Program Descriptions Section – Three-Year Plan for Energy Efficiency

Draft – September 23, 2015

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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 four 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 PAsto 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

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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[1] 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.

[1] Available at: http://www.masscec.com/content/2014-clean-energy-industry-report.

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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 and a C&I Management Committee. 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, 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.

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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.[2]

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.[3] 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.

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.

[2] Examples include the recent Retrocommissioning 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.

[3] MTAC materials can be found here: http://www.masssave.com/professionals/business-opportunities/assessment-of-new-efficiency-technologies

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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.

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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, PA staff, and to engage in a dialog about program design and operations.
- **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.[4]
- **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

[4] The documents related to the proposal process are available at http://www.masssave.com/professionals/business-opportunities/process-for-managing-unsolicited-proposals.

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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.

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 gas and electric 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.[5] 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. This allows 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.

[5] The Green Communities Act requires that low-income residential demand side management and education programs be implemented through the low-income weatherization and fuel assistance program network.

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Even with this strong history, the PAs are committed to continuous improvement and evolution of the programs. Since 2010, the PAs have actively participated in discussion, debate, and collaboration with stakeholders, most notably through the Council process. Many of the successes of the past three year plans owe some debt to this fertile give and take. Several highlights from the 2013-2015 plan implementation and many of the new enhancements under consideration for 2016-2018 (detailed here) have originated or been substantially influenced through the interplay of PAs, the EEAC and consultants, along with the PAs strong network of vendors, contractors, manufacturers, distributors, and stakeholders¶

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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® energy savings opportunities. PAs work with retailers, manufacturers, distributors, and trade allies within each 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® 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 Home Energy Services ("HES") core initiative. The HES 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 Massachusetts EEAC 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 EEAC 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 Facebook page (which currently has more likes than ENERGY STAR®) 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 also effectively provides customers with a no–cost home energy score card, tied directly to customer-specific actionable Mass Save® energy efficiency opportunities specific to the resident's circumstances, all from the comfort of their keyboard and

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Deleted: Several of these highlights also speak to the continuing priorities and recommendations offered by the EEAC in their March 31 resolution and/or spoken to during the preceding workshops. Specifically, the PAs and the Council share a commitment to understanding and deploying effective new strategies for reaching moderate income customers and renters. These new strategies will be greatly informed by the evaluation of the collaboratively designed Efficient Neighborhoods + and review of the Renew Boston efforts sited in Program design highlights. Key technology successes, such as the remarkable advances in technology coupled with nimble program design responding to these advances, allowed very rapid scaling on LED light bulbs, mini-split heat pumps, and early deployment of Wi-Fi enabled thermostats.

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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.

Program highlights from the last three years include:

a. Customer Focus

- Increased customer awareness of programs, with 77% of customers agreeing that Mass Save® communicates how to lower energy bills, and 83% finding the Mass Save® campaign messaging clear and relevant. A majority of residential customers report awareness of the Mass Save® website, and 30% report using the website more than once in the past year.
- Built a strong social media presence over the 2013-2015 period, 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® 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® 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® 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.

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- 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 an 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.
- Massachusetts PAs boast one of the earliest and most comprehensive applications of 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 +® 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% 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.

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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 introduction of a possible breakthrough—**a renter-specific visit**. The PAs will be trialing 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. 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 period 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.

The renter visit is by no means the only enhancement to respond to the Council and PAs' shared commitment to ensuring all customers are supported in realizing energy-savings opportunities. The Council workshops and resolution 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

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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 trial a program enhancement to ensure that moderate income customers, from 61-80% 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.

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

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 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 exploration of 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,

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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 be qualified 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.

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4. Residential Program and Core Initiative Descriptions

a. Residential Whole House: Residential New Construction

RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL NEW CONSTRUCTION
Overview & Key Objectives	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. **Target Market:** 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.
	New Enhancements: • Explore the addition of home automation technologies in new construction. Deploy field trials in the 2016-2018 Plan. Depending on results, integrate home automation technologies into the residential new construction program design. • Transition the High Rise path to a performance path in 2016. • Explore a "Path to Zero" option for the top tiers of the performance path. • Increase promotion of the value of net zero and renewable ready measures to builders through marketing, education and training. • 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.
Core Initiative Design	**Measures Promoted:** Builders are encouraged to improve a building's energy efficiency through enhanced envelope measures, energy efficient space and water

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL NEW CONSTRUCTION
	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. The Low Rise path offers two prescriptive path 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 path 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 path to a performance path in 2016. All homes participating in the initiative are required to install efficient lighting products in appropriate hard wired sockets and pass a final verification inspection. **Implementation Strategy:** 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 of high efficiency homes to consumers and other key decision makers and influencers in the residential new construction market. 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. 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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL NEW CONSTRUCTION
	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. 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. 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. 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. The combination of builder training, targeted incentives, associated 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. 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. For the Low Rise path, PAs will continue working with the HERS infrastructure. In the High Rise path, the Joint Management Committee ("JMC"), including residential and commercial new construction

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	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.
Delivery Mechanism	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. There is a joint management committee comprised of PA staff from both the residential teams and the commercial and industrial teams to oversee the implementation of the High Rise path. The lead vendor provides the direct field implementation. 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. 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, 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.
Marketing Overview	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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL NEW CONSTRUCTION
	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. 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. 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. Although not a requirement for participation, the initiative promotes participation in the national ENERGY STAR® Homes program and as a partner benefits from the regional, as well as national, advertising efforts that ENERGY STAR® Homes implements.
Three-Year Deployment Strategy/Roadmap	For the 2016-2018 period, 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. 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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL NEW CONSTRUCTION
	additional savings. 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. Another success of the performance path has been 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. 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". 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. 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.

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b. Residential Whole House: Residential Multi-Family Retrofit

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL MULTI-FAMILY RETROFIT
Overview and Key Objectives	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 approval by RCS regulations. Incentives

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL MULTI-FAMILY RETROFIT
	include (but are not limited to) lighting, shell improvements, heating, cooling, and water heating equipment and controls. The Multi-Family Retrofit 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 period. A program impact evaluation is currently in progress, which will influence PAs ultimate program enhancement and design adjustments. **Target Market:** 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 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. *(i.e., 50% or more of units are market rate)
	New Enhancements: 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 cycle, the PAs established the Multi-Family working group, integrated gas and electric measures, and introduced the Multi-family Market Integrator (MMI). During the 2013-2015 cycle, the PAs added C&I representation to the Multi-Family working group, expanded HEAT Loan availability to residentially metered condominium owners, and successfully added in-unit direct install measures. The PAs rolled out the Multi-Family Energy Action Plan 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. Strategies to achieve deeper savings include: • Provide a single point of contact for measure delivery. The designated project point of contact (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

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	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. * • Incorporate additional emerging technologies. Ongoing throughout program years 2016-2018. • 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. • 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&I program management staff and vendors, working together to streamline delivery of packaged, comprehensive energy efficiency services to the multi-family sector. • *(For very large multifamily buildings PAs may continue to utilize Account Executives as the PPC.)
Core Initiative Design	**Measures Promoted:** The measures available to each property vary based on unique building characteristics/constraints but may include: • Insulation for attic, wall, basement, pipe, rim joist (in-unit, common areas) • Air sealing • Domestic hot water equipment (in-unit) • Heating equipment (in-unit) • Light fixtures (common area/exterior) • Instant savings measures (in-unit) typically include: o Energy efficient light bulbs and nightlights o Light fixtures o Programmable and wireless enabled thermostats

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	o Faucet aerators o Low-flow showerheads o Smart strips 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&I Retrofit program. These C&I measures may include: • HVAC high efficiency equipment upgrades and controls • Variable speed drives, motors • Chillers • Air compressors • Water heating equipment • Energy management systems • Custom measures The Multi-Family 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. **Implementation Strategy:** 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 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. Enrollment: 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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL MULTI-FAMILY RETROFIT
	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. Participant Screening: The MMI uses a screening process to obtain key information to triage projects and optimally dispatch resources to support customer participation in the initiative. 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 Multi-Family 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. Whole Facility Assessment 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 assessments, benchmarking, and engineering studies will be coordinated. Proposal for Energy Efficiency Services Using the findings from the site-specific assessment, the PPC will draft an Energy Action Plan (EAP), including all applicable energy efficiency opportunities, both residential and commercial (in-unit and

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL MULTI-FAMILY RETROFIT
	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. Delivery of Measures and Services 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 core initiative will continue to integrate with the C&I initiatives for applicable measures and services for seamless delivery to the customer. Quality Assurance 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. Additional Core Initiative Design Elements 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 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. 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&I offering include

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	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.
Delivery Mechanism	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. 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 triaged to the appropriate program resources, including connection to the designated PPC. PPCs will be designated by each gas and electric PAs. 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 triage and 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&I Multi-family measure lines.
Marketing Overview	**Strategy:** • Strategies for targeting market and industry actors 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 environmental benefits for the community. • Continue to promote case studies for print and online media to help educate and market to facility owners. • Target landlord, building management, building operator trade associations, design professionals, and other organizations and professionals involved in regular interaction with multi-family facilities.

