

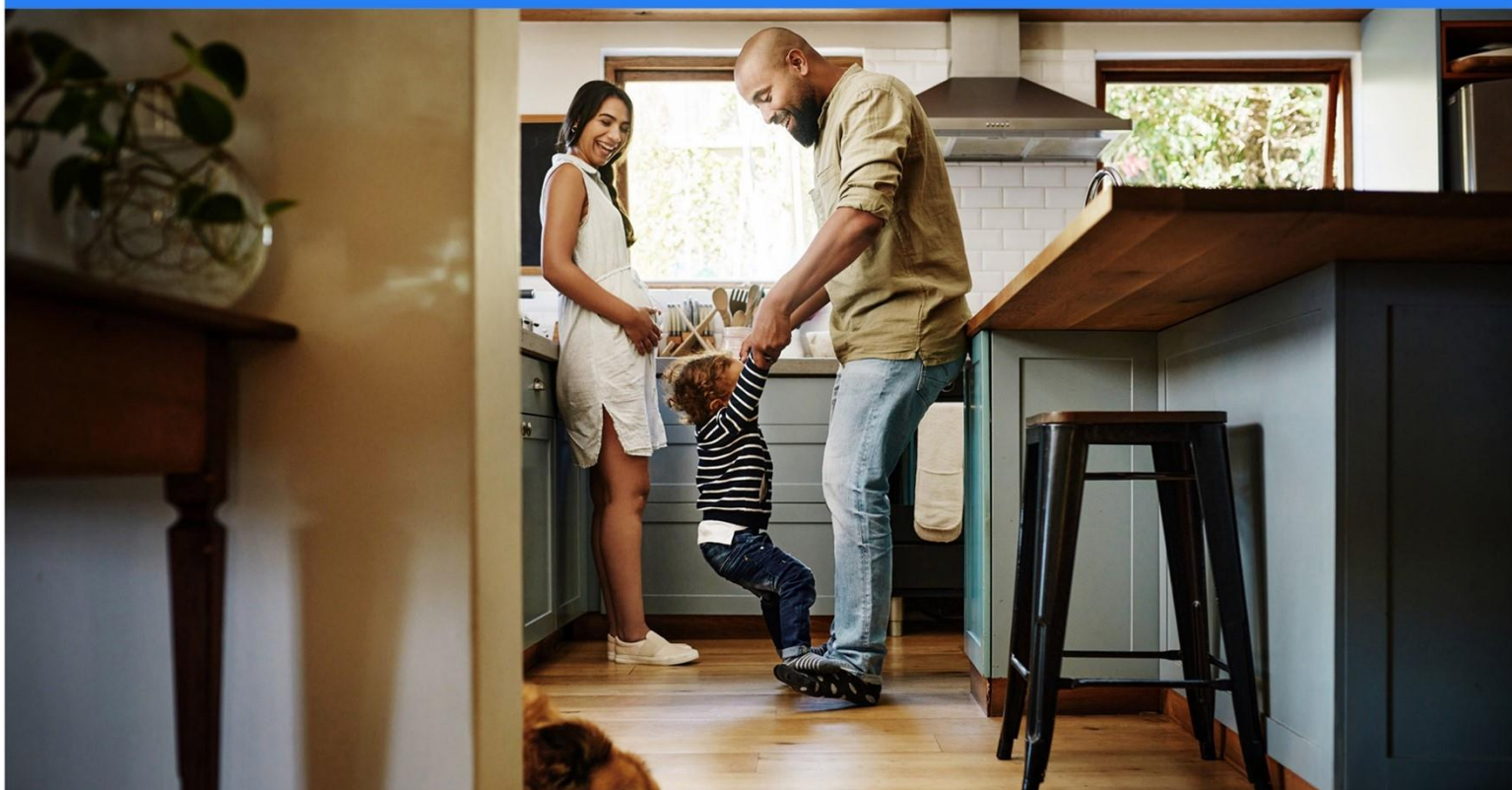


APRIL 30, 2021

MASSACHUSETTS JOINT STATE WIDE ELECTRIC AND GAS

THREE-YEAR ENERGY EFFICIENCY PLAN

2022-2024



WE ARE MASS SAVE®:



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EXECUTIVE SUMMARY

This Massachusetts 2022-2024 Energy Efficiency Plan (2022-2024 Plan or Plan) comes at a transformational moment in the state's policy making and approach to energy and the environment, as the Commonwealth seeks to prioritize greenhouse gas (GHG) emissions reductions and equity across the energy sector. The 2022-2024 Plan coincides with a concentrated effort by the General Court and the Baker Administration to place Massachusetts on the path to net zero GHG emissions by 2050. At the end of 2020, the Commonwealth's Executive Office of Energy and Environmental Affairs (EEA) released a roadmap to outline multiple technical and policy pathways to achieve net zero GHG emissions by 2050 (the *2050 Roadmap*). In addition, on March 26, 2021, Governor Baker signed into law Chapter 8 of the Acts of 2021, *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*, establishing a legal requirement to reduce GHG emissions by 50 percent below the 1990 baseline level by 2030 and to achieve net zero GHG emissions by 2050, with a particular focus on doing so in an equitable manner.

We, the Massachusetts Program Administrators (PAs),¹ fully support the Commonwealth's ambitious goal of net zero GHG emissions by 2050 and for the past several years have been the most-effective contributors to the achievement of the state's climate change goals. Through the first quarter of 2020, our energy efficiency programs have reduced GHG emissions by at least 5.6 million metric tons of carbon dioxide equivalent (MMTCO_{2e}). As demonstrated throughout this Plan, electrification and equity are two of our top priorities. We have the expertise, relationships, and delivery infrastructure to build on our prior achievements and deliver long-term energy savings and GHG emissions reductions, coupled with an emphasis on equity and management of near- and long-term customer energy burdens.

The 2022-2024 Plan will build on our strong track record of transformational investments, such as driving changes in the lighting market to light-emitting diode (LED) technology, to create the foundation for another market shift—electrification. One path to decarbonizing the Commonwealth's economy is increasing electrification in the building sector. The transformation of the building heating market will need to be done in a sustainable way to create a long-term path to success. First and foremost, the Plan reflects the need for us to ensure that homes and businesses are equipped for clean heating and cooling technologies, primarily through weatherization. The Plan also focuses on a ramp up of heat pump installations, as well as critical investments in consumer education and workforce development and training to build general awareness and familiarity around heat pumps and electrification, and to foster a diverse and well-trained workforce.

Simultaneously, due to the growing recognition of societal inequities systemic in the Commonwealth and our nation, we conducted a close examination of how participation in our energy offerings is distributed across the state. This focus has been informed by a set of comprehensive evaluation studies identifying *which* groups of customers participate at relatively lower levels and *why* they participate less. Our work on equity has also been informed by discussions with stakeholders through the Equity Working Group (EWG), convened by the Energy Efficiency Advisory Council (EEAC). These rich sources of

¹ The PAs are: The Berkshire Gas Company, Fitchburg Gas & Electric Light Company d/b/a Unitil, Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty, Massachusetts Electric Company, Nantucket Electric Company, Boston Gas Company and former Colonial Gas Company, each d/b/a National Grid, NSTAR Electric Company, NSTAR Gas Company and Eversource Gas Company of Massachusetts, each d/b/a Eversource Energy, and Cape Light Compact JPE (the Compact). As a public entity and municipal aggregator, the Compact does not participate in performance incentives. Accordingly, any reference to or discussion of performance incentives in this Plan does not pertain to the Compact.

quantitative and qualitative information and guidance set the stage for our comprehensive and aggressive commitment to increasing equitable participation in our programs in the upcoming three-year term.

Thus, this Plan reflects the general premise that energy efficiency does not stand in isolation, but is intimately connected to other Commonwealth policy goals, including reducing GHG emissions and increasing equity. While we will continue to focus on delivering energy-related benefits, our Plan adopts a more nuanced and broader definition of success than previous three-year plans. Specifically, we will prioritize electrification, equity, and workforce development, in close collaboration with the Massachusetts Clean Energy Center (MassCEC), in the upcoming term. Elevating these goals is critical for supporting complementary Commonwealth policy priorities, ensuring the long-term effectiveness of our work, and meeting the needs and expectations of customers. These themes are woven throughout this Plan.

The 2022-2024 Plan therefore represents the most distinct shift in how we define success since our development of the first three-year plan following the passage of the *Green Communities Act of 2008*.² While we constantly look to expand and refine our offerings and respond swiftly to quickly evolving market conditions and priorities, the three-year planning process offers an opportunity for us to step back, reflect, and more deliberately reevaluate our program goals and the resources needed to achieve them. The scale of the benefits that we have delivered to the Commonwealth, in close partnership with the Department of Energy Resources (DOER), the Office of the Attorney General (AGO), the EEAC, the Low Income Energy Affordability Network (LEAN), contractors, and other stakeholders, represents both a source of pride and a welcome challenge. We and other stakeholders are continuously looking to raise the bar to deliver sustainable and equitable energy savings, GHG emissions reductions, and benefits to customers, stakeholders, and the Commonwealth.

We will face notable challenges during the upcoming term, including mature and evolving markets, energy prices, and baselines. The increasing baseline efficiency of equipment and buildings in Massachusetts is a success story, but it also reduces claimable energy savings. Lower energy prices put further pressure on cost effectiveness and change the customer economics of efficiency investments. Ensuring more equitable participation across all customers is a critical goal, but success will require resources. Promoting and establishing a diverse and well-trained workforce, including by working closely with the MassCEC, will take time and strategic partnerships. Educating customers on technologies that are new to them will be critical to our success. Some of these factors will result in increased costs to achieve our goals and will require that we redouble our dedication to innovation and partnership, and with our stakeholders and regulators recommit to a shared vision of success.

The urgency of issues like the climate crisis and the heightened understanding of, and need to respond to, societal inequity related to energy is unquestionable. As this Plan documents, we are dedicated to contributing toward progress on these issues, while also balancing the need to do so in a sustainable and affordable way for customers. We particularly sought to create a Plan that is sensitive to the reality that many of the Commonwealth's residents and businesses find themselves in more financial uncertainty than ever before due to COVID-19 and the economic downturn. Accordingly, the Plan strives to ensure that customers are realizing the benefits of energy efficiency that they expect. The delivery of sustained benefits that continue to exceed spending is critical for maintaining the broad-based support for one of the most comprehensive energy efficiency and demand response portfolios in the nation.

² *Massachusetts Green Communities Act of 2008*, which was passed by both chambers of the Massachusetts General Court, Jul. 2, 2008, legislation accessible online at: <https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter169>.

In this Plan, we describe our priorities, relevant context and trends, and the work we will undertake to achieve the proposed goals over the next three-year term. The 2022-2024 Plan draws on our experience as implementers, the passion of stakeholders, and the insight of customers. The Plan contains both exciting innovation and critical incremental improvements and details our strategy to achieve a bold vision, acknowledging the need to continuously evaluate, test, and improve processes and offerings along the way. We are proud to submit this Plan and are eager to get to work on reducing energy use, improving equity, and contributing to the continuing decarbonization of the Commonwealth's economy.

1. OVERVIEW



SECTION 1: OVERVIEW

1.1 PLAN PRIORITIES

The *Green Communities Act of 2008*, as amended and codified at G.L. c. 25, §§ 19, 21, 22 (GCA), mandates the Massachusetts PAs “pursue all cost-effective energy efficiency that is less expensive than supply” and construct the Plan to meet or exceed the GHG reduction goal set by the EEA Secretary pursuant to G.L. c. 21N, § 3B. This mandate has created a broad framework for planning and implementation. Given the breadth of their programs and offerings, the PAs must clearly define key priorities to help focus their efforts, establish alignment with stakeholder interests, and signal a clear direction to Massachusetts customers and the marketplace. For the 2022-2024 term, the PAs have identified electrification, equity, and workforce development as three key priorities.

1.1.1 ELECTRIFICATION

After the transportation sector, the state’s largest source of GHG emissions is the building sector.³ Therefore, any plan to mitigate GHG emissions must include a pathway for decarbonizing space and water heating. Electrification will play a central role in reducing the carbon intensity of heating, and energy policies such as the Renewable Portfolio Standard (RPS), Solar Massachusetts Renewable Target (SMART) program (photovoltaic feed-in tariff), offshore wind procurement, and imports of hydroelectric power will increase the proportion of low-carbon electricity on the grid. An increase in these lower carbon sources of electricity will make the electrification of heating a key contributor to reaching the Commonwealth’s decarbonization goals. Electrification can enable incremental efficiencies and benefits beyond what is possible with delivered fuel systems and represents an opportunity for the PAs to continue to play a central role in decreasing GHG emissions.

The PAs recognize the importance of decarbonizing the building sector, and this Plan represents a necessary and measurable shift to electrification and away from traditional fossil-fuel based heating and cooling measures. The PAs seek to execute this shift in a measured, data-driven manner to ensure they continue to fulfill statutory requirements to pursue all cost-effective savings that benefit customers and provide opportunities for customers to engage in energy efficiency. For the upcoming term, the PAs will seek to prioritize higher savings opportunities and place a greater emphasis on electrification. For example, given the small incremental savings available for replacing condensing natural gas and propane heating systems with new condensing systems, the PAs will eliminate incentives for these replacements in residential buildings in the 2022-2024 term. Additionally, the PAs will eliminate residential incentives for oil-fired boilers (as the code has set efficient baselines) and phase out incentives for central air conditioning systems that are not heat pumps by year three of the Plan. During the upcoming term, the PAs will continue to offer residential incentives for non-condensing and efficient condensing oil furnaces (for as long as baseline data show there are still material cost-effective savings and benefits to be realized). The PAs will closely follow the data as the market evolves to determine appropriate incentives throughout the three-year term.

³ Commonwealth of Massachusetts, *Request for Comment on Clean Energy and Climate Plan for 2030*, Rel. Dec. 30, 2020, at 9, available online at: <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>.

Increased electrification under the Plan will help the Commonwealth achieve its climate goals and potentially reduce heating expenses for some customers. During the upcoming three-year term, the PAs will make a concerted effort to promote electrification, particularly in instances in which customer economics and building characteristics (e.g., in the displacement of delivered fuels, or in specific new construction scenarios) favor the use of high-efficiency heat pump technologies.⁴ Further, the most successful heat pump installations take place in buildings that are already weatherized; therefore, the PAs will bolster their efforts to improve building envelopes as a critical component of a larger electrification strategy that ensures buildings are ready to accommodate heat pumps when customers are installing new heating, ventilation, and air conditioning (HVAC) equipment.

The PAs believe that ensuring positive customer outcomes among early adopters, including reducing heating costs and maintaining comfort, is critical for the long-term success of electrification. For these reasons, the PAs will prioritize transitioning customers who are more likely to experience reduced heating costs and a seamless installation, while simultaneously working to address the technical and financial hurdles that make electrification more challenging for other customers. Specifically, customers who currently heat with oil, propane, or electric resistance are more likely to realize reduced heating costs from transitioning to a heat pump technology. Switching heating from oil to heat pumps also produces greater GHG emissions reductions than switching from natural gas to electricity, further supporting a strategy of switching delivered fuel customers first. To support customer acceptance of heat electrification, the PAs will work with manufacturers and installation contractors to increase their comfort and capability in proposing and installing efficient electric heat where it can provide customer benefits, regardless of fuel type.

The PAs note that the relatively high penetration of natural gas in the state presents challenges from both a programmatic and customer standpoint. For natural gas-to-electric fuel switching, both the cost effectiveness and customer economics are tenuous. In almost all cases, a customer switching from natural gas to a heat pump as their primary source of space heating would realize an increase in the cost to heat their home or business, in addition to the incurred capital cost for the system's installation. In instances where customers may choose to switch from natural gas to electric (despite the cost implications), the rate of free ridership is likely to be very high, reducing claimable savings and calling into question the prudence of energy efficiency incentives for this type of investment. Despite these conditions, the PAs anticipate that changing economics during the 2022-2024 term and beyond (both for system installation and energy supply), may support a broader range of scenarios where natural gas to electric fuel switching is economic and cost effective. The PAs will remain vigilant in monitoring the data and adjusting incentive levels and programs accordingly. In the interim, the PAs will prioritize immediate investments in improving building envelopes and readying the customer base and the workforce to prepare for these likely situations in the future.

Given the substantial difference between the status quo and the vision detailed in the Commonwealth's *2050 Roadmap*, building electrification is an excellent candidate for market transformation efforts. Therefore, the PAs' strategy will include implementing tactics that boost the pace of space heating electrification in the short term, while also creating an

⁴ Planned heat pump measure quantities for retrofit programs can be found in the benefit-cost ratio (BCR) models for each PA. The models currently do not yet include any heat pump quantities for the Residential New Homes & Renovations Core Initiative; the PAs are actively engaged in modifying program design in response to recent evaluation results and are awaiting the results of a study that explicitly identifies the costs of electrifying new construction homes.

environment for a larger market transformation over time. The implementation of this strategy will entail multiple approaches, such as pairing incentives with customer education, and contractor training alongside workforce development investments.

The PAs remain committed to promoting electrification within the bounds of the energy efficiency programs; however, for the electrification of heat to proceed at the scale and pace envisioned by the Commonwealth, additional policy support that tilts the relative economics in favor of electrification will be necessary. Electrification also will be a sustained effort over time; heating systems are not replaced frequently, but a significant portion will be replaced naturally before 2050. Customers who have recently invested in a heating system may not consider any further upgrades in the near term. However, as the market begins to transform during the upcoming term due to the PAs' sustainable approach to building a strong foundation for electrification, the PAs expect to see a significant increase in heat pump installations over time, providing critical assistance to the Commonwealth as it works to meet its 2050 net zero GHG goals.

Due to the nature of their programs, the PAs' primary electrification efforts during the 2022-2024 term will be focused on space and water heating. The PAs, however, recognize that transportation is the largest source of carbon emissions and that there are a number of opportunities for electrification outside of just space and water heating. Therefore, the PAs will pursue additional opportunities to bolster electrification in other areas, which may include electrifying end uses, such as lawn and garden equipment, and using their considerable reach and program delivery infrastructure to drive incremental adoption of electric vehicles (EVs) and charging equipment.

The residential and small business-scale heat pump offerings are great examples of how the PAs work across sectors to develop high-quality energy efficiency offerings. Since the equipment and HVAC contractor base for installing heat pumps in both homes and small businesses are largely similar, the PAs leveraged the implementation and evaluation work conducted at the beginning of the 2019-2021 term to expand the Residential program structure (i.e., minimum efficiencies, qualified products list, and incentive structure) to small commercial buildings. During the 2022-2024 term, the PAs expect to continue this coordination and manage these offerings in parallel. In addition to coordinating on incentive levels, the PAs will focus on workforce and market development efforts that increase the speed and quality with which HVAC systems can be electrified. Further evaluation efforts should help to resolve any issues or questions (e.g., how to efficiently specify and operate heat pumps in different building configurations) and the PAs will apply the evaluation findings across all the sectors, wherever applicable.

STRATEGIES

Residential and Income Eligible Sectors

The PAs will introduce the following electrification strategies to the Residential and Income Eligible Sectors during the Plan term:

- Increased general customer education and outreach as it pertains to heat pumps and their benefits.
- Introduction of a heat pump contractor network.
- Targeted outreach to customers whose homes have already been weatherized to promote heat pump technologies.
- Optimization of HVAC incentive levels to ensure prioritization of heat pumps when they deliver positive customer economics.

- Continued workforce development and training to increase contractor comfort in recommending and installing heat pumps.
- Introduction of a New Construction Path-to-Zero offering.
- Increased installation of heat pumps to delivered fuel customers in Income Eligible programs.
- Scaling up of active demand response (ADR) offerings for EVs, establishing make-ready requirements in residential new construction, and exploring the use of energy efficiency infrastructure to promote EVs.
- Consideration of new incentives for electrification of other end uses, such as lawn and garden equipment.

Commercial & Industrial Sector

The PAs will introduce the following electrification strategies to the Commercial and Industrial (C&I) Sector during the upcoming term:

- Significant ramp up of the Small Commercial Heat Pump offering that mirrors the Residential Sector’s heat pump offering.
- Continued workforce development and training to increase contractor comfort in recommending and installing heat pumps.
- Increased engagement with manufacturers, distributors, and installers to better characterize the scenarios in which heat pumps are being installed and to streamline the application process.
- Increased commercial weatherization services to facilitate economic electrification of heating systems.
- Increased technical assistance and financial support for customers constructing new buildings minimizing overall energy consumption.

1.1.2 EQUITY

The PAs have made equity one of the key strategic priorities of the 2022-2024 Plan. Equity, as used herein, is defined as the process of establishing more equal access to and participation in energy efficiency, particularly among those groups who have historically participated at lower rates, including renters/landlords, moderate-income customers,⁵ English-isolated families,⁶ and microbusinesses. Across all Sectors, the PAs are working to increase participation among the above-referenced groups by researching and deploying the most effective strategies to engage these customers, including through

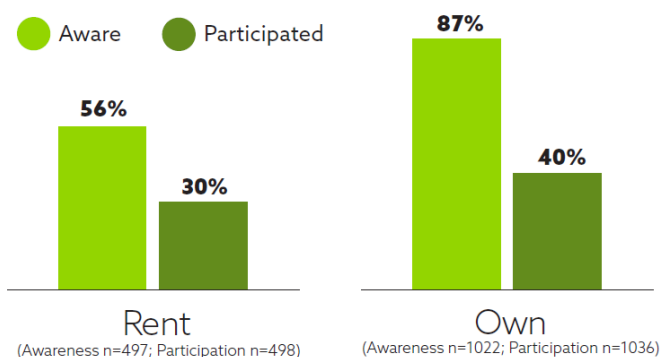
⁵ For the purposes of the 2022-2024 Plan, the PAs will define moderate-income customers as customers with incomes greater than 60 percent and equal to or lesser than 80 percent of the state median income.

⁶ In Massachusetts, the EEAC and the PAs refer to customers where 25 percent or more of their household has *no one* over the age of 14 who speaks “English only” or “very well” as “English-isolated families.” Being classified as an English-isolated family is one of the Commonwealth’s three criteria for a geographic area/community to be designated as an Environmental Justice community. The Environmental Protection Agency (EPA) defines the same population of customers as “linguistically-isolated customers.” For the 2022-2024 Plan document, the Massachusetts PAs will use the term “English-isolated families” to remain consistent with the Commonwealth’s and EEAC’s policies.

increased collaboration with community partners, enhanced incentives, improved language access, and targeted messaging.

The first step to reducing inequities in energy efficiency is understanding where they exist. During the 2019-2021 term, the PAs commissioned a series of studies that were completed in 2020, including the *Residential Non-Participant Customer Profile Study*,⁷ the *Residential Non-Participant Market Characterization and Barriers Study*,⁸ and the *C&I Small Business Non-Participant Customer Profile Study*.⁹ As depicted in Figures 1-1, 1-2, and 1-3 below, these studies showed that some groups of customers are less aware of the PAs' programs and therefore less likely to participate than others.

Figure 1-1: Participation Data (Renters vs. Owners)¹⁰



For example, renters are less likely to participate than homeowners (Figure 1-1), while moderate-income customers are less likely to participate than those with higher than moderate incomes (Figure 1-2). Additionally, customers who speak English “not at all” or “not well” are less likely to participate in the PAs’ programs than those that speak English “well” or “very well”.

The largest differences are among renters versus owners (a 10 percentage point difference in participation), while for the other groups, the differences are smaller but still statistically significant. Renters face particular challenges to participating, since they are not the decisionmakers for installing measures such as weatherization and heating system upgrades. If renters pay the utility bills, landlords may not see the value in funding upgrades that would reduce costs only for the tenants.

The *Non-Participant Market Characterization and Barriers Study* also identified several consistent themes around barriers to customer participation, including lack of trust in government and landlords, prioritizing basic needs, lack of

⁷ *Residential Non-Participant Customer Profile Study (MA19X06-B-RESNONPART)*, produced for the Massachusetts PAs by DNV GL, Feb. 6, 2020, available online at: https://ma-eeac.org/wp-content/uploads/MA19X06-B-RESNONPART_Report_FINAL_v20200228.pdf.

⁸ *Residential Non-Participant Market Characterization and Barriers Study (MA19X06-B-RESNONPART)*, produced for the Massachusetts PAs by Navigant, Illume, and Cadeo, Feb. 27, 2020, available online at: https://ma-eeac.org/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy_Final.pdf.

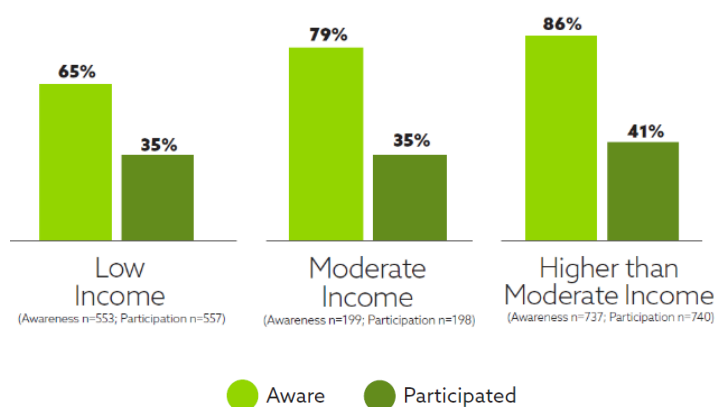
⁹ *Commercial and Industrial Small Business Non-Participant Customer Profile Study (MA18X11-B-SBNONPART)*, produced for the Massachusetts PAs by DNV GL, Apr. 15, 2020, available online at: https://ma-eeac.org/wp-content/uploads/Final-MA19X11_B_SBNONPART-Report-20200415-1.pdf.

¹⁰ See *Residential Non-Participant Market Characterization and Barriers Study*.

understanding/awareness of offers, and perceptions that offers are not relevant to them. Customers who do not trust the legitimacy of the programs may prioritize other areas of their lives, and customers who do not understand the benefits that energy efficiency offers may not see the relevance of program participation to their lives.

The most common reasons that non-participants give for not participating in Mass Save programs are: (1) not being aware of the program offers (27 percent), (2) thinking that their house is already energy efficient (23 percent), (3) not wanting to deal with the hassle of participating (22 percent), or (4) not having the time (18 percent). Financial barriers were less commonly cited, with 10 percent of non-participants saying they did not have financing options, and 7 percent saying they could not afford to implement the energy efficiency project.¹¹ The PAs conclude from this data that successful efforts must address both financial and non-financial barriers.

Figure 1-2: Participation Data (Income Levels)¹²



During the 2019-2021 term, the PAs worked collaboratively with EEAC Councilors and other stakeholders to form the EEAC’s EWG to make recommendations regarding improving the equity of outcomes achieved within the programs and to expand their understanding of the barriers customers encounter when engaging in energy efficiency. A key objective of the EWG was to conduct a series of focus groups to solicit feedback from public and private organizations, and businesses who engaged with renters, landlords, and English-isolated families.

The PAs actively identified external stakeholders to support this important initiative and facilitated several listening sessions to help foster inclusion. Dozens of stakeholders representing various customer segments throughout the state shared ideas on how the PAs can improve equitable participation in energy efficiency programs.¹³ The PAs also benefitted from valuable insight and received feedback from participants to launch the second iteration of the Municipal & Community Partnership

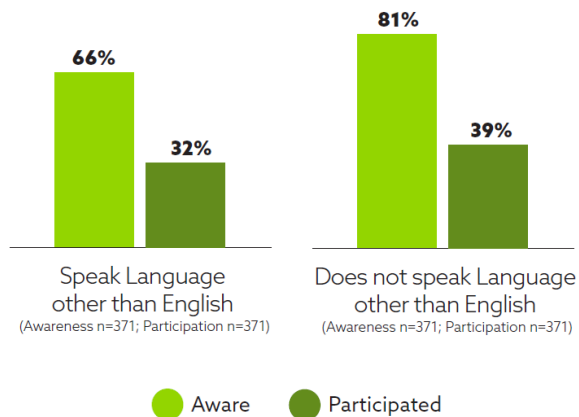
¹¹ See *Residential Non-Participant Market Barriers Study*, at C-10.

¹² See *Residential Non-Participant Market Characterization and Barriers Study*.

¹³ *EEAC EWG Summary to EEAC on Moderate-Income, Renter and Landlord, Small Business, and Community Partnerships Recommendations*, Jan. 2021, available online at: <https://ma-eeac.org/wp-content/uploads/Workshop-5-Equity-Working-Group-Process-and-Recommendations-01.08.21-MM-Final-002.pdf>. In February 2021, the EEAC EWG updated these recommendations. See *Updated EWG Recommendations 2/19/2021*, Feb. 19, 2021, available online at: <https://ma-eeac.org/wp-content/uploads/EWG-Recommendations-2.19.21.pdf>.

Strategy, an initiative first scaled statewide by the PAs in 2019 to work with local partner communities to increase the reach of energy efficiency savings, especially among renters, moderate-income residents, English-isolated families, and small businesses, with an emphasis on Environmental Justice neighborhoods.

Figure 1-3: Participation Data (English vs. Language Other Than English)¹⁴



The recommendations resulting from the EWG focus groups and the PAs’ experience in implementing the Municipal & Community Partnership Strategy greatly informed and guided the approaches to achieving equity that the PAs will pursue during the 2022-2024 term. The Residential Management Committee and C&I Management Committee have convened several cross-sector implementation groups to implement the PAs’ Workforce Development Strategy (see Section 1.1.3 below) and Municipal & Community Partnership Strategy. The PAs’ approach is to treat equity as a lens through which to view everything that they do, rather than a discrete set of activities. The PAs have highlighted several of their planned strategies to increase equity below and these strategies are woven throughout the 2022-2024 Plan. Where equity overlaps with workforce development, the PAs’ planned efforts are highlighted in Section 1.1.3 (workforce development overview). Further details regarding the PAs’ equity efforts are included in the Residential and Income Eligible Sector descriptions (see Section 2) and the C&I Sector description (see Section 3).

STRATEGIES

Residential, Income Eligible, and C&I Sectors

The PAs will introduce the following equity strategies to the Residential, Income Eligible, and C&I Sectors during the Plan term:

- **Improved Municipal & Community Partnership Strategy.** This effort is focused on an enhanced place-based approach, increased partnership with community-based organizations (CBOs), and greater flexibility of program design.

¹⁴ See *Residential Non-Participant Market Characterization and Barriers Study*.

- **Enhanced incentives for moderate-income customers.** The PAs will focus on increased participation by moderate-income customers, including the continuation of 100 percent weatherization measures, new enhanced HVAC incentives, support to address and mitigate barriers to weatherization, and increased partnerships delivered through the Municipal & Community Partnership Strategy. In 2024, the PAs are planning to spend more than \$60 million on weatherization and heating system incentives for income-qualified moderate-income customers, with a total of \$115 million over the term. Importantly, these figures are just for enhanced weatherization and heating system incentives and do not include other incentive and non-incentive spending benefitting moderate-income families. The PAs are also committed to addressing the non-financial barriers highlighted in the *Residential Non-Participant Market Characterization and Barriers Study*. For the upcoming term, the PAs propose to increase spending on incentives for heating systems, pre-weatherization barrier mitigation, and weatherization for moderate-income customers.
- **Targeted programming to communities.** The PAs will target Main Streets programming for Environmental Justice communities,¹⁵ explore partnerships with diverse business groups, and expand Main Streets materials to be available in several languages spoken in those communities.
- **Address customer language barriers.** The PAs will work to address customer language barriers through the creation and implementation of a Language Access plan, partnering with inclusive and multilingual CBOs and driving toward the closure of gaps in the customer journey for the most commonly spoken languages in Massachusetts—Spanish, Portuguese, and Mandarin.
- **Increased outreach to renters.** The PAs will provide a statewide 100 percent weatherization incentive for rental units, increase promotion to renters, and improve strategic outreach to multifamily properties of 5-25 units.

Further details regarding the PAs' equity efforts are included in the Residential and Income Eligible Sector description (see Section 2) and the C&I Sector description (see Section 3).

1.1.3 WORKFORCE DEVELOPMENT

The PAs recognize that a stable, trained, diverse, and adaptable workforce is fundamental to the continued success and growth of their Residential, Income Eligible, and C&I programs. A robust workforce will also increase equity across the energy efficiency portfolio and help achieve the Commonwealth's decarbonization goals as they relate to building

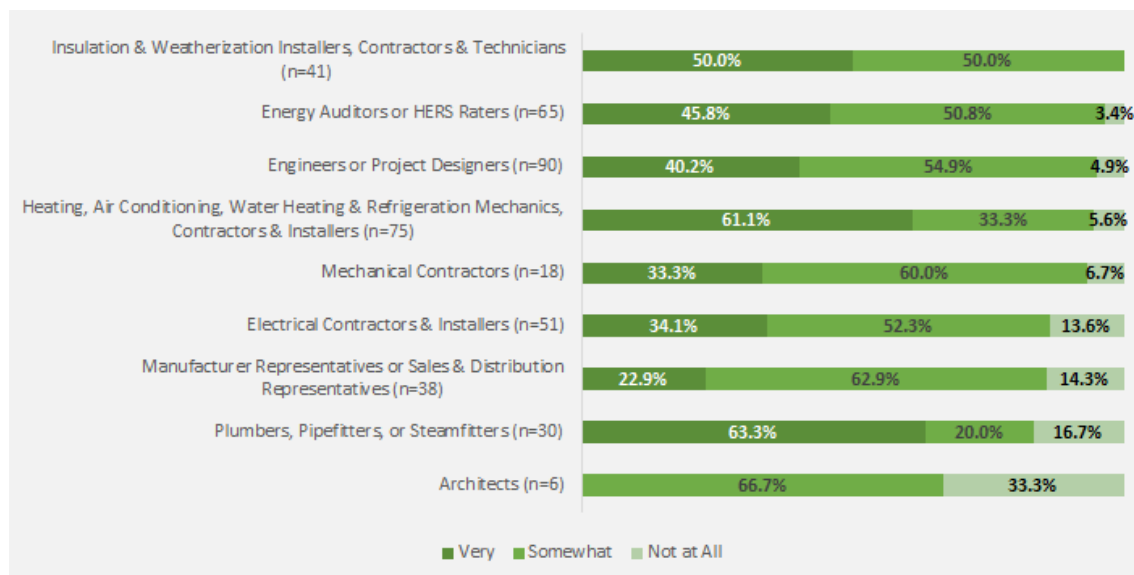
¹⁵ In Massachusetts, beginning in June 2021, a neighborhood (*i.e.*, a census block group) is defined as an Environmental Justice community if any of the following are true: (1) the annual median household income is equal to or less than 65 percent of the statewide median (\$81,468 for a household of four in 2021), (2) minorities comprise 40 percent or more of the population, (3) 25 percent or more of households lack English language proficiency (English isolated), or (4) minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income. Further, the EEA Secretary may determine that a neighborhood shall not be designated an Environmental Justice community if she finds the following: (1) the annual median household income of that neighborhood is greater than 125 percent of the statewide median household income, (2) a majority of persons age 25 and older in that neighborhood have a college education, (3) the neighborhood does not bear an unfair burden of environmental pollution, and (4) the neighborhood has more than limited access to natural resources, including open spaces and water resources, playgrounds, and other constructed outdoor recreational facilities and venues. More information about Environmental Justice communities is available at: <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts>.

efficiency. Over the last decade, the Massachusetts energy efficiency workforce has grown rapidly—over 86 percent between 2010 and 2020, to nearly 112,000 workers—and there are opportunities for growth in future years.¹⁶ Current and future workforce growth projections indicate the need for new HVAC and weatherization workers is greatest; this is a direct effect of the PAs’ ambitious goals to increase air source heat pump installations during the 2022-2024 term.

While the PAs have historically invested in upskilling the current energy efficiency workforce to meet the evolving needs of the industry and are also consistently engaged with business and community partners in ongoing workforce development efforts, they recognize the immediate need to shift to a more proactive, future-oriented role in workforce development. To that end, the PAs are developing and putting in place a statewide Workforce Development Strategy and several new efforts to grow and diversify the Commonwealth’s energy efficiency workforce and provide opportunities for workers in the delivered fuels industry to transition into building electrification. The above-referenced efforts will enable the PAs to meet aggressive energy savings goals during the upcoming three-year term.

The PAs learned from the *Workforce Development Needs Assessment* and ongoing contractor surveys throughout the 2019-2021 term that there is a high degree of difficulty hiring qualified candidates for some occupations, especially weatherization installers, HVAC technicians, and plumbers.¹⁷ Prior to the pandemic, over 90 percent of employers reported that it was “somewhat” or “very difficult” to find qualified candidates for these positions.¹⁸ As many of the PAs’ programs that rely on these occupations continue to expand, the need for new workers in these fields is likely to become more acute and critical in meeting energy savings goals.

Figure 1-4: Employer Survey – Hiring Difficulty by Occupation



¹⁶ *Massachusetts Energy Efficiency Workforce Development Needs Assessment*, produced for the Massachusetts PAs by BW Research, Mar. 2020, available online at: <https://ma-eeac.org/wp-content/uploads/Massachusetts-Energy-Efficiency-Workforce-Development-FINAL-REPORT-CAREER-PROFILES.pdf>.

¹⁷ See *Workforce Development Needs Assessment*, Rel. 2020, at 4.

¹⁸ See *Workforce Development Needs Assessment*, at 15.

Moreover, the *Workforce Development Needs Assessment* found that workplace diversity is low, and few employers have formal diversity initiatives.¹⁹ Most energy efficiency workers are Caucasian men who primarily speak English, though the percentage of energy efficiency workers that are Caucasian is slightly lower than in the population overall. The proportion of Hispanic and Latinx individuals with energy efficiency jobs is higher than in the overall statewide population, while the proportion of Black or African American energy efficiency workers is lower compared to the overall state population. A small minority (13 percent) of energy efficiency workers are women. The study also noted that potential candidates, especially young adults, have low levels of awareness of both entry-level job opportunities and long-term career paths in energy efficiency.²⁰

To be more equitable in reaching customers, it is vital that the workforce supporting the PAs' programs reflects the diversity of the communities served. A diverse workforce will enable contractors to understand the varied experiences of customers, allowing them to reach more customers in their neighborhoods and communities, and making customers more comfortable implementing energy efficiency. It is also important that the PAs help to increase the number of individuals and companies attracted to working in energy efficiency so that the programs continue to grow and achieve robust savings goals and support the Commonwealth's targets for decarbonization. Further, ongoing opportunities for upskilling and growth continue to be critical so that the energy efficiency workforce supporting PA programs can adapt to changing conditions and support customers in saving energy. Finally, the PAs want to ensure that the energy efficiency workforce continues to move the market to adopt the latest efficient building technologies.

Similar to the approach the PAs are taking to achieve equity, cross-sector collaboration will be key to the success of their workforce development efforts. The PAs have established a Cross-Sector Workforce Development Working Group, overseen by the Residential and C&I Management Committees, to coordinate on implementation strategies. This ensures an emphasis on sector-specific goals, as well as overall management. Additionally, the PAs will continue to engage other stakeholders and groups, including the Contractor Best Practices Working Group, Income Eligible Best Practices Working Group, key trade allies, and the EWG.

Over the last few years, the PAs have worked collaboratively with the MassCEC to share insights and future planning to ensure that any collective efforts benefit the overall energy efficiency workforce. Due to recently enacted legislation, the MassCEC will have a clearer and more focused role in workforce development efforts in the Commonwealth during the 2022-2024 term. Over the next three years, the PAs plan to work collaboratively with the MassCEC to continue providing in-field experience and expertise to advance energy efficiency throughout the Commonwealth and to ensure investments made by MassCEC in workforce development are informed by the PAs' energy efficiency programs.

For a more detailed discussion of workforce development activities that the PAs will engage in during the 2022-2024 term, please see the strategic interventions discussions in the Residential and Income Eligible Sector description (see Section 2) and C&I Sector description (see Section 3). Below, the PAs have highlighted several planned strategies to improve workforce development.

¹⁹ See *Massachusetts Workforce Needs Assessment*, at 5.

²⁰ See *Massachusetts Workforce Needs Assessment*, at 52-53.

STRATEGIES

Residential, Income Eligible, and C&I Sectors

The PAs will introduce the following workforce development strategies to the Residential, Income Eligible, and C&I Sectors during the 2022-2024 term:

- **Train new and diverse candidates**, including the Clean Energy Pathways Internship program, targeting multilingual 18- to 24-year-olds from backgrounds underrepresented in the energy efficiency workforce for extended internships in partnership with workforce CBOs and with vendors in high-growth industries.
- **Grow and diversify the pool of business partners**, including putting goals and strategies in place to increase the number of certified Minority-owned Enterprises (MBEs), Women-owned enterprises (WBEs), and Veteran-owned businesses (VBEs) contracting and subcontracting in PA programs, as well as providing a path for firms working in the delivered fuels industry to transition into work on electrification in buildings.
- **Increase coordination with vocational, technical, and other public high schools** to offer energy efficiency career education curriculum and pathways into internships and the workforce.
- **Grow and upskill contractors, existing workers, and new entrants**, including establishing an online vendor network and more training and education to recruit new contracting companies to work in energy efficiency. In addition, the PAs will continue to upskill the workforce in new technologies such as Passive House certification, Building Operator Certification, automated controls, building codes and standards, and HVAC equipment.
- **Engage stakeholders to achieve more success through collaboration** with state agencies, CBOs, and educational institutions that specialize in workforce development.

Further details regarding the PAs' workforce development efforts are included in the Residential and Income Eligible Sector description (see Section 2) and C&I Sector description (see Section 3).

1.2 CONTRIBUTING TO STATE POLICY GOALS, CONTINUING INNOVATION UNDER THE GCA

The initial passage of the GCA transformed energy efficiency efforts in Massachusetts, and the GCA, as amended,²¹ continues to lead the Commonwealth on a path of innovation. The enactment of the GCA expanded energy efficiency mandates by requiring the PAs to develop three-year energy efficiency plans that will “provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply”.²² To date, the GCA's framework and statewide collaborative approach has produced unprecedented results. Due to the GCA, the PAs are able to embrace new strategies and adopt emerging technologies in order to continuously pursue new cost-effective opportunities and meet the goals of the Commonwealth, including supporting GHG emissions reduction goals.

²¹ Acts of 2018, c. 227 § 20; Acts of 2021, c. 8.

²² G.L. c. 25, § 21.

Following updates enacted in 2018, the GCA maintained the same scope and objective to pursue all available cost-effective energy efficiency and demand reduction resources, with amendments for clarification purposes and to provide additional opportunities to deliver holistic energy efficiency services and GHG emissions reductions. These amendments include the clarification that the electric PAs may deliver non-electric energy efficiency services, ADR strategies (including energy storage), and other clean energy technologies. Additionally, since 2018, the amended GCA has allowed the PAs to pursue electrification measures that are designed to result in cost-effective reductions in GHG emissions while minimizing ratepayer costs and conversions to renewable energy sources or other clean energy technologies. For the 2022-2024 term, the PAs will continue to use all strategies available to achieve the outcomes of energy and GHG emissions reductions.

In May 2021, Governor Baker signed into law *An Act Creating a Next Generation Roadmap for Climate Policy*, which requires the Commonwealth to achieve net zero GHG emissions by 2050 and makes various provisions for meeting this climate goal, including amendments to the GCA. The 2021 GCA amendments focus on ways to further leverage the energy efficiency framework to reduce GHG emissions. First, the three-year energy efficiency plans will have to be constructed to meet the GHG reduction goal set by the Secretary of EEA. Second, calculations of program benefits must include a calculation of the social value of GHG emissions reductions, except for instances where the conversion is from fossil fuel heating and cooling equipment to another fossil fuel heating and cooling system.²³ Third, three-year plans may now prioritize projects that will result in substantial GHG reductions. The PAs also must transfer \$12 million to the MassCEC every year to implement a clean energy equity workforce and market development program.

The new amendments to the GCA complement the strategy documents released by the Commonwealth in late 2020, which outline the importance of energy efficiency in achieving the Commonwealth's goal of net zero GHG emissions by 2050. Both the interim *Clean Energy & Climate Plan for 2030* (CECP)²⁴ and the *2050 Roadmap* highlight the decarbonization strategies needed to help achieve the Commonwealth's net zero by 2050 goal. In the interim CECP, the buildings sector is slated to reduce emissions by 9.4 MMTCO₂ over the next decade to help the Commonwealth achieve its decarbonization goals. For the buildings sector, the key focus is on the decarbonization of buildings through widespread weatherization measures, clean heating and cooling technologies (with a focus on electric heat pumps), implementation of high-performance stretch codes that advance building code closer to net zero, and deep energy retrofits. Similarly, the *2050 Roadmap* outlines the need to use the energy efficiency programs to help decarbonize the building sector in a coordinated manner.

In addition, on October 29, 2020, the Massachusetts Department of Public Utilities (Department) issued a Notice of Inquiry (NOI) in D.P.U. 20-80, opening an investigation into the role of natural gas distribution companies (LDCs) in achieving the Commonwealth's target 2050 climate goals. The investigation will focus on exploring "strategies to enable the Commonwealth to move into its net-zero GHG emissions energy future while simultaneously safeguarding ratepayer interests; ensuring safe, reliable and cost-effective natural gas service; and potentially recasting the role of the LDCs in the Commonwealth."²⁵

The Plan takes each of these executive agency initiatives into account. For example, over the 2022-2024 term, the PAs will prime the HVAC market for a transformation to clean heating and cooling technologies, with a focus on the advancement of heat pump technologies, while taking into account issues that must be addressed to facilitate customer adoption. The Plan

²³ For discussion of how the social value of GHG emissions reductions are reflected in this Plan, refer to the AESC Study section of A.4.2

²⁴ EEA released the interim CECP for public comment on December 30, 2020, with comments due on March 22, 2021. The EEA is expected to release a final CECP in the spring of 2021.

²⁵ NOI at 1.

also includes a continued focus on weatherization, a foundational measure that reduces energy use and prepares buildings for electrification, which will significantly contribute to the Commonwealth’s goals as outlined in the interim CECP. Additionally, the PAs will continue to advocate for the advancement of codes and standards which help the Commonwealth achieve greater savings for appliances and new buildings.

In delivering energy efficiency programs under the GCA, the PAs have already achieved almost \$32 billion in total benefits. Using the strategies set forth in this Plan, including building a sustainable market for building electrification and pursuing energy efficiency opportunities among historically underserved populations, the PAs plan to deliver at least another \$7 billion in total benefits during the 2022-2024 term. The benefits delivered under the PAs’ programs directly tie to customer savings, GHG reductions, and other benefits. Delivering programs under the GCA provides an optimal framework for delivering broad and innovative programs, while at the same time ensuring a direct benefit for customers and balancing short-term and long-term customer bill impacts. The GCA framework also provides stability for the energy efficiency market and contractors, which help drive innovations and provide high-quality, consistent services for customers.

1.3 KEY CROSS-SECTOR ACTIVITIES

1.3.1 ACTIVE DEMAND REDUCTION STRATEGIES

BACKGROUND

The Independent System Operator-New England (ISO-NE) is responsible for the reliability of New England’s generation and transmission infrastructure available to meet the system load at every hour of the day, year-round. In order to do this, ISO-NE assesses the needs of the system during peak demand. By working with customers to actively reduce loads during these peak hours through ADR strategies, the PAs can influence both the long-term forecasting methodology ISO-NE uses to establish the Installed Capacity Requirement (ICR), as well as the price of capacity in the forward capacity market (FCM). As a result, all customers benefit from the lower costs of a smaller generation, transmission, and distribution system. These peak demand reductions also provide immediate benefits to all customers in the form of suppressing wholesale power prices during times of high demand, by reducing the system’s reliance on what would otherwise be the most economically and environmentally expensive forms of generation. Even customers who do not pay demand charges directly benefit from ADR offerings in the form of avoided capacity, transmission, and distribution costs that are incorporated into their electric rates on a long-term basis.

ACTIVE AND PASSIVE DEMAND REDUCTION

ADR offerings depend on discrete actions that a customer would not have otherwise taken to reduce their electrical load for a specified and limited period of time. The so-called “passive” demand reductions that result from traditional asset-based energy efficiency programs generate reductions in load year-round, simply because their higher efficiency produces energy savings and demand reductions. These demand reductions are aggregated and bid into ISO-NE’s FCM, earning revenue that offsets energy efficiency program costs. The PAs can derive additional value from implementing ADR offerings which incentivize brief reductions in customer load during targeted periods of high system demand.

BENEFITS OF ACTIVE DEMAND REDUCTION

Over the long term, ADR strategies provide a number of benefits to customers, utilities, and the grid, including improving the reliability of the grid and reducing customer costs due to reduced peak demand. In addition, ADR strategies provide

significant environmental benefits by reducing energy usage which offsets the need for fossil-fueled power plants and results in GHG emissions reductions.

The PAs' C&I Interruptible Load offering is specifically intended to target the system peak hour. This is the hour of the year during which the New England electrical system experiences its highest overall demand and is typically in the afternoon during the summer months of July and August. The majority of the total ICR for the present year is determined by this single peak hour and the cost of this capacity and related transmission is borne by all electric customers (costs are proportionally split across all load-serving entities).

The PAs rely on system forecasts to predict which days are likely to be peak days and provide customers and curtailment system providers (CSPs) with day-ahead notifications prior to calling a dispatch event. Dispatch is the period of time when electric utility or grid operators can call upon participants to reduce electricity consumption. By calling dispatch events for only a few hours, on days that the electric system is likely to peak, the PAs can reduce the ICR and associated marginal costs. The New England electrical system is a summer peaking system, and the PAs will continue to monitor ISO-NE's load forecasts and are prepared to make future changes to their ADR strategies to continue to implement offerings that provide system benefits to ratepayers.

While daily dispatch offerings target the system peak hour, ADR offerings target many more hours during the summer season. While the peak hour is the primary determinant of the ICR, the ISO-NE's regression model assesses the 62 peak hours during July and August in order to build its long-term forecasting model. The degree to which demand is consistently and repeatedly reduced on these days increases the confidence that those reductions are "firm" and can be counted on in future forecasts. This "limited scaling factor" allows the PAs to derive additional benefits from capacity reductions that can perform repeatedly, rather than on a more limited basis.

In determining how often to call events, the PAs must balance the potential value of curtailment with the disruption that the event may cause for customers. If there are too many dispatched events, then the PAs risk increasing the rate of opt-outs or decreased performance. However, batteries, generators, thermal storage, and some other types of equipment can lend themselves to repeated dispatch *without* substantially altering the comfort or operations of a customer's home or facility. These technologies are typically used in daily dispatch offerings because they can be called on many of the peak days during July and August with limited event fatigue.

Residential and C&I customers who sign up for ADR offerings receive incentives for reducing their energy consumption during PA-called dispatch events. The PAs' ADR incentives are just one financial offering available that rewards customers for shedding load and reducing energy consumption during seasonal peak demand periods. Other similar financial benefits available primarily to C&I customers include ISO-NE market revenue, Installed Capacity (ICAP) tag cost avoidance, Massachusetts Clean Peak Energy Standard revenue, and demand charge management. While the PAs strive to create ADR offerings that allow customers to stack various revenue streams, reducing the level of incentives needed, the targeted system peaks may not always line up with the behavior required to maximize these other sources of revenue.

The PAs do not claim significant energy savings from these events. In most instances, total energy consumption is unchanged because the activity associated with the controlled load is simply shifted away from the peak period, not eliminated entirely. However, customers may experience increased consumption in some cases. Specifically, with respect to batteries, overall consumption generally increases due to the "round-trip losses" associated with charging and discharging the battery.

CURTAILMENT STRATEGIES

The PAs' ADR offerings can be grouped into two main strategies for reducing demand during peak load events: (1) "device-specific" demand reduction strategies and (2) "metered" demand reduction strategies. While not intended to be exclusive to either sector, device-specific strategies are deployed more for residential customers and metered strategies tend to favor C&I customers.

Device-specific demand reduction strategies use connected device telemetry to temporarily adjust control settings in a way that results in lower demand during the event, such as thermostats, storage, and EVs. Because device-specific strategies rely on telemetry from the devices themselves to assess performance, these strategies do not require interval metering. This is especially important in Massachusetts as interval metering for residential customers and the majority of C&I customers has not yet been approved and implementation of any future approvals will likely take several years, at a minimum.

A challenge with the device-specific approach is that the PAs cannot rely on access to a meter to assess performance; therefore, they need to develop relationships with device manufacturers in order to implement curtailment offerings and receive data documenting participation and verifying performance. The PAs work with their Distributed Energy Resource Management System (DERMS) providers to integrate as many products as feasible, but some product manufacturers are not motivated to integrate with a DERMS, for a variety of potential reasons (see the section below for more details regarding DERMS).

"Metered" demand reduction strategies are aimed at customers with existing interval meters, or with enough load to justify the installation of third-party meters by CSPs. This approach assesses the total reduction in facility load relative to a baseline that an enrolled customer is able to achieve in response to a curtailment event. The baseline methodology is aligned with how ISO-NE calculates their baseline for the FCM, and customers are provided with performance-based incentives which reflect the incremental curtailment the PAs were able to affect.

CONSIDERATION FOR PRODUCT INCLUSION IN ACTIVE DEMAND REDUCTION OFFERINGS

The first key criterion when considering new products or technologies to add to the ADR offerings is whether the product has load that is curtailable and coincident with peak periods. For C&I Sector applications, any load is theoretically curtailable through a metered approach. For other applications that are device specific, there must be a means for the PA to cause the device to reduce load during peak events. Safety is another consideration, as there are some end uses in which a load may be hypothetically curtailable; however, there may be safety concerns associated with the load curtailment. Further, the technology must be one that is often drawing power during these peak periods (high coincidence), or there would be little load to be reduced. Lower coincidence may be acceptable for technologies that have a large potential load reduction, such as EVs. Products that have curtailable, coincident load should be considered because they have the potential to deliver meaningful demand reductions.

Another key consideration is the persistence of a potential demand response product. As an example, several PAs have experimented with using plug load controllers to reduce demand from window air conditioners. While results in the first year are sometimes promising, most of these offerings found that few people properly installed the plug load controllers the second year, leading to a low persistence. Low persistence compromises the total value that a device might deliver through ADR.

The last key value component that is evaluated when considering a new ADR product is whether the load is discretionary. Batteries are nearly fully discretionary because there are no direct impacts to a customer from cycling it, aside from roundtrip losses and the potential for a reduced state of charge if there is an outage. Dryers, on the other hand, are not a

discretionary load and customers who have started a load of laundry are usually not willing to delay the drying of their clothes by several hours. Loads that are not discretionary may be curtailable and coincident, however they do not deliver reductions because customers will often choose to opt out of events.

After the potential ADR benefits have been established, the costs to achieve those benefits must be understood. The incentive cost is a variable cost that scales with the number of responding participants. Incentives are often separated into enrollment and performance incentives, especially for Residential Sector measures. These must address both the value a customer would place on not having their product curtailed and any incremental costs for controllable technologies (e.g., purchasing a smart thermostat or adding a load controller). The incentive must also overcome any time or convenience barriers to participation. For example, an existing pool pump could be a source of substantial curtailable load, but customers may struggle to see the value in hiring an electrician to install a wireless load controller. There are customer acquisition costs in addition to enrollment incentives, such as marketing and sales commissions.

For technologies that are controlled through a DERMS, there are also integration costs. These are the costs (i.e., legal, technical, and administrative) of adding new technologies to the DERMS. These costs are often fixed, regardless of the number of devices or total curtailable load. Further, these fixed costs are generally for each additional device manufacturer or, in some cases, each additional product for a given manufacturer. If for instance, there is a technology with some curtailable load that is highly fragmented across many device manufacturers, these fixed integration costs may make adding that technology less cost effective.

After establishing these potential benefits and costs, the PAs can determine whether a technology or device should be included in the ADR offerings. The PAs commissioned a study to evaluate the cost effectiveness of potential residential end uses based on many of these criteria. While such evaluations are very helpful in addressing most costs and benefits, they may not always accurately identify integration costs, as these costs may be considered proprietary by DERMS providers. Still, the evaluations provide a good starting point for identifying which measures should be included in ADR offerings. Over the course of the 2022-2024 term, the PAs will continuously review new technologies and device manufacturers for inclusion in their ADR offerings.

ENROLLMENT STRATEGIES AND CROSS-PROMOTION

Most large C&I customers are served by dedicated account managers who are familiar with the operational specifics of each site. To that end, these account managers can identify customers who may be good candidates for participation in demand reduction offerings and bring in the appropriate partners to implement their curtailment strategy.

The PAs recognize that the Commonwealth has established multiple policies intended to incentivize the installation of storage technologies (i.e., ACES grants, SMART incentives, and Clean Peak Energy Standard).²⁶ To the extent that the PAs invest customer funds to achieve *additional* load reduction that would not have occurred in the absence of their offering, they will continue to work with evaluation staff to assess their incremental impact and will monitor their incentives in the

²⁶ The Advancing Commonwealth Energy Storage (ACES) program is managed by DOER and MassCEC. ACES projects are aimed at piloting innovative, broadly replicable energy storage use cases/business models with multiple value streams in order to prime Massachusetts for increased commercialization and deployment of storage technologies. In 2017, ACES awarded \$20M in grants to 26 projects. The SMART program is a photovoltaic feed-in tariff. The Massachusetts Clean Peak Energy Standard is designed to provide incentives to clean energy technologies that can supply electricity or reduce demand during seasonal peak demand periods. See <https://www.mass.gov/clean-peak-energy-standard>.

context of the value stack available to owners of storage assets. As part of the approved addition of daily dispatch to the PAs' ADR portfolio in 2020, the PAs will continue to offer the five-year "incentive lock" for projects that meet and maintain certain development milestones. For projects with new interconnection agreements, the PAs will guarantee a fixed per-performed-kW incentive for five years, even if the published incentive changes in the interim. This guarantee is intended to provide a measure of financial certainty for new projects in the development phase, even if the PAs ultimately change incentives, or if the offering is discontinued.

As described in greater detail in the Residential Behavior Initiative description (see Section 2), residential enrollment strategies are generally tied to the device manufacturer. The PAs have not always, however, effectively integrated the value of demand reduction into the promotions of demand reduction-capable devices, such as thermostats. During the next term, the PAs will make this connection stronger through promotions, allowing devices to be enrolled in demand reduction offerings while purchasing them, and potentially by netting enrollment incentives from the purchase price when purchased through a PA's online retail marketplace. These strategies have two benefits: (1) increasing the universe of potentially controllable devices, and (2) increasing the percentage of devices that are enrolled.

The PAs may also offer higher purchase incentives for some controllable tiers of technologies. This strategy will allow the PAs to increase the number of controllable devices in instances in which there are insufficient installed devices to justify integration costs. Offering tiered incentives may also allow the PAs to increase the purchase of devices which may not yet be cost effective as an ADR offering but is one the PAs reasonably believe will have a path to cost effectiveness in the near future. To help support these higher incentives, the PAs will look for every opportunity to identify devices in which connectivity delivers additional energy efficiency (kWh) and passive demand reduction (kW) savings and has the option for incremental ADR (kW) reductions.

WINTER DEMAND RESPONSE

During the 2019-2021 term, the PAs have incentivized winter demand reduction efforts in order to test customer acceptance in responding to winter dispatch signals and to continue exploring claimable values that may result from winter demand reduction performance. During the winter of 2019-2020 the PAs called two events, and during the winter of 2020-2021 different PAs called different numbers of events. While performance was significantly lower during the winter than what was observed during the summer, the PAs found that customers were able to curtail load during events and paid out incentives accordingly.

As part of this effort, the PAs contracted with a consulting firm to explore potential value streams from winter curtailment as part of the *2019 Avoided Energy Supply Cost (AESC) Supplemental Study*.²⁷ The resulting memorandum confirmed that ISO-NE does not consider winter demand in determining the ICR. This value is used to establish the amount of generation capacity that must be procured to meet system needs. In New England, the winter peak is roughly 20 percent lower than the summer peak, curtailing winter load has no impact on the ICR, and therefore curtailment in winter does not result in avoided capacity costs.

²⁷ The AESC is a regional avoided energy supply cost study that is used by the Massachusetts PAs and other New England program administrators to calculate electric and fossil fuel avoided costs. See Appendix A.3 and the eTRM for more information about AESC studies and calculations.

As a result of their findings and implementation experiences during the previous three-year term, the PAs have determined that there are no material benefits from winter demand reduction and are not planning to provide winter electric demand reduction offerings during the 2022-2024 term. However, the PAs have demonstrated both customer interest and the ability to curtail load during the winter in response to demand reduction events. The PAs will continue to monitor the dynamics of the New England electric grid and ISO-NE's forecasting methodologies and if there is a point in the future at which there are avoided costs that the PAs can claim, they will reassess winter demand reduction offerings.

NATURAL GAS DEMAND RESPONSE

The PAs acknowledge that the topic of natural gas demand response is one that has generated considerable interest amongst various stakeholders. Both National Grid and Eversource have proposed natural gas demand response demonstrations through their most recent rate cases and Eversource has already been approved to conduct a natural gas demand response demonstration through its recent acquisition of Columbia Gas.²⁸ In response to the Department's orders and guidance on the appropriate role and filing mechanism for natural gas demand response, the PAs are considering what value these projects may provide within the context of the 2022-2024 Plan. In particular, the PAs must consider how to craft a demonstration project that could potentially deliver cost-effective benefits to customers at scale. The PAs are also working to ensure that any demonstration project proposed herein is not duplicative of other demand response demonstration projects either already underway or proposed..²⁹

1.3.2 CODES & STANDARDS AND TECHNICAL SUPPORT

OVERVIEW

While the majority of the programs seek to save energy by spurring voluntary action by customers, the PAs also seek to drive energy savings through supporting mandatory efficiency policies. The Codes & Standards Compliance and Technical Support Initiative (CSCS) saves energy by: (1) increasing overall market compliance with current minimum energy efficiency codes and standards, and (2) increasing the level of energy efficiency required by such policies. The PAs have employed the former strategy for roughly a decade and introduced the latter during the 2019-2021 term.

CSCS develops and delivers technical guidance on the energy efficiency policies applicable to the state's building sector to a wide variety of stakeholders, including private industry and public entities. The PAs' use of this technical support, whether at the individual project or company level or in a jurisdiction's policy-making or enforcement activities, generates energy savings that can be estimated at the market level. The PAs have a unique role to play in providing this support, and the resulting energy savings are attributable to this intervention. Savings from these efforts are claimed through the Residential New Homes & Renovations Initiative, the C&I New Buildings & Major Renovations Initiative, the Residential Retail Initiative, and the C&I New & Replacement Equipment Initiative that are further detailed in Sections 2 and 3 of the 2022-2024 Plan.

²⁸ This natural gas response demonstration is part of the settlement agreement pursuant to Eversource's acquisition of NiSource's Columbia Gas of Massachusetts assets.

²⁹ See NSTAR Gas d/b/a Eversource Energy, D.P.U. 19-120, at 127 & n. 63 (2020).

CSCS is a valuable component in the pursuit of all cost-effective energy efficiency and more equitable distribution of benefits. CSCS is a highly cost-effective initiative that unlocks sources of typically long-lived energy savings not eligible for other programs. Additionally, CSCS is a market transformation initiative that primarily impacts historical nonparticipants and customer segments considered “hard to reach” (HTR) by raising efficiency baselines market wide.

