

Multi-Family Retrofit: Recommendations for Achieving a Fully Integrated Energy Efficiency Program Effort in Massachusetts

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EXECUTIVE SUMMARY

Purpose

This report presents a high-level examination of several opportunities to build on prior successes the Massachusetts Program Administrators (PAs) have achieved in moving toward a more seamless customer experience and achieving deeper energy savings for residential and commercial multi-family customers. In August 2014, the Consultants presented an overview of these opportunities to the Council pursuant to their work plan and as part of the Implementation Update process. This report provides the details supporting the Consultants' recommendations for multi-family retrofit, additional information regarding policy and regulatory issues that should be addressed, and specific next steps for 2015 and the 2016-18 planning period.

Methodology

In support of this high-level review, the Consultants' research included four components: 1) a process review, 2) a technical review, 3) an impact assessment, and 4) an opportunity assessment. The work on the four components drew on a variety of primary and secondary data sources from within and outside of Massachusetts. Much of the Massachusetts-specific information was supplied by the PAs and their contractors, including program implementation and evaluation contractors. The Consultants also reviewed the January 2015 draft Mass Save® Multifamily Program Process Evaluation Report. Information on other PA practices was gathered from a literature review and multi-state review of existing program best practices.

Market Segment

The market segment for the Massachusetts Multi-Family Retrofit Initiative includes all buildings containing five or more attached dwelling units, as well as certain sites where five or more detached dwelling units function under a single facility or site, as is the case with some condominiums. The initiative covers both residential and commercial customer meters for natural gas and electricity. For purposes of this report, this segment does not include low income housing, which is covered under a separate Low Income Multi-Family Initiative, administered by the PAs and the Low-Income Energy Affordability Network (LEAN). The multi-family market segment includes nearly 585,000 units, accounting for 21% of the housing stock in Massachusetts. Renters make up the majority of occupants (75%), followed by owners (15%) with current estimates of 10% of units unoccupied.

Current Massachusetts Practice

The Mass Save® Multi-Family Retrofit Initiative currently functions as a joint residential and C&I offering serving market rate customers in properties with five or more residential units. It is supported by a combination of residential and commercial program resources. This initiative has been restructured in recent years, and the PAs have been focused on increasing integration between gas and electric and between the residential and commercial sectors. For example, in 2010 the PAs introduced a Multi-Family Market Integrator (MMI), which provides a common point of contact for customers to assist in guiding them to the program resources that will best serve them and assists in coordinating vendors for customers who are eligible for both residential and commercial program services.

In general, individual residentially metered dwelling units are eligible for services through the Residential Multi-Family Retrofit Initiative, while improvements benefitting the whole building "house" meter (typically on a commercial account), such as common area lighting¹ and central mechanical system improvements, are typically processed through the Commercial and Industrial Retrofit Program, which provides incentives for a range of prescriptive and custom measure options. In 2013, year-end results indicate that the residential Multi-Family Retrofit Initiative accounted for approximately 4.5 percent of the PAs' total annual savings for both electric and gas. The multi-family contribution to savings for the C&I Sector is not currently tracked. Under current interpretation of the Residential Conservation Services statute, the PAs do not provide weatherization

¹ Note that some PAs allow for common area lighting improvements to be managed by the residential vendors but the savings still accrue to the associated commercial meter.

services to customers in multi-family buildings heated by delivered fuels (e.g. oil and liquid propane gas).

While the establishment of multi-family residential customer eligibility for services covered by the RCS statute has ensured greater consistency of services provided to the residential customer base across all PAs, there are opportunities for additional enhancements that would improve the multi-family customer experience: further residential and C&I integration, benchmarking, and serving buildings with delivered fuels. These are more fully described in the main body of the report.

Other PA Practices

To supplement the Consultants' own combined prior experience in multi-family programs, a review of published "best practices" from a variety of sources was utilized to help gauge Massachusetts' progress toward achieving the combined goals of a more streamlined customer experience and capturing all cost-effective energy savings in multi-family buildings. Additional information was collected via publicly available sources, informal discussions with a small sample of representatives from programs outside of Massachusetts, and research targeting best practices in low-income multi-family programs completed by Research Into Action, Inc. A summary of the program models reviewed for this effort is included in Tables B-1 and B-2 in Appendix B. The results of the consultant's preliminary research was shared with the evaluation team to supplement a more rigorous interview and focus group process conducted by the evaluation team for the Multifamily Program Process Evaluation that is still being finalized. Both reports note several themes that emerged from this review that should be considered as Massachusetts continues to refine and evolve its multi-family initiatives. In addition to practices from outside the Commonwealth, Massachusetts' own Low Income Multi-Family Initiative provides examples of several recommended practices that can be translated to market rate multi-family program delivery.

Recommended Practices for Massachusetts Implementation

This report presents analysis and recommendations in three main sections: deepening integration of the multi-family offer, conducting benchmarking, and serving buildings heated by delivered fuels. The sections include additional information about the PAs' offerings in these areas, opportunities for enhancements, and recommended next steps. This Executive Summary presents only the recommendations; we strongly recommend that the reader review the full text of this report to gain a full understanding of the context, considerations, and implications for each issue.

Main Recommendation	Components	Next Steps
Deepen Integration of the Multi-family Offer	Implement a single point of contact model	Implement near-term actions <ul style="list-style-type: none"> Identify and screen new eligible measures Identify and develop a fast-track implementation approach and rule set for “hybrid” measures Develop a rule set for applying the commercial Pay for Performance approach to multi-family Provide building operator training for staff of participant buildings
	Enable customer-focused program experience (owner-centric vs. program centric)	Implement unique site identifiers
	Enhance educational efforts	Begin active collaboration on multi-family issues
	Pursue opportunities for greater comprehensiveness	Address regulatory and evaluation implications
	Equalize residential and C&I incentives	
	Reduce program and sector “silos”	
Conduct Benchmarking		Include benchmarking in 2016-18 Plan Identify multi-family sites using PA account data
Serve Buildings Heated by Delivered Fuels		Address when RCS regulation and guideline revisions are completed

A review of the January 2015 draft Mass Save® Multifamily Program Process Evaluation Report indicates that many of the evaluators’ findings are in agreement with the consultants’ observations, and the majority of recommendations in both reports are closely aligned.

INTRODUCTION

Background and Purpose

In March 2014, the Program Administrators (PAs) provided the Council with program Implementation Updates (IUs). As a result of the information put forward in the IU process, the PAs and Council Consultants engaged in a process to explore the potential for program enhancements using a “deeper dive” approach in three specific topic areas. One of these topics was an exploration of the potential to further integrate commercial and industrial (C&I) services into the Residential Sector Multi-Family Retrofit Initiative and to identify opportunities to further the pursuit of deeper energy savings. This topic was suggested by the PAs as a candidate for a deeper dive because the 2013 electric benefits preliminary results statewide for residential multi-family retrofit were just 53 percent of goal. In parallel to the IU process, the Council expressed interest in developing a greater understanding of multi-family issues.

The Consultants originally presented preliminary ideas for enhancements to the Multi-Family Retrofit Initiative to the PAs at the June 26, 2013 Residential Management Committee (RMC) meeting. PA comments and suggestions resulting from that meeting were addressed and incorporated into a memorandum with recommendations presented to the RMC on September 12, 2013. The Consultants’ recommendations primarily focused on opportunities to further streamline the multi-family initiative process from the customer’s

perspective. The recommendations contained within this document build from ideas originally presented in September 2013.

Significant milestones to date related to this effort include:

- March 17, 2014: PA Implementation Update presentation to Council
- April 25, 2014: Consultant memo describing deeper dive topics and data requests
- May 16, 2014: Consultants and PAs meet to discuss deeper dive topic and data requests
- May 22, 2014: Joint status update from PAs and Consultants provided to Council
- August 12, 2014: PA and Consultant presentations of multi-family deeper dive findings and recommendations to the Council

This recent work by the Consultants builds on and is an extension of the PAs' own continuous improvement assessment process for multi-family. In 2009, in light of changes set in motion by the Green Communities Act, NSTAR hosted a facilitated stakeholder workshop designed to explore the options for multi-family programs in Massachusetts. The ideas that emerged from this workshop are consistent with many of the "best practices" currently in use in multi-family programs across the country and remain relevant to Massachusetts today.² The output from this group emphasized the importance of offering comprehensive, whole-building improvement packages and the necessity of eliminating program and policy driven fragmentation of program offers. Specific tactics recommended by this group included benchmarking, the use of a single point of contact (similar to a general contractor), and uniform cost/benefit metrics. The recommendations presented in this report support those themes and offer a platform for furthering those goals.