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL MULTI-FAMILY RETROFIT
	• Continue to enhance the online user experience. • Continue to build on the MMI relationship with larger property managers to enroll complete portfolios of eligible sites. • 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.
Three-Year Deployment Strategy/Roadmap	The Multi-Family Retrofit 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. 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 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&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.
Special Notes	

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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
Overview and Key Objectives	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

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RESIDENTIAL WHOLE HOUSE	**CORE INITIATIVE** **RESIDENTIAL HOME ENERGY SERVICES – MEASURES** **RESIDENTIAL HOME ENERGY SERVICES – RCS**
	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 energy savings. HES is fuel blind. 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. **Target Market:** 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% SMI) are referred to appropriate low income programs.
	New Enhancements: The 2013-2015 Plan rolled out multiple new elements gradually over the three-year plan period, 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: • 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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
	their HEA. This is an ongoing effort. • Continue to seek to understand and delineate moderate income and renter markets and explore solutions for clearly defined segments. Beginning in Q1 2016 PAs will trial a renter visit and a moderate income offer enhancement, detailed below. • 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. • 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% 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. • 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. • Support the continued development of highly qualified Home Performance Contractors ("HPCs") and Independent Installation Contractors ("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. • Explore improvements in tracking across programs for measure

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
	implementation originating from an HES Home Energy Assessment.
Core Initiative Design	**Measures Promoted:** Customers receive a ***Home Energy Assessment ("HEA")***, an in-home visit. During the HEA, the Energy Specialist will: • Install instant energy saving measures at no cost to the customer, which may include ***LED bulbs, compact fluorescent light bulbs, faucet aerators and showerheads, programmable thermostats, and advanced power strips.*** • Provide recommendations on ***weatherization, including air sealing and insulation***, qualifying customers for instant incentives for these measures delivered by HPCs or IICs. • Provide recommendations and connections to ***heating, cooling, water heating equipment, and other qualified efficient product rebates***). • 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 PAs will work with the MTAC to include new measures or technologies as appropriate. For the renter-specific visit, the PAs plan to provide: • Installation of instant energy savings measures at no cost to the customer, identical to instant savings measures offered through an HEA. • Refrigerator screening, high-level visual inspection of possible weatherization opportunities, and review the heating system for potential rebates. • Information on deeper measures that could be installed with landlord approval. PAs plan to develop marketing materials specifically tailored to renters. **Implementation strategy:**

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RESIDENTIAL WHOLE HOUSE	**CORE INITIATIVE** **RESIDENTIAL HOME ENERGY SERVICES – MEASURES** **RESIDENTIAL HOME ENERGY SERVICES – RCS**
	The HEA Visit: 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 appropriate service providers. Customers schedule an HEA through a dedicated statewide toll free number. The Mass Save® 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. 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. 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% 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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
	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. Two groups of participating contractors, HPCs and IICs, provide installation of weatherization measures. A more detailed description of the differing roles of each type of contractor is provided under Delivery. Customers are always free to choose their preferred qualified participating contractor. 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 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. Special Visits: 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. The Renter Visit:

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If the HEA is performed by an Energy Specialist from the HES lead vendor, 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.

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RESIDENTIAL WHOLE HOUSE	**CORE INITIATIVE** **RESIDENTIAL HOME ENERGY SERVICES – MEASURES** **RESIDENTIAL HOME ENERGY SERVICES – RCS**
	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 full HEA. The renter visits allows a more streamlined delivery system to provide instant savings measures to renters. 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. 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. Quality Assurance Visits: 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, e-mail, 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

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
	installation initiative standards, as well as to ensure savings. On site 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.
Delivery Mechanism	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 HPC's, 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. 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.

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RESIDENTIAL WHOLE HOUSE	**CORE INITIATIVE** **RESIDENTIAL HOME ENERGY SERVICES – MEASURES** **RESIDENTIAL HOME ENERGY SERVICES – RCS**
	In order to receive incentives or rebates, customers are required to have 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 *cost effective* energy efficiency upgrades for customers, contractors, and PAs alike. This prevents claims of price gouging by customers, provides ease of participation (e.g., 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 initiative. 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 (*e.g.*, 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. 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. 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. IIC's 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® Materials and Installation Standards. Through a competitive bidding process, the PAs contract with a third-party Quality Control ("QC") vendor to perform

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	QC inspections of program implementation vendors, including PA lead vendors and participating contractors. The QC vendor provides valuable information and feedback to the PAs on successes and identifies areas of possible improvement. 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 vs. 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. 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.
Marketing Overview	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). 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). The successful inclusion of a common online assessment tool that

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
	funnels interested customers to the HEA provides a model for identifying low cost/high touch digital enhancements that streamline and improve customer experience. 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. The initiative will build off of the Mass Save® 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 www.Masssave.com. Current forms of multi-media outreach include the Mass Save® 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. 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.
Three-Year Deployment	The goal of new enhancements in the 2016-2018 period is to refine and optimize the initiative, minimizing radical shifts in program design or

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL HOME ENERGY SERVICES – MEASURES RESIDENTIAL HOME ENERGY SERVICES – RCS
Strategy/Roadmap	delivery. PA efforts will focus on streamlining and enhancing the 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. PAs have worked over the Plan development year (2015) to be able to deploy the renter visit and add the enhanced moderate income incentive as trials within Q1 2016. PAs anticipate learning from the trials and adjusting and refining these new enhancements over the three-year plan period. 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. 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.

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d. Residential Whole House: Behavioral/Feedback Initiatives

RESIDENTIAL WHOLE HOUSE	**CORE INITIATIVE** **RESIDENTIAL BEHAVIORAL/FEEDBACK INITIATIVES**
Overview and Key Objectives	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. 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, has moved from trial to full implementation by the largest PAs and is described more fully under implementation. **Target Market:** All residential customers
	New Enhancements: • 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. • 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. • 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.

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL BEHAVIORAL/FEEDBACK INITIATIVES
Core Initiative Design	**Measures Promoted:** 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. **Implementation Strategy:** The most prevalent behavioral initiative currently deployed by multiple PAs is the Home Energy Report ("HER") model. PAs assign participants to the program and participants are offered an opt-out option. 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. The HER program prompts energy savings through two primary paths: • Educational reports • Educational reports *and* customer interaction with their online platform. 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.
Delivery Mechanism	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.

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RESIDENTIAL WHOLE HOUSE	CORE INITIATIVE RESIDENTIAL BEHAVIORAL/FEEDBACK INITIATIVES
Marketing Overview	The current initiative uses an opt-out model, therefore does not employ additional marketing beyond direct offerings to selected customers.
Three-Year Deployment Strategy/Roadmap	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. 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 period 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.
Special Notes	

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e. Residential Products: Heating and Cooling (electric)

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING AND COOLING - Electric
Overview and Key Objectives	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.

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING AND COOLING - Electric
	The PAs began offering rebates for residential CACs and heat pumps in 2004. Originally called the ENERGY STAR® HVAC Program, COOL SMART® 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. **Target Market:** Residential electric customers.
	New Enhancements: The PAs will explore the following proposed enhancements: • Explore emerging technologies, ongoing effort. • 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. • Explore offering an online training for contractors in order to expand their participation in the program while reducing costs. • Explore protocols for installation and best practices for ductless mini-split heat pumps.
Core Initiative Design	**Measures Promoted:** High efficiency central air conditioning, ducted air source heat pumps, ductless mini-split heat pumps (for heating and cooling), heat pump water heaters, ECM furnace fans, ECM circulator pumps. There are incentives provided to appropriate contractors for following installation best practices. COOL SMART® 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. Additionally, customers may utilize the 0% HEAT loan to finance

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING AND COOLING - Electric
	eligible HVAC equipment purchases. **Implementation Strategy:** This 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. 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. The Residential Heating and Cooling - Electric core initiative will continue to work with the Residential Heating and Cooling – Natural Gas core initiative (GasNetworks®) on joint offerings; marketing, contractor training, and trade ally outreach including circuit rider. 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. In addition, the PAs will continue to work with the following industry partners to promote best installation practices, awareness, education, and training for HVAC contractors: • ENERGY STAR® HVAC Quality Installation program (EPA) • Consortium for Energy Efficiency • Air Conditioning Contractors of America • Northeast Energy Efficiency Partnerships 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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING AND COOLING - Electric
Delivery Mechanism	The Residential Heating and Cooling - Electric core initiative will be administered by the electric PAs in each service territory. Delivery is 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. 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 training 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. Quality control/follow-up inspections are performed by independent inspectors on up to 10 percent of installations to verify equipment installation. 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.
Marketing Overview	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: • New systems in existing and new homes (new systems) • Replacement systems in existing homes (new equipment/old systems), including the early retirement of existing equipment • Improvements in operational systems in existing homes (new equipment/old systems) Marketing strategies are developed for educating and promoting efficient choices to residential customers directly as well as working

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING AND COOLING - Electric
	with other key decision makers such as new construction builder, renovation contractors, distributors, and retailers to ensure key decisions makers and influencers are all aligned to promote efficient equipment adoption. 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. Marketing activities will continue to emphasize outreach to HVAC professionals (contractors and distributors, including gas contractors). 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® website, collateral updates, e-mail 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. 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 initiative plans 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. PAs will also work with the ENERGY STAR® HVAC Quality Installation program team, the CEE HVAC Committee, and other industry partners to promote best installation practices, awareness,

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING AND COOLING - Electric
	education, and training for HVAC contractors. The initiative plans to review cooperative (upstream) promotions with the HVAC industry, in coordination with C&I where feasible. The initiative 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 initiative 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. The initiative 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. PAs will market and leverage all available federal tax credits where applicable as well as all supplemental consumer incentives (*e.g.*, equipment manufacturers) as a means to increase consumer purchases of high efficiency central air conditioning and heat pump systems.
Three-Year Deployment Strategy/Roadmap	Two evaluations currently underway may influence deployment in the 2016-2018 plan period. Specifically, a review of central air incentives may be required due to a central air conditioning evaluation in the fall of 2015, and the mini-split evaluation due in the spring of 2015 will influence incentive deployment. Consumer interest in cold climate heat pump technology and its application in Massachusetts is likely to influence additional PA exploration and testing of different heat pump technologies and applications.
Special Notes	

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f. Residential Products: Heating and Cooling (gas)

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING & COOLING - Natural Gas
Overview and Key Objectives	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, warm air furnaces), water heating equipment, and associated 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 program, 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. 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 PA's 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. **Target Market:** All residential gas customers.
	New Enhancements: The PAs anticipate the following initiative enhancements for the three year planning period of 2016-2018: • 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.

