b>	Independent System Operator – New England
<b>JMC</b>	Joint Management Committee of PA and non-PA parties that manages the Residential and Low-Income New Construction Core Initiatives
<b>LDAF</b>	Local Distribution Adjustment Factor
<b>LDAC</b>	Local Distribution Adjustment Clause
<b>LEAN</b>	The Low-Income Energy Affordability Network
<b>LED</b>	Light Emitting Diode
<b>LBR</b>	Lost Base Revenue (For companies not operating under decoupled rate structure, these costs account for revenues not collected by the Company's distribution business as a result of the energy efficiency undertaken during the program year)
<b>LCIEC</b>	Large Commercial & Industrial Evaluation Contractor
<b>Lifetime</b>	The expected length of time, in years, that an installed measure will be in service and producing savings.
<b>MassCEC</b>	Massachusetts Clean Energy Center
<b>Measure</b>	Specific technology or practice that produces energy and/or demand savings for which the Company provides financial incentives.

<b>MFNC</b>	Multi-Family New Construction
<b>Mid-Term Modification</b>	Modification to approved Three-Year Plan during term of Plan.
<b>MMI</b>	Multi-Family Market Integrator
<b>MOU</b>	Memorandum of Understanding
<b>MSD</b>	Mass Save Data
<b>MTAC</b>	Massachusetts Technical Assessment Committee
<b>MTM</b>	Mid-Term Modification
<b>NBI</b>	New Building Institute
<b>NCP</b>	Negotiated Cooperative Promotions
<b>NEED</b>	National Energy Education Development
<b>Net to Gross Ratio or NTGR</b>	A factor representing net program savings divided by gross program savings that is applied to gross program impacts to convert them into net program load impacts.
<b>NEI</b>	Non-Energy Impacts
<b>Network</b>	Low-Income Weatherization and Fuel Assistance Program Network
<b>NPS</b>	Non Participant Spillover
<b>NTG</b>	Net-to-Gross
<b>NWA</b>	Non-Wires Alternative
<b>PA</b>	Program Administrator
<b>PAF</b>	Pension Adjustment Factor
<b>PBOP</b>	Post-Retirement Benefits Other than Pensions
<b>Participant Cost</b>	The total cost of a project or measure less the customer incentive.
<b>Performance Incentive</b>	Compensation for the Company's successful execution of the energy efficiency programs during the program year as determined by Massachusetts Department of Public Utilities.
<b>PEx</b>	Program Expediter
<b>PI</b>	Performance Incentive
<b>Plan</b>	Three-Year Energy Efficiency Plans approved by the Department by its Orders, dated January 28, 2010, in dockets D.P.U. 09-121 to D.P.U. 09-128 and D.P.U. 09-116 to D.P.U. 09-120, and dated January 31, 2013 in dockets D.P.U.12-100 through 12-111.
<b>PP&amp;A</b>	Program Planning and Administration
<b>Program Administrators</b>	Utilities and municipal aggregators that offer energy efficiency programs.
<b>QA/QC</b>	Quality Assurance/Quality Control
<b>RCS</b>	Residential Conservation Service, established in An Act Establishing The Massachusetts Residential Conservation Service, Chapter 465 of the Acts of 1980, July 11, 1980.

<b>RFP</b>	Request For Proposal
<b>RGGI</b>	Regional Greenhouse Gas Initiative
<b>RMC</b>	Residential Management Committee
<b>RNC</b>	Residential New Construction
<b>SBC</b>	System Benefit Charge
<b>SO</b>	Participant Spillover
<b>STAT</b>	Sales, Technical Assistance & Training
<b>Spillover</b>	Additional energy efficient equipment installed by customers that was influenced by the Company's sponsored program, but without direct financial or technical assistance from the program. Spillover is separated into <u>Participant</u> and <u>Non-participant</u> factors. Non-participating customers may be influenced by product availability, publicity, education and other factors that are affected by the program.
<b>Spillover Rate</b>	Estimate of energy savings attributable to spillover effects expressed as a percent of savings installed by participants through an energy efficiency program.
<b>T&amp;D</b>	Transmission and Distribution
<b>Term</b>	Three-year term of the energy efficiency plan
<b>Three-Year Plan</b>	Energy Efficiency Investment Plans required by the GCA every three years. To date, the Department has approved two Three-Year Plans by its Orders in dockets D.P.U. 09-121 to D.P.U. 09-128 and D.P.U. 09-116 to D.P.U. 09-120 (January 28, 2010), and dockets D.P.U. 12-100 to D.P.U. 12-111 (January 31, 2013).
<b>TRC</b>	Total Resource Cost
<b>TRL</b>	Technical Resource Library
<b>TRM</b>	Technical Reference Manual
<b>WAP</b>	Weatherization Assistance Program

B. **Regulatory Background and History**

C. **Statewide Energy Efficiency Data Tables**

D. **Term Sheet**

E. **Council's Resolution of March 31, 2015**

F. **PA Response Matrix to March Resolution**



G. **Council's Resolution of July 21, 2015**

H. **PA Response Matrix to July Resolution**

I. **Council's Resolution of October 26, 2015**

J. **Avoided Energy Supply Costs in New England: 2015 Report**

K. **Examples of Demonstration Project Reports**

L. **PA-Specific Programming**

M. **Studies of Remaining Potential**

N. **Maps of Service Areas**



O. **Unique Service Area Challenges Presentations**

P. **Participant Definitions**

Q. **Vendor Cost Categories**

R. **Performance Incentive Models**

S. **Strategic Evaluation Plan**

T. **Evaluation Study Summaries**

U. **Evaluation Studies**

V. **Technical Reference Manual**



W. **Database Background Materials**

X. **Responses and Roadmap to Department's Additional Filing Requirements**