In addition, the Multifamily Process Evaluation completed in June 2012 obtained feedback from participating building owner/managers and residents. While securing meaningful sample sets of non-participants was not within the scope of this study, some conclusions about non-participants can be inferred from the participants' responses to the researchers' questions. Among many other specific recommendations, this evaluation suggested "anything to streamline the process even further, *from the perspective of the customer*, would also be beneficial to the program." To build on this evaluation finding, the Consultants believe that deeper, yet still cost-effective, energy savings may be achieved by continuing work to reduce the number of steps for the customer in the program, minimizing or eliminating aspects that may seem fragmented and confusing, and by providing an incentive design that supports more comprehensive energy efficiency packages. For the purposes of this exercise, the issues of greatest significance at this time are related to the on-going need to better integrate the services that benefit both the residential and commercial customer bases represented by the multi-family segment.

For the sake of clarity, the Consultants note that the focus of this report is the residential sector Retrofit Initiative and related C&I services. The Low Income Multi-Family Initiative has not been reviewed in detail, and the findings and recommendations do not necessarily apply directly to that effort. Nonetheless, the Consultants are mindful that its work and the work of the Council, PAs, and other stakeholders should include an ongoing assessment of opportunities to apply solutions across multiple sectors.

The Consultant's overarching recommendation to the Council in August was to establish a distinct multi-family sector to overcome the remaining obstacles toward more fully integrating the commercial and residential program activities related to the multi-family market. In follow up to that recommendation, additional work has been completed exploring the potential impact on the PAs in terms of internal process, system, and resource modifications as well as the policy and regulatory impacts of creating a new sector for multi-family energy efficiency program delivery. Alternative options are also considered. Additionally, a set of suggested action items are included to ensure the recommendations are addressed and viable enhancements resulting from this exercise are implemented on a timely basis. Several recommended steps could be implemented in the near term. Others should be reviewed as part of planning for the 2016-2018 period and incorporated into the final

² Point380, LLC, "Multi-family Housing EE Programs: Workshop Results", NSTAR Electric and Gas, April 2009.

plan. These recommendations are intended to help further develop the program to achieve both broader and deeper energy savings while being both responsive to the customer's point of view and maintaining cost-effectiveness for the PAs. The Consultants look forward to discussing these recommendations with the PAs and to working together on refining the recommendations with the benefit of additional information on the Massachusetts Multi-Family Retrofit initiative that the PAs and other stakeholders may supply.

Methodology and Data Sources

This report includes a high-level examination of several opportunities to build on prior PA successes in moving toward a more seamless customer experience and achieving deeper energy savings for residential and commercial multi-family customers. Toward that end, the research encompasses four key components:

- Process review of the project implementation cycle to identify opportunities to enhance residential and C&I integration
- Technical review of measures currently being offered, with emphasis on the potential impact of increased customization and the addition of delivered fuel measures
- Assessment of the impact of including buildings heated by delivered fuels
- Identification of opportunities for using pre-screening and benchmarking to prioritize multi-family participants

General information pertaining to program design, implementation and day-to-day operations was collected via a series of discussions with the RMC and phone calls with the PAs and their implementation vendors. The Consultants developed a composite view of the measures currently available and being delivered to multi-family building owners in Massachusetts by reviewing the incentivized measure tables from each PA's three-year plan (2013-2015) and the commercial program offers listed on the Mass Save website. Other research tasks included collecting and reviewing several additional data sources.

- Data on call center activity from monthly reports to the Multi-Family Working Group by the Multi-Family Market Integrator (MMI) (RISE).
- Data related to historical participation rates of customers with oil and propane heating fuel (provided by the PAs) and deemed savings estimates for oil heated multi-family units (provided by the Low-Income Energy Affordability Network (LEAN)).
- Primary market data from the Massachusetts Multifamily Market Characterization and Potential Study (2012), and additional market characterization data extracted from the National Apartment Association, the National Multi Housing Council, weareapartments.org, and the U.S. Census Bureau American Communities Survey (2009)

Initial analysis results were reviewed with the RMC and adjusted as necessary to ensure an accurate representation of the information being provided, after which a draft of this report was provided to the PAs and to DOER for review and comment. In addition to the above activities, results of prior Consultant team work, including a literature scan and multi-state review of existing program best practices, were incorporated into this work product; the conclusions and recommendations included in this report are reflective of the best practices extracted from that research. The Consultants also reviewed drafts of the Mass Save[®] Multifamily Program Process Evaluation in November and January.

MARKET SEGMENT INFORMATION

Description of Market Segment

The market segment for the Massachusetts Multi-Family Retrofit Initiative includes all buildings containing five or more attached dwelling units, as well as certain sites where five or more detached dwelling units function under a single facility or site, as is the case with some condominiums. The initiative covers both residential and commercial customer meters for natural gas and electricity. Two to four unit attached dwelling sites are served

under the Home Energy Services (HES) residential program. For purposes of this report, this segment does not include low income housing, which is covered under a separate Low Income Multi-Family Initiative, administered by the PAs and LEAN.

According to a 2012 multi-family potential study, the multi-family market segment, at 584,896 units, accounts for 21% of the housing stock in Massachusetts.³ Renters make up the majority of occupants (75%), followed by owners (15%). The remaining 10% of units sit unoccupied. An estimated 60% of units have natural gas service, and larger buildings are much more likely to fall within this group. Table 1 details the distribution of multi-family units and buildings by number of units in a structure.

Table 1 | Estimated Number of Multi-Family Buildings

Units in Structure	Total Occupied Units		Assumed Units Per Building	Estimated Buildings	
	N	Percent		N	Percent
5 to 9	150,275	29%	7	21,468	64%
10 to 19	109,050	21%	15	7,270	22%
20 to 49	108,604	21%	35	3,103	9%
50 or more	156,301	30%	100	1,563	5%
<i>Total</i>	<i>524,230</i>	<i>100%</i>	<i>16</i>	<i>33,404</i>	<i>100%</i>

Segment-Specific Challenges

There are several challenges related to this market segment that complicate the delivery of multi-family energy efficiency. These challenges are related to technical, customer types, implementation, and policy issues.

TECHNICAL

The cross-cutting nature of multi-family retrofit poses challenges. The housing stock includes a wide range of building types, ranging from single family detached condominiums to high-rise apartment buildings. This creates challenges related to the level of technical expertise and professional credentialing that is needed to assess and improve the energy efficiency of these buildings.

CUSTOMER TYPES

Multi-family properties exhibit a variety of ownership structures with varying levels of organization and decision-making channels. These entities range from small building private landlords to large real estate investment and management companies, as well as individually owned condominiums and co-operatives with varying governance structures.

The split incentive issue causes situations where building owners may be disinclined to invest in energy savings that accrue to the resident and vice versa.

IMPLEMENTATION

Related to the split incentive problem, many multi-family facilities include a combination of residential and commercial metered accounts for electric and gas services. This creates a challenge for energy efficiency programs to seamlessly deliver services across sectors and maintain accurate accounting of multi-family building costs and savings that accrue to each sector.

POLICY

The current Residential Conservation Services (RCS) guidelines in Massachusetts, which govern the residential Home Energy Services (HES) program, allow for oil and propane heated homes to be serviced through HES. On the other hand, the current interpretation of the RCS regulations and guidelines do not extend the same offer to multi-family buildings. This creates an inequity in the services that are available to

³ Multifamily Market Characterization and Potential Study Volume 1: Final Report (May 2012).

residential customers living in facilities that are categorized as multi-family under Mass Save, including individual condominium owners.

CURRENT MASSACHUSETTS PRACTICE

Current Approaches to the Multi-Family “Sector”

The Mass Save Multi-Family Retrofit Initiative currently functions as a joint offering serving market rate customers in properties with five or more residential units.⁴ Low income multi-family buildings are served by the Low Income Multi-Family Initiative administered by LEAN, which is distinct from the Multi-Family Retrofit Initiative. The market rate initiative is supported by a combination of residential and commercial program resources. It is not distinguished as a standalone program, although efforts have been made in recent years to improve the integration of the two sides of the offer (i.e. offers targeting both commercial and residential accounts.) This initiative has been restructured in recent years and the PAs have been focused on increasing integration between gas and electric and between the residential and commercial sectors. In 2013, year-end results indicate that the residential Multi-Family Retrofit Initiative accounted for approximately 4.5 percent of the PAs’ total annual savings for both electric and gas.⁵ The statewide goals for the initiative were achieved except for electric benefits and gas program spending. At the individual PA level, there were some very strong results, but also a number of instances in which goals were not met. Commercial multi-family results are generally not tracked by individual PAs and are not available on a statewide basis.