SCOPE OF BENEFITS

Unlike other programs offered by the PAs, CSCS does not include the participation of individual customers. Instead, customers automatically realize the benefits of this initiative when their energy consumption is reduced due to a CSCS intervention. Since CSCS targets energy end uses across all sectors and markets, all customer segments are covered within the scope of this initiative. CSCS advances the development and adoption of, and increases compliance with, building sector energy efficiency policies where there are energy-saving opportunities. The policies within the scope of CSCS include, but are not limited to:

- State, local, and national building energy codes.
- State and federal appliance and equipment standards.
- State and local existing building performance standards.

While compliance support services are offered continuously, advancement support activities are scheduled in alignment with relevant state and national codes and standards development cycles.

DESIGN

There are two distinct delivery pathways:

- **Codes & Standards Advancement Support** accelerates the adoption of more stringent efficiency requirements than would have otherwise been adopted through tactics such as an analysis of market data, research and development of policy proposals, and presentation of results to stakeholders.
- **Codes & Standards Compliance Support** reduces energy savings lost due to noncompliance with such policies through tactics such as delivery of training and outreach events to the building and design community, staffing of on-demand codes and standards “hotline” support, and development and dissemination of tools and resources.

In both cases, CSCS uses relevant evaluation studies, input from local stakeholders, and best practices from other jurisdictions to target these services based on the demonstrated need or opportunity.

STRATEGIC ENHANCEMENTS

The level of investment in this initiative is expected to increase relative to the 2019-2021 term. While this initiative has historically focused on energy code support, more investment in supporting appliance standards (at both the state and federal level) is planned in the 2022-2024 term. This increased investment is warranted given the PAs’ successful

demonstration of the Codes & Standards Advancement Support element of this initiative.³⁰ Active pursuit of appliance standards opportunities will help the Commonwealth achieve its climate and decarbonization goals, and the PAs will continue to coordinate with stakeholders to develop a clear path to attribution for these activities. In addition, the PAs supported the Commonwealth's adoption of efficiency standards for 17 products during the 2019-2021 term, and these standards were ultimately promulgated as part of 2021 legislation.³¹ The PAs intend to claim the savings attributable to this support starting in 2022.

1.4 CROSS-SECTOR TRENDS

In developing the 2022-2024 Plan, the PAs have considered a wide variety of policy, market, and technology trends and drivers and how they will affect energy efficiency program implementation. Each trend and driver referenced below has the ability to influence the direction and focus of the PAs during the upcoming three-year term.

Policy

Several policy drivers were considered in developing the 2022-2024 Plan, including state legislation and priorities. These policies and priorities present opportunities to expand and improve on the PAs' already successful, nation-leading energy efficiency portfolio.

- **Reducing GHG emissions.** The Commonwealth set a goal of net zero GHG emissions by 2050. More specifically, the EEA Secretary will set a GHG reduction goal for the 2022-2024 Plan.³² Reducing building energy consumption through weatherization and other demand reduction efforts is a key component of achieving GHG reductions in the building sector. The energy efficiency programs also will directly contribute to the Commonwealth's climate goals through an increase in the number of heat pumps installed in homes and businesses, along with a strong focus on creating a sustainable market for building electrification, including consumer education and workforce development and training. As a proven resource to cost effectively reduce emissions, the PAs' programs will directly contribute to the Commonwealth's climate goals with increasingly innovative programs.
- **Greater emphasis on equitable services.** The PAs recognize there are groups of customers that participate to a relatively lesser extent in the efficiency programs and have been working with stakeholders to identify and address barriers facing these customers and communities. For the upcoming term, the PAs will continue to explore and implement creative solutions to alleviate participation barriers, emphasizing efforts for equitable services for all customers. Serving customers who have participated at lower rates may increase the cost to achieve, but the imperative to ensure greater equity in participation in the PAs' offerings warrants these higher costs. The PAs are committed to increasing the participation of relatively lesser served and HTR customers, such as renters, moderate-income customers, and small and microbusinesses, and will continue to assess the bill impacts of the

³⁰ Final Report: Code Promulgation Attribution Study (MA19X07-B-CDPROMATT) produced for the Massachusetts PAs by NMR Group, Inc. and The Cadmus Group, Sep. 15, 2020, available online at: https://ma-eeac.org/wp-content/uploads/MA19X07-B-CDPROMATT_OverallReport_Final_2020.09.15.pdf.

³¹ *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*, May 2021, at Chapter 8.

³² See G.L. c. 25, § 21(d)(4).

programs overall so as not to further increase the burden on these customers, who may already have significant energy burdens.

- **Expanding codes and standards.** The success of the PAs' energy efficiency programs has presented new challenges and opportunities when evaluating potential claimable savings opportunities. As technologies and building efficiencies have improved, so have the codes and standards that determine the minimum efficiency levels of new construction or new technologies. This has, in turn, resulted in higher baselines and a reduction in claimable savings. The PAs support adoption of more efficient codes and standards and will remain active in their development and deployment, working with stakeholders to develop and quantify attributable savings from these efforts while also advocating for removal of existing disincentives to their promotion.

MARKET

Program offerings are shaped by local, state, and federal policies, as well as exogenous factors driven by consumers and businesses, energy markets, and the changing utility landscape.

- **COVID-19 and the economy.** Perhaps the biggest driver of current business investment behavior is the considerable uncertainty that remains regarding the full impact of COVID-19. To date, the impact has been large and very uneven, with some businesses, like those in the life sciences and manufacturing, experiencing a significant improvement, while others in retail, leisure and hospitality, and office markets experiencing enormous declines. Regardless of the timing and speed of economic recovery, there will be lasting, uneven impacts and it will be important, more so than ever, for the PAs to target those segments with the greatest appetite for investment in energy efficiency. For many residential customers, the pandemic has increased financial challenges and uncertainty. To assist, the PAs will strive to use and adapt their programs to deliver as much benefit to these households as possible. For other residential customers, increased time spent at home has driven higher consumption and an elevated interest in home improvement projects, providing an opportunity for the PAs to help customers address these changes through energy efficiency. For all customer types, the experience of the pandemic permanently affects some customers' attitude towards on-premise work and increased comfort with and appetite for virtual interactions.
- **Evolution of commercial building stock.** While average building sizes have been increasing for years, the vast majority of buildings (roughly 70 percent) still have floorspace under 10,000 square feet. Conversely, buildings with more than 10,000 square feet of floorspace account for less than 5 percent of the entire building stock. In aggregate, the number of commercial buildings and square footage have decreased over the last decade by roughly 10 percent. Additionally, as the economy has continued to shift toward a more service-based composition (rather than manufacturing), the largest increases in building stock have come from the lodging, warehouse and storage, and service industries. As the building stock evolves further, perhaps more quickly and in unexpected ways given the impact of COVID-19 on business closures and occupancy rates, the PAs will continue to adapt their efforts to targeting and serving C&I customers.
- **Personalization and changing customer expectations.** Customer expectations for how products are marketed and delivered continue to evolve. For the upcoming term, the PAs' goal is to anticipate and meet customers' needs, ensuring the right solution is made available to the right customer in the right way at the right time, increasing the likelihood of effectuating the desired outcome.

- **Shifting value of energy savings.** Delivering high-quality products and services to customers remains a top priority. Avoided costs, which drive claimable savings and benefits, have decreased for the 2022-2024 term and in turn, reduced cost effectiveness. The PAs will continue to identify ways to maintain high levels of benefits for customers while continuing to deliver the products and services expected. While avoided costs for some fuels are declining, there is also a shift in values for reduced electricity usage with greater emphasis being placed on reducing peak load even if it only produces a shift, rather than a reduction, in energy use.

TECHNOLOGY

In addition to the policy and market trends, there are shifts occurring in the technologies available for residential and C&I customer adoption and which, despite limitations to adoption, represent opportunities for efficiency and ADR offerings.

- **Electrification.** Over the next decade, adoption of heat pump technologies for heating and cooling purposes will increase considerably and the PAs' energy efficiency programs will make these technologies more affordable and more easily accessible for customers. The PAs' heat pump activities are simultaneously driving and responding to this quickly evolving market and while changes in the technology itself are important, the efficiency and efficacy of heat pumps are sensitive to appropriate equipment selection and installation. Additionally, the PAs must continue their work to influence the local and regional inventory and salesforce (contractors and distributors) to promote heat pump technologies. The PAs continue to help establish best practices in these areas and promulgate them throughout the market, as discussed in Sections 2 and 3 of this Plan.
- **Building optimization and controls.** Monitoring and control of building conditions and operations has advanced significantly. Despite its potential, however, challenges in terms of cost, capability, and complexity have prevented widespread adoption of sensors and controls in building operations that could ensure achievement of maximum savings from lighting, HVAC equipment, and other core systems and processes. Lighting controls now exist in over 50 percent of commercial buildings and HVAC controls are present in more than 70 percent. However, more sophisticated building energy management systems and associated controls exist in only roughly 5 percent of commercial buildings with the vast majority in larger buildings with more sophisticated building management operations and capabilities. Enabled by improvements in sensor size and functionality, along with continued reductions in cost, the PAs plan to expand efforts focused on building optimization and controls across all end uses in the 2022-2024 term.
- **Clean energy technologies.** The PAs envision the incorporation of new clean energy technologies into energy efficiency programs as one of the key areas where the PAs can help address the aggressive GHG policies set forth by the Commonwealth. In the past, some of these technologies have been cost prohibitive for customers or not ready for broader adoption. With some progress in terms of both reduced costs and technical improvements, more of these technologies will be included in the PAs' offerings, either as incentivized measures or technologies co-delivered with incentivized measures. For example, the falling price of battery storage and solar photovoltaics (PV) have made them better candidates for widespread adoption, so the PAs are using incentives for DR from storage to encourage the pairing of storage with solar PV. The PAs will continue to support the inclusion of new technologies that cost effectively result in energy savings, demand reductions, and GHG emissions reductions.

1.5 HIGH-LEVEL METRICS

The following energy savings, demand reductions, benefits, and related metrics represent the PAs' best estimates of the resources required, and the outcomes resulting therefrom, to achieve their vision for the energy efficiency portfolio described in this Plan.

1.5.1 HIGH-LEVEL METRICS BY SECTOR

Figure 1-5: Combined 2022-2024 Plan Goals (Combined Natural Gas & Electric)

Sector	Incentives Spend	Net Annual MMBtu Savings	Adjusted Gross Annual GHG Emission Reductions (Metric Tons)	Total Benefits
Residential	\$1,051,900,789	10,101,428	2,783,688	\$3,991,538,647
Income Eligible	\$344,370,528	1,797,064	444,469	\$1,044,075,917
Commercial & Industrial	\$664,701,038	8,840,365	1,801,119	\$2,405,666,793
Total	\$2,060,972,355	20,738,857	5,029,276	\$7,441,281,358

1.5.2 HIGH-LEVEL METRICS BY YEAR

Figure 1-6: Statewide Budgets. Savings, GHG Emissions Reductions, and Benefits (Combined Natural Gas & Electric)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$941,041,311	\$966,970,084	\$1,028,002,006	\$2,936,013,401
Net Annual All-Fuel MMBtu Savings	7,160,361	6,820,129	6,758,367	20,738,858
Net Lifetime All-Fuel MMBtu Savings	82,091,478	78,262,767	78,525,045	238,879,290
Annual GHG Emissions Reductions (Metric Tons CO₂e)	1,669,108	1,669,426	1,690,743	5,029,276
Total Benefits	\$2,463,806,850	\$2,438,813,826	\$2,538,660,681	\$7,441,281,358

Figure 1-7: Statewide Budgets, Savings, GHG Emissions Reductions, and Benefits (Electric)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$639,197,992	\$644,054,797	\$678,100,346	\$1,946,353,135
Net Annual All-Fuel MMBtu Savings	4,560,926	4,184,679	4,074,155	12,819,760
Net Lifetime All-Fuel MMBtu Savings	46,019,480	41,461,091	40,707,938	128,188,509
Annual GHG Emissions Reductions (Metric Tons CO₂e)	177,715	161,333	158,503	497,551
Total Benefits	\$1,665,971,200	\$1,618,773,827	\$1,687,037,571	\$4,971,782,599
Active Peak Demand Reduction (MW)	231	265	300	300

Figure 1-8: Statewide Budgets, Savings, GHG Emissions Reductions, and Benefits (Natural Gas)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$301,843,319	\$322,915,287	\$349,901,660	\$974,660,266
Net Annual MMBtu Savings	2,599,435	2,635,450	2,684,212	7,919,097
Net Lifetime MMBtu Savings	36,071,998	36,801,676	37,817,108	110,690,781
Annual GHG Emissions Reductions (Metric Tons CO₂e)	1,491,393	1,508,093	1,532,240	4,531,726
Benefits	\$797,835,650	\$820,039,999	\$851,623,110	\$2,469,498,759

1.6 BUDGET SUMMARY BY YEAR

The PAs' budget, as summarized here, is based on expected levels of spending, by cost category, required to achieve the savings and associated objectives described throughout this Plan.

Figure 1-9: 2022-2024 Budget Summaries (\$ Million)

Budgets Category	2022	2023	2024	2022-2024
Participant Incentives	\$658	\$675	\$728	\$2,061
Sales, Technical Assistance & Training	\$191	\$198	\$204	\$592
Program Planning & Administration	\$41	\$41	\$43	\$125
Marketing & Advertising	\$31	\$32	\$31	\$94
Evaluation & Market Research	\$21	\$21	\$22	\$64
Total Planned Spending	\$941	\$967	\$1,028	\$2,936



2. RESIDENTIAL AND INCOME ELIGIBLE SECTORS



SECTION 2: RESIDENTIAL AND INCOME ELIGIBLE SECTORS

2.1 VISION

For over two decades, the Massachusetts PAs' Residential and Income Eligible programs have served as a national model for other energy efficiency efforts across the country. Among many other accomplishments, the PAs introduced a new pathway to promote Passive House new construction, created the first integrated controls specification for heat pumps in the country, and quickly pioneered virtual Home Energy Assessments (HEAs) during the COVID-19 pandemic. To maintain their national leadership role and to provide the highest level of benefits and service to customers, the PAs will continue to evolve and improve their energy efficiency solutions and delivery during the 2022-2024 term.

At the highest level, the vision for the Residential and Income Eligible Sectors is to provide a comprehensive set of services that benefit all of the PAs' residential and income-eligible customers across the state. The PAs design energy efficiency offerings to pursue all cost-effective opportunities. With innovation and customer service at the center, the PAs are continuously testing new products and delivery approaches, to reach impactful scales and ultimately transform markets. The PAs see their work in the Residential and Income Eligible Sectors as an essential tool in helping to meet the Commonwealth's climate goals but are also proud of their contributions in other areas, such as helping customers manage energy burdens, providing consumer energy education, supporting a robust energy efficiency workforce, and improving the health and comfort of homes.

To reach all of their customers, the PAs must provide services that meet their unique needs, based on the kind of building they live in, whether they own or rent, their income, what languages they speak, where they are located in the state, and other key demographic characteristics. This diversity of the PAs' customers affects who they trust, which benefits from energy efficiency are meaningful to them, and what barriers they might face in trying to participate in energy efficiency. The PAs recognize that designing programs addressing such an array of needs and preferences is an immense challenge, requiring constant refinement over time.

The PAs provide services that address almost every residential building end use, including the home's building envelope, HVAC and domestic hot water (DHW) systems, small appliances and electronics, and the enrollment of connected devices in ADR offerings. In order to effectively address all of these end uses, the PAs' solutions must be available wherever these decisions are being made, across the lifecycle of residential occupancy. Customers need efficiency solutions when building a new home, making renovations or upgrades to an existing home, replacing a failed piece of equipment, or purchasing a new appliance or electronic device. Addressing a wide set of end uses in different types of interactions is not just a way to comply with the PAs' obligation to deliver all cost-effective energy efficiency; it is also part of how the PAs ensure that all types of customers can find ways to benefit from programs that suit their specific circumstances.

For most customers, even those who may struggle with their utility bills, pursuing energy efficiency is not a priority. To overcome this hurdle, the PAs must intervene in various ways and pursue education, marketing, and partnerships that increase customer awareness of the PAs' energy efficiency offerings, the benefits they can provide, and how customers can participate in them. The PAs provide technical support, such as HEAs and useful web-based resources, to enable customers to make informed decisions. Contractor trainings and programs build capacity, encourage selling efficient equipment, and improve work quality, translating into greater customer satisfaction and savings. Incentives and rebates can tip the financial scales in favor of energy-efficient options, leading distributors and contractors to change what they stock and sell and making the efficient choice the better deal for the customer. And, at the highest level, the PAs influence codes and standards to increase baseline efficiency across the board.

Influencing customers' decisions is contingent upon trust. For some customers, this means ensuring customers believe the PAs have their best interest in mind and that the information provided is reliable. Fortunately, after a neighbor, relative, or friend, the PAs are the most trusted source of information on energy efficiency.³³ Still, there is more work to be done. For the 2022-2024 term, the PAs' primary strategy for building trust is to identify the entities that their customers trust, and to work with them to promote the benefits of energy efficiency. These trust-building efforts are reflected in the Municipal & Community Partnership Strategy, which is built around the PAs forming relationships between municipal governments and trusted community organizations to reach residents and small businesses with information about energy efficiency from neighbors and local leaders they know and trust. Maintaining trust requires that the PAs provide accurate, useful, and transparent information. When customers act on the information provided and find that their experience matches their expectations, that customer becomes a potential advocate for energy efficiency. Individuals sharing their experiences continue to be the most powerful and effective means of inspiring others to engage with the PAs' energy efficiency offerings.

When engaging with customers, the PAs always try to guide them toward a path that leads to an optimal outcome (e.g., for a customer who resides in an uninsulated house heated with propane, this would mean weatherizing their home and upgrading to heat pumps). The PAs acknowledge that some customers may not always be interested or able to pursue this ideal path of all cost-effective energy efficiency. In these instances, it is the individual PA's role to help guide their customers in making the most energy-efficient choice possible. If this means continuing to heat with propane, the individual PA's role is to move the customer to use the most efficient propane-fired equipment possible. While some of these actions may not always be optimal, they still produce real, near-term climate benefits, and allow the customer to make the decision that is right for their circumstances, while still allowing for further future improvements.

Over the years, the PAs' most impactful benefits achieved through energy efficiency are those delivered in close partnership with LEAN to Massachusetts income-eligible customers. The accumulation of decades of efforts to address these customers' energy burdens and to make their homes safer and more comfortable requires that the PAs focus attention during the 2022-2024 term on new energy-efficient measures and building types that have been less comprehensively served. This includes an increased focus on installing heat pumps for customers with electric resistance or delivered fuels and on serving smaller, naturally-occurring affordable housing buildings that have had lower levels of engagement with the PAs and local Community Action Agencies partners (CAPs). The PAs also acknowledge the challenges associated with serving buildings that house both income-eligible and market-rate customers and will continue to collaborate with LEAN and CAPs on how to better serve all residents of these buildings.

The PAs recognize that this is an ambitious vision and that the scope and scale of their work and goals create challenges tied to resources, bandwidth, and complexity. Still, providing comprehensive programs that benefit all customers is not just the PAs' obligation, it is also fundamental to their mission and purpose. The offerings described in this Plan detail how the PAs will deliver on this vision for all of their residential customers throughout the 2022-2024 term. The figure below details the complexities the PAs must consider when designing the Residential and Income Eligible Sectors' programs, including customer characteristics, home characteristics, end uses, points of intervention, and customer motivations.

³³ See *Residential Non-Participant Market Characterization and Barriers Study*, Table 69, at C-55.

Figure 2-1: Examples (not exhaustive) of Dimensions Across which the Residential and Income-Eligible Programs are Designed to Work

Customer Characteristics	Home Characteristics	End Uses	Points of Intervention	Customer Motivations
Demographics: age, language, geography, etc.	Heating fuel, style, size, date constructed, and home configuration	Envelope	New purchase	Financial savings
Sources of trusted information	Number of units	HVAC	Customer-initiated interest in energy efficiency	Environment, climate
Rent or own	Previous participation	Appliances	Product/system failure or new product/system purchase	Property value, tenant recruitment and retention
Income: income eligible, moderate income, etc.	Pre-weatherization barriers	Demand response enrollment	Renovation or addition	Comfort and health

2.2 KEY LEARNINGS FROM 2019-2021 PLAN

The 2022-2024 Plan builds upon key learnings from the 2019-2021 term and further refines customer energy solutions to equitably achieve deeper energy savings for all customers across the state. The PAs were presented with unique challenges to overcome during the recent three-year term, resulting in new and unexpected program modifications and learnings that will be carried into the 2022-2024 term to further enhance delivery. Below are the key lessons learned from implementation of the 2019-2021 Plan that the PAs will use for the 2022-2024 term.

- **Meet the customer where they are.** This was a key priority for the 2019-2021 term, and experiences during this term reinforced its importance. One example was enrolling customers in the ADR offering for smart thermostats. While the PAs did execute dedicated promotions through marketing channels such as email, enrollment on the device itself or through an email from the device manufacturer were far and away the most effective means to recruiting participants to the ADR offerings. The PAs will continue to look for creative ways to present opportunities for education and participation wherever the customer is making energy-related decisions (e.g., increasing efforts to enlist solar PV contractors to pair battery storage with solar when making their sales pitch to customers).
- **Understanding the value of remote tools.** The COVID-19 pandemic challenged the PAs to quickly develop and leverage virtual solutions that provide customers the flexibility to participate on their own schedules. The PAs offer a variety of virtual solutions, including but not limited to virtual HEAs, online HEAs, remote inspection opportunities, an online marketplace for energy efficiency purchases, heating solutions calculators, and online submission portals. The PAs will continue to leverage these virtual tools during the 2022-2024 term.
- **Leaning into municipal and community partnerships.** The PAs recognize that municipal and community partners have the local knowledge and trust from the community needed to educate and encourage

residents to pursue energy efficiency opportunities. For the 2022-2024 term, the PAs plan to modify their community approach based on stakeholder feedback and key learnings from the previous three-year term and further leverage these valuable community relationships to access HTR populations including renters, moderate-income customers, English-isolated families, and small businesses. More information on the PAs' Municipal & Community Partnership Strategy can be found in Section 2.9.2.

- **Trade ally support.** Support from partners is paramount to the PAs achieving their aggressive energy savings goals. Together with their trade ally partners, the PAs plan to continue encouraging high-efficiency equipment stocking practices, motivating contractors to offer energy-efficient equipment, encouraging weatherization measures prior to the installation of HVAC equipment, providing education to partners on the proper installation of newer technologies, working collaboratively on new customer paths to participation, and striving to make access to customer incentive dollars as streamlined as possible to reduce customers' financial burdens.
- **COVID-19 pandemic.** In March 2020, PAs were challenged to quickly rethink new virtual options for service delivery. The virtual HEA offering was developed in March of 2020 and remained a primary offering for customers in 2020 and 2021. The PAs plan to continue refining the virtual HEA as a permanent delivery offering during the 2022-2024 term. There are many benefits to this pathway including reaching additional customers in a more convenient and time sensitive way, reacting to the diversity in the PAs' customer base by offering a friendly virtual solution, reducing challenges with customer rescheduling, and eliminating Energy Specialist travel time allowing PAs to reach more customers in a day. The one-on-one walkthrough with the customer also enhances the repertoire and education opportunities between the Energy Specialist and customer.
- **Creating comprehensive and effective end-to-end language support is challenging.** While the PAs have invested in translating key points of customer communications, including MassSave.com and the residential phone hotline, the scope and complexity of offerings combined with the number of contractors the PAs work with pose critical challenges to ensuring an end-to-end in-language experience. While maintaining the translation of some of these key customer touchpoints, the PAs will focus on ensuring a limited number of critical customer journeys. This more focused approach will allow the PAs to provide seamless experiences, learn from vendors and customers, and apply feedback to the next participation pathway.
- **Energy savings packages may not deliver substantial savings, but they are a useful tool for engaging and serving customers.** The PAs had envisioned energy savings packages, which included measures typically installed during an in-home HEA, such as light bulbs, faucet aerators, and smart strips, as a means to engage with customers with limited technical opportunity or without the authority to make changes to their home. The elimination of most claimable lighting savings further reduces their potential to deliver savings. Still the PAs believe that energy savings packages can help reach customers who may not otherwise participate. During the 2022-2024 term, energy savings packages will continue to evolve as the PAs continue to learn about which customers benefit most from them and how they can complement other offerings.
- **Customers are willing to trade financial incentives for simplicity.** Specifically, the PAs continue to find that the current income-verification process is a barrier for participation in the moderate-income insulation offer, despite the 100 percent incentive. While maintaining confidence that ratepayer funds are being reserved for those in the greatest need and ensuring that as many potential income-eligible customers are being identified as possible, the PAs will focus on streamlining the income-verification process as a means to increase participation in moderate-income offerings.

- **Understanding barriers to participation.** The *Non-Participant Study* provided some key insights to the PAs' customer base, including roadblocks for participation.³⁴ The PAs continue to look for solutions to address these participation barriers and more information on the PAs' plans to address them are addressed in Section 2.9.1 (Strategic Intervention: Increasing Equitable Service). Some findings from the *Non-Participant Study* include:
 - *Populations of interest tend to cluster together geographically.* For example, Census block groups that have a high proportion of renters are more likely to have a similarly high percentage of multifamily homes and households that speak limited English. The PAs can use this information to geographically target these areas to increase participation across the three identified HTR segments.
 - *Nonparticipants are more likely to be renters and reside in smaller multi-unit buildings.* The PAs continue to identify methods to streamline delivery for small multi-unit buildings and will explore additional tactics in the 2022-2024 term.
 - *Characteristics of non-participants.* These include:
 1. Often expressed a lack of trust in the government and their landlords and have a fear of scams.
 2. Prioritized their time and resources on needs that they considered more fundamental to living (i.e., food and shelter).
 3. Needed more information or understanding of Mass Save offerings, participation processes, and benefits.
 4. Perceived energy efficiency as irrelevant or not applicable to them.
 5. Believed Mass Save offerings are government-funded, therefore deterring participation.

Understanding these underlying characteristics can help the PAs to develop targeted strategies to address each area of concern. For example, the PAs could consider additional strategies to minimize time and resources needed to participate in energy efficiency so that it does not compete with customers' needs that they consider to be more fundamental.

2.3 2022-2024 STRATEGIC INTERVENTIONS OVERVIEW

As noted earlier, during the 2022-2024 term, the PAs will prioritize equity, electrification, and workforce development, in addition to their fundamental pursuit of delivering energy-related benefits. Taking into account these goals, learnings noted above, and sector challenges (discussed below), the PAs will take on a set of strategic interventions in the 2022-2024 term, as described below and in greater detail in Section 2.9.

³⁴ Navigant, Illume, and Cadeo. *Residential Non-Participant Market Characterization and Barriers Study*, at 16-29, available at: https://ma-eeac.org/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy_Final.pdf.

- **Equity.** Increased focus on new strategies to reach renters, moderate-income customers, and English-isolated families.
- **Workforce development.** Growing and diversifying the energy efficiency workforce supporting PA programs using four strategies:
 - Train diverse candidates.
 - Engage stakeholders.
 - Retain diverse entrants.
 - Grow and upskill small contractors and new entrants.
- **Scaling up residential electrification.** Achieving the widespread adoption of electrification of space heating requires deliberate and careful growth. The PAs plan to draw on lessons learned from the 2019-2021 term, as well as contractor feedback to continue to develop such growth. To achieve this, the PAs plan to build a market – customers, contractors, distributors, and manufacturers – that supports a sustained ramp up in electrification, including focusing workforce development efforts on transitioning the HVAC market to electrification.
- **Easing participation and virtualization.** New virtual options introduce access to customers who may not have participated otherwise. Building upon their newly developed virtual offerings, the PAs can provide shorter, more tactical and personalized interactions with customers, serving their immediate needs like collecting data and laying groundwork for future interactions. The PAs plan to continue to using feedback from customers and contractors to inform the design of new offerings and the refinement of existing ones.
- **Engaging contractors in the market.** Continued education and outreach tactics to trade allies and contractor partners. The PAs will explore new and streamlined ways to partner in reaching customers with energy efficiency solutions.
- **Municipal & Community Partnership Strategy.** Strengthen and expand on partnerships with municipalities and CBOs to address customer participation barriers together and achieve shared goals building on the 2019-2021 term strategy. This includes a focus on Environmental Justice communities, expanding the involvement of CBOs, increasing the flexibility of design to encourage innovative proposals, and aligning goals, data, and outcomes shared between the PAs and partners.

2.4 GOALS, SPENDING, GHG EMISSIONS REDUCTIONS, AND BENEFITS

As part of their three-year planning process, the PAs must develop energy and demand savings goals, budgets, cost-effectiveness models, and cost-efficiency forecasts that represent their best estimates to realize their vision for the Residential and Income Eligible Sectors. Additionally, as set forth in the Acts of 2021, c. 8, § 106, the EEA Secretary will set a GHG reduction goal for the 2022-2024 Plan by July 15, 2021.

The PAs will need to meet multiple objectives and outcomes for the Residential and Income Eligible Sectors, including meeting electric savings, natural gas savings, demand reduction, and GHG reduction goals. The programs also yield considerable non-energy-related benefits, such as improved health outcomes. These different types of value are all converted into dollars as a common denominator and summed as benefits.

A summary of the PAs' best estimates for spending, savings, GHG reductions, and benefits for the Residential and Income Eligible Sectors is provided in the following figures.

Figure 2-2: Residential and Income Eligible Budgets, Savings, and Benefits (Combined Natural Gas & Electric)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$612,266,382	\$664,719,174	\$732,528,375	\$2,009,513,932
Net Annual All-Fuel MMBtu Savings	3,810,351	3,950,901	4,137,240	11,898,492
Net Lifetime All-Fuel MMBtu Savings	46,828,265	49,173,724	52,463,467	148,465,456
Annual GHG Emissions Reductions (Metric Tons CO₂e)	1,043,160	1,071,768	1,113,229	3,228,157
Total Benefits	\$1,540,889,794	\$1,663,882,229	\$1,830,842,542	\$5,035,614,564

Figure 2-3: Residential Budgets, Savings, and Benefits (Electric)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$277,918,477	\$308,828,334	\$351,274,703	\$938,021,514
Net Annual All-Fuel MMBtu Savings	1,657,133	1,760,147	1,894,541	5,311,822
Net Lifetime All-Fuel MMBtu Savings	18,659,368	20,205,349	22,366,048	61,230,765
Annual GHG Emissions Reductions (Metric Tons CO₂e)	83,649	90,560	101,093	275,302
Total Benefits	\$775,113,028	\$875,074,366	\$1,010,000,624	\$2,660,188,017

Figure 2-4: Income Eligible Budgets, Savings, and Benefits (Electric)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$85,457,403	\$86,238,843	\$86,398,021	\$258,094,267
Net Annual All-Fuel MMBtu Savings	343,015	336,668	328,996	1,008,679
Net Lifetime All-Fuel MMBtu Savings	3,845,032	3,798,722	3,733,311	11,377,065
Annual GHG Emissions Reductions (Metric Tons CO₂e)	13,260	12,666	11,918	37,845
Total Benefits	\$184,719,894	\$184,754,868	\$183,525,738	\$553,000,499

Figure 2-5: Residential Budgets, Savings, and Benefits (Natural Gas)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$183,821,424	\$202,446,667	\$223,611,807	\$609,879,898
Net Annual All-Fuel MMBtu Savings	1,555,930	1,591,772	1,641,904	4,789,606
Net Lifetime All-Fuel MMBtu Savings	19,251,985	19,930,898	20,928,567	60,111,450
Annual GHG Emissions Reductions (Metric Tons CO₂e)	814,986	833,242	860,158	2,508,386
Total Benefits	\$424,271,928	\$440,828,995	\$466,249,707	\$1,331,350,630

Figure 2-6: Income Eligible Budgets, Savings, and Benefits (Natural Gas)

Metric	2022	2023	2024	2022-2024
Total Statewide Budget	\$65,069,078	\$67,205,330	\$71,243,844	\$203,518,252
Net Annual All-Fuel MMBtu Savings	254,273	262,314	271,799	788,385
Net Lifetime All-Fuel MMBtu Savings	5,071,879	5,238,755	5,435,541	15,746,175
Annual GHG Emissions Reductions (Metric Tons CO₂e)	131,264	135,300	140,060	406,624
Total Benefits	\$156,784,944	\$163,224,000	\$171,066,474	\$491,075,418

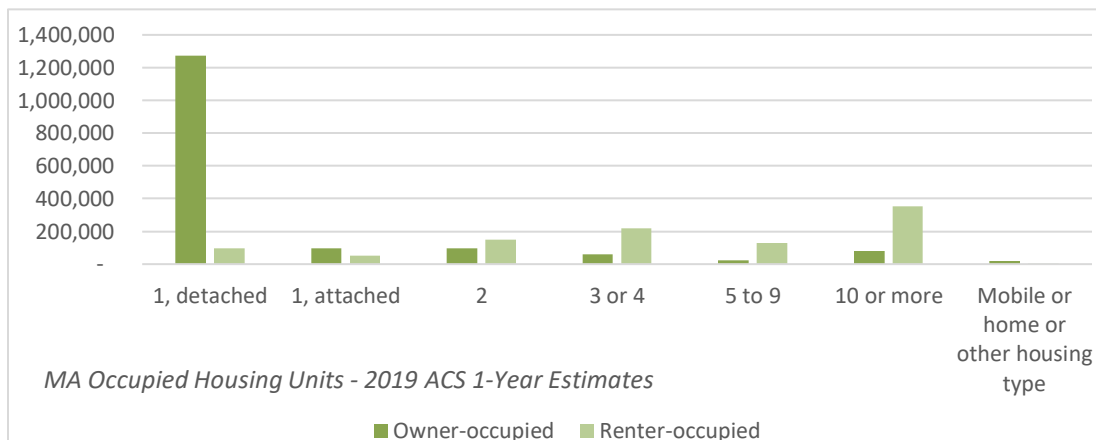
2.5 OVERVIEW

There are approximately 2.5 million and 1.5 million residential electric and natural gas customers, respectively, served by the Massachusetts PAs. These customers are served with energy efficiency solutions through a variety of initiatives to ensure comprehensive, whole-home energy evaluations, recommendations, and supporting financial incentives. A brief description of the Core Initiatives is included below with additional details in the program description sections.

2.5.1 BUILDING STOCK HIGHLIGHTS

Massachusetts residents and the homes that they live in are diverse. Approximately 38 percent of housing units are renter occupied and more than half of these rental units are in buildings with four units or fewer (see figure below). This means that while a substantial number of renters live in larger buildings, many live in buildings that may traditionally be thought of as being predominantly owner occupied.

Figure 2-7: Residential Units by Own vs. Rent and Number of Units in Structure



While natural gas is the primary heating fuel in the state, oil still maintains a substantial share, heating approximately 24 percent of Massachusetts homes. Oil is more prevalent in single-family, owner-occupied housing. Approximately 17 percent of units are heated with electricity, concentrated primarily in renter-occupied homes in multifamily buildings. The share of homes heated with fuel oil has declined over time, with customers switching to electricity, natural gas, and propane. See figure below.

Figure 2-8: Primary Heating Fuel for Occupied Residential Units

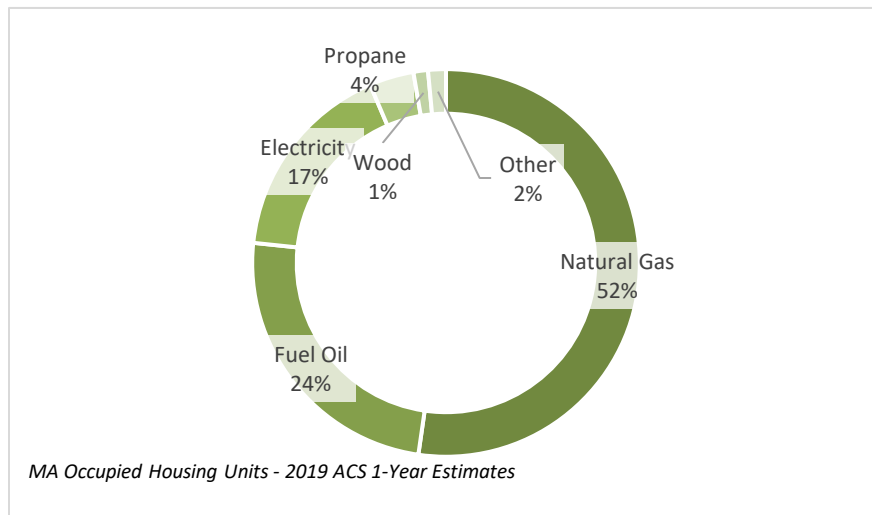


Figure 2-9: Historical Trends for Primary Heating Fuel in Occupied Residential Units

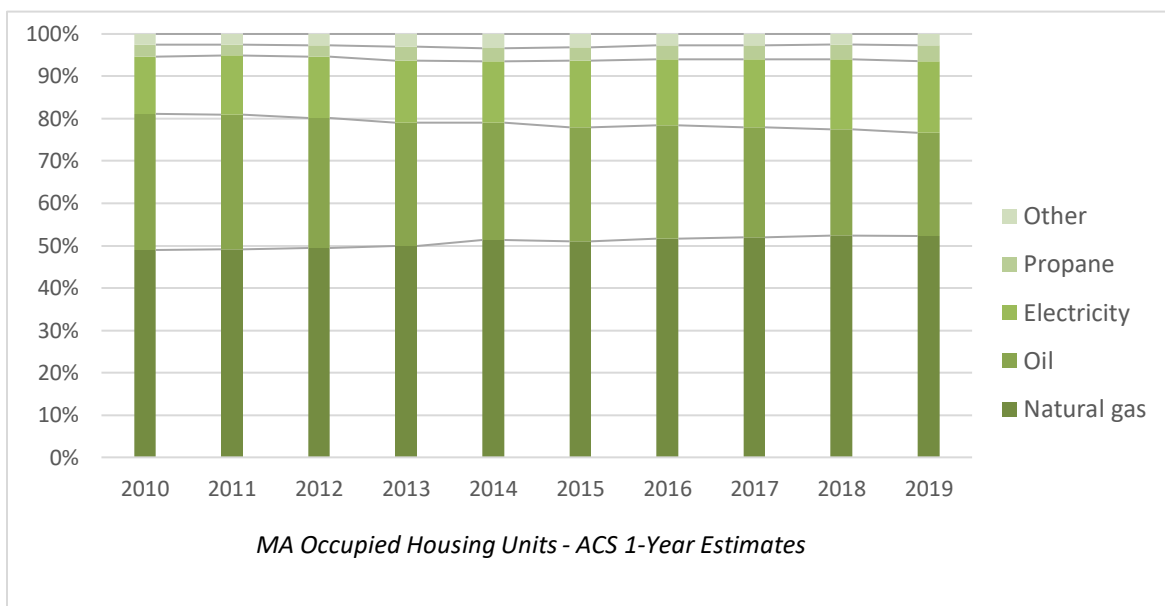
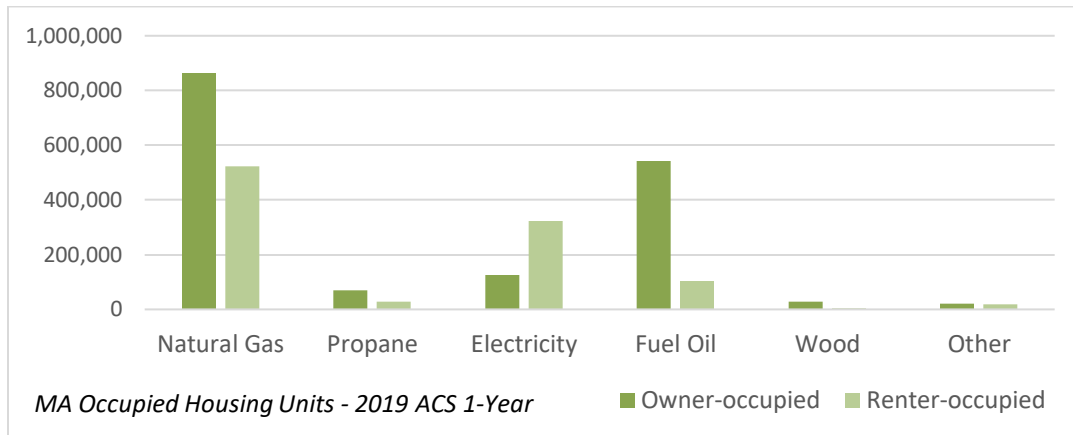
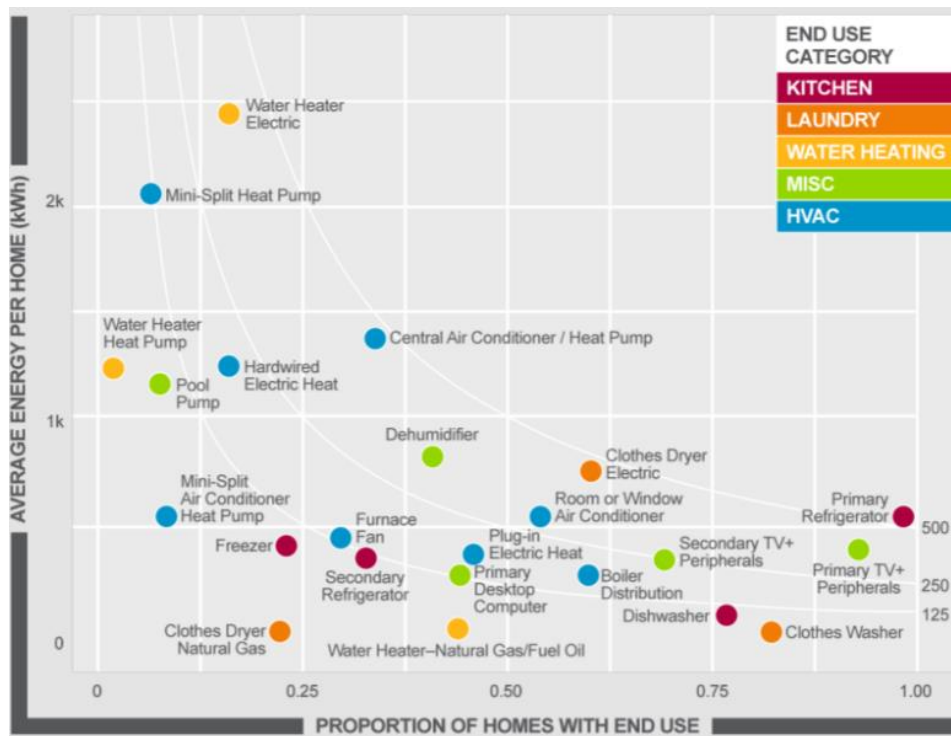


Figure 2-10: Primary Heating Fuel (Own vs. Rent)



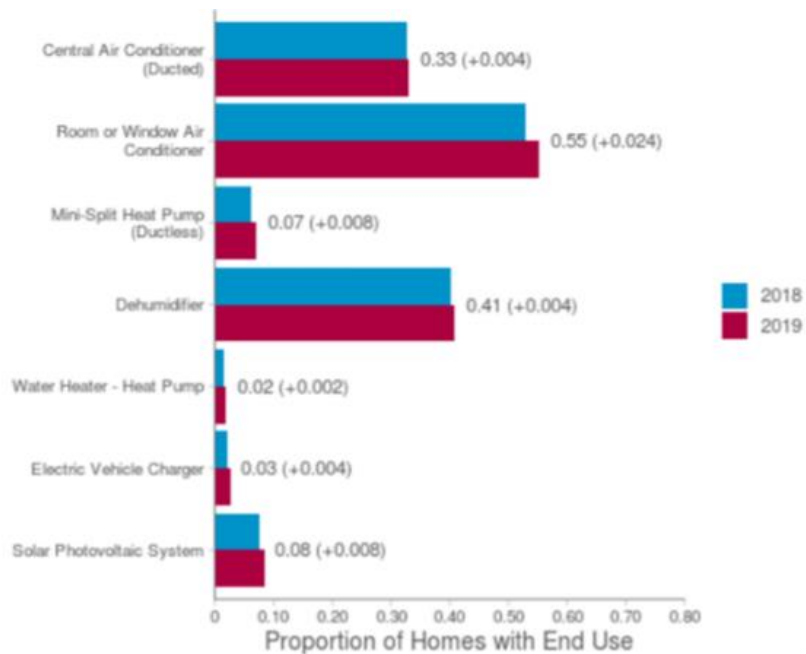
The appliances that use the most electricity, on average, in customers' homes are refrigerators, air conditioners, electric clothes dryers, and electric water heaters. The figure below demonstrates that some appliances, such as refrigerators, consume less electricity than end uses such as air conditioners on an individual basis; however, because refrigerators are present in almost every home, they consume more electricity when looking at statewide data. Still, less common high-usage appliances, such as pool pumps and electric water heaters, are excellent targets for energy efficiency.

Figure 2-11: Electric End-Use Consumption and Saturation (2020 MA Residential Baseline Study)



The prevalence of various end uses is also changing over time. The figure below shows changes in the saturation of a number of end uses. For example, just between 2018 and 2019, the share of homes with room or window air conditioners increased from approximately 53 percent to 55 percent. This is in line with a longer-term trend of increasing saturations of air conditioning, including central air conditioning, which is present in approximately 34 percent of homes. This trend represents a challenge in terms of managing residential electricity consumption, but it does provide an opportunity for the PAs to encourage all new HVAC equipment to be as efficient as possible.

Figure 2-12: Changes in Saturation of End Uses (2020 MA Residential Baseline Study)



Source: Guidehouse analysis

Customers also continue to add more internet-connected devices to their homes, with the most common devices being smart speakers, cameras, thermostats, televisions, outlets, and lights. Though becoming increasingly prevalent, smart thermostats were actually present in only 20 percent of Massachusetts homes. At the same time, 42 percent of homes still report having at least one manual thermostat. More details on end use consumption and the PAs' customer base can be found in the Residential Baseline and Profile studies, respectively.³⁵

³⁵ Residential Baseline and Profile studies, as well as other valuable evaluations can be accessed at: <https://ma-eeac.org/studies/>.

2.5.2 CUSTOMER HIGHLIGHTS

Aside from the buildings they live in, the characteristics of customers themselves influences how the PAs think about designing and implementing programs that reach a diverse set of customers. One key attribute is the preferred language of customers. Approximately 75 percent of Massachusetts households only speak English at home. The figure below illustrates the following most common languages, as well as what percent of respondents would describe themselves as speaking English “very well.” The languages listed in this figure, in addition to English, represent 94 percent of Massachusetts households.

Figure 2-13: Languages Spoken at Home in MA Households and Level of English Proficiency

Language Spoken at Home	Population	% of MA Population	% Speak English "Very Well"
Spanish	632,230	9.7%	59.8%
Portuguese	206,232	3.2%	56.1%
Chinese(incl.Mandarin,Cantonese)	148,270	2.3%	51.4%
Haitian	89,731	1.4%	64.6%
French(incl.Cajun)	49,442	0.8%	82.6%
Vietnamese	41,986	0.6%	48.3%
Russian	37,092	0.6%	60.8%
Arabic	33,369	0.5%	76.7%

All MA - 2019 ACS 1-Year Estimates

Household income is another key characteristic in informing the delivery of the PAs’ offerings, as it affects their eligibility for certain incentives and their ability to shoulder the costs of energy efficiency upgrades. In general, the PAs focus on household income as a percent of the state median income, which takes household size into account. Because this does not perfectly overlap with how US census data is collected, this can make estimating customer income challenging. One useful source of data is the *2018 Moderate Income Market Characterization* study. This evaluation focused on customers living in homes with 1-4 units, so while it may not be perfectly representative, the study still provides useful information. The study found that approximately 27 percent of households in these buildings are at or below 60 percent of state median income, making them eligible for income-eligible programs, with an additional 16 percent greater than 60 percent and equal to or less than 80 percent, which the PAs consider moderate income. The study also found that while home ownership rates are lower at lower income levels, most income-eligible and moderate-income customers in 1-4 unit buildings do own their own homes.

Figure 2-14: Household Income as % of State Median Income for Households Living in 1-4 Unit Buildings

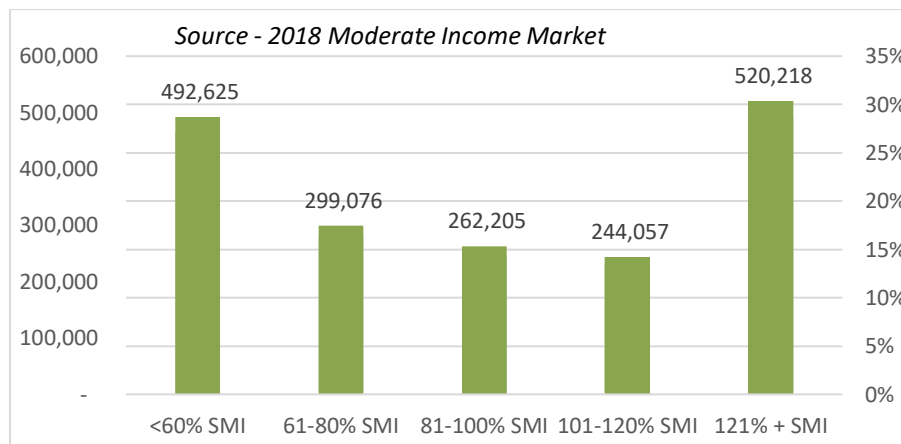
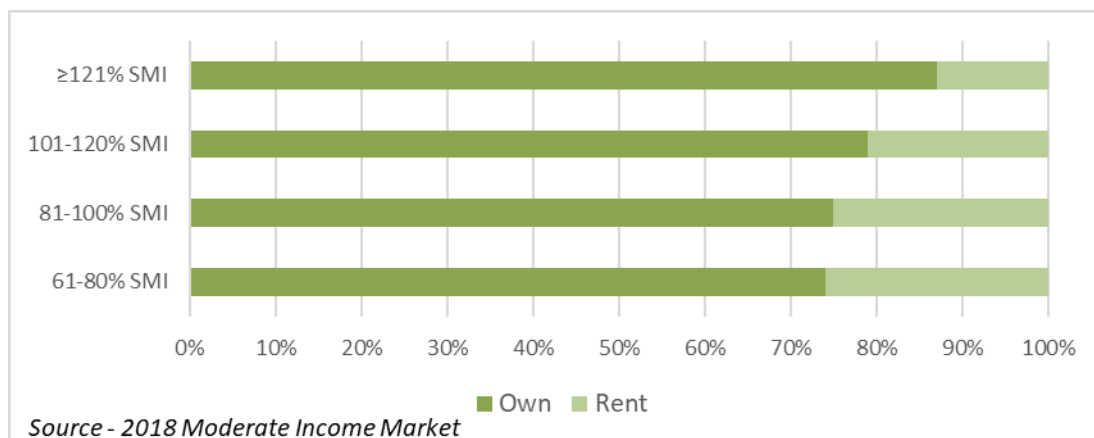


Figure 2-15: Own vs. Rent by Household Income for Those Living in 1-4 Unit Buildings



Additional valuable information on residents in Massachusetts is available from the US Census Bureau, the *Moderate-Income Market Characterization Study*, the *Customer Profile Study*, the *Non-participant Market Characterization & Barriers Study*, and the *Residential Non-participant Customer Profile Study*.³⁶

2.5.3 ENERGY EFFICIENCY POTENTIAL

The PAs have each undertaken potential studies to assess the remaining cost effective energy efficiency potential in their service territories as directed by the Department (see Appendix C for the PAs' potential studies). The potential studies for the 2022-2024 term indicate that the type of measure that historically has made up the bulk of the Residential and Income Eligible Sectors' electric savings—lighting—will have virtually no potential in 2024 and beyond due to the transformation of the residential lighting market. This transformation is due in part to the efforts of the PAs over the past decade and represents substantial energy and cost savings for customers. Now, the PAs must pursue opportunities for growth in electric savings in other measure types, particularly HVAC and building envelope measures. Residential delivered fuel savings and natural gas savings have the potential to grow in the next term, primarily due to building envelope and HVAC measures in the single-family, market-rate segment.

2.6 RESIDENTIAL SECTOR OVERVIEW

For the Residential Sector, the PAs offer a comprehensive set of programs, initiatives, and offerings designed to pursue the market opportunities described above. Below is a brief description of some of the key Residential Sector offerings. Additional program details are provided in Section 2.10.

³⁶ These studies, with the exception of the US Census data, are available online at: <https://ma-eeac.org/studies/>.

2.6.1 RESIDENTIAL NEW BUILDINGS PROGRAM

RESIDENTIAL NEW HOMES & RENOVATIONS INITIATIVE

The primary objective of the Residential New Homes & Renovations Initiative is to reduce energy use and demand (kW) in the construction of new homes and existing homes undergoing renovation. The Initiative's secondary objective is to support the transition of the residential new construction market toward the highest efficiency building standards and equipment installations.

2.6.2 RESIDENTIAL EXISTING BUILDINGS PROGRAM

RESIDENTIAL COORDINATED DELIVERY INITIATIVE

The Residential Coordinated Delivery (RCD) Initiative is designed to promote and facilitate the implementation of energy efficiency upgrades in existing homes to help customers reduce their overall whole-home energy usage, with a particular focus on improvements to the building envelope. RCD provides customers with information and technical assistance to help them understand their specific energy efficiency opportunities, paired with aggressive incentives. The Initiative strives to provide flexibility in delivery of services to best match each customer's unique needs and preferences and align with the technical opportunities for the home and the customer's authority to implement recommended improvements.

RESIDENTIAL RETAIL INITIATIVE

The Residential Retail Initiative provides a broader integrated marketplace where energy-efficient products and equipment are positioned as attractive, primary choices for customers making purchasing decisions, whether online, in-store, or through independent contractors and distributors. The Initiative offers education to help customers make informed decisions, incentives to make efficient choices more financially attractive, and training and support for the market actors, to help shift contractors toward more efficient, correctly installed equipment.

RESIDENTIAL BEHAVIOR INITIATIVE

The Residential Behavior offering includes behavioral-based interventions that are designed to motivate and help customers to reduce energy consumption through changes in behavior (e.g., using fans to reduce cooling needs) and ADR offerings, which help reduce customer demand during system peaks. The figure below provides a comparison of some of the key offerings that are focused on efficiency improvements in existing buildings.

Figure 2-16: 2022-2024 Market Rate Residential Initiatives

Initiative/ Offering	Renovations and Additions	RCD	Retail – Upstream and Midstream	Retail - Downstream
Customer interface	HERS auditor	Energy specialist	Contractor or retailer	Online marketplace, retailer, contractor, or rebate processor
Approach	Project based: technical assistance and incentives	Project based: technical assistance and incentives	Point-of-sale	Equipment based
Project types	Additions or renovations that trigger code	Pure energy retrofit (does not trigger code)	Replacement on failure and early replacement	Replacement on failure and early replacement
Scalability	Low: triggering code limits opportunity	Medium: closed market addresses many concerns but limits scalability	High	Medium
Transaction costs	High	High	Low	Medium: depending on type of transaction
End uses available	Almost all	Benefits are primarily from envelope improvements	Some DHW, pool pumps, boiler reset controls, and related	Almost all, except envelope
Customer types	Primarily customers who have already decided on renovation or addition, increases efficiency of their project	Generally, customers exploring energy efficiency specifically. Focused on envelope or seeking general energy feedback	Focus is often on the contractor, promoting them to sell equipment to customers who may have not have actively sought efficient equipment themselves	Wide variety, but often focused on a single transaction (e.g., new dehumidifier). Some are also leveraging these incentives for larger projects (e.g., part of RCD)
Process mechanics	HERS Rater influences owner, architect, or contractor to increase the project's efficiency. HERS Rater models consumption of project relative to a baseline	Energy specialist conducts HEA, creating weatherization scope and recommendations for other opportunities If customer signs weatherization contract, work is completed by program contractor and incentive is netted against project cost	Incentive paid directly to distributor and "embedded" as discount in retail price at point of sale. No paperwork required of customer	Various: Downstream, instant incentives, and online marketplace allow customer to purchase product net of incentive. Rebates: customer fills out application, provides any required documents, and receive rebate after review
Incentive strategy	Incentive designed to make it easier for homeowners to roll slightly higher cost for efficiency into their larger renovation or addition project	Incentive designed to be attractive enough to inspire customers to pursue elective, fairly-involved work (e.g., insulating attic)	Incentive designed to motivate distributors and contractors to stock, promote, and sell energy-efficient products	Incentive calibrated to mitigate some or most of the incremental cost energy-efficient equipment relative to standard efficiency alternatives
Incentive structure	Incentive for HERS Rater complaint projects and to customer based on delta between modeled consumption and baseline	Primarily set as a % of total job cost. Most job costs are set for customers, as they have been negotiated between the PAs and participating contractors	\$ per widget/unit	\$ per widget/unit
Savings methodology	Modeled savings	Modeled savings	Deemed savings	Deemed savings

2.7 INCOME ELIGIBLE SECTOR OVERVIEW

2.7.1 INCOME ELIGIBLE EXISTING BUILDINGS PROGRAM

INCOME ELIGIBLE COORDINATED DELIVERY INITIATIVE

The Income Eligible Coordinated Delivery Initiative provides cost-effective, energy efficiency products and services in a fuel-blind approach to income-eligible, residential customers. “Income eligible” is defined as at or below 60 percent of the state median income level for 1–4-unit buildings and at or below 60 percent of the area median income level for 5+ unit buildings.

2.8 CHALLENGES

Successfully designing and implementing a set of offerings requires understanding obstacles that may hinder progress toward set goals. To that end, the PAs have identified some of the key challenges they expect to face during the 2022–2024 term as they pursue benefits goals, the three-year plan priorities, and other objectives. Some are standing challenges (and thus were mentioned as key learnings from the 2019–2021 term), while others are new.

- **Trust gap.** While most customers do trust the PAs for information related to energy efficiency, as noted above, the *Nonparticipant Market Barriers Study* highlighted the importance of establishing trust in order to serve segments that have historically participated at lower levels. The PAs’ offerings are often conflated with government programs, which is a problem for customers who do not trust governmental entities. Unfortunately, there is no simple solution for bridging this trust gap, as each customer trusts different entities and may have varied reasons for their lack of trust.
- **Perceived relevance.** Some customers either do not intuitively grasp how energy efficiency might benefit them or do not think that services offered by the PAs are applicable to them. It is worth noting that relevance is a spectrum – a customer may understand that they could participate in the program but perceive (accurately or not) that the benefits that would accrue to them may be limited. Further, different customers will attribute different value to the same set of benefits (e.g., some may be motivated by financial savings, others sustainability, and others comfort).
- **Customer bandwidth and priorities.** Of course, whether a customer is likely to participate will be driven by how relevant and beneficial they perceive the offering to be, as well as their bandwidth, tied primarily to their available time and how they prioritize energy efficiency relative to other tasks. Even for less affluent customers, time often outranks finances as a barrier to participation.
- **Program complexity.** Providing a comprehensive set of services to customers is a key component of the PAs’ vision, but it also can create a barrier. The many ways that customers can engage in energy efficiency offerings can lead to confusion, which, in turn, can lead a customer to not participate. Further, the complexity of individual participation pathways (e.g., complicated eligibility criteria or excessive number of steps) can deter customers from engaging or lead them to drop out before completing their energy efficiency action. In some instances, even if participation is in fact fairly seamless, customer perception of complexity can be a barrier. As the PAs offer increasingly targeted initiatives, it will be challenging to avoid increasing complexity.

- **Sequencing energy efficiency improvements.** In retrofitting a home for energy efficiency, certain actions are best taken in a specific sequence. Most importantly, envelope measures should, whenever possible, precede HVAC upgrades in order to ensure proper design and sizing, which in turn drive comfort and efficiency. Certain circumstances, like a desire to add cooling or the need to replace a broken system, however, often lead customers to address their HVAC system before their envelope. This creates challenges for the PAs who want to promote ideal sequencing, but who also would like to push customers toward the most efficient equipment possible.
- **Customer finances.** While many energy efficiency actions are inexpensive or free, many others involve substantial capital investment. During the 2022-2024 term, the Residential Sector portfolio will be more heavily weighted toward expensive measures, like heat pumps. The tools that the PAs offer to try to overcome financial barriers, namely incentives and financing, are themselves expensive. Further, the PAs are committed during this term to further improving participation by moderate-income customers, many of whom will have a higher energy burden and competing financial priorities. The dynamics of trying to increase participation among customers who may require higher incentives for an increasingly expensive set of measures results in substantial challenges in creating budgets.
- **Language support.** Key elements of the PAs' initiatives are already being translated into the most common non-English languages. During the 2019-2021 term, the PAs introduced in-language marketing, creating campaigns that were not only created in another language, but drafted in scratch with the intent of resonating with customers who speak that language. Still, there are challenges associated with maintaining in-language services across all offerings. The sheer number of offerings, pieces of collateral, partnering contractors and vendors, and the frequency with which they change will force the PAs to be dedicated and adaptable in serving English-isolated families.
- **Renter participation options.** Renters have always been fundamentally constrained in how they can pursue energy efficiency because they lack the authority to make most capital improvements. With the reduction of claimable lighting savings, a key means to deliver benefits to this customer group is now lost. The remaining measures that may be within a renter's control (e.g., portable appliances and behavior changes) all have modest impacts on bills. Unfortunately, this may justifiably reinforce the feeling among some renters that energy efficiency is not relevant for them without their landlord's involvement. In theory, using renters as a means to engage with their landlords could be worth pursuing, but the *Nonparticipant Market Barriers Study* established that many renters do not trust their landlords or do not believe their landlord would do anything beyond making required repairs.
- **Recruiting landlords.** The PAs work hard to promote the value of their programs to landlords (e.g., reduced consumption on common meters, more satisfied tenants with less turnover, fewer complaints and emergency calls from tenants, etc.). Still, the split incentive, namely that the benefits from efficiency investments behind tenant-specific meters accrue to the tenants is a fundamental challenge.

The PAs have experience with other critical landlord barriers to participation, including coordinating access to units with minimal tenant disruption, preference for equipment they know how to service themselves, and potential code and safety concerns. As with other customers, landlords may simply use their limited time and financial resources to pursue other priorities, like granite countertops. COVID-19 has introduced new issues for landlords, like reduced rent collection and eviction moratoria. Getting landlords, especially those for whom property management is not their full-time job, to prioritize energy efficiency in the face of these barriers will continue to be a vexing challenge for the PAs.