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING & COOLING - Natural Gas
	• Continue to focus on streamlining customer and contractor transactions with tools such as online rebate fulfillment and increased leveraging of data from the GasNetworks® website to design additional targeted marketing as well as increase use of digital marketing.
Core Initiative Design	**Measures Promoted:** 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"). **Implementation Strategy:** 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. 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 : • Plumbing and HVAC contractors and technicians • Manufacturers, distributors, and suppliers of high efficiency heating and water heating equipment and related parts/accessories • New home builders and remodeling contractors • Home designers, architects, and engineers. • Building Inspectors and industry affiliate organizations including the Massachusetts Building Inspectors, *i.e.*, Southeastern Massachusetts Building Officials Association ("SEMBOA"),Plumbing, Heating and Cooling Contractors of

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING & COOLING - Natural Gas
	MA ("PHCC of MA"), International Association of Plumbing and Mechanical Officials ("IAPMO") • 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. The initiative maintains a contractor facing GasNetworks® website that was recently completely refreshed. The site is tied to the Mass Save® website but allows for more in depth and targeted information for the target market actors. 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. The initiative depends significantly on high quality training opportunities as a mechanism to connect with installation contractors and influence installation practices. GasNetworks® 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. 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 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 WiFi thermostats, boiler reset controls, and heat recovery ventilator units.

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING & COOLING - Natural Gas
	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. Gas PAs consistently monitor this initiative and evaluate free-ridership in order to drive customers to go deeper and achieve the highest level of efficiency available.
Delivery Mechanism	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. 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. 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. 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.
Marketing Overview	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-

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING & COOLING - Natural Gas
	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 PAs will continue to implement this approach in 2016-2018. PAs have also built strong relationships with building inspectors and industry affiliate organizations including the Massachusetts Building Inspectors, *i.e.*, SEMBOA, PHCC of MA, IAPMO and will continue to promote initiative offerings through these strategic relationships. 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.
Three-Year Deployment Strategy/Roadmap	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. 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. PAs will continue to leverage the GasNetworks® 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. The PAs will continue to enhance integration and cross-promotion

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL HEATING & COOLING - Natural Gas
	efforts with the Residential Heating & 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.
Special Notes	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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL CONSUMER PRODUCTS
Overview and Key Objectives	The objective of the Residential Consumer Products initiative is to increase consumer awareness of the importance and benefits of purchasing or ENERGY STAR® 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. 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. The Products initiative has successfully leveraged creative marketing, including significant social media, affinity marketing, retail partnerships and point of purchase promotions. **Target Market:** All residential electric customers

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL CONSUMER PRODUCTS
	New Enhancements: PAs are exploring various methods to streamline incentive delivery methods to the consumer (*e.g.*, midstream/upstream) and to address the rapidly changing appliance and electronics marketplace. This is an ongoing effort.
Core Initiative Design	**Measures Promoted:** 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.
	Implementation Strategy: The Consumer Products core initiative educates consumers about the benefits of ENERGY STAR® certified products to increase consumer acceptance of products and to encourage them to look for and purchase ENERGY STAR® certified models when they shop. The initiative promotes select ENERGY STAR® 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® standards. The initiative actively participates in national ENERGY STAR® awareness campaigns and in efforts to keep ENERGY STAR® specifications up to date and relevant. The Consumer Products 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: • 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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL CONSUMER PRODUCTS
	carry these products. • Partnerships with local and national retailers with joint 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. • Social media outlets, like Facebook and Twitter, offer the ability to launch creative campaigns promoting energy efficient products and package with lighting offers. • "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.
Delivery Mechanism	PAs jointly contract with a ***manufacturer/retailer outreach contractor***, 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. The Consumer Products initiative utilizes the same competitively bid ***rebate fulfillment contractor*** 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. The Consumer Products initiative is also able to share the ***internet/mail-order sales channel contractor*** used in the Residential Lighting Initiative. This vendor maintains stock of products offered through the catalog and the Mass Save® website, staffs a toll-free line for customers, and processes catalog and website purchases. The temporary "pop-up" retail kiosks described under implementation, done in conjunction with the Residential Lighting initiative, create an

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL CONSUMER PRODUCTS
	opportunity to promote a small number of consumer products, currently the APS and Shower Start products. To the extent that smaller 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.
Marketing Overview	The Consumer Products initiative provides significant opportunity to market the Mass Save® 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® brand should not be underestimated. 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. 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. 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. Tactics to support these efforts will include consumer education via social media channels, consumer events, and retail promotions and

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL CONSUMER PRODUCTS
	point of sale materials to educate and motivate consumers to use these new technologies. As in lighting, product marketing will continue to leverage the strong social media presence built over the 2013-2015 period.
Three-Year Deployment Strategy/Roadmap	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. PAs will continue to explore expanding the products included in upstream efforts in an attempt to duplicate the successes with lighting. As standards became more stringent during the 2013-2015 period, 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. The PAs will also explore tactics to support deeper savings through education, promotion, and possibly higher incentive offerings, if appropriate.
Special Notes	

h. Residential Products: Residential Lighting (electric)

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
Overview and Key Objectives	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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
	efficient lighting technologies and controls. Residential lighting provides 54% of the annual electric savings for the residential and low income sectors. There are increasing pressures on these savings from increased standards/baselines and higher prices for the newer energy efficient technologies. However, lighting remains a critical driver of residential savings. 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. PAs saw rapid expansion of the LED market in 2013-present through aggressive upstream incentives enabling more affordable pricing by manufacturers and retailers. **Target Market:** All residential electric customers.
	New Enhancements: PAs will continue to explore approaches that support additional savings. This is an ongoing effort. • PAs plan further expansion and focus on introducing LED bulbs and fixtures into the marketplace and phasing out CFL bulbs. • PAs will explore lighting controls as a possible initiative expansion measure. PAs will coordinate with other research and development efforts.
Core Initiative Design	**Measures Promoted:** 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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
	phasing out CFL bulbs. **Implementation Strategy:** The Residential Lighting program strategy depends on a fluid mixture of: • Advanced market knowledge and data of efficient lighting technology and products • Sophisticated incentive structure that includes incentive placement at the manufacturer (upstream) and at retail purchase points (midstream) • Cutting edge marketing and educational strategies to support customer adoption of the most efficient technologies 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. The Residential Lighting core initiative includes several components and entry points designed to educate consumers about the benefits of ENERGY STAR® qualified lighting products and to make these products more affordable and easily available: • 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. • 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.

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
	The initiative's field service vendor will also set up educational tables to promote the program at various times throughout the year. • Special attention and increased incentives to retail outlets designated to serve hard to reach customers, to ensure equal access to affordable efficient lighting for all customers. • 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® website helping guide customers to the online store and to local retailers with promotional activity. • 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. • 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. • "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. • 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.
Delivery Mechanism	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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
	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. PAs jointly contract with a ***manufacturer/retailer outreach contractor***, 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. A ***rebate fulfillment contractor*** 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. The ***internet/mail-order sales channel contractor*** 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. 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.
Marketing Overview	**Strategy:** 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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
	outreach, and other point of sale communications. 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 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. The marketing team has designed highly effective campaigns that help focus consumers on appropriate end uses or applications for specific lighting technology, e.g., 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. The Residential Lighting initiative has seen tremendous success and intends to expand its affinity marketing activity. In the 2013-2015 period, 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.
Three-Year Deployment Strategy/Roadmap	The Residential Lighting core initiative continues to face challenges in the upcoming three-year period. 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

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RESIDENTIAL PRODUCTS	CORE INITIATIVE RESIDENTIAL LIGHTING
	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 within responsible budgets. For the three-year deployment, the PAs will focus on: • Expanding the mix of energy efficient lighting products available in retail • Increased focus on LED products to reach "deeper" savings for each customer with more options for each socket • Continuous offerings over longer horizon periods at retail to ensure year-round product availability to consumers • Innovative approaches to community and corporate events including areas with high percentages of renters or moderate income households. • Phasing in of qualified products for new technologies that require new entrants and implementation strategies.
Special Notes	Specialty CFL bulb incentives will phase out in 2016.