To support an integrated approach, the PAs introduced a Multi-Family Market Integrator in 2010. The MMI provides a common point of contact for customers to assist in guiding them to the program resources that will best serve them and also assists in coordinating vendors for customers who are eligible for both residential and commercial program services. If the MMI receives inquiries from customers who would qualify for the Low Income Multi-Family Initiative, they are referred to LEAN.

The PAs engage both residential and commercial vendors who provide energy auditing and measure installation services. The in-unit services provided to residentially metered dwelling units have been aligned to correspond to the residential measures offered to single family homeowners through the HES initiative. Improvements benefitting the whole building “house” meter (typically on a commercial account), such as common area lighting and central mechanical system improvements, are captured and accrue to the C&I Retrofit Program, which provides incentives for a range of prescriptive and custom measure options. In general, measures associated with the commercial meter are managed and implemented by the PAs’ C&I vendors. However, to facilitate the implementation of common area lighting, which often represents a significant opportunity for savings in multi-family buildings, some PAs have enabled their residential vendors to collect field data and screen these measures without requiring a handoff to a commercial vendor. This practice helps streamline the process and reduce project cycle times for certain types of buildings and sites.

Individual dwelling units are eligible for services through the Residential Multi-Family Retrofit Initiative (tied to residential meters, except for common lighting) including:

- Instant savings measures
- Air sealing and insulation, where appropriate
- Common area and exterior lighting (in most circumstances can be addressed by residential vendors but savings and costs accrue to Commercial Sector)

Whole building and common area services (apart from common area lighting noted above) are provided through the Commercial and Industrial Retrofit Program (tied to commercial meters) including:

⁴ Customers in 1-4 unit buildings are served by the Home Energy Services (HES) Initiative.

⁵ The multifamily contribution to savings on the commercial side is not currently tracked so a similar metric for commercial accounts was not available for this report.

- Central mechanical equipment (heating, cooling, domestic hot water)
- Pumps and motors
- Custom measures

Additional detail regarding specific types of measures that are commonly installed in multi-family buildings on the commercial side was not available from the PAs due to the fact that multi-family buildings are not explicitly designated as a unique sub-set of the data collected for the C&I Sector.

The treatment of common area lighting presents a model by which a single vendor can interact with the building and customer while still providing services that benefit both the residential and commercial accounts associated with that building or site. With modifications to some of the current implementation practices, this approach can be expanded to address a broader range of building improvements and further streamline and enhance the customer's experience of participating in the program.

Successful Aspects of Current Approach

The establishment of multi-family residential customer eligibility for services covered by the RCS statute has ensured greater consistency of services provided to the residential customer base across all PAs. The availability of core residential measures aligned with the HES program offers has been successful at driving in-unit savings and ensures that all residential customers are eligible for similar levels of service from the Mass Save program overall.

The addition of the MMI has helped ensure that incoming customers are provided with information about the program(s) they are eligible for and facilitates transferring customers to the most appropriate program delivery channel (residential, C&I, or both). There is also anecdotal evidence that the MMI has been effective in identifying the decision maker for each building or site prior to handoff to a vendor, which has proven helpful, especially for condominiums.

In response, in part, to findings from the 2012 Massachusetts Multifamily Program Process Evaluation, it is our understanding that the PAs have started to implement marketing messaging and outreach tactics that are tailored to the multi-family market sub-segments identified and described in the process evaluation report. These segments include smaller multi-family building owners (or landlords), larger multi-family building owners (i.e. commercial property owners and management companies), and condominium owners and governance bodies. This sub-segmentation of the multi-family market could also be carried over to other aspects of the program to further maximize the effectiveness and cost-efficiency of delivering program services. Suggested approaches for further capitalizing on this sub-segmentation approach are described in Table A-1 in Appendix A.

In 2012 the HEAT loan was made available to individually owned, residentially metered condominiums, regardless of the number of units within a specific property or facility. This is an important and valuable change in policy that had previously prevented residents living in facilities with five or more units from accessing this key efficiency resource.

Potential Enhancements to Current Approach

The following action areas were identified as potential enhancements to Mass Save's approach to multi-family buildings and are described in greater detail in the "Recommended Practices for Massachusetts Implementation" section of this document.

INTEGRATION OF RESIDENTIAL AND COMMERCIAL MULTI-FAMILY OFFERS

The primary objective of fully integrating the multi-family initiative across sectors is to improve customer experience. In order to achieve this, reducing "back of house" program silos will be required.

Customer Experience

In the Consultants' assessment, there are three main focuses for improving the experience of Massachusetts multi-family customers:

1. Process Enhancements

The current program design and delivery model, while much improved, still seems to focus more strongly on the needs of the program/PA than it does on the customer, particularly the building owner customer. A true single point of contact model is needed to better support the customer through the audit and retrofit process. A more owner-focused approach, in which greater flexibility is provided to support innovations that best meet the customer's needs, will provide a strong complement to the single point of contact.

The Consultants also note the opportunity for enhanced education of building operations staff and building residents to ensure success of program and customer investments. Further description of the opportunity for Massachusetts to incorporate building operator training in its multi-family initiative is described below.

2. Comprehensiveness

The current Massachusetts multi-family program incentive and delivery structure emphasizes capturing savings from prescriptively defined measures. Yet when asked in the 2012 Multifamily Process Evaluation what motivated property managers to participate in the program, only 13% indicated free upgrades and cash incentives to be a primary driver. Additionally, they indicated a desire for additional flexibility in measure options, including a co-pay option so owners can share the cost of measures that might not pass the PAs eligibility screening due to specific material or equipment selection or other site-specific applications.

Related to delivery challenges presented by the separation of residential and commercial measure screening and implementation, it appears that the existing vendor skill sets are not being fully tapped to assist multi-family building owners in developing work scopes that address the needs and opportunities for their buildings. For instance, the residential vendors may have experience that would qualify them to complete more complex whole building air sealing and insulation measures and ventilation system improvements, which are measures that are not of particular focus to commercial vendors. The commercial vendors, on the other hand, have engineering capacity that could enable customized whole building work scopes to be considered and screened but are currently being overlooked in favor of picking measures off the eligible list.

Another aspect of comprehensiveness relates to addressing the "split incentive" issue due to utility bills being paid partially by the building owner and partially by the tenants. The split incentive generally keeps the owner from investing much in tenant spaces. Programs that require a minimum achievement level force the owner to make investments in tenant space in order to get the desired incentives for common area measures. Doing otherwise is a lost opportunity that will be even harder to capture once the low hanging fruit and/or an individual big ticket item has been addressed.

3. Incentives

In interviewing the implementation vendors, it was also revealed that anecdotally, some customers are disinterested in pursuing the commercial incentives once they have completed the residential improvements. This is largely because the commercial custom incentive approval process adds complexity and potential delays to the experience from the customer's perspective. Additionally, the commercial incentives do not seem as attractive in comparison to the extremely generous residential incentives, which include many free services, insulation discounted by 75%, and 0% financing. This issue was noted in the building owner interviews reported in the 2012 Multifamily Process Evaluation and apparently persists to the current day.

"Back of House" Program Silos

"Siloing" of budgets and savings by customer meter type is a barrier to effectively tracking overall PA savings and expenditures for multi-family buildings, determining improvements by site, and enabling a one-stop-shopping experience for the customer. However, with continued emphasis on creating a customer-oriented implementation strategy, the customer could effectively be shielded from the effects of these back-end silos. Multi-family buildings undoubtedly present a complex and challenging situation with a wide range of building types, from condos including units resembling single family homes to high rises with large central heating and

cooling plants. Furthermore, customers include both unit occupants and building owners and depending on building type may be considered residential or commercial customers.

The PAs certainly cannot avoid the regulatory implications prompted by the different rate classes. But these issues should not be the primary driver in delivering a multi-family program that best serves multi-family customers. In parallel with pursuing the process and other improvements noted above, the PAs will need to internally restructure how traditionally residential and C&I staff and other resources are deployed to best serve multi-family customers. Accounting and other administrative methods (such as identifying and tracking multi-family sites) will also need to be revised to support this more integrated program.

BENCHMARKING

Benchmarking of multi-family buildings based on available energy consumption data has proven useful for a variety of applications including pre-screening of customers and portfolio management for multi-site building owners and management companies. In addition, benchmarking data can be used to develop and support targeted program offers, customized vendor services, pre-screened measure packages, and performance-based program offers. For instance, Homeowner's Rehab, Inc (a Cambridge-based affordable housing developer) reports achieving 17% savings in total energy costs across their portfolio of 73 buildings after using WegoWise to help them target inefficient buildings for upgrades, locate previously undetected water leaks, and identify malfunctioning equipment post-installation.