- **Workforce availability and diversity.** As discussed throughout this Plan, access to a sufficient, qualified, and diverse workforce is a challenge for many of the partners that help deliver the PAs' programs. Any other plans for increased and improved service to the PAs' customers is contingent upon a skilled and representative workforce.
- **Loss of claimable lighting.** With a few exceptions (lighting for income-eligible customers and some fixtures), the PAs will no longer offer residential lighting incentives in the 2022-2024 term. While these changes highlight the success of transforming the lighting market, it has substantial impacts on the initiatives offered. First, lighting was an abundant source of very cost-effective savings, for which there is no comparable substitute. Second, lighting did serve as one marketing hook for HEAs, though the PAs have reduced their emphasis on lighting over time. Though the PAs have been planning for these changes for years, the impact is still notable.
- **Cost-effectiveness challenges.** Increasing baselines and falling commodity prices are challenging the cost effectiveness of some measures, initiatives, and programs. This may force the PAs to no longer support measures that customers and the market have become accustomed to seeing incentives for in previous terms. Managing this transition in a way that does not alienate customers or contractors is critical.
- **Lower commodity prices.** In addition to their impact on cost effectiveness, falling commodity prices affect customer economics for investing in energy efficiency. As an example, high oil prices have been a driver of increased weatherization interest in the past while lower energy prices tend to reduce customer interest in energy efficiency across the board.
- **More challenging weatherization opportunities.** For over a decade at this point, the PAs have been implementing aggressive weatherization programs. While opportunity remains, it becomes increasingly challenging to reach and serve the customers and homes not already addressed. This is because those customers most inclined to pursue weatherization have already participated and, to a lesser extent, homes with the fewest barriers have already been served. This means that recruitment and services of the remaining customers and markets will be more challenging, and likely, expensive.

2.9 STRATEGIC INTERVENTION DESCRIPTIONS

Building on the above-referenced goals, trends, and key learnings in the Residential and Income Eligible Sectors, the PAs will focus many of their new efforts and strategic interventions on six key categories. While the interventions and tactics outlined below are not inclusive of all the new activities planned for the 2022-2024 term, the PAs believe that they are the most important undertakings necessary to achieve the vision and priorities discussed throughout this Plan document. Please note that several tactics may also show up more than once, because they are designed to help overcome more than one type of barrier.

2.9.1 STRATEGIC INTERVENTION: INCREASING EQUITABLE SERVICE

The PAs are committed to pursuing the more equitable distribution of their programs' benefits to all customers, making equity one of the key strategic priorities of the 2022-2024 Plan. In the context of energy efficiency, PAs define equity as the process of establishing more equal access to and participation in energy efficiency programs, particularly among those groups who have historically participated at lower rates, including renters/landlords, moderate-income

customers, and English-isolated families. The PAs are working to increase participation among these groups by researching and deploying the most effective strategies to engage these customers.

During the next three years, the PAs will use equity as a lens through which they will view all initiatives, ensuring they are considering and addressing how initiative design translates into the distribution of benefits to customers. The PAs will collaborate with industry and community leaders to reach more moderate-income customers, renters, English-isolated families, and small businesses, recognizing that these groups often overlap. The PAs will continue to serve customers through a place-based approach by working with CBOs and municipalities as partners to offer a tailored engagement experience for residents and small business owners.

As described in Section 1.1.2, both financial and non-financial barriers to participation are critical challenges for moderate-income customers. To help address financial barriers, the PAs will continue to offer a 100 percent incentive for insulation for moderate-income customers and will extend a 100 percent incentive for insulation for rental units with residential heating accounts. In addition, for moderate-income customers, the PAs will introduce new incentives for addressing pre-weatherization barriers and will offer higher incentives for heating systems (initially amounting to approximately 70 percent of the average installed cost of natural gas and propane systems and 80 percent of heat pumps). Customers taking advantage of these incentives will be encouraged to consider using the HEAT Loan to finance their remaining out-of-pocket expenses. In order to ensure as many customers as possible have access to responsible credit, many PAs have partnered with the Capital Good Fund, which specializes in providing financing to customers with less than perfect credit. The PAs will closely monitor the impact of these new incentives and make adjustments as needed. In 2024, the PAs are planning to spend more than \$60 million on weatherization and heating system incentives for income-qualified moderate-income customers, with a total of \$115 million over the term. Importantly, these figures are just for enhanced weatherization and heating system incentives and do not include other incentive and non-incentive spending benefitting moderate-income families.

In addition to these enhanced incentives, the PAs will promote all available incentives to moderate-income customers, including those for appliances. The PAs will continue to host appliance turn-in events in Environmental Justice communities, including increased promotion and emphasis on these communities, as another means to serve these customers and generate awareness of enhanced incentives.

The PAs will partner with contractors, CBOs, and workforce development organizations to coordinate statewide workforce development goals and expand residential education efforts to include a workforce development component. As leaders in the energy industry, the PAs will strive to set supplier diversity goals across the energy efficiency initiatives and increase the participation of certified MBEs, WBEs, LGBTQI+, VBEs, and Small Business Enterprises (collectively referred to as Diverse Business Enterprises) in the PAs' programs, recognizing that a more representative workforce is key to them serving customers equitably. As the PAs continue to prioritize serving customers, they recognize that they are more than a convener of energy services and play a vital role in helping communities thrive.

Figure 2-17: Strategic Interventions for Residential and Income Eligible Sectors (Equity – Moderate-Income Customers)

EQUITY: MODERATE INCOME

Goals

- Increase the number of moderate-income customers participating in energy efficiency programs.
- Introduce new incentives that make energy efficiency upgrades more affordable for moderate-income customers.
- Create greater ease of access to weatherization and HVAC incentives for moderate-income customers.
- Streamline the verification process to income qualify for enhanced incentives.

Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-Term
• Customer awareness of services and incentives	Continue to offer 100% weatherization incentive for moderate-income customers, and make adjustments as necessary	RCD	S
• Customer understanding of priority and relevance	Offer new enhanced incentive on HVAC equipment for moderate-income customers and in conjunction provide information about the HEAT Loan to cover the balance. Each PA may target geographic areas for the enhanced incentive	Retail	S
• Customer lack of time to participate in a HEA	Streamline the moderate-income verification process, offering verification options that minimize customer effort, based on which verification options are applicable to the customer	RCD	S
• Lack of disposable income limits customer ability to install measures	Bundle weatherization and HVAC by requiring installation of recommended weatherization measures as a prerequisite to receiving the enhanced HVAC incentive	RCD, Retail	S
• Lack of disposable income limits customer ability to address pre-weatherization barriers	Market the enhanced weatherization and HVAC offers together to customers and ensure that Home Performance and Independent Installation Contractors are trained to promote them to all customers	RCD	S
	Engage in proactive outreach to moderate-income customers who have already completed weatherization and may benefit from a new HVAC system	Retail	S
	Market the enhanced incentive together with a virtual HEA option with flexible evening and weekend hours to complete to minimize customer time needed to participate in energy efficiency while maximizing comfort and savings	RCD	S
	Cover the cost of major barriers to weatherization for moderate-income customers, including: <ul style="list-style-type: none"> • Cost for electrician to check for live or inactive knob and tube wiring • Incentive toward knob and tube replacement • Incentive toward flooring removal and platform buildup • Incentive toward vermiculite remediation 	RCD	S

Figure 2-18: Strategic Interventions for Residential and Income Eligible Sectors (Equity – Rental Properties)

EQUITY: RENTAL PROPERTIES

Goals

- Increase the number of rental properties that are served by Residential and Income Eligible Sector programs.
- Create greater ease of access to Residential and Income Eligible Sector programs for owners of rental properties.

Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> • Split incentive whereby the landlord is the decisionmaker and the tenant pays the utility bills affects customer interest and engagement 	Make 100% weatherization incentive for individually-metered rental units permanent	RCD	S
	Updated approach for 3–4-unit homes where only one unit is income eligible (Mixed-Income Protocol) to both streamline delivery of services by both RCD contractors and CAP agencies	RCD, Income Eligible	S
	Continue to leverage online assessments and virtual HEAs for renters, while continuing to try to reach the landlord to serve the whole building	RCD	S
<ul style="list-style-type: none"> • Lack of customer awareness of services and incentives, especially landlords of smaller (5-25 unit) buildings 	Continue to provide renters with no cost high-efficiency lighting in addition to other instant savings products delivered via the Online Store	RCD, Retail	S
	Use of data and alignment with Municipal & Community Partnership Strategy for targeted outreach to owners of 5–25-unit buildings in municipalities with an above-average density of rental units	RCD, Income Eligible	S
<ul style="list-style-type: none"> • Customer lack of time to participate in an HEA 	Provide owners of rental properties and customers who are renters information about income-based HVAC and pre-weatherization barrier incentives, in addition to the 100% weatherization incentive	RCD, Retail	S
<ul style="list-style-type: none"> • Landlord concern for code violations limiting unnecessary access to the property 	<ul style="list-style-type: none"> • Explore a targeted marketing approach through the use of visual aids to better inform and connect renters and landlords to energy efficiency offerings, • Foster opportunities with external stakeholders to deepen understanding of varying incentive models to increase renters' and landlords' program participation rates 	RCD	S, M, L
<ul style="list-style-type: none"> • Lack of priority for property owner 	<ul style="list-style-type: none"> • Work with local industry partners who service and engage landlords to market energy efficiency programs 		

Figure 2-19: Strategic Interventions for Residential and Income Eligible Sectors (Equity – Customer Language Access)

EQUITY: CUSTOMER LANGUAGE ACCESS

Goals

- Increase the number of customers who participate in Residential and Income Eligible Sector programs in their language of choice for the most commonly spoken languages in MA after English, including Spanish and Portuguese.
- Create greater ease of access to Residential and Income Eligible Sector programs for customers who primarily speak a language other than English.
- Connect energy specialists and contractors who speak another language with customers in that language when possible.

Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> • Lack of customer awareness of services and incentives 	Develop a Language Access plan that spells out how to provide services to individuals who are non-English speaking or have English-isolated families. This plan will include: Language Access Policy directives, implementation plan, and procedures to address language access across the customer journey. In order to address any existing gaps, the plan will be implemented in conjunction with a map of the customer journey	RCD, Income Eligible	M
<ul style="list-style-type: none"> • Lack of customer awareness of programs generates mistrust in programs 	Administer a community-based social marketing strategy that is place-based and data-driven to address community-level behavior and reduce program participation barriers by addressing behavior challenges and beliefs by enhancing motivation through social influences	Statewide Marketing, RCD	M
<ul style="list-style-type: none"> • Customers may be discouraged from completing installation of measures because of steps in the customer journey that are not in their primary language 	Through the Municipal & Community Partnership Strategy, partner with CBOs whose constituents primarily speak the three most commonly spoken languages in MA after English (Spanish, Portuguese, Mandarin) to co-create culturally appropriate and in-language marketing materials and additional delivery channels for customers, as well as increase trust in energy efficiency programs	RCD, Income Eligible	M
	Ensure that new centralized LEAN call center and single-family website are available in the same languages as Mass Save website and Mass Save hotline	Income Eligible	M

2.9.2 STRATEGIC INTERVENTION: MUNICIPAL & COMMUNITY PARTNERSHIP STRATEGY

A cornerstone of the PAs' efforts to increase equity and program participation of HTR customers over the next three years will be to strengthen and expand on partnerships with municipalities and CBOs, including educational institutions to address customer participation barriers together and achieve shared goals. The PAs will continue to build on the 2019-2021 term's Municipal & Community Partnership Strategy and include a focus on Environmental Justice communities. This focus will include improvements to expand the involvement of CBOs, increase the flexibility of design to encourage innovative proposals, and align goals, data, and outcomes shared between the PAs and their partners. The ultimate goal of these efforts is to increase participation among HTR customer segments, especially renters and owners of rental properties, moderate-income customers, English-isolated families, and small businesses.

Figure 2-20: Strategic Intervention for Residential and Income Eligible Sectors
(Municipal & Community Partnership Strategy)

MUNICIPAL & COMMUNITY PARTNERSHIP STRATEGY

Goals

- Increase participation in energy efficiency programs in geographic areas shown to have the lowest program participation rates and among customers that are HTR, including owners of rental properties and their tenants, moderate-income customers, English-isolated families, and small businesses.
- Increase customers' trust in energy efficiency programs and greater understanding of program benefits.

Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> • Lack of customer awareness of services and incentives • Lack of customer awareness of programs generates lack of trust in programs • Customers' need to prioritize basic necessities; perception that energy efficiency is not a priority • Customers may be discouraged from completing installation of measures because of steps in the customer journey that are not in their primary language 	<p>PAs will enter into partnerships with municipalities, community-based non-profit organizations, and/or other CBOs working at the local, regional, or state level, or combinations therein. Partnerships will:</p> <ul style="list-style-type: none"> • Require goals to increase participation among renters/landlords, English-isolated families, moderate-income customers, small businesses, or a combination of some of these customer segments • Give priority to geographic areas with high levels of non-participation in PAs' programs, high energy burdens, and multiple Environmental Justice community indicators as designated by the Commonwealth • Allow flexibility in proposed initiative structure and approach for the partnering entities, provided that they agree to participation goals, data collection, and shared evaluation mechanisms • Allow for one-, two-, or three-year partnership contracts • Negotiate sufficient compensation and technical assistance from PAs for the partnering entities to accomplish their goals 	RCD, HVAC, Small Business Turnkey, Income Eligible	M

Other strategies to increase program awareness and participation through strengthened collaboration with CBOs and municipalities is highlighted in the Residential and C&I Equity Strategic Interventions. CBOs will be integral partners in the PAs' Workforce Development Strategy, particularly the Clean Energy Pathways internship, to ensure that PAs are recruiting new talent to the energy efficiency workforce from communities and populations that are currently underrepresented in the workforce, especially people of color, women, and first-generation young people. PAs will also coordinate with immigrant and first generation-serving CBOs with cultural and linguistic fluency in the most commonly spoken languages in the state besides English in order to improve the customer journey for English-isolated families.

2.9.3 STRATEGIC INTERVENTION: WORKFORCE DEVELOPMENT

Another key component of the PAs' efforts to increase equity and program participation of HTR customers over the next three years will be to implement a statewide strategic workforce development plan. To help reach more customers and achieve increasing energy savings targets, the PAs want to ensure that their investments in workforce development are both growing and diversifying the workforce supporting energy efficiency programs. A strategy to reach these goals will also involve addressing the major barriers outlined in the PAs' *2020 Workforce Development Needs Assessment* which found that most contractors struggle to find qualified talent in key jobs, many potential candidates are unaware of the career opportunities in energy efficiency, and that in many cases the energy efficiency workforce does not fully reflect the diversity of the Massachusetts communities it serves. In all of these efforts, the PAs will collaborate closely with MassCEC to ensure that the collective workforce development efforts of the PAs and MassCEC are well aligned.

The PAs' statewide strategy is focused on four key areas:

- **Train diverse candidates**, particularly young adults, people with fluency in multiple languages, people of color and women, and candidates based in communities with historically low participation. The PAs will:
 - Recruit and train diverse new entrants to enter the trade ally network and participate in PA programs.
 - Continue to build the Clean Energy Pathways internship to connect young adults (including a focus on Environmental Justice communities) with internships with contractors in high-growth job areas.
 - Plan to increase coordination with public vocational technical high schools, including offering career discovery programming.
- **Engage stakeholders for bigger wins** such as CBOs, including educational institutions, that specialize in workforce development. The PAs will:
 - Engage with workforce development, education, and industry stakeholders to ensure program effectiveness toward meeting the PAs' goals of diversifying, expanding, and upskilling the energy efficiency workforce.
- **Retain diverse entrants** through mentorship and support for both entrants and their employers.

The PAs plan to provide a mentorship component for participants in Clean Energy Pathways, as well as diversity, equity, and inclusion training for participants and employers.
- **Grow and upskill small contractors and new entrants**, including growing the pool of contractors working on programs and including more certified MBEs, WBEs, VBEs, and Small Business Enterprises (collectively referred to as Diverse Business Enterprises (DBEs)) working on the PAs' programs. The PAs will:
 - Plan to establish a contractor network and facilitate upskilling within that network through virtual resources and strategically subsidized/sponsored training.
 - Explore putting processes in place through contracting that encourage vendors to hire and subcontract with diverse talent.

For all four aspects of this strategy, the PAs will set targets, measure progress, and evaluate success.

Figure 2-21: Strategic Intervention for Residential and Income Eligible Sectors (Workforce Development – Train New and Diverse Candidates)

WORKFORCE DEVELOPMENT: TRAIN NEW AND DIVERSE CANDIDATES			
Goals <ul style="list-style-type: none"> Grow the total size and diversity of the workforce supporting the PAs’ Residential and Income Eligible programs, so that the energy efficiency workforce more closely reflects the customers in communities served by the PAs’ programs. Improve the ability of contracted and subcontracted vendors to identify qualified talent to support the achievement of the PAs’ program goals. Increase language capacity of contracted and subcontracted vendors to meet customer demand. 			
Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> Young people especially, and potential entrants in general, lack awareness of job opportunities and career growth potential in energy efficiency Contractors and CAP agencies report challenges recruiting qualified entry-level talent to meet increasing demand of the PAs’ programs “Traditional” recruitment strategies, such as word of mouth and standard employment websites are not leading diverse applicants to apply There is no formal, centralized link to connect entities with job seekers, such as CBOs and vocational technical schools, with energy efficiency employers 	<p>Clean Energy Pathway (CEP) internship for entry level HVAC and weatherization professionals, building operators, and weatherization crew chiefs, with the goal of training 120 individuals over three years. Career tracks may be added or shifted to accommodate the changing market and needs of PA programs. The CEP internship involves:</p> <ul style="list-style-type: none"> Developing relationships with trusted CBOs in key geographies where PAs see both low participation in residential programs and including a focus on Environmental Justice communities. CBOs, which could include K-12 and post-secondary educational institutions and 501(c)(3) non-profits, will facilitate recruitment of candidates Targeting participants as young adults ages 18-25 who are fluent in at least one language other than English or who identify as people of color and/or women Involving contracted vendors for internship placement and job opportunities Providing participating individuals and contracted vendors with training on diversity, equity, and inclusion to support retention and upskilling, Mentorship for CEP participants with experienced energy efficiency professionals Provide an hourly wage for participants during their training and internship, and a subsidy for initial post-internship period 	RCD, Income Eligible, Retail (HVAC)	L
	Coordinate with LEAN to establish an annual training and recruitment plan with CAP agencies for new energy specialists, heating, and weatherization staff, as well as upskilling plans for existing CAP energy services staff, such as training on heat pump technologies	Income Eligible	M
	PAs will seek to integrate K-12 educational programming with workforce development through engagement with vocational technical high schools so that more high school students are aware of and have pathways to pursue careers in energy efficiency. Programming could include energy efficiency career days and courses spread out over part of the academic year	Residential Education	L

Figure 2-22: Strategic Intervention for Residential and Income Eligible Sectors (Workforce Development – Increase Number of Workers)

Workforce Development: Increase Number of Workers

Goals

- Increase the number of entry-level energy efficiency workers who are still working in an energy efficiency role after three years.
- Clarify pathways to career advancement for entry and mid-level energy efficiency professionals.

Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> • Existing contractors and potential contractors are not always aware of trainings subsidized by PAs • Lack of centralized source for training and workforce information limits knowledge about career advancement opportunities in the PAs' programs • In-person trainings and certifications for contractors limit geographic diversity of participants • Lack of readily available information about how to become a high-performance, low-rise builder and how to maximize involvement with New Construction program 	<p>Explore a contractor network platform on MassSave.com and facilitate upskilling within that network through virtual resources and virtual training offers. This platform could include:</p> <ul style="list-style-type: none"> • A calendar of training opportunities supported by the PAs for new entrants and for upskilling existing staff • Information for contractors interested in being involved directly with PAs' programs that are not currently involved, • Links to virtual trainings • Information about how to certify as a DBE • Information about energy efficiency career pathways for vendors and other workforce development partners to share with staff and prospective employees 	All Residential Sector Programs	M
	Upskill 90 building professionals, including subsidizing the certification from Passive House International and Passive House U.S., over 3 years as part of the Path to Zero low rise new construction offer, Passive House offer, and Zero Energy Modular Home offer. This should enable and speed greater market adoption of the highest performance low-rise new construction methods	Residential New Construction	L

Figure 2-23: Strategic Intervention for Residential and Income Eligible Sectors (Workforce Development – Increase Number of Contractors)

INCREASE NUMBER OF CONTRACTORS

Goals

- Increase the number of contractors participating in energy efficiency programs, both in programs with an open market structure and programs with a lead vendor structure, in order to continue meeting statewide energy savings goals.
- Increase the number of certified DBEs participating in energy efficiency programs in order to meet increasing program goals and ensure that staff working on the PAs' programs best reflect the communities they serve.

Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> • Vendors unsure of how to go about diversifying their subcontractor base 	To the extent permitted by applicable law, for new and, when possible, existing contracts, establish target goals in PA vendor contracts requiring a vendor to subcontract with more certified DBEs and monitor their progress	All Residential Programs	S
<ul style="list-style-type: none"> • Potential DBEs unsure of or face barriers to officially certifying as a DBE; are unsure of how to connect with PAs' programs 	Connect vendors with technical assistance to locate more DBEs with whom they can subcontract, such as connections with ethnic and gender-based business associations, as well as technical assistance on how to become a certified DBE	All Residential Programs	S
	Include at least one certified DBE on the bidder list for all Requests for Proposals (RFPs), Requests for Information (RFIs), and Requests for Quotes (RFQs) whenever feasible	All Residential Programs	S
<ul style="list-style-type: none"> • CAP agencies need to locate more contractors willing to work in Income-Eligible Sector programs to meet customer demand 	Connect contractors with online platform for information about how to connect with PAs' programs	All Residential Programs	M
	Outreach and recruitment plan to attract more weatherization and HVAC installers to contract directly with CAP agencies	Income-Eligible	S

2.9.4 STRATEGIC INTERVENTION: SCALING UP RESIDENTIAL ELECTRIFICATION

The 2019-2021 term was the first in which the PAs began actively promoting and incentivizing heat pumps specifically for space heating and introduced several innovations supporting delivery. The PAs introduced the first integrated controls specification and requirement, ensuring that heat pumps installed to augment existing systems operated efficiently. In addition, the PAs introduced and refined aggressive heat pump incentives that substantially improved the customer economics of choosing to install heat pumps for space heating and also established additional incentives for customers switching from delivered fuel water heating to heat pump water heaters (HPWHs). The PAs collaborated with contractors and energy specialists to train them on heat pump technologies, how to discuss them with customers, and how to specify and install these technologies effectively. The PAs developed customer-facing materials and guides to help inform customers on how the technology works, how a heat pump might affect their heating bills, and what the best next steps are if they are interested in pursuing a heat pump. Based on performance through the

end of 2020, the PAs are on track to meet their goals for heat pumps for customers switching from electric resistance and delivered fuels and are excited to build on this success in the next term.

Electrifying space heating will play a key role in contributing toward meeting state policy goals. The PAs believe that it is critical to increase the pace with which heat pumps are installed. At the same time, the PAs believe that achieving the widespread adoption of electrification of space heating requires sustainable growth. Ensuring that customer comfort is not compromised by the installation of heat pumps and that the costs to operate their new equipment are in line with their expectations are critical to the long-term success of this effort. This helps inform the PAs' high-level heat pump strategy:

- Increase the share of new construction homes that are all-electric.
- Focus outreach on homes where electrification outcomes are likely to be most positive, namely those where customer comfort will be maintained or improved, and heating costs will be reduced.
- Use these outcomes to increase awareness, favorable customer sentiment, and contractor confidence in heat pumps, creating momentum for heat pump installations.
- Simultaneously, work to address the technical and financial challenges associated with other heat pump applications, with a particular focus on enabling the equitable distribution of the benefits of electrification.

Adhering to this strategy will lay a strong foundation in the earlier years and creates the conditions necessary for aggressive future growth rates and longer-term success.

Figure 2-24: Strategic Intervention for Residential and Income Eligible Sectors (Residential Electrification)

RESIDENTIAL ELECTRIFICATION				
Goals				
<ul style="list-style-type: none"> • Increase pace of retrofits from delivered fuels and electric resistance to heat pump space and DHW heating, focusing on homes with attractive customer economics and the greatest likelihood of highly satisfied customers. • Increase percent of new construction homes that are all-electric. • Continue focus on weatherization both for those homes ready to electrify, and those that will electrify in the future. • Build a market – customers, contractors, distributors, and manufacturers – that supports a sustained ramp in electrification, including workforce development efforts focused on transitioning the HVAC market one focused primarily on electrification. 				
Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term	
• High upfront cost of heat pumps	Continue to provide aggressive heat pump incentives that are easy for customers to understand and contractors to sell, helping to address concerns regarding capital cost and encouraging contractors to prioritize selling heat pumps	Retail	S	
• Coordination of multiple heating fuels, in some applications	Monitor and adjust, as needed, qualified products over time. Consider desired efficiency levels, available equipment, and need to provide clear signals to the market	Retail	S	
	Continue to require integrated controls in applicable installations in order to ensure coordination between existing and new systems and to ensure that the desired heat load is picked up by the heat pump	Retail	S	
• Customer concerns about selecting a contractor	Roll out an all-electric home offering through the New Buildings program, incentivizing the construction of homes with no fossil fuel-based heating or cooking	New Buildings	S	
	Create a network of preferred heat pump contractors, including training and other requirements that promote properly sized, specified, and installed heat pumps. Give these contractors access to perks such as listing on the Mass Save site and special access to the HEAT Loan. Promote this network of contractors to customers to increase confidence in heat pumps	Retail	M	
• Customer comfort concern	Refine existing customer education and decision-making tools, such as pages on MassSave.com, the HVAC calculator, and recommendations included in the home energy reports delivered through HEAs. Ensure they provide current information and clear pathways to action	Retail, RCD	S	
• Distribution challenges for hydronic systems	Target heat pump promotions to previous RCD Initiative participants who are ideal heat pump candidates (e.g., those who have completed weatherization and have an oil or propane furnace). When data is available, tailor message to take into account the likely remaining life in the existing heating equipment, encouraging early replacement when appropriate. Depending on responsiveness of customers to this offer, consider offering incremental incentives to these customers	Retail, RCD	S	
• Variable quality in heat pump specifications and installations	To ensure positive customer outcomes and to inform adjustments to overall strategy, closely monitor customer sentiment and use of heat pumps in recent installations	All	S	
• O&M requirements associated with heat pumps	Expand the set of customers who can more easily choose to switch to electric heat by promoting air-to-water heat pump installations through contractor training and targeted promotions	All	S	
• Developer and contractor discomfort with heat pumps	Work with the LEAN network and affordable housing entities to overcome barriers to installation of heat pumps in income-eligible properties, large and small. Specifically, ensure CAP agencies are identifying/recommending heat pumps when customer economics and comfort are favorable and provide, as needed, incentives to help defray any increased O&M expenses that may be borne by affordable housing entities	Income Eligible, RCD	S	
• Importance of weatherizing before installing heat pumps – results in a large project	Continue aggressive push to weatherize homes across the Commonwealth. Weatherizing a home before installing heat pumps increases the likelihood that the customer will be comfortable and realize reduced heating costs. While not all customers may be ready to install heat pumps, by continuing to aggressively weatherize homes across the Commonwealth, the PAs can make it simpler for a customer to choose to electrify in the future, eliminating the need to consider adding weatherization to an already substantial investment and change to their home	Income Eligible, RCD	S	
• Proclivity to always replace like-for-like when a system fails	Move HPWHs midstream to encourage distributors to stock and upsell this equipment	All	S	
	Increased focus on customer education and outreach as it pertains to heat pumps and their benefits	All	M	

2.9.5 STRATEGIC INTERVENTION: EASING PARTICIPATION

The PAs know that they must intervene in every part of the market to be successful and educate customers and provide incentives so they understand, desire, and can afford heat pumps. The PAs must continue to train contractors to make heat pumps and HPWHs a core part of their business which they can specify and install effectively. Additionally, they must continue to influence distributors to change their stocking practices, favoring high-efficiency heat pumps and HPWHs over less-efficient alternatives. Collaboration with manufacturers is essential to ensure that future products help address the market's needs and that the PAs are prepared for new products as they arrive. The PAs are confident that their proposed strategy and associated work will help them build toward a future of widespread electric heating and water heating.

First, as noted above, the PAs will introduce a new all-electric home offering in the PAs' New Construction program. Designing and constructing a new all-electric home, as opposed to retrofitting a home for electrification, yields a number of benefits. Optimizing the building envelope, the distribution system, and the size of the HVAC system allows the customer to realize capital cost reductions that are not achievable by customers retrofitting their home. As a result, the long-term cost to electrify the housing stock can be lowered by focusing efforts on new construction. Similarly, designing a home specifically to be all-electric allows for strategies that ensure occupant comfort. This reinforces the larger strategy of ensuring positive outcomes for customers and the market. Taken together, these benefits make achieving an increase of all-electric new construction homes critical.

The PAs will continue to focus their retrofit electrification efforts where, as noted above, the outcomes are likely to be most positive for the customer. Within this strategy, the PAs see the partial displacement of delivered fuel heating as the best near-term solution. The PAs expect that, on average, partial displacement installations will still offset the majority of fossil-based heating load, delivering customer savings and carbon reductions. These experiences contribute toward the overall momentum noted in the strategy above as well as allowing the specific customer to become more comfortable with heat pumps in their own home. This sets the stage for them to move to fully electric heating in the future, as new practices, improved pricing, and new technology may make a fully all-electric home more achievable.

In this paradigm, customers heating with natural gas will not be a priority for electrification. While the PAs may consider incentives for electrifying gas-heating when cost effective, they expect that this will be a narrow offering that will not be widely promoted. The reality of current commodity prices makes it nearly impossible for a heat pump to deliver operational savings, even before taking into account the substantial capital investment. Customers with incomplete information or working with less integrous contractors may result in customers who expect, but do not realize, bill savings. The PAs have fielded complaints from customers in this very situation.

The PAs will continue to focus on retrofit water heating electrification efforts, as noted above, by moving HPWHs into a midstream delivery model. The PAs will work with heating and cooling distributors to encourage them to stock and up-sell high-efficiency HPWHs. The intended result is that contractors will be more apt to install this equipment in customer homes.

The PAs' enthusiasm for electrification also comes within the context of their obligation to pursue all cost-effective energy efficiency, regardless of underlying fuel choice. As long as they provide a path to cost-effective savings and benefits, this will include the ongoing provision of incentives for high-efficiency fossil-based equipment. As they are no longer cost effective, the PAs are not including incentives for oil-fired boilers for the 2022-2024 term, with the potential exception of Income Eligible custom applications. The PAs will offer incentives for propane and natural gas-fired space heating equipment when a customer is upgrading from a non-condensing (low efficiency) system. While there may be a higher savings potential in switching from these delivered fuels to a heat pump, moving customers to

the higher efficiency fossil-based system also delivers short-term carbon benefits that can contribute toward state policy goals. There will be opportunities to replace these systems again in coming years, at a point when the grid will be further decarbonized, and the carbon benefits of electrification will be even greater. Still, the PAs see it as their duty to guide customers toward the benefits and savings associated with heat pumps when applicable. The PAs will also set incentives that favor electrification over high-efficiency propane and acknowledge that some customers may not be ready to switch to heat pumps. In these instances, the PAs will continue to provide incentives, where cost effective, for customers to select higher efficiency-fossil-based equipment than they may have otherwise selected.

The PAs are committed to ensuring that the benefits of electrification are realized as equitably as possible. The challenges here, however, are notable. Most importantly, the installation cost of heat pumps is a challenge, with costs often double that of the fossil-based alternative. Even if the incremental cost might be offset by operational savings, finding ways to pay for that upfront cost may not be possible for many lower-income customers. To increase access to electrification, the PAs are focused on increasing the installation of heat pumps through their Income Eligible programs, providing aggressive incentives to moderate-income customers, and looking for ways to responsibly finance remaining out-of-pocket costs. The PAs also anticipate that as the prevalence of heat pumps increases, costs will decrease, reducing the differential between heat pumps and their traditional alternatives.

Figure 2-25: Strategic Intervention for Easing Participation

EASING PARTICIPATION			
Goals <ul style="list-style-type: none"> Encourage participation by designing offerings and implementation of those offerings that are easy to participate in and comprehend. When possible, offer customers multiple channels to communicate with us and participate in offerings. Ensure programs are designed to accommodate customers with different tolerances and resources to take on large, complicated projects. 			
Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
<ul style="list-style-type: none"> Customers unable to find sufficient time to participate 	Continue to offer and evolve virtual home energy assessments. Virtual HEAs may be the preferred choice for some customers. They also offer great flexibility for future changes that can even better fit customer preferences	RCD	S
	Continue to expand use of remote verification options wherever applicable, such as verifying that current heating system is non-condensing for gas furnace incentives	All	S
<ul style="list-style-type: none"> Offerings require engagement during certain hours (e.g., HEAs) that may not work for some customers 	Consider options to extend facilitated services for addressing knob and tube and combustion safety issues to customers working with home performance contractors	RCD	M
	Pre-enroll smart thermostats in ADR offerings when sold through PA marketplace for eligible customers to agree to participate	Behavior (ADR)	M
<ul style="list-style-type: none"> Complexity discourages participation – customers may walk away if they don't understand 	Simplify Home Energy Report, particularly the presentation of recommended weatherization measures, to further focus customer on next steps	RCD	M
	Wherever possible, simplify eligibility criteria for incentives and other offerings	All	S
<ul style="list-style-type: none"> Multi-step processes offer more points at which a customer may drop out 	Enable contractors to perform weatherization up front, with remaining functions of the HEA completed either remotely or at the time of the weatherization work itself	RCD	M
	Introduce a preferred contractor network of heat pump installers, helping customers to identify a set of well-trained contractors	Retail	S
<ul style="list-style-type: none"> Customers may struggle to select a contractor with confidence 	Explore alternative pathways for HVAC rebate delivery, including the facilitation of rebates payments directly to contractors or exploring alternative upstream options with the intent to reduce the customer's out-of-pocket costs	Retail	M
	Introduce additional, easier options for income verification for moderate-income offerings	RCD, Retail	S
<ul style="list-style-type: none"> Many customers may prefer to interact electronically/remotely for health reasons or simply personal preference 	Simplify and reduce the cycle time of rebate application process, especially for smaller purchases with straightforward eligibility criteria, and instant rebate opportunities	Retail	M
	Test alternative approaches to implementing the HEAT Loan, with an emphasis on reducing the number of steps required to secure financing	All	M
<ul style="list-style-type: none"> More granular eligibility requirements require more verification, adding complexity and steps 			
<ul style="list-style-type: none"> Additional education needed to simplify any technical complexity of the recommended improvements 			

2.9.6 STRATEGIC INTERVENTION: ENGAGING CONTRACTORS AND THE MARKET

Almost every process evaluation that the PAs conduct confirms what we all intuitively know to be true – one of the greatest barriers to participation in energy efficiency programs is time. That is why this theme has been emphasized in each of the most recent three-year plans. Still, several trends will make focusing on simplifying the process for customers to access the benefits of energy efficiency programs particularly critical during the 2022-2024 term.

Complexity can take several forms, such as unclear descriptions of offerings, an offering with too many steps, or eligibility criteria that are nonintuitive. Each of these issues, in turn, can have different impacts on participation in the programs. Customers may be reluctant to participate because they do not fully understand the program or because it seems overwhelming. Customers may be less likely to complete an engagement after starting because there are multiple steps where they can fall out of the process. Customers may choose not to participate because they do not have enough time to navigate the program. Any of these experiences could cause a customer to not recommend the opportunity to family and friends. Each of these issues can affect the cost to implement a program and the ability to deliver benefits.

Several key elements of the Plan drive substantial upward pressure on the PAs' budgets. One response to program complexity may be to increase incentives. A customer may be more willing to dedicate more of their own time if the financial incentive is more generous. Given the ambitious goals for the 2022-2024 term, the PAs will redouble their efforts to increase participation by complementing proposed incentives and delivery to motivate participation.

Some elements of the 2022-2024 Plan may increase the prospect of complexity and therefore the PAs will also continue to focus on refining delivery to simplify the process. Electrifying the space heating of a home, for instance, may be a daunting task for some customers. Ideally, the customer would weatherize their home first, select the right heating solution for their home, identify a trustworthy contractor who will size and install the system correctly, and change how they use temperature setbacks to optimize the efficiency of their new type of system. This is a fundamentally demanding process, which makes it even more important for the PAs to look for ways to simplify it for customers. Another example is the PAs' increased emphasis on equity. Achieving equity goals will, in some cases, require additional differentiation in the programs along demographic characteristics, such as income. Introducing more differentiation into the PAs' offerings will challenge them to ensure that the right message reaches the right customer, and that more involved eligibility criteria does not depress participation.

To combat these challenges, the PAs will constantly strive to design and implement offerings that are and appear to be easy to participate in. The PAs will continue to build on lessons learned by delivering more services remotely during the pandemic, incorporating remote options wherever possible. The PAs will further refine decision support tools that reduce the amount of information customers need to gather by themselves to gain confidence in making an energy efficiency investment. And more generally, the PAs will place the customer at the center of program design.

While several specific tactics are listed below, running accessible programs requires constant attention to meeting customer needs. The PAs will continue to use feedback from customers and contractors through mechanisms like surveys, evaluations, and meetings to inform the design of new offerings and the refinement of existing ones. The cumulative impact of larger, visible changes and smaller tweaks can noticeably change the PAs' success to serving their customers.

Figure 2-26: Strategic Intervention for Engaging Contractors and the Market

ENGAGING CONTRACTORS AND THE MARKET			
Goals			
<ul style="list-style-type: none"> • Empower contractors with knowledge about Mass Save programs so they can engage customers. • Encourage distributors/supply houses to stock high-efficiency equipment. • Ensure manufacturers are producing equipment that is eligible for Mass Save incentives and that the PAs are aware of new technologies coming to market. 			
Barriers	Example Tactics	Applicable Initiative(s)	Short, Mid, Long-term
• Complex, but necessary program requirements	Continue to conduct contractor training, which include the annual Heating and Cooling Conference, annual Contractor Heating and Cooling Kickoff Event, and the Energy Efficiency Online Training Center	Retail	s
	Continue supply house, distributor, and contractor outreach and support through a myriad of channels across program delivery partners including contractor newsletters, distributor/supply house trainings and outreach, program trainings, and account manager outreach	Retail	s
• High upfront equipment costs for customers	Explore alternative pathways for HVAC rebate delivery including the facilitation of rebates payments directly to contractors or exploring alternative upstream options with the intent to reduce the customer's out-of-pocket expenses. Lowering the high upfront cost of HVAC equipment benefits the customer and can be used as a sales tool by contractors	Retail	s
	Establish a preferred contractor network for heat pump measure installation. After completing a series of trainings, contractors can be included on this list, which will be hosted on MassSave.com. Trainings will focus on program requirements, quality installation, and right-sizing	Retail	S
• Open HVAC and plumbing contractor market – challenges to engage and affect such a larger number of market actors	Move HPWHs mid-stream to encourage distributors and supply houses to stock and up-sell high efficiency equipment	Retail	S
	Mass Save logo for contractors to use on website and marketing material	Retail	S
	Continue to engage with the elected Home Performance Contractors and Independent Installation Contractors at the Best Practices Working Group	RCD	S
	Continued coordination with HVAC and electricians via the facilitated services offer	RCD	S
	Leveraging heat pump trainings developed for HVAC partners, to further education Energy Specialists on the technology	RCD	S
	Continue to engage HERS Raters in quarterly meetings and the HERS Rater best practices panel for ongoing feedback on customer engagement and program implementation	RNC	S
• National/international manufacturers with many interests	Continue to engage Massachusetts Home Builders Associations regionally and provide training through those organizations on building science, building codes, program structure and benefits of participating	RNC	S

The PAs recognize that the purchase and installation of energy-efficient equipment in customers' homes is heavily influenced by independent contractors and the supply chain behind them. Outreach to manufacturers informing them there is a market for efficient equipment, continuing to influence distributors/supply houses to stock high-efficiency equipment, and educating contractors about programs so they promote efficient equipment to customers, are all

imperative to the success of the programs. The PAs will therefore focus on working with and engaging these market actors on a regular basis.

Contractors have direct contact with customers and are the face of the energy efficiency programs. For this reason, the PAs will continue the education and outreach tactics that have proven to be successful engagement tools. One successful tactic includes contractor training through the energy efficiency learning center (EELC), an online platform that offers multiple trainings aimed at educating contractors about the Mass Save work flow, quality installation processes, high-performance equipment tune-ups, as well as other topics aimed at empowering contractors to be as successful as possible in selling and installing high-efficiency equipment. Certain EELC technical trainings are accredited for continuing education units (CEUs) by national organizations like RESNET, Building Performance Institute (BPI), and the Air Conditioning Contractors of America (ACCA). Other courses also provide CEUs from state and local trade and professional organizations, such as local National Association of Home Builders (NAHB), American Institute of Architects (AIA), and building/construction licensure boards.

In addition to the online training center, the PAs will offer in-person trainings when appropriate and safe. The annual Mass Save Contractor Heating and Cooling Kick-off event is held at the beginning of each program year to inform contractors about any program changes for the upcoming program year. Contractors will also continue to receive newsletters throughout the program year, so they can stay up-to-date with the latest relevant program information. Finally, the PAs will continue to host the annual Heating and Cooling Conference, which includes manufacturer and distributor, program, and other relevant trainings for contractors.

As stated above, the PAs understand the importance of engaging other market actors such as manufacturers and wholesale distributors. The PAs participate in regular outreach to manufacturers to keep them well-informed about Mass Save programs, engaging them in discussions before making any major changes to the programs. These discussions also help ensure that the PAs are aware of new technologies or equipment that could be incorporated into the programs. The PAs also conduct outreach and visits to wholesale distribution partners to educate and train staff about Mass Save programs.

The PAs will be introducing new engagement tactics in the 2022-2024 term, which include establishing a Direct Contractor pathway and a preferred contractor network. Both tactics are meant to empower contractors – by both helping them attract customers by lowering upfront costs and increasing customer satisfaction through knowledge of efficient equipment, Mass Save programs, and quality installation.

2.10 RESIDENTIAL SECTOR PROGRAM DESCRIPTIONS

The vision, goals, and strategic interventions described above outline where the PAs will be focusing their efforts in this Plan thematically. The delivery of these efforts within the Residential and Income Eligible Sectors are organized into Programs and Core Initiatives. These offerings align with the functional implementation of the PAs' efforts, in support of the themes noted above and their descriptions are below. Please note that two efforts categorized as Hard-to-Measure Initiatives (financing and education) are included below. For a complete list of Hard-to-Measure Initiatives, please refer to Section 6.

2.10.1 RESIDENTIAL NEW BUILDINGS PROGRAM

The following figure summarizes the PAs' projected energy savings, program costs, benefits, and cost-effectiveness for the Residential New Buildings Program, including both electric and natural gas values.

Figure 2-27: 2022-2024 Planned Performance Summary (Combined Electric and Natural Gas)

Planned Results	Projection
Energy Savings (Net Lifetime MMBTU)	6,225,574
Total Program Costs	\$64,337,308
Total Program Benefits	\$173,798,160
Projected Cost Effectiveness (BCR)	3.33

RESIDENTIAL NEW HOMES & RENOVATIONS INITIATIVE

The primary objective of the Residential New Homes & Renovations Initiative is to reduce energy use and demand in construction of new homes and existing homes undergoing renovation. The secondary objective is to support the transition of the residential new construction market toward the highest efficiency building standards and equipment installations available.

The greatest opportunities to maximize the performance of a home, particularly its shell (the exterior walls, foundation, and roof), comes during the initial design and construction, and when the home is undergoing a renovation. The Residential New Homes & Renovations Initiative provides financial incentives, coupled with education, training, and technical support to developers, architects, builders, and homeowners, to help residential new construction and renovation projects meet the highest achievable energy performance standards, including Passive House certification, ENERGY STAR certification, and Zero Net Energy Ready status.

Eligibility

Participation in the Residential New Homes & Renovations Initiative is available to all active residential natural gas and electric PA customers who are building a new residential home or building or undertaking a renovation. Residential multifamily buildings can be either individually metered or master metered.

Incentives are determined by calculating the amount of electric savings and fuel savings (natural gas, propane, or oil) and comparing the overall performance of the home to that of the average new home in Massachusetts. This incentive structure is called a pay-for-savings approach. To qualify for incentives, single-family (1–4-unit) homes and low-rise multifamily buildings of 5+ units must have a minimum of 5 percent total savings per unit above the average home. High-rise multifamily building projects must achieve savings above the average commercial multifamily building.

Offerings

The initiative provides two pathways: (1) a Low-Rise pathway for homes that are three stories and under, including single-family and multi-unit projects, and (2) a Master-Metered/High-Rise pathway for residential master-metered buildings and/or those homes with four or more stories or a centralized HVAC plant. The pathways provide tailored technical support, outreach, recruitment, training, verification, and incentive structures that encourage and support participation from all residential new construction projects in the state. In addition to the two pathways, the Residential New Homes & Renovations Initiative also includes two offerings: (1) a Renovations and Additions offering and (2) a Passive House offering. With the exception of the Renovations and Additions offering, the Residential New Buildings Initiative is unique in the Residential Sector in that the ultimate occupant of the home is rarely the decisionmaker on core choices of construction and mechanicals impacting energy efficiency.

Incentives are directly tied to a dwelling's modeled energy performance, and all participating homes must pass a final verification. Overall energy savings are determined by modeling the electric savings and fuel savings and comparing them to the average new home in Massachusetts, the User Defined Reference Home (UDRH). The pay-for-savings incentive structure rewards builders and customers for each unit of energy savings secured, as well as each percentage of savings achieved, driving participants to want to consider each additional incremental savings opportunity.

For the Low-Rise pathway, the PAs will continue working with the Home Energy Rating System (HERS) rater infrastructure. HERS Raters serve as the primary point of contact for all participants engaging in this pathway. They play a critical role in recruiting builders to enroll projects in the Low-Rise pathway and in advising participants on the value of additional efficiency upgrades. HERS Raters can directly enroll projects into the Initiative via an online intake tool and provide verification of savings at project completion.

The Renovations and Additions offering provides customers with all the technical support of the Residential New Homes & Renovations Initiative, including training and education for builders and connection of builders to the HERS Raters. This enables customers to leverage the most advanced building science and efficiency technology and push for highest efficiency in both the existing and renovated portions of their projects. For this offering, customers have the opportunity, while their builder and rater support are in place, to add building envelope, mechanical systems, appliances, HVAC systems, and other energy-efficient measures to their project, securing the maximum energy savings presented by the renovation opportunity. The savings are modeled, and incentives reward participants for each unit of energy savings secured.

In the Master-Metered/High-Rise pathway, a PA-contracted vendor works directly with developers and trade allies to enroll projects. The High-Performance Housing Working Group includes residential and commercial new construction technical experts from PA staff and the Initiative's competitively procured implementation vendor. This working group assists in recruiting and defining performance targets while providing guidance on maximizing incentives, energy-efficient construction practices, and high-efficiency technologies and systems.

The Passive House offering provides an option to achieve deep energy savings for all new residential buildings with five or more units. This offer covers the full cost of the required feasibility study, 75 percent of energy modeling costs, offsets pre-certification and post-certification costs for certification through either Passive House Institute US (PHIUS) or Passive House Institute (PHI), and also provides a net performance bonus on a per kWh and per therms basis for the buildings that achieve the deepest level of energy efficiency.

To ensure early intervention and guarantee more design teams and owners are ready to make a commitment to Passive House projects, including single-family projects pursuing the Path to Zero as described in the innovations section below, the PAs will continue to offer subsidized trainings and certifications to develop the expertise needed to

achieve certified buildings, including Certified Passive House Consultant (CPHC[®]), Certified Passive House Designer/Consultant, Certified Passive House Builder, Certified Passive House Tradesperson, Rater and Verifier certifications. The PAs will require a small cost share from participants for these trainings and certifications. In addition, the PAs will continue to provide Passive House outreach and education to other project stakeholders, such as architects and lenders, and provide hands-on building science technical trainings to installation contractors to ensure that all involved in a Passive House project have the information and skills necessary to achieve Passive House certification.

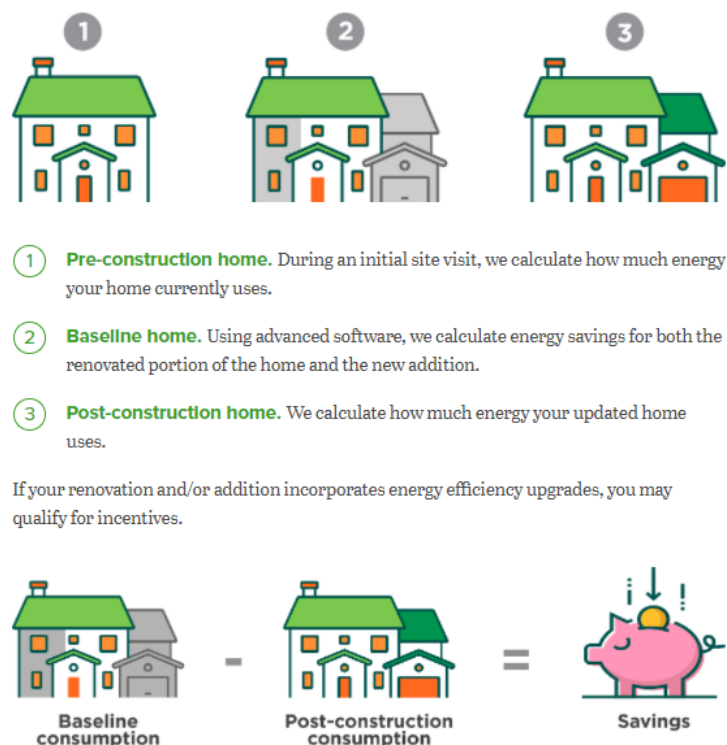
Also included within the Residential New Buildings Initiative is the CSCS offering. The CSCS offering includes education and outreach to the building industry to improve compliance with the current energy code and technical support to accelerate the development and adoption of more efficient codes and standards.

Design and Delivery

Marketing and Customer Acquisition

PAs employ a variety of marketing techniques tailored across offerings in order to target customers for participation. A key component of low-rise marketing and customer acquisition is through HERS Raters, who receive a referral fee for every customer who successfully participates in the Initiative. Meetings are held every quarter with HERS Raters from around the state to provide continuous updates on the Initiative's progress and any programmatic changes, as well as to receive feedback from Raters.

Figure 2-28: Program Delivery Process for the Residential New Construction & Renovations Initiative



Important for high-rise customer acquisition is the annual outreach and engagement strategy that the Initiative employs to reach design and construction companies across the state to educate them on the benefits of

participation. As part of this outreach, the PAs' lead implementation vendor includes a strategy to expand the number of DBEs that are aware of and participating in the Initiative. Above and beyond traditional marketing and outreach for the High-Rise pathway, the PAs organize marketing and outreach for the Passive House offering. The PAs hold Passive House 101 lunch-and-learn trainings multiple times a month, in both on-site and virtual formats, to educate the market about Passive House design and the PAs' offering. These lunch-and-learns are offered to architectural firms, builders, engineering firms, and other interested stakeholders.

PAs and their lead implementation vendor also employ comprehensive digital marketing campaigns throughout the year. Digital marketing in social media and through paid search is particularly beneficial for acquiring customers in the Renovations & Additions pathway. The PAs also employ use of historical and current permit data for geographic targeting, annual recruitment, and engagement of design and construction companies across the state.

Strategic Enhancements

The four major innovations planned for the 2022-2024 term include:

- Introduction of a new Path to Zero 1-4 Initiative.
- Enhanced Low-Rise Pathway incentives for homes reaching 30 percent savings.
- Introduction of a new Zero Energy Modular Homes offering.
- Integration of ADR measures.

Path to Zero 1-4 Initiative

The PAs will introduce the Path to Zero 1-4 Initiative (Path to Zero Initiative), a new high-performance offering for the 1–4-unit building sector; showing their intent to establish a gold standard for home efficiency in Massachusetts. The Path to Zero Initiative will have a specific check list of advanced construction standards for smaller building projects and is expected to achieve savings in the 50-60 percent range compared with standard practice. The PAs have named this offering “Path to Zero” because the standards for this Initiative will focus on critically advanced building shell techniques and mechanical systems to dramatically reduce heating and cooling loads and prepare these homes for carbon neutrality, while increasing occupancy comfort year-round (similar to other high-performance building standards, such as Passive House).

These advanced homes will also include an additional 240-volt outlet and larger electrical panel to enable readiness for demand reduction programs if the occupant later decides to install an EV charger. With substantially reduced space conditioning requirements, homes built to Path to Zero Initiative requirements will predominantly use electricity for their energy needs and will be better positioned to achieve net zero performance, compared with homes built using current standard building practices.

As with the PAs' current multifamily Passive House offering, the Path to Zero Initiative will provide both financial and technical support, likely spread over key milestones of decision making and construction. Thus, the Initiative may include design incentives intended to encourage development of high-performance design plans, as well as training for architects, builders and other trade allies, and specific incentives for achieving the checklist of performance criteria.

Enhanced Low-Rise Incentives for Reaching 30% Savings

Given current standard practice, it is unlikely that all builders, architects, and developers will be prepared to immediately build to the PAs' proposed Path to Zero Initiative. To encourage builders to explore the practices required by the Path to Zero offering, the PAs intend to develop a bridge between the existing pay-for-savings Residential New Construction program and the super-efficient Path to Zero standard. Currently, the more savings a new building project achieves (both in absolute and percentage terms) compared to the UDRH, the higher the incentives for that project. This approach has enabled builders and end-use customers to participate on their terms, earning additional incentives for any additional energy efficiency upgrades they are willing to consider in their projects, so long as they achieve a minimum of 5 percent of savings. As standard building practices improve, this approach enables broad participation while always encouraging participants to identify upgrades through their HERS Rater's modeling of their building plans. An analysis of participant data for 2019 and 2020 shows the typical low-rise project continues to achieve 15 percent savings over the applicable baseline, while only a small percentage (less than 5 percent) reach savings in the 30 percent or higher range.

At this level of efficiency (30 percent), program data shows all-electric homes are the norm in new construction, far outweighing fossil-fuel heated home projects. In an effort to move some portion of the participant market and encourage a deeper level of savings for a larger group of projects, the PAs will institute a step increase to the program's pay-for-savings incentives, enhancing the per-unit incentive rate for projects pursuing the 30 percent savings threshold. The PAs believe that few builders are comfortable and experienced building to this level of energy efficiency, and that the higher incentive levels will encourage more builders to explore more advanced building practices by mitigating risk in doing so. Additionally, the enhancement will include an increased fee to HERS Raters submitting projects at the 30 percent or higher level, encouraging their efforts to provide greater technical assistance to builders and other customers who may be willing to consider more advanced building techniques for their project. As with the current Passive House offering and the Path to Zero Initiative described above, this innovation will include technical support in the form of trainings for builders and other trade allies wishing to learn more about advanced building practices.

Zero Energy Modular Homes Offer with Income Testing

As part of their efforts to increase the depth of savings in the Residential New Buildings program in the 2022-2024 term, the PAs propose to also implement a Zero Energy Modular (ZEM) Homes offering. The goal of this offering is to increase the participation of ZEM buildings, particularly in the single-family market, by developing an offer designed to make high-efficiency home ownership more accessible to low- and moderate-income housing sectors. The PAs know that high-performance stick-built homes come at a cost premium that puts them even further out of reach to low- and moderate-income customers than standard construction built just to code. Because off-site modular construction can reduce some of that incremental premium and bring costs down to within range of a code-level site-built home, modular construction has the potential to make zero energy home ownership a greater possibility for lower income customers, while at the same time making it a more attractive option for prospective home builders and homeowners across all income brackets.

Integration of ADR Measures

The PAs will monitor ADR program participation, particularly the integration of battery storage and EV readiness among customers. Additionally, the PAs plan to study how ADR offerings, such as battery storage and EV charging, can best be integrated into the single-family new construction pathway, including consideration of how ADR strategies can support the more general goal of reducing consumption. New Residential Construction & Renovations Initiative

participants will receive information regarding the PAs' connected devices offerings through HERS Raters or lead vendor account representatives, depending on whether the customer is building a low-rise or a high-rise project.

2.10.2 RESIDENTIAL EXISTING BUILDINGS PROGRAM

The following figure summarizes the PAs' projected energy savings, program costs, benefits, and cost-effectiveness for the Residential Existing Buildings Program, including both electric and natural gas values.

Figure 2-29: 2022-2024 Planned Performance Summary (Combined Electric and Natural Gas)

Planned Results	Projection
Energy Savings (Net Lifetime MMBTU)	115,116,642
Total Program Costs	\$1,287,805,176
Total Program Benefits	\$3,817,740,487
Projected Cost Effectiveness (BCR)	2.18

RESIDENTIAL COORDINATED DELIVERY INITIATIVE

Overview

The RCD Initiative is designed to promote and facilitate the implementation of energy efficiency upgrades in existing homes to help customers reduce their overall, whole-home energy usage. The Initiative provides customers with information and technical assistance, primarily through home energy assessments, to help them understand their specific energy efficiency opportunities, and which financial incentives can help defray the costs of their investments. Customers are served in a fuel-blind manner, with PAs coordinating a streamlined experience for customers, even if they are served by two different PAs. The Initiative strives to provide flexibility in delivery of services to best match each customer's unique needs and preferences and align with the technical opportunities for the home and the customer's authority to implement recommended improvements.

The RCD Initiative includes incentives for some measures installed directly by program contractors, such as water savings devices, and for air sealing and insulation. Additionally, the RCD Initiative promotes a wide array of energy-efficient technologies which are incentivized through the PAs' other initiatives such as Retail (energy-efficient products, HVAC and DHW systems) and the HEAT Loan (zero percent financing). The PAs work with Lead Vendors (LVs) selected through competitive solicitations, to administer the Initiative. The LVs work with trade ally partners, including Independent Installation Contractors (IICs) and Home Performance Contractors (HPCs), along with other contractors such as electricians and HVAC companies to deliver the RCD Initiative.

Eligibility

Participation in the RCD Initiative is available to all active, market-rate, residential natural gas and electric customers, regardless of ownership status or the type of residence. The RCD Initiative serves the full range of residence types including single and multifamily homes, townhomes, condominiums, and apartments, regardless of heating fuel type.

When serving residential spaces with commercial meters, services are still provided in an integrated manner to customers, while savings and spending associated with commercial accounts are associated with the C&I Existing Building Retrofit Initiative. While all residential market-rate customers are eligible to participate and access available incentives, the Initiative seeks to tailor the delivery approach to align with each customer's opportunity and authority to implement the recommended energy efficiency improvements.

Please note that income-eligible customers (defined as at or below 60 percent of the state median income level for 1–4-unit buildings and at or below 60 percent of the area median income level for 5+ unit buildings) are served through the Income Eligible Coordinated Delivery Initiative, which is further described in Section 2.11. The PAs collaborate with LEAN to best serve mixed-income properties, as discussed below.

Offerings

The RCD Initiative offers customers comprehensive support and education to better understand the energy use of their home and provides technical opportunities for efficiency solutions. The goal of these solutions is to help customers identify and fund energy efficiency improvements resulting in a more comfortable home for the customer, as well as whole home energy savings and costs and GHG emissions reductions.

Technical assistance and support are primarily provided through HEAs. In 2020, in response to the COVID-19 pandemic, the PAs developed and implemented a new method for delivering assessments, the virtual HEA. Virtual services have proven to be an effective way to engage with many customers enabling increased flexibility and convenience for the customer. The PAs intend to continue to offer multiple forms of HEAs during the 2022-2024 term including online, in-person, virtual, or hybrid (virtual plus on-site) to provide options that are flexible and best meet the customer's technical needs and preferences. For large multi-unit buildings with complex systems, engineering support and technical assessments are available to identify and evaluate energy efficiency opportunities. Regardless of the type of HEA the customer completes, the goal is to identify the site-specific energy efficiency opportunities that exist, educate the customer of the value proposition of the opportunities, determine which ones the customer is interested in implementing, and define next steps for the customer to complete the improvements.

All energy savings opportunities applicable to the customers' residence will be promoted through the RCD Initiative through one of the HEA offerings. The largest opportunities for energy savings identified through the RCD Initiative are weatherization (air sealing and insulation) and HVAC equipment; however, other eligible measures include duct sealing, programmable and Wi-Fi thermostats, water-saving devices, water heating equipment, and other qualified efficient products. The PAs may also explore the opportunity to influence customers' decision to choose an EV and facilitate the installation and use of charging equipment.

Larger multi-unit buildings may contain residential and/or commercial metering, with building envelope and mechanical systems more complex and similar to those found in C&I facilities. The intent is for the delivery of services to be seamless for the customer. In these types of residential buildings, commercial-type measures may include HVAC systems and controls, variable speed drives (VSDs) and motors, chillers, air compressors, energy management systems, advanced lighting controls, and custom measures. Energy efficiency measure costs and savings will be allocated to the appropriate sector when both residential and commercial meters are present in a building. These larger buildings are served through a combination of prescriptive (pre-defined for specified measures) and custom incentives.

To help cover the costs of recommended improvements, the PAs offer multiple types of financial assistance for customers. For residentially metered customers who reside in residential buildings, the incentives are prescriptive in design.

- Weatherization incentives include no-cost targeted air sealing and 75 percent or more off the cost of insulation improvements.
- Weatherization incentives for residentially-metered, rental-occupied units, and moderate-income customers (as defined by 61-80 percent of the state median income) are offered at no cost.
- Incentives to evaluate pre-weatherization barriers (i.e., knob & tube wiring, combustion safety concerns, etc.).
- Additional incentives are available for pre-weatherization barrier mitigation on select barriers for qualified moderate-income customers.
- Select barrier mitigation costs are eligible for zero percent financing via the HEAT Loan.
- No-cost instant savings measures (i.e., low-flow faucet aerators and showerheads, power strips, etc.) via direct install or shipped as an Energy Savings Package. No cost lighting is also available to be shipped to qualified moderate-income customers and renter-occupied units.
- Customers may be eligible to apply for zero percent financing through the HEAT Loan.

For commercially-metered residential buildings, financial assistance consists of a range of options including prescriptive rebates for some measures, custom incentives depending on the type of project, as well as cost sharing for engineering support services. The PAs intend to continue to offer enhanced incentives for HTR customer segments including renters, landlords, and moderate-income customers. Additionally, the PAs will continue to work with the Massachusetts Technology Assessment Committee (MTAC) to include new measures or technologies whenever possible and appropriate for the market-rate residential sector.

During the 2022-2024 term, the PAs will continue to push to increase the number of homes weatherized across the state. Weatherizing a home before installing heating upgrades increases the likelihood that the customer will be comfortable and realize reduced heating costs. While the RCD Initiative does provide a holistic view of a residential building, envelope improvements are the core of the program, especially for single-family and low-rise buildings. Thus, the RCD Initiative will play a key role in preparing customers for electrification, even if the customer is not yet ready to move to heat pumps.

One significant change in RCD Initiative offerings for the 2022-2024 term is the elimination of lighting measures, with the exception of some fixtures. While no-cost bulbs offered abundant, cost-effective savings for the Initiative and were often featured in marketing materials, the PAs anticipate minimal impact from this change on the overall ability to recruit customers. Free light bulbs were not explicitly called out as a primary reason for participation by customers, and the PAs have been reducing emphasis on no-cost bulbs over time.³⁷ Still, the PAs will closely monitor their ability to recruit customers.

³⁷ Navigant, Illume, and Cadeo. *Home Energy Service Process Evaluation (Res 35)*, available at: https://ma-eeac.org/wp-content/uploads/MA-RES-35-HES-Process-Evaluation-Comprehensive-Report_FINAL_31MAR2018.pdf.