F. **Low-Income Programs**

1. Low-Income Program Descriptions

a. Low-Income: Single Family

LOW-INCOME	CORE INITIATIVE SINGLE FAMILY
Overview and Key Objectives	The Low-Income Single Family core initiative implements cost-effective, energy efficiency products and services directly for residential customers living in 1 to 4 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

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LOW-INCOME	CORE INITIATIVE SINGLE FAMILY
	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 required from participating customers. **Target Market:** Residential customers living in 1 to 4 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 2 to 4 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. Any changes to eligibility criteria will be addressed collectively between the PAs, LEAN, DHCD, lead vendor (where applicable) and CAP agencies.
	New Enhancements: • 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. • 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.

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LOW-INCOME	CORE INITIATIVE SINGLE FAMILY
Core Initiative Design	**Measures Promoted:** 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: • Insulation (attic, wall, pipe, and duct) • Air sealing • Heating system repair and replacement • Programmable Thermostats • Domestic water heating, including low-flow showerheads, faucet aerators, pipe wrap, heat pump water heater (electric) • Lighting, including LEDs, CFLs, lighting fixtures, and torchieres • Appliances, including refrigerator and freezer replacement, second refrigerator removal, advanced power strips, window air conditioner replacement • Weatherization repairs (electrical, roofs, etc.) • Health and safety In coordination with LEAN, the PAs will work with the MTAC to include new measures or technologies as appropriate **Implementation Strategy:** 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. 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

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LOW-INCOME	CORE INITIATIVE SINGLE FAMILY
	for cost-effective energy efficient measures to be installed. 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. 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% of all jobs that are exclusively funded by the PAs to be inspected by a third party quality control vendor. 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.
Delivery Mechanism	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

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LOW-INCOME	CORE INITIATIVE SINGLE FAMILY
	PA-funded independent third party vendor.
Marketing Overview	**Strategy:** Marketing outreach designed to reach more income-eligible customers 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. 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.
Three-Year Deployment Strategy/Roadmap	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.

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LOW-INCOME	CORE INITIATIVE SINGLE FAMILY
	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.
Special Notes	

b. Low-Income: Multi-Family

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LOW-INCOME	CORE INITIATIVE MULTI-FAMILY
Overview and Key Objectives	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. **Target Market:** 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. Any changes to eligibility criteria will be addressed collectively between the PAs, LEAN, lead agencies and CAP agencies.
	New Enhancements: • In 2012, the funding of the Low-Income Multi-Family core

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LOW-INCOME	CORE INITIATIVE MULTI-FAMILY
	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. • 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 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. • 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 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 • 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

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LOW-INCOME	CORE INITIATIVE MULTI-FAMILY
	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. • 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.
Core Initiative Design	**Measures Promoted:** 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: • Insulation (attic, wall, pipe, and duct) • Air sealing • Heating system repair and replacement • Programmable thermostats • Domestic water heating, including low-flow showerheads, faucet aerators, pipe wrap, water heating equipment, heat pump water heater (electric) • Lighting, including LEDs, CFLs, lighting fixtures, common area (interior and exterior) lighting upgrades and controls, torchieres • Appliances, including refrigerator and freezer replacement, ENERGY STAR® clothes washer replacement, power smart strips, window air conditioner replacement • 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 • Weatherization repairs (electrical, repairs, roofs, etc.)

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LOW-INCOME	**CORE INITIATIVE** **MULTI-FAMILY**
	• Health and safety The PAs will work with the MTAC to include new measures or technologies, as appropriate, and in coordination with LEAN's other efforts.
	Implementation Strategy: 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 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. 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. 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

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LOW-INCOME	CORE INITIATIVE MULTI-FAMILY
	measures; to the extent the overall project remains cost-effective. The initiative piggybacks on the current DHCD low-income energy efficiency programs and all other eligible funding sources (*i.e.*, 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 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. Customer Education 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.
Delivery Mechanism	The initiative will be administered cooperatively by the gas and the electric PAs in conjunction with interested stakeholders.

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LOW-INCOME	**CORE INITIATIVE** **MULTI-FAMILY**
	Enrollment 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). Participant Screening 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. 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. 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. 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. Whole Building Assessment 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.

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LOW-INCOME	CORE INITIATIVE MULTI-FAMILY
	Integrated Proposal for Energy Efficiency Services 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. Delivery of Measures and Services The lead vendor or CAP agency will coordinate the delivery of the measures and services. The installation contractors will strive to have 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. Quality Assurance/Quality Control 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. The delivery mechanism serves to minimize lost opportunities and encourage deeper savings in the following ways: • 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. • 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.
Marketing Overview	Demand for the Low-Income Multi-Family core initiative will be managed jointly by the PAs and the Multi-Family Advisory Committee. The PAs will engage in outreach efforts to notify customers of the availability and value of energy efficiency services to stimulate interest

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LOW-INCOME	CORE INITIATIVE MULTI-FAMILY
	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. 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.
Three-Year Deployment Strategy/Roadmap	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.
Special Notes	

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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.

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- *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 American Council for an Energy Efficient Economy 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 Northeast Energy Efficiency Partnerships, 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.

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.

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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 plan will be discussing in some detail program concepts and technologies that are unknown to us today.

Deleted: In addition to the professional network sources for program improvements noted above, the PAs have been very active participants in the Council, participating in over 100 Council-related public meetings since 2013. Further, the PAs have invited individual Councilors, and small groups of Councilors, to participate on an informal basis in multiple C&IMC meetings and internal team meetings. The PAs have also been active participants in the Council-convened C&I stakeholder workshop process and look forward to the final upcoming workshop in June. The PAs have greatly benefitted from the input of the Council and these stakeholders, and many of the ideas and concepts arising from these engagement efforts are reflected in the detailed program designs that follow. The PAs have carefully considered Council and stakeholder input and are gratified that, in so many instances, the interests and suggestions of the Council are reflected in the PAs' program designs for 2016-2018. The PAs believe that these innovative strategies position Massachusetts for continued success in 2016-2018 as a national leader in the delivery of energy efficiency services to the diverse C&I sector.¶

3. Accomplishments During 2013-2015 Plan Period

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 Period (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% increase in gas benefits to $200 Million
  - 16% increase in electric benefits to over $1.4 Billion
- *Participation*
  - 88% increase in gas participation – equivalent to roughly 4,500 additional businesses
  - 27% 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_2 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:

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- 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[6];
- Conducted 20 code compliance training sessions, attended by almost 700 code officials, architects, and contractors.
- Completed a redesign and rewriting of the C&I section of Mass Save® website, improving organization, navigation, and customer-oriented language;
- Grew C&I customer awareness of Mass Save® precipitously to its highest point ever (66%); and likewise grew C&I customer use of the Mass Save® website nearly tripling traffic over the last two years (from 13% to 34%).[7] Brand awareness among C&I customers even outpaced that of residential customers (66% to 54%).[8]
- 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[9] which found that as of 2014, 63% of Massachusetts commercial customers reported having installed at least one type of LED lighting in their facilities versus just 46% in California. Similarly, 42% of Massachusetts commercial customers reported installing screw-based LEDs versus only 12% 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.
- Expansion of 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;
- Completion of 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;

[6] US Energy Information Agency and ISO-New England

[7] *2014 Massachusetts Statewide Marketing Campaign, Post-Campaign Report*, Opinion Dynamics February, 2015, p.2.

[8] Id., p. 16.

[9] *Final Draft Report of Massachusetts LED Market Effects: Baseline Characterization*, DNV GL, March 1, 2015

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- Consolidation of Residential & C&I Massachusetts Technology Assessment Committees (MTAC) into a single entity and the addition of Connecticut representation to increase efficiencies, improve coordination, and expand reach;
- Addition of 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;
- Delivery of 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;
- Development of a number of segment-specific approaches to serving customers – grocers, municipalities, offices, etc.;
- Collaboration 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