Benchmarking and pre-site visit screening can provide the basis for smarter resource allocation and improved customer experience, as can offering tiered levels of service based on screening data. The Low Income program's recently completed statewide benchmarking project can provide valuable guidance for a similar market-based effort. Given the growing interest in energy use disclosure, including Boston's 2013 Building Energy Reporting and Disclosure Ordinance, required for non-residential buildings, it should be anticipated that the information provided by benchmarking will become increasingly meaningful for all building owners and occupants.

SERVING BUILDINGS HEATED WITH DELIVERED FUELS

It is estimated that approximately 8% of the multi-family buildings in Massachusetts are heated with oil or liquid propane, but are not currently receiving the full range of services being provided to single family customers—despite strong PA interest in doing so—due to an interpretation of the RCS statute that DOER is currently working to clarify through revised regulations and guidance. Based on historical production numbers and market potential estimated by the EM&V team, approximately 80,000 multi-family oil and propane heated dwelling units could be reached by 2030 if eligible to participate in the Mass Save program. The oil and propane heated low-rise condominium market represents a unique challenge in that it is currently served via the multi-family initiative although the housing units themselves closely resemble single family units from the perspective of the general public. It is particularly difficult to justify the exclusion of oil and propane fueled heating measures from the condominium market due to what is fundamentally an accounting issue. The enabling RCS regulations are intended to assist all Massachusetts residences, so equal treatment regardless of segmentation into program-defined “single family” and “multi-family” should be allowed.

OTHER PA PRACTICES

Summary of Findings

To supplement the Team's own combined prior experience in multi-family programs, a review of published “best practices” from a variety of sources was utilized to help gauge Massachusetts' progress toward achieving the combined goals of a more streamlined customer experience and capturing all cost-effective energy savings in multi-family buildings. Additional information was collected via publicly available sources such as program websites and reports and informal discussions with a small sample of representatives from programs outside of Massachusetts. Information collected directly by the Consultant team was supplemented by additional research targeting best practices in low-income multi-family programs completed by Research Into Action, Inc.

Specific Practices Identified

A summary of the program models reviewed for this effort is included in Tables B-1 and B-2 in Appendix B. Several themes emerged from this review that should be considered as Massachusetts continues to refine and evolve its multi-family initiatives including the following:

- Use of a “one-stop-shopping,” single point of contact experience from the customer’s perspective
- Providing “end-to-end” support via the single point of contact for building owners as they progress through the program from intake to final inspection and release of incentives
- Customizable work-scopes
- Leveraging and coordination between low income and market-based program offers
- Energy consumption billing analysis and/or benchmarking
- Performance-based incentives and/or minimum savings thresholds

In addition to programs operating in other states, Massachusetts’ own low income multi-family initiative provides examples of several recommended practices that can be translated to market rate multi-family program delivery. A multi-party collaborative process was used in the development of LEAN’s multi-family program model and a similar process should be considered for the market rate program. Several lessons emerged from the LEAN program re-design experience.

- An advisory committee including building owners provided valuable information
- A common program across all utilities, including a common audit form, helped streamline and rationalize the operation
- The benchmarking requirement, including establishment of a threshold performance level to target buildings for program services, allowed for prioritized use of program resources based on opportunity
- Identifying and then participating in “trigger events,” especially emergency repairs and planned capital improvements, is an important aspect of successfully navigating the multi-family sector and leveraging opportunities for improved energy efficiency

RECOMMENDED PRACTICES FOR MASSACHUSETTS IMPLEMENTATION

The Consultants identified a fundamental need to define a distinct multi-family offer that transcends the regulatory boundaries currently constraining the multi-family services provided under Mass Save[®]. Coordinating services from both residential and commercial programs to address all of the needs of multi-family building owners and occupants is the ultimate objective of such an integrated initiative or program. Upon consideration of the feedback from the current implementation teams, stakeholder input from EM&V reports, and “best practices” explored from other states’ programs and sources, it is the Consultants’ opinion that the following recommendations hold the most promise for helping Massachusetts achieve the outcome of an improved customer experience while at the same time laying the groundwork for a future state where energy savings may become increasingly difficult to capture. Several recommended practices grouped below under the heading of “Deepen Integration of Multi-family Offer” serve to further these objectives. While still not yet final, the findings and recommendations of the January draft of the Mass Save[®] Multifamily Program Process Evaluation Report are largely consistent with those presented in this paper.

Deepen Integration of Multi-family Offer

This recommendation has several components, each of which is described below. The overall contribution of these components to addressing barriers and market challenges, the relevant issues to be addressed in implementing the recommendations, and proposed next steps are all discussed in aggregate at the end of this recommendation section.

COMPONENTS OF DEEPER INTEGRATION

1. Implement Single Point of Contact model

A central point of contact (e.g. the MMI model), while helpful, is not the same as a “single point of contact” from the customer’s perspective. An implementation model that enables building owners to develop a relationship with a person who acts as an overall project manager for each specific building/site is needed. Account Representatives serve this role in a limited capacity for some C&I customers, but no such service is available to multi-family building owners who are struggling to navigate through both the residential and commercial program offers available to them.

The customer experience remains disjointed for multi-family buildings with both residential and commercial needs, in spite of the addition of the MMI. The MMI provides a resource to process incoming leads and provide help to active customers, but the current implementation structure still lacks a true single point of contact, a project manager to help the customer navigate between the residential and commercial sides of the program offer. Some PAs use the same vendor for both residential and commercial work, but even within that paradigm, the intrinsic structural barriers between the residential and commercial program offers still necessitates handoffs from one side of the house to the other. Currently, participating building owners must engage the services of a vendor hired by the PA to provide energy auditing services and create a proposed scope of work. Some building owners have existing relationships with fully qualified engineering firms or other types of energy consultants who could provide “single point of contact” services

As described in the “Other PA Practices” section and summarized in Appendix B, several successful multi-family programs operating in other states use a consultant model to provide comprehensive services to building owners including a complete analysis of the building as a whole inclusive of improvement opportunities that cross lines between residential and commercial accounts. This approach not only results in deeper energy savings by virtue of promoting more complete work scopes, but also supports a more streamlined customer experience. As with other implementation models, this consultant-based approach typically is supported by quality assurance of the consultant’s work throughout the project cycle. For instance, New York’s program maintains an implementation vendor who is responsible for reviewing the audit reports and measure recommendations as well as a quality assurance vendor who is responsible for in-process and post-installation field inspections. In addition, this program has designed an incentive payout schedule that is tied to successful achievement of specific milestones throughout the project, so the first incentive is not paid until the audit report and recommendations have been reviewed and approved and final incentives are not released until the installation is verified.

Another potential model is delivery through account management to improve the overall customer experience. This is particularly true for owners that represent corporate entities. Many PAs assign account managers to larger commercial customers who can address the owner’s motivations, capital investment strategies, and the operational challenges of bigger/taller buildings with commercial grade mechanical systems from a business perspective.

2. Enable Customer-Focused Program Experience (owner-centric vs. program-centric)

Flexibility and innovation are necessary to be responsive to the needs of the owner as a business while still operating within the program’s cost-effectiveness requirements. Some specific tactics for achieving this goal include:

- Use the account management approach to develop relationships with these large customers. Aggregate energy and demand at the property level to assess size of multi-family buildings. Under this model, it will be necessary to determine if the account managers for multi-family are part of a PA’s C&I program, as is the case with the current account manager construct, or if a new role should be created on the residential side that essentially replicates the C&I model but maintains a specific focus on multi-family buildings.
- For customers who are not large enough to qualify for account management, promote trusted relationships between vendors and owner/management businesses, allowing for

customization of measure packages, and clearing a path for vendors to work with customers to find the best solutions.

- Ensure that project proposals represent the customer's value proposition with sufficient latitude to accommodate each building's unique challenges, needs, and goals. With further revisions, the statewide template "Energy Action Plan" could include an executive summary articulating the fundamental project economics and serve as a cover sheet to a more detailed audit report.
- Allow for and encourage flexibility in scheduling of installations and up-selling of enhanced services (such as construction management, assistance finding qualified contractors and/or commissioning) that support the completion of more comprehensive and high quality projects.