Design and Delivery

The RCD Initiative promotes and helps to support customers' efforts to complete comprehensive home energy efficiency solutions, with a primary focus on identifying and installing weatherization and identifying opportunities for high-efficiency HVAC systems. The PAs promote the Initiative through ongoing trade ally partners and ongoing marketing and outreach. The PAs utilize education, technical support, incentives, and financing to simplify the process for customers to implement recommended energy efficiency upgrades.

Marketing & Customer Acquisition

In addition to the comprehensive marketing strategies developed by the PAs to reach customers, the RCD Initiative also benefits from many years of historical service to customers making word of mouth the primary driver of participation. Due to this long history of serving market-rate customers, the RCD Initiative is widely known by customers and benefits by having a large percentage of participants come from word-of-mouth referrals of satisfied customers, as well as repeat customers who re-engage for assistance when they change residences. Further, the large number of trade allies that work directly in the RCD Initiative as IICs or HPCs, as well as HVAC contractors throughout the Commonwealth whose businesses benefit from the PAs' generous consumer rebates, are all valuable sources of leads through their own independent marketing and promotional efforts.

Along with strong customer and trade ally referrals, the PAs will continue to seek to drive further customer participation through comprehensive marketing efforts collaboratively developed through the Statewide Marketing Group, as well as through individual PA campaigns. The PAs will continue to refine their data analytics capabilities to better target different customer segments with tailored messaging and imagery that resonates with target audience to continually improve customer response and participation. In this work, the PAs will consider both building characteristics associated with high energy savings potential (e.g., larger, older homes) and customer demographics, to ensure the equitable delivery of the Initiative.

The Mass Save website is leveraged in marketing efforts and is maintained as a "go to" source of information for customers. This site includes key information such as descriptions of offerings, ways to participate in the RCD Initiative, and lists of participating contractors.

Customers can also access the Residential Online Assessment via the Mass Save website. This online assessment collects basic, readily available information from customers and uses this information to identify potential savings opportunities. This includes both estimated savings for the various recommendations in addition to clear next steps for each of the recommended actions. Customers with likely weatherization opportunity are excellent RCD Initiative candidates, and the online assessment makes the appropriate recommendation. Other recommendations might include a purchase through the online marketplace, upgrading a piece of HVAC equipment, or participating in the PAs' ADR programs. In addition to providing actionable next steps, the data collected through the online assessment can be used for targeted remarketing and to build customer profiles, if customers provide their contact information or associate with an active PA account.

The goal of RCD marketing is to reach all eligible customers to solicit participation, including HTR customer segments (i.e., moderate income, English-isolated families, renters, landlords, and Environmental Justice communities). These customer segments are discussed further in Section 2.9.1. The PAs intend to continue to work with communities and CBOs as part of their overall marketing strategy, particularly where those channels can help recruit participation from HTR customer segments. The PAs will also build upon the lessons from the Municipal & Community Partnership Strategy's implementation during the 2019-2021 term to further refine their efforts for the 2022-2024 term. The PAs

understand the importance of reaching HTR customers through placed-based and community outreach. More information on the Municipal & Community Partnership Strategy can be found in Section 2.9.2.

Delivery Infrastructure

The core principle of the RCD Initiative delivery infrastructure is to provide flexible participation pathways for customers to best meet their wants and needs in consideration of the type of building in which they reside, the technical opportunity available, and their authority to implement the recommended improvements. The PAs recognize that the Residential Sector is very diverse, both in terms of the extensive variety of styles, types, sizes, and complexity of buildings, as well as the diversity of the customers themselves.

Historically, the RCD Initiative almost exclusively served customers via an in-home HEA or on-site Facility Level Assessment for multi-unit properties. The PAs have learned, through the development of virtual HEAs in response to the COVID-19 pandemic, that alternate means of serving customers can be done effectively and efficiently, while delivering high levels of customer satisfaction and strong adoption of energy efficiency improvements. Virtual HEAs offer greater scheduling flexibility for customers, both in terms of when (time, day of the week) they are scheduled and how much of a customer's time they require. While not appropriate for all customers and all technical situations, virtual HEA services are an appropriate alternative for many customers and the PAs intend to continue refinement and expansion of alternate service offerings in the 2022-2024 term. Of course, the PAs will continue to offer on-premise assessments to meet the needs and preferences of customers.

Customers who have general interests in the benefits of energy efficiency but have not already identified specific technical opportunities or do not have self-identified "wants" will always likely be best served via a comprehensive HEA, whether that be fully virtual, hybrid, or in-person. However, for those customers that have specific needs and/or wants, alternate service options can achieve high levels of customer satisfaction, reduce a customer's time commitment to participate, deliver savings and benefits, and reduce program-related administrative costs. This enhanced flexibility provided by different service options allows for a customized approach to meet the needs of the customer, keeping it simple and straightforward when that is all that is needed while having the ability to support more comprehensive or complex projects for any given customer when warranted. The objective is to keep it simple when that is all that is needed or wanted and scale the level of engagement and support as warranted by the customers' interests and technical opportunities.

Regardless of the assessment type or delivery partner, each customer receives a personalized home energy report summarizing the findings of the assessment and detailed recommendations. The home energy report includes estimated savings, and information on available incentives (for each recommended energy efficiency improvement). The home energy report is designed to provide customers with motivational and actionable information to encourage implementation of the recommendations.

The RCD Initiative offers a turnkey offering for customers whose homes have technical opportunities for weatherization. Customers are provided a formal contract for the work at established set prices. The set pricing for all recommended program weatherization eliminates the need for a customer to obtain multiple bids for their weatherization work. The customer will receive the same pricing, and the same quality installation, regardless of the participating IIC or HPC they choose to complete the weatherization work.

For customers that have identified pre-weatherization barriers (i.e., knob & tube wiring, combustion safety concerns, etc.), the PAs offer financial incentives for the customer to support having those barriers evaluated and mitigated so that the weatherization work can proceed. To make it convenient for the customer, some PAs offer direct Facilitated Services and can assign a participating electrician or HVAC contractor to evaluate the electrical or combustion safety-related barrier. If the customer already has a relationship with a contractor, they may choose to work with their own

qualified contractor to evaluate the pre-weatherization barrier(s). In some instances, if the barrier is evaluated and unmitigated, as in a situation with live knob & tube wiring, customers can take advantage of financing through the HEAT Loan to mitigate the barrier.

The following are examples of a few typical customer journeys:

- A customer contacts the RCD Initiative with specific interests and/or needs that do not require an HEA or consultation. The PA Customer Service Representative (CSR) fulfills the customer's immediate need at the initial phone call, chat, or email inquiry and no further immediate action is needed. Examples include: providing information on available rebates where no HEA is required (e.g., HVAC rebates), providing the customer the necessary documentation to utilize the HEAT Loan, facilitating fulfillment of an Energy Savings Package, or referring the customer to a specialty contractor for support. While this type of interaction may yield less customer data, it simplifies customer participation, increasing the likelihood that the customer will take advantage of energy efficiency offerings now and in the future.
- A customer contacts RCD with specific interests and/or needs or with a general interest in energy efficiency that warrants a consultation with an Energy Generalist or Specialist.
 - The CSR schedules the customer for an initial virtual consultation with an Energy Generalist.
 - The Energy Generalist completes the initial virtual consultation and determines next steps depending on customer interest and specific technical opportunities resulting in one of the following outcomes.
 - Customer's immediate needs are met, any immediate follow-up information and/or material fulfillment is arranged (e.g., sends HEAT Loan information, sends weatherization contract that was specified virtually, sends any additional relevant information and/or rebate applications, etc.) and initial customer service is complete.
 - Customer needs an on-site visit (Hybrid) to complete the technical analysis of the home and/or to complete a weatherization specification.
 - Customer has interest in a major measure and/or has specific technical questions beyond the Energy Generalist's area of expertise.
 - The online assessment is another path for customers with general interest to identify potential efficiency opportunities with actional next steps identified for each of these opportunities. This path also enables highly targeted re-marketing efforts by the PAs.

Ongoing Engagement and Follow-Up

The PAs are committed to ongoing customer engagement and follow-up to minimize the potential for customer drop off and lost opportunities. Throughout their engagements with each customer, the PAs collect information and maintain a customer and site-specific profile of technical opportunities based on building attributes (e.g., age, style, already completed upgrades, etc.) as well as customer-specific attributes to inform tailored targeted marketing messaging. Ongoing engagement may be customer driven or driven by the PAs.

Based on the outcomes of an effective and convenient initial engagement with the RCD Initiative, the customer gains an understanding of what the PAs can offer and recognizes them as their "go to" resource for all future energy-related needs. The customer then re-engages proactively in the future as their needs dictate. All customers will be tracked for

specific follow-up activities as the different engagements with the customer builds a profile of customer interest and technical opportunity. Outreach through various marketing channels will occur over time to persuade customers to act on recommendations and to market special, targeted, and limited time promotions as part of a continuous engagement strategy.

In the 2019-2021 term, the PAs began differentiating single-family, attached low-rise, and high-rise buildings. The intent behind this change was to better align the organization and delivery of offerings with the needs of customers and technical opportunities in different types of buildings. During the 2022-2024 term, the PAs will continue to report measures, savings, and incentive costs by these same categories. While the PAs believe that these categories better align with customer needs and technical opportunity, the numerous permutations of building type, ownership structure, and other key characteristics require the PAs and their vendors to be flexible, accommodating customers and buildings according to their specific needs. The PAs intentionally avoid referencing these building types in customer-facing communications, as they may breed confusion. Instead, the PAs focus on presenting RCD Initiative offerings to customers with a focus on the recipient's role (e.g., the owner of a single-family residence, a renter in an apartment building, or the owner or manager of a larger residential facility).

Quality Assurance

The PAs ensure high-quality services are provided to customers participating in the RCD Initiative through a multi-tiered Quality Assurance (QA) structure. While each LV and Participating Contractor is responsible for their own internal QA, the PAs utilize the Lead Vendor structure to provide training, mentoring, and QA for the participating contractors. Additionally, the PAs contract with a third-party QA vendor to provide an additional layer of "umbrella QA" over both the LVs and the Participating Contractors. QA is performed on all critical aspects of RCD, including key performance indicators (KPIs), assessments, and on the implemented energy efficiency measures. QA is performed in a variety of ways including customer and contractor surveys, data review and analysis, and virtual and in-person inspections. QA results are routinely reviewed by PAs and shared with each LV or Participating Contractor as a means to support a culture of continuous improvement.

Strategic Enhancements

The PAs are committed to continuous innovations, leveraging past lessons learned, and building on the historical success of the RCD Initiative. The PAs plan to introduce several new strategic enhancements for the 2022-2024 term including:

- Expanded insulation solutions.
- Enhanced incentives for comprehensive projects.
- Streamlined process for serving customers in mixed-income buildings.

Expanded Insulation Solutions

While the core RCD Initiative measure and service offerings have proven to be attractive and appealing solutions for the vast majority of market-rate residential customers, the PAs recognize that there are some technical opportunities where alternate methods and/or materials may be a better technical solution or preferred customer approach.

An example of this is spray foam insulation. Historically, spray foam was more of a niche product that was cost prohibitive and only offered by a limited pool of contractors. Currently, with wider adoption in the market and a broader trade ally network installing spray foam, the PAs believe the time is right to add this product to the RCD

Initiative. There are many types of spray foam; each with its own pros and cons for specific applications, each having manufacturer-specific installation requirements, and costs still at a premium to conventional methods and materials, such as targeted air sealing and cellulose insulation. For these reasons, the PAs intend to introduce spray foam as an eligible measure for specific applications when it is clearly the best technical solution such as for “hot roof” applications when there is mechanical equipment and/or ducts in attics, for crawl space treatments, and for antique homes where framing dimensions and spacing are irregular.

Incentives for these new weatherization measures may differ from those that are already offered, in order to motivate customers to select the most cost-effective solution that can appropriately serve the need. The ultimate goal is to have a framework that is easy for customers and contractors to understand, has minimal administrative burden to implement, provides incentives to custom projects that are equitable to the core offerings, provides a pathway to reduce lost opportunities for efficiency solutions, and meets cost-effectiveness requirements.

Enhanced Incentives for Comprehensive Projects

In conjunction with core RCD Initiative offerings or the expanded insulation solutions as previously described, the PAs intend to offer enhanced incentives for comprehensive projects, specifically those that include weatherization combined with high-efficiency cold climate heat pumps offsetting heat from electric resistance or delivered fuels. These enhanced incentives are intended to not only help encourage customers to achieve greater savings and environmental impacts, but to also foster contractor development through business expansion or through strategic partnerships with other contractors. The PAs acknowledge that this larger scope may not be appealing to all customers but introducing incentives to pair weatherization and heat pumps is part of a longer-term strategy to normalize among customer and contractors, that weatherization should precede heat pump installation.

Streamlined Process for Serving Customers in Mixed-Income Buildings

Due to some differences in the customer offerings, and delivery differences for the market-rate RCD Initiative and the Income Eligible Coordinated Delivery Initiative, completing comprehensive projects in multi-unit, mixed-income buildings has proven to be challenging. Historically, this has resulted in the property owner having to engage with multiple parties from both the RCD Initiative and the Income Eligible Coordinated Delivery Initiative to complete a project for the entire building, ensuring that each tenant received all the appropriate energy solutions.

The PAs have collaborated with LEAN to develop a refined process to serve residential buildings that have both market-rate and income-eligible residents more seamlessly.

RESIDENTIAL RETAIL INITIATIVE

Overview

The goal of the Residential Retail Initiative is to provide a broader integrated marketplace where energy-efficient products and equipment are positioned as attractive, primary choices for customers making purchasing decisions, whether online, in-store, or through independent contractors and distributors. The Residential Retail Initiative offers education to help customers make informed decisions, incentives to make efficient choices more financially attractive, and training and support for the market actors, to help shift contractors toward more efficient, correctly installed equipment.

The Residential Retail Initiative ensures that all residential customers can access high-efficiency HVAC and DHW equipment, smart thermostats, appliances, and other energy-efficient products. The Initiative works to place the most energy-efficient options in front of customers.

Eligibility

Participation in the Residential Retail Initiative is available to all active residential natural gas and electric PA customers. Incentive levels may vary based on income levels, existing energy source, and/or whether the existing equipment is being displaced or replaced. To encourage contractors to be engaged in training and practices that yield the best outcomes for customers, some offerings are only available through contractors who meet the PAs' requirements.

Offerings

The Residential Retail Initiative offers customers rebates on energy-saving appliances, products, and HVAC equipment. Appliances and products include ENERGY STAR-certified window air conditioning units, room air cleaners, dehumidifiers, and electric dryers. A number of smaller energy-saving devices are also incentivized, including Tier 1 and Tier 2 advanced power strips, low-flow showerheads, faucet aerators, and thermostatic shutoff valves. The Initiative also incentivizes the recycling of working old or inefficient refrigerators, freezers, and dehumidifiers.

Additionally, the Residential Retail Initiative offers customers rebates for installing high-efficiency HVAC equipment, water heating equipment, HPWH technologies, and associated controls such as wireless and programmable thermostats and outdoor reset controls. For the 2022-2024 term, the PAs will continue to focus on the installation of heat pumps to replace/displace delivered fuel heating and water heating in addition to electric resistance heat. As noted earlier, the PAs will discontinue incentives for some equipment in the 2022-2024 term because it is no longer cost effective, including oil boilers and gas and propane space heating equipment when the existing equipment is condensing. Additional products are continuously being evaluated via the PAs and/or MTAC and added to the Residential Sector portfolio.

Also included within the Residential Retail Initiative is the CSCS offering. The CSCS offering includes technical support to accelerate the development and adoption of more efficient codes and standards. CSCS may also include industry education and outreach to improve compliance with newly adopted appliance and equipment standards if there is a demonstrated opportunity for energy savings.

Design and Delivery

Residential Retail Initiative incentives are available to customers via multiple modalities. At some larger retailers across the state, customers can access instant rebates at the point of sale. This is available for smart thermostats, window air conditioners, dehumidifiers, and room air cleaners. In addition to instant rebates, the PAs offer an Online Marketplace which applies the incentive instantly to qualifying products at the time of checkout. Products on the marketplace include smart thermostats, dehumidifiers, room air cleaners, window air conditioners, and advanced power strips, as well as non-incentivized energy saving products such as lighting, pipe wrap, and various "smart home" devices. As a customer's eligibility can be verified instantly and the rebate applied automatically to the cost at checkout, the customer experience is streamlined, circumventing the need to complete additional rebate forms or waiting to receive a check in the mail. The Online Marketplace also allows the PAs to offer special manufacturer promotions. When paired with the instant incentive, this can significantly lower the cost of the eligible products and drive participation in the Initiative.

Following their eligible purchase, customers can also apply for a downstream rebate, which is available either online via the PAs' rebate processing portal or via a hard copy that can be mailed in using the US Postal Service. Lastly, PAs partner with manufacturers, distributors, and retailers to offer smaller products such as advanced power strips and water-saving devices through an upstream model where the products are offered at a discounted price for customers at the time of purchase, without any additional steps required of the customer.

HVAC equipment is also incentivized through downstream rebates, both via mail-in rebate forms and online submissions through the rebate portal. Some equipment such as boiler reset controls, electronically commutated motors (ECM) circulator pumps heat and energy recovery ventilators, and room-to-room response controls are offered through a midstream model where the incentive is applied at the distributor level.

The PAs are always evaluating the most effective ways to incentivize the installation of energy-efficient appliances and equipment, whether that is at the customer, contractor, distributor, or manufacturer level, as well as exploring new solutions to provide customers more streamlined access to incentives. For example, the PAs chose to move boiler reset controls midstream because these measures are an aftermarket technology that customers may not be familiar with. By moving these measures midstream, the PAs can influence a large portion of the market through fewer communication points while impacting the greatest possible number of purchasing decisions. Some measures may be a better fit for downstream rebates which involve the customer directly. This is particularly true for measures that may require additional information to ensure eligibility. The PAs may make changes based on how incentives are delivered throughout the term.

Marketing and Customer Acquisition

The Residential Retail Initiative's offerings are marketed to eligible customers through several different channels. The PAs educate customers about the available rebates through email, paid and organic social media, digital, paid search, and point-of-purchase brochures and flyers. The creative used for each of these channels is optimized to address customers based on where they are in the customer acquisition funnel. Customers at the top of the funnel are educated about the energy and cost saving benefits of energy-efficient equipment and appliances through social media, blog posts, emails, and brochures. When a customer goes to purchase eligible equipment and products, in-store point-of-purchase materials educate the customer regarding available rebates and the options for redemption. For customers searching online for purchases, paid search advertisements help direct customers to the Mass Save website for access to the available rebates. Marketing planning and implementation is administered statewide through a selected marketing vendor, as well as by each of the PAs' marketing departments.

Trade Ally Training and Education

The Residential Retail Initiative seeks to create opportunities for customers to access efficient options by working with big box and other retailers, manufacturers, distributors, and supply houses, and through the Mass Save Online Marketplace. In addition to working with traditional retail outlets, a major focus of Initiative activity is to provide support to plumbing and HVAC contractors and others in the supply chain (manufacturers, distributors, and suppliers) to ensure the availability, promotion, and proper installation of the highest efficiency equipment.

The PAs continuously engage their partners and train retail associates about the Residential Retail Initiative, in addition to placing and maintaining effective placement of point-of-purchase materials. The PAs also work closely with supply houses and support trade allies' education. The purchase and installation of heating and water heating equipment in customers' homes is heavily influenced by the installing contractor and the supply chain behind them. In practice, these contractors become the face of the PAs' offerings during these conversations. For this reason, a major focus of this Initiative is to work with influential market actors, including plumbing and HVAC contractors and

technicians to promote and install efficient equipment and engage them as true partners with the PAs in moving customers to adopt more comprehensive energy efficiency.

The installation and service practices of these same key trade allies further influence how well energy-efficient equipment performs once it is installed. Therefore, the PAs promote installation best practices for a wide assortment of energy-efficient equipment, including central air conditioning equipment and air-source heat pumps, hot water boilers, warm air furnaces (with ECM or equivalent advanced furnace fan systems), select heating system controls (including after-market boiler reset controls and programmable and wireless enabled thermostats), water heating equipment, and heat-recovery ventilator (HRV) equipment. This contractor education is done online through the EELC and in-person classes, as well as manufacturer and distributor trainings offered at the annual Fall Heating and Cooling conference and in supply houses.

The PAs train contractors to use measureQuick®, a software-based diagnostic tool that tests air flow and refrigerant charge to ensure that air source heat pumps and central air conditioners have been properly commissioned to deliver optimal comfort, efficiency and savings. Once a contractor has completed the measureQuick training requirements, they are included in a searchable database of measureQuick certified contractors located on MassSave.com.

Strategic Enhancements

The PAs are considering a number of strategic enhancements to the Residential Retail Initiative for the 2022-2024 term, including:

- Leveraging midstream channels.
- Alternate HVAC rebate delivery.
- Preferred contractor network.
- Enhanced incentives for bundled weatherization and heat pumps.
- Targeted HVAC discussions.

Leveraging Midstream Channels

For the 2022-2024 term, the PAs plan to work with heating and cooling distributors to encourage stocking of high-efficiency equipment. The PAs will offer HPWHs as a midstream measure and evaluate the other measures best suited for this delivery channel with the goal of increasing installations.

Alternate HVAC Rebate Delivery

The PAs are exploring delivery options to reduce the upfront costs for customers installing high-efficiency HVAC equipment. Currently, heating equipment incentives are available via a downstream rebate process requiring customers to front the full cost of installation while they wait for their rebate to be processed. The PAs are evaluating various pathways to provide the rebate amount upfront, therefore making it more financially feasible to move forward with more costly upgrades.

Preferred Contractor Network

With the increased focus on heat pump technologies, the PAs intend to establish a preferred contractor network of HVAC contractors trained on heat pump technology and quality heat pump installations. In order to be included in the

network, contractors will have to complete a series of trainings. The intent is to provide customers additional support when navigating a heat pump installation. The PAs aim to foster a network of quality installers with the training, experience, and knowledge necessary to effectively talk to customers about the benefits of heat pumps and ensure a properly sized and quality installation. This list will be made available to customers on MassSave.com and may be promoted in other customer interactions.

Enhanced Incentives for Bundled Weatherization and Heat Pumps

As referenced in the Strategic Enhancements section of the RCD Initiative description, the PAs recognize the importance of weatherization when it comes to the installation of a new heating system, more specifically cold climate heat pumps. Having a properly weatherized home prior to the installation of heat pumps will help to ensure the heat pump system is properly sized, which permits the technology to operate more efficiently, resulting in increased customer comfort and satisfaction. Therefore, the PAs plan to offer an enhanced incentive to customers who pair the weatherization of their home with the installation of heat pumps to displace fossil fuel or electric resistance heating. The enhanced incentives are intended not only to help encourage customers achieve greater savings, comfort, and environmental impacts, but also foster contractor development through business expansion or strategic partnerships with other contractors.

Targeted HVAC Discussions

Not all customers who are pre-screened for a virtual HEA or who complete the online assessment need weatherization, but they could be good candidates for heat pumps. The PAs plan to explore introducing a pathway for customers specifically interested in cold climate heat pumps to have a targeted HVAC discussion with a specialist to discuss opportunities for their home.

RESIDENTIAL BEHAVIOR INITIATIVE

Overview

The primary goal of the Residential Behavior Initiative is to encourage customers to engage in behavior that will result in energy conservation and/or demand reduction. This is distinct from other Initiatives that seek to encourage purchases of efficient equipment or other investments in changes to their home. Offerings within this initiative are divided into two main categories: (1) those that use information, social cues, and other prompts to motivate customers to reduce or shift their consumption (behavioral savings offerings) and (2) those that provide incentives for enrolling devices in offerings that reduce their consumption during periods of high demand (ADR offerings).

Eligibility

Participation in behavioral savings offerings varies by PA. For those PAs who have a behavioral savings offering, participants are often divided into control and treatment groups, to enable the measurement of savings attributable to behavioral interventions. Participation in ADR offerings is based on a customer owning an eligible communicating device connected to an active PA electric account. This eligibility is based on whether the technology is included in the offering (e.g., thermostats connected to central air conditioning) and whether the manufacturer of the device has enrolled in the offering.

Offerings

As noted above, there are two main offerings within the Residential Behavior Initiative: (1) a Behavioral Savings offering and (2) an ADR offering.

Behavioral Savings Offering

Historically, behavioral savings offerings have been tied to the delivery of Home Energy Reports (HERs). Most HERs consisted of a few common elements – visuals showing changes in consumption, comparisons to the consumption of neighbors or other similar buildings, and tips identifying behaviors the customer could engage in to reduce their consumption. By comparing the usage of customers receiving these reports (in the treatment group) to those not receiving the HERs (in the control group), savings attributable to the reports themselves could be calculated. These HERs also often include targeted messaging and promotions of energy efficiency offerings outside of the Residential Behavior Initiative.

During the 2019-2021 Plan term, all the PAs offered HERs to their customers (or for at least a portion of the term). The feasibility and cost effectiveness of behavioral offerings is contingent upon scale. There are large, fixed, upfront costs associated with creating the data integrations that have created cost-effectiveness challenges for the PAs serving fewer customers which cannot be addressed through a statewide contract. For this reason, not all PAs will enroll customers in behavioral savings offerings in this term. It is worth noting that even without all PAs participating, most customers in the state will be served by at least one PA (either natural gas or electric) that does have a Residential Behavioral Savings offering.

The specific design and implementation of a Behavioral Savings offering will differ amongst PAs. These variations are largely driven by differences in data management practices and related customer-facing activity within the PA. Importantly, as the PAs explore different approaches to Behavioral Savings offerings, the PAs will share learnings and best practices with each other to maximize the benefit to customers.

Active Demand Reduction Offering

Residential ADR offerings use incentives to motivate customers to enroll eligible equipment in the program. Once enrolled, the PAs, through a service provider (discussed below), send signals to customer equipment to reduce or offset the customer's consumption during peak periods. Eligible technologies in the residential sector include thermostats connected to central air conditioning, residential storage (batteries), and EVs and vehicle chargers. Generally, the PAs offer an incentive for a customer to sign up for a technology, and an additional incentive for participating during called DR events. Customers can override these signals and choose not to participate, but this may affect the level of incentive they receive or their eligibility for continued program participation.

Central air conditioning represents one of the largest controllable loads in residential homes and use of air conditioning is highly coincident with ISO-NE system peaks, making it an ideal end use for ADR. By adjusting the temperature settings on a connected thermostat during peak periods, the PAs can deliver substantial reductions in demand. Several management strategies, such as staggering when setbacks are enacted and pre-cooling, can help maximize savings delivered across a portfolio of connected thermostats. The increasing penetration of both connected thermostats and central air conditioning make this a key area of continued growth for ADR.

Battery storage is an ideal candidate for ADR, especially in residential applications. Currently, there are no demand charges on residential distribution bills, meaning there is little incentive for customers to charge and discharge their battery. This results in valuable assets that may serve little purpose other than to provide backup during a power outage. By enrolling storage, the PAs can dispatch signals that cause batteries to discharge (send power back to the

grid) during peak periods. Further, unlike adjusting thermostat settings, there are no direct impacts to customer comfort or convenience. While there are currently a modest number of batteries installed in the Commonwealth, each battery can deliver substantial demand reductions and the PAs expect continued growth in residential storage installations.

EV charging is similar to batteries in that their numbers are currently limited, but each EV's impact is substantial, and their numbers are expected to grow rapidly. Most charging, however, occurs outside of peak periods, limiting their potential to reduce demand during these periods. For those EVs that are charging during peak periods, the PAs will offer an incentive for the customer to reduce their rate of charge. As with other offerings, customers may choose to override this signal if it is an inconvenient time for their vehicle's charging to be slowed. Please see Section 1.3.1 for a discussion of the types of benefits that the PAs achieve by engaging in these activities and how the PAs consider which end uses are appropriate for ADR strategies.

During the 2019-2021 term, National Grid introduced a new type of offering for inverters connected to residential PV installations, as an R&D effort. Inverters are capable of providing valuable grid services that can increase the efficiency with which the distribution grid operates. Specifically, this offering leverages the ability of inverters to provide power factor correction, helping address feeders with excessive positive or negative reactive power. Excessive reactive power effectively increases the amount of energy that needs to be delivered to meet a fixed demand. By providing customers with an incentive for altering and maintaining settings on their inverter, the PAs are able to deliver value to all ratepayers. Pending an evaluation of this effort, National Grid may introduce this as a regular measure and other PAs may also offer this service to their customers. In the future, this offering could be extended to provide other grid benefits besides power factor correction.

Design and Delivery

Behavioral Savings

As noted above, the specific design and delivery of behavioral savings offerings varies by PA. During the previous term, the PAs explored altering the delivery channel (e.g., email vs paper) and design of behavioral prompts, in an effort to optimize for cost and efficacy. For example, Eversource has moved away from providing behavioral prompts through a third-party provider, instead offering electronic messages implemented in-house. Evaluations and studies documenting attributes of behavioral savings offerings, such as the rate at which savings revert to the mean after treatments cease, help inform evolutions in the design of these offerings. The PAs with behavioral savings offerings will also continue to experiment with cross-promoting other energy efficiency and ADR offerings, drawing on the data required for an effective Behavioral Initiative in order to deliver pertinent, motivating promotions to customers.

Active Demand Reduction

Most customers learn about and enroll the PAs' demand reduction offerings through the device itself. For instance, many customers installing connected thermostats controlling central air conditioning are prompted to sign up for ADR while they are setting up their device or through an email from the thermostat manufacturer. Follow-up messaging can occur through the device itself or through communications from the manufacturer to the customer. The PAs have found this to be an effective means to enroll customers. For storage, most customers will learn about the DR program from their installer while considering installing a solar PV system. Installing solar and storage together allow the customer to access tax benefits and incremental solar incentives. The PAs market outside of these pathways as well to drive additional demand but have found these channels to be most effective.

ADR offerings are implemented through a PA's DERMS. The DERMS provider establishes integrations with the manufacturer of the equipment, or, in the instances of some storage, the system integrator, or operator. This allows

the DERMS to connect directly to customer equipment to reduce demand during peak events, without the customer needing to take any action. While not all manufacturers of equipment in the included end uses are enrolled with the DERMS, in all end uses served, the vast majority of equipment being installed is eligible to participate in the PAs' demand reduction offerings. Since there is a cost associated with adding a manufacturer's devices to the offerings, projected market share of a manufacturer's device is considered in the context of the offering remaining cost effective.

An EV ADR offering, primarily targeting system peaks, can be implemented by sending a dispatch signal through connected electric vehicle supply equipment (EVSE) or directly to the vehicle itself using vehicle telematics. During the previous term, Eversource implemented an EVSE-based approach while National Grid used a telematics-based approach, with the intention of comparing outcomes to design a statewide approach. Eversource and National Grid are in the process of evaluating these two approaches, with the potential of implementing a statewide EV demand reduction offering or offerings by the summer of 2022. Because of the implications of large-scale vehicle electrification, the PAs, individually or collectively, may offer customers other options for shifting EV charging through EV-specific, grid modernization, or other efforts, as well as time-varying rates or pricing. While customers may have more than one choice in EV-charging offerings at a time, customers will not receive duplicate incentives for the single action of charging during off-peak hours.

Strategic Enhancements

Behavioral Savings

As noted above, the PAs will continue to explore how to optimize the effectiveness and cost of Behavioral Savings offerings in the 2022-2024 Plan term. This may include the use of videos, one-click surveys to gather data and include the relevance of information provided and using different messaging for different customers who may be more receptive to different types of prompts. The PAs will continue to refine the use of behavioral channels to effectively move customers to participate in other offerings as well. Further, the PAs will look for opportunities to further integrate different sets of data and experiences, such as the online energy assessment. PAs facing cost-effectiveness challenges will explore alternative approaches, such as leveraging existing engagement platforms and new techniques for quantifying savings.

Active Demand Reduction

During the 2022-2024 term, the PAs will make several key enhancements. First, the PAs will continue to work with DERMS providers to streamline the process for enrolling new equipment manufacturers, ensuring as much of the market as possible is served. Second, the PAs will introduce incremental incentives for the purchase of cost-effective, ADR-capable equipment in end uses that are not yet included in ADR efforts but may be in the future when sufficient scale is reached to support a new end use. Third, for smart thermostat purchases made through the Online Marketplace, the PAs will introduce point-of-sale ADR promotions. At a minimum this will include highlighting ADR incentives to potential customers. The PAs will also explore offering customers the option to pre-enroll their thermostat in ADR offerings, netting the DR incentive from their purchase price, and delivering a thermostat that is already enrolled in ADR when it is installed. Fourth, upon successful demonstration of the cost effectiveness of using customer-owned smart solar inverters to reduce energy use, the PAs will investigate additional system benefits available through customer-owned smart solar inverters. As described in Section 1.3.1, the PAs will continuously consider the addition of new end uses to the pool of supported ADR technologies.

2.11 INCOME ELIGIBLE SECTOR PROGRAMS

2.11.1 INCOME ELIGIBLE EXISTING BUILDINGS PROGRAM

The following figure summarizes the PAs' projected energy savings, program costs, benefits, and cost-effectiveness for the Income Eligible Existing Buildings Program, including both electric and natural gas values.

Figure 2-30: 2022-2024 Planned Performance Summary (Combined Electric and Natural Gas)

Planned Results	Projection
Energy Savings (Net Lifetime MMBTU)	27,123,240
Total Program Costs	\$447,777,477
Total Program Benefits	\$1,044,075,917
Projected Cost Effectiveness (BCR)	2.33

INCOME ELIGIBLE COORDINATED DELIVERY INITIATIVE

Overview

The Income Eligible Coordinated Delivery Initiative provides cost-effective, energy efficiency products and services to income-eligible residential customers in a fuel-blind approach. Income eligible is defined as at or below 60 percent of the state median income level for 1–4-unit buildings and having at least 50 percent of units be at or below 60 percent of the area median income level for 5+ unit buildings. Customers that qualify for the utility discount rate are also considered income eligible. Customers qualify for the utility discount rate by meeting Low-Income Home Energy Assistance (LIHEAP) eligibility or by meeting the eligibility requirements for other means-tested programs, such as Chapter 115 Veterans' Service Benefits, Supplemental Security Income, and Supplemental Nutrition Assistance Program (SNAP) services.

The initiative is administered in coordination with LEAN and implemented by local CAP agencies. The Initiative leverages other sources of funding, including the Massachusetts Department of Housing and Community Development (DHCD), Weatherization Assistance Program (WAP), and the Heating Emergency Assistance Retrofit Task Weatherization Assistance program (HEARTWAP). This approach provides a seamless, integrated experience leveraging all applicable funding sources for income-eligible participants with no co-payments required from customers.

Eligibility

1–4 Unit Buildings

The Income Eligible Coordinated Delivery Initiative serves residential customers living in 1-4 unit dwellings who are at or below 60 percent of the state median income level and/or are qualified to receive fuel assistance and/or utility discount rates.

5+ Unit Buildings

The Income Eligible Coordinated Delivery Initiative also serves properties that have five or more units in which at least 50 percent of the occupants are at or below 60 percent of the area median income level, including properties owned by public housing authorities, non-profit organizations and for-profit organizations. Eligibility for the Initiative measures and services is based on the established cost effectiveness of measures and services, which includes agreed upon non-energy benefit calculations specific to income-eligible populations and is not restricted by the rate class associated with the meter(s) for the facility.

Offerings

Cost-effective measures are provided at no cost to 1–4-unit customers. For qualifying projects with 5+ unit buildings with cost-effective opportunities, the PAs will pay 100 percent of the project cost with established dollar limits where applicable.

The measures available to Income Eligible Coordinated Delivery Initiative customers include:

- Insulation (attic, wall, pipe, and duct).
- Air sealing.
- Heating system repair and replacement, including both like-for-like system replacement (i.e., upgrading to a high-efficiency version of the existing equipment type) and fuel switching measures where appropriate by electric PAs.
- Programmable and Wi-Fi thermostats.
- Domestic water heating, including low-flow showerheads, faucet aerators, pipe wrap, and HPWHs (electric).
- Lighting, including LEDs, lighting fixtures, and torchieres.
- Appliance upgrades, including refrigerator and freezer replacement, second refrigerator removal, advanced power strips, clothes washer replacement, dehumidifier replacement, and 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.
- Some repairs and pre-weatherization barrier remediation required for weatherization (electrical, roofs, etc.).
- Health and safety testing and improvements (combustion safety testing, ventilation, etc.).

In coordination with LEAN, the PAs will work with MTAC to include new measures or technologies as appropriate.

Design and Delivery

Marketing and Customer Acquisition

Customers primarily become eligible for the Income Eligible Coordinated Delivery Initiative because they are enrolled on utility natural gas and electric discount rates or because they are referred to heating assistance programs at local CAP agency locations. The Initiative benefits from a long-standing relationship with the Commonwealth of

Massachusetts Department of Transitional Assistance, with whom the PAs have a data sharing agreement that ensures residents who are enrolled in income-based public benefits programs are automatically enrolled in utility natural gas and electric discount rates. CAP agencies regularly receive lists of single-family customers who are newly enrolled on utility discount rates, and CAP agency staff proactively reach out to customers by phone, email, and mail to inform them of their eligibility for energy efficiency upgrades and to schedule energy assessments.

The PAs, together with LEAN, also leverage relationships with local housing authorities, the MA DHCD, regional Community Development Corporations (CDCs), and private and non-profit affordable housing companies to recruit multifamily customers into the Initiative. PAs also use utility account data, as well as other available data, to target, market to, and recruit additional multifamily customers into the program.

Bearing in mind the continuously changing economic situations for many customers due to the effects of the COVID-19 pandemic, the PAs will also closely monitor the numbers of new customers enrolling in utility discount rates and ensure that they continue to be promptly contacted regarding energy efficiency upgrades. The PAs will work with LEAN and CAP agencies to provide support necessary for additional capacity should it become necessary.

Customer Education

Energy efficiency education and information is provided to all participating customers. The primary form of energy education is verbal communication between the energy specialist and the customer accompanied by leave-behind materials. Educational materials have been translated into 13 languages and will continue to be updated and provided to customers as applicable. Additionally, the CAPs notify all customers verified for fuel assistance of the energy efficiency programs available to them and to encourage enrollment in the program.

The PAs will work in collaboration with the Low-Income Best Practices working group, LEAN, DHCD, LVs (where applicable), and CAP agencies to coordinate statewide on all aspects of the Income Eligible Coordinated Delivery Initiative, including but not limited to planning, delivery, implementation, education, marketing, training, cost effectiveness, evaluation, and QA.

1-4 Units

The PAs will fund 100 percent of the cost of qualified installed measures. All applicable funding sources from each program are leveraged and offered jointly to income-eligible residents to enhance services.

The Initiative is seamlessly offered in conjunction with the current DHCD WAP and HEARTWAP programs. Federal money will primarily be used to address heating system upgrades, health and safety issues, as well as repairs, to allow for energy-efficient measures to be installed safely and cost effectively. PA energy efficiency funds can be used to push for deeper measures on the cost-effective priority list, including approved weatherization-related repairs. As federal support has decreased over recent years, an increasing portion of both repair and energy efficiency measures are covered by the Mass Save energy efficiency budgets.

As mandated by DHCD, all projects that receive DOE funding, must receive CAP agency post-installation QA inspections to ensure that all work is performed to the Initiative's guidelines. The CAP agencies also perform a minimum of 50 percent in-process inspection of projects. Because the PAs' Initiative is run on top of the DHCD program, many weatherization jobs have multiple funding streams with associated requirements; therefore, quality control is completed for both DOE and PA-funded projects at the same time. DHCD Technical Field Monitors perform another level of visual inspection for 20 percent of all DOE-funded projects; 10 percent of these total units also receive a full Quality Control Inspection that includes complete testing on the dwelling. During these inspections, the DHCD

reviews both DOE and PA-funded work. In addition, an independent third-party vendor performs QA inspections on up to five percent of all jobs, whose services are exclusively funded by the PAs.

5+ Units

The Income Eligible Coordinated Delivery Initiative is structured to ensure 5+ unit buildings are provided with a whole building, fully integrated offering that targets both natural gas and electric end uses. Assessments and services for buildings that are going through the refinancing process are be coordinated with relevant stakeholders. Once a property is deemed eligible, an energy assessment is performed by the local CAP agency. The assessment evaluates the building shell, efficiency, and (for electric PAs only), the appliance conditions. All energy assessments include a building health and safety evaluation. The CAP agency then arranges for all applicable measures and services to be installed by a qualified contractor. Savings are deepened by installing additional energy efficiency measures, to the extent the overall project remains cost effective.

Energy efficiency products and services are implemented within the common interior and exterior areas of the building as well as directly within the dwellings of residential customers, benefiting both income-eligible occupants and owners of multi-unit buildings. The PAs will provide up to 100 percent of the funding for cost-effective projects with established limits based on projected savings. All available and applicable revenue streams from each program are leveraged and offered jointly to income-eligible residents.

Innovations Planned for 2022-2024

Innovations Overview

The PAs, in close collaboration with LEAN, plan to build on the historical success of the income-eligible programs by taking steps to further improve and streamline the customer experience and offer more opportunities for greater energy savings for both single and multifamily income-eligible customers, all in an environment that anticipates the continued long-term impact of COVID-19. The innovations planned for the 2022-2024 term include:

1. Increased focus on installing heat pumps.
2. Streamlined income-eligible customer online experience.
3. Increased opportunities for multifamily buildings:
 - a. Customized “All Electric” conversion approach,
 - b. Incentives for greater efficiency in multifamily common area laundry facilities,
 - c. Multifamily remote monitoring and building optimization, and
 - d. Targeted small multifamily engagement strategy.
4. COVID-19 considerations.

Increased Focus on Installing Heat Pumps

Over the last three-year term, the PAs and LEAN saw a decrease in the costs of air-source heat pumps and the development of cost-effective savings in single-family applications for both partial and total displacement of oil, propane, and electric resistance with these technologies. The PAs and LEAN will develop and implement a sustained and coordinated effort to expand cost-effective heat pump adoption among income-eligible customers across building

types. In both single-family and multifamily properties, customers with electric resistance heat will be prioritized, followed by customers with oil heat that are undergoing or have already had their homes weatherized, so as to ensure that heat pump systems are appropriately sized. All heat pumps will be installed in conjunction with home weatherization for homes that have not yet been insulated.

Streamlined Income Eligible Online Experience

The PAs will coordinate with LEAN to improve the consistency of both the customer intake experience and the h HEA experience for income-eligible customers statewide. This will include the launch of a new centralized LEAN single-family intake website to complement the existing multifamily website.³⁸ To guarantee greater language access for income-eligible customers, the website will be provided in the same languages (including Spanish, Portuguese, and English), and the intake phone line will have options in the same languages as the Mass Save hotline (including Spanish, Portuguese, Mandarin, and English). These new resources will provide a centralized, comprehensive, and consistent experience for income-eligible customers statewide. The Mass Save website (www.MassSave.com) is also provided in Spanish, Portuguese, and English. This new resource will provide a centralized, comprehensive, and consistent online experience for income-eligible customers statewide.

Increased Opportunities to Multifamily Buildings

Multifamily buildings have unique savings opportunities, because of differences in technical potential and the nature in which they are managed. Because of the higher available incentives and the possibility of non-energy impacts which can enhance cost effectiveness, income-eligible initiatives are often well suited for testing new opportunities. Depending on the results associated with the efforts below, these opportunities may also be added to the market-rate initiatives.

Customized All Electric Conversion Approach

An emerging submarket of income-eligible multifamily retrofit projects are existing income-eligible buildings that have participated in the Income Eligible Coordinated Delivery Initiative in the past; however, they may now be going through the refinancing process and/or pursuing major renovations more typically seen in the Residential New Buildings program. These projects are integrating the latest high-performance building technologies and are integrating heating system conversion from delivered fuels or natural gas to electric heat with the intent to achieve deeper energy savings. The PAs will work with their partners in LEAN to develop a customized approach within the Income Eligible Multifamily path to identify cost-effective energy savings and serve these customers.

Incentives for Greater Efficiency in Multifamily Common Area Laundry Facilities

The goal of this offering will be to increase the efficiency of common area laundry room equipment in multifamily buildings, an area of the building that is often neglected because ownership and leasing arrangements provide little incentive for industry actors to utilize more efficient commercial equipment. The PAs will research the typical specifics of contract and leasing arrangements for laundry facilities multifamily buildings in Massachusetts to develop an offering that focuses on the business model with the greatest savings impact potential.

³⁸ Existing multifamily website is: www.LEANmultifamily.org.

Multifamily Remote Monitoring and Building Optimization

Many income-eligible multifamily facilities have limited maintenance staff. Connecting these facilities with available technologies to optimize equipment and alert staff to problems can streamline operational efficiencies. There are several products on the market that install sensors in boiler rooms and other key areas of the building that connect to a web platform that allow maintenance staff to monitor and keep their equipment optimized and alerts them to problems with less time and effort, leading to greater long-term energy savings for the building owner.

For the 2022-2024 term, the PAs propose to test the use of these monitoring and optimization products in the income-eligible multifamily market. As a component of participation in a multifamily building retrofit, and to trial this technology, the PAs will consider paying for the annual costs of monitoring systems for three years, which would give time to building staff and owners to develop comfort with their equipment, realize energy savings, and create a longer-term maintenance plan for future years.

Targeted Small Multifamily Engagement Strategy

The PAs plan to increase their engagement of owners of small income-eligible, multifamily properties with the goal of increased participation and therefore benefits to their tenants. Landlords of small multifamily properties have different challenges and resources than larger landlords, who are more likely to have property management staff engaged in operational planning and therefore more likely to be aware of the value proposition offered by energy efficiency program participation. Smaller landlords on the other hand, are more likely to self-manage their properties, and therefore have fewer management resources to dedicate to energy efficiency program participation. This means a targeted effort to better reach small landlords and educate them about the program and its benefits and value proposition, but also potentially offering simplified participation options and processes for small landlords and greater access to technical support.

A key element of this effort will focus on forming partnerships and new outreach avenues in specific municipalities with substantial smaller landlord multifamily building ownership. Some of this work will build on or expand prior efforts to engage with local entities and organizations, while some of it will be new and might include alignment with Municipal & Community Partnership Strategy, to focus on those towns entering into such partnerships in a given year. Many of these efforts will benefit both income-eligible and market-rate properties and residents.

Remote Interactions

During the 2022-2024 term, the PAs plan to work with CAP agencies on developing and improving remote electric assessments (trialed by some CAP agencies during the 2020 program year) and integrate them as a permanent component of the Initiative. This component will be provided as an option for customers who prefer more remote interactions. The PAs and their lead CAP agencies will look for opportunities to further digitize the income-eligible customer journey where possible, as well as minimize in-person interaction for both single and multifamily paths when a site visit is not necessary.

2.12 RESIDENTIAL FINANCING

2.12.1 OVERVIEW

The highly successful Mass Save HEAT Loan offers zero percent interest financing to help customers pay for the installation of qualified energy efficiency technologies. For some customers, raising sufficient capital to pay for their

upfront customer contribution is a barrier to installing energy efficiency. Financing allows these customers to borrow funds without having to also bear the cost of the interest on the loan to invest in energy efficiency. Customers may qualify for loans up to \$25,000 with terms up to seven years, depending on the PA and the loan provider.

2.12.2 RESIDENTIAL FINANCING OFFERING

Eligibility

All PA customers with an active residential account are eligible to apply for a HEAT Loan on qualified measures. HEAT Loans are available for a variety of energy efficiency purchases, including HVAC and envelope improvements. Eligibility criteria and borrowing limits are set for each type of purchase. The PAs work with a network of over 100 participating HEAT Loan lenders. Loan agreements are between the customer and the selected HEAT Loan Lender, and therefore, receipt of a HEAT Loan is contingent upon approval by the selected lender.

Offerings

In addition to HVAC, DHW, and envelope improvements, the HEAT Loan is available to help with the cost of the most prevalent pre-weatherization barriers. It is also available for the installation of residential storage solutions enrolled in the PAs' ADR offerings. The loans are offered at zero percent interest to customers, up to a total of \$25,000, although there are lower limits for specific items. Previous evaluations have established that customers are particularly motivated by the availability of no-interest loans, and that the HEAT Loan motivates many customers to install more efficient items that they would have in the absence of the loan.³⁹

The PAs have paid considerable attention to ensuring reasonable access to the HEAT Loan. In order to increase the number of customers who can successfully take advantage of the HEAT Loan, some PAs are working with the Capital Good Fund, a community development financial institution that focuses on extending responsible credit to customers who may not be approved for loans by traditional lenders. At the same time, the PAs are sensitive to concerns about customers taking on debt that they may not be able to repay. The PAs will continue to look for ways to increase access to the HEAT Loan to customers without encouraging unmanageable debt.

Design and Delivery

As noted above, the HEAT Loan is delivered through a network of over 100 banks, credit unions, and other lenders. This wide array of lenders allows many customers to receive their loan from a local institution or the lender with whom they already do their banking or select a lender that meets their needs for application process or approval timelines. After the eligibility of the measures to be financed has been confirmed, customers apply for a loan from one of these lenders and repay the loan directly to the lender. The process for applying for a HEAT Loan is described in detail on <https://www.masssave.com/en/saving/residential-rebates/heat-loan-program/>.

Customers may learn about the HEAT Loan program a number of different ways. Energy specialists promote the HEAT Loan to customers with an opportunity for an eligible measure identified during the home energy assessment. The

³⁹ Navigant. *HEAT Loan Assessment (RES 37)*, available at: https://ma-eeac.org/wp-content/uploads/MA-RES-37-HEAT-Loan-Evaluation-Report_FINAL_01AUG2018.pdf.

HEAT Loan is particularly attractive to customers financing expensive installations, such as new heating and cooling equipment. For that reason, some HVAC installers promote the availability of the HEAT Loan to their customers. Many lenders promote the HEAT Loan themselves, providing another pathway for customers to enter the PAs' programs.

Any savings or costs associated with installing energy efficiency measures due to availability of the HEAT Loan are included in the initiatives under which the measure was installed, for example, in the RCD Initiative. The PAs arrange for payment to the lender to buy down the interest rate to zero percent to the customer. HEAT Loans are generally administered by the electric PAs, except for instances in which a natural gas PA serves a customer in a municipal electric utility territory, in which case the natural gas PA would offer the loan. The PAs collaborate with the Massachusetts Bankers Association to provide procedures for banks to participate in the Residential Sector programs.

Strategic Enhancements

The increasing prevalence of costly items such as heat pumps and energy storage in the HEAT Loan program have put upward pressure on the program budgets over time. As noted above, previous evaluations have found the HEAT Loan to be an effective tool in motivating customer action and during the 2022-2024 term, the PAs will explore ways to control interest buy-down costs. Third-party evaluations have found the HEAT Loan process to work well for most customers; however, in the interest of always improving their programs, the PAs will also identify opportunities to further simplify the process, from confirmation of eligibility to securing the loan. This could include introducing processes that differ from those described in this section.

2.13 RESIDENTIAL EDUCATION

Overview

Today's K-12 students are tomorrow's energy consumers, innovators, and participants in the energy efficiency workforce. The objective of the Residential Education effort is to offer educational outreach programs and enhanced consumer education that will teach Grades K-12+ students how to be efficient energy consumers. The Residential Education effort increases awareness of the benefits of energy efficiency and its impact on climate and encourage participation in Mass Save programs.

The PAs support educators, students, and families by providing curriculum and materials on energy efficiency, energy conservation, efficient technologies, and related career opportunities. This includes age-appropriate materials at each grade level to encourage learning and fostering an energy-efficient literate society.

Several PAs collaborate to offer energy efficiency curricula and training to Massachusetts educators. Educators receive ongoing support for implementing energy efficiency programming in the classroom. For the 2022-2024 term, curriculum enhancements will include career exploration and training opportunities in energy efficiency, which will be offered to both educators and students. Additional efforts directed at consumers will focus on educating customers on the benefits of investing in energy efficiency products and services available to them through Mass Save programs. Consumer education will be delivered in several languages besides English that are widely spoken across Massachusetts, such as Spanish and Portuguese, and reviewed for cultural relevance.

During the 2022-2024 term, the PAs will focus their outreach to students and families who reside within Environmental Justice communities. This is part of the PAs' continued commitment to serve the state's customers equitably. The PAs plan to offer several workshops to educators and students annually. The PAs will focus on recruiting Environmental Justice communities or underserved school districts to participate in the workshops.

Eligibility

Participation in the Residential Education program is available to all educators, school districts, students, and customers in participating PA territories.

Offerings

The Residential Education program reaches students, CBOs, and educators through a variety of different channels. Educator resources include workshops on the science of energy, introduction to energy efficiency, integrating energy efficiency into other subject areas, insulation and air infiltration, and energy audit tools. Educators are also provided the opportunity to choose kits with materials needed to implement the lessons in their classrooms and learning environments. There is an array of curricula on all aspects of energy that is available to educators to utilize. Educators receive professional development credits (CEUs) for their participation in the program's workshops.

Resources for students include but are not limited to, science fair project ideas, energy information and resources guides, youth award participation, and leadership opportunities. In addition to the resources, some of the PAs utilize hands-on, interactive exhibits and games at community-based events in their service areas to further conduct outreach to K-12 students.

Massachusetts residents have the opportunity to participate in community events, where they can learn about Mass Save programs, as well as ways to save energy. The PAs have also distributed Kill-a-Watt kits (devices that measure how much electricity an appliance or electronic uses) to libraries across the state. Residential customers can check out these Kill-a-Watt devices to learn more about their energy usage at home.

Design and Delivery

Residential energy education offerings are available to educators, students, and families and are provided through Massachusetts K-12 schools. Locations may vary depending upon the specifics of the offering and are available across the state.

Figure 2-31: Professional Development Workshop Images



Due to the COVID-19 pandemic, virtual offerings are now being offered for all professional development workshops. Typically, the PAs support six to eight professional development workshops offered in different parts of Massachusetts to effectively accommodate educators from across the state. These virtual workshops (and when possible again, in-

person workshops) will continue to be offered to all educators in the 2022-2024 term. In addition to school year workshops, the PAs offer a three-day summer workshop to educators who apply to the program and are accepted. Professional development credits are earned, and graduate college credit can be received if teachers do an extra assigned project.

Strategic Enhancements

The PAs are committed to continuous improvement and building upon past success. During the 2022-2024 term, the PAs are considering the deployment of the following strategic enhancements for education offerings:

- **Increased Focus on School Districts with Lower PA Participation.** The PAs will encourage school districts to participate in workshops as a district and not on a teacher-by-teacher basis so that all educators and students receive the same opportunities and programs. Securing buy-in from a district's superintendent and requiring participation in the workshops ensures that all students will receive the same opportunities. In support of the PAs' continued focus on equitable services, outreach will be increased to schools in Environmental Justice communities, as well as those communities identified with lower-than-average historical participation in energy efficiency programs.
- **Training and Career Development Opportunities for High School Students.** The PAs will provide workshops for educators and students to promote and encourage careers in energy efficiency. These workshops will focus on introducing various career opportunities for students and highlight the career pathways and education needed to succeed in these careers.
- **Community Outreach.** The PAs will continue to reach out to customers through various community events and CBOs to encourage participation in the Mass Save programs.
- **Exploring Additional Virtual Pathways.** During the 2022-2024 term, the PAs will continue to offer virtual professional development workshops to give all educators the opportunity to attend these trainings if they cannot participate in person. Additionally, the PAs are exploring other opportunities to add virtual programming where appropriate.

3. COMMERCIAL & INDUSTRIAL SECTOR



SECTION 3: COMMERCIAL & INDUSTRIAL SECTOR

3.1 COMMERCIAL & INDUSTRIAL SECTOR VISION

3.1.1 VISION

For more than two decades, the Massachusetts PAs have been national leaders in designing and implementing award-winning C&I energy efficiency programs and have served as a model for other program administrators throughout the country to emulate. Notably, the PAs pioneered the Small Business turnkey pathway, developed a leading model for combined heat and power (CHP) programming, built one of the largest and most successful Midstream delivery pathways in the country, and most recently, launched a next generation new construction program design that will inevitably become a best-in-class model. Sustaining a similar level of thought leadership and success for the 2022-2024 term will require continued innovation in both program design and deployment.

The vision for the C&I Sector builds upon the PAs' previous accomplishments with a focus on expanding equity and customer engagement across all industry segments, building types and sizes, geographical locations, end uses, and project types. Against a backdrop of diminishing savings opportunities, especially from lighting, and a challenging and uncertain economic climate (especially for small businesses), the PAs will redouble their efforts and focus on the fundamentals that drive program success. This includes increasing the awareness and understanding of the availability and value of energy efficiency, simplifying and streamlining delivery pathways, investing in continuous improvement and portfolio development to expand the range of services available to customers, and building capacity and capability in the energy efficiency market to help customers realize the value of those services. Ensuring that all C&I customers, large or small, participate in energy efficiency programs is a strong component of the PAs' vision for the sector in the upcoming term. To implement this strategy, the PAs will explore partnerships with diverse business and commerce groups and will target Main Streets programming for Environmental Justice communities.

As the lighting market has matured, the PAs will look toward the decarbonization of buildings to drive transformation and innovation in the marketplace. To implement this vision, the PAs will deploy a number of strategies to accelerate the pace of space and water heating electrification in the short term, while laying the groundwork for larger market transformation shifts in the future. These strategies will include the pairing of incentives with customer education and contractor training alongside workforce development investments. Additionally, the PAs will look to significantly ramp up their Small Commercial Heat Pump offering.

For most business customers, energy efficiency is simply not a priority with energy costs typically representing a very small percentage of operating costs. In the face of this barrier to participation, the PAs must invest in building awareness through marketing, education, and outreach to highlight both the availability and value of energy efficiency improvements in commercial buildings and industrial facilities. While increasing awareness is an important area of focus, the PAs will also increase their efforts to help customers understand the participation options available and to simplify the pathways through which customers can avail themselves of those opportunities in a way that best suits their needs, priorities, and decision-making criteria. More generally, the PAs will strive to provide each customer with the right offer(s) at the right time to effectuate the maximum benefits—in terms of energy savings, cost reductions, and operational efficiencies—for that customer based on their individual circumstances and business needs.

The PAs fully recognize the ambitious nature of this vision. However, providing energy efficiency opportunities that benefit all customers is a fundamental guiding principle of their mission and purpose and the offerings described in this Plan detail how the PAs will deliver on this vision for all their C&I customers throughout the 2022-2024 term.

3.2 COMPARISON TO 2019-2021 PLAN

To successfully achieve the goals and outcomes described above, the PAs have identified the following six strategic interventions for the C&I Sector:

- **Equity.** The PAs will use new techniques and enhanced targeting efforts to reach the small business community, a market segment with historically less participation than C&I customers as a whole. The PAs will build upon their previous efforts to increase small business participation with an increased focus on equity during the 2022-2024 term.
- **Workforce development.** With demand for energy efficiency services exceeding capacity of the existing workforce and buildings and building systems becoming increasingly complex, the PAs will expand efforts to grow, diversify and improve the workforce in Massachusetts. New efforts will include special focus on diversity, equity, and inclusion by drawing under-represented groups into the energy efficiency workforce.
- **Awareness, understanding, and accessibility.** The PAs will increase efforts to facilitate greater participation through a variety of activities intended to overcome informational and organization barriers. For the 2022-2024 term, the PAs will focus on providing more outreach and education, increasing access to information about efficiency opportunities, and simplifying and streamlining the participation process.
- **Technical assistance and tools.** For many years, the PAs have offered technical assistance through trade allies and engineering and implementation vendors, and connected C&I customers with a network of independent energy advisors. For the 2022-2024 term, the PAs will expand upon these efforts by developing custom express calculator tools and providing a comprehensive savings assessment tool to identify opportunities in small businesses. Through these and similar efforts, the PAs anticipate increased energy savings and reduced program costs.
- **Advancing electrification.** The PAs believe energy efficiency is and will continue to be a major contributor to the Commonwealth's efforts to reduce GHG emissions. In addition to ongoing efforts to promote greater efficiency in newly constructed buildings, the PAs will also increase efforts to efficiently and cost effectively electrify existing buildings with an additional focus on increasing weatherization as an enabler of electrification.
- **Continuous improvement and portfolio expansion.** As the C&I Sector programs continue to mature, the available savings opportunities are dwindling. For the 2022-2024 term, the PAs will systematically investigate and develop new savings opportunities for inclusion in the C&I Sector portfolio.

The figure below shows how these strategic interventions will be applied to help the PAs meet their C&I Sector goals for the 2022-2024 term and is a significant shift in implementation from previous three-year plans.

Figure 3-1: C&I Sector Map of Goals to Intervention Strategies for 2022-2024 Plan

Goal	Equity	Workforce Development	Awareness, Understanding & Accessibility	Technical Assistance & Tools	Advancing Electrification	Continuous Improvement & Portfolio Expansion
Save energy and reduce demand	X	X	X	X	X	X
Increase participation	X		X	X	X	X
Increase comprehensiveness	X			X	X	
Reduce program costs				X		X
Increase awareness and understanding			X	X		
Simplify and streamline	X		X	X		
Increase capacity and capability		X				

3.4 KEY LEARNINGS

- Evaluation Measurement & Verification (EM&V) reports and other studies commissioned by the PAs were integral in determining where to focus resources and activity for the next three-year period. The following learnings from these various studies had a particular impact in shaping the C&I Sectors' goals, objectives, and offerings for the 2022-2024 term.
- Currently, Massachusetts is experiencing a tight labor market for energy efficiency professionals as job openings exceed the supply of workers. Employers are having particular difficulty in hiring workers for the vocational trades and building operators and facility management technicians with interdisciplinary knowledge are in short supply..⁴⁰
- In the C&I electric portfolio, medium-sized businesses had a contribution ratio below 1 suggesting these businesses are underrepresented in the C&I electric savings portfolio. In the C&I natural gas portfolio, small and microbusinesses also had contribution ratios below 1..⁴¹
- Greater measure comprehensiveness, or the diversity of end uses in an industry segment, leads to higher overall energy savings when participation is held constant..⁴²

⁴⁰ See Workforce Development Study.

⁴¹ See Customer Profile Study.

⁴² See Customer Profile Study.

- From 2013-2018, participation in energy efficiency programs was not equally distributed across the state. Rural areas participated at lower levels and achieved less savings as a percentage of energy used when compared to the state's urban and suburban areas..⁴³
- Microbusinesses are commercial entities that annually use less than 110 MWh or less than 8,000 therms. While microbusinesses participate at lower rates and achieve less savings than other business segments, the PAs noted when reviewing microbusiness locations that the C&I natural gas portfolio has served over half of the microbusiness locations from 2012 to 2017..⁴⁴
- Manufacturing, retail trade, and professional services are the C&I market segments that use the largest amount of electricity while the healthcare, educational services, and retail trade segments have the highest account participation rates..⁴⁵
- Manufacturing, educational services, and real estate leasing are the largest users of natural gas in Massachusetts, while educational services, accommodations/food services, and recreation have the highest account participation rates..⁴⁶
- For the C&I electric portfolio, the Custom pathway represents 9 percent of projects but 45 percent of savings and the Prescriptive pathway accounts for 59 percent of projects but only 31 percent of savings. The Midstream pathway makes up the remaining 32 percent and 24 percent of projects and savings, respectively..⁴⁷
- For the C&I natural gas portfolio, the Custom pathway represents 30 percent of projects but 69 percent of savings and the Prescriptive pathway accounts for 40 percent of projects but only 15 percent of savings. The Midstream pathway makes up the remaining 30 percent and 16 percent of projects and savings, respectively..⁴⁸

During the 2022-2024 term, the PAs will increase their efforts to facilitate greater participation through a variety of activities intended to overcome informational and organizational barriers. Providing more outreach and education, increasing access to information about efficiency opportunities, and simplifying and streamlining the participation process will be key areas of emphasis.