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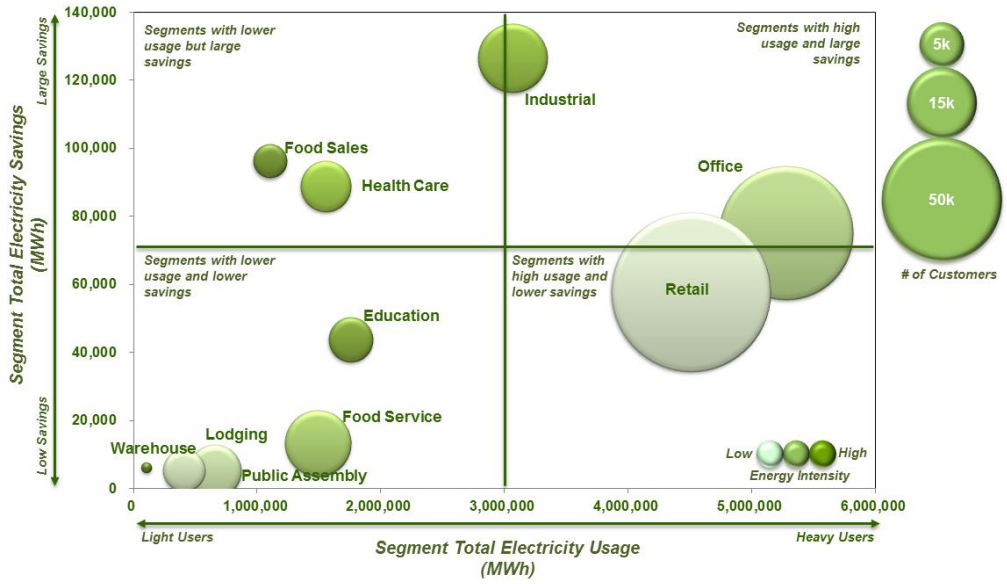
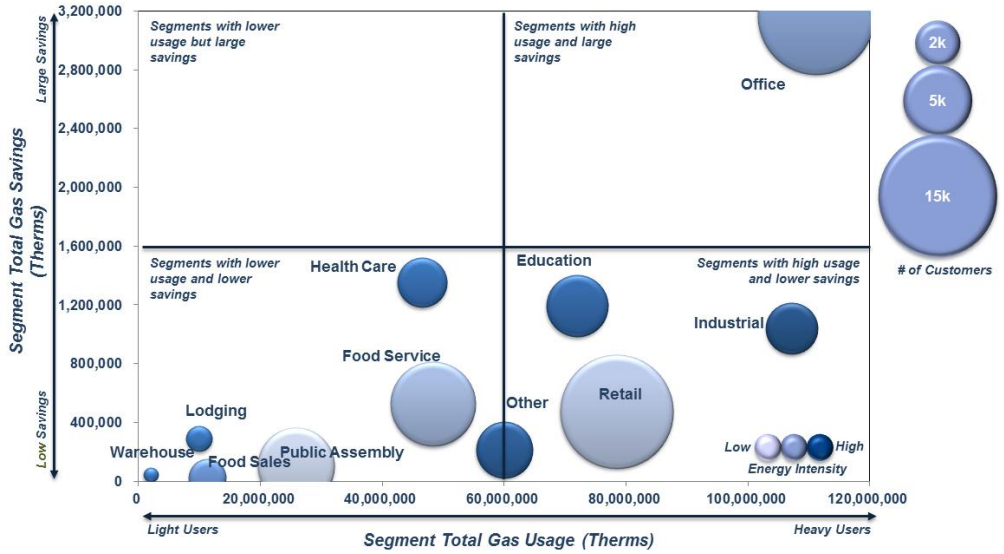


Source: *2013 Commercial & Industrial Customer Profile Report, DNV GL, March 27, 2015*

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



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

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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.

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- 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® 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

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.

a. 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;

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- 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.

b. 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

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Coldwater System, had been verified by a highly-credible independent authority on efficiency – Eversource. In another case, National Grid and Eversource are helping EMC (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 will apply the lessons from its Massachusetts experience in their North Carolina and California facilities.

c. 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 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.

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 Program Requirements for Connected Thermostat Products specification.

d. 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 Massachusetts Technology Assessment Committee ("MTAC"), as described below.

6. The Massachusetts Technology Assessment Committee (MTAC)

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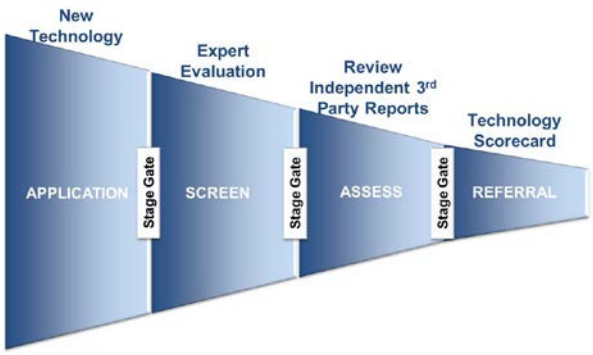
MTAC consists of key technical and evaluation staff from each of the PAs. A Project Manager designated by the PAs coordinates the work of the Committee. Also, the chair of the Connecticut Joint Utility RD&D Program attends monthly MTAC meetings for the purpose of sharing information about ongoing technology research, tests, and results from that state.[10]

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® 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® website at: http://www.masssave.com/en/professionals/business-opportunities/assessment-of-new-efficiency-technologies

[10] 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.

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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

C&I NEW CONSTRUCTION	**CORE INITIATIVES** **NEW BUILDINGS & MAJOR RENOVATIONS** **INITIAL PURCHASE & END OF USEFUL LIFE**
Overview & Key Objectives	The New Construction Program has two Core Initiaitives. The objective of the first – New Buildings & Major Renovations – is to offer developers of new buildings, and the owners of existing buildings that are

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C&I NEW CONSTRUCTION	**CORE INITIATIVES** **NEW BUILDINGS & MAJOR RENOVATIONS** **INITIAL PURCHASE & END OF USEFUL LIFE**
	undegoing 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 & 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. 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 (*e.g.*, 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.[11] 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

[11] Approximately 70% of the building stock in Massachusetts is more than thirty years old.

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C&I NEW CONSTRUCTION	**CORE INITIATIVES** **NEW BUILDINGS & MAJOR RENOVATIONS** **INITIAL PURCHASE & END OF USEFUL LIFE**
	capture considerable efficiency, again at relatively modest expense. 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. 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. 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. 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 program works with equipment vendors and suppliers – often using an upstream approach – to ensure that premium alternatives are available and promoted in that brief window. **Target Market**

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	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.
	New Enhancements 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 period are the following: Net Zero Buildings 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. There are many challenges to achieving this vision, as set forth in the report of the Massachusetts Zero Net Energy Task Force.[12] 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. First, the PAs will continue to closely monitor developments in

[12] *Getting to Zero Final Report of the Massachusetts Zero Net Energy Buildings Task Force*, March 11, 2009

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	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. Second, the PAs will assess opportunities for joint NZE R&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. 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. 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.[13]. However a larger cohort may be interested in pursuing Near

[13] A recent national survey of Net Zero buildings by the New Buildings Institute found a total of 39 NZ 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 remaining 33 are either public buildings or buildings in the non-profit/philanthropic/higher education sectors.

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	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. Expanding Upstream Offerings 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. 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. Improved Comprehensiveness in Small/Midsized Buildings All of the PAs have developed streamlined approaches to encourage comprehensiveness in smaller (<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% of the US non-residential building stock is less than 50,000 square feet.[14] 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 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

[14] *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

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	their building project without the necessity of a complex and often expensive modeling process. 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. 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.[15] Sustainable Office Design 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.[16] 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% 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%.[17] 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 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

[15] The economics of both approaches are based on buildings with central mechanical cooling systems.

[16] The smaller PAs will consider adoption to the degree applicable once experience with the larger PA effort has produced results for consideration.

[17] *Office Real Estate Value Proposition*, Northwest Energy Efficiency Alliance

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	construction disruption in their planning. 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.[18] 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. 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. 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. Key elements of SOD include: • Lighting solutions that emphasize efficiency and occupant comfort and productivity; • Low Lighting Power Density; • Exceptional lighting energy savings (>2 kWh/square foot, on average);

[18] According to a GSA survey, allowances can range from $2/SF for paint only to $50/SF for extensive TI.

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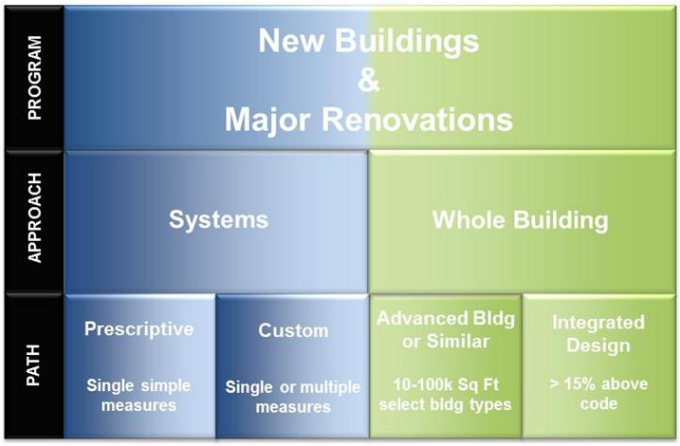
	• Thoughtful, integrated application of lighting controls (*i.e.*, programmable sweep, tuning, vacancy, etc.); and • Daylight harvesting, where possible.
Program Design	**Participation Options** The New Construction program has multiple participation options depending both on where the building is in 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.  • *The Whole Building Approach* 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 possible – including going all the way to a Net Zero Ready (NZR)

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	building. 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. 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. • *The Systems Approach* 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. • The *Custom* 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

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	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. • The *Prescriptive* 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.

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	Component and Ancillary Services Technical Assistance ("TA") Services 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. 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. 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. 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. Performance Lighting The PAs promote high performance lighting technologies and design practices that are either more efficient than standard practice and/or the

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	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. Building Energy Codes and Appliance Standards 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. 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. 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 higher first cost. A progressive energy code ensures that at least the floor requirements for efficiency are high.

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	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. 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% 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. 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% of its target attendance goal and has received high marks with attendees in post-session evaluations. 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 assistance to project teams, as well as to local code officials.

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	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.
Delivery Mechanisms	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. 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." 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 manufacturers rather than end users, with the end users benefiting from the significant reductions in retail product costs that this enables. The

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	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.
Marketing Overview	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. 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. 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 stage to actual completion, and from all the projects that are proposed, it is often difficult to determine which proposed projects will materialize,

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particularly at the earliest conceptual phase.

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.