Using the delivery model described above has a secondary advantage of effectively establishing an outreach network capable of spreading the word on behalf of the program free of charge via the vendors who act as energy consultants. While the current Massachusetts multi-family vendors are effective at leveraging their existing relationships with multi-family owners and managers, to recruit participation, a larger network would allow for casting an even broader net. For instance, Efficiency Maine reports that roughly half of their multi-family pipeline is brought to the program via their partner network at no cost to the program.⁶

3. Enhance Educational Efforts

Program support for education targeting both the staff and residents of participating multi-family buildings can not only improve the acceptance rate of newly installed energy efficiency measures while the project is in process, but can also help maximize both direct measure-driven savings as well as behavioral-driven savings. To ensure predicted energy savings are achieved and maintained over time, it is vital that the occupants of multi-family buildings take responsibility for instituting energy efficient practices throughout the building. In addition to proper operations and maintenance of newly installed energy efficiency measures and equipment, opportunities exist in most buildings to achieve additional energy savings through modifications to standard O&M procedures.

The Massachusetts Multi-Family Retrofit Initiative could benefit from including a building operator training component for staff of participant buildings. In addition to providing general knowledge of good energy management practices, these trainings typically include a wide range of tips and ideas that building managers and staff can implement to save energy immediately at low cost or even no cost. These trainings could further be customized to offer guidance for O&M issues specific to the measures installed through the program, such as information on how often to clean photocell lenses to ensure proper performance. Providing a resource for this information would be responsive to concerns raised by prior participants surveyed for the Process Evaluation Report.

A 2012 evaluation⁷ of New York City's "Green Supers" initiative, which trained nearly 1,800 multi-family building maintenance staff across all five NYC boroughs in energy efficient building operations, estimated that the training could be directly linked to overall energy reductions ranging from 5-20%. These savings were generated via a combination of modifications to O&M practices; knowledge transfer to management, condo/co-op boards and residents; installation of non-subsidized energy conservation measures; and participation in utility-sponsored rebate programs for measure installations. Interviewed participants in the Green Supers program reported that 95% had installed energy efficiency upgrades and 80% had instituted green O&M practices within one year of completing the program and as a direct result of the training.

The Energy Savers program operating in the Chicago area takes this approach one step further by offering building owners post-retrofit support from energy analysts who assist building staff in tuning their buildings and

⁶ Zuluaga, M. "Case Studies & Lessons Learned: Multifamily Building Performance Programs," ACI National Home Performance Conference, May 2013

⁷ Zuluaga, M., Brabon, E., and Eisenberg, L.; "Measurement & Verification of the Green Supers Program: Final Report"; August 2012

operational procedures if they do not meet predicted energy savings performance goals.⁸

4. Pursue Opportunities for Greater Comprehensiveness

A review of the eligible measures for multi-family as listed in the PAs' 2012-15 Plan and interviews with the PAs and implementation vendors revealed further opportunities for the program to support greater comprehensiveness of improvement packages for multi-family buildings. Data reported in the 2012 Multifamily Process Evaluation supports this finding; in particular, multi-family building owners and managers interviewed for this evaluation indicated a desire for greater flexibility to apply available program incentives to a wider range of measures including the option of using customer co-pays to "buy up" for more specialized measures. While the "buy up" option presents special challenges related to cost-effectiveness screening, in particular how the participant's added contribution would impact the Total Resource Cost (TRC) test, the challenge is not insurmountable. This issue is described in greater detail in the "Recommended Practices for Massachusetts Implementation" section of this report.

The data that are currently available through the PAs' regular tracking systems could not provide the level of detail needed to fully understand the types of measures or the frequency of installation of measures that cross boundaries benefitting both the residential and commercial customers. These measures are difficult to target and track given the current program construct because it is not clear whose responsibility it is to identify these opportunities for the customer and promote their installation. Additionally, since the types of measures that fall into this category (central heating and hot water system improvements, central ventilation system improvements, air sealing and envelope improvements that are not directly tied to individual dwelling units, etc.) are typically attributed to the commercial accounts, it is virtually impossible to harvest the existing data sets to identify those measures that are specific to multi-family buildings in the current PA tracking systems. A concerted effort to identify and track multi-family sites for both commercial and residential accounts would help address this problem and allow for meaningful quantification of actual program impacts.

Data from Massachusetts' market characterization study completed in May 2012 indicates that 63% of buildings have central DHW, the majority of buildings use common laundry facilities, and 86% of buildings have ventilation systems. Improvements to these systems are frequently cost-effective in multi-family buildings and often represent a significant portion of the building's overall energy consumption. A more customized approach for measure screening would make it possible for the program to relatively easily capture savings from this "low-hanging fruit," which appears to be neglected, or at least not prioritized in the current program incentive and delivery model. Attachment 1 contains three additional examples of customized measures. Pushing the envelope farther, with customization of packages more readily accessible, a performance-based program design could be pursued to support the drive for deeper energy savings.

- Allow for more customized measures to be included in improvement packages
- Consider a performance-based path to further stimulate innovation
- The pay for performance (P4P) commercial incentive, in which participants are allocated an incentive based on the kWh or therm saved, represents a model that could be viable and effective in certain types of multi-family buildings. This approach enables greater flexibility and innovation to occur when retrofitting existing buildings as compared to the prescriptive approach that is most commonly used in multi-family buildings in Massachusetts at this time. We recommend that the PAs consider a P4P option specific to multi-family buildings.
- Enabling additional "hybrid" measures that can be screened on a fast-track by residential vendors (e.g. DHW re-circulator controls)
- Enabling/promoting performance-based options (e.g. replicate the P4P model already available for C&I)

⁸ McKibben, A., Evens, A, Nadel, S., and Mackres, E.; "Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities," ACEEE Summer Study 2012

A Note Regarding Cost-Effectiveness Testing

The PAs have raised concerns regarding the impact of including more comprehensive and custom measure options on the cost-effectiveness of the Multifamily Retrofit Initiative. As demonstrated by results of peer programs in other states, these challenges are not insurmountable. For instance, New Jersey's Clean Energy Fund has operated a P4P program for several years--serving both C&I and multifamily buildings--that uses project level screening of custom projects to ensure compliance with program level TRC requirements. The TRC presents the most significant challenge when applied at the measure level, which is common practice in Massachusetts but not a DPU requirement (see MA DPU Order 08-50A, March 16, 2009). The current Technical Reference Manual (TRM) includes guidance for screening "Vendor Calculated Savings" for HES and Low Income Multifamily as well as custom measures for both large and small C&I projects (including a "Pay-for-Performance" option). This guidance provides both precedent and a basis for developing screening tools applicable to the more innovative approaches proposed in this document.

In the case where a customer specifically requests the ability to "buy up" to a higher-priced option after being presented with the basic program offer, it can be presumed that the customer has his or her own reasons for being willing to pay the price difference; this should not affect the TRC estimate on either the cost or benefit side. It is important to note that the TRC was never intended to be used to prohibit customers from making their own spending choices. According to the original source document, the California Standard Practice Manual (CSPM), the intent was to focus on *costs associated with the energy efficiency activity* and further acknowledges the need for local public policy decisions to determine the final inputs.¹ If a consumer voluntarily elects to pay for an enhanced feature of an otherwise cost-effective improvement measure and that upgraded measure incurs no additional resource demands from the program, then the added cost to the customer does not belong in the TRC analysis. Allowing the TRC to stand in the way of customers investing their own resources in upgrades that go above and beyond what the program offers is a perverse and unintended effect of the tests described in the CSPM.

In 2013, the Massachusetts Multifamily Initiative operated at a statewide BCR of 1.5. While this is not as high as some other programs, it does indicate that it is possible to incorporate some measures that are less cost-effective without dropping below a BCR of 1.0 at the program level. The DPU acknowledges that approaches that allow for non-cost-effective measures to be included are viable, particularly when those measures are integral to a whole house approach or represent a lost opportunity if not completed at the time other measures are installed. If multifamily buildings using delivered fuels for heat become eligible for Mass Save services, the savings and benefits accrued by specifically targeting those heating fuels will further improve the BCR. Additionally, the Consultants recommend that the Evaluation Team and PAs work together to identify NEIs and NRBs that are not currently counted toward multifamily improvements but should be. These efforts would help bring the multifamily initiative's BCR closer to the level that of the Residential Whole House Program (4.2 in 2013) creating even greater opportunities to expand and enhance the multifamily offer.

5. Equalize Residential and C&I Incentives

Additional work is needed to provide more reasonable balance between residential and commercial incentive offers and to streamline the project implementation process. It is recommended that an incentive and screening process be developed that allows for a single combined offer to be made to the building owner from the beginning of the project which covers both the residential and commercial sides of the program. This would allow the complete improvement package for the building to be considered by the owner in a single transaction, reducing the chances that they might opt out of part of the offer mid-way through the project. Providing a mechanism for a consolidated offer to the customer would also enable further improvements in the coordination of the multiple contractors that are often needed to complete the work on a multi-family retrofit project.