⁴³ See Customer Profile Study.

⁴⁴ See C&I Small Business Non-Participant Study.

⁴⁵ See Customer Level Database.

⁴⁶ See Customer Level Database.

⁴⁷ See Customer Level Database.

⁴⁸ Customer Level Database.

3.5 C&I GOALS, BUDGETS, GHG EMISSIONS REDUCTIONS AND BENEFITS

3.5.1 GOALS

The PAs develop energy and demand savings goals, budgets, and cost-effectiveness forecasts that represent best estimates to realize their vision for the C&I Sector. This section provides the aggregate, statewide values for the C&I Sector programs for the 2022-2024 term (information for individual PAs can be found in Appendix A. The key savings metrics for measuring success of these programs are:

- Net lifetime MMBtus savings at site from all fuel sources (excluding MMBtus associated with combined heat and power, and ADR efforts), and net lifetime MMBtus savings at source from CHP. Statewide MMBtus are expressed as adjusted MMBtus to reflect the MMBtu savings from energy efficiency and combined heat and power measures.
- Demand savings (kW) for electric PAs.
- Net lifetime electric savings (MWh) for the electric PAs (excluding fuel conversions and ADR efforts).
- Net lifetime gas savings (therms) for the natural gas PAs.

KEY METRICS

As part of their three-year planning process, the PAs must develop energy and demand savings goals, budgets, cost-effectiveness models, and cost-efficiency forecasts that represent their best estimates to realize their vision for the C&I Sector. Additionally, as set forth in the Acts of 2021, c. 8, § 106, the EEA Secretary will set a GHG reduction goal for the 2022-2024 Plan by July 15, 2021.

The PAs will need to meet multiple objectives and outcomes for the C&I Sector, including meeting electric savings, natural gas savings, demand reduction, and GHG reduction goals. The programs also yield considerable non-energy-related benefits, such as improved health outcomes. These different types of value are all converted into dollars as a common denominator and summed as benefits. A summary of the PAs' best estimates for spending, savings, GHG reductions, and benefits for the C&I Sector is provided in the following figures.

Figure 3-2: C&I Budgets, Savings, GHG Emission Reductions, and Benefits (Combined Natural Gas & Electric)

	2022	2023	2024	2022-2024
Total Statewide Budget	\$328,774,929	\$302,250,909	\$295,473,631	\$926,499,470
Net Annual All-Fuel MMBtu Savings	3,350,010	2,869,228	2,621,127	8,840,365
Net Lifetime All-Fuel MMBtu Savings	35,263,213	29,089,044	26,061,578	90,413,835
Annual GHG Emissions Reductions (Metric Tons CO₂e)	625,948	597,658	577,513	1,801,119
Total Benefits	\$922,917,056	\$774,931,598	\$707,818,139	\$2,405,666,793

Figure 3-3: C&I Budgets, Savings, GHG Emission Reductions, and Benefits (Electric)

	2022	2023	2024	2022-2024
Total Statewide Budget	\$275,822,112	\$248,987,620	\$240,427,622	\$765,237,354
Net Annual All-Fuel MMBtu Savings	2,560,777	2,087,864	1,850,618	6,499,260
Net Lifetime All-Fuel MMBtu Savings	23,515,079	17,457,020	14,608,579	55,580,678
Annual GHG Emissions Reductions (Metric Tons CO₂e)	80,805	58,107	45,492	184,404
Total Benefits	\$706,138,279	\$558,944,594	\$493,511,210	\$1,758,594,082

Figure 3-4: C&I Budgets, Savings, GHG Emission Reductions, and Benefits (Natural Gas)

	2022	2023	2024	2022-2024
Total Statewide Budget	\$52,952,817	\$53,263,289	\$55,046,009	\$161,262,116
Net Annual All-Fuel MMBtu Savings	789,233	781,364	770,509	2,341,106
Net Lifetime All-Fuel MMBtu Savings	11,748,133	11,632,023	11,453,000	34,833,157
Annual GHG Emissions Reductions (Metric Tons CO₂e)	545,143	539,551	532,021	1,616,715
Total Benefits	\$216,778,778	\$215,987,004	\$214,306,929	\$647,072,711

3.5.2 BUDGETS

BUDGET SUMMARY BY YEAR

The following figures summarize the expected levels of spending by cost category required to achieve the PAs' savings goals and other objectives for the C&I Sector.

Figure 3-5: C&I Sector Budget Summary

Program Budgets (\$M)	2022	2023	2024	2022-2024
Participant Incentives	\$241	\$215	\$208	\$665
Sales, Technical Assistance & Training	\$56	\$56	\$56	\$169
Program Planning & Administration	\$14	\$13	\$13	\$40
Marketing & Advertising	\$7	\$7	\$7	\$20
Evaluation & Market Research	\$11	\$11	\$11	\$32
Total Planned Spending	\$329	\$302	\$295	\$926

3.5.3 COST EFFECTIVENESS AND EFFICIENCY

The PAs conducted a cost-effectiveness analysis of the proposed C&I Sector portfolio using the AESC Study to determine avoided costs. The PAs will strive to meet the cost effectiveness and efficiency projections for the C&I Sector; however, they acknowledge that potential market changes will influence the final outcome. In addition to producing cost-effective energy savings and demand reductions, the C&I Sector is also projected to produce considerable environmental benefits in the form of reductions in GHG emissions, helping the Commonwealth meet its decarbonization goals.

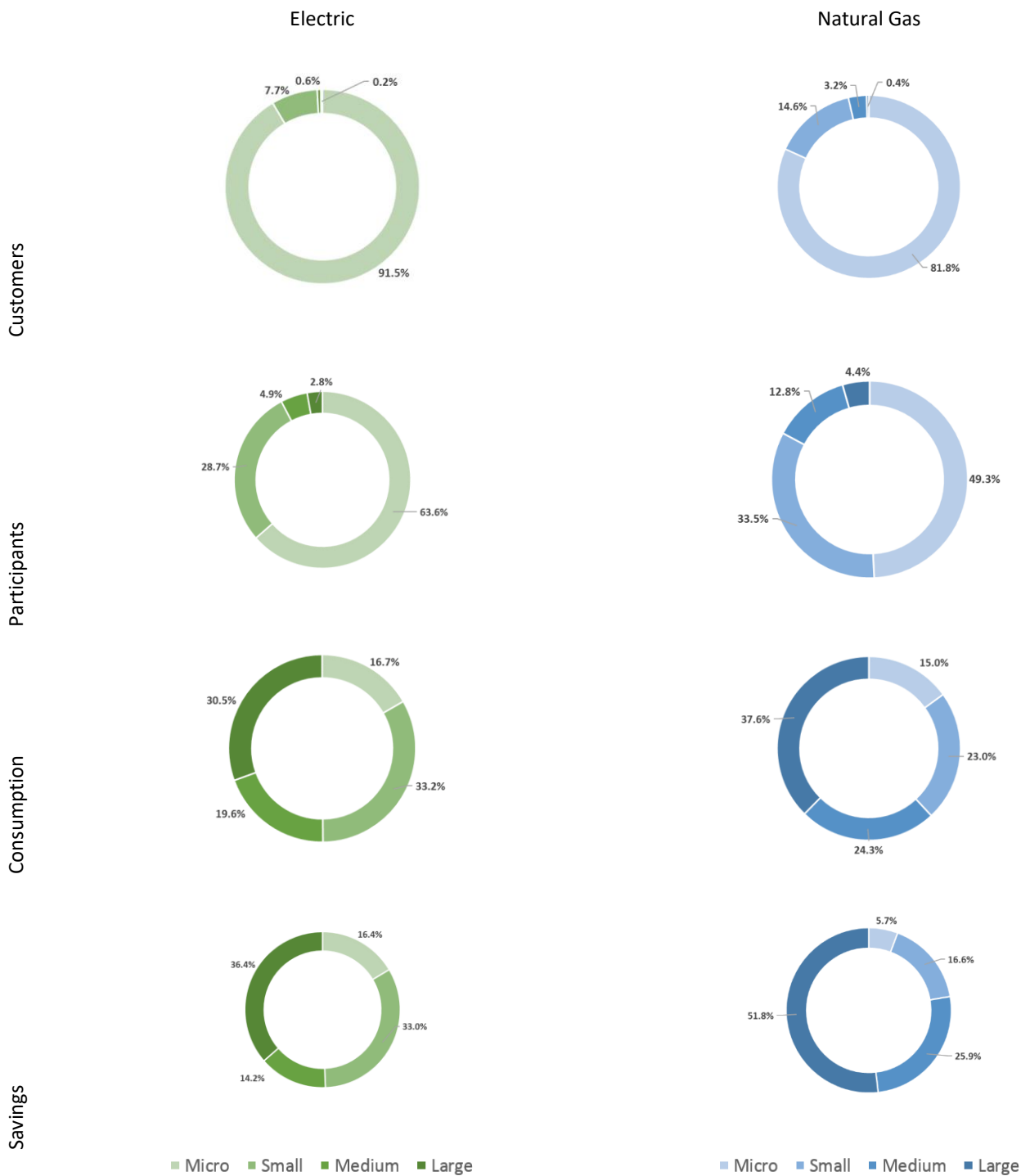
3.6 COMMERCIAL & INDUSTRIAL SECTOR OVERVIEW

There are roughly 350,000 and 150,000 electric and natural gas C&I customers, respectively, served by the PAs in Massachusetts. These customers span a wide array of sizes and industry segments. The PAs define C&I customer size based on annual consumption levels, consistent with the *C&I Customer Profile Study*. Annual consumption is a useful basis for categorization because it is a reasonable proxy for and is indicative of savings potential. The figure below summarizes the size ranges used by the PAs to categorize C&I customers.

Figure 3-6: C&I Customer Sizes by Annual Consumption

Customer Size	Annual Electricity Usage	Annual Natural Gas Usage
Microbusiness	Less than 0.11 GWh	Less than 8,000 Therms
Small Business	0.11 – 1.5 GWh	8,000 – 40,000 Therms
Medium Business	1.5 – 4.5 GWh	40,000 – 250,000 Therms
Large Business	Greater than 4.5 GWh	Greater than 250,000 Therms

Figure 3-7: C&I Customers, Participants, Consumption, and Savings by Customer Size⁴⁹



⁴⁹ See 2018 C&I Customer Profile Study.

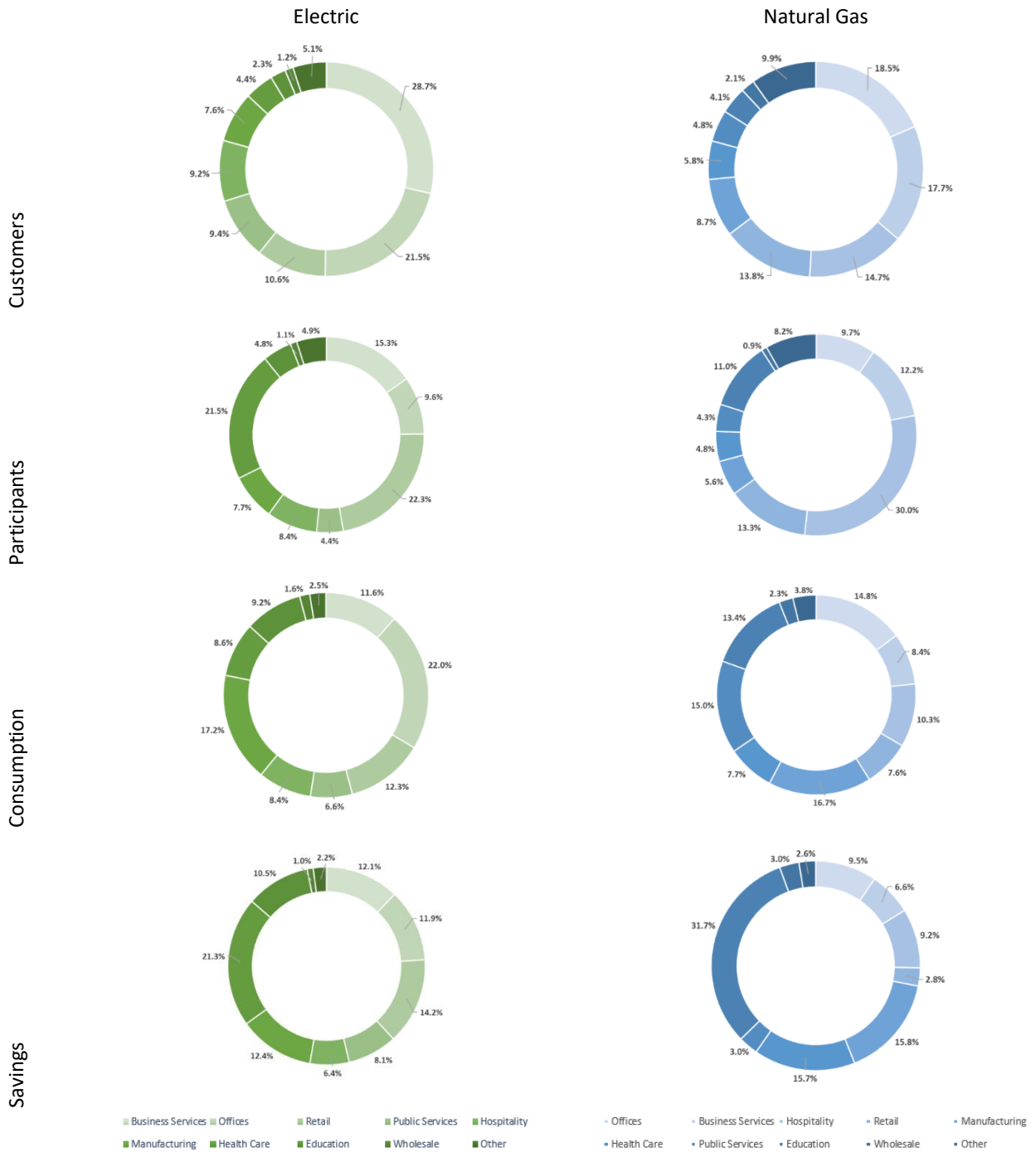
Based on these parameters, over 90 percent of the PAs' electric and natural gas C&I customers are characterized as microbusinesses or small businesses. Conversely, less than 1 percent of the PAs' electric and natural gas customers are characterized as a large business; however, they represent over 35 percent and over 50 percent of electric and natural gas savings, respectively. This is due in part to large businesses having much greater consumption and therefore savings opportunities. Additionally, larger customers typically have greater financial resources as well as staff resources and expertise to support the identification of and investment in energy efficiency opportunities. In addition to more limited opportunities and resources, smaller customers are also more sensitive to financial paybacks and more focused on avoiding investments that impinge on cash flows.

In addition to encompassing a wide variety of sizes, C&I customers also span a wide array of industry segments, each with its own typical facility design and infrastructure, business needs, budgeting processes, and decision-making criteria. The figure below provides a listing of the customers served (by market segment) through the C&I Sector's programs.

Figure 3-8: C&I Customers by Market Segment

Segment	Customer Types
Business Services	<ul style="list-style-type: none"> Professional, scientific, and technical services
Education	<ul style="list-style-type: none"> Colleges and universities K-12 schools
Health Care	<ul style="list-style-type: none"> Hospitals Medical offices and clinics Nursing and residential care facilities
Hospitality	<ul style="list-style-type: none"> Arts, entertainment, and recreation Food services and drinking places Lodging
Manufacturing	<ul style="list-style-type: none"> Manufacturing Chemicals, minerals and petroleum Construction Utilities Agriculture, forestry, fishing and hunting
Offices	<ul style="list-style-type: none"> Finance and insurance Information Real estate and rental/leasing Transportation and warehousing
Public Services	<ul style="list-style-type: none"> Local, state, and federal government Wastewater and water treatment
Retail	<ul style="list-style-type: none"> Clothing stores Electronics and appliance stores Food and beverage stores Sporting goods, hobby, books, and music stores
Wholesale	<ul style="list-style-type: none"> Wholesale trade
Other	<ul style="list-style-type: none"> Other services (excludes public administration)

Figure 3-9: C&I Customers, Participants, Consumption, and Savings by Customer Segment⁵⁰



⁵⁰ See 2018 C&I Customer Profile Study.

Figure 3-10: Billing Data, 2011-2018, Number of Unique Accounts from C&I Customer Profile (Electric PAs)

Electric PA	2013	2014	2015	2016	2017	2018	2019
Cape Light Compact	25,661	25,909	26,069	25,842	25,535	26,829	26,665
Eversource	162,688	117,462	145,989	170,830	171,586	172,653	173,146
National Grid	158,306	168,548	177,996	179,742	181,765	171,575	178,654
Unitil	3,706	3,529	3,765	3,667	4,081	3,891	4,025
Statewide Total	350,361	315,448	353,819	380,081	382,967	374,948	382,490

Figure 3-11: Billing Data, 2011-2018, Number of Unique Accounts from C&I Customer Profile (Natural Gas PAs)

Natural Gas PA	2013	2014	2015	2016	2017	2018	2019
Berkshire	4,661	5,277	5,307	5,328	5,380	5,372	5,649
Columbia	39,397	34,137	23,917	34,332	35,502	34,736	34,993
Eversource	28,365	27,009	26,108	30,246	30,187	30,843	30,595
Liberty	4,186	3,993	4,127	3,976	4,462	4,410	4,459
National Grid	71,142	73,395	77,531	78,174	78,730	79,118	79,595
Unitil	1,333	1,668	1,663	1,687	1,749	1,744	1,974
Statewide Total	149,084	145,479	138,653	153,743	156,010	156,223	157,265

Figure 3-12: Annual Consumption Electric (MWh) from the C&I Customer Profile

Electric PA	2013	2014	2015	2016	2017	2018	2019
Cape Light Compact	909,163	903,607	808,110	851,558	838,320	923,446	791,034
Eversource	16,191,031	14,753,423	14,563,785	15,817,829	15,454,060	15,696,509	14,340,957
National Grid	12,314,825	12,191,982	12,260,878	11,735,509	11,362,904	11,069,174	10,442,903
Unitil	283,900	254,320	387,932	255,999	257,343	260,393	194,829
Statewide Total	29,698,919	28,103,332	28,020,706	28,660,895	27,912,627	27,949,522	25,769,723

Figure 3-13: Annual Consumption Natural Gas (dekatherms) from the C&I Customer Profile

Natural Gas PA	2013	2014	2015	2016	2017	2018	2019
Berkshire	39,552	40,226	42,689	37,714	42,298	46,793	40,948
Columbia	259,012	234,992	197,155	300,365	345,532	332,954	290,761
Eversource	357,648	480,146	453,889	424,923	473,171	488,870	488,235
Liberty	27,899	31,074	31,183	26,007	24,714	27,821	25,938
National Grid	533,141	678,622	687,638	643,960	632,542	700,519	696,052
Unitil	13,935	14,614	14,988	15,022	14,289	15,663	21,008
Statewide Total	1,231,188	1,479,673	1,427,543	1,447,991	1,532,545	1,612,620	1,562,943

Figure 3-14: Population Size and Electric Savings, from the C&I Customer Profile

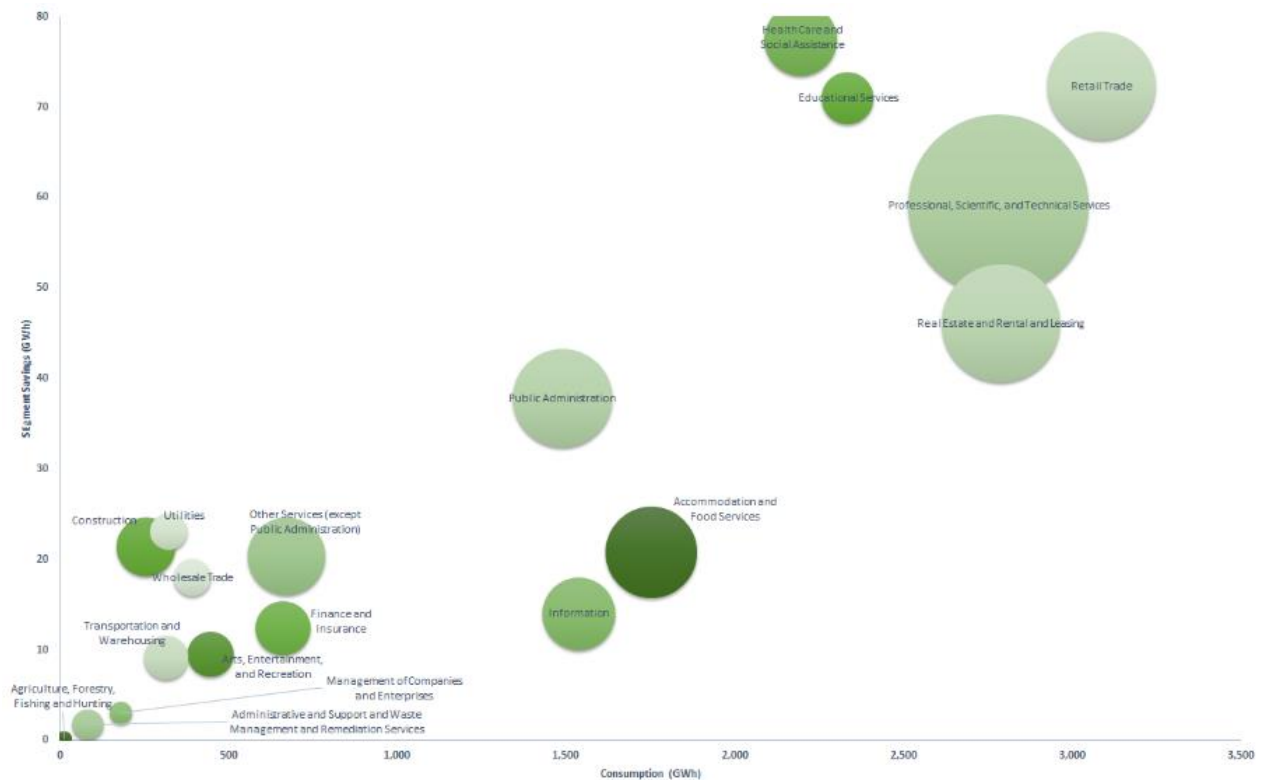
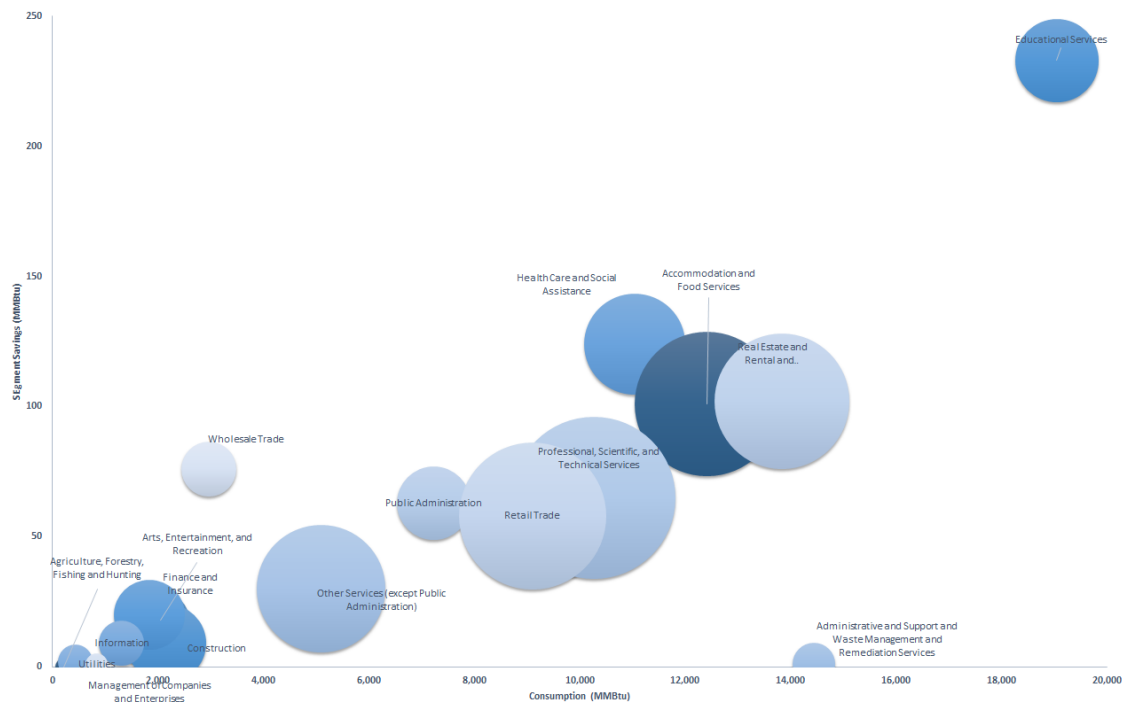


Figure 3-15: Population Size and Natural Gas Savings, from the C&I Customer Profile



3.7 COMMERCIAL & INDUSTRIAL SECTOR OFFERINGS

For the C&I Sector, the PAs have developed a diverse portfolio to effectively serve the many sizes and segments of customers. The C&I Sector has several participation pathways that enable the individual customer to be served in a manner most consistent with their needs and preferences, no matter how simple or complex the project they are undertaking.

3.7.1 MIDSTREAM PATHWAY

The Midstream pathway employs a point-of-sale approach in which the PAs collaborate directly with distributors of high-efficiency lighting, HVAC, water heating, and food service equipment. The PAs provide incentives to distributors to motivate them to stock, promote, and sell high-efficiency products and to provide retail price discounts to motivate customers or their contractors to purchase more efficient products than they would otherwise. By working with distributors at an important juncture in the supply chain, the Midstream pathway provides an incredibly scalable means by which to influence thousands of transactions cost efficiently.

3.7.2 DOWNSTREAM (PRESCRIPTIVE) PATHWAY

The Downstream pathway employs a prescriptive equipment-based approach where the PAs, or their vendors and trade ally partners, work directly with customers to identify, promote, and incentivize investments in energy-efficient products and equipment including lighting, furnaces, boilers, heat pumps, rooftop air conditioners, water heaters, motors and drives, process equipment, building optimization and controls products, and pumps. Incentives, which are

typically offered on a per unit basis (e.g., dollar per fixture, dollar per heat pump, etc.) are calibrated to mitigate some or most of the incremental cost of the more energy-efficient equipment relative to standard efficiency alternatives. By working directly with customers in the Downstream pathway, the PAs have the opportunity to inform the customer of the various efficient options available and guide them through the process of determining which option best meets their technical needs and financial criteria.

Figure 3-16: C&I Participation Pathways

Pathway	Midstream	Downstream (prescriptive)	Custom
Approach	Point-of-sale	Equipment based	Project based
Project Types	Retrofit, replace on failure, and new equipment	Retrofit, replace, on failure	Retrofit
Scalability	High	Medium	Low
Transaction Costs	Low	Medium	High
End Uses Available	Lighting, HVAC, gas water heating, food service, pumps	Almost All (exc. Combined Heat & Power, food service, true new construction)	All
Eligibility	Active Massachusetts C&I Account	Active Massachusetts C&I Account	Active Massachusetts C&I Account and more complex than one-for-one replacement
Target Market	<ul style="list-style-type: none"> Small C&I customers Large C&I customers with small retrofit projects 	<ul style="list-style-type: none"> Medium/Large C&I customers with equipment upgrade projects 	<ul style="list-style-type: none"> Large customers and projects, including new construction and major renovation
Process Mechanics	<ul style="list-style-type: none"> Incentive paid directly to distributor and distributor applies customer incentive as a line item on the invoice No paperwork required of customer or customer agent 	<ul style="list-style-type: none"> Incentive paid directly to customer or designee Incentive application (PDF, web) completed and submitted by customer or representative 	<ul style="list-style-type: none"> Incentive paid directly to customer or designee Incentive application completed, along with engineering calculations and analysis, submitted by customer
Incentive Strategy	<ul style="list-style-type: none"> Incentive designed to motivate distributors to stock, promote, and sell energy-efficient products 	<ul style="list-style-type: none"> Incentive calibrated to mitigate some or most of the incremental cost energy-efficient equipment relative to standard efficiency alternatives 	<ul style="list-style-type: none"> Incentive calibrated to motivate customer action in consideration of customer economics (e.g., payback, Return on Investment (ROI), Net Present Value (NPV), etc.)
Incentive Structure	Incentives for each product as \$ per unit (i.e., Horsepower (HP), Ton, etc.)	Incentive for each product as \$ per Unit (i.e., HP, Ton, etc.)	Dollar per unit of savings incentive based on project-specific savings and economics
Savings Methodology	Deemed	Deemed formula	Project-specific based on technical/engineering analysis

3.7.3 CUSTOM PATHWAY

The Custom pathway employs a project-based approach where the PAs, or their vendors and trade ally partners, work directly with customers to identify, promote, analyze, and incentivize investments in customer and/or site-specific investments in energy efficiency across all energy end uses and equipment and system types. Incentives are project specific and calibrated based on the specific needs and criteria of the customer and the project being considered. In the Custom pathway, the PAs provide financial support for a technical or engineering analysis of the opportunity and rely heavily on the results of that analysis to understand the economics of the project and calibrate the incentives. By working directly with customers in the Custom pathway, including providing both technical and financial support, the PAs are able to effectively serve the needs of customers contemplating large, complex, often system- or whole building-based projects in such a way as to maximize the energy savings achieved subject to the customers' needs and financial criteria.

In addition to the Midstream, Downstream (prescriptive), and Custom pathways the PAs also have a turnkey pathway that is exclusively for eligible small business customers (defined as having annual usage of under 1.5 million kWh and/or 40,000 therms). The Turnkey pathway involves direct-install services provided by PA-contracted lead vendors. These vendors directly engage small business customers to identify the complete array of potential electric or natural gas savings opportunities and then carry out installation of the measures chosen by the customer.

3.8 COMMERCIAL & INDUSTRIAL SECTOR CHALLENGES

In addition to considering the various policy, market, and technology trends in the development of the 2022-2024 Plan, the PAs are also aware of and considered the various barriers to energy efficiency. Because of the variety of C&I customers in Massachusetts the existence or extent of these barriers can vary greatly based on industry segment, customer size, and other factors. Examples of the barriers include informational, organizational, operational, and economic, and are further detailed below.

3.8.1 INFORMATIONAL CHALLENGES

Informational barriers result from a lack of information or expertise and can stall or even prevent projects from being identified or started. Examples of informational barriers include:

- **In-house technical expertise.** Identifying energy efficiency opportunities requires a level of specialized knowledge that often does not exist in many businesses, particularly smaller enterprises.
- **Awareness of available resources.** Many business owners are unaware of or do not sufficiently understand the variety of federal, state, and other financial or technical resources that are available to support energy efficiency investments.
- **Valuation of investments in energy efficiency.** Business customers may not understand the value of actions taken and investments made in energy efficiency and thus may perceive those investments as being more risky and less valuable.

3.8.2 ORGANIZATIONAL CHALLENGES

Organizational barriers emerge due to the structure, culture, capacity, and behavior of a business. Examples of organizational barriers include:

- **Capability and capacity.** Many businesses simply lack sufficient staff with the knowledge or time necessary to identify and act upon the energy efficiency opportunities available in business processes, systems, and buildings.
- **Split Incentives.** Roughly 50 percent of commercial buildings and floorspace are occupied by someone other than the building owner; however, over 80 percent of building owners are responsible for energy-related equipment purchases and O&M of the energy systems in their buildings. When customers rent property (thus not responsible for or authorized to make capital investments), the benefits of energy efficiency investments do not accrue to the person or entity with the authority to make those investments thereby complicating the decision-making process.
- **Multiple decision makers.** Many capital investments decisions, particularly those requiring non-trivial changes to the infrastructure of a building, require the involvement and approval of multiple levels of decision makers, who each have their own perspectives and criteria for judging the efficacy of those investments. This can greatly delay or even prevent investments in energy efficiency.

3.8.3 OPERATIONAL CHALLENGES

Operational barriers refer to impediments to energy efficiency due to conflicts with the everyday operations of a business. Examples of operational barriers include:

- **Competing business priorities.** For many C&I customers, energy efficiency opportunities must compete for both attention and funding with a wide array of alternative priorities. These competing priorities can vary widely by industry type, building type, and size. Small business customers, in which the business owner is often the sole decision maker for energy efficiency investments, lack the time or expertise to understand and assess the available options and are likely to prioritize investments that improve revenue and thus cash flow. In some industries, such as health care or technology manufacturing, continuity of operations is critical and thus requires that installation of energy efficiency measures be completed with minimal, if any, disruption. In the hospitality industry, customer comfort and satisfaction are the number one priority and will always supersede investments in energy efficiency.

3.8.4 ECONOMIC CHALLENGES

Economic barriers can prevent an energy efficiency project from getting off the ground due to high upfront costs or demanding customer payback requirements. Examples of financial barriers include:

- **Internal competition for capital.** Investments required to upgrade equipment, provide energy management training to staff, or hire outside consultants to provide energy are all often subordinate to other corporate priorities. In the healthcare industry, hospitals must make large investments to remain in compliance with strict regulatory requirements.

- **Investment and payback criteria.** Many C&I customers require investment paybacks of less than three years making many energy efficiency projects difficult to justify. Commercial real estate customers, for example, can have a very short investment horizon because they often do not hold onto properties for long-term periods.
- **Energy prices.** Low commodity prices reduce the value of the reductions in energy usage that result from energy efficiency investments and volatile prices create uncertainty about the likely financial benefits of those investments.

3.9 COMMERCIAL & INDUSTRIAL SECTOR STRATEGIC INTERVENTIONS

The PAs have a long and successful history of providing a diverse range of energy efficiency offerings to their C&I customers. As the C&I Sector in Massachusetts evolves along with the energy efficiency technological and policy landscape, the PAs have identified the following strategic interventions as keys to successfully achieving their proposed goals.

3.9.1 STRATEGIC INTERVENTION: EQUITY

As discussed in Section 1, in planning for the 2020-2024 term, the PAs have participated in various efforts to review and address issues around equity in their offerings. Some of these tactics have been developed, while others are still being developed with an eye toward engagement with customers and trade allies to encourage them to install energy-efficient measures and participate in the C&I Sector programs.

To address equity, the PAs will focus their efforts on small businesses with a particular focus on microbusinesses, which often are locally owned and operated, and many of these “Main Street” commercial enterprises have been particularly affected by the pandemic. In addition to juggling many roles within a small business, the owners and/or general managers have had to continuously adapt their businesses to new models and changing economic conditions. The PAs are dedicated to efforts that will increase energy efficiency measures within these small businesses, which will in turn help to control some costs for the business itself.

Figure 3-17: Key Findings from Non-Participant Studies (C&I Sector)

Finding	Explanation
Microbusinesses have consistent patterns of lower population savings and account participation rates than other small and non-small businesses.	Microbusiness electric accounts had considerably lower population savings achieved (PSA) metrics than small business electric accounts. Microbusiness participation continues to increase, largely due to the upstream pathways. In 2017, there was a ~70% difference in PSA between microbusinesses (1.07%) and small/non-small businesses (1.82% and 1.81%, respectively). Microbusiness participation rates have also remained 10% to 13% below small business participation rates.
While microbusiness participation rates are relatively low at the account level, viewing participation at the location level reveals that over half of natural gas microbusiness locations have been served over the analysis period.	From 2012-2017, for microbusiness gas accounts, location participation was 53% and current account participation was 6.6%. For small gas accounts, location participation was 65.3% and current account participation was 22.7%. For microbusiness electric accounts, location participation was 34% and current account participation was 8.9% between 2012-2017. For small electric accounts, location participation was 70.1% and current account participation was 44.1%.
Upstream lighting initiatives have driven a substantial increase in the number of microbusiness participants over the analysis period, but other initiatives, especially turnkey, provided deeper savings for participants and the population as a whole.	From 2012-2017, turnkey microbusiness participants decreased by 34.5%, while upstream lighting microbusiness participants increased by 1,384.5%. Upstream lighting provided the second-highest GWh savings every year in the analysis period.
While seasonal microbusinesses have lower participation rates than non-seasonal microbusinesses, they do have higher population savings achieved.	Electric microbusinesses have the most seasonal accounts of any size group. In 2017, seasonal accounts made up 7.74% of the microbusiness population and about 5% of total microbusiness consumption. Results show that microbusiness seasonal accounts participate least often compared to non-seasonal microbusiness accounts, small seasonal accounts, and non-small seasonal accounts. Within microbusiness, non-seasonal account participation is higher than seasonal account participation, but seasonal microbusinesses have higher PSA than non-seasonal (1.42% compared to 1.30%). This is the case for all electric PAs, including Cape Light Compact, which has the highest proportion of seasonal microbusiness accounts.

Small businesses have a number of constraints, including awareness, time, and capital costs. Awareness is key to increasing small business participation in energy efficiency, and the PAs are dedicated to increasing awareness through the addition of newly-translated materials, materials focused on renter-landlord efforts, and door-to-door efforts through the PAs' Main Streets deployments in Environmental Justice communities. Main Streets efforts often include microbusinesses that typically rent their spaces, and these are keys to addressing equity. The Main Streets offering also has the benefit of providing proactive outreach to businesses rather than relying on them to initiate the service, thereby reducing time constraints. Main Streets also generally provides a comprehensive approach with on-site instant savings measures, so that the business can see savings immediately. In addition, the PAs are exploring other avenues, such as key partnerships and tools that can enhance awareness of potential incentives and the necessary steps to implement energy efficiency measures.

Figure 3-18: Strategic Intervention (Equity)

STRATEGIC INTERVENTION – Equity

GOALS

- Save energy and reduce demand.
- Provide comprehensive services to all small business customers.
- Ensure that there are clear pathways for participation across diverse segments.
- Increase participation in previously lesser served communities.

Barriers	Example Tactics	Tactic Status	Customers Impacted	Building Type(s)	Pathway(s) Involved	Time Horizon
Awareness of services and incentives <ul style="list-style-type: none"> • Small business owners often juggle a lot of tasks. They may not be aware of offerings. 	Focus Main Streets efforts on targeted communities (e.g., Environmental Justice). These will bring the services to the customers in a proactive manner	M	S	E	P, C	S
	Develop marketing materials focused on renter participation. These will provide an overview of the services and incentives as well as provide materials that can be shared with landlords	N	S	E	M, P, C	M
	Investigate a small business tool to evaluate all applicable measures. This will ensure that energy engineers are reviewing all measures at once and providing a consistent output to customers statewide	N	S	E	M, P, C	L
Split incentives for renters and landlords <ul style="list-style-type: none"> • The renter may need to educate the landlord on the benefits of energy improvements. 	Commit to offering a statewide online assessment sign-up platform with the focus on allowing customers to sign up at any time and have that effort centralized across the state. This effort builds on the success some PAs have had to date with online sign-ups on their own websites	N	S	E	M, P	S
Driving customers to holistic solutions <ul style="list-style-type: none"> • Some customers choose only the projects with the fastest paybacks and/or measures that they have the ability to change 	Commit to translating materials in the most commonly spoken languages in MA after English, including Spanish, Portuguese, and Mandarin, while considering additional languages that are widely spoken in certain PA territories. While there have been efforts to translate materials for specific efforts such as Main Streets as well as the midstream efforts, the PAs hope that these new materials will aid in reaching the customers with language isolated population	N	S	E	M, P, C	S
Reaching new audiences <ul style="list-style-type: none"> • Based upon the non-participant study, the PAs have begun to identify customers that have not historically participated 	Continue to explore partnerships with groups that are trusted sources. In recent years, the PAs have started to partner with key local partners on implementation of Main Streets and the Municipal & Community Partnership Strategy. They often offer translation services, project management support, and connections with peers on resources. These partnerships can also serve as part of the feedback loop that enhances our services. Please see Section 2.9.2 about small business integration into the Municipal & Community Partnership Strategy	N	S	E	M, P, C	M, L
	Explore partnerships such as minority business associations to increase diverse participation	N	M	N, E	P	S, M, L

Tactic Status: Existing (E), Modified (M), and New (N)

Customers Impacted: Small (S), Medium (M), and Large (L)

Building Type(s): Existing (E) and New (N)

Pathway(s) Involved: Midstream (M), Downstream Prescriptive (P), Custom (C), and New Construction (NC)

Time Horizon: Short-term (S), Mid-term (M), and Long-term (L)

3.9.2 STRATEGIC INTERVENTION: WORKFORCE DEVELOPMENT

The PAs recognize that their existing workforce development efforts to date have mainly been reactive to market forces and focused on upskilling their existing business partners and have not significantly considered how to engage new market participants (employees of business partners and new business partners). The PAs' approach to overcoming these recruitment and technical proficiency barriers to participation will span an array of tactics, both existing and new, across the full array of C&I customer segments in order to create the most significant market impact as possible.

On March 26, 2021, Massachusetts Governor Baker signed Massachusetts State Senate Bill S.9, *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* into law.⁵¹ The PAs will closely monitor the implementation of various provisions in the legislation relating to workforce development. The details contained in this section are minimum planned strategic interventions, and any impacts from this enacted legislation may alter the PAs' planned activities. The topics discussed here relate to those interventions which impact the C&I Sector.

To ensure the long-term success of the energy efficiency programs, the PAs need a proactive approach to develop new employees who can be placed into jobs with their business partners. The Clean Energy Pathways (CEP) seeks to increase the supply of qualified HVAC workers and building operators, the diversity of the workforce, and energy efficiency program participation in traditionally HTR communities by creating a career pathway for women, people of color, and low-income young adults. Over the 2022-2024 term, the PAs will strive to train and place approximately 120 individuals into energy efficiency-related careers. In addition, the PAs are also engaging with the marketplace to bring diversity, equity, and inclusion trainings to their business partners, and to proactively reach out to those looking to become part of the ecosystem. In this manner, the PAs can broaden the pool of business partners they rely on to meet their goals and increase the diversity of employees.

In looking to further diversity, equity, and inclusion in the programs, the PAs have also started to create strategic partnerships with local entities. One partnership is with the Emerald Cities Collaborative, a national non-profit organization working to create sustainable and inclusive local economies, to host round tables for WBEs and MBEs. Through these partnerships, the PAs are endeavoring to expand the business partner base that currently leverage the incentive programs and to ensure those organizations have an opportunity to participate in RFPs.

Beyond helping to train and place employees with their business partners, the PAs are working to overcome a lack of customer technical proficiency by engaging with the Northwest Energy Efficiency Council (NEEC) to bring their Builder Operator Certification (BOC) trainings to building and facility operators. As a mission-driven organization, the BOC works to elevate the profession of the building operator through training in energy efficiency and smart building technologies, continued education, and certification. This newly upskilled workforce provides energy and resource savings to building owners and organizations. By leveraging the BOC trainings, the PAs have found that facilities operators are more prepared to run facilities where incentivized energy-efficient technologies have been installed. The PAs further recognize the challenges their municipal customers are facing and are endeavoring to bring no-cost access to the BOC technical webinar library to them, beyond offering the BOC course series in the state. With over 60

⁵¹ Massachusetts Senate Bill S.9., *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*, effective and signed into law on Mar. 26, 2021, Section 13, available online at: <https://malegislature.gov/Bills/192/S9>.

webinars offering practical maintenance solutions taught by industry experts, municipal facilities staff can work to develop useful skills to optimize their buildings' energy use on a cadence that fits their schedules.

In looking to diversify areas of expertise of their business partners, the PAs have partnered with the University of Massachusetts at Amherst to create the Massachusetts Energy Efficiency Partnership (MAEEP). The partnership has allowed the development of partial or all-day general awareness and technical training sessions with information that will lead to implementation of energy efficiency improvements. The primary purpose of these training sessions is to educate, inform, and equip end-users with tools to identify implementation improvements. The trainings typically include introduction to advanced technologies, tools for understanding the benefits of implementing improvements, and opportunities to make use of resources available through the PAs. In light of COVID protocols, MAEEP was able to pivot to a virtual training environment in 2020 to ensure that the business partners were able to continue to develop their skills. The partnership also allows for participants to obtain CEUs when offered.

At the beginning of each program year, the PAs host several Business Partner Open Houses where energy efficiency programs are discussed. In addition, the PAs review program performance during the prior program year and plans for the future. As part of these meetings, the PAs offer breakout sessions to review details on specific program offerings, how they are utilized, and the best pathways to leverage them with C&I customers. Beyond the Business Partner Open Houses, the PAs also work with their contracted vendors on bringing specific training opportunities to them, including sales, industry certification, and measure-specific trainings.

Figure 3-19: Strategic Intervention (Workforce Development)

STRATEGIC INTERVENTION – Workforce Development						
GOALS <ul style="list-style-type: none"> Save energy and reduce demand. Create a sustainable workforce to support the local energy efficiency and DR industry. Attract and retain a demographically and geographically diverse workforce. Ensure personnel are equipped with the skills necessary to deliver current and future energy efficiency and DR portfolios. 						
Barriers	Example Tactics	Tactic Status	Customers Impacted	Building Type(s)	Pathway(s) Involved	Time Horizon
Diversity, Equity, Inclusion (DEI)	Offering DEI trainings to contracted vendors and Business Partner network	N	S, M, L	E, N	-	S
<ul style="list-style-type: none"> Some customers have language barriers that may prevent or discourage participation. Additionally, some customers may be more likely to trust business partners that have a similar cultural background and understanding 	Clean Energy Pathways (CEP), as explained below, is designed to create an internship that targets ethnic minorities and women in cohorts to develop and place new entrants into positions in the clean energy market	N	S, M, L	E, N	-	S
	PAs maintain a close relationship with business partners to gain insight on workforce needs as well as customer feedback to develop training protocols	N	S, M, L	E, N	-	M
	Continue to conduct workforce trainings such as energy-efficient technologies, building codes and standards, and building above code. Specialized contractor trainings will push for more comprehensive energy projects and to increase the adoption of new and emerging energy-efficient technologies. Workforce trainings will include but are not limited to: advanced lighting design and controls, HVAC equipment and systems, and refrigeration tuning and controls	E	S, M, L	E, N	-	S, M
Technical Proficiency						
<ul style="list-style-type: none"> Workforce tends to focus on specific areas of expertise. Customer's facility staff not trained to manage new advanced technology 	PAs recognize the benefit of Building Operator Certification (BOC) for all facility operators and are targeting municipal facility managers specifically. PAs will continue to offer trainings regarding advanced energy-efficient technologies and controls and will explore offering tuition reimbursement to municipal representatives	E	L	E, N	-	S
	Work with Business Partners to identify transferable skills and promote opportunities to current workforce	N	S, M, L	E, N	-	S, M
New Market Entrants						
<ul style="list-style-type: none"> Vendors report there are not enough qualified candidates Non-participants do not know Energy Efficiency is a career opportunity 	Marketing and outreach to business partners to gain new entrants to the energy efficiency programs	N	S, M, L	E, N	-	M
	CEP, see below	N	S, M, L	E, N	-	S

Tactic Status: Existing (E), Modified (M), and New (N)

Customers Impacted: Small (S), Medium (M), and Large (L)

Building Type(s): Existing (E) and New (N)

Pathway(s) Involved: Midstream (M), Downstream Prescriptive (P), Custom (C), and New Construction (NC)

Time Horizon: Short-term (S), Mid-term (M), and Long-term (L)

3.9.3 STRATEGIC INTERVENTION: IMPROVING PARTICIPATION THROUGH GREATER AWARENESS, UNDERSTANDING, AND ACCESSIBILITY

Limited awareness, understanding and accessibility of energy efficiency opportunities is an impediment to greater program participation. Additionally, given the tremendous diversity of the C&I customer base in the state, there is great variation in the extent and type of organizational and informational barriers that must be addressed to overcome these impediments to participation.

Some, primarily smaller C&I customers simply lack the staffing capacity to investigate efficiency opportunities while others may have sufficient staffing capacity but lack the technical knowledge to understand or evaluate available opportunities. Still others may have both the capacity and knowledge to be aware of and understand the technical opportunities but are not able to translate that into a sufficiently compelling business case in order to obtain or authorize funding, particularly in light of competing priorities.

For the 2022-2024 term, the PAs' approach to overcoming these organizational and informational barriers to participation will span an array of tactics, both existing and new, across the full array of customer segments and sizes as well as participation pathways in order to positively impact as many customers as possible. The PAs are committed to making additions to and improvements in the information that is provided to customers as well simplifying the materials needed to participate in the programs. In addition to redesigning and simplifying all the incentive application materials, the PAs have begun, and will continue, to develop additional information about the various participation pathways (Midstream, Downstream Prescriptive, Custom) and the benefits and applicability of each. This provides customers greater flexibility in choosing the pathway that works best for them given the particular nature of their project, their preferences, and decision-making criteria.

Similarly, the PAs have begun and will continue to reorganize and update information on the statewide website, MassSave.com. Information will be provided regarding the complete array of financial and technical resources the PAs provide, the pathways through which those resources are available, and the types of products and projects the PAs support across all end-use categories. In addition, the PAs will be providing segment-specific information to build awareness and understanding of the options available to specific kinds of customers. The goal is to minimize the effort required for a customer to find relevant and useful information. An assessment of the structure and navigation of MassSave.com and will be completed and the results of that assessment will be key in guiding the redesign of the website.

Figure 3-20: Strategic Intervention (Improving Participation with Greater Awareness, Understanding, and Accessibility)

STRATEGIC INTERVENTION – Improving Participation With Greater Awareness, Understanding and Accessibility

GOALS

- Save energy and reduce demand.
- Increase C&I participation rates.
- Expand awareness of energy efficiency opportunities.
- Simplify and streamline offerings.

Barriers	Example Tactics	Tactic Status	Customers Impacted	Building Type(s)	Pathway(s) Involved	Time Horizon
<ul style="list-style-type: none"> • Organizational <ul style="list-style-type: none"> ○ Limited technical expertise to understand, identify and act upon energy efficiency opportunities ○ Insufficient awareness of available technical and financial resources available to support efficiency investments ○ Difficulty determining and conveying the value of efficiency investments to internal financial decision makers 	Redesign and simplify incentive application materials and processes by reorganizing and consolidating along major end use categories	M, N	S, M, L	E, N	P, C	S
	Simplify, streamline, and calibrate C&I Sector portfolio and pathways	E, M	S, M, L	E, N	M, P, C, N	S
	Reorganize, update and expand portfolio content for C&I customers on MassSave.com including information organized both according to end-use category and business or building type	E, M	S, M, L	E, N	M, P, C, N	S
	Increase use of native language marketing and outreach materials using the languages most commonly spoken in MA beyond English (Spanish, Portuguese, Mandarin), particularly in communities and segments showing historically lower participation	N	S	E	P, C	M, L
	Develop and deploy segment-specific content for target markets that speaks to customers using relevant peer-to-peer comparisons	E, M, N	S, M, L	E, N	M, P, C, N	S, M, L
<ul style="list-style-type: none"> • Informational <ul style="list-style-type: none"> ○ Low level of awareness of benefits of energy efficiency ○ Lack of confidence in realizing energy savings resulting from energy efficiency projects 	Provide web-based registration for small businesses to request facility assessments	M, N	S	E	P	S
	Research and provide publicly available tools for assessing project analysis for small business customers	N	S, M	E	M, P, C	S

Tactic Status: Existing (E), Modified (M), and New (N)

Customers Impacted: Small (S), Medium (M), and Large (L)

Building Type(s): Existing (E) and New (N)

Pathway(s) Involved: Midstream (M), Downstream Prescriptive (P), Custom (C), and New Construction (NC)

Time Horizon: Short-term (S), Mid-term (M), and Long-term (L)

For the 2022-2024 term, the PAs will focus additional attention on small businesses to overcome both informational and organization barriers which are often more acute with this large population of customers. In order to improve accessibility for small business customers, the PAs will provide a web-based tool so these customers can request facility assessments to identify savings opportunities. While some PAs already provide this capability on their own internal websites, this new tool will be made available on the MassSave.com website thus allowing any small business in the state to take advantage of this capability. Also, the PAs will provide additional outreach and communications using native language materials, particularly in areas of the state that have experienced historically lower participation rates, perhaps in part due to language barriers.

To address the challenges some customers may have in valuing investments in energy efficiency, the PAs are exploring available tools that will enable customers to conduct a simple techno-economic analysis of their project. Designed primarily for simple, relatively small projects, these tools will enable customers to evaluate their energy use and demand reductions, as well as the financial impacts from their energy efficiency investments.

3.9.4 STRATEGIC INTERVENTION: TECHNICAL ASSISTANCE & TOOLS

Technical assistance and tools are critical in making C&I energy efficiency a strategic value proposition. Organizational and operational barriers that may impede the energy efficiency program participation are as diverse as the C&I marketplace itself, resulting in a variety of energy efficiency program offerings. Customers may need understanding on the value of energy efficiency, or they may struggle with competing priorities and often overlook energy efficiency quantification as it may not be their top priority. For example, customers who have unique or specialized equipment, like laundromats, may be focused on the number of shirts/clothes cleaned per hour, while a restaurant owner may be more occupied with maintaining the aesthetics and quality of their cuisine and customer satisfaction. Additionally, C&I customers often struggle with techno-economic analysis required to substantiate their incentive applications and are overwhelmed with program requirements. For example, small business customers do not have the time, staffing, or skillset to consider performance data prior to installing insulation or lighting controls. The purpose of continuing to innovate and develop technical assistance tools and training is to help customers understand the cost-value proposition, streamline the requirements, and increase program participation.

For the 2022-2024 term, the PAs will continue to communicate with customers through trade allies and engineering and implementation vendors who are specialized by customer segment and size and are well equipped to deliver targeted pathways to energy savings. Further, the PAs will continue to provide access to unbiased technical assistance provided by a network of independent energy advisors (TA vendors) drawn from a pool of private sector engineering consultants that meet the PAs' criteria for expertise and experience. The PAs will also improve and expand their technical trainings offered to facility personnel so energy efficiency best practices can be shared and heightened recognition for efficiency opportunity can be developed. PA internal resources and independent outside technical experts will continue to be leveraged for technology or industry-specific trainings. Creating unique savings opportunities requires technical expertise and knowledge of energy efficiency program guidelines, therefore, the PAs will continue to support workforce development efforts in technologies such as weatherization and building controls. Additionally, the PAs will offer trainings to diverse customers, vendors, and trade allies through organizations such as MAEEP to help nurture and grow expertise in the field of energy efficiency and decarbonization.

Custom express calculators allow for readily quantifying the savings associated with projects being considered for implementation. These tools are designed or in development to target sectors (small business), initiatives (ESPO) and end uses (lighting). For the 2022-2024 term, the PAs will continue to update and revise existing tools for industry standard practices or energy efficiency code and associated existing building conditions. For example, the PAs intend to develop a weatherization tool for vendors and customers to identify cost-effective weatherization projects. The PAs

envision that this easy-to-use tool will increase program participation and foster faster adoption of comprehensive measures such as weatherization. In the short term, the PAs will continue to serve all customers by promoting scoping studies and energy assessments that identify saving opportunities through independent engineering firms who can quantify savings and support project development to facilitate implementation. While every customer has different needs, the PAs will continue to expand the delivery model for fast-track review of semi-complex projects with automated underlying savings and cost-benefit calculations. The relative rigor of the review is expected to align with the scope of potential implementation (e.g., savings potential and proposed incentive amounts).

Figure 3-21: Strategic Intervention (Technical Assistance & Tools)

STRATEGIC INTERVENTION – Technical Assistance & Tools						
GOALS		<ul style="list-style-type: none"> Support customer and vendor engagement through education and outreach. Reduce cost of program delivery. Maintain high program realization rates. Identify and quantify savings most relevant to customers. 				
<ul style="list-style-type: none"> Save energy and reduce demand. Streamline statewide program delivery Increase consistency. 						
Barriers	Example Tactics	Tactic Status	Customers Impacted	Building Type(s)	Pathway(s) Involved	Time Horizon
Consistency in decision making processes <ul style="list-style-type: none"> Businesses require calculations to support applications for incentives Customer of all types and sizes need assistance with existing conditions, standard practice, and code requirements to assess savings New technologies require understanding prior to adoption Programmatic ease of use and participation <ul style="list-style-type: none"> Multiple pathways for similar projects necessitates deeper understanding of program delivery options 	Provide sector based (small business tool), initiative-based (ESPO LCTM, grocery) industry based, end use based (HVAC, lighting) and technology based (kitchen hood, transformer, heat pumps) approaches to customers	N	S, M	E	C	M
	Develop a weatherization tool for vendors and customers to easily identify cost effective weatherization projects for small business customers	M	S	E	C	S
	Review support services for customers that have invested in the expansion of automated systems (MBCx, EMIS, EMS, fault detection), as the implementation of measures can help offset the initial capital investment	E, M, N	S, M, L	E, N	M, P, C, N	S, M, L
	Improve and expand upon technical trainings offered to facility personnel at customer or vendor sites. Recruit technical experts to deliver technology or industry-specific trainings (i.e., compressed air, labs, RCx) on energy efficiency best practices	M, N	S, M, L	E, N	M, P, C, N	S, M, L
	Increase equitable access to the MAEEP trainings by continuing to offer these trainings virtually (as well as in person). Also, continue to use MAEEP to help train the market on new developments in energy efficiency while targeting specific areas of growth needed in industry	M, N	S, M, L	E, N	M, P, C, N	S, M, L
	Conduct techno-economic analysis of emerging technologies prior to consideration for implementation and incentivizing to drive market decisions (MTAC, etc.)	E, M	S, M, L	E, N	M, P, C	M, L
	Continue to simplify the delivery model for fast-track review of semi-complex projects with automated underlying savings and cost-benefit calculations. The relative rigor of the review should align with the project scope (e.g., savings potential and proposed incentive amounts)	E, M	M, L	E	P, C	S, M

<ul style="list-style-type: none"> Proliferating energy efficiency requires knowledgeable and agile staff capable of identifying customers' unique savings opportunities 	Continue to develop prescriptive offerings and Custom Express tools based on technology and rigor of savings in alignment with program regulations and guidelines	E, M	M, L	E	P, C	S, M
	Improve existing technical and project-management support to enable project identification and completion	M	M, L	E	P, C	S, M
	Continue to offer on-site consultative engineering assistance through both statewide and targeted (third-party) offerings to guide customers toward efficient options, evaluate vendor proposals, and facilitate savings submissions	E, M	M, L	E	P, C	S, M
	Expand ways to connect customers with engineering firms for energy audits and pay for scoping studies	E, M	M, L	E	C, N	S, M
	Develop new approaches to leverage and complement existing building energy compliance needs (example: BERDO, PACE)	N	L	E	C	S, M
	Continue to work with regulatory agencies to drive synergies in approaches resulting in effective utilization of resources (e.g., Working together with DOER to standardize energy audit guidelines and templates for auditing municipal sector buildings)	M	M, L	E	M, P, C, N	S, M
	Develop comprehensive, strategic offering and tool to ease participation, streamline program delivery and ensuring the smallest businesses can benefit to stretch beyond turnkey measures	N	S	E	C, P	M, L
	Continue to grow Zero Net Energy pathways through the new construction efforts	M	S, M, L	N	N	S, M, L
	Develop case studies and other marketing materials to help risk-averse customers overcome their concerns. Use printed materials, publications, testimonial videos (of efficient manufacturing plants), and site tours	N	S, M, L	E	M, P, C, N	S, M

Tactic Status: Existing (E), Modified (M), and New (N)

Customers Impacted: Small (S), Medium (M), and Large (L)

Building Type(s): Existing (E) and New (N)

Pathway(s) Involved: Midstream (M), Downstream Prescriptive (P), Custom (C), and New Construction (NC)

Time Horizon: Short-term (S), Mid-term (M), and Long-term (L)

The PAs are committed to providing streamlined and comprehensive C&I Sector program delivery that keeps pace with the existing and forthcoming compliance demands and advancements in technology and innovative approaches to program implementation. This process begins with techno-economic analysis of emerging technologies in groups such as MTAC that reviews the energy savings appropriateness of technology, codes, and standards prior to consideration for implementation and incentivizing to drive market decisions.

For example, the New Construction Team aligned the program delivery to incorporate pathways supporting Zero Net Energy (ZNE) and is considering adopting building Energy Use Intensities (EUI) for incentive determination. Further, to acknowledge that all customers may not achieve ZNE but desired maximum efficiency, the PAs will offer additional

New Construction pathways to support these efforts. Similarly, the PAs are committed to continue their work with regulatory agencies to drive synergies in approaches resulting in effective use of resources. For instance, the PAs have worked with DOER to standardize energy audit guidelines and templates for auditing municipal sector buildings. As new technologies emerge in the market, the PAs will continue to develop case studies and other targeted marketing materials to help risk-averse customers overcome their concerns for implementation, productivity loss, and more.

While every customer has different needs, the PAs will continue to deploy and partner with independent technical energy advisors to maximize savings from end uses such as lighting, HVAC equipment, building envelope, and process and refrigeration based on need and applicable program/initiative. The PAs will strive to provide bundled solutions and develop technical assistance tools that facilitate comprehensiveness. Additionally, the PAs will also continue to advance innovative approaches to empower customers to review their energy usage data once projects are implemented for greater savings persistence. For example, the PAs use an EUI-based approach and incentivize post-install commissioning on new construction projects. This post-install feedback loop is critical in moving customers through their energy journey.

Ultimately, this strategic intervention plays a critical role in spurring customers to take action and initiate implementation of energy efficiency projects. The PAs will continue to develop a more comprehensive measure mix with the flexibility to support unique approaches of energy savings despite market or policy changes. As the programs expand from widget-based energy efficiency options to systems-based energy efficiency strategies, the PAs will continue to develop and prioritize comprehensive technical assistance solutions and training that drive efficiency and support market innovation for their C&I customers.

3.9.5 STRATEGIC INTERVENTION: ADVANCING ELECTRIFICATION

The Commonwealth's goal of electrifying the built environment dovetails with the PAs' efforts to advance energy efficiency and DR. In the 2022-2024 term, the PAs will have two main areas of focus: (1) pursuing low EUI through the electrification of new buildings, and (2) supporting increased electrification of HVAC systems in existing buildings, with an emphasis on envelope weatherization as an enabling measure.

NEW BUILDINGS

In Massachusetts, building heating and cooling are one of the leading sources of carbon and GHG emissions. Fossil-fueled heating equipment (furnaces and boilers) are the primary heating technologies used during the winter months and air conditioning loads are the main contributor to peak electric consumption in the summer months. The electrification of heating systems in new buildings is a logical first step in addressing the equipment and design savings that can help bring a building from baseline efficiency to these greater EUI reduction tiers while presents an option for developers and design engineers to potentially reduce the onsite carbon footprint of a building. For the 2022-2024 term, the PA's incentive structure is designed to provide increasing incentive rates to customers who achieve higher levels of savings relative to baseline. The highest tiers of efficiency are easier for customers to achieve when they are considering buildings with electric heating systems.