Additionally, it is estimated that between 40 and 50% 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.

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:

- 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;
- Larger architectural and engineering firms, who tend to design 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;

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C&I NEW CONSTRUCTION	**CORE INITIATIVES** **NEW BUILDINGS & MAJOR RENOVATIONS** **INITIAL PURCHASE & END OF USEFUL LIFE**
	• Leading design firms who tend to establish the new market standards that are then followed by more conventional firms; • 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; • Public sector owners, who often have regulatory requirements that include life-cycle costing and legislated goals for energy efficiency; • Environmentally conscious owners, who wish to promote their building as an extension of their corporate ethic; • Speculative developers to the extent they can be persuaded that a low-energy-cost building has a promotion value to attract tenants; • 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. 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 CEU credits, case studies, open houses, etc. 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 energy-efficient equipment and systems to their customers and to explore innovative ways to work together to mutual advantage. 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

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C&I NEW CONSTRUCTION	CORE INITIATIVES NEW BUILDINGS & MAJOR RENOVATIONS INITIAL PURCHASE & END OF USEFUL LIFE
	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. 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. 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.
Three-Year Deployment Strategy/Roadmap	For the 2016-2018 period, 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 exists when hotels are either rebranded or "refreshed" to keep customer amenities current and competitive.[19] 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

[19] 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.

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C&I NEW CONSTRUCTION	CORE INITIATIVES NEW BUILDINGS & MAJOR RENOVATIONS INITIAL PURCHASE & END OF USEFUL LIFE
	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.[20] One recent respected study placed Metro Boston as the #9 (of 75) U.S. Markets to Watch for real estate development prospects.[21] 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. 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 period, potential candidates include: boilers, furnaces, circulator pumps, some component motors in HVAC systems, and some commercial kitchen equipment measures.

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

C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING
Overview & Key Objectives	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

[20] New England Market Outlook 2015, CB Richard Ellis New England Partners

[21] *Emerging Trends in Real Estate United States and Canada 2015*, the Urban Land Institute and PwC, October, 2014

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	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 period. Existing Building Retrofit 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&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. 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 Retrofit Program fits this mature program profile. 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. Prescriptive incentives are offered for measures that provide predictable energy savings in virtually all applications where they replace a similar technology of lessor 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 the program and may lead to more complex custom projects. 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

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING
	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. 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. Small Business Small businesses account for about 45% 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. The Small Business Core Initiative was designed to specifically address each of these barriers by offering a package of services – assessment, installation, incentives, financing, and repayment methods – that make it easy for a customer to say yes.[22] As noted elsewhere, this 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 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.

[22] 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.

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	Multi-family Retrofit As described in greater detail in the Residential Section of this Plan, 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 Retrofit Program. 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 Multifamily Market Integrator (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. These C&I measures may include: • HVAC high efficiency equipment upgrades and controls • Variable speed drives, motors • Chillers • Air compressors • Water heating equipment • Energy management systems • Building envelope measures • Custom measures **Target Market** The potential market for the 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.

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING
	New Enhancements Further Market Segmented Delivery Market segmentation is the process of defining and subdividing the class of C&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. PA markets can be defined by business type (*e.g.*, health care, education, government, agriculture, industrial, hospitality, etc.), building type (*e.g.*, 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. The PAs continue to evolve customized approaches for these and other markets, making use of local EM&V studies, the experience of peer programs around the country, and data reported in studies and program evaluations from other jurisdictions. For example, the "Mid-Size Customer Needs Assessment"[23] of customers in the 300-750 kW range 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

[23] Final Report Mid-size Customer Needs Assessment, for the EEAC Consultants and Massachusetts Energy Efficiency Program Administrators, KEMA, December 22, 2013

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	Retrofit Program as a whole. Consistent with the assessment findings, 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. An example of a specific submarket sector analysis is the profile of small and medium sized food stores conducted in 2014.[24] 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 period. 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:

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[24] Market Sector Profile: Small and Medium-Sized Food Stores – Final, for the Massachusetts Program Administrators and EEAC Consultants, DNV GL, 9/26/14

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING

NOTABLE SEGMENTS		Education	CRE / Office	Grocery	Houses of Worship	Lodging	Municipal	Restaurant
Metrics	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
Drivers	Energy Intensity							
	Cost Conscious							
	Personnel Productivity							
	Customer Satisfaction							
	Brand Value							
	Property Value							
Barriers	Lack of Available Capital							
	Limited Resource Availability							
	Landlord / Tenant Split Incentives							
	Limited Opportunity Awareness							
	Lack of Technical Expertise							

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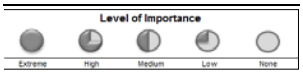

Source: *2003 Commercial Building Energy Consumption Survey (CBECS), U.S. Department of Energy*

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&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.

Using this thoughtful, strategic, holistic approach to serving C&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 collectively have actively pursued, or are developing plans to pursue, such strategies targeted to a number of C&I customer segments including grocery, hotel, restaurant, local and state government, houses of worship,

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	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 period.

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING

Current & Planned Segment-based Approaches

Program Administrator	Segment	Why this Segment	New, Existing, Expansion of Existing, Extension of Existing?	Market Test or Full Deployment
Cape Light Compact	Grocery	Common measures, business model and barriers, can benefit from provision of industry expert technical assistance. Also, potential for economies of scale in marketing and delivery.	Expansion of existing test	Full
Cape Light Compact	Lodging	Similar to Grocery, high density of this segment in territory.	New	Full
Cape Light Compact	Grocery	Common measures, business model and barriers, can benefit from provision of industry expert technical assistance. Potential for economies of scale in marketing and delivery.	Existing	Test
Cape Light Compact	Municipal	Common significant barriers, higher incidence in customer base	Existing	Full
Cape Light Compact	Tenants	Common barriers and lower participation rates. Seasonal small business tenants prevalent in territory.	Existing	Full
Columbia Gas	Hospitality	Higher and more gas opportunities relative to other segments	Existing	Full
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
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 heterogenous 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
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 sensistive to costs, concentrated usage. All quartiles	New	Full

During the course of the Plan period, the PAs will continue to identify additional segments that may best lend themselves to these more targeted

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	approaches. Expand Strategic Energy Management The concept of Strategic Energy Management 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"[25]. 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. Within the Massachusetts programs, activities that contribute to Strategic Energy Management include: • Retro-commissioning • A variety of broadly-available and ongoing facility owner, manager, and operator training and education opportunities • Customized process and behavioral approaches within the broader context of a customer-specific Memorandum of Understanding ("MOU")/Strategic Energy Management Plan ("SEMP") Over the 2016-2018 Plan period 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. Retro-commissioning (RCx) The majority of buildings in Massachusetts are more than 30 years old and many are much older.[26] 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 Retrofit Program.

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

[26] National Grid's data indicates that almost a third of their building stock (31%) predates 1940.

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	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." [27] 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). [28] 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. [29] 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. In 2013-14 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. 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

[27] "Retro-commissioning Best Practice Study", Revised Draft for C&IMC Review, May 22, 2014.

[28] Id.

[29] As well as identifying promising capital measures that can be implemented through regular program channels.

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Deleted: *Facility Staff Training and Education*¶ Like any complex machine, a commercial building requires constant, regular attention to run well and serve the needs of its owners and occupants every day. While the specific training strategies discussed below will serve the needs of specific sub segments of the market, it is important to also
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program changes will need to be managed by the PAs to limit market disruptions." [31]

The following summarizes the report recommendations around each of the five "elements", as rank ordered in the report, and planned PA actions in response:

(#1) "RCx provider gives on-going support through implementation and operation including: commissioning for measures implemented as a result of the RCx study; M&V; and building operator training."

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 experience to date for Massachusetts application.

(#2) "Savings estimates (are) developed by RCx providers using a consistent statewide set of approved tools; reviewed by program administrator and validated through M&V provided by RCx provider."

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[32], 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.

(#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."

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

[31] Ibid, p. 4.

[32] 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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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.

(#4) "Aggressive screening of potential participants to reduce risk, combined with up front incentives covering study cost."

The PAs are implementing the former already, and will test application of the latter before making a full implementation decision.

(#5) "Energy Management Information System (EMIS)/interval meters directly funded by PA. Ongoing support to assure savings and measure persistence."

The PAs recognize that maintaining the outcomes of the RCx process over time is critical to cost-effectiveness, customer confidence, and 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.

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 wit: "(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."[33]

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

[33] *Retrocommissioning Programs, Five Tips for Boosting Participation*, E Source Focus Report, Merson, et al, December 9, 2013

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	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. 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. 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 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. 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. Education and Training for Customers, Trade Allies, and PA Staff and Contractors *Customer Education* 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

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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.

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:

- Advanced Manufacturing Collaborative (AMC)
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
- Association of Energy Engineers (AEE)
- BOMA – Boston, the Greater Boston Real Estate Board
- Boston Green Ribbon Commission
- Boston Green Tourism
- Boston Society of Architects (AIA)
- Boston Redevelopment Authority
- Illuminating Engineering Society (IES), Boston and Rhode Island Section
- International Facility Management Association (IFMA), Boston Chapter
- Massachusetts Clean Energy Center (CEC)
- Massachusetts Lodging Association
- Massachusetts Restaurant Association
- Municipal Solid-State Street Lighting Consortium (MSSLC)
- Northeast Sustainable Energy Association
- U.S. Green Building Council (USGBC), Massachusetts Chapter

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:

- Strives to make at least one general C&I program presentation each month, with the goal of reaching every town or regional chamber on Cape Cod each year;
- Makes specialized segment-relevant presentations at both the Cape Code Chamber and at the Martha's Vineyard Chamber;
- Makes one or two presentations at the Lower Cape Community

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Development Partnership as part of their Cape & Islands Green classes for Cape Cod businesses;

- 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;
- Presents at the annual Massachusetts Facilities Managers when it takes place on the Cape;
- 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.