6. Reduce Program and Sector "Silos"

The recommendation presented to the Council in August 2014 was for the establishment of a fully integrated

and independent multi-family sector to mitigate the parallel paths currently in play as a result of multi-family buildings using both commercial and residential meters and accounts. Upon reviewing the potential impacts of creating an entirely separate sector for what is essentially one specific customer type (e.g., carving out an entirely new rate category for a single market sub-segment would require action before the DPU and a tremendous amount of PA and regulatory bandwidth), the consulting team suggests that the same goal can be achieved with less dramatic interventions. While the fundamental recommendation to establish a dedicated multi-family offer remains, the Consultants have explored alternative scenarios to address the issue at the program and initiative level as alternative options, as described below under the heading of “Operational and Implementation Issues for Consideration.”

HOW DEEPER INTEGRATION ADDRESSES MARKET CHALLENGES

By leading with in-unit direct install measures, air sealing, and insulation, the Massachusetts multi-family offering now looks and feels like a residential program that has been adapted to address multi-family buildings. In contrast, NYSERDA’s Multifamily Performance Program, New Jersey’s (PSE&G) Residential Multifamily Housing Program, Efficiency Maine’s Multifamily Program, and CNT’s Energy Savers Multifamily Program (Chicago) were designed specifically to serve the multi-family housing market with a decided emphasis on customized work scopes developed as a result of whole building evaluation. These programs all place a premium on providing the customer with “end-to-end” assistance and technical support via a dedicated project manager or consultant and as a result, they are able to consistently provide their multi-family customers with work scopes that seamlessly cross the barriers between the residential and commercial account interests of both the utilities and their customers.

Enhanced program integration and comprehensiveness enables better communication of program benefits from the customer’s perspective (i.e. customer-centric rather than program-centric presentation) and enables building owner decision-making based on the total package vs. a multi-step process with handoffs between multiple vendors.

An effort to establish a consistent set of statewide program specifications including all of these elements could have the following benefits:

- Bring a wider variety of qualified vendors to the program, giving multi-family property owners a choice of who they will engage to work in their buildings
- Increase the breadth of skills available to multi-family projects and improve the delivery of the program if vendors could specialize in serving certain types of buildings
- Ensure that an appropriate level of diagnostics, modeling, analysis, and measure specification is completed for every project, which will give customers the best possible service in a consistent format and minimize the chance of missed efficiency opportunities
- Create a streamlined delivery model, which would allow qualified vendors to easily transition between C&I and larger multi-family projects
- Increase the familiarity of market actors with energy efficiency options thereby increasing the impact of the program on the market as a whole

OPERATIONAL AND IMPLEMENTATION ISSUES FOR CONSIDERATION

The following table lists some of the more significant issues that will need to be addressed when implementing a dedicated multi-family offer in terms of PA resources, public policy, and regulatory constraints. A checkmark indicates an area that is likely to be impacted, and therefore will require some level of intervention and investment of resources. While this list is not exhaustive, it begins to illustrate the level of difficulty involved in addressing the multi-family issue at each of the following levels: Sector, Program, and Initiative:

Table 2 | Summary of Policy and PA Resource Implications for a Dedicated Multi-Family Offer

Issue	Sector	Program	Initiative
Reallocation of program budgets	✓	✓	Study further
Reallocation of program goals	✓	✓	Study further
Re-assignment or contractual modifications to existing vendor agreements	✓	✓	✓
Modification to contractor network (beyond primary vendors)	Study further	Study further	Study further
Modification to existing incentive structures	✓	✓	✓
Revised cost-benefit analysis	✓	✓	✓
Re-assignment of PA internal staffing	✓	Study further	Study further
Modification of data systems	✓	✓	✓
Modifications to rate structure	✓	Study further	NA
Modifications to rate-payer surcharge collections	✓	Study further	NA
Regulatory order	✓	Study further	NA

In addition, the following specific policy and regulatory issues were identified and require further assessment before any additional program restructuring occurs.

- DPU Order 11-120 requires a **Category One Mid-Term Modification** to be filed when the modification is projected to result in changes in program benefits by more than 20% over the three year plan. Category Two Mid-Term Modification are to be filed when a projected under or over recovery of costs for a customer sector would result in a bill impact greater than two percent for an average customer or when a new energy efficiency program is added. Category One MTM's may be approved by the Council, while Category Two MTM's require DPU approval. The implications of this requirement on the changes needed to achieve full multi-family integration require further review and assessment.
- The residential and commercial programs are subject to **different rules for benefit-cost analysis**, which can be problematic for screening measures in multi-family buildings. To enable more comprehensive work scopes, it must be possible to screen these packages of measures for the whole building in a way that appears rational to the customer and does not require multiple hand-offs and approvals between the commercial and residential sides of the program. On the savings side of the equation, there are measures that could legitimately accrue savings to both the commercial and residential meters of a building (for instance whole building air sealing, or certain ventilation system improvements.) Not being able to fully screen these measures becomes a barrier to their uptake in the program.
- The Non-Energy Impact (NEI) benefits associated with residential projects have been extensively evaluated and help boost the eligibility and incentive levels available for residential measures. **These benefits do not translate directly to commercial accounts, even when the proposed measures could be generating NEIs for residential customers.** This makes screening of measures benefitting the commercial account inherently more restrictive even in circumstances where they should not be. For example, a condominium complex with townhouse-style units might be served by a central heating plant. While savings accrue to the building owner on the commercial gas account, there are also clear benefits to the residents

that are largely similar to those experienced by single-family homeowners. The current Technical Resource Manual (TRM) does not account for this. To enable more streamlined and rational screening of multi-family projects, revisions to the TRM need to be considered. The low income sector has benefits designated for multi-family that could provide an initial basis for this revised analysis and should also be considered.

Close coordination between the PAs and their vendors and contractors will be needed to execute the recommendations made here. Revisions to the current roles and responsibilities of vendors will most likely be required to enable a more seamless customer experience. Examples of procedures that would be affected include the scheduling of appointments and deployment of field staff for energy audits and as project managers, the actual energy audit procedures, custom measure and package screening procedures, and management of referrals between vendors and specialized contractors. In this context, it will also be important to assess the opportunity to promote a more balanced set of incentives that are designed to treat the building comprehensively and encourage owner investment in both common area and tenant spaces. Under the current offer, the residential program is effectively being forced to pay for all or most of the tenant savings. While this is the legacy practice in Massachusetts and transition to a different incentive paradigm could be challenging, it is most likely not the best approach for capturing all cost-effective energy savings and is not currently providing the best possible customer service as indicated by our assessment of the overall process and project cycle for multi-family buildings in Massachusetts.

To address the issues described here, the PAs will need to consider new methods for identifying and tracking multi-family projects to enable cross-sector tracking of customers, sites, energy savings, and other attendant benefits. PAs will also need to consider how the proposed enhancements to measure eligibility, screening, and incentives might affect projected energy savings and program costs.

The Consultants believe it is possible to achieve full integration by creating an umbrella initiative that looks and feels like a distinct, unified initiative from the public view while still allowing for PAs to track and manage program resources, savings, and benefits on a sector-by-sector basis.

Such an initiative requires the buy-in and cooperation of both the commercial and residential sides of each PA's operations as well as a common understanding and overt acknowledgment of multi-family being an inherently cross-sector undertaking at every level of program delivery (marketing and outreach, incentive design, vendor contracts, etc.) While the PAs' residential teams have been an integral part of the discussions leading to these recommendations, input from the commercial side of the PAs has been largely absent. As is evident in the current draft Multifamily Process Evaluation report, it is very difficult to extract any meaningful information or data regarding the commercial elements of the Multi-Family program. To enable further integration of Multi-Family services, it is vital that Multi-Family be better defined as a distinct sub-sector within the commercial program offer to enable tracking of data and sharing of information and resources with a cross-sector initiative.

NEXT STEPS TOWARD IMPLEMENTATION

1. Near-term actions

The Consultants have identified some shorter-term strategies that could be launched in the 2015 calendar year to provide a basis and testing ground for consideration of larger modifications to the Multi-Family program for the upcoming three-year planning process. The suggested short-term program enhancements are as follows:

- Continue to identify and screen new eligible measures, particularly those that could represent cross-sector opportunities such as central ventilation system improvements
- Identify and develop an implementation approach and rule set for "hybrid" measures like domestic hot water demand circulator controls, whereby residential vendors could be enabled to collect field data which could be run through a simple screening tool for measures that currently exist on the eligible measure list for commercial buildings but do not necessarily require an independent visit and/or analysis by an engineering consultant

- Develop a rule set for applying the commercial Pay for Performance approach to multi-family and develop a pathway for customers to take advantage of this option
- Provide building operator training for staff of participant buildings

2. Implement unique site identifier

In 2012, the EM&V team identified need for the PAs to establish a means of assigning a unique site identifier in their data systems allowing for tracking of multi-family sites across multiple accounts and sectors. This continues to be an important recommendation that will help enable a more streamlined multi-family service offer.