In the 2019-2021 term, the PAs launched a re-structured set of pathways or tiers for customers constructing new buildings. Paths 1 and 2 capture an important segment of the commercial building stock (those looking to be leaders in the efficient building sector), and the impact of these design-level decisions will have lasting impacts over the life of the buildings.

For the 2022-2024 term, the PAs will work to increase confidence and experience in the design and building industry regarding high-performance building design. While it may seem counterintuitive, given the “showcase” nature of many high-efficiency buildings, the reality is that many design and construction industry practitioners tend to be conservative, especially when it comes to building comfort. Buildings can be complicated not just to design, but to operate, and many systems interact in ways that can be unexpected. Modeling can help reduce the uncertainty associated with the performance but ultimately, architects and engineers are legally liable for their designs, and even progressive firms are likely to seek to minimize risk. The tendency to rely on traditional HVAC systems that are tested can be a difficult barrier to overcome. The PAs hope that by developing case studies of successful projects, and by convening customers and industry practitioners, they can help facilitate the “normalization” of non-traditional approaches to building and system design and the increased acceptance of high-performance building designs.

EXISTING BUILDINGS

During the 2022-2024 Plan term, the electrification of existing heating systems in commercial buildings is something that the PAs will continue to emphasize. The vast majority of the building stock that will exist in 20 years has already been constructed. While new construction represents an obvious opportunity to design a building with efficiency in mind, most buildings are likely to experience incremental improvements in efficiency incrementally, via equipment replacement or renovation. Large-scale “gut renovations” represent an opportunity to make significant overhauls, but these projects are the exception, rather than the rule.

When assessing HVAC electrification opportunities in existing buildings, the PAs will be working with customers with a diverse array of heating, cooling, and distribution systems. While the PAs will work with vendors and customers to promote heat electrification, they expect these projects to be most practical for customers when existing heating systems are in already need of replacement and there is an underlying need to modify or replace the distribution system. While high-efficiency heat pumps may be capable of serving the entire heating load of a building, the PAs expect the partial displacement of fossil-fuel systems to be the predominant use-case for customers considering electrification due to both technical and economic reasons.

More so than for other many other technologies, the economic rationale for heat electrification often depends not just on the age, distribution layout, and fuel type of the heating system, but also on the cooling system. Because heat pump technologies can provide both heating and cooling, and provide the most economic value when doing so, the degree to which heat electrification represents an appealing option depends on both systems.

Commercial buildings, especially larger ones, are more likely to be sited in locations that have access to natural gas. While this has resulted in reduced heating costs for many customers for years, the continued low cost of natural gas relative to electricity means that heat electrification is often not a cost-effective efficient measure. Even in situations for which heat electrification may be cost effective from a programmatic standpoint, it may not always be cost efficient from a customer standpoint (heat electrification may cost more in terms of project and operational expense than a natural gas option). There are certainly situations in which a customer may opt to pay more for heat electrification—such as corporate sustainability goals—but the non-economic nature of that decision raises questions of the role of ratepayer funds, program attribution, and free-ridership.

Customers who do not have air conditioning may be interested in installing a heat pump to provide cooling in the summer and as a supplemental heating source for shoulder seasons. While installation would be sized for cooling load, not heating, the system would still be able to partially displace heating during the cooler months. Such a scenario is one which the PAs expect to be fairly common, as it does not require a major retrofit of the existing heating system and can easily replace window air conditioner units if they exist.

While commercial heat electrification retrofits, especially large ones, are likely to be complicated, the PAs acknowledge that for a large proportion of commercial customers with small heating and cooling loads, they need not be. In response to feedback from distributors, manufacturers, and installers, the PAs developed an offering for C&I customers installing small heat pumps in 2020. For these small systems, the PAs found that the equipment being installed in residential and small commercial facilities was often identical and was often being installed by the same base of installation contractors. Because the Residential Sector represented the most installations of this equipment and had established minimum efficiencies and qualified products lists, the PAs designed the C&I Sector offering to mirror the residential effort as much as possible.

While this offering specifically pertains to small split and central heat pump systems, this represents the equipment most suitable for the majority of C&I customers. For the 2022-2024 term, the PAs will explore ways of expediting savings estimation and incentive determination for larger and more complicated systems. While this may not eliminate the need for “custom” estimates of savings and incentives based on project specifics, it will provide greater clarity to customers and installation contractors as to the best pathway for participating in energy efficiency and the level of support that the PAs can provide. The PAs will also continue to stay engaged with internal and external evaluation staff to better understand how heat pumps are operated in customer facilities. To the extent that customers are successfully using heat pumps to displace fossil fuels, the PAs will seek to ensure that the programmatic funds expended result in demonstrable value for ratepayers.

For many customers, electrifying heating systems may depend on site-specific characteristics, which includes the type and configuration of the building. The fact that heat pumps can serve both heating and cooling loads and often partially displace the heating load of existing buildings means that the cost effectiveness and customer economics are dependent on a variety of factors. The PAs expect to address most of these large projects on an individual basis through site-specific energy savings estimates and incentives.

HVAC systems in commercial buildings are often much larger and more complicated than those typically found in homes and are subject to more stringent ventilation and comfort requirements. The PAs work with manufacturers, distributors, and installers to better understand the specific circumstances under which heat pumps are being installed to either displace or replace fossil fuel-fired systems as well as the customer economics of such systems. At the same time, the PAs will develop tools to expedite savings estimation and create pathways that standardize offerings for heat pumps where feasible.

The PAs expect that user behavior and controls optimization will continue to be a challenge to the successful deployment of heat electrification at scale. Heat pumps have different O&M considerations than fossil fuel-fired systems and customers will need some time to get used to this technology. Additionally, the optimization of heat pumps when installed alongside fossil fuel-fired systems adds complexity and an additional control point that can lead to less-than-optimal system performance. The PAs have found HVAC controls settings, whether in the form of relatively simple thermostats or more extensive building automation systems, to be a thorn in the side of facilities managers and program evaluators alike; this is likely to continue to be a challenge as heat electrification grows.

As part of their efforts to advance electrification, the PAs intend to develop specific offerings for commercial building types that support cost-effective prescriptive weatherization services. To the extent better insulated buildings have reduced heating and cooling loads, weatherization may be an important enabling measure for some building owners who are interested in electrifying their heating system, especially if energy costs remain at their current levels.

Figure 3-22: Strategic Intervention (Advancing Electrification)

STRATEGIC INTERVENTION – Advancing Electrification

GOALS

- Save energy and reduce demand.
- Provide customers with options that meet their economic, technical, and environmental needs.
- Motivate customers to think comprehensively about building design, construction, and operation.

Barriers	Example Tactics	Tactic Status	Customers Impacted	Building Type(s)	Pathway(s) Involved	Time Horizon
<ul style="list-style-type: none"> • HVAC retrofit electrification could result in higher capital and operational costs 	Provide the market with more transparent information for evaluating electrification options and pathways, including incentives and total system costs	E, M, N	S, M, L	E, N	M, P, C, N	S
<ul style="list-style-type: none"> • Many existing commercial building systems have technical barriers to full electrification 	Promote electrification where appropriate and will work with customers to develop HVAC solutions that best suit their needs	M, N	S, M, L	E, N	M, P, C, N	M, S
<ul style="list-style-type: none"> • The market does not have extensive experience with heat pump technologies and design elements 	Offer financial assistance intended to promote the role of energy efficient design and technical assistance for Path 1 – ZNE/low EUI and Path 2 in the development process for new buildings	M	S, M, L	N	N	S
<ul style="list-style-type: none"> • Building commissioning is more focused on functionality as opposed to the performance and optimization of systems 	Verification incentive offered through New Construction Paths 1 & 2 will encourage customers to support energy performance commissioning	M	M, L	N	N	S
<ul style="list-style-type: none"> • Market perception is that low EUI/highly efficient buildings come with significant added costs 	Facilitate information sharing regarding electrification best practices in both new and existing buildings	M	M, L	N	N	M
<ul style="list-style-type: none"> • Commercial weatherization remains challenging to deliver cost-effectively at scale but can be an enabler of the electrification of heating 	Address gaps in the skills and experience through workforce development efforts to train on operations and maintenance of electric heating systems	N	S, M, L	E, N	C, N	M

Tactic Status: Existing (E), Modified (M), and New (N)

Customers Impacted: Small (S), Medium (M), and Large (L)

Building Type(s): Existing (E) and New (N)

Pathway(s) Involved: Midstream (M), Downstream Prescriptive (P), Custom (C), and New Construction (NC)

Time Horizon: Short-term (S), Mid-term (M), and Long-term (L)

3.9.6 STRATEGIC INTERVENTION – CONTINUOUS IMPROVEMENT & PORTFOLIO EXPANSION

Massachusetts has been offering energy efficiency programs for decades, and these programs have led the country for several years. The Commonwealth has one of the most mature programs in the country. For any program to stay relevant for that long, it needs to adapt and improve to meet the market conditions. As the PAs have been able to move the market to adopt high-efficiency equipment over the years, the PAs continue to expand the C&I Sector portfolio to include asset optimization measures as well as equipment-based measures. These types of energy savings require more engagement with the customers or facility operators and provide less predictable savings, which often means that achieving deeper energy savings at a facility is more expensive. Facing these challenges, the PAs will need this strategic intervention to achieve energy savings in a cost-efficient manner across all customer segments.

The PAs continuously engage with other efficiency programs across the country to find new approaches and enhancements that can be adapted to fit within the Massachusetts regulatory framework. They typically go through iterations and follow a deliberate process of research, test, design, and then delivery through existing or new C&I Sector program delivery pathways. Through groups like MTAC and internal resources, the PAs will continue to move new measures through this process to bring them to the market. Recent examples of this include the micro-CHP (mCHP) and the Equipment and System Performance Optimization (ESPO) low-cost Tuning measures. Market research showed that mCHP could be an area for growth, so a new measure was created to eliminate barriers such as the development of a custom express tool and streamlining the interconnection process.

For the EPSO low-cost tuning measures, market research showed customer equipment could be better maintained and operated, so the PAs created a pathway to motivate customers to optimize their existing equipment and controls. For the low-cost repeatable measures, the PAs created a series of custom express tools to make participating as easy as possible while capturing energy savings. In addition to these improvements and expansions the PAs plan to add a prescriptive weatherization offering to the C&I Sector portfolio to achieve additional energy savings and increase customer participation. They will also investigate the potential to achieve a more comprehensive measure mix in the small business segment with a new online audit tool for small business vendors.

With increasingly challenging goals, the PAs will need to attract customers who have not participated frequently in the past and increase the size of the energy efficiency workforce in the Commonwealth. Moreover, with the increasing complexity of systems-based measures and comprehensive energy retrofits, the energy efficiency workforce will need to grow and improve. Workforce development in this context can be seen as an enabling tactic that ensures the marketplace has enough qualified professionals to deliver energy efficiency. Therefore, the PAs are dedicated to building on their existing workforce development efforts by expanding the BOC initiative by offering more classes and attempt to expand access to the MAEEP trainings by offering them remotely and in person. With investments in the communities and workforce of Massachusetts, the PAs are ensuring the continued long-term success of the energy efficiency programs.

Figure 3-23: Strategic Intervention (Continuous Improvement and Portfolio Expansion)

STRATEGIC INTERVENTION – Continuous Improvement and Portfolio Expansion

GOALS

- Save energy and reduce demand.
- Increase average savings per participant.
- Increase customer participation.
- Increase operational efficiency.
- Decrease cost of savings.

Barriers	Example Tactics	Tactic Status	Customers Impacted	Building Type(s)	Pathway(s) Involved	Time Horizon
• Past success means the low hanging fruit is largely gone	Go beyond installing efficient equipment for deeper energy savings by helping customers optimize the operation of their assets	E, M	S, M, L	E	P, C	S
• Expanding beyond widget-based measures adds complexity and less predictable savings	Develop a comprehensive assessment tool for small businesses to achieve energy savings beyond lighting measures	N	S	E	M, P, C	L
	Continue to use MTAC to assess new technologies as they become commercially available and increase the portfolio of offerings.	E	S, M, L	E, N	All	S
• Comprehensive energy retrofits are more expensive to achieve	Bundle measures and measure categories and offer greater incentives to achieve deeper energy savings	N	S, M, L	E	C	L
	Develop prescriptive weatherization and air sealing offerings	N	S, M, L	E	P	L
	Adopt more custom express tools to streamline custom calculations and provide consistency across the state	M	S, M, L	E, N	P, C	L
• The market lacks enough knowledgeable building operators	Break out CHP systems smaller than 50 kW as a separate measure with a custom express tool and a prescriptive incentive offering	E	S, M	E, N	C, N	S
	Facilitate successful implementation of energy efficiency projects by expanding on current workforce development efforts and offering more training courses each year	M	M, L	E	C	M
	Increase ease of participation by developing new C&I applications that are easier to understand and access.	E	S, M, L	E, N	P, C, N	S

Tactic Status: Existing (E), Modified (M), and New (N)

Customers Impacted: Small (S), Medium (M), and Large (L)

Building Type(s): Existing (E) and New (N)

Pathway(s) Involved: Midstream (M), Downstream Prescriptive (P), Custom (C), and New Construction (NC)

Time Horizon: Short-term (S), Mid-term (M), and Long-term (L)

As the PAs pursue more comprehensive energy savings at customer facilities, they must find ways to improve internal operations and decrease the cost to achieve savings. Recently the PAs launched a redesign of their application forms. The new forms will be easier for customers to understand and access and will also reduce the time spent by the PAs in processing applications. Another area where the PAs have and will continue to streamline their processes is with the development and use of custom express calculators. With the use of custom express calculators for frequently implemented measures, PA engineers can reduce the time spent reviewing measures and help to streamline the evaluation process. Additionally, to help control costs, the PAs intend to prioritize the bundling of measures. By packaging high-cost savings measures with low-cost savings measures, the PAs will be able to achieve deeper energy savings for customers without significantly inflating their budgets. This strategic intervention will be integral in helping the PAs reach their goals while staying within their budgets.

3.10 COMMERCIAL & INDUSTRIAL SECTOR PROGRAM DESCRIPTIONS

The PAs provide their C&I customers with a wide array of technical and financial supports and services support investments in cost-effective energy efficiency. These supports and services are provided to customers considering the construction of a new building, planning a major renovation of an existing building, upgrading existing systems or equipment, or replacing systems or equipment that have or soon will fail, and are intended to educate customers about and motivate them to choose the most efficient, cost-effective options across all end uses regardless of industry or building type.

The PAs have developed participation, energy and demand reduction goals, budgets, and cost-effectiveness and cost-efficiency projections that represent best estimates to realize their C&I Sector vision and have assessed the cost effectiveness of the proposed portfolio. The PAs will strive to meet the cost-effectiveness and performance projections for the C&I Sector while acknowledging that potential market changes will influence the final outcome.

The figure below summarizes the PAs' projected energy savings and demand reduction, budget, benefit, cost-effectiveness and GHG reduction projections for the C&I Portfolio of Programs and associated Core Initiatives.

Figure 3-24: 2022-2024 Planned Performance Summary – C&I Sector Portfolio

Planned Results	Projection
Net Annual Electric MWh Savings	985,120
Net Annual Natural Gas Therms Savings	23,407,854
Active Demand Reductions (Net MW)	202
Total Program Costs	\$860M
Total Program Benefits	\$2,406M
Cost-Effectiveness (BCR) - Electric / Gas	1.9 / 3.7
Annual CO2e Avoided (Metric Tons)	1,801,119

3.10.1 C&I NEW BUILDINGS PROGRAM

The PAs work with customers planning new buildings or major renovations to help them achieve the lowest EUI and greatest energy efficiency possible. The PAs have developed multiple participation pathways to provide options that meet customers' needs whether they are contemplating a ZNE building, minimizing EUI across an entire building, or simply replacing individual systems or equipment that have or are soon to fail. The New Buildings & Major Renovations Core Initiative is discussed in further detail in the sections below.

Figure 3-25: C&I New Buildings Program – Core Initiative and Pathways



The figure below summarizes the PAs' projected energy savings, budget, benefit, cost-effectiveness and GHG reduction projections for the New Buildings Program.

Figure 3-26: 2022-2024 Planned Performance Summary – C&I New Buildings Program

Planned Results	Projection
Net Annual Electric MWh Savings	69,608
Net Annual Natural Gas Therms Savings	4,097,723
Total Program Costs	\$84 Million
Total Program Benefits	\$288 Million
Cost-Effectiveness (BCR) - Electric / Gas	2.9 / 5.1
Annual CO2e Avoided (Metric Tons)	290,498

C&I NEW BUILDINGS & MAJOR RENOVATIONS - CORE INITIATIVE

Overview

The PAs work with all customers and on all building types, regardless of project size, complexity or function, to help achieve the lowest EUI and greatest energy efficiency possible in new buildings or major renovations. For the 2022-2024 term, the PAs will offer four participation paths to drive customers to the most progressive solutions for new construction and major renovation projects:

- Paths 1, 2 and 3 (see figure below) are comprehensive whole building pathways that consider all energy systems and the entire building design in an integrated fashion, where the two EUI-based participation pathways (1 and 2) offer the highest available incentives.
- Path 3 is available for customers who may not be ready or able to focus on EUI targets and whose projects, due to size and scope, are more cost effectively served without the need for an energy model.
- Path 4 is available for customers who engage late in the design/construction timeline but may yet be influenced in decisions regarding certain equipment for partial building new construction projects (e.g., tenant fit-outs) and projects that may not be conditioned whole buildings, such as parking garages.

Multifamily projects are handled collaboratively between the Residential, Income Eligible, and C&I Sectors depending upon the measures and metering with the largest projects participating in one of the pathways below. For details on smaller multifamily projects (under 4 stories), please see Section 2.10.2 and 2.11.1. The figure below summarizes the PAs' projected energy savings, budget, benefit, cost-effectiveness and GHG reduction projections for the New Buildings & Major Renovations Core Initiative.

Figure 3-27: 2022-2024 Planned Performance Summary – C&I New Buildings & Major Renovations (Core Initiative)

Planned Results	Projection
Net Annual Electric MWh Savings	69,608
Net Annual Natural Gas Therms Savings	4,097,723
Total Program Costs	\$84 Million
Total Program Benefits	\$288 Million
Cost-Effectiveness (BCR) - Electric / Gas	2.9 / 5.1
Annual CO ₂ e Avoided (Metric Tons)	290,498

By engaging customers early in their project timeline, the goal is to unlock maximum opportunities for cost savings, technical support, and optimal energy efficiency and energy use reduction. Both building owner and design team incentives are available to help cover the incremental construction and design service costs associated with the inclusion of energy-efficient equipment and systems. By working together from the project's feasibility or conceptual design phase, customers can achieve deep energy savings, and even ZNE status, to minimize future energy use and operating costs while reducing their building's carbon footprint.

Eligibility

Participation in the C&I New Buildings and Major Renovations Core Initiative is available to all active, or soon to be active, non-residential electric and/or natural gas customers who contribute to the energy efficiency funds.

Offerings

The PAs offer two main sources of support and value: (1) technical assistance and (2) financial assistance. Technical assistance can take a variety of forms including design charrettes, technical guidance on energy efficiency and EUI reduction strategies, whole building energy modeling, and mid-design feedback. All technical support is intended to

identify and assess energy efficiency and usage reduction opportunities and inform customers' project development and decision making.

Financial assistance consists of a range of options including prescriptive and custom incentives, as well as cost sharing for engineering services, post-occupancy verification support, or other energy and energy efficiency-related activities. The goal of this support is to help customers identify, evaluate, and fund energy efficiency opportunities in a manner which motivates and enables them to undertake projects that result in greater levels of energy usage, cost, and GHG emissions reductions than they would otherwise have achieved.

Design and Delivery

Due to the large variation in new construction projects and the wide range of customer priorities, aspirations and constraints, there are a range of pathways tailored to meet customers' expectations. These pathways are shown in the figure below.

Strategic Enhancements

For the 2022-2024 term, the PAs will drive improvements by setting EUI targets with customers early in the design phase and by focusing on post-occupancy performance along with ZNE and Passive House designs. For the first time, the PAs have tied the New Construction & Major Renovation Initiative's incentives and savings to operational performance with the new Path 1 ZNE/Low EUI approach. In this approach, customers must commit to commissioning their project to the equivalent of Leadership in Energy and Environmental Design's (LEED) Enhanced level, including envelope commissioning. Design teams will be required in this path to use energy models to predict operational EUIs, while project teams will look at performance relative to predictions. This is a feedback loop that is sorely lacking in the field but is necessary to bend the EUI curve downward in Massachusetts and the Northeast region.

As part of this effort, the PAs have restructured incentives, hoping to influence more and more customers to strive for the maximum possible efficiency for their new buildings. For Paths 1 and 2, incentives are now paid on a dollar per square foot basis, allowing the customer to easily estimate achievable incentive amounts in advance. To motivate customers to go deeper with energy savings, Path 2 will offer incentives on a progressive scale where the incentive rate increases in reverse proportion to the EUI achieved.

For the 2022-2024 term, the PAs will introduce a verification incentive designed to motivate customers to compile energy use trend data following occupancy (post occupancy) to determine whether buildings are operating as intended as early as possible. This verification incentive also requires a review of controls to ensure they are operating optimally.

Additionally, the Path 3 Whole Building Streamlined approach now utilizes a simplified spreadsheet tool to estimate energy savings for small and mid-size buildings that are less energy intensive. This tool replaces more costly and time-intensive building modeling and allows for faster energy savings and incentive calculations to inform and influence the customer during the design process.

Figure 3-28: New Buildings & Major Renovations Pathways

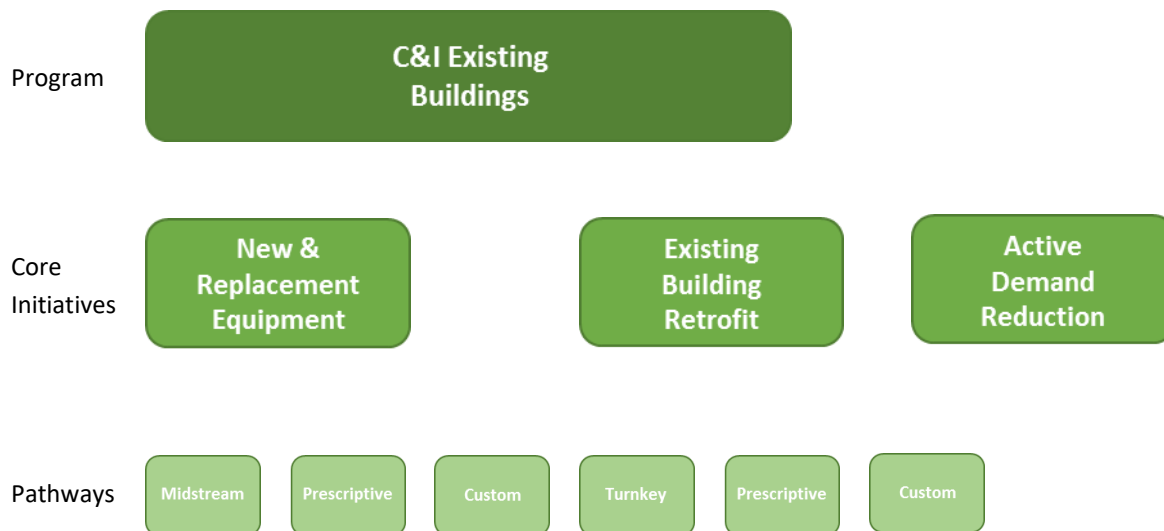
PATHWAY	Path 1 Zero-Net Energy / Deep Energy Savings	Path 2 Whole Building EUI Reduction	Path 3 Whole Building Streamlined	Path 4 Systems
Project Types	ZNE, ZNE ready, Passive House & Low EUI	Large building, EUI focused	Small to medium-sized, non-energy intensive	Very small or partial building and late engaging customers
Eligibility/ Target Building Sizes	20,000 SF or greater heated & cooled space	50,000 SF or greater heated & cooled space	20,000-100,000 SF heated & cooled space	Any size, as applicable
Objective	Drive projects toward ZNE and a 25 EUI (or negotiated target) in operation; focus on outcomes	Drive projects toward low EUIs	Support for smaller, fast moving projects providing flexibility when spreadsheet analysis could take place of modeling	Support tenant fit-outs, late engagers, and projects not involving entire building to optimize energy efficiency of equipment and systems
Incentive Design	Performance based – both customer and design team incentives with additional certification and optional verification incentives	Customer and design team incentives w/optional verification incentive	Customer and design team incentives	Prescriptive and custom
Incentives*	<p>Customer</p> <ul style="list-style-type: none"> Construction - \$1.25/SF Post-occupancy - \$1.00 /SF ZNE or Passive House certification - \$3,000 Design-based technical assistance for ZNE Services – 50% of fee up to \$10,000 Verification – 50% of fee up to \$10,000 <p>Design Team</p> <ul style="list-style-type: none"> Up to \$15,000, not less than \$8,000 	<p>Customer</p> <ul style="list-style-type: none"> 25%+ EUI reduction - \$1.25 / SF 10-24.9% EUI Reduction - \$0.35 - \$0.75/SF Design-based technical assistance – 75% cost share up to \$20,000 per PA Verification – 50% of fee up to \$10,000 <p>Design Team</p> <ul style="list-style-type: none"> Up to \$15,000 	<p>Customer</p> <ul style="list-style-type: none"> Custom – envelope, HVAC, energy recovery, water heating, other - \$0.35 / kWh and \$2.00/therms Prescriptive – lighting, VFDs, boilers, etc.– Standard program incentives Design-based technical assistance – 100% covered by PAs <p>Design Team</p> <ul style="list-style-type: none"> Up to \$10,000 	<p>Customer</p> <ul style="list-style-type: none"> Custom and prescriptive incentives for a variety of energy using equipment Equipment-based technical assistance – up to 50% cost share
Other Costs to PAs	PAs pay 100% of cost of energy modeling and post occupancy model true-up to determine claimable savings			

* Incentives are subject to change.

3.10.2 C&I EXISTING BUILDINGS

The PAs work with building owners to help them upgrade existing systems and equipment with more efficient options. To meet the wide variety of customer types and sizes, building types, and end uses, the PAs have developed a portfolio of technical and financial supports and participation pathways to assist customers regardless of whether they are in need of a one-for-one equipment replacement, upgrading an entire system, or contemplating a custom, multi-end use project. For additional details, please refer to the New & Replacement Equipment Initiative, Existing Building Retrofit Initiative, or C&I ADR Initiative sections.

Figure 3-29: C&I Existing Buildings Program – Core Initiatives and Pathways



The figure below summarizes the PAs’ projected participation, energy and demand reduction, budget, and cost-effectiveness and cost-efficiency projections for the Existing Buildings Program.

Figure 3-30: 2022-2024 Planned Performance Summary – C&I Existing Buildings Program

Planned Results	Projection
Net Annual Electric MWh Savings	915,511
Net Annual Natural Gas Therms Savings	19,310,131
Total Program Costs	\$776 Million
Total Program Benefits	\$2,117 Million
Cost-Effectiveness (BCR) - Electric / Gas	1.8 / 3.5
Annual CO2e Avoided (Metric Tons)	1,510,621

C&I EXISTING BUILDING RETROFIT - CORE INITIATIVE

Overview

The Existing Buildings Retrofit Initiative is available to all non-residential customers and supports efficiency and associated DR opportunities for all types of commercial, industrial, institutional, and municipal buildings and operations. The Initiative works with customers to pursue energy and DR measures and strategies to optimize their operations, manage their energy and capacity expenses, and improve their workplaces. The Initiative promotes a menu of incentives and technical services to encourage building owners to replace inefficient equipment with more efficient options and to optimize systems and processes to reduce energy consumption and demand. The goal is to give customers confidence in estimates of project savings, equipment reliability and performance to justify investments, and then to support the upgrades as simply and seamlessly as possible.

The figure below summarizes the PAs' projected energy savings, budget, benefit, cost-effectiveness and GHG reduction projections for the Existing Building Retrofit Core Initiative.

Figure 3-31: 2022-2024 Planned Performance Summary

Planned Results	Projection
Net Annual Electric MWh Savings	759,770
Net Annual Natural Gas Therms Savings	15,136,111
Total Program Costs	\$573 Million
Total Program Benefits	\$1,581 Million
Cost-Effectiveness (BCR) - Electric / Gas	1.7 / 3.6
Annual CO ₂ e Avoided (Metric Tons)	1,072,483

Eligibility

Participation in the C&I Existing Building Retrofit Core Initiative is available to all active non-residential electric and/or natural gas customers who contribute to the energy efficiency funds. Additionally, eligibility for the small business turnkey pathway within this Core Initiative is restricted to customers using less than 1.5 million kWh and/or 40,000 therms annually..⁵²

Offerings

For the 2022-2024 term, the PAs will offer two main sources of support and value: (1) technical assistance and (2) financial assistance. Technical assistance can take a variety of forms including buildings assessments, engineering assessments, and advanced building or equipment/system modeling to identify and assess potential energy efficiency

⁵² For Unitil customers, eligibility is restricted to those using less than 1.0 million kWh annually.

opportunities and inform customers’ project development and decision making. Financial assistance consists of a range of options including prescriptive and custom incentives for energy efficiency projects that deliver energy savings. The goal of providing financial support is to help customers identify, evaluate, and fund energy efficiency opportunities in a manner which motivates and enables them to undertake projects that result in a greater reduction of energy usage, costs, and GHG emissions reductions than they would otherwise have undertaken.

Design and Delivery

The PAs understand that there is a large variation in C&I customer size and type, and that each customer segment requires a range of approaches tailored to meet customers’ needs and expectations. The figure below details the PAs’ customer segment engagement approaches for the 2022-2024 term.

Figure 3-32: Customer Segment Engagement Approaches

Segments	Medium & Large	Small Businesses	Multifamily
Description	Medium & large C&I customers have a small number of accounts; however, they represent a significant portion of energy consumption in the C&I Sector.	Small businesses can participate in all C&I offerings. However, the PAs have developed pathways specifically to provide turnkey services	Multi-unit residential use buildings have unique characteristics that require a cross-functional offering. Multi-unit buildings may contain building-level systems more traditionally found in commercial facilities while also consisting of in-unit residential measures
Objective	The PAs engage in market segmentation to classify and serve these large customers with their unique needs.	Remove barriers and increase participation within the small business category. PAs define small businesses by energy consumption	Integrated offering of residential and commercial implementation teams to support delivery of services to multi-unit buildings with both residential and commercial meters
Engagement Strategy	The PAs generally engage with these larger customers through a managed account approach that connects customers directly to resources and offerings best suited to their circumstances	Small businesses can utilize the Turnkey offering and work with one of the PAs’ contracted vendors. here is also a Customer Directed Option if a small business work with a vendor of their choice.	This pathway is supported mainly within the Residential Coordinated Delivery Initiative
Financial Support	Custom and prescriptive incentives as well as cost-share for technical assistance services	Up to 70% of cost-effective measures	Custom and prescriptive incentives
Technical Assistance and Consultation Services	Customers may receive technical assistance from an independent firm that is contracted with the PAs or from a vendor contracted with the customer. The outcome of technical support is to help customers understand their energy savings opportunities and to act on them	The PAs provide a Turnkey vendor to provide technical assistance and consultation on Turnkey measures	The PAs work with contracted vendors to offer the assessment, which provides a path for implementation based upon cost-effective measures

Strategic Enhancements

Due to their wide-ranging customer base, the PAs work to offer multiple pathways in order to best meet the customer’s needs. The key areas of focus in this area are: (1) awareness of the offerings, and (2) access to incentives and services that motivate the customer to adopt energy-efficient measures and services in their building. To this end, the PAs are working on some enhancements to support this work during the 2022-2024 term.

The PAs rely on dedicated account managers, contracted vendors, and trade allies to engage customers; however, some customers are still not aware of the full suite of C&I Sector offerings. To increase customer awareness, the PAs are working on updating the statewide website to provide the best possible information about the C&I Sector's energy efficiency offerings. Additionally, the PAs are developing a statewide online platform that will gather information about a customer's building and provide the most applicable information regarding efficiency options. Outside of the Turnkey offering approach and incentives, customers and trade allies must complete applications to receive incentives. These forms have evolved over the years and the PAs have recently initiated an effort to streamline and consolidate the forms. In addition to the above-referenced efforts, the PAs are committed to reviewing the Mass Save Application Portal (MAP), the online platform to submit applications, for possible improvements.

C&I NEW & REPLACEMENT EQUIPMENT - CORE INITIATIVE

Overview

The PAs work with customers who are purchasing new equipment or replacing equipment that has failed or is at risk of failing, by encouraging them to opt for the most energy-efficient equipment available in the market. Most major commercial equipment continues to be used until the end of its useful life, and the goal of the New & Replacement Equipment Core Initiative is to help motivate customers to purchase high-efficiency equipment, ultimately saving on their energy consumption and costs.

The figure below summarizes the PAs' projected energy savings, budget, benefit, cost-effectiveness and GHG reduction projections for the New & Replacement Equipment Core Initiative.

Figure 3-33: 2022-2024 Planned Performance Summary

Planned Results	Projection
Net Annual Electric MWh Savings	155,790
Net Annual Natural Gas Therms Savings	4,174,020
Total Program Costs	\$149 Million
Total Program Benefits	\$379 Million
Cost-Effectiveness (BCR) - Electric / Gas	1.9 / 3.2
Annual CO ₂ e Avoided (Metric Tons)	438,146

Eligibility

Participation in the C&I New & Replacement Equipment Core Initiative is available to all active non-residential electric and/or natural gas customers.

Offerings

The PAs offer financial support in the form of incentives for a range of measures across a variety of end uses based on incremental cost, which is the price difference between industry standard practice (ISP) or code-compliant equipment, and the higher-efficiency equipment. This is balanced against the incremental savings difference between the operation of the standard or code-compliant equipment and the high-efficiency equipment over the expected life of the equipment. The PAs guide and influence customers' decision making through energy consulting, qualified product

lists, and setting efficiency thresholds. There are multiple measures available through Downstream Prescriptive pathway applications (prescriptive and custom) and the Midstream point-of-sale pathway (formerly known as upstream), to customers who are installing new equipment or replacing failed equipment.

The PAs plan to continue supporting customers switching from oil, propane, or electric resistance heat to a high-efficiency electric HVAC system. The PAs offer a prescriptive heat pump offering for small-size equipment (<5.4 tons) that aligns with the Residential Sector’s offerings since the equipment and contractors are similar. For larger units, the PAs can accommodate fuel-switching installations through a custom application process.

Figure 3-34: Downstream Prescriptive and Custom Offerings

HVAC	Lighting	Process
Natural gas	Interior lighting	New compressors
Furnaces	Interior lighting with controls	Refrigerated dryers
Condensing boilers	Exterior lighting	Additional storage
Wireless enabled and programmable thermostats	Exterior lighting with controls	Zero-loss condensate drains
Infrared heaters	Lighting controls	Enhanced controls
Steam traps		Piping improvements
Faucet aerators		Leak repairs
Showerheads		Motors with VSDs
Electric		VSDs
Small C&I heat pumps <5.4 tons		
Room air purifiers		
Motors and VSDs		
VSDs		
Chillers		

The PAs also offer a Custom pathway for any project regardless of end use.

The PAs continually review energy-efficient measures to determine whether they can effectively be provided to C&I customers through a Midstream pathway versus, or in addition to, other pathways such as Custom. For example, the PAs recently added Ultra-Low Temperature (ULT) Freezers to the Midstream pathway given that the customers purchasing these are generally researchers who are working from grants. Submitting applications through the Upstream (prescriptive) or Custom pathway has proved to be challenging for them given their grants and inability to apply an incentive check to the purchase. Having the equipment incentivized at the point of purchase through the Midstream pathway allows customers to purchase high-efficiency equipment without conflicting with grant requirements. This addition of ULT freezers (and other cold-storage equipment) to the Midstream pathway also helped proactively mitigate the storage needs required for the COVID-19 vaccines to help support Massachusetts communities during the pandemic.

Another example of the PAs working to serve C&I customers more comprehensively and streamlining the process is the shift to having all commercial foodservice equipment being solely incentivized at the point of purchase through

the Midstream pathway. This allows customers to receive incentives instantly for eligible equipment without the need to complete application forms.

Figure 3-35: Midstream Offerings

HVAC	Lighting	Foodservice	Natural Gas Water Heaters
Unitary air conditioners	LED linear lamps and linear lamps with controls	Ovens – combination, convection, conveyor, rack, deck	Storage
Air-cooled heat pumps > 5.4 tons	LED linear fixtures and fixtures with controls	Broilers - conveyor and underfired	Tankless (on-demand)
Water-source heat pumps	High/low bay and high/low bay with controls	Griddle, steamer, fryer	Volume (DHW boiler)
Dual enthalpy economizers	LED exterior and LED exterior with controls	Dishwashers	Indirect
ECM circulator pumps		Refrigerators, freezers, and ice machines	
Variable refrigerant flow (VRF) heat pumps		Hot food holding cabinets and refrigerated chef bases	
Cold-storage equipment		On-demand commercial electric hand wrap machine	

The PAs periodically review equipment and technology that can be included in the Midstream pathway. For the 2022-2024 term, the PAs are considering the inclusion of commercial electric HPWHs and Pump Energy Index (PEI)-rated pumps into the Midstream pathway.

Design and Delivery

When customers are faced with having to purchase a new, or replace a failed piece of equipment, they have a choice between standard-efficiency equipment and high-efficiency equipment. The PAs have multiple pathways available for customers under the New & Replacement Equipment Core Initiative, the Midstream pathway, Prescriptive Downstream pathway, and the Custom pathway. Each pathway is clearly defined with a set of guidelines and requirements allowing customers to participate based on the individual customer’s business needs. These pathways provide customers with choices when faced with the need to add new equipment or replace failed equipment. The PAs have worked to align offerings across the Midstream and Downstream pathways to simplify the experience for customers while expanding the portfolio of energy efficiency measures.

Midstream Pathway

The Midstream pathway leverages existing distributor networks and infrastructure to influence thousands of equipment-purchasing decisions that customers and contractors make every day. This provides customers a

streamlined participation channel where incentives are provided at the point of purchase on eligible equipment purchased from participating distributors or dealers. This eliminates the need for applications to be filled out and reviewed in advance of the installation. The success of the PAs' Midstream pathway has made high-efficiency equipment more readily available to customers, especially in the instance of emergency replacements, where previously distributors may have only stocked standard efficiency equipment. The PAs require a mandatory pass through of a portion of the incentive to the contractor or purchaser, who is encouraged to pass through the incentive to the customer in their pricing. This allows the PAs to directly promote these offerings to customers and contractors for increased engagement in the pathway.

The PAs have various program requirements in place such as pre-approval requirements, which allows them to engage customers and discuss their potential project. PAs are also engaged in training distributors to promote upselling and pivoting toward a systems-based approach based on type, size, and quantity of equipment being purchased at distributors' or dealers' locations. Some examples of distributor trainings include lighting controls trainings and presentations which has led to increased adoption of controls and cross-promotion education regarding other energy efficiency offerings. Additionally, the PAs send follow-up mailings to customers who have purchased equipment through the Midstream pathway promoting other available offerings. This has helped cross-promote and upsell other opportunities that customers can take advantage of to make their buildings more energy efficient.

Prescriptive Downstream Pathway

Prescriptive incentives are most effective when the customer or the trade ally serving the customer can be actively engaged before the installation of new equipment or replacement of failed replacement. PAs exert influence over the customer and/or the trade ally purchasing equipment directly through involvement of account managers, training of trade allies, and building awareness across customers and industry regarding more efficient options. The prescriptive application process involves reviewing the proposed equipment in advance of the installation which gives the PAs an opportunity to potentially influence (cross promote and upsell) additional energy efficiency measures at the facility.

Custom Pathway

While the Downstream and Midstream pathways offer customers opportunities to access common energy efficiency measures, the Custom pathway provides customers with an opportunity to put forth more complex and/or site-specific energy efficiency measures for consideration within the programs. Typically, these more complex measures require detailed energy efficiency savings analysis, review (or calculation) of measure-specific implementation costs, and, in some instances, inputs from energy modelling programs. This information is required by the PAs to determine if the energy efficiency measures are cost effective and are consistent with other pertinent program guidelines. The Custom pathway allows the customer and PAs the flexibility to consider new technology and advance other cost-effective energy efficiency measures and strategies not offered through the Downstream Prescriptive or Midstream pathways. As increasingly stringent code adoption, rising standard practice, customer awareness, and the success of our energy efficiency programs continues to put pressure on PAs' ability to claim savings for simple equipment replacement, the Custom pathway is a key to creating integrated solutions that create new energy efficiency savings.

Figure 3-36: New & Replacement Equipment Pathways

Pathway	Midstream	Downstream Prescriptive	Custom
Project types	Adding new equipment or replacing failed equipment	Adding new equipment or replacing failed equipment	Adding new equipment or replacing failed equipment
Eligible / target building sizes	Any facility	Any facility	Any facility
Objective	Provide easy access to high-efficiency equipment and lower upfront costs	Widget based or high-efficiency equipment replacement with predefined set of qualification guidelines and active PA participation in decision making process	Widget or systems-based replacement with consultative style engagement and influence of customer decision. Significant PA participation through techno-economic analysis via in-house staff or contracted vendors
Incentive design	Incentives provided at point of purchase on eligible equipment from participating distributors or dealers	Per unit incentives provided for installation of eligible equipment	Incentives provided based on project specific energy savings and economics

Strategic Enhancements

During the 2022-2024 term, the PAs' main focus for this Core Initiative will be to identify opportunities to expand the range of measures offered and work closely with business partners to increase upsell and cross-sell opportunities in the Midstream pathway. The PAs also plan to increase direct-to-customer marketing in order to drive greater awareness of the available opportunities. In addition, the PAs will continue to translate Midstream pathway materials, consider additional native language materials, and will work with Environmental Justice communities to provide appropriate materials based on the needs of their community.

C&I ACTIVE DEMAND REDUCTION - CORE INITIATIVE

Overview

The PAs work with C&I customers to target peak system demand reductions. This Core Initiative provides system benefits by reducing the long-term capacity, transmission, and distribution costs that are borne by all ratepayers. Additionally, customers with third-party supply rates subject to ICAP fees may realize additional value through the reduction of coincident demand. During the 2022-2024 term, the PAs propose offering ADR offerings for the summer seasons, corresponding to peak system loads.

To a large extent, this Core Initiative's offerings are outcome based and technology agnostic; they do not proscribe or limit how or what technology customers should use when responding to events. Customers can participate in ADR offerings with a wide range of strategies. While not exhaustive, the PAs expect customers to respond with operational changes to HVAC and chiller system sequences and controls, lighting dimming and switching, production, shift scheduling, storage, and generation assets. Some customers may prefer to develop automated response sequences while others will prefer to engage in manual adjustments to facility systems on equipment during events.

The figure below summarizes the PAs’ projected energy savings and demand reduction, budget, benefit, cost-effectiveness and GHG reduction projections for the Active Demand Reduction Core Initiative.

Figure 3-37: 2022-2024 Planned Performance Summary

Planned Results	Projection
Active Demand Reductions (Net MW)	202
Total Program Costs	\$55 Million
Total Program Benefits	\$157 Million
Cost-Effectiveness (BCR) - Electric-Only	2.9

Eligibility

This Core Initiative has two primary DR elements: (1) Targeted Dispatch and (2) Daily Dispatch. Participation in the Targeted Dispatch offering is available to any customer with electric interval metering. If the customer does not have an interval meter installed by their utility as part of their electric service or rate class, they or their CSP may install one, provided the data is shared with the appropriate PA at the end of the performance period. Individual PAs may have restrictions with respect to the equipment or technologies used to curtail load.

Participation in the Daily Dispatch offering is open to any customer with an eligible asset that can achieve a reduction in facility demand for up to 40 two- or three-hour events per summer. The PAs may have differing eligibility requirements and will evaluate performance based on the output of the device used or based on the whole building load reduction measured at the utility meter, depending on technology and metering capabilities. To be eligible for this offering, any battery storage systems must be considered a behind-the-meter (BTM) asset. BTM means a facility that serves an on-site load other than parasitic load or station load utilized to operate the facility. The PA’s CSP or DERMS providers can send dispatch signals directly to the customers’ CSP, who then sends dispatch signals directly to customer-owned devices, such as batteries and other participating equipment. This machine-to-machine communication makes it easier for customers to participate.

Offerings

The Targeted Dispatch offering pays customers with interval metering capability for actual, measured curtailment of load during events called during ISO-NE system peaks. The PA staff work with customer facility staff and CSPs to identify peak load curtailment opportunities and to manage them through reduction during up to eight targeted events lasting three hours each. Customers are paid a fixed cost per kW of DR at the end of the season, based on average performance, relative to their baseline load.

The Daily Dispatch offering pays customers a higher incentive rate for responding to an increased number of events (up to 40 events per summer). This offering gives customers and vendors the flexibility to curtail or discharge electricity in a way that works best for the customer. As with the Targeted Dispatch offering, Daily Dispatch incentives are paid based on average performance at the end of the season.

Design and Delivery

The success of the C&I DR Core Initiative relies heavily on existing energy efficiency sales teams who regularly conduct outreach to customers to develop efficiency projects. While customers can participate directly, experience to date

suggests that most customers prefer to work with a CSP to assess curtailment potential, control strategies, and potential upgrades or equipment that may facilitate greater performance during events.

It should be noted that equipment installed to facilitate load reduction during peak events is fully eligible for incentives through “traditional” equipment-based pathways. Similarly, the PAs’ staff can work with customers and installation contractors to leverage energy efficiency projects for additional value through the ADR offerings where appropriate. Energy efficiency and DR efforts offer two distinct incentives for differing purposes.

Many smaller commercial customers may have HVAC systems which are controlled by the same Wi-Fi thermostats most commonly found in residences. To the extent that these customers have connected air conditioning loads, they will be targeted by the same marketing efforts that the device manufacturers apply to their residential customers. As with residential customers, the PAs will work to increase the number of Wi-Fi thermostats installed in commercial buildings with compatible systems and to encourage enrollment.

Strategic Enhancements

At present, the PAs’ efforts around EV participation in ADR offerings have been focused on residential EV charging. Both National Grid and Eversource are exploring the efficacy of delivering cost-effective benefits through the curtailment of EV charging during events. Eversource is implementing a demonstration utilizing direct load control of vehicle chargers (called EVSEs). National Grid has been working with vehicle manufacturers in an effort to utilize direct load control of vehicles’ on-board charge controllers. Eversource and National Grid are in the process of evaluating these two approaches, with the potential of implementing a statewide EV demand reduction offering by the summer of 2022.

Natural Gas Demand Response

As described in Section 1, both National Grid and Eversource have proposed natural gas demand response demonstrations through their gas rate cases and Eversource has an approved gas demand response demonstration as part of the settlement agreement pursuant to their acquisition of NiSource’s Columbia Gas of Massachusetts assets. Given that Eversource already has an approved natural gas demand response demonstration, this section describes National Grid’s proposed demonstration, to be filed as a part of the Plan.

National Grid sees the greatest potential for natural gas demand response to provide cost-effective value to rate payers in specific geographic areas that could defer or altogether avoid certain natural gas winter reinforcement or increased capacity investment costs. National Grid believes that natural gas demand response would likely be part of a package of strategies that could provide the necessary reduction in gas consumption at specific times to render some capital upgrades unnecessary or lessen the need for winter reinforcing portable liquid natural gas (LNG) vaporization.

This package would likely include targeted incremental energy efficiency investments, localized natural gas demand response, and potentially the electrification of customer owned and operated natural gas heating equipment. The composition of any portfolio would ultimately be a function of both the customer profiles within the affected area, customer participation and acceptance rates, and the scale of the peak period natural gas demand reduction necessary to achieve desired cost avoidance.

In this demonstration, National Grid proposes to deploy and test the potential contributions that targeted natural gas demand response could be expected to make as a component of a comprehensive, non-pipes alternative (NPA) to more traditional infrastructure investments or traditional winter operational balancing requirements. Unlike the Eversource demonstration which is focused on the reduction of peak hour natural gas consumption across its service

territory, National Grid will offer natural gas demand response to customers in specific areas for which a distribution constraint has resulted in the potential for higher-than-average avoided costs.

This demonstration will attempt to measure the discrete avoidable consumption and associated value that natural gas demand response is able to provide, as well as a clearer understanding of the costs necessary to achieve the avoided consumption. Due to the nature of the wholesale gas market, much of the value of gas demand response is likely to be realized over significantly longer curtailment periods than is common for electric demand reduction efforts. National Grid intends to recruit customers with the potential to curtail natural gas consumption for periods of 8 hours in duration, with no offsetting pre- or post-event usage increases. National Grid acknowledges that natural gas curtailment of this magnitude may not be possible without fuel-switching and may involve customers who have thermal systems capable of dual fuel (i.e., delivered fuel in lieu of natural gas during demand response events) operation.

National Grid is currently assessing the suitability of two areas in its territory that may face supply capacity or distribution system constraints that would require significant near-term investments to alleviate. As part of its 2022-2024 Plan filing, National Grid plans to propose a more detailed plan demonstrating the potential for gas demand reduction to provide value to ratepayers, to be included in the final Plan submitted to the Department. Proposed cost estimates are under development but are anticipated to be in the range of \$500,000 to \$1 million per year.

4. EVALUATION, MEASUREMENT & VERIFICATION



SECTION 4: EVALUATION, MEASUREMENT & VERIFICATION

4.1 INTRODUCTION

EM&V has been an integral component of the efficiency programs in Massachusetts since their inception. The robust EM&V framework supports the development and continuous improvement of cost-effective demand side management (DSM) programs as the programs adapt to changing markets. Evaluation plays an essential role throughout the program lifecycle, from conducting research in support of new program designs and key priorities such as equity and electrification, to developing program theory, assessing demonstration projects for new offerings, and ultimately evaluating verified savings and benefits from mature programs. Evaluation can also track progress toward market transformation and can assess PA contributions to shifting markets toward more efficient standard practices. Massachusetts has invested heavily in EM&V research, and leads the country in terms of comprehensive, in-depth evaluations.

The key purposes of EM&V are to support continuous program improvement and program innovation, ensure accurate and credible impacts, determine cost effectiveness, and support timely regulatory reporting to the Department and ISO-NE. These purposes are interactive and are all equally important.

4.2 EM&V FRAMEWORK

Consistent with previous three-year plans and Department precedent, the PAs propose to continue the evaluation framework that has been successfully used to promote high-quality, third-party EM&V efforts in Massachusetts. It is critical that the state's energy efficiency programs be evaluated, measured, and verified in a way that provides confidence to the public at large in the results of the programs. The EM&V efforts enable the PAs to report savings to the Department with full confidence. Additionally, there is a need to ensure both the reality and the perception of the independence and objectivity of EM&V activities. Accordingly, the EEAC will continue to have an oversight role over the EM&V activities of the PAs, which will help ensure consistency, timeliness, and credibility of the results. The EEAC's oversight role will be accomplished through the EEAC's EM&V consultant (EM&V Consultant), a third-party expert consultant who has primary responsibility for working with the PAs to plan and implement high-quality EM&V in Massachusetts.

The PAs and the EM&V Consultant will continue to work diligently to reach a consensus on evaluation issues throughout the 2022-2024 term. If there are areas of difference that arise that cannot be resolved through consensus during the ongoing interactive process between the EM&V Consultant and the PA evaluation staff, authority for decision making will reside with the EM&V Consultant and the EEAC.

To enable the PAs to fulfill their responsibility to report program savings to the Department with full confidence, an appeals process has been established, through which the PAs may bring decisions made by the EM&V Consultant to the EEAC for review and resolution. This process is implemented through the formation of an evaluation appeals committee (Appeals Committee) of the EEAC, whose responsibility in this area is to hear the matter under dispute and rule so that the study may proceed in a timely way. In general, it is expected that this review process will be completed within 72 hours once an issue is elevated to the Appeals Committee.

The Appeals Committee consists of three voting members of the EEAC, including DOER. Consistent with general EEAC proceedings, the Appeals Committee will include and consult with, in both deliberations and decision making, a representative of both the PAs and the EEAC's consultant team, neither of whom shall have a vote in the Appeals

Committee. The Appeals Committee will review the issues related to the disputed matter, hear from the PA evaluation staff and EM&V Consultant, and make a determination on the outcome of the matter. The decision will be recorded, along with a description of the applicable issues. The participants in the appeal will sign the record of the decision, indicating their acceptance of, the representation of the issues and of the decision.

In exceptional cases, where the PAs perceive there to be significant risk to their ability to manage the energy efficiency programs in the near term, the PAs will note their disagreement with the decision of the Appeals Committee on the record of the decision and reserve the right to immediately petition the Department. The PAs shall be able to submit any such documents to the Department in conjunction with the filing of the three-year plans, mid-term modifications, and term reports. The Department will be able to review the record of this decision in its review of three-year plans, mid-term modifications, plan-year reports, and term reports.

To date, the EM&V Consultant and PA evaluation staff have been able to resolve areas of differences specific to evaluation without proceeding to the Appeals Committee. This is a testament to the professionalism, hard work, and collaborative engagement of the PAs and the EM&V Consultant. The PAs are continuously looking for opportunities to improve evaluation processes and address new issues that arise and may suggest updates to the EM&V framework in the future if needed.

The PAs will maintain a statewide focus to the maximum extent possible and review EM&V budgets with the EM&V Consultant. In addition, the PAs will integrate electric and natural gas evaluation efforts to the maximum extent possible. In addition, where possible, the PAs and EM&V Consultant will collaborate on evaluation studies conducted in conjunction with nearby jurisdictions in order to reduce costs. For example, during the 2019-2021 term, Massachusetts participated in regional studies related to residential lighting sales and C&I ADR.

The PAs are responsible for contracting with independent evaluation contractors and ensuring that they meet all required terms and conditions in order to protect customers' safety, property, and privacy and security of customer data. Each PA signs contracts with each independent evaluation contractor in order to ensure their contractual requirements to protect customers are satisfied.

4.3 EVALUATION MANAGEMENT COMMITTEE

The PAs and the EM&V Consultant established the Evaluation Management Committee (EMC) as a steering committee for statewide evaluation issues, providing guidance and direction to each of the evaluation research areas. The EMC works to plan, prioritize, and delineate the research studies to be undertaken over the three-year plan term. The EMC meets monthly and serves as a forum to coordinate evaluation studies and related tasks, resolve issues, and set strategic direction.

The PAs and the EM&V Consultant have worked to consistently improve the EM&V process over time. As issues arise, the EMC has established working groups to review and address new topics, areas of concern, or disagreement. For example, the EMC currently has working groups related to EM&V for ADR, and the EMC is also co-chairing a broader working group on the topic of offering ventilation measures during the COVID-19 pandemic that includes representatives from PA evaluation staff, implementation staff, engineering staff, and the EEAC Consultants. The EMC will continue to develop working groups, as needed, in order to keep the EM&V process running transparently, efficiently, and effectively.

4.4 DESCRIPTIONS OF RESEARCH AREAS

Consistent with the experience since the establishment of the GCA, the EMC worked collaboratively to develop and refine four market research areas for the 2022-2024 Plan term. These research areas are organized as follows: (1) Residential Energy Efficiency, (2) C&I Energy Efficiency, and (3) Demand (both Residential, Income Eligible, and C&I Sectors), and (4) Special and Cross Cutting. The Special and Cross Cutting research area covers topics that do not fit cleanly into the other areas, and also includes additional specialized topics in which it is particularly important to ensure consistency across research areas and markets. Examples of Special and Cross-Cutting topics include codes and standards, education and training, market effects, marketing, customer profile report, and data management.

More details regarding these research areas and specific research topics can be found in the Strategic Evaluation Plan, which is attached as Appendix B.

4.5 TYPES OF EVALUATION FUNCTIONS

EM&V includes the following types of studies:

- **Impact evaluation** refers to the measurement of gross energy and demand (electric and natural gas) savings achieved within program populations. Impact evaluations may also include the study of key impact factors to estimate savings and benefits, such as in-service rates and other resource savings, including water and non-utility fuels (propane and oil).
- **Net-to-gross (NTG) studies** refer to specific research that quantifies program influence by estimating free-ridership and the various components of spillover (participant and/or non-participant).
- **Baseline studies** refer to specific research to determine baselines, such as industry-standard practice baselines. Baseline research is sometimes conducted concurrently with impact evaluation research.
- **Measure life studies** research equipment life and the effects of measure persistence. Equipment life is the number of years that a measure is installed and will operate until failure. Measure persistence takes into account business turnover, early retirement of installed equipment, and other reasons measures might be removed or discontinued.
- **Non-energy impact (NEI) studies** refer to research that estimates NEIs of DSM measures, including participant and utility benefits. These impacts include changes such as O&M, comfort, productivity, and avoided arrearages.
- **Cost studies** include research to determine the total and incremental costs of DSM measures.
- **Market effects evaluation** refers to the measurement of the long-term effects that programs or measures have on the structure and functioning of their target markets (e.g., changing product availability and pricing).
- **Market characterization** refers to the systematic assessment of product and service markets for the purpose of improving the design and effectiveness of programs targeting those markets.

- **Process evaluation** refers to the systematic assessment of programs for the purpose of documenting their operations and developing recommendations to improve their effectiveness and design. It may also include marketing studies to understand the effectiveness of various marketing approaches.

4.6 EVALUATION PLANNING AND STRATEGIC EVALUATION PLAN

The EMC has sought to establish a long-term strategic view of EM&V for the 2022-2024 Plan, including developing evaluation strategy and determining priorities that the EMC expects to research during the three-year term. These priorities were developed based on the findings of current research, input from the EEAC planning workshops held in late 2020, and discussion during a series of eight EMC workshops held in January and February 2021. The EMC workshops included PA evaluation and implementation staff, EEAC consultants, and evaluation vendors, and focused on lessons learned from past studies and priorities for future research. The Strategic Evaluation Plan (Appendix B) summarizes the findings from the workshops and lays out planned topics of evaluation research in the 2022-2024 term.

4.7 EVALUATION BUDGETS

In the 2022-2024 term, the EMC expects to dedicate \$54 million to EM&V studies.⁵³ This budget includes funding for independent third-party evaluators to conduct research managed by the EMC and is equal to the total actual spending on EM&V studies in 2019 and 2020 and expected spending on EM&V studies in 2021. The budget is slightly higher than the planned EM&V study budget for the 2019-2021 term of \$52 million, which was in turn based on spending in the 2017 program year. For more details on the Evaluation budget, see Appendix B: Strategic Evaluation Plan.

The EM&V budget is included in the Evaluation and Market Research Hard-to-Measure line item, along with other evaluation and market research costs, such as potential studies, the AESC Study, the Technical Reference Manual (TRM or eTRM), and internal PA staffing related to EM&V. See Section 6 for more information on the Hard-to-Measure Initiative.

4.8 EVALUATION & IMPLEMENTATION FEEDBACK LOOP

One of the purposes of EM&V is to provide information to enhance the energy efficiency programs. Evaluation can contribute to program improvements at all stages of the program lifecycle, from initial program design and formulation to small scale testing, full scale implementation, and refinements of mature programs. The EMC strives to engage program implementers at the earliest stages of program development or redesign. For example, in the 2019-2021 term, EM&V was actively engaged in the redesign of the Non-Residential New Construction program, the refinement of the Municipal & Community Partnership Strategy, and the initiation of a comprehensive Workforce Development program. EM&V provides essential information for program design by providing data on baseline

⁵³ This study budget excludes PA staff labor and expenses, potential studies, costs for the AESC study, non-study consultant costs, and maintenance of the TRM.

efficiencies, market conditions, and program participation levels. In addition, EM&V performs an important function to check program effectiveness and verify savings.

The PAs have developed a feedback loop to ensure that the results of evaluations are communicated to program implementers, who can then use those results to enhance and refine the programs. The feedback loop has many steps, from the initial consideration of a study to completion. Before a study is commenced, multiple teams, including evaluation, implementation, contractors, stakeholders, and consultants, convene to identify researchable questions across the statewide portfolio. The EMC then works with contractors and consultants to create a plan based on the researchable questions. As evaluation studies are scoped and planned out, the work plan may be shared with implementation to ensure that the EMC is asking the most appropriate researchable questions to help implementation. Evaluators also provide advanced notice of evaluation activity, such as customer on-sites and staff interviews. The implementation team is often interviewed as part of an evaluation study, particularly for process and market studies. Implementation and engineering staff may also be consulted about detailed project information and customer contacts for projects selected for evaluation.

Once a draft report is available, the draft findings and recommendations are shared with implementation, consultants, evaluation, and other stakeholders to give interested parties the opportunity to review and provide feedback. Once a study is complete, final findings and recommendations are shared with the Residential Management Committee (RMC) and Commercial and Industrial Management Committee (C&IMC) and their respective working groups, which determine whether it is appropriate to adopt and implement a recommendation. If the PAs determine that it is not appropriate to adopt a recommendation, the decision and reasoning will be documented clearly. A chart describing EM&V recommendation decisions is provided to the Department as part of the Term Report filing. Final impact results are also reviewed and incorporated into the TRM by PA evaluation staff and into the BCR model by the Common Assumptions Working Group.

Information on EM&V continuously flows in both directions between implementation and evaluation, allowing the implementation teams to seek guidance from EM&V, and the EMC to ensure that they are researching topics of importance to the programs. An EMC liaison participates in RMC and C&IMC meetings to inform the management committees of studies about to commence, seek input from implementation when it is needed, and to explain results and recommendations. Also, as discussed above, the three management committees meet quarterly in Tri-MC meetings to discuss various topics, including evaluations. Finally, PA evaluation staff stay in consistent communication with program implementation staff to stay current on program offerings and suggest relevant data and findings from program evaluation that can inform program strategy.

4.9 COMPLETE EVALUATION STUDIES

In advance of the 2022-2024 term, the PAs completed approximately 40 new studies, in addition to other studies filed in previous plan-year reports. These new studies include a wide range of evaluation topics in the Residential, Income Eligible, and C&I Sectors, as well as cross-sector evaluation areas. All currently completed studies are available on the EEAC's website at: <http://maeeac.org/studies/>. The new studies that have not previously been filed will be filed with the 2020 Plan-Year Report.

5. STATEWIDE MARKETING



SECTION 5: STATEWIDE MARKETING

The Statewide Marketing Hard-to-Measure initiative is used to support general statewide marketing efforts and the statewide Mass Save® brand. By creating powerful, engaging and motivating education and marketing strategies, the PAs can increase awareness of the benefits of energy efficiency and drive increased participation in programs and services. Proposed marketing strategies put the customer at the center and consider the unique motivational differences among residential and non-residential customers. This means being aware of, empathetic to, and reflective of the needs of the community. COVID-19 has been a game changer, with many customers facing unprecedented hardship. The PAs recognize these challenges and the need to innovate in order to support the customers' needs. With people spending more time at home, marketing strategies quickly pivoted to engage customers in their homes through streaming video, connected TV, streaming radio, and social media platforms.

Building on the success of digital and social marketing platforms will continue to be a key focus in the 2022-2024 term. Mass Save marketing efforts play a key role as informational sources for customers, connecting them to the energy-saving opportunities best suited to improve their homes and businesses regardless of objective or where they are in their energy efficiency journey. The Mass Save website has become a critical focal point in the state's comprehensive marketing strategy, providing a consolidated one-stop-shop for residents and businesses to learn about energy efficiency, program offerings, and partner opportunities. In 2020, MassSave.com received over 1.2 million unique visitors.