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.

Vendor, Trade Ally, External Energy Professional and PA Staff Training
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:

- Trade Ally & PA Staff Sales Training (by EEFG/Mark Jewell);
- Changing technology and Energy Efficiency in Data Centers;
- Laboratory safety and EE can work together to reduce cost;
- Changing opportunities in exterior lighting as technology rapidly advances;
- CHP opportunities and advances;
- High Efficiency water heating solutions;
- Impact of steam system O&M on energy expense and often overlooked EE opportunities;
- Advances in lighting control technology;
- New accelerated pre-inspection service
- Energy Management Systems as a tool to improve building

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environment;

- Hospitality industry efficiency day event;
- Often overlooked opportunities to save energy in C&I heating systems;
- Commercial leased space rapid project turnaround – advanced lighting system and technology incentives;
- VFD opportunities on HVAC systems;
- Introduction to scope of New Construction services;
- Introduction to National Grid energy saving solutions and incentives; and
- National Grid Customer & Partner Summit.

Similarly, the gas PAs, using a contractor retained through GasNetworks®, conducted 79 training events, often technology-specific and co-hosted by a vendor/trade ally and located at their site.

End Use-Specific Training

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."[34]

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.

- *Building Operator Certification* ("BOC") is a nationally recognized, competency-based training and certification program.[35] It is designed to give facility staff practical skills and knowledge that they can apply to make their buildings more

[34] "Best and Emerging Practices and Technologies in Energy Efficiency Program Delivery: Phase One Findings", Memo to the Massachusetts Program Administrators, March 20, 2015

[35] http://www.theboc.info/index.html

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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.[36] 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.

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.

In recent years NEEC has made significant updates to the Level I and II. In 2013 almost 40% of the content was updated or replaced. The new content focuses on low-cost opportunities to improve energy performance, building scoping and tune up, retro-commissioning, high performance HVAC systems, energy

[36] http://www.theboc.info/

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diagnostics using data loggers and BAS, selling efficiency projects, occupant engagement, and water conservation.[37] Additional new products include:

- 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;
- One day MOC events provided in partnership with sponsoring utilities for BOC certified operators in their service areas; and
- A blended, online Level I course offering a mix of classroom and online training to earn the BOC Level I credential.

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.

BOC was the subject of a very recent evaluation in Massachusetts.[38] The evaluation suggests that the PAs can best promote BOC enrollment and increase the savings attributable to BOC by:

- Employing multiple channels to promote BOC - e-blasts to eligible customers, direct outreach by account executives promotion of BOC at trade events, etc.
- Working with NEEC to ensure that the program collateral, website, and registration systems serving the Northeast are clear to prospective Massachusetts participants.
- Crafting messaging that conveys the value proposition of certification and maintenance of certification to high-level managers, who must authorize staff training. The value

[37] Detailed curriculum outlines are at: http://www.theboc.info/h-course-descriptions.html

[38] "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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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,

- Promoting and explaining to participants the benefits of all the other energy efficiency programs offered by the PAs.[39]

The findings also suggest that the level of effort put into promoting BOC affects training uptake.[40] 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.

- *Compressed Air Challenge* 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.[41] 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.

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" course. Two Massachusetts PAs, Eversource and National Grid,

[39] 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.

[40] Id., p. 2.

[41] https://www.compressedairchallenge.org/

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	sit on the CAC Board of Directors, so Massachusetts experience with the program, and expectations for the future, are integrated into this planning. • *Water/Wastewater Plant Operator Training:* 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. 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. • *Building Owners and Managers Association High-Performance Sustainable Building Principles:* 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."[42] 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

[42] http://www.bomi.org/Courses/High-Performance-Sustainable-Building-Principles

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not yet been offered in the Northeast, and the PAs have contacted BOMA to explore development of a partnership to do so in 2016 and beyond.

- *California Advanced Lighting Controls Training Program* (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.

- *Site-Based Facility Management Initiative:* 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.

MOU/SEMP-Based Training

Some PAs offer Memoranda of Understanding (MOU) or Strategic Energy Management Planning (SEMP), 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

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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 is also integral to the EM&V process, particularly when attribution and verification of behavior-based savings must be established.

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[43]), and incorporate the results of their research activities and field experience.[44]

Increased Use of Interactive and Web-Based Learning

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 period the PAs moved aggressively into multiple new modes of education and training. During the 2016-2018 Plan period 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.

As a part of the planned Mass Save® website upgrade, a calendar feature will be added that shows all scheduled trainings, and provides contact information to register or participate.

[43] http://neea.org/get-involved/northwest-industrial-sem-collaborative

[44] 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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	Small Business Core Initiative 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.[45] 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.[46] 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[47], 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% of their prior electric consumption and 5% of gas consumption.[48] Since its initial introduction, over 50,000 small businesses in Massachusetts have taken advantage of the Small Business offerings.[49] 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 PAs were also subsequently raised by the EEAC consultants in their briefing memo to the Council.[50] The recent process evaluation of the program pointed to some potential process and delivery improvements that will also be explored.[51] Examples of the options under consideration

45 87% of program participants are satisfied with program overall. *DI Process Evaluation: Final Report for the Massachusetts Program Administrators*, DMV.GL, February, 2015, p. 51.

46 Since its inception the Small Business Service offering has served over xx thousand customers.

47 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.

48 Id. p. 59.

49 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.

50 *Effective Practices for the Small Business Sector*, February 11, 2015

51 Small Business Program Process Evaluation Final Report, DNV GL, March 23, 2015.

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	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. Examples of the tests currently underway and continuing into the next Plan period or targeted to begin in 2016 are: • 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&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. • 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 incentives. Post installation will be conducted by an independent firm or an Eversource internal auditor. • National Grid plans to experiment with the EnergySavvy[52] platform as an online portal to guide small and medium businesses

[52] http://www.energysavvy.com/

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to the program offerings applicable to their business. EnergySavvy walks customers through a 5-10 minute online assessment whereby they learn what is available/applicable to them from the full C&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.

- To better serve the smallest customers and niche customers, National Grid will also continue to experiment with variations of the "Main Street" delivery model

- Cape Light Compact is launching a new effort for its smallest and most numerous C&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.

Factors that must be balanced when considering the results of these or other tests in any redesign include:

- *Cost of delivery:* 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.
- *Equity:* All business customers, including the smallest of 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.

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

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	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. Further Engage the Commercial Real Estate Sector 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.[53] 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". 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 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. 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

[53] 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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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.

The PAs plan to pursue the following potential strategies due to the considerable interest received from industry representatives:

- *Tenant build-out/refit offerings:* 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:
  - 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.
  - 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.
  - Packages could also vary according to the space types, particularly in market sectors where CRE firms are more prominently represented, such as retail and hospitality.[54]

- *Turnkey-delivery models for CRE customers*: With research showing that much of the CRE property in Massachusetts is small – on average half the size of non-CRE property[55]-- and

[54] "Massachusetts Commercial Real Estate Survey Analysis-Final Report", DNV-GL, March 18th, 2015, p. 4.

[55] Id., p.5.

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as a result having limited resources to identify potential improvements and keep track of available incentives, the turn-key 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.[56]

- *Dashboards and building labeling*: 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.
  - 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.[57]
  - 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.
  - Presenting consumption in terms of end use intensity (EUI) and usage per square foot (kWh/sf and/or KBTU/sf) metrics is most useful, as are peer level benchmarking comparisons.

- *Additional program improvements*
  - Process improvement – CRE customers would like reduced paperwork and streamlined application processes. The PAs will be implementing online incentive applications to address this need.

[56] The CRE Report suggested partnering with key trade associations, such as BOMA and NAIOP that are active in this marketplace.

[57] http://www.linkcycle.com/review-of-top-energy-management-software/

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- 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.

In general, the specific elements and approaches of a successful CRE strategy include:

- Developing marketing strategies that resonate with the distinct submarkets within CRE;
- 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;
- Streamlining PA paperwork and decision making to meet the pace of decisions being made in the sector;
- Delivering better CRE training for all channel partners, particularly Small Business contractors

Additional Planning Input

The Northwest Energy Efficiency Alliance (NEEA) also released an assessment of the CRE Market this year.[58] The Northwest research plan also involved extensive interviews: 21 executives representing 18 CRE firms and 17 representatives from 5 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 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."

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

[58] "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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	large commercial portfolio owners and receptive tenants, service providers, industry trade and research associations, and governmental organizations to pilot standardized tenant energy efficiency packages."[59] 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&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. 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&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."[60] 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. Maintain/Improve Services for Financing Energy Efficiency Investment 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

[59] 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, p.46.

[60] Id., p. 50.