3. Begin active collaboration on multi-family issues

The Consultants also recommend that PAs efforts begin as soon as possible to begin active collaboration across the residential and C&I sectors to address the issues addressed in this report and to convene a stakeholder advisory group to help guide the process of program re-design. A multi-party collaborative process similar to that used in the development of LEAN's current multi-family program model should be considered for the market rate program. Key considerations for such a process includes use of an advisory committee that includes building owners and managers and a multi-stage process (as opposed to a one-time workshop) that encourages input and feedback from the advisory committee at various stages of the program development process.

4. Address regulatory and evaluation implications

In the meantime, the Consultant Team should begin work with the PAs to determine the impacts of any revisions to the RCS regulations and guidelines, assess the implications of DPU Order 11-120, and sort out the specific actions required to update the TRM to appropriately address such a cross-sector approach for multi-family buildings. This work should include reviewing existing TRM and basis evaluation reports to support the development of appropriate attribution rules for cross-sector savings and attendant benefits.

Conduct Benchmarking

DESCRIPTION AND BACKGROUND

Between 2010 and 2013, over 10,000 electric accounts and 10,000 gas accounts serving low income multi-family buildings were benchmarked using WegoWise, a commercially available tool that captures energy and water consumption data to allow for benchmarking and trend analysis over individual buildings and groups of buildings. This project was completed via a collaborative effort between LEAN and the PAs. This analysis included both master metered and individually metered properties for both gas and electricity. The results of this exercise were used to rank the relative energy efficiency of the buildings from "poor" (the lowest quartile) to "energy efficient" (the highest quartile). These rankings can then be used to more effectively deploy program resources to the multi-family low income market. This analysis further revealed valuable market characterization trends related to energy consumption patterns based on varying building and occupancy types. This type of information can also be used to inform program design details, targeting of outreach and marketing, and assignment of program and vendor resources.

Benchmarking holds promise for supporting program enhancements across all types of multi-family ownership structures, not just low income buildings. For larger buildings, benchmarking enables a means for comparing the aggregated relative performance of buildings and/or sites housing multiple residents regardless of the metering configuration. In addition to assisting the program in identifying the sites with greatest need and potential for achieving energy savings, benchmarking can help allocate capital improvement investment resources across portfolios of buildings under common ownership.

Given benchmarking's distinguishing feature of normalization by building size and weather conditions, it also presents an opportunity for similar applications in condominiums and even single-family homes. For example, benchmarking individual condominium units across an entire facility could be used in conjunction with knowledge of the unit layouts or model types to generate a prioritized approach to developing recommended improvement packages on a site-wide basis, thereby minimizing the need for an individual energy audit in every unit.

An example of how benchmarking data can be used to help inform program design is provided in Appendix C.

HOW BENCHMARKING ADDRESSES MARKET CHALLENGES

As discussed above, benchmarking presents opportunities for management of program resources and targeting of energy efficiency measure installations. On the customer side, the results of benchmarking analysis can be a persuasive tool in convincing building owners to invest in energy efficiency upgrades, particularly as tenant awareness increases. On the program side, benchmarking results can be leveraged to more effectively manage program resources by deploying program vendor assets strategically, offering customized levels of energy audits, and managing customer expectations. For instance, in a recent report published by Retroficiency⁹, for a randomly selected pool of 500 commercial buildings, it was determined that the buildings with energy consumption benchmarks in the top 20% had an average energy saving opportunity of 41%, while the buildings in the lowest 20% of consumption had an average opportunity for savings of only 3%. Knowing this kind of information about the market being served within an initiative or program would allow vendors and PAs to help building owners understand better what to expect in terms of the level of intervention needed and potential results from program participation. Additionally, account managers could use benchmarking data to assist larger property owners in managing their energy efficiency retrofit strategies across their entire portfolios, identifying outliers, unusual consumption patterns, and even tracking post-retrofit performance. These types of tactics enable increasingly customer-friendly and cost-efficient program delivery.

OPERATIONAL AND IMPLEMENTATION ISSUES FOR CONSIDERATION

The PAs will need to develop systems to identify accounts associated with multi-family sites for both commercial and residential meters and to attribute those accounts on a building-by-building or facility basis. The recently completed statewide low income benchmarking project and the Residential Customer Profile Study provided opportunities to develop methods for addressing this issue. The Residential Customer Profile Study developed a novel approach for identifying and aggregating individual tenant accounts associated by U.S. Postal Service addresses, and deriving average utility bill information that can be extrapolated across an entire facility even if some accounts are missing data. These experiences will help provide a basis for each PA to evaluate their own systems and level of effort needed to complete this task.

In addition to the benefits benchmarking can bring to the Multi-Family Retrofit Initiative, it is also important to note that there is increasing demand for disclosure of energy consumption and costs associated with multi-family buildings. For example, Boston's Building Energy Reporting and Disclosure Ordinance establishes a deadline of May 15, 2015 for all multi-family buildings of with more than 50 units and May 15, 2017 for all multi-family buildings with more than 35 units to report energy and water consumption data via ENERGY STAR Portfolio Manager or other approved tools. Buildings subject to this ordinance are further required to obtain energy assessments and make energy improvements if they do not already meet certain energy-related standards (e.g. ENERGY STAR.) This presents an important opportunity for the PAs to align the multi-family initiative with Boston's requirements to be able to leverage the disclosure process to further promote energy efficiency improvements in these buildings. Although this ordinance is limited to the Boston city limits, it presents an opportunity to establish a standardized process for benchmarking multi-family buildings and a standard vernacular for communicating the relative energy efficiency of one building over another.

NEXT STEPS TOWARD IMPLEMENTATION

1. Include benchmarking in the 2016-2018 Plan

The Consultants recommend that benchmarking be included as a standard component of the 2016-2018 plan and that the PAs develop an implementation plan for benchmarking using results from the low income benchmarking project to inform this plan. In preparation for this, the Consultants suggest that benchmarking should be introduced on a test basis in 2015 by one or more PAs to determine how it can be best implemented in the next Three-Year Plan. In preparing the test initiative, the PAs should assess whether WegoWise could also serve the market rate program in Massachusetts or whether another tool like Portfolio Manager might work better. Various options for deployment of a benchmarking program should be considered and would not necessarily be limited to the full inventory approach used in the Low Income Program effort. In other states,

⁹ Retroficiency, "Building Energy Efficiency Opportunity Report", September 2013.

programs have used benchmarking as part of the standard energy audit process, which allows the energy auditor to better understand the potential for savings and communicate that information to the customer. Using this approach and tools like WegoWise or Portfolio Manager, a repository of buildings served by the program can be built over time and at low cost to the program. It also provides a service that the customer can access in the future to track their own building(s) performance.

This planning process should include intended applications for use of benchmarking results, for example: possible pre-screening of customers, portfolio management for multi-site building owners, targeted program offers, customized vendor services, pre-screened measure packages, and performance-based program offers. In addition, the dwelling unit level analysis developed for the Residential Customer Profile Study presents an additional opportunity to apply benchmarking that targets the individual residential customers, providing additional leverage to overcome the split incentive issue with building owners.

2. Identify multi-family sites using existing PA account data

Identifying multi-family sites using existing PA account data could be a helpful first step towards targeted marketing of the program and a potential benchmarking initiative. A review of each PA's account data is needed to identify multi-family buildings using data already tied to customer accounts (including any useful coding by facility type for commercial meters), or by correlating clusters of residential meters with commercial meters by address or location. While some PAs' data systems may not support this type of analysis, a review of each system to determine what can and cannot be accomplished is an important first step.

Serve Buildings Heated by Delivered Fuels

OVERVIEW OF THE OPPORTUNITY AND RECOMMENDED STRATEGY

Due to a policy issue, the existing multi-family initiative is limited to targeting energy efficiency measures associated with electricity and natural gas savings. This represents an inequity between the multi-family and HES residential program offers because single-family customers are eligible for all services regardless of the fuel type. For some time, the PAs have supported the expansion of services to multi-family building. Because the enabling RCS regulations apply to residential customers, it is appropriate to attribute the same eligibility criteria across all residential customers, regardless of the type of building they happen to live in. To assist in quantifying the potential opportunity represented by non-electric and non-gas heated multi-family buildings in Massachusetts, a high level analysis was completed using a combination of PA provided data, data from the Massachusetts Multifamily Market Characterization and Potential Study (2012), and national sources. A summary of the results of that analysis follows.