Social media platforms have become an inseparable part of daily life for Massachusetts residents and businesses, with users turning to social media platforms for entertainment, news, and inspiration. Statewide marketing will continue to leverage the strong social media presence built over past terms. With over 130K Facebook followers (www.facebook.com/MassSavers) and nearly 21.8K Twitter followers (www.twitter.com/MassSave), PA marketing and education reach an ever-broadening audience to promote energy efficiency. The social media platforms allow the PAs to tell a unique story that engages and entertains by tapping into cultural moments and trending topics, and to support effective peer-to-peer marketing, allowing customers to become brand ambassadors.

Reaching customers who have not yet participated in Mass Save branded programs remains a fundamental commitment of the PAs. Engaging customers traditionally considered HTR continues to be a core focus of marketing efforts with greater emphasis on diversity and inclusion in the 2022-2024 Plan term.

5.1 MARKETING PLAN OVERVIEW

The ultimate goal of all educational, community outreach, and marketing efforts is to build a culture of energy efficiency in the Commonwealth. It is necessary for a rapidly evolving energy marketplace to be able to utilize a system of effective communication with Massachusetts residents and businesses. This system is a critical tool to support customer awareness, understanding, and participation in the PAs' comprehensive energy efficiency programs. For the 2022-2024 term, the core objectives of the PAs' education, awareness, and promotion campaign will include:

- Maximizing reach to ensure all residential and business customers are provided access to information and connection to resources.
- Providing compelling and accessible messages, which clearly describe the benefits of energy efficiency without excess jargon or overly technical language.
- Ensuring marketing and services are inclusive and representative of the diverse communities served.
- Exploring and deploying targeted marketing to communities where English is not the primary language.

- Utilizing diverse media (e.g., internet, radio, public transit, social media, etc.) to disseminate consistent and clear messages.
- Ensuring that the various strategies work together to ultimately achieve deeper and broader savings.
- Creating awareness and understanding of Mass Save as a trusted statewide resource for all customers' energy efficiency needs.
- Ensuring that customers understand who their Mass Save sponsor is and increasing the awareness of PAs' commitment to their customers.

Through an extensive array of effective messages and an all-inclusive media strategy, the PAs commit to engaging with the broadest cross section of residential and business customers with tailored, targeted, and actionable information. The careful balancing of breadth, depth, and understanding of customer motivation in the campaigns will drive value to customers and support obtaining the aggressive energy efficiency goals set forth in the 2022-2024 Plan. During the 2022-2024 term, the PAs will:

- Increase the message that associates Mass Save with "A way to lower your energy bills" to both residential and business customers.
- Message and graphically tie in the PA brand logos with the Mass Save mark to create a strong association and clarity of message.
- Utilize the segmentation work identified by the RMC and C&IMC so the PAs can better and more consistently target customers.
- Educate customers about the opportunities to save energy and motivate them to act.
- Ensure cross-promotion and broader and deeper program participation through a number of strategies including featuring all energy efficiency programs on social media platforms, driving customers from Facebook and Twitter to MassSave.com blog articles or program-specific web pages.

As stated above, reaching customers who have not yet participated in Mass Save branded programs, often referred to as HTR customers, remains a fundamental commitment of the PAs. The Mass Save website is currently accessible in English, Spanish and Portuguese, the most common languages spoken across the state, and may include other language tools in the future to ensure accessibility for diverse linguistic populations. The statewide Mass Save phone line offers five different language options (English, Spanish, Portuguese, Russian, and Mandarin). During the 2019-2021 term, the PAs executed specific educational outreach to reach targeted audiences including Spanish and Portuguese speakers, renters, income-eligible customers, and small business owners, and will continue to target them in the 2022-2024 term.

5.1.1 Mass Save®

In 2010, the PAs joined together to promote energy efficiency programs to the Commonwealth through a statewide PA brand. As sponsors of the Mass Save word service mark, the intent of the PAs was to complement their individual PA brands when communicating with residential and business customers about energy efficiency programs.

The PAs are the owners of the Mass Save word service mark. A trademark or service mark identifies goods and services as originating from a single source. Trademarks, in effect, represent the goodwill that a business has built up through its history of offering quality goods and services. A word mark is the most common form of trademark and

simply consists of a word or group of words. The PAs have rights to the word mark Mass Save, having obtained federal registration of it on August 29, 2006. Under trademark law, the PAs monitor and control the use of their marks in order to maintain them and to prevent inferior energy efficiency services from diminishing them. Throughout the past four plan periods, the PAs have overseen significant monitoring efforts with respect to the Mass Save mark to identify unauthorized uses of the service mark. Legal measures have been successful to stop such unauthorized uses and thus the integrity of the mark has been protected.

5.1.2 2022-2024 Marketing

The PAs maintain a joint statewide website, MassSave.com, which is designed to educate customers and provide access to energy efficiency program information and participation. The website provides the PAs an opportunity to offer streamlined information, including the online home energy assessment, online rebate processing, access to an online retail marketplace, and online HVAC Facilitation tool, which offer substantial customer experience benefits. The centrality of this website to the PAs' marketing efforts demonstrates the commitment of the PAs to working together for the benefit of customers throughout the state. In 2020, the PAs continued to implement strategic and creative updates on MassSave.com.

The PAs' focus on total customer experience recognizes the entry of the customer through the website as a critical component of that experience. The PAs will continue to feature all the PAs' brands in conjunction with the Mass Save marks per the findings from the *Massachusetts Statewide Marketing Campaign Evaluation Report* and consistent with their goal to convey information regarding Mass Save. The PAs will utilize multiple marketing and branding strategies to facilitate customer perception of individual PAs as trusted energy advisors, leveraging the strong awareness and trust held by existing utility brands. These efforts will support the expansion of messaging and branding strategies into the broader context of energy and environment as a whole, supporting the Commonwealth's expanded policy objectives around electrification, renewable energy, and clean peak strategies.

The marketing efforts include: (1) updating and optimizing the MassSave.com website, (2) posting customer-success stories on the Mass Save website that share customers' positive experiences with home energy assessments and energy efficiency technologies, (3) leveraging of social media outlets like Facebook, Instagram, LinkedIn and Twitter to launch creative campaigns, (4) reviewing marketing materials and rebate forms across programs to ensure they leverage a consistent look and feel and follow best practices, (5) using an integrated out-of-home advertising campaign, including platforms such as commuter rail, subway, bus, and billboard ads across the state, and (6) using native advertising and infographics to the mix of promotional strategies. The PAs have also proposed enhanced marketing partnerships with communities (Municipal & Community Partnership Strategy), as discussed above. Because this work will cross sectors and programs, it will be funded through statewide marketing, although the partnerships will be managed primarily by the PA staff responsible for implementing the promoted programs.

The PAs receive monthly status updates on campaign successes and results, allowing them to benchmark and evaluate the effectiveness of their messaging and media planning and adapt the marketing strategies to take into account the results.

5.1.3 Maintenance of Complementary Efforts

While working diligently on the statewide education efforts, the PAs will also continue individually to maintain customer awareness, satisfaction, and participation goals. Accordingly, the PAs will continue their outreach efforts using customer representatives and account executives (who enjoy one-on-one/person-to person relationships that are especially important in the C&I Sector) and PA-specific efforts that complement and are consistent with statewide marketing and outreach efforts.

6. HARD-TO-MEASURE INITIATIVES



SECTION 6: HARD-TO-MEASURE INITIATIVES

The PAs classify some of their undertakings as “Hard-to-Measure” initiatives. This set of work describes activities that contribute to or facilitate the PAs’ achievement of their goals, but do not, by themselves, directly produce savings. Each sector has Hard-to-Measure Initiatives which are listed below.

- **Statewide Marketing (All Sectors).** The budget in the Statewide Marketing’s Hard-to-Measure Initiative is used to support general statewide marketing efforts and the statewide brands, including Mass Save. Program marketing is included in each of the program’s budgets.
- **Statewide Database – Residential, Income Eligible, and C&I.** The budget in this category is used to support database and data review and sharing efforts, including costs associated with vendors developing and improving Mass Save Data, the PAs’ statewide energy efficiency database. Statewide database efforts will affect all sectors, with funds budgeted for each sector. Please refer to Appendix A for more information on Mass Save Data and the PAs’ statewide energy efficiency database.
- **DOER Assessment – Residential, Income Eligible, and C&I.** The DOER Assessment represents an annual budget for DOER that is assessed.⁵⁴
- **Sponsorships & Subscriptions – Residential, Income Eligible, and C&I.** Sponsorships and subscriptions support the energy efficiency market, encourage workforce education, attract skilled employees to Massachusetts, and promote innovation in both service delivery and the development and testing of energy-efficient technologies. In accordance with the Department’s Order regarding the 2019-2021 Plan and general accepted practice, each sponsorship and subscription expense must be reasonable, prudently incurred, and provide a direct benefit to Massachusetts customers. For additional information on Sponsorships & Subscriptions, please see Appendix G.
- **Workforce Development – Residential, Income Eligible, and C&I.** The PAs continue to monitor and support trainings in order to contribute to building and maintaining a qualified workforce that will meet the demand for energy efficiency. For the 2022-2024 term, the PAs will charge only external (non-employee) general training to this hard-to-measure category. In addition to the cross-program workforce development costs booked in this hard-to-measure cost category, additional workforce development spending is included in the initiative-level budgets within Sales, Training, and Technical Assistance (STAT). For example, the Residential New Homes Initiative budget for STAT includes continued support for training industry professionals on advanced building practices. For more information on Workforce Development efforts, refer to Sections 1.13 (All Sector efforts), 2.9.3 (Residential and Income Eligible Sector efforts), and 3.9.2 (C&I Sector efforts).
- **Evaluation & Market Research – Residential, Income Eligible, and C&I.** This budget category includes costs associated with the EM&V budget, potential studies, the AESC Study, the eTRM, acquisition of data sets, related labor costs, and other evaluation and market research costs. As the results of this research provides value across programs, these costs are allocated to the Hard-to-Measure Initiative category,

⁵⁴ Per G.L. c. 25A, § 11H.

consistent with the 2019-2021 Plan filing. Evaluation and market research costs will be allocated to one or more sectors as appropriate for each activity.

- **EEAC Consultants – Residential, Income Eligible, and C&I.** The EEAC Consultants’ budget is managed by DOER and used to support the retention of expert consultants by the EEAC and reasonable administrative costs, in accordance with G.L. c. 25, § 22(c). The EEAC must annually submit to the Department a proposed budget for the “retention of expert consultants and reasonable administrative costs.”⁵⁵
- **Research, Development & Demonstrations – Residential, Income Eligible, and C&I.** In their continued efforts to explore new technologies, measures, and solutions available for customers, the PAs set forth this budget to pursue research and development for new technologies, measures, and solutions that may or may not immediately lead to savings. This allows the PAs to be proactive and leaders in innovation. Costs associated with research and development into areas of interest, are charged to this category. Demonstration projects, meeting the definition and intent of recent Department Guidelines,⁵⁶ may be considered, where applicable. Proposed demonstration projects must meet the following criteria:
 - Reasonableness of the size, scope, and scale of the proposed project in relation to the likely benefits to be achieved.
 - Adequacy of the evaluation plan.
 - Extent to which there is appropriate coordination among the PAs.
 - Bill impacts to customers.

The PAs will seek to identify demonstration project candidates during plan development or propose them within a plan term through a mid-term modification.

- **Residential HEAT Loan – Residential.** The Residential HEAT Loan budget includes costs to buy down the interest due on the loan and the cost to administer the loans. For more information on the Residential HEAT Loan, please see Section 2.12.
- **Residential Education – Residential.** The budget in the Residential Education Hard-to-Measure initiative is used to support public energy efficiency education efforts. For more information on Residential Education efforts, please see Section 2.13.
- **Low-Income Energy Affordability Network – Income Eligible.** LEAN and the PAs work together to comprehensively serve income-eligible households across the state. LEAN delivers energy programs to income-eligible customers and also represents them in legislative discussions and regulatory proceedings in the state. The LEAN budget is used to pay for their administrative and personnel costs related to program implementation. For more information on LEAN, please see the Income Eligible Sector description in Section 2.11.

⁵⁵ G.L. c. 25, § 22(c).

⁵⁶ Department of Public Utilities, DPU 20-150.

7. CLOSING



SECTION 7: CLOSING

The 2022-2024 Plan sets an ambitious vision and aggressive goals for the PAs over its three-year term. Achieving the Plan's objectives will contribute toward achieving the Commonwealth's climate goals, improving the equity of energy efficiency programs, and delivering benefits to the state. As the draft document progresses toward the final version of the 2022-2024 Plan, the PAs look forward to receiving feedback from stakeholders and to ultimately working with partners across Massachusetts to deliver the outcomes outlined in the filed final document.

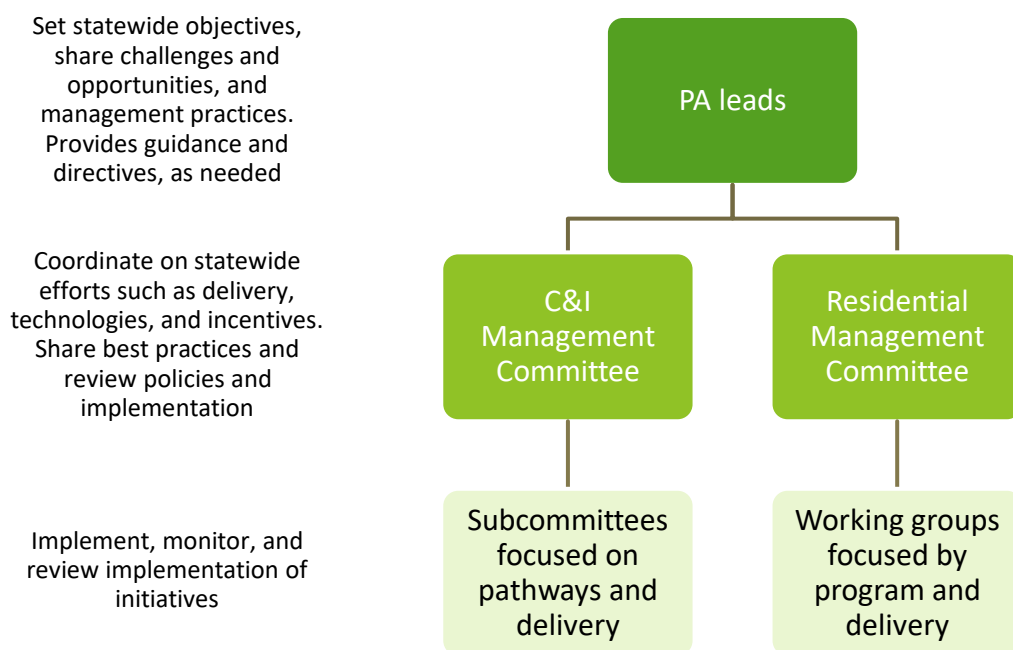


APPENDIX A: COORDINATION AND BEST PRACTICES

A.1 OVERVIEW

Consistent with the GCA, the PAs work together to jointly develop and implement the three-year plans. The PAs work collaboratively on a daily basis to ensure that all eligible customers in Massachusetts experience seamless programs, with consistent application procedures, incentives, and supportive educational and technical services. The PAs continuously develop and share best practices and seek to improve the energy efficiency and programs to provide the best possible service to their customers.

Figure A-1: Management Structure for Program Delivery



In addition to the management groups above, the PAs serve on a number of essential committees and working groups that ensure statewide collaboration among stakeholders and consistency within and across the programs. These committees and groups are detailed in the figure below.

Figure A-2: Committees and Working Groups

Group/Committee	Members and Responsibilities
Low Income Best Practices Group	<ul style="list-style-type: none"> Representatives from PAs, CAP agencies, and LEAN Discuss program implementation, new measures, innovative strategies, and other matters related to income-eligible offerings
Evaluation Management Committee	<ul style="list-style-type: none"> Steering committee for statewide evaluation activities and issues, program guidance, and direction to each of the evaluation research areas Plan, prioritize, and delineate the research studies to be undertaken. See Section 4 for more details
Massachusetts Technology Assessment Committee	<ul style="list-style-type: none"> Proactive and a reactive body. The committee addresses residential and C&I technologies, drawing on the subject matter experts from the committee, PA staff, or outside expertise as necessary Authority for consistent program interpretation of technical matters relating to emerging technologies and provides information, documented technical interpretations, and technology assessments
Statewide Marketing Group	<ul style="list-style-type: none"> Organizes statewide marketing and media campaigns, manages www.MassSave.com, updates social media campaigns, and works to ensure that communications are presented in multiple channels to reach highly diverse customer bases
Common Assumptions Group	<ul style="list-style-type: none"> Maintain consistent application, calculation, and presentation of savings, benefits, and costs
Demand Working Group	<ul style="list-style-type: none"> Works on initiatives related to reducing customer demand, including pilot programs, cost-effectiveness review, and statewide strategies

A.2 STATEWIDE BUDGETS, SAVINGS, AND BENEFITS

A.2.1 SUMMARY OF BUDGETS, LIFETIME SAVINGS, AND BENEFITS

The program budgets, savings, and benefits set forth in the 2022-2024 Plan are presented on an aggregate, statewide basis. As detailed in the Energy Efficiency Data tables, each PA provides its individual recommended savings and budget levels for the three-year term commencing January 1, 2022, consistent with the statewide program designs and Energy Efficiency Guidelines. Please see Appendix D: Statewide Energy Efficiency Data Tables for budgets, savings, benefits, and cost-effectiveness calculations. As described above, the PAs have established key savings metrics in the 2022-2024 Plan that are designed to measure success and support their overall holistic approach to reducing energy use for customers. The key savings metrics are:

1. Net lifetime all fuel savings, which is determined by converting all fuel savings to MMBtus savings. The conversion factor takes into account, when converting electric savings, the embedded energy with heat values from a mix of fuels that generate the electricity.
2. Three-year adjusted gross annual CO₂ emissions reductions (short tons).
3. Demand savings (kW) for the electric PAs.
4. Net lifetime electric savings (MWh), excluding fuel conversions and ADR efforts for the electric PAs.
5. Net lifetime natural gas savings (therms) for the natural gas PAs.

Please see Appendix D for more details regarding the use of these core savings metrics for measuring success in the 2022-2024 term. Following historic aggregate savings achievements, the goals set forth in this Plan reflect the current market after years of energy efficiency programming in Massachusetts, the unique characteristics of each PA's service area, the specific needs of each PA's customers, and the Commonwealth's policy goals related to energy and GHG emissions reductions. The PAs' energy efficiency and ADR programs provide benefits for customers related to avoided costs, NEIs, GHG emissions reductions, and job growth and retention.

A.2.2 STATEWIDE COMBINED, ELECTRIC, AND NATURAL GAS DATA

STATEWIDE COMBINED DATA

Figure A-3: Statewide Adjusted Net Lifetime Savings All Fuels (MMBtu), excluding ADR

	2022	2023	2024	2022-2024
Residential	37,911,353	40,136,247	43,294,615	121,342,215
Income Eligible	8,916,912	9,037,477	9,168,852	27,123,240
Commercial & Industrial	35,263,213	29,089,044	26,061,578	90,413,835
Total	82,091,478	78,262,767	78,525,045	238,879,290

Figure A-4: Statewide Benefits (\$)

	2022	2023	2024	2022-2024
Residential	\$1,199,384,956	\$1,315,903,361	\$1,476,250,330	\$3,991,538,647
Income Eligible	\$341,504,838	\$347,978,868	\$354,592,212	\$1,044,075,917
Commercial & Industrial	\$922,917,056	\$774,931,598	\$707,818,139	\$2,405,666,793
Total	\$2,463,806,850	\$2,438,813,826	\$2,538,660,681	\$7,441,281,358

Figure A-5: Statewide Budgets (\$)

	2022	2023	2024	2022-2024
Residential	\$461,739,901	\$511,275,001	\$574,886,510	\$1,547,901,412
Income Eligible	\$150,526,481	\$153,444,173	\$157,641,865	\$461,612,519
Commercial & Industrial	\$328,774,929	\$302,250,909	\$295,473,631	\$926,499,470
Total	\$941,041,311	\$966,970,084	\$1,028,002,006	\$2,936,013,401

STATEWIDE ELECTRIC DATA

Statewide tables reflect aggregated proposals of the individual electric PAs.

Figure A-6: Electric PA Net Adjusted Lifetime Savings All Fuels (MMBtu), excluding ADR

	2022	2023	2024	2022-2024
Residential	18,659,368	20,205,349	22,366,048	61,230,765
Income Eligible	3,845,032	3,798,722	3,733,311	11,377,065
Commercial & Industrial	23,515,079	17,457,020	14,608,579	55,580,678
Total	46,019,480	41,461,091	40,707,938	128,188,509

Figure A-7: Electric PA Lifetime Electric Energy Savings (MWh), excluding fuel conversions and ADR

	2022	2023	2024	2022-2024
Residential	956,533	1,011,566	1,080,662	3,048,761
Income Eligible	314,275	302,053	291,866	908,194
Commercial & Industrial	3,899,382	2,992,688	2,529,549	9,421,619
Total	5,170,190	4,306,306	3,902,077	13,378,574

Figure A-8: Electric PA Summer Peak Demand Reductions (MW)

	2022	2023	2024	2022-2024
Residential	84.6	103.0	123.4	170.9
Income Eligible	5.0	4.9	5.2	14.4
Commercial & Industrial	222.7	229.9	240.5	338.4
Total	312.2	337.8	369.2	523.6

Figure A-9: Electric PA Budgets (\$)

	2022	2023	2024	2022-2024
Residential	\$277,918,477	\$308,828,334	\$351,274,703	\$938,021,514
Income Eligible	\$85,457,403	\$86,238,843	\$86,398,021	\$258,094,267
Commercial & Industrial	\$275,822,112	\$248,987,620	\$240,427,622	\$765,237,354
Total	\$639,197,992	\$644,054,797	\$678,100,346	\$1,961,353,135

STATEWIDE NATURAL GAS DATA

Statewide tables reflect aggregated proposals of the individual natural gas PAs.

Figure A-10: Natural Gas PA Net Lifetime Savings (MMBtu), All Fuels

	2022	2023	2024	2022-2024
Residential	19,251,985	19,930,898	20,928,567	60,111,450
Income Eligible	5,071,879	5,238,755	5,435,541	15,746,175
Commercial & Industrial	11,748,133	11,632,023	11,453,000	34,833,157
Total	36,071,998	36,801,676	37,817,108	110,690,781

Figure A-11: Natural Gas PA Lifetime Gas Savings (therms)

	2022	2023	2024	2022-2024
Residential	188,650,421	195,376,929	205,267,323	589,294,673
Income Eligible	49,264,507	50,854,939	52,725,996	152,845,443
Commercial & Industrial	117,465,661	116,303,968	114,513,896	348,283,524
Total	355,380,589	362,535,836	372,507,215	1,090,423,640

Figure A-12: Natural Gas PA Budgets (\$)

	2022	2023	2024	2022-2024
Residential	\$183,821,424	\$202,446,667	\$223,611,807	\$609,879,898
Income Eligible	\$65,069,078	\$67,205,330	\$71,243,844	\$203,518,252
Commercial & Industrial	\$52,952,817	\$53,263,289	\$55,046,009	\$161,262,116
Total	\$301,843,319	\$322,915,287	\$349,901,660	\$974,660,266

A.3 COMMON ASSUMPTIONS AND TECHNICAL REFERENCE MANUAL

The PAs continuously work together to develop and apply common assumptions. Consistent collaboration and structured review of common assumptions through the working groups, such as the Common Assumptions Working Group, allows the PAs to collectively provide the best available data in a consistent manner. The PAs work together to standardize assumptions and approaches to various costs, savings, and benefits data. The PAs coordinate the application of the avoided costs from the AESC studies and evaluation results. In addition, the PAs collaborate to maintain similar data definitions, measure identifications, naming conventions in the screening models, reporting tables, and the TRM.

Specific program assumptions are accounted for uniformly, and algorithms are applied in the same manner across the PAs, as set forth in the TRM. The TRM documents how the PAs consistently, reliably, and transparently calculate savings resulting from the installation of prescriptive energy efficiency measures. The TRM provides methods, formulas, and default assumptions for estimating energy, peak demand, and other resource impacts from energy efficiency measures. The TRM is an excellent example of how the PAs work together, share data and best practices, and work to develop common assumptions that reflect EM&V results. The PAs have transitioned the paper TRM manual into an electronic version, which is available publicly, provides additional search functions to aid users, and is user friendly. The TRM is available at <http://www.masssavedata.com/Public/TechnicalReferenceLibrary>.

The PAs also apply common assumptions to define participants consistently for statewide programs. In order to be able to review participants in a consistent manner, the PAs develop a set of common definitions to guide each PA's participant

calculation. These definitions are designed to reflect unique participants in each program and initiative. Please see Appendix E for participant definitions used in the 2022-2024 Plan.

A.4 DEVELOPMENT OF GOALS

A.4.1 INTRODUCTION

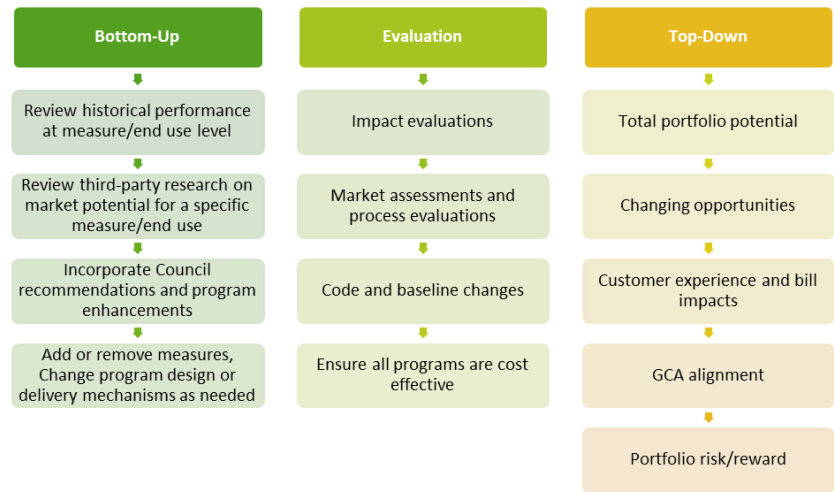
The PAs engage in a highly collaborative and detailed planning process for setting savings goals and budgets. Programmatic decisions that inform savings goals and budgets are made both at the individual PA level and at the statewide level, including work by the respective management committees, which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

A.4.2 PROCESS TO DETERMINE GOALS

OVERVIEW

The development and determination of the proposed statewide and PA-specific savings goals involve many considerations, and there is no simple, algebraic method to develop goals to meet the requirements of the GCA. The PAs’ process considers many factors, including the assessment of savings opportunities in individual PA service areas (bottom up), incorporation of recent evaluation study findings, and a collaborative consideration of statewide policy objectives that balances savings goals with the total cost of capturing energy efficiency (top down). The bottom-up process involves determining savings by measure, including projected quantities and customer incentive amounts for every piece of energy-efficient equipment, and the type of technology or program service. The top-down process looks at the portfolio as a whole, evaluating the potential for achieving savings given the mature markets in which the programs are operating, subject to overall cost.

Figure A-13: Process to Determine Goals



The impact of evaluation results, including process and market assessment studies, are considered in both bottom-up and top-down planning and may drive other adjustments. The process to determine goals is appropriately fluid, flexible, and iterative, incorporating information that the PAs learn throughout the planning process related to program design, evaluation, market conditions, costs, and other factors.

CONSIDERATIONS

The 2022-2024 Plan accounts for many interacting considerations, including but not limited to: a focus on equity and workforce development, support for electrification of buildings in alignment with the Commonwealth's energy goals, bill impacts, cost efficiency, integrated program delivery, contractor and market infrastructure, economic and environmental benefits, efforts focused on innovation, customer experience, changing market conditions, and the need to establish an "integrated" effort that can be "sustained" over time, as mandated by the GCA.⁵⁷ In assessing the level of energy efficiency savings that is possible and sustainable for the 2022-2024 Plan, the PAs considered a number of factors.

These factors include:

1. Quality of program implementation.
2. Customer economic conditions.
3. Bill impacts.
4. Market conditions and seasonality for various measures.
5. Lower avoided costs.
6. Market barriers,
7. Equity concerns.
8. Need to avoid "stops/starts" that send negative messages to the contractor community.
9. Capacity and reach of vendors and contractors.
10. Need to provide consistency over time to be able to capture time-dependent opportunities such as renovations and new construction.
11. Need to accommodate new technologies over time.
12. Input and consideration of priorities articulated by DOER and the AGO in Term Sheet discussions.

Ensuring sustainability requires the PAs to examine all of these considerations when developing their energy efficiency goals. The planning process for the 2022-2024 term began with a focus on customers' experiences with the suite of energy efficiency programs, and in particular how to improve the experiences of moderate-income residential customers, as well as those customers living in mixed-income multifamily buildings. Significant effort and expertise were dedicated to updating

⁵⁷ G.L. c. 25, § 22(b).

the Residential and Income Eligible programs and initiatives to better serve customers who qualify as low or moderate income. In addition, across all sectors, the PAs updated the design of programs and initiatives in order to increase efforts to enhance delivery of electrification. These updates, including workforce training and development, as well as weatherization efforts, will help drive maximum achievement of energy efficiency savings and benefits through electrification.

BOTTOM-UP PLANNING

The PAs typically begin each three-year planning process by examining historical data to gain insight into participation trends, savings achieved, and the costs to achieve annual and lifetime savings. The PAs also consider recent or pending changes in federal efficiency standards, as well as other third-party research on consumer adoption of new technologies. In parallel, each PA assesses what they individually can achieve over the next three years, and collectively collaborate to decide what changes, if any, need to be made to program offerings. For example, the PAs may decide to discontinue measures that have become standard efficiency practice, or to add new measures and services in response to improved technologies or identified consumer needs, subject to consideration of cost effectiveness. The value of energy benefits is determined through the New England AESC Study, which also guides the PAs as they strive to achieve all cost-effective energy efficiency opportunity.

The statewide planning work is undertaken at the respective management committees and working groups, ensuring input from all stakeholders, continuous sharing of best practices, and facilitating consistency of offerings among the PAs. Each PA uses this information to develop an estimate of energy efficiency that can be achieved in its unique service territory. The PAs consult with their own or statewide vendors to support or augment their estimates based on their own market intelligence. Manufacturers and contractors may also be consulted for insight into workforce capacity and technology availability and limitations.

TOP-DOWN PLANNING

While bottom-up planning focuses on individual measures within each PA's service territory, top-down planning considers what is reasonable and achievable for the energy efficiency portfolio as a whole. This planning effort involves the examination of impacts to the markets the programs are targeting, as well as cost implications to the PA, its participating and non-participating customers. One of the tools that the PAs use in top-down planning is potential studies, which helps them to better understand the potential opportunity to achieve energy efficiency savings within their service territory. Potential studies typically provide the PAs with insight into three types of energy efficiency potential:

- **Technical potential** is defined as the *complete* adoption of energy efficiency measures that are technologically feasible without consideration of cost or likely consumer acceptance.
- **Economic potential** is a subset of *technical potential* consisting only of that technology that results in more estimated benefits than costs over the life of the measure.

- **Achievable potential** is a further subset of economic potential and is limited to that which is attainable given customer barriers, market barriers, or other limitations..⁵⁸

The PAs use the results of potential studies to gain valuable insight into the achievable, cost-effective energy efficiency potential over a period of years. Each of the PAs has performed a territory-specific potential study in advance of the 2022-2024 Plan filing in accordance with the Department’s directives..⁵⁹ The PAs have diligently worked to coordinate studies to use a consistent set of measures and measure characteristics, and to present findings using common definitions for the various levels of achievable potential, common benefit-cost inputs, and common savings assumptions for high-impact measures, such that study results are comparable. In addition, with input from the EEAC, the PAs have established a common study deadline to submit final potential study results..⁶⁰ The overall consistency across the PAs’ potential studies in terms of timing, formatting, and definitions enhances their value to the Department and stakeholders..⁶¹

The potential studies consider a wide range of factors to estimate potential savings over time including, but not limited to, the size of the market, economic trends, modeled market penetration and saturation of specific equipment, adoption rates for efficient equipment, costs and benefits associated with efficiency upgrades, and market barriers. In general, the potential studies relied on the most recent TRM (2019 Report Version) and NTG assumptions for the current term. The potential studies are intended to provide a top-down estimate and are useful to inform high-level planning but are not intended to provide detailed assessments of potential at the measure level. Potential studies are also not intended to suggest specific program changes or model alternative program designs. In conjunction with other data sources and experience implementing programs, the PAs use the results of potential studies to approximate the remaining achievable, cost-effective potential opportunity for savings over the next three-year period. The potential studies provide one key source of information to inform overall goals, as well as expected savings trends and areas of opportunity for investment.

Each of the potential studies, in addition to providing technical, economic, and achievable scenarios as described above, looks at several different scenarios of achievable potential in order to understand the sensitivity of achievable savings to inputs such as increased incentive levels and higher levels of spending on marketing and program awareness. The studies generally include statements of potential that range from looking at the “business as usual” case using current incentive levels, up to a “Max achievable” scenario in which the PA pays 100 percent of incremental costs as customer incentives and significantly ramps up costs associated with marketing and program awareness. The PAs review these scenarios with an understanding of the need to minimize customer bill impacts, and the need to maintain sustainable energy efficiency efforts over time.

The PAs also take into account any changes in market conditions, potential program design enhancements, and other information that may impact the recommendations from the potential studies. The PAs share technical potential studies results with each other and are able to benefit from comparing and contrasting the work of the different study experts to ensure they are consistently informed on industry best practices and different ways of looking at complex issues. The

⁵⁸ Potential definitions are based on American Council for an Energy Efficient Economy (ACEEE) definitions available at <http://aceee.org/topics/efficiency-potential-and-market-analysis>.

⁵⁹ 2016-2018 Three-Year Plans Order at 24-25; 2019-2021 Three-Year Plans Order at 38.

⁶⁰ 2019-2021 Three-Year Plans Order at 38.

⁶¹ 2019-2021 Three-Year Plans Order at 38.

diversity of perspectives ultimately adds to increased confidence in results. The PA-specific potential study materials are attached as Appendix C.

EVALUATION RESULTS

As noted above, the PAs also utilize the results of third-party evaluations to inform proposed goals. As part of the statewide EM&V framework, the PAs collectively conduct many different types of evaluation studies, including impact evaluations, baseline studies, NTG studies, market effects evaluation, NEI studies, cost and measure life studies, market characterization, and process evaluations. For more information on each type of study please see Section 4.5.

COST DRIVER CONSIDERATIONS

A final step in energy efficiency goal setting for the three-year term is to develop budgets to deliver the energy efficiency programs to the marketplace. This involves assessing the cost impact of the programs on participating and non-participating ratepayers in support of “right sizing” proposed budgets. The PAs’ statewide energy efficiency programs have matured significantly since the development of the first three-year plan in 2009, as have the technologies that are promoted through the programs. In the 2022-2024 term, the PAs face new challenges in pursuing all cost-effective energy efficiency, including: (1) the PAs’ reduced reliance on the lighting market as a result of the widespread adoption of the least expensive energy-efficient lighting technologies, driven by past PA-led efforts, such as LED lighting, (2) the achievement of aggressive GHG emissions reduction goals set pursuant to statute, and (3) an emphasis on serving low and moderate-income residents, especially those residents most impacted by the COVID-19 pandemic. The cost of marketing, delivering, and evaluating ever more sophisticated programs is also expected to increase in order to capture more complex and deeper opportunities, such as controls and demand reduction. Increased efforts and incentives designed to capture customers who have not historically participated in the PAs’ programs at a proportional rate will also contribute to increased costs.

To address these challenges and deliver cost-effective energy efficiency programs to their customers, the PAs have developed a thorough understanding of current and future cost drivers for their proposed energy efficiency programs. Because each PA is affected to a different degree by each cost driver, variations in savings goals and the cost to achieve these goals are to be expected. Customer demographics, fuel mixes, economic conditions, differences in the built environment, and even contractor wages vary widely across the state and impact each PAs’ service territory differently. Each PA sets its goals based on their own unique service territory.

From 2009-2011, the cost to achieve savings for electric energy efficiency programs throughout the state was trending downwards,⁶² while conversely, the cost to achieve savings for natural gas programs was trending upwards. From 2012-2014, the cost to achieve savings for electric and natural gas energy efficiency programs throughout the state was relatively stable with a modest increase in the cost of delivering natural gas programs. During the 2016-2018 term there was an upward trend in cost to achieve savings from the 2013-2015 term, although due to cost-effective implementation practices,

⁶² The PAs note that the costs and savings of large, one-time projects can skew the historical costs to achieve savings, often making the costs appear lower than the average. Because large projects are not typical or replicable, they should not be included in the planning process to estimate budgets or savings, or when calculating costs to achieve savings, without careful analysis and appropriate adjustments. For example, some PAs had large CHP projects in 2011, making the cost per kWh appear to decrease in 2011 compared to previous years. When excluded, however, costs were relatively flat.

the increase was not as great as the PAs anticipated.⁶³ Looking ahead to the 2022-2024 term, the PAs expect the cost to achieve savings per participant to be higher due to a more expensive measure mix as claimable lighting savings decline, baselines increase due to codes and standards adoption, and efficiency increases in the market overall, cost increases necessary to serve HTR populations, greater emphasis on electrification, and significant investments in enhanced workforce development and training initiatives. As a result, the PAs anticipate that costs in 2022-2024 will increase.

Additional details on key cost driver considerations include the following:

- **Measure mix.** As claimable lighting savings decline, the electric PAs will increase investment in other measures which tend to be more expensive per kWh. Therefore, as lighting savings decrease in the portfolio, the average program cost per unit of electric savings should be expected to increase. In addition, given the focus on electrification, PAs will invest more in incentivizing adoption of heat pumps, which are a relatively expensive measure. Moreover, as the PAs strive to meet aggressive goals, they may raise incentives, which increases the cost not just for newly acquired savings but also for savings that would have been obtained under lower incentive levels as well. Increased incentives will also tend to drive greater adoption of measures with higher unit savings costs.
- **Increased baselines.** As federal and state codes and standards become increasingly rigorous, the amount of incremental savings from installing program-qualifying energy efficiency measures decreases (unless the efficiency of the program measures rise as well). This decrease in savings results in a higher cost per unit of savings. The Energy Independence and Security Act (EISA) lighting standards continue to increase baseline efficiency levels and therefore decrease program savings, as do federal water heater and other appliance standards. New construction practices in the state are increasingly efficient due to the GCA requirement that Green Communities adopt stretch codes, aggressive outreach by the PAs, and increasing federal standards for many different kinds of equipment. In addition to increasing efficiency required from updated codes and standards, in many cases markets are adopting more efficient practices due to innovation, enhanced technology, and evolution of industry standard process. This naturally occurring market adoption of efficient equipment and practices are accounted for through evaluation studies, and savings attributable to PAs are adjusted accordingly. While these trends result in real savings for customers in the state, they reduce the incremental energy savings the PAs s can capture and claim through their programs.
- **Strategies to foster greater participation and deeper savings.** As the PAs seek to increase participation in their programs across all customer groups, they will invest more resources in reaching customer groups that have historically participated at lower levels. This will require financial investments in partnerships, enhanced marketing, more resources in additional languages, and additional incentives, among other strategies. In addition, the PAs are committed to increasing investment in workforce development, which will require investment in recruitment, training, establishing career pathways, and supporting the contractor network as they expand,

⁶³ “Cost to achieve” is typically discussed in terms of net savings. NTG factors historically have been only updated at the beginning of a three-year plan term and their impact may therefore be more pronounced when looking at differences between two different three-year plans.

diversify, and upskill the workforce. These investments are essential to the long-term success of the programs, but do not produce directly claimable savings, and therefore increases the cost to achieve in the short term.

- **Cost-effectiveness limitations.** The *2021 AESC Study* projected lower wholesale natural gas prices, as well as electricity, and summer demand prices than the previous iteration (*2018 AESC Study*). As a result, energy savings are assigned less-per-unit economic value than in prior terms, challenging the PAs to minimize costs and maximize benefits to maintain cost-effective program delivery. The PAs are pursuing new delivery options, as well as new technologies, to capture untapped energy efficiency potential. These efforts are not without cost, however, which puts pressure on programs in the short term.
- **Unique service area drivers.** Despite consistent program offerings, variations among PAs in savings goals and costs to achieve naturally result due to each PA's unique service territory. Each PA's territory has a distinct mix of customers, markets, and vendors. Contributing to these differences are varying customer demographics, different mixes of building and business types, penetration of natural gas and delivered fuels, economic conditions, depth of community engagement, and population density. Each PA has unique commercial and residential demographics, which may result in differences in how each PA approaches program delivery.

For example, the service territory of one PA may have a smaller percentage of commercial customers than the statewide average, and thus may not be able to benefit from the higher savings opportunities that tend to correspond with that customer segment. Similarly, a PA may have a higher proportion of lower-income residents, requiring greater coordination with the community and higher costs to serve. Unique characteristics of smaller territories are more apparent than in larger territories, which represent a broader array of customers and communities that make these unique characteristics less visible. Variances among the PAs are appropriate, consistent with sound regulatory policy, the GCA, and previous Department recognition of PA differences. In setting their goals, each PA has used their knowledge of their unique service territory, as well as inputs and insights from independent energy efficiency potential studies to design programs that best meet the needs of their customers. All PAs are committed to achieving all available cost-effective energy efficiency in accordance with the GCA.

- **PA collaboration with stakeholders.** As part of the process of developing goals and budgets, the PAs engaged in discussions with the EEAC's consultants on the assumptions that were used for bottom-up planning. The PAs also considered the multiple (and sometimes conflicting) priorities of the EEAC members and other stakeholders in planning for cost-effective savings opportunities in the 2022-2024 Plan. For example, the PAs have included a strong commitment to promoting equity in service as well as a robust workforce development initiative in the 2022-2024 Plan, which offer an exciting opportunity that is supported by the Commonwealth, but also comes with additional costs. Finally, the PAs worked with the DOER and the AGO to review aspects of the 2022-2024 Plan, including savings and cost assumptions.
- **Summary of savings goals development.** In developing the proposed savings goals, the PAs undertook, individually and collectively, a detailed review of energy efficiency opportunities and costs, with a particular emphasis on customer barriers and opportunities. This analysis included a bottom-up approach to assess savings opportunities by measure and initiative, a top-down look at overall savings potential and cost to achieve savings, and careful consideration of evaluation study findings, potential studies, and market changes. Development of the 2022-2024 Plan was influenced by collaborative discussions with the EEAC and stakeholders to better understand key savings and cost drivers across the Commonwealth, considering sustainability of delivery efforts and bill impacts.

COST-EFFECTIVENESS AND BENEFITS

Cost-Effectiveness

The PAs have projected the expected benefits and costs associated with this statewide 2022-2024 Plan to be consistent with the requirements of the Guidelines and D.P.U. 0850-A, in which the Department reaffirmed that “the Total Resource Cost test is the appropriate test for evaluation of the cost effectiveness of ratepayer-funded energy efficiency programs.”⁶⁴ A program is cost effective under the TRC test if the cumulative present value of its benefits is equal to or greater than the cumulative present value of its costs.⁶⁵ Under the updated GCA, for the purposes of cost-effectiveness screening, programs are aggregated by sector.⁶⁶ To conduct the TRC test, the PAs have developed detailed benefit/cost screening models, and use these models to reflect assumptions relating to program costs and benefits, the discount rate, the general rate of inflation, and avoided costs. The PAs identify and quantify costs and benefits needed to calculate the cost effectiveness of programs consistent with the TRC test. Costs included in the TRC test include all PA costs and program participant costs. PA costs include program implementation expenses, evaluation costs, proposed performance incentives, and tax liability for performance incentives. Program-participant costs include initial costs incurred by customers as a result of their participation in the program.

Benefits included in the TRC test are the value of avoided costs and non-energy impacts (NEIs) resulting from a program over the lifetime of the measures. Benefit categories include resource benefits and NEIs (sometimes referred to as non-resource benefits). Resource benefits include avoided energy valued at different times, avoided capacity valued at peaking periods, avoided transmission, avoided distribution, and effects on energy market prices. Specifically, the PAs calculate the benefits associated with positive or negative electric, natural gas, oil, propane, water savings, and capacity savings, and energy DRIPE.⁶⁷ NEIs are the values associated with the positive or negative effects attributable to energy efficiency programs apart from energy savings, such as reduced costs for O&M, longer equipment replacement cycles and productivity improvements, reductions in costs associated with reduced customer arrearages, service terminations, and reconnections, and other measurable benefits due to the installation of the energy efficiency.

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

⁶⁴ D.P.U. 08-50-A at 14.

⁶⁵ Guidelines § 3.4.3.1.

⁶⁶ G.L. c. 25, § 21(b)(3), as revised by Acts of 2018, c. 227.

⁶⁷ Demand Reduction-Induced Price Effect (DRIPE) is a measurement of the value of demand reductions in terms of the decrease in wholesale energy prices, resulting in lower total expenditures on electricity or natural gas across a given system.

Benefit Analysis Components

Overview

The PAs developed methods to determine the appropriate manner to measure and verify the benefits associated with the energy efficiency programs. Important elements of this analysis include using the AESC Study, and assessing NEIs, market effects, and demand reduction initiatives, each of which are described further below.

Avoided Energy Supply Cost Study

To develop avoided supply costs, the PAs participate in the AESC Study process, which is a well-established regional and collaborative process. The AESC Study determines projections of marginal energy supply costs that will be avoided due to reductions in the use of electricity, natural gas, and other fuels, as well as avoided environmental compliance costs resulting from energy efficiency programs. The AESC study is prepared every three years for the AESC Study group, which is comprised of the PAs, state agencies, and other interested parties throughout New England. In order to inform the initial draft of the 2022-2024 Plan (must be submitted to EEAC by April 30, 2021), the *2021 AESC Study* was completed on March 15, 2021.

The AESC Study provides projections of avoided costs of energy in each New England state for a hypothetical future, the “Base Case,” in which no new energy efficiency programs are implemented in New England. The *2021 AESC Study* provides an updated assessment of avoided electricity, natural gas, and delivered fuel costs using a model that simulates the operation of the New England wholesale energy and capacity markets in an iterative, integrated manner. The *2021 AESC Study* projected lower wholesale natural gas prices, electricity, and summer demand prices than the previous iteration (2018 AESC Study). The *2021 AESC Study* also provides a literature review of social cost of carbon methodologies, including a recommended value. The recommended value is applied in the initial draft of the 2022-2024 Plan, pursuant Senate Bill 9 - *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*.

Pursuant to *An Act Creating a Next Generation Roadmap for Climate Policy*, St. 2021, c. 8, which requires the calculation of program benefits to include the social value of GHG reductions, the PAs have applied the Social Cost of Carbon value from the 2021 AESC. Due to timing, the PAs have applied the value to all portfolio measures (including fossil fuel measures) for this draft in lieu of the environmental compliance cost value, which is currently a similar value that otherwise would be attributed to all measures. The PAs will work with DOER to interpret the law and apply the Social Cost of Carbon value to the appropriate measures (*i.e.*, excluding certain fossil fuel measures) in advance of the final Plan filing in October 2021.

Non-Energy Impacts

A NEI is a benefit (positive or negative) for participants in energy efficiency beyond the energy savings gained from installing energy-efficient measures. NEIs include benefits such as reduced costs for O&M associated with efficient equipment or practices or reduced environmental and safety costs. The Department has stated that NEIs are “a well-established component of the program cost-effectiveness analyses conducted by the PAs” and found that the benefits of the NEIs are quantifiable and flow to Massachusetts ratepayers.⁶⁸ The Department has specifically stated that non-resource benefits

⁶⁸ 2013-2015 Order at 61.

should be included in cost-effectiveness..⁶⁹ Consistent with Department precedent, the PAs have included the benefits associated with NEIs established in evaluation studies in the program cost-effectiveness calculations.

For the 2022-2024 term, the PAs will include NEIs not filed in previous three-year plans and will apply pre-existing NEIs to other programs as set forth below:

- **Income Eligible Multifamily NEIs for Health and Safety.** Producing annual NEI benefit recommendation due to weatherization programs in income eligible, multi-family housing. The study will be finalized by July 1, 2021 to inform the final draft plan.
- **C&I Update Scoping Study, April 2020.** Provided a gap analysis to prioritize areas of needed C&I NEI research. This study will provide recommendations for research but not NEI values.

Demand Reduction

The 2022-2024 Plan includes ADR initiatives. Unlike passive demand reduction measures, active demand savings and benefits accrue during specified and limited time periods. Under the proposed initiatives, ADR measures will be called on to perform during specified dispatch events and the claimed savings will be based on customer performance during those called events. Due to these unique characteristics of ADR measures, the PAs developed a methodology for appropriately accounting for costs and benefits in the TRC test. The methodology was first utilized in the 2019-2021 Plan and will continue to be utilized in the 2022-2024 term.

Economic Development and Job Growth and Retention

Another positive effect of the energy efficiency programs in Massachusetts has been green job growth and retention. As further explained in the Workforce Development Section, the PAs carefully develop programs and savings goals to foster and sustain a robust energy efficiency contractor and vendor community. As the programs continue to drive market transformation, energy efficiency businesses continue to serve customers and drive deeper energy savings.

A.5 COST CATEGORIZATION

A.5.1 OVERVIEW

The PAs have developed consistent definitions and methods of assigning and allocating budget costs across all five program implementation cost categories. With respect to salaries and overhead, each PA has developed their own methods to allocate these costs to appropriate cost categories. For vendor costs, the PAs utilize uniform practices to assign these costs based on cost-causation principles.

⁶⁹ Guidelines at §§ 3.4.4.1, 3.4.4.2.

A.5.2 PROGRAM IMPLEMENTATION BUDGET COST CATEGORY DEFINITIONS

The PAs developed and refined the program implementation cost category definitions over several years. The cost categories listed below are consistent with the implementation of the 2019-2021 Plan. For the 2022-2024 Plan, the statewide cost category definitions used by all the PAs will be:

- **Program planning and administration.** This includes costs associated with developing program plans, including:
 - Market transformation plans.
 - Research & Development (R&D), excluding R&D assigned to Evaluation and Market Research.
 - Day-to-day program administration, including labor, benefits, expenses, materials, and supplies.
 - Overhead costs.
 - Any regulatory costs associated with energy efficiency activities.
 - Database/data repository development and maintenance.
 - Energy efficiency services contracted to non-affiliated companies, e.g., outside consultants used to prepare plans, screen programs, improve databases, and perform legal services. This category also includes internal salaries for administrative employees/tasks, including program managers who do not have direct sales and technical assistance contact with customers.
- **Marketing and advertising.** This includes costs for the development and implementation of marketing strategies and costs to advertise energy efficiency programs, such as television, radio, billboards, brochures, telemarketing, websites, and mailings. These marketing strategies are designed to educate customers and trade allies regarding the existence and availability of energy efficiency programs and/or technologies, and to induce them to participate. These costs include internal salaries for employee functions related to marketing and advertising.
- **Participant incentives.** includes funds paid by the reporting PA to or on behalf of customers or trade allies as rebates or in other forms. Participant incentives include costs that directly benefit customers, including permit fees, pre-weatherization expenses, repairs, and interest buy-downs.
- **Sales, technical assistance, and training.** These costs include administration, sales technical assistance, and training costs to motivate: (1) customers to install energy efficiency products and services, (2) retailers to stock energy efficiency products, (3) trade professionals to offer energy efficiency services, (4) manufacturers to make energy efficiency products, and (5) use of vendor services and suppliers that demonstrate benefits of energy efficiency. This category also includes costs not directly tied to savings, including residential assessments, technical assistance studies, contractor fees and performance bonuses, vendor cost of money, lead vendor fees, and internal salaries for employees with direct customer sales and technical assistance contact.
- **Evaluation and market research.** These are costs associated with:
 - Market research, such as baseline studies, market assessments and surveys, and technical potential studies.
 - Impact and process evaluation reports.
 - Cost-effectiveness testing.

- AESC Study.
- TRM maintenance and updates.
- Other costs related to evaluations and market research. This category also includes internal salaries for employee functions related to evaluating the programs.

At this time of this filing, the PAs have not encountered any costs that are difficult to assign to one of the five cost categories. Costs are assigned to the appropriate category within the relevant program, core initiative, or hard-to-measure program. Costs that are not assigned directly to a program are allocated among relevant programs on an appropriate basis and tracked accordingly. Costs related to Evaluation and Market Research are assigned to the Hard-to-Measure line item.

A.5.3 BREAKDOWN OF PROGRAM IMPLEMENTATION BUDGET BY COST CATEGORY

Historically, the majority of program implementation budgets are delivered directly to customers in the form of incentives; intended to help customers overcome financial barriers to investment in energy efficiency. For the 2022-2024 term, the PAs have allocated the majority of the electric and natural gas budgets to be delivered directly to customers (i.e., participant incentives). Participant incentives help customers adopt high-efficiency measures and is a primary driver of historic and continuing energy savings. For budget allocation percentages, see Figures A-15 and A-16 below.

The second largest budget allocation is for the Sales, Technical Assistance & Training cost category, supporting the activities of vendors, contractors and other industry professionals. These investments are major contributors to the green economy in the Commonwealth. The remaining program implementation budgets are allocated across the three cost categories of Evaluation and Market Research, Marketing and Advertising, and Program Planning and Administration (PP&A). These percentages are in line with historical averages, demonstrating that the PAs have been able to significantly grow their energy efficiency portfolios while keeping administrative costs low and maximizing the value of the programs for participating customers.

Figure A-14: Statewide Electric Breakdown of Budget by Cost Category

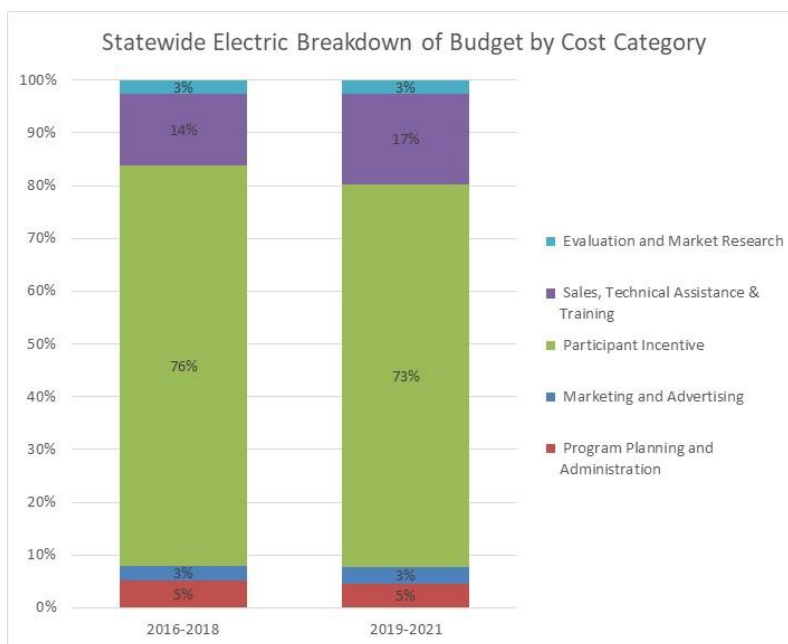
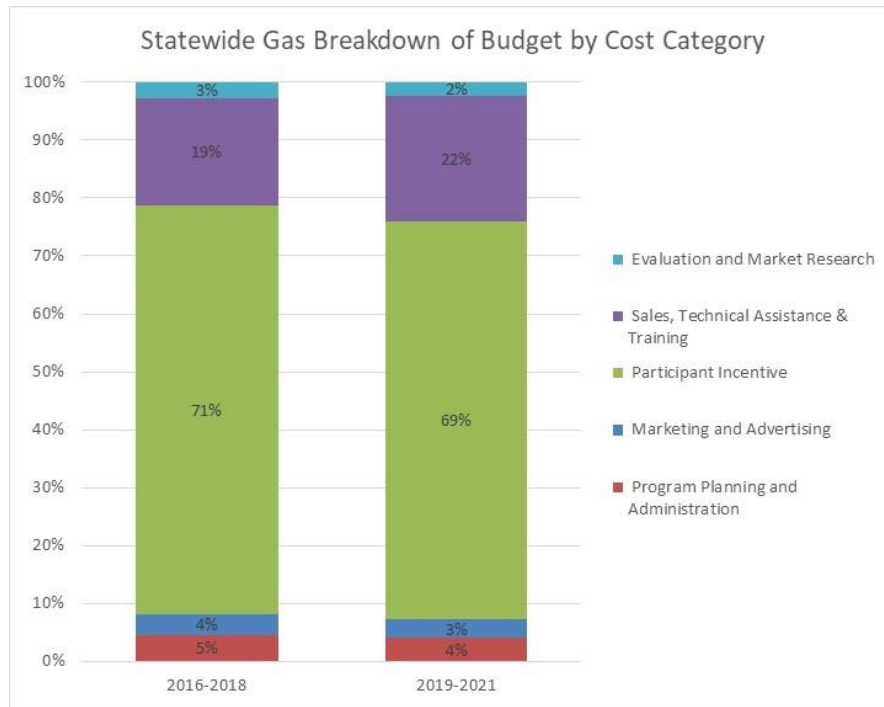


Figure A-15: Statewide Natural Gas Breakdown of Budget by Cost Category



A.5.4 SALARIES

Consistent with Department precedent, all the PAs have developed allocation methods based upon cost causation principles to assign expenses to the appropriate budget category. For PA staff performing multiple functions, employee salaries are allocated across the appropriate budget categories based on the percentage of employee time spent on various functions within energy efficiency. The PAs treat salaries as follows: (1) assign salaries of staff performing a single function to the appropriate cost category in the appropriate program/sector, and (2) assign salaries of staff performing multiple functions to multiple cost categories across several programs and sectors, as appropriate, based on an allocation for each employee in accordance with assigned job tasks. Salaries of program managers with direct sales and technical assistance customer contact are allocated to STAT, while salaries of program managers without direct contact are allocated to PP&A.

A.5.5 ALLOCATION OF OVERHEAD COSTS

Consistent with historical practice, the PAs allocate certain non-program specific costs to each relevant core initiative or sector. In particular, many of the costs in the PP&A budget category are allocated across core initiatives. This includes costs such as overhead services and fees related to building maintenance, technology and software, finances, telephones, legal counsel, and other vendors. These costs are allocated to all core initiatives in all relevant sectors. The PAs allocate these costs to non-hard-to-measure programs based on the core initiative's percent of total planned costs. The PAs develop the allocation percentages based on planning assumptions and maintain those percentages for reporting purposes.

A.5.6 VENDOR COST CATEGORIES

The PAs also collaborate to use consistent vendor cost categories. The PAs consistently review new costs to determine the appropriate category. The PAs maintain a chart, attached at Appendix F, showing vendor cost types and the related cost category to support consistency and serve as a guide. This list has remained consistent since the last three-year plan.

A.5.7 SPONSORSHIPS & SUBSCRIPTIONS COSTS

Sponsorships and subscriptions support the energy efficiency market, encourage workforce education, attract skilled employees to Massachusetts, and promote innovation in both service delivery and the development and testing of energy efficient technologies. Consistent with Department directives, the PAs developed a methodology for assigning costs related to sponsorships and subscriptions. Expenses paid to directly support a program are considered program expenses and are allocated to the appropriate programs/initiatives where benefits are expected to be realized. Sponsorship and subscription costs that are not directly linked to specific in-the-field energy efficiency measures or services are allocated the Sponsorship and Subscription hard-to-measure program. A cost may be included in program line items even if called a sponsorship or subscription because the expense is directly related to the program. Please see Sponsorships and Subscriptions Policy at Appendix G for more information.

A.5.8 EVALUATION AND MARKET RESEARCH COSTS

During the 2019-2021 term, the PAs began to charge all EM&V costs to a hard-to-measure line item called Evaluation and Market Research. No EM&V costs are allocated to individual programs. This budget category includes costs associated with the EM&V budget, potential studies, the AESC Study, the TRM, acquisition of data sets, and other evaluation and market research costs. Evaluation and Market Research costs are allocated to one or more sectors as appropriate to the cost.

A.5.9 STATUTORY BUDGET REQUIREMENTS

MINIMIZING ADMINISTRATIVE COSTS

In accordance with the GCA, the PAs seek to minimize administrative costs to the fullest extent practicable. Administrative costs, also commonly referred to as PP&A costs, are associated with:

- Developing program plans, including market transformation plans, R&D activities (excluding R&D assigned to Evaluation and Market Research).
- Day-to-day program administration, including labor, benefits, expenses, materials, supplies, and overhead costs.
- Any regulatory costs associated with energy efficiency activities.
- Costs for energy efficiency services contracted to non-affiliated companies such as outside consultants used to prepare plans, screen programs, improve databases, and perform legal services.
- Internal salaries for administrative employees/tasks, including program managers that do not have direct sales and technical assistance contact with customers.

For the 2022-2024 term, 5 percent of the statewide electric and natural gas PAs' costs are assigned to PP&A. These percentages are in line with the budget allocations approved by the Department historically, demonstrating that the PAs have been able to provide direct benefits to customers and contractors and grow the energy efficiency portfolios while minimizing costs. Most importantly, the majority of energy efficiency budgets are returned to customers in the form of incentives that are intended to overcome the financial barrier to investment.

The most significant factor in the PAs' approach to minimizing administrative costs is the statewide collaborative process. This process is used by the PAs to coordinate planning, the adoption of consistent programs and processes, program design, EM&V studies, statewide marketing, regulatory proceedings, and the development and sharing of all best practices. Sharing of these costs, which would otherwise be borne by each PA individually, results in economies of scale that reduce the cost for each PA. For example, joint releases of RFPs lead to minimization of administrative costs (i.e., cost for preparation and release of the RFP are shared by the PAs). The PAs also minimize administrative costs by coordinating energy efficiency program delivery, where appropriate, with other customer service activities such as customer acquisition, key account management, and trade ally relationships.

The PAs also seek to minimize administrative costs in reporting by collaborating on reporting templates, utilizing joint vendor services where appropriate, and seeking to balance requests for additional data with the benefits to customers of collecting and reporting such data and the costs. The PAs continue to receive requests regularly from many parties, including at the Residential and C&I Management Committees and EEAC meetings, which can increase administrative costs. The PAs continue to look to find ways to balance what is essential and valuable from processes that do not provide sufficient benefit for the cost. The PAs are working to raise awareness with all parties that every data request, meeting, committee, and point of contact results in additional administrative costs and the diversion of resources from activities that more directly translate into benefits. In the 2022-2204 term, the PAs will continue to work with stakeholders on finding the right balance of providing information, utilizing existing information, and understanding the purpose of a data request in order to seek to minimize administrative costs where possible.

Notwithstanding any appropriate coordination with other customer service departments, it is necessary and appropriate for all PAs to maintain a skilled and dedicated administrative staff to ensure successful delivery of programs, compliance with the GCA, timely responses to the requests of the EEAC, Department, and DOER, and documentation and achievement of substantial savings. The PAs seek to balance the need to minimize administrative costs to the extent prudent with the need to maximize program quality and oversight. Councilors have emphasized the need to devote sufficient administrative resources to successfully implement the aggressive programs called for in the three-year plans.