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	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. Mass Save® 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.[61] As the 2012 "Massachusetts Large Commercial & Industrial Process Evaluation" concluded: "Lack of financing activity appears to be due mostly to very few organizations relying on outside financing in general."[62] 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.[63] Second, because of this disappointing performance there is a new surge of interest in investigating alternative and creative financing vehicles, such as commercial PACE[64]. New financing options may have the potential to improve customer uptake of project financing and reach more customers

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61 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

62 Ibid, p. 3-17

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

64 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.

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	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.[65] 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.[66] More Tools for Customer Engagement Surveys indicate that consumers have tremendous expectations that they will have an abundance of choices in energy services in the future.[67] 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.[68] 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 satisfaction among Massachusetts businesses that have participated in Massachusetts programs,[69] and that customers view the PAs as trusted sources of information[70], 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

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65 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.

66 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.)

67 "Knowledge is Power: Driving Smarter Energy Usage Through Consumer Education", IBM Institute for Business Value, January, 2012

68 Id.

69 89% of participants gave the PAs a 4 or a 5 on five-point scale for overall satisfaction. "Massachusetts Large Commercial & Industrial Process Evaluation", KEMA, May 17, 2012

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70 When asked about trust in a variety of different sources of information, from community and business organizations to the press and other media, 78% 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, p. 56.

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	to fully realize the efficiency capabilities in their properties. 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. An example of the platform's capabilities is the online tool, *My Energy Consultant*. *My Energy Consultant* 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. *My Energy Consultant* 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. 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 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. Combined Heat and Power During the 2016-2018 Plan period the PAs will aggressively explore more ways to increase CHP installations in Massachusetts while

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Market segmentation is the process of defining and subdividing the class of C&I customers into identifiable segments that have similar needs, wants, or

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PA markets can be defined by business type (*e.g.*, health care, education, government, agriculture, industrial, hospitality, etc.), building type (*e.g.*, 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 develop ...

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	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.[73] 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.[74] 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 systems, carbon reduction, payback formulas, and incentives.
Program Design	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

[73] The last assessment was conducted in 2009.

[74] 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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	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. 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. 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. 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.

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING
Delivery Mechanism	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.
Marketing Overview	Collectively, the PAs serve approximately 350,000 electric and 154,000 gas C&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&I customers. Examples of current strategies to serve the diversity of submarkets, and some proposed enhancements are detailed below. Segments of Special Interest *Large Customers* 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 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. 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

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	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. 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. 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, 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. Depending on the maturity of the customer/PA relationship, it may take from 3 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

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	order of 20-30% – 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. By way of example, past MOUs/SEMPs have included such features as: • Customer access to utility equipment procurement processes to achieve volume pricing; • Turnkey installation services using PA contractors, pre-selected for price and competence; • Joint engineering reviews and installation inspections, eliminating duplication and costs; • Simplified incentives, such as $/kWh saved; • Tiered incentives for higher, deeper savings; • Expansion of eligible technologies/strategies beyond the common portfolio; • Support for staff behavioral efforts; • Facility staff and user training; • Joint application for outside federal and state funding/grants; • Sharing of company-specific expertise; and • Test bed for new technologies and promotions. 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. *Cities, Towns and Special Purpose Districts* 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 statuary 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

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	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[75] funding for engineering assessments of opportunities, and financial assistance structured to meet their needs and constraints.[76] 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. 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 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. 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.

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[75] The larger PAs, with many municipal accounts, coordinate these resources through a fully dedicated municipal account manager.

[76] Reporting data indicates that municipalities and other public entitles now receive at least their fair share of funding.

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	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% 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. 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. The PAs stay current in the water/wastewater area by monitoring other best practices programs nationally[77] and by routinely reviewing emerging technologies and refinements to existing technologies.[78] 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. *Industrial* There are almost always a wide variety of cost effective energy efficiency

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Note: This section will be revised based on findings from CRE Working Group.¶
The PAs have identified several barriers that have limited full participation in energy efficiency opportunities in the property management/real estate segment. These barriers include but are not limited to:¶
<#>Identifying individual tenants (and associated decision makers) in buildings with multiple tenants ¶
<#>Cost effectively engaging multiple, sometimes small, tenants leasing space in a single building¶
<#>Identifying decision makers in buildings with one property management entity and a different ownership entity¶
<#>Split incentives between the customer paying the bill and the entity actually using the energy¶
<#>Identifying single building LLCs that may be part of larger ownership entity¶
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[77] E.g., Wisconsin Focus on Energy, Energy Trust of Oregon, NYSERDA.

[78] E.g., the PAs commissioned an ESource "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).

C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	investment opportunities present in industrial facilities, and industrial participation in PA programs is consistent and strong.[79] 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. 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. 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 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. 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

[79] "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, p. 22. & 26.

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING
	industrial customers (> 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. *Commercial Non-Profits* 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. Drawing on delivery models from other programs and initiatives such as 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. Combined Heat and Power During the 2013-2015 Three-Year Plan period, 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.[80] That

[80] ACEEE, "The 2014 State Energy Efficiency Scorecard," October 2014, Report Number 01408.

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C&I RETROFIT	**CORE INITIATIVES** **EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING**
	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. 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% of surveyed customers would not accept paybacks of just one year.[81] 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 past six years of experience in implementing CHP projects. These include: • 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. • 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

[81] Combined Heat and Power: Policy Analysis and 2011-2030 Market Assessment. ICF International. February 2012

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	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). • 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. 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 analysis. PA staff provide continuous active assistance and are objective and unbiased partners to the customer throughout the process. LED Street Lighting During the last Plan period 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. 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.

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C&I RETROFIT	CORE INITIATIVES EXISTING BUILDING RETROFIT, SMALL BUSINESS, MULTI-FAMILY RETROFIT, UPSTREAM LIGHTING
	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 [82] 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 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 period that will allow all these issues to be considered and addressed, and rate policies to be established by the DPU that will facilitate and expedite the conversion process.
Three-Year Deployment Strategy/Roadmap	For the 2016-2018 Plan period, the program will concentrate on continuous improvement to our processes and exploration of targeted additions.

c. C&I Retrofit: Existing Building Retrofit

C&I RETROFIT	CORE INITIATIVE EXISTING BUILDING RETROFIT
Overview & Key Objectives	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

[82] The City of Boston's conversion has been underway for five years.

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C&I RETROFIT	**CORE INITIATIVE** **EXISTING BUILDING RETROFIT**
	inefficient equipment with premium efficiency counterparts. Because it accounts for a significant share of C&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. 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 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 Retrofit Program generally, and this Existing Building Retrofit Core Initiative specifically, fits this mature profile. 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. 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. In addition to periodic equipment upgrades, the PAs offer a suite of

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C&I RETROFIT	CORE INITIATIVE EXISTING BUILDING RETROFIT
	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.
Design and Delivery Mechanism	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 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. 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. 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

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C&I RETROFIT	CORE INITIATIVE EXISTING BUILDING RETROFIT
	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. 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. 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.
Marketing Overview	Collectively, the PAs serve approximately 350,000 electric and 154,000 gas commercial and industrial 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&I customers. Examples of current strategies to serve the diversity of submarkets, and some proposed enhancements are detailed earlier in the Retrofit Program description.
Three-Year Strategy/Roadmap	For the 2016-2018 Plan period, the Existing Building Retrofit Core Initiative will concentrate on continuous improvement to our processes and exploration of targeted additions.

d. C&I Retrofit: Small Business

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C&I RETROFIT	CORE INITIATIVE SMALL BUSINESS
Overview & Key Objectives	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 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.[83]
Design and Delivery Mechanism	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. 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, in where available, on-bill repayment, options for the customer portion) reduce marketing costs and produce high sales closure rates, further reducing overheads.
Marketing Overview	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

[83] 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.

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C&I RETROFIT	CORE INITIATIVE SMALL BUSINESS
	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.
Three-Year Strategy/Roadmap	As described in greater detail above, the PAs have begun a thorough review of the program. Many of the opportunities under consideration by the PAs include those identified in recent evaluations. In addition to basic 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.

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

C&I RETROFIT	CORE INITIATIVE C&I MULTI-FAMILY RETROFIT
Overview & Key Objectives	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 Energy Action Plan ("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 Multi-Family Market Integrator ("MMI").
Design and Delivery	The PAs strive to deliver a fully integrated offering to participants, regardless of fuel type, service territory, or rate class. An integral part of

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C&I RETROFIT	CORE INITIATIVE C&I MULTI-FAMILY RETROFIT
Mechanism	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. Commercial Retrofit measures may include: • HVAC high efficiency equipment upgrades and controls • Variable speed drives, motors • Chillers • Air compressors • Water heating equipment • Energy management systems ("EMS") • Building envelope measures • Custom measures 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.
Marketing Overview	Please refer to Residential Multi-Family Retrofit Core Initiative description.
Three-Year Strategy/Roadmap	Please refer to Residential Multi-Family Retrofit Core Initiative description.

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

C&I RETROFIT	CORE INITIATIVE UPSTREAM LIGHTING (Electric Only)
Overview & Key Objectives	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 (*e.g.*, replacement of functioning, but less efficient lamps) as well.
Design and Delivery Mechanism	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

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	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."
Marketing Overview	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. For lighting products in a retrofit scenario the target markets are facility or maintenance managers and operators.
Three-Year Strategy/Roadmap	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.

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