While the economies of scale and other steps taken minimize costs are effective, and administrative costs incurred by the PAs are transparent, exact quantification of the minimization of administrative costs is not possible in a meaningful way. This is because the continuous scaling up and evolution of the plans make it impractical to establish a solid baseline for a comparison. When the variables are constantly (and necessarily) shifting, there is no opportunity to make a meaningful quantitative comparison. Further, a direct quantitative comparison would not be useful because it would only provide a comparison of two points in time. The mandate of the GCA is to seek administrative efficiencies, which is a continuous process that evolves along with energy efficiency planning and programming. Program needs and opportunities for administrative efficiency are always changing. The PAs seek to minimize costs at all available opportunities, and not just from one point in time to another. By collaborating, creating consistent programming, optimizing staffing needs, and providing beneficial reporting, the PAs can minimize administrative costs to the extent practicable while providing quality energy efficiency services for customers.

The PAs have continued to apply lessons from an administrative cost study conducted in advance of the 2019-2021 term. This study, *The Best Practices for Minimizing Program Planning and Administrative Costs for the Massachusetts Utilities and*

Energy Efficiency Services Providers, was finalized on October 25, 2018 (PP&A Report) and was filed with the 2019-2021 Plan. The PP&A Report:

1. Identified best practices, both in Massachusetts and nationwide, for tracking and assessing administrative costs.
2. Identified potential benchmarks, metrics, and/or indicators for measuring administrative costs.
3. Provided specific recommendations, as appropriate, for reducing administrative costs.

Consistent with the PP&A Report, the PAs continue to seek to minimize administrative costs using the following overall recommendations:

1. Continue to focus on ways to improve consistency in accounting practices.
2. Formalize and seek to streamline further the reporting and data request process.
3. Follow cost accounting best practices in allocation, tracking, and control.
4. Seek new ways to minimize the regulatory/collaboration/facilitation/reporting and ad hoc requests burden without compromising goal obtainment.
5. Implement an annual process to stress test status quo processes and spending.

The PAs will continue to use these recommendations during the 2022-2024 term to assist in efforts to continuously minimize administrative costs to the greatest extent practicable without negatively affecting program delivery. The PAs will continue to regularly review costs and allocation procedures internally and through statewide Cost Review Working Group meetings and other discussions and will examine whether there are ways to streamline reporting and updates to interested parties. Additionally, at the time of each plan-year and term report filing, the PAs will review administrative costs and cost allocation procedures.

A.5.10 ALLOCATION OF FUNDS FOR INCOME ELIGIBLE PROGRAMS AND EDUCATION

Energy efficiency funds shall be allocated to customer classes in proportion to their contributions to those funds, and “at least 10 percent of the amount expended for electric energy efficiency programs and at least 20 percent of the amount expended for natural gas energy efficiency programs shall be spent on comprehensive low-income residential demand side management and education programs.”⁷⁰

A.5.11 COMPETITIVE PROCUREMENT

The PAs use competitive procurement processes to engage and retain contractors and vendors to perform activities including, but not limited to assessment delivery, quality control, rebate processing, monitoring and evaluation, potential studies, and marketing. The PAs are committed to continuing to utilize competitive procurement practices to the fullest

⁷⁰ G.L. c. 25, § 19(c).

extent practicable throughout the implementation of the 2022-2024 Plan. Therefore, consistent with past practice, the PAs anticipate that they will continue to issue RFPs to engage appropriate third-party vendors to provide energy efficiency services and work collaboratively to ensure that energy efficiency services have been procured in a manner that minimizes costs to ratepayers, while maximizing the associated benefits of those investments. The PAs will continue to seek to expand the pool of qualified program vendors, promote the entry of new market actors into contractor and subcontractor roles, encourage diversity and inclusion through procurement, and ensure the transparency of the contractor bidding process and selection criteria used to evaluate proposals.

A.5.12 PERFORMANCE INCENTIVES

SUMMARY OF RELEVANT PRECEDENT AND GUIDELINES

Pursuant to the GCA, the three-year plan must include a proposed mechanism designed to provide an incentive to distribution companies based on their success in meeting or exceeding certain performance goals.⁷¹ The Department has established Guidelines outlining the principles and requirements for the design of a performance incentive mechanism.⁷² Pursuant to the Guidelines, an incentive mechanism must be:

1. Designed to encourage PAs to pursue all available cost-effective energy efficiency.
2. Designed to encourage energy efficiency programs that will best achieve the Commonwealth's energy goals.
3. Based on clearly defined goals and activities that can be sufficiently monitored, quantified, and verified after the fact.
4. Available only for activities in which the PA plays a distinct and clear role in bringing about the desired outcome.
5. As consistent as possible across all electric and natural gas PAs.
6. Avoid any perverse incentives.⁷³

Further, the Guidelines specify that the amount of funds available for performance incentives should be kept as low as possible to minimize the costs to electric and natural gas customers, while still providing appropriate incentives for the PAs.⁷⁴ All PAs must calculate design level incentive payments based on projections of performance for the entire three-year term, not based on annual projections.⁷⁵ Both electric and natural gas PAs collect performance incentives through the Energy Efficiency Surcharge (EES) at the design level during the three-year term.⁷⁶ The Department reviews each PA's performance based on the entire term of the three-year plan and approves final performance incentives through the term

⁷¹ G.L. c. 25 § B.2.v. The Compact, as a municipal aggregator, does not receive a performance incentive. See D.P.U. 08-50-A at 51.

⁷² Guidelines § 3.6.2.

⁷³ Guidelines § 3.6.2.

⁷⁴ Guidelines §§ 3.6.2, 3.6.3.

⁷⁵ Guidelines § 3.6.4; D.P.U. 11-120-A, Phase II at 7-8. Design level performance is defined as 100 percent of the PA's projected benefits and net benefits multiplied by the appropriate payout rate.

⁷⁶ D.P.U. 11-120-A, Phase II at 13 n.16.

report proceeding.⁷⁷ Each PA reconciles actual and design performance incentive payments at the end of each term as part of their respective EES filings.⁷⁸

The Department has approved performance incentive mechanisms that include savings and value components based on benefits and net benefits.⁷⁹ Specifically, the Department has found that uniform statewide payout rates for the savings and value components is consistent with the goals of the GCA and Department precedent, and, because the rates do not vary by year, found that the payout rates were consistent with the D.P.U. 11-120-A, Phase II Order.

The Department requires that a proposed performance incentive mechanism must encourage the PAs to achieve savings where they exist to reach portfolio goals.⁸⁰ The Department has rejected proposals that do not comply with this principle. In 2016, the Department specifically rejected a split performance incentives proposal, finding that it would not encourage the PAs to seek all available cost-effective savings opportunities wherever they exist, but rather would encourage the PAs to focus on only the sector in which performance incentives remain available.⁸¹

The Department has approved performance incentive mechanisms that are designed to provide additional incentives where the PAs successfully deliver benefits to customers by overcoming barriers associated with a nascent market, such as ADR.⁸² To avoid double counting of benefits in this type of performance incentive model, the PAs must appropriately track and consistently allocate all savings associated with the market-specific measures to ensure they are not also counted as traditional energy efficiency savings.⁸³

Also, in D.P.U. 13-67, the Department determined that performance metrics, an incentive model designed to encourage PAs to undertake specific actions or meet specific goals, were no longer appropriate under the GCA. This is because the PAs are obligated to undertake activities targeted by performance metrics to satisfy the mandates of the GCA.⁸⁴ Further, the Department found that preparing and verifying performance of these metrics would divert PA and stakeholders focus from the successful implementation of the three-year plans and is inconsistent with the Department's obligation to fulfill its oversight responsibilities in an administratively efficient and effective manner.⁸⁵

The Department affirmed these findings from D.P.U. 13-67 in the *2019-2021 Three-Year Plans Order*.⁸⁶ In that Order, the Department rejected a proposed renter component designed to incentivize services to renters by awarding the PAs with \$20 for each renter served, in addition to any performance incentive earned in connection with the savings and benefits attributed to the measures installed for each renter.⁸⁷ The Department found that the renter component incentivized the PAs to undertake activities (i.e., serving renters) that they were already obligated to undertake under the GCA.⁸⁸The

⁷⁷ See D.P.U. 11-120-A, Phase II at 13.

⁷⁸ Guidelines § 3.6.4.2.

⁷⁹ See 2016-2018 Three-Year Plans Order at 67.

⁸⁰ 2016-2018 Three-Year Plans Order at 69.

⁸¹ 2016-2018 Three-Year Plans Order at 69.

⁸² 2019-2021 Three-Year Plans Order at 96.

⁸³ 2019-2021 Three-Year Plans Order at 96.

⁸⁴ D.P.U. 13-67, at 14-15.

⁸⁵ D.P.U. 13-67, at 13.

⁸⁶ D.P.U. 13-67, at 93-95.

⁸⁷ 2019-2021 Three-Year Plans Order, at 92-93.

⁸⁸ *Id.* at 94, *citing* G.L. c. 25, § 21(a); D.P.U. 13-67, at 12.

Department also rejected the renter component because it would lead to the PAs achieving an incentive in multiple incentive components for a single action.⁸⁹ Finally, the Department rejected the renter component because it would allow the PAs to potentially collect performance incentives for activities that failed to achieve the special renter component threshold, as the PAs would still be eligible to collect performance incentives based on the measures installed for each renter regardless of whether they succeeded in serving a specified number of renters, thus “rendering the renter component threshold superfluous.”⁹⁰

PROPOSED PERFORMANCE INCENTIVE MECHANISM

Overview

In the 2019-2021 term, the Department approved an incentive mechanism with a value component and a two-part savings component with (1) an energy efficiency and passive demand component and (2) an ADR component. The value component was based on net benefits and the savings components were based on total benefits. Thus, a benefits-based performance incentive mechanism appropriately aligns the PAs’ performance with the pursuit of all available cost-effective energy efficiency. Benefits are directly associated with the cost effectiveness that is required by the GCA, and align with other state goals, including energy savings and GHG reductions. The value component ensures that PAs are incentivized to achieve benefits for customers in a way that effectively minimizes costs to those customers.

For the 2022-2024 term, the PAs plan to use a similar construct for their performance incentive mechanism. The PAs, however, plan to move away from the ADR component of the performance incentive mechanism. The market for ADR offerings is no longer nascent, and as described in the 2022-2024 Plan, the PAs have made significant progress in this area and forecast continued growth in ADR in this new three-year term.

The PAs have engaged in robust discussions with several interested stakeholders regarding the inclusion of an equity component in the performance incentive mechanism for the 2022-2024 term. The PAs remain committed to further engaging with stakeholders to determine how to craft an appropriate incentive mechanism to address equity in a way that is both responsive to stakeholder feedback and compliant with Department precedent. The PAs expect any incentive mechanism geared towards equity to be benefits-based, achievable, and aligned with desired outcomes for all PAs—regardless of size of customer base and other service territory characteristics.

A.6 STATEWIDE DATA/DATA AVAILABILITY

A.6.1 OVERVIEW

The PAs provide transparent reporting on their energy efficiency activities in multiple presentations, reports, and electronic data platforms. Providing regular communications allows the public and stakeholders to receive up-to-date information regarding energy efficiency investments and savings directly from the PAs. The PAs provide formal reporting required by

⁸⁹ Id. at 93.

⁹⁰ Id. at 94.

the GCA and the Department, including the three-year plan, plan-year reports, term reports, annual EES filings, and quarterly reports to the EEAC. Additionally, the PAs provide monthly data dashboards to the EEAC, present regularly on various topics of interest to the EEAC, and maintain a detailed energy efficiency database, Mass Save Data, (<http://www.masssavedata.com>).

REPORT TYPES

Quarterly Report

At the end of each quarter, the PAs provide a detailed report on the implementation, expenditures, savings, and benefits regarding activities during that quarter. These quarterly reports include a narrative component with information on energy efficiency activities in each sector, as well as a working spreadsheet. Data is provided by an individual PA and aggregated statewide reflecting costs, participants, savings, benefits, and GHG emissions reductions. This data is reported on a cumulative basis throughout the year (e.g., the Q3 report includes the most up-to-date values from the start of the program year through the end of Q3), as well as cumulatively over the three-year term. All data is also available on Mass Save Data.

Plan-Year Report

As discussed above, the PAs annually file a plan-year report in order for the Department to fulfill its obligation to review the effectiveness of the programs.⁹¹ The plan-year report documents fully evaluated implementation results for each program year that are later incorporated as part of each PA's term report. The plan-year reports include updated data tables comparing planned, preliminary, and evaluated results. Each PA provides detailed explanations of variances in budget, lifetime savings, total benefits, and total resource benefits. These reports include information on cost effectiveness. In the event of a non-cost-effective program or initiative, a PA must provide a detailed explanation of the reasons why the program is not cost effective, and how the PA expects to proceed with the program (e.g., modify program implementation, modify program budget, terminate the program, etc.) and why this course of action is appropriate. The plan-year report is filed following the first two program years of a three-year plan.

Term Report

At the conclusion of a three-year plan term, the PAs file a term report with the Department documenting performance over the entirety of the term. The term report contains similar data and variance explanations to the plan-year report, along with other information to demonstrate compliance with the approved plan and statutory requirements. The Department reviews each PA's term report in a publicly noticed adjudicatory proceeding. At the conclusion of the proceeding, the Department provides final approval of program expenditures, performance incentives, and lost base revenue (LBR), if any.

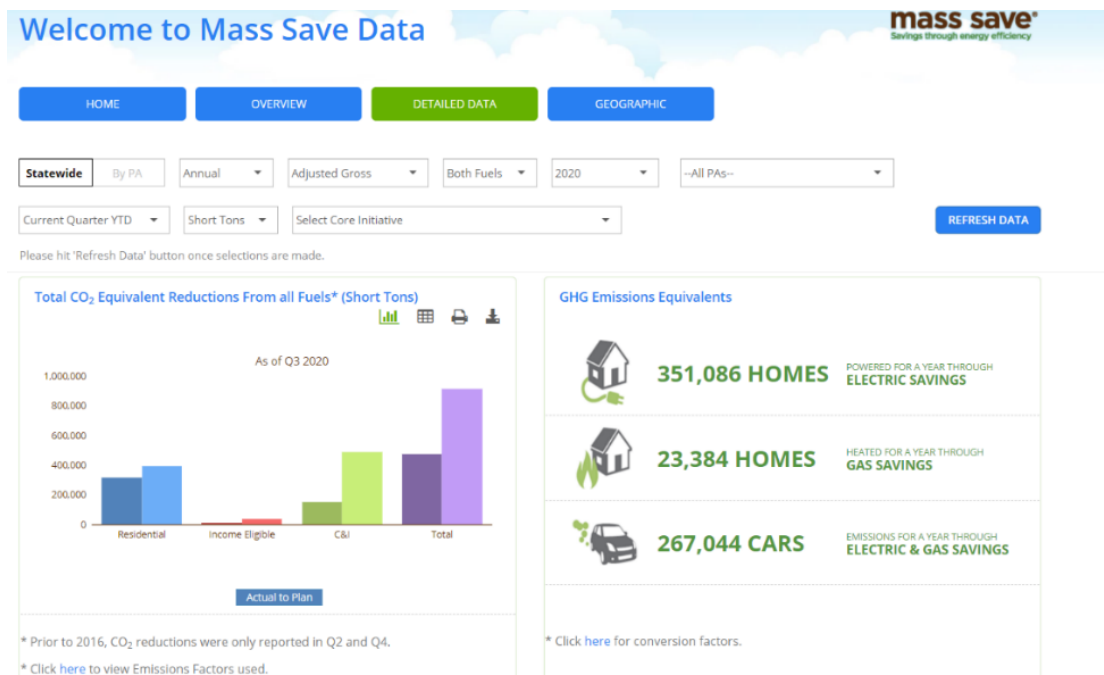
⁹¹ Pursuant to G.L. c. 25, § 21(d)(2).

Data Sources

Mass Save Data

The PAs develop and maintain a publicly accessible statewide energy efficiency database, Mass Save Data, which is available at <http://www.MassSaveData.com>. Mass Save Data is an online statewide database that improves public and stakeholder access to the extensive data already reported by the PAs, as well as additional information and presentations of data. The database provides a single, reliable and timely data source for currently reported data on an individual PA and statewide basis that can be accessed at any time. Mass Save Data enables users to export data to Excel or PDF formats for further analysis and queries. The PAs designed Mass Save Data to export data easily for those stakeholders like the EEAC and DOER who prepare data-driven reports on energy efficiency and, at the same time, to display data in a user-friendly, understandable manner for those users who prefer charts and graphs. Mass Save Data has been implemented in a manner that is cost efficient and protects customer privacy. The platform provides accessible, meaningful information to customers, municipalities, and stakeholders over time.

Figure A-16: Mass Save Data



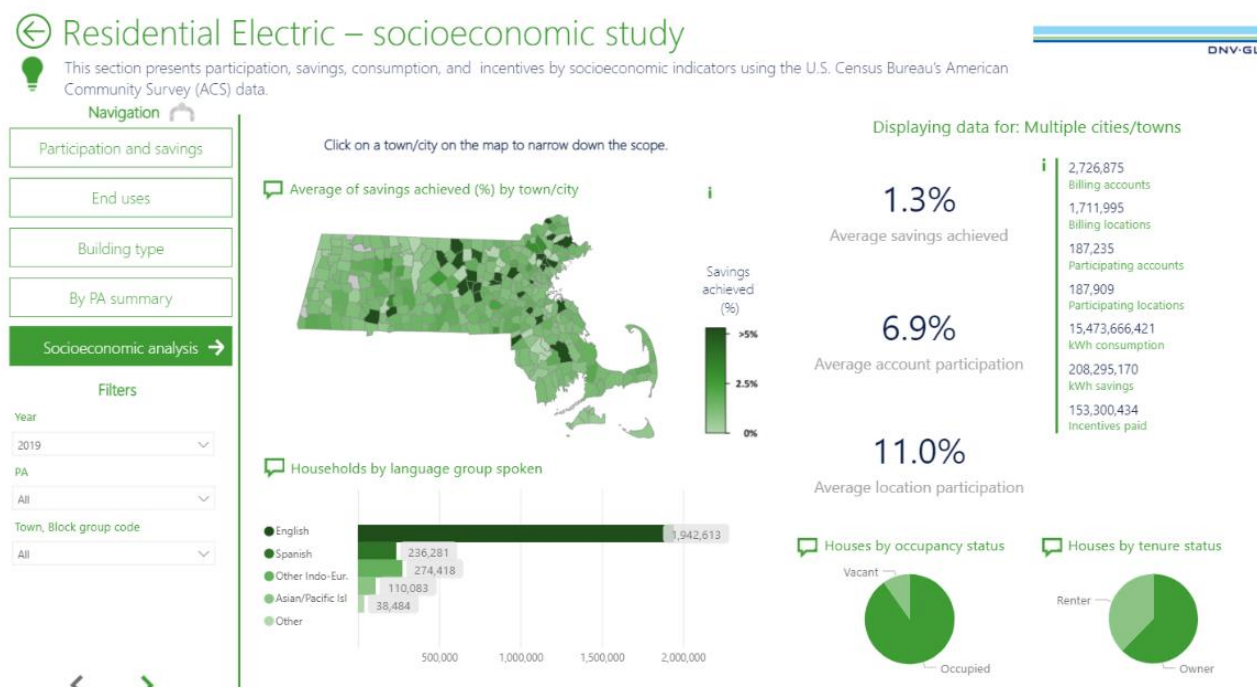
Mass Save Data provides quantitative data similar to that provided in the PAs’ public reports, including information related to participants, expenditures, annual and lifetime savings, electric capacity savings, and benefits. The database includes data at the sector, program, initiative, and measure levels. In addition to the PAs’ specific data, Mass Save Data also provides savings, usage, and incentives data on the geographic tab at the county, town, and zip code level. This data allows municipalities to see the effects of energy efficiency in their town and other areas. Following a request from several municipalities, the PAs are now providing usage data by town by individual month on an annual basis. The PAs have updated Mass Save Data and provided new information and views based on input from members of the EEAC and other stakeholders. Mass Save Data tabs and sections include overview sections such as time series, performance overview, monthly reporting, and sales and savings, detailed data such as performance details, cost to deliver, HEAT Loan, GHG emissions reductions, measure details, and geographic information including savings, usage and incentives by county, town,

and zip code. There are also reference materials such as a glossary and the link to the eTRM. The PAs update Mass Save Data with various data sets monthly, quarterly, and annually.

Customer Profile Studies and Data Dashboards

Accessible through Mass Save Data, the Residential and C&I customer profile dashboard (<https://www.masssavedata.com/Public/CICustomerProfileDashboard>) is a web-based platform with dashboard functionality. The platform was developed using customer usage and energy savings data and the dashboard presents data visualizations and extracts data previously available via the paper-based Customer Profile reports in a transparent and easy-to-use web-based format while maintaining existing customer confidentiality rules. The annual profiles studies offer diverse views of participation, savings, and geographic dynamics within the PAs’ energy efficiency programs.

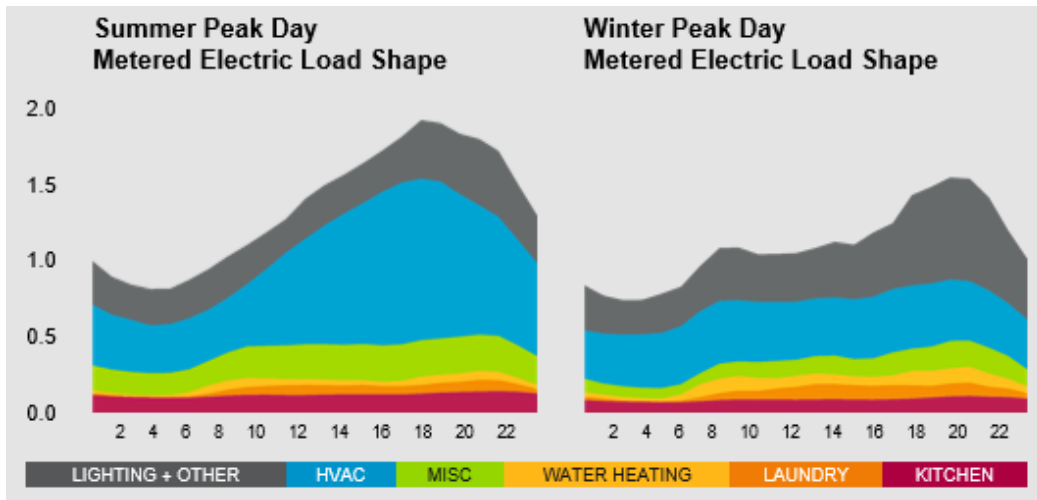
Figure A-17: Customer Profile Dashboard



Baseline Studies

The baseline studies posted to the MA EEAC website (<https://ma-eeac.org/studies/>) collect saturation, characterization, and usage behavior data for all major electric and natural gas appliances, HVAC equipment, and electronics in MA homes and businesses. These are useful in understanding: (1) how and when people use the electric and natural gas equipment in their homes and businesses, (2) how habits and use change over time, and (3) how quickly new technologies are being adopted statewide.

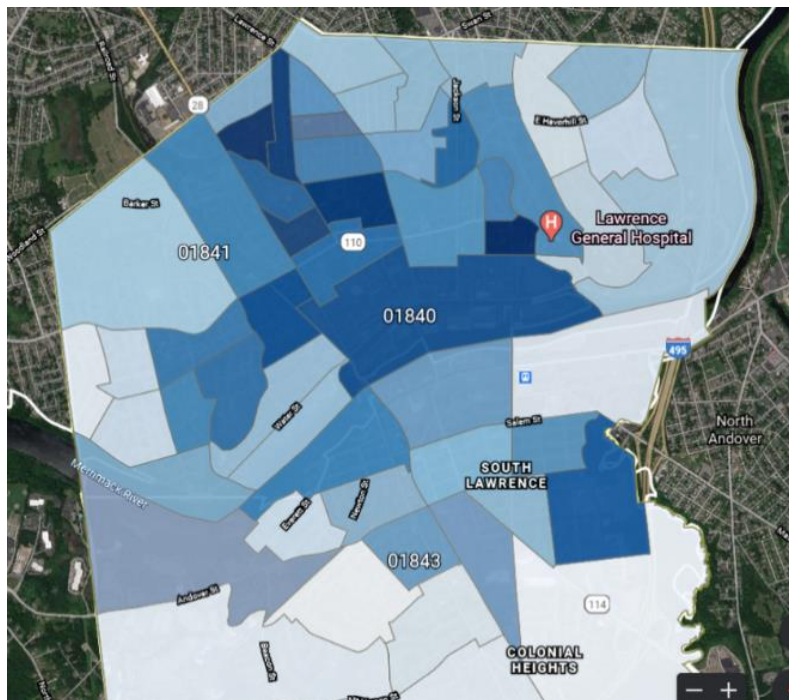
Figure A-18: Baseline Studies



Municipal Mapping Tool

A new municipal mapping tool is currently under development and will leverage the Google Earth platform and combine data on historical participation in energy efficiency programs with statistics and HTR populations such as renters, income level, English isolated, and small business counts. Currently, the first round of maps is being developed for those municipalities participating in partnerships with the PAs. These maps, which can be viewed at a street level, can be used as a tool to geographically target the PAs' energy efficiency offerings.

Figure A-19: Municipal Mapping Tool



Data Availability

While the PAs have made an extensive quantity of data available, stakeholders have shown particular interest in town/municipal and zip code level data. The figure below is an easy reference guide to what data is available at two levels: (1) from which data source (sources described in more detail in section above), and (2) at what frequency.

Figure A-20: Data Availability

Reporting source and how often it is reported	Municipal Level			Zip Code Level	
	Mass Save Data	DNV GL Veracity Customer Data Dashboards	Mass Save Data	PA Reports to EEAC	DNV GL Veracity Customer Data Dashboards
	Annual ¹	Annual ³	Annual	Bi-Annual	Annual
Residential and Income Eligible Sectors	Annual usage, savings, and incentives Usage by month	Under development	Annual usage, savings, and incentives	Number of participants, including income eligible and moderate income ⁴	Under development
C&I Sector	Annual usage, savings, and incentives Usage by month	Number of participants Savings, including upstream and non-upstream savings	Annual usage, savings, and incentives (Boston only) ⁵	N/A	N/A

[1] Annual geographic data for Mass Save Data, the PAs' energy efficiency database, is updated 6-12 months after calendar year-end (<https://www.masssavedata.com/Public/GeographicSavings?view=C>).

[2] Biannual geographic data is provided as part of the Q2 and Q4 EEAC Quarterly reports submitted by the PAs (<http://ma-eeac.org/august-19-eeac-meeting/>). For the most recent Bi-Annual Reporting, see file titled: 2020 Q2 Bi-Annual Data Reporting Statewide; see tab Bi-Annual No. 6.

[3] Annual geographic data on the DNV GL Veracity Platform is updated 6-12 months after calendar year-end (available online at: <https://www.masssavedata.com/Public/CICustomerProfileDashboard>). While the data is open to the public, account set-up is required to access this database. The Residential Dashboard is still in development.

[4] This spreadsheet (see footnote 2) includes the number of participants (excluding upstream and behavior) by zip code broken out by: (a) total income-eligible participants, (b) total non-income-eligible participants, (c) single-family/attached low-rise participants (not moderate income), and (d) single-family/attached low-rise participants (moderate income).

[5] For the C&I Sector, zip code data is shown for neighborhoods of the city of Boston but is not available in other municipalities due to customer privacy protections.

Data Privacy

Mass Save Data appropriately protects customer privacy and reduces the need for expensive data security measures because the website is populated with aggregated rather than customer-specific energy efficiency data.⁹² Protecting customer data is a core database concern of the Department, PAs, and stakeholders. Safeguarding the confidentiality of sensitive customer-specific account data is both a legal obligation and an important corporate responsibility for the PAs. As Energy Efficiency PAs, customers trust us with their data, and we take seriously customer privacy and security.⁹³ In order to protect customer privacy, and pursuant to standards articulated by the Department in D.P.U. 14-141, data has been aggregated according to the following guidelines:

- C&I data is displayed only when there is a minimum of 15 customers, with no single customer accounting for more than 15 percent of electric or natural gas usage.
- Residential and Income Eligible data is displayed only when there is a minimum of 100 customers.

A.7 COST RECOVERY, FUNDING SOURCES, AND BILL IMPACTS

A.7.1 COST RECOVERY

Cost recovery is a critical element of the three-year plans. Cost recovery associated with the implementation of energy efficiency programs includes the recovery of a performance incentive.⁹⁴ For the PAs to pursue the aggressive goals set forth in this Plan, it is essential that the Department provide a full and fair opportunity for the PAs to be made economically whole for aggressively pursuing sales-reducing energy efficiency and demand reduction efforts and to earn a reasonable return on this investment based upon their performance and achievement. Although Department approval of the proposed Plan should ensure cost recovery of reasonable Plan-related costs, and performance incentives, if applicable, the details related to individual PA cost-recovery mechanisms will be addressed in separate Department proceedings.

Pursuant to the GCA, after reviewing a PA's proposed three-year plan, the Department must approve fully reconciling funding mechanisms, in addition to other statutorily-specified sources. If the Department determines that the three-year plan ensures that the PAs have identified and will capture all energy efficiency and demand reduction resources that are cost effective or less expensive than supply.⁹⁵

⁹² In Massachusetts, the PAs strictly control access to sensitive customer-specific account information like customer names, account numbers, rate class, location, usage, and demand data. Customer consent is necessary to permit third-party access to sensitive customer-specific account information outside the conduct of regulated PA business. Disclosure of customer information to a third party without customer authorization would violate corporate privacy policies and expose a PA to liability under the Massachusetts Right to Privacy Act, M.G.L. c. 214, § 1B or Chapter 93A, and potentially other statutes.

⁹³ The PAs have each adopted strict corporate privacy policies and safeguards to protect sensitive customer-specific account information. These corporate privacy policies explicitly state that customers' personal information will be safeguarded and only disclosed for a regulated PA business purpose.

⁹⁴ For a discussion of performance incentives, please see supra Section IV.F.

⁹⁵ G.L. c. 25, §§ 19, 21(d)(2).

A.7.2 FUNDING SOURCES

INTRODUCTION

The PAs seek to leverage available funding sources and financing initiatives to increase the benefits of three-year plans and minimize customer bill impacts. For electric PAs, the GCA identifies four specific funding sources for energy efficiency programs: (1) revenues collected from ratepayers through the System Benefit Charge (SBC), (2) proceeds from the PAs' participation in the FCM, (3) proceeds from cap-and-trade pollution control programs, including but not limited to the Regional Greenhouse Gas Initiative (RGGI), and (4) other funding as approved by the Department, including revenues to be recovered from ratepayers through a fully reconciling funding mechanism (i.e., an EES).⁹⁶

Consistent with the Department's Guidelines, the PAs allocate SBC, FCM, and RGGI revenues to each customer sector in proportion to the kWh consumption of each class.⁹⁷ In approving other funding for electric PAs, the Department must consider: (1) the availability of other private or public funds, (2) whether past programs have lowered the cost of electricity to customers, and (3) the effect of any rate increases on customers.⁹⁸ The Department has determined that a bill impact analysis with a short-term perspective that isolates the effect of a proposed change in the EES is appropriate because it provides an accurate and understandable assessment of the impact that customers will experience on their bills.⁹⁹

For natural gas PAs, the GCA does not identify multiple funding sources for energy efficiency programs and instead requires them to include a fully reconciling funding mechanism to collect energy efficiency program costs from customers (i.e., EES).¹⁰⁰ In approving funding for the natural gas PAs, the Department must consider the effect of any rate increases on customers.¹⁰¹

Below is a description of each funding source currently available to the PAs.

NON-EES REVENUES

System Benefit Charge (electric only)

The SBC is calculated consistent with G.L. c. 25, § 19(a) which states: "The [D]epartment shall require a mandatory charge of 2.5 mills per kilowatt-hour for all customers, except those served by a municipal lighting plant, to fund energy efficiency programs including, but not limited to, demand side management programs." Specifically, each electric PA calculates projected SBC revenues as the product of the statutorily mandated SBC of \$0.0025 per kWh and projected sales for the applicable year.

⁹⁶ G.L. c. 25, §§ 19(a); 21(b)(2)(vii).

⁹⁷ The Income Eligible Sector is allocated at least 10 percent of the funds for electric energy efficiency programs and 20 percent of the funds for natural gas energy efficiency programs pursuant to G.L. c. 25, § 19(c).

⁹⁸ G.L. c. 25, § 19(a).

⁹⁹ 2013-2015 Three-Year Plans Order at 122; D.P.U. 08-50-D at 11-12.

¹⁰⁰ G.L. c. 25, § 21(b)(2)(vii); see also G.L. c. 25, § 21(d)(2).

¹⁰¹ Guidelines § 3.2.2.2.

Forward Capacity Market Proceeds (electric only)

Pursuant to G.L. c. 25, § 19(a), the three-year plans of electric PAs shall be funded in part by “amounts generated by the distribution companies and municipal aggregators under the FCM program administered by ISO-NE.”¹⁰² Specifically, each PA calculates projected FCM revenues as the product of the clearing prices of the FCM in the applicable year and the energy efficiency capacity that is designated by ISO-NE as an FCM capacity resource for the year. The PAs propose to apply all net proceeds from the FCM to energy efficiency programs.

To minimize ratepayer funding for energy efficiency efforts, each electric PA seeks to maximize FCM revenues for its customers. FCM bidding strategies are designed to strike an appropriate balance between maximizing revenues through participation in the FCM and avoiding the risks associated with FCM penalties for failure to deliver their capacity supply obligations. In addition, demand reduction resources must participate in the energy market if the resource has a capacity supply obligation in the FCM, which adds potential for additional revenues but carries the risk of penalties. Each PA employs its own individual strategy in bidding future capacity into the FCM. For more information on PA bidding strategy, see each electric PA’s testimony.

The Department has recognized the challenges PAs face in projecting (with precision over the term of a three-year plan) the level of planned energy efficiency resources that will be installed before and during each FCM commitment period.¹⁰³ One of these challenges is driven by the timing of the FCM auction cycles, which are conducted three years ahead and begin with a “show-of-interest” submission almost four years before the capacity commitment- period.¹⁰⁴ Another is that there are financial penalties for failing to deliver on FCM supply obligations. However, each PA takes all reasonable steps to maximize FCM revenues during the term.

In developing a bid, each PA uses the best information available at the time and considers historic achieved annual peak period MW reductions from their energy efficiency programs, as well as ongoing studies and evaluations that may affect future savings potential. Given the difficulty in estimating the actual energy efficiency savings that will be eligible to participate in the FCM and the potential penalties, PAs typically do not bid into future FCM commitment periods the total amount of energy efficiency savings they expect to achieve. In making conservative FCM bids, the PAs avoid overpromising and thereby compromising future system reliability. In addition, the reconciling nature of the EES ensures that customers are made whole if PA FCM revenue projections are overly conservative and the PA ultimately collect additional FCM revenues.

Regional Greenhouse Gas Initiative Proceeds (electric only)

Pursuant to G.L. c. 25, § 19(a), the three-year plans of the electric PAs shall be funded in part by “not less than 80 percent of amounts generated by the CO₂ allowance trading mechanism established under the RGGI Memorandum of Understanding, as defined in subsection (a) of section 22 of chapter 21A, and the NO_x Allowance Trading Program.”

¹⁰² G.L. c. 25, § 19(a) as defined in section 1 of chapter 164.

¹⁰³ 2013-2015 Order, at 119.

¹⁰⁴ The next forward capacity auction, in February 2022, will be for capacity delivery in July 2025.

As stated in the PAs' June 28, 2019 report to the Department on RGGI funding, DOER is responsible for allocating the proceeds from the RGGI auctions in a proportion determined by DOER for the purposes set forth in G.L. c. 21A, § 22(c)(1). Accordingly, the electric PA work with DOER to develop the most accurate projection of RGGI revenues that will be allocated by DOER for the programs.

In December 2019, as part of the state's supplemental budget, the Massachusetts Legislature adjusted how DOER allocates RGGI revenue.¹⁰⁵ The Legislature prioritized the spending of RGGI revenue on state programs other than energy efficiency, such as the Green Communities program and EV incentive programs, among others. As a result, DOER advises that the PAs should not expect any RGGI revenue for the 2022-2024 term.

EES REVENUES

The EES is a fully reconciling funding mechanism.¹⁰⁶ that the Department approves for funding the three-year plans.¹⁰⁷ On an annual basis, each PA submits an updated EES for Department review, based on: (1) the PAs' most recent projections of budgets, revenues for non-EES funding sources (for electric PAs), and sales for the current year, and (2) a reconciliation of any under- or over-recovery of costs from the previous year.¹⁰⁸ Electric PAs collect the EES through EERF tariffs.¹⁰⁹ For natural gas PAs, the EES is collected through the LDAC tariff in accordance with established Department practice.¹¹⁰ The EERF and LDAC filings of the PAs are separate proceedings from the three-year plan proceeding and are implemented on schedules that vary among the PAs.¹¹¹

Carryover Information

In determining its EES, an electric PA takes into account carryover funds. Pursuant to the Guidelines, if the funding for a customer sector from SBC, FCM, RGGI, and other non-EES sources exceeds the customer sector's budget, the electric PA must carry over any excess funding to the customer sector's budget for the subsequent year in order.¹¹² For the 2022-2024 term, the electric PAs do not have any carryover funds. Each PA may have an over- or under-collection from their respective EES, and these are reflected in the electric PA-specific funding tables in each PA-specific Exhibit.

¹⁰⁵ See Section 95 of Chapter 142 of the Acts of 2019, available at <https://malegislature.gov/Laws/SessionLaws/Acts/2019/Chapter142>.

¹⁰⁶ The PAs collect funds related to RCS through their EES. 220 C.M.R. § 7.00 et seq. The Department reviews the reconciliation of any over and under collections of RCS funds in the LDAC filings for the natural gas PAs and in the Energy Efficiency Reconciliation Factor (EERF) tariff filings for the electric PAs.

¹⁰⁷ G.L. c. 25, § 21(d)(2).

¹⁰⁸ 2016-2018 Three-Year Plans Order at 114.

¹⁰⁹ Guidelines §§ 2(9), 3.2.1.6.

¹¹⁰ Guidelines §§ 2(9), 3.2.2.

¹¹¹ With the exception of Compact, EERF filings are made coincident with each electric PAs' residential basic service rate change, creating a lag between energy efficiency program spending and collection. The Compact's rates are effective January 1 of each year, consistent with the 2013--2015 Order at 125, n.106. The natural gas PAs' LDAC filings are approved for effect November 1 each year. Due to the timing of these filings, the budget and revenue projections are based on the 12-month period starting on the effective date of each EES, rather than on a calendar year. Therefore, projected expenditures and revenues included in the respective EERF and LDAC filings will differ from the amounts included in the 2022-2024 Plan.

¹¹² See § 3.2.1.6.1.

OUTSIDE FUNDING LEVELS

The 2022-2024 Plan does not contain outside funding assumptions at this time given the absence of material viable funding sources. The PAs, as well as Councilors and government agencies, all actively continue to seek new sources of outside funding. The PAs' approach in this regard reflects lessons learned over the course of prior three-year plans. There continues to be a low likelihood that a major new federal cap-and-trade program will be implemented in the immediate future as had been anticipated when the 2010-2012 Plan was initially developed and approved by the EEAC.

As part of their holistic and integrated approach, the PAs will seek to educate customers about funding offered through other government programs. An example of this is DOER's Green Communities program, which provides grants to qualified municipalities to reduce energy usage as compared to a set baseline. While the objectives of these programs differ from the goals of the PAs' energy efficiency programs, customers may leverage the multiple funding sources to reduce the customer contribution cost, removing barriers to adoption of measures that provide both energy efficiency benefits and advance other state policies, including reducing GHG emissions.

BILL IMPACTS

Consistent with directives of the GCA and the goal of the 2022-2024 Plan (to provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply), the PAs have sought to develop a statewide energy efficiency plan that acquires these resources with the lowest reasonable customer contribution..¹¹³ For the 2022-2024 Plan, the PAs assessed potential bill impacts with a heightened sensitivity, as many customers' bills remain in arrears due to the economic downturn associated with the ongoing COVID-19 pandemic. The Department has determined that a bill impact analysis with a short-term perspective that isolates the effect of a proposed change in the EES is appropriate because it provides an accurate and understandable assessment of the impact that customers will experience on their bills..¹¹⁴

The Department requires the PAs to submit traditional bill impacts for non-participants under the following scenarios:

- The current (i.e., 2021) EES to the proposed EES for the first year of the three-year plan (i.e., 2022).
- The EES from the first year of the three-year plan (i.e., 2022) to the proposed EES for the second year of the three-year plan (i.e., 2023).
- The EES from the second year of the three-year plan (i.e., 2023) to the proposed EES for the third year of the three-year plan (i.e., 2024).
- The current EES (i.e., 2021) to the proposed EES for the third year of the three-year plan (i.e., 2024)..¹¹⁵

¹¹³ See G.L. c. 25, § 21(b).

¹¹⁴ 2013-2015 Three-Year Plans Order at 122; D.P.U. 08-50D, at 11-12.

¹¹⁵ D.P.U. 08-50-D, at 12.

The Department also directed the PAs to submit bill impacts for participants, “where consumption is reduced for three levels of savings – low, medium, and high – and [to] provide a description of how these savings levels were determined.”¹¹⁶ The Department later clarified the bill impact requirements for non-participants by providing a spreadsheet to the PAs, directing them to use average monthly usage levels under the first and fourth scenarios listed above.

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

The PAs determined that there is no low, medium, and/or high savings scenario for income-eligible participants. These participants typically receive a comprehensive “whole house” energy efficiency approach, meaning potential measures are installed in most cases (the work that can be done is completed). Similarly, the PAs determined that there is no low, medium, and/or high savings scenario for residential and income-eligible natural gas non-heating participants and street lighting. Accordingly, the PAs determined that the percentages in the table below best approximate savings for those types of participants.

Figure A-21: Proposed Budgets

	Low	Medium	High
Residential (electric)	2%	10%	30%
Residential (natural gas)	2%	15%	30%
Residential (natural gas non-heating)		2%	
Income Eligible (natural gas non-heating)		2%	
Income Eligible		25%	
Street Lighting		10%	
C&I (electric)	1%	10%	20%
C&I (natural gas)	1%	10%	20%

As of this April 30, 2021 submission date, several key components that are necessary to finalize the most accurate bill impact calculations consistent with the Department’s requirements have yet to be determined or finalized. Each PA will provide final bill impacts for all rate classes in its individual filing to be made at the Department in October 2021.

¹¹⁶ Id.

Additionally, it is important to emphasize that actual rate and bill impacts for customers associated with the 2022-2024 Plan will vary based upon a multiplicity of factors, such as the cost of service in a particular PA's service territory, the customer's actual individual usage, the level and quality of measure installation, and the availability of public or private funds other than those collected through the SBC for application toward energy efficiency expenditures, such as proceeds realized from the FCM or from cap-and-trade programs (i.e., RGGI). Finally, bill and rate impacts will vary from the bill and rate impacts included in each PA's EES filings, which are done on a different time schedule from this filing and include up-to-date over- and under-collections.

A.7.3 PA-SPECIFIC INITIATIVES

PA-specific initiatives (those that are proposed by individual PAs based on the unique characteristics of their service area or governing structure) will be described in more detail in the final Plan. Further, in accordance with the Department's directives in D.P.U. 18-116, the Compact will ensure that stakeholders and the EEAC have reviewed any Compact-specific initiatives.

The Compact's budget for the 2022-2024 term includes the Compact-specific Cape & Vineyard Electrification Offering (CVEO), originally presented as a Compact specific initiative in the 2019-2021 term. In D.P.U. 18-116, the Department did not approve CVEO or its associated budget; rather, it recommended that the Compact refine its proposal with stakeholder input, obtain EEAC approval, and submit a revised proposal to the Department for review. The EEAC approved the Compact's revised offering on April 15, 2020 and CVEO is currently under review by the Department in D.P.U. 20-40. During the 2022-2024 term, the Compact intends to offer CVEO to the same customer classes and for the same number of participants as identified to the Department in D.P.U. 20-40. Therefore, the proposed budget for CVEO contained in the 2022-2024 Plan is comparable to the budget under consideration by the Department in D.P.U. 20-40 (updated solely to reflect the most current costs of the offering if implemented during the 2022-2024 term).¹¹⁷

¹¹⁷ In accordance with D.P.U. 18-116, a detailed description of CVEO, with supporting testimony and data tables will be included in the Compact's final 2022-2024 Plan filing. The Compact also intends to present a detailed description of CVEO and data tables to the EEAC for review in advance of the EEAC's Fall 2021 resolution on the 2022-2024 Plan, in the hopes that in the interim, it may incorporate or otherwise address any feedback from the Department received in D.P.U. 20-40.

APPENDIX B: STRATEGIC EVALUATION PLAN

Please see the separate file for Appendix B.

APPENDIX C: POTENTIAL STUDIES

Please see the separate file for Appendix C.

APPENDIX D: STATEWIDE ENERGY EFFICIENCY DATA TABLES

Please refer to the separate file for the data tables.

APPENDIX E: PARTICIPANT DEFINITIONS

A final version of this Appendix will be prepared for the October filing.

APPENDIX F: VENDOR COST CATEGORIES

Program Administrator Vendor Cost Categories

Row Number	Cost Type	Elec/Gas/Both	Cost Category
1	Statewide Database/Mass Save Data	B	PP&A
2	Builder and Equipment Incentives	B	Incentive
3	Heating System Rebates	B	Incentive
4	Lighting/ISMs	B	Incentive
5	Permits	B	Incentive
6	Pre-weatherization Incentive	B	Incentive
7	Rater Inspection Fees	B	Incentive
8	Rebates/ Incentives (customer)	B	Incentive
9	Refrigerator Costs within Low-Income	E	Incentive
10	Repairs within the Low-Income Initiatives	B	Incentive
11	Total Interest Subsidy	B	Incentive
12	Weatherization Costs	B	Incentive
13	Marketing and Advertising Support	B	Marketing
14	Cost Effectiveness Screening	B	PP&A
15	EEAC Consultants/Regulatory Assessments/LEAN	B	PP&A
16	Legal Services	B	PP&A
17	Planning Support	B	PP&A
18	Tracking System Maintenance	B	PP&A
19	Account Management	B	STAT
20	Audit Fees	B	STAT
21	Call Center Activities	B	STAT
22	Circuit Rider Activities	B	STAT
23	Postage Associated with Rebate Processing	B	STAT
24	Processing Fee	B	STAT
25	Program Administration Fees	B	STAT
26	Quality Assurance and Control activities	B	STAT
27	Reporting	B	STAT
28	Technical Assistance Studies	B	STAT
29	Technical Support for Contractors	B	STAT
30	Travel	B	STAT
31	Contractor Fees	B	STAT (contractor services/fees); Incentive (measure costs/labor)
32	Training	B	STAT (Workforce Development)

POLICY ON SPONSORSHIPS & SUBSCRIPTIONS

A. Hard-to Measure “Sponsorships and Subscriptions”

Sponsorships and subscriptions are undertaken by the PAs in order to support the goals of the Green Communities Act (“GCA”) and acquire all available cost-effective energy efficiency. Costs included on the Sponsorships and Subscriptions hard-to-measure line items provide direct benefits to customers, but are not directly linked to specific in-the-field energy efficiency measures or services. Sponsorships and subscriptions support the energy efficiency market, encourage workforce education, attract skilled employees to Massachusetts, and promote innovation in both service delivery and the development and testing of energy efficient technologies. In accordance with the Order of the Department of Public Utilities regarding the 2016-2018 Three-Year Energy Efficiency Plan and general accepted practice, each sponsorship and subscription expense must be reasonable, prudently incurred, and provide a direct benefit to Massachusetts customers. Detailed definitions are as follows:

- **Sponsorship:** Payment by or on behalf of a PA to financially support an organization, event, or project directed by a non-PA person or group, in order to gain participation or access to a benefit of sponsorship. The purpose of these costs may include, without limitation, sharing of regional and national best practices, transformation of energy efficiency markets, influencing manufacturers, furthering energy efficiency evaluation techniques and standards, and the ability to network (with customers, contractors, evaluators, or other experts) to learn about additional energy efficiency opportunities and ways in which to improve offered energy efficiency services. These activities all provide benefits to customers and programs generally, but do not focus on a specific initiative. Specific categories of sponsorships enumerated by the Department include:
 1. Energy efficiency forums
 2. Trade associations
 3. National industry associations
 4. Groups that target specific industry sectors
 5. Universities and organizations that develop new technologies
 6. Residential focused groups to educate and engage with the community

Costs reported in the hard-to-measure line items will be limited to sponsorships that are anticipated to provide benefits to customers but are not associated with a specific program or initiative. Conversely, expenses related to the above categories that directly impact programs will be included in the appropriate program budget (see Section B, below).

- **Subscription:** Payment by or on behalf of a PA to receive or use something related to energy efficiency over a fixed period of time, such as a periodical, a book series, or an informational service.

Costs will be categorized in the appropriate cost category.

Examples and Cost Categorization

1. Membership Dues for Consortium for Energy Efficiency (“CEE”) - allows the PAs to provide guidance to manufacturers who make equipment that can be used to increase efficiency or options in the programs, and gives the PAs early insight into new technologies coming to market.
 - *Line item:* Sponsorships & Subscriptions hard-to-measure for each sector
 - *Cost Category:* PP&A(Note that other charges from CEE specifically related to programs may be included as program costs; see Section B, below)
2. Membership in Ally Program of American Council for an Energy-Efficient Economy (“ACEEE”) - allows PAs to bring awareness to the programs generally and advance Massachusetts’ goals throughout the national energy efficiency community. Allies gain access to a national center of expertise as well as unique opportunities to help contribute to and shape the nation’s energy efficiency research and program agenda. Allies also learn from networks of peers and other experts about the latest trends and issues in energy efficiency. Additionally, Allies receive industry-leading information on energy efficiency markets, technology, and policy. Participation in ACEEE’s Ally program allows the PAs to share in the expertise of ACEEE and other Ally members on energy efficiency technologies and opportunities that can influence the programs of the future and help PAs improve program delivery.
 - *Line item:* Sponsorships & Subscriptions hard-to-measure for each sector
 - *Cost Category:* PP&A
3. Sponsorship of International Energy Program Evaluation Conference (“IEPEC”) – allows the PAs to participate in the annual professional conference, which is held for energy program implementers, evaluators of those programs, local, state, national and international representatives, and academic researchers involved in evaluation. The conference provides a forum for the presentation, critique and discussion of objective evaluations of energy programs, and promotes the documentation of unbiased, peer-reviewed evaluations that establish the basis for accurate information and provide credible evidence of program success or failure. In addition, the PAs gain access to information on current issues, market assessments, emerging technologies, and alternatives to traditional centralized supply-side options, as well as educational workshops on relevant topics, including information on evaluation methodologies, vendors, and strategies to continuously improve evaluation of the PAs’ programs. In addition, support of IEPEC provides the PAs with the opportunity to learn about new program efforts and how those innovative approaches are working in other areas. This helps the PAs to effectively deliver energy efficiency solutions to customers.
 - *Line item:* Sponsorships & Subscriptions hard-to-measure for each sector
 - *Cost Category:* Evaluation and Market Research

B. Program Expenses (NOT Hard-to-Measure “Sponsorships and Subscriptions”)

Expenses paid to directly support a program are program expenses and will be included in and allocated to the appropriate programs/core initiatives where benefits are expected to be realized. *A cost may be included in program line items even if called a sponsorship or subscription because the expense is directly related to the program.* These expenses include:

- **Data Purchase:** Payments made to receive data on a one-time or recurring basis will be included in the programs to which the data relates.
- **Memberships / Employee Training:** Membership fees (group or individual) where the fee is not used to sponsor a conference or event, but rather as a cost-efficient way to obtain multiple individual employee memberships, receive tickets to conferences for learning opportunities for employees, advertise energy efficiency programs to customers/contractors, provide direct access to member lists, and advertise energy efficiency job positions. Employee conference and training attendance enhances employee skills and teaches the employee about new technologies and strategies, helping the employee in his or her job/role and improving the programs. The conference/training must provide an energy efficiency related benefit and the PA should determine if the value of the employee's attendance justifies the costs.
- **Goods or Services:** Expenditures made to pay for a good or service, such as a product table at an event (without otherwise sponsoring the event or organization).

Costs will be categorized in the appropriate cost category.

Examples and Cost Categorization

1. Sponsorship of an HVAC conference where a PA presents on Heating & Cooling energy efficiency in order to market the Mass Save program.
 - *Line item:* Residential Heating & Cooling program core initiatives
 - *Cost Category:* Marketing and Advertising
2. Subscription to or sponsorship of an organization that shares or disseminates data that the PAs use for planning or evaluation.
 - *Line item:* Each affected program/core initiative
 - *Cost Category:* PP&A for planning data or Evaluation and Market Research for evaluation data
3. Sponsorship of a community event at which a PA promotes Mass Save through brochures, banners, and tabling to potential customers.
 - *Line item:* All relevant programs/core initiatives
 - *Cost Category:* Marketing and Advertising

4. Sponsorship of the Design Lights Consortium, which directly impacts the lighting products the PAs offer in C&I programs as well as lighting design practices for C&I customers and program design and implementation.
 - *Line item:* C&I Upstream Lighting and C&I Retrofit core initiatives
 - *Cost Category:* Sales, Technical Assistance & Training
4. Group Membership in Association of Energy Services Professionals, with which the PA gains “points,” and uses these points to assign individual memberships to staff members, allowing staff to improve their skills and learn innovative ideas and best practices to improve program delivery and achieve energy savings.
 - *Line item:* All relevant programs/core initiatives
 - *Cost Category:* PP&A

Documentation of Expenditures Included in Program Costs

In 2016-2018, the PAs will contemporaneously document the benefits to customers of expenditures that are or were previously included in the Sponsorships & Subscriptions hard-to-measure line item in 2013-2015, including any sponsorship or membership payment that is made to directly affect programs and is included in program line items. PAs do not intend to provide a detailed explanation of benefits (or contemporaneously document the benefits) associated with costs that were never included in the Sponsorships & Subscriptions line items, including (1) payments solely for goods and services (e.g., tabling), (2) the purchasing of data, (3) conference fees paid for directly by employees, and (4) costs included in other line items (e.g., Residential Education (in-school programs), Workforce Development (third-party trainings)). The PAs will provide detailed information about all costs in the Term Report in accordance with the Term Report template.

C. Lobbying or Engagement in Legislative Activity

For each sponsorship and subscription expenditure, the PA will determine whether the sponsored organization is a registered lobbyist or engages in legislative activity¹. For all sponsored organizations, whether registered as a lobbyist or not, PAs will seek to obtain a written statement prior to providing monetary support covenanting in substance as follows:

[The Organization] understands that the Massachusetts energy efficiency Program Administrators cannot and do not support lobbying activities by organizations sponsored by the Program Administrators. [The Organization] covenants and agrees that funds provided by [Company] as an energy efficiency or demand savings sponsorship or subscription will not be used for lobbying or other legislative activities.

In the event a PA determines that sponsorship of an organization that is involved in lobbying activities has a direct benefit to Massachusetts customers, the PA will document the benefits and provide evidence of how the funds at issue are used by the sponsored organization. Consistent

¹ In 2016 – 2018, this information will also be obtained for commitments that were included as “Sponsorships and Subscriptions” in 2013-2015 even if the costs are now being directed to specific programs or core initiatives.

with the Department's directives in the 2016-2018 Three-Year Plan Order, the organization must also provide documentation that (1) details the structure and function of the sponsored organization; (2) identifies the percentage of resources devoted to lobbying and legislative activities; and (3) provides the method used to derive the percentage.

PAs expect to sponsor organizations that lobby or advocate for more stringent codes and standards. The PAs will document all spending as noted above, but will work under the presumption that more stringent codes and standards provide a direct benefit to customers.

D. Annual Review Process

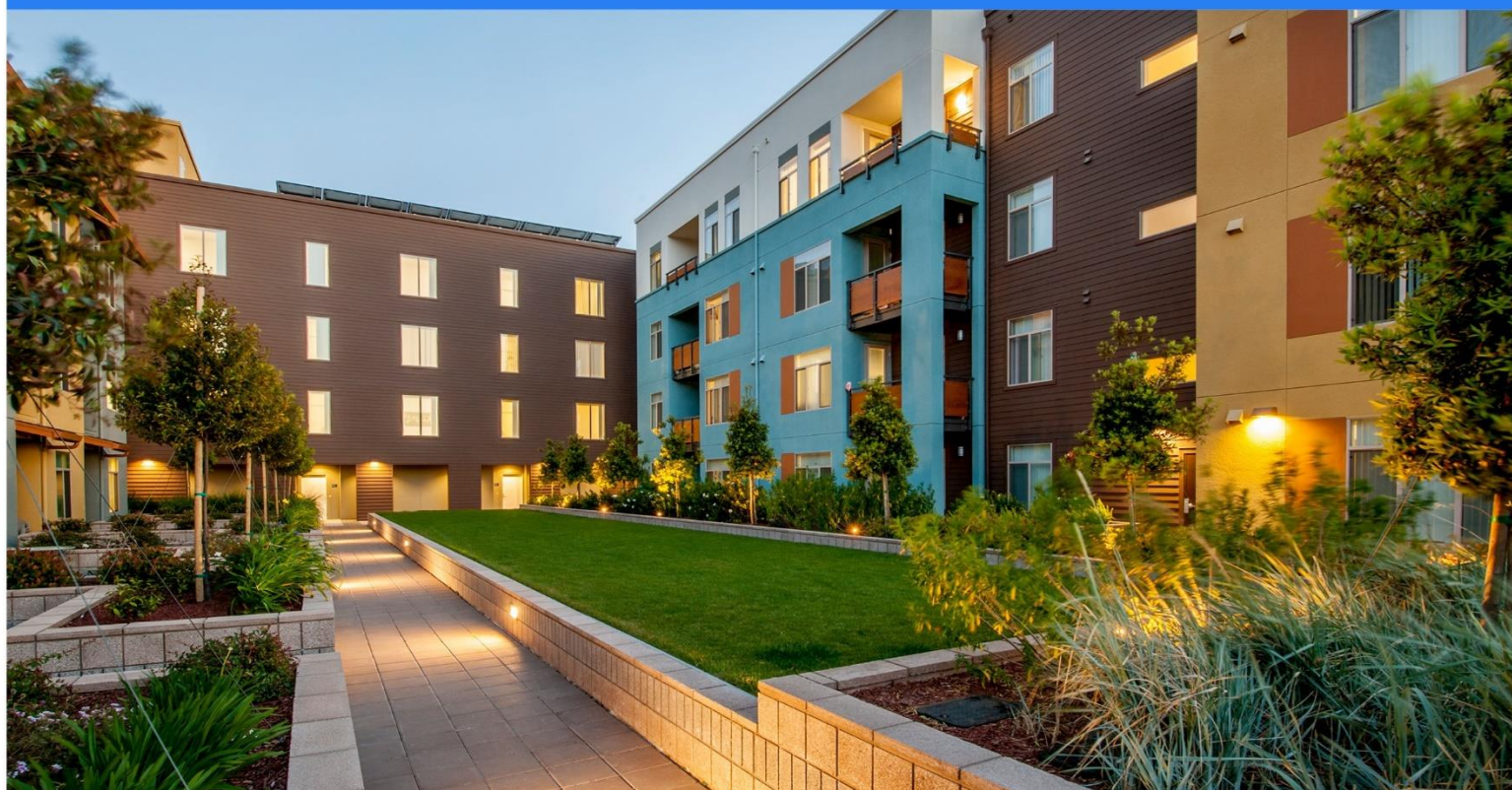
Prior to filing the Plan-Year Report or Term Report, each PA will review all sponsorship and subscription spending incurred during the prior program year (including, in 2016-2018, those expenses directly affecting programs and categorized in program line items that were previously included as Sponsorships & Subscriptions hard-to-measure costs in 2013-2015) to determine whether the events or organizations sponsored in the prior year realized the expected benefits (noting that some benefits may take more than a year to accrue, and that many benefits are not quantifiable). Each PA will document actual benefits realized, and verify that each expense was reasonable, prudently incurred, and was intended to provide a direct benefit to customers.

E. Process to Determine Whether to Enter into a Sponsorship or Subscription; Contemporaneous Documentation

- Step 1.** Identify sponsorship or subscription opportunity – may come from staff or vendor.
- Step 2.** Identify and document the **purpose** of the organization or event to assess whether it is **directly related to energy efficiency**.
- Step 3.** Identify and document in detail the expected **direct energy efficiency-related benefit to Massachusetts customers** of the expense, which may include: enhanced energy efficiency program delivery, marketing and education opportunities, reaching key industry sectors, sharing of best practices, access to manufacturers, contractors, and/or data and evaluation materials, assisting the PA in achieving savings or satisfying an energy efficiency related statutory mandate, or other benefits. For sponsorships that are being renewed, identify the benefits that were achieved in prior years and their impact on the decision to renew the sponsorship.
- Step 4.** Assess whether the associated sponsorship costs are **reasonable and prudent** in relation to the expected benefits; determine if the opportunity is the best and most cost-efficient means by which the PA can achieve the expected benefits.
- Step 5.** Determine whether or not the organization is a registered lobbyist or otherwise **engages in lobbying** (note that an organization can be engaged in lobbying even if it is not required to be a formally registered lobbyist). For organizations that do engage in lobbying, additional scrutiny should be used to determine that the sponsorship funds will not be spent for lobbying purposes. If it is determined that the sponsorship is prudent, ensure that the organization seeking sponsorship signs a statement that organization will not use PA funds for lobbying purposes and gather evidence that: (1) details the structure and function of the sponsored organization (e.g., organization

chart, mission statement); (2) identifies the percentage of resources devoted to lobbying and legislative activities; and (3) provides the method used to derive the percentage.

- Step 6.** Determine and document how the expenditure will be allocated between a PA's **gas and electric operations** (when applicable), based on the benefits to be realized by each fuel type's customers.
- Step 7.** Determine and document the **appropriate line item and cost category**, including: whether the expense (1) is a hard-to-measure Sponsorship or Subscription; or (2) directly affects a program, and if so, determine which programs and how the expense will be allocated among the impacted core initiatives. Determine and document the appropriate budget category (PP&A, Marketing, STAT, or Evaluation and Market Research). When appropriate, coordinate with other PAs for consistency.
- Step 8.** Obtain sign-off from the designated PA staff approving the sponsorship or subscription.
- Step 9.** Obtain documentation from a manager (or equivalent) of the organization stating that it **will not use PA funds for lobbying purposes**. For organizations that engage in lobbying, ensure that the PA has received all information listed in Step 5.
- Step 10.** Confirm that all **logos and marketing** materials used in relation to the sponsorship for which the PA will seek cost recovery from energy efficiency are designed to support and promote energy efficiency programs.
- Step 11.** **Pay invoice** per standard PA procedure.
- Step 12.** **Review** all costs following completion of sponsored event or program and determine whether and how the expected benefits were realized. Determine whether the PA would sponsor or participate in the organization or event again in the future.



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