Based on PA self-reported data¹⁰, an average of 3,100 oil-heated units have historically been serviced annually through multi-family program incidental to the electric and gas savings offers (i.e. without specifically targeting oil heated buildings). Based on the deemed savings multiplier used by LEAN to capture the benefits of weatherization to oil-heated multi-family units, this translates to an estimated 8,600 MMBtu in missed opportunity annual energy savings for each program year. If oil and propane heated multi-family units were explicitly included and eligible for the same services as gas and electrically heated buildings, it is estimated that the program could treat 80,000 oil heated multi-family units by 2030, resulting in an additional 223,000 MMBtu in annual energy savings.¹¹

HOW DELIVERED FUEL ENERGY EFFICIENCY IN MULTI-FAMILY WILL ADDRESS MARKET CHALLENGES

Oil and propane heated multi-family buildings currently represent an unserved market segment for the Mass Save. In addition to the lost opportunity represented by these buildings, the condominium market stands out as an example of an inequity in the availability of program services among individual homeowners across the state. Due to the classification of all facilities with five or more units as multi-family under the program, an individual condominium homeowner is not currently eligible for the same services as an individual homeowner

¹⁰ Two years of data were provided by all electric PAs and National Grid provided additional data dating back to 1998.

¹¹ Analysis based on findings from "Massachusetts Multifamily Market Characterization and Potential Study" (Cadmus, 2012)

whose home is not located in a condominium facility. It is difficult to justify this discrepancy to customers wishing to participate in the program. The inclusion of all oil and propane heated residential buildings within the RCS program rule set would alleviate these problems.

NEXT STEPS TOWARD IMPLEMENTATION

The process for modifying the RCS guidelines to allow for the inclusion of all oil and propane heated multi-family dwelling units is currently under way. This change was fully supported during the public comment period on this issue and several other RCS concepts that DOER shared with stakeholders this summer. The Consultants' understanding is that the formal revision process will proceed this winter. If and when this policy change is finalized, it would need to be addressed in the budgeting and goal-setting of the PAs for the 2016-18 planning cycle.

CONCLUSION

The Massachusetts Multi-Family Retrofit Initiative has implemented many changes in recent years and has made progress toward creating an integrated offer for multi-family customers. More work is needed, however, to continue to drive for deeper energy savings while offering customer experience that is accessible, easy to understand and navigate, and resonates with the multi-family community. A collaborative effort including the PAs, the Consultant Team, and external stakeholders is recommended to move the multi-family initiative further along this path.

APPENDIX A – SUGGESTED APPROACHES FOR ADDRESSING MULTI-FAMILY MARKET SUB-SEGMENTS

Table A-1 | Suggested Segmented Program Design Elements by Building Ownership Type

	Condos*	Smaller Property Owners	Larger Property Owners
Marketing and Outreach	Similar to single family to target owners, plus specialized presentations and collateral targeting governance bodies, website	Direct mail, bill inserts, website	Word of mouth, vendor network, trade publications and listservs, trade meetings and conferences, website
Vendor Pool	Same as single family with some specialized training to understand interactions between units and to identify energy saving opportunities for community facilities, exterior lighting, etc.	Similar to condos with additional expertise in central boilers for heating and DHW as well as common area treatments	Energy consulting and engineering firms with specialized training in multi-family buildings
Assessments and Overall Approach	Attempt to work through governance body, but allow for unit-by-unit participation, audit and customer report similar to single family, consider options to develop prescriptive packages for units with similar features to streamline the delivery process	Provide comprehensive whole-building assessment with proposals that include all eligible measures (DI and incentives) as a package, and a cost-benefit analysis from the customer's perspective	Provide comprehensive whole-building assessment including engineering analysis of proposed custom measures, recommended packaging and staging of improvements, and alternatives when applicable, and a cost-benefit analysis from the customer's perspective
Access to DI Measures and Incentives	Develop methods to leverage in-unit measures to encourage community investment in common facility improvements, for instance make common facility improvements contingent upon meeting a threshold participation rate among individual units.	Make access to DI measures contingent upon acceptance of incentivized measures (within a prioritized specification) or some other threshold investment on the part of the customer	Make access to DI measures contingent upon acceptance of incentivized measures (within a prioritized specification) or some other threshold investment on the part of the customer

	Condos*	Smaller Property Owners	Larger Property Owners
Financing	Align with offers available to single family (1-4 unit) for individual condo owners	Similar to single family but as a business loan with larger limits, energy consultant could assist in identifying other sources to leverage and include in c-b analysis for customer	Work with owner to develop a work plan that fits within their capital improvement resources and timelines, providing supporting documentation of costs/savings/incentives/ etc. as needed, energy consultant may assist in identifying other sources to leverage and include in c-b analysis for customer
Installations	Completed by PA's contracted vendors or other qualified service providers (for instance HPC's or IIC's), similar to single family	Completed by PA's contracted vendors or owner's preferred contractor with some oversight by PA's vendor	Completed by PA's contracted vendors or owner's preferred contractor with some oversight by PA's vendor, energy consultant to assist as needed in identifying qualified contractors to bid on specialized custom measures
Construction Management	Project installations overseen by PA's contracted vendor or other authorized agent (for instance HPC's or IIC's)	Project installations overseen by combination of energy consultant, customer's staff, and PA's contracted vendor where applicable	Project installations overseen by combination of account manager, energy consultant, customer's staff, and/or PA's contracted vendor where applicable
Testing and Verification**	Post-installation "test-out" completed by installing contractor (if trained and qualified) or PA's contracted vendor	Post-installation "test-out" completed by installing contractor (if trained and qualified), the energy consultant, or PA's contracted vendor	Post-installation "test-out" completed by installing contractor (if trained and qualified), the energy consultant, or PA's contracted vendor

*In this context, "condos" refers to low rise buildings similar to what would be found in 1-4 unit buildings, townhouses, etc. Larger buildings (e.g. high rise) with condominium ownership structures would be addressed more like larger property owners with some variation due to decision-making attributes unique to the condo's ownership and governance structure.

**Testing and Verification refers to the "test-out" process that should occur as part of normal project close-out to verify and document that installed measures conformed to specifications. This is not the same as third-party QC inspections.

APPENDIX B – SUMMARY OF OTHER MULTI-FAMILY RETROFIT PROGRAMS

Table B-1 | Measure-Based Incentive Models

PA	Measure Eligibility	Delivery Model	Units Completed	Reported Metrics (average)	Incentive Summary	Eligible Measures	Cost Range
Austin Energy (TX)	Prescriptive	Energy audits are mandate by local ordinance, AE's program assists owners in overcoming disclosure burden	~11,000	\$64/MMBtu \$158/unit 2.4 MMBtu/unit <i>Electricity only</i>	Measure rebates, exemption from municipal energy disclosure ordinance	Solar window treatments Insulation Reflective roofs Duct sealing HVAC Lighting	\$1-2/sqft \$.05-.15/sqft \$.15 sqft \$.20-.35/sqft \$200-600/system \$3-4/lamp \$30-35/fixture
Com Ed (IL)	Direct install, prescriptive, custom	Offers "pre-negotiated discounts" on eligible measures. Directs owners to other programs for additional rebates	68 buildings, 5,500 units	\$158/MMBtu \$231/unit 1.5 MMBtu/unit <i>Electricity only</i>	Free assessment, discounted measures, measure rebates	Eligible measure details not available through program website	
ETO (OR)	Direct install, prescriptive, custom	Direct install used as opportunity to conduct walkthrough audit to identify rebate-eligible measures, custom measures are generally market-driven by trade allies	548 buildings, 8,220 units	\$76/MMBtu \$156/unit 2.1 MMBtu/unit <i>All fuels</i>	Free walkthrough assessment with DI, measure rebates	Windows Insulation HVAC Lighting Appliances DHW system DHW demand control Commercial kitchen equipment	\$2-3/window \$.25-.30/sqft \$150-600/system, Up to 50% of cost, \$25-300/appliance \$35-100/system, or \$2.50-2.5/kBtuh \$240/system \$150-1,300
PSE (WA)	Direct install, prescriptive	Focus on integrating energy efficiency work with other planned retrofit and replace upon failure events	1,020 buildings, 3,378 units	\$137/MMBtu <i>Electricity & Gas</i>	Free assessments, measure rebates	CFL showerhead pipe insulation Window replacement Insulation Heating DHW Lighting Appliances	Direct install \$5-8/sqft \$.75/sqft \$250/system \$50-150/system \$20/fixture \$50-100/appliance

Table B-2 | Project-Based Incentive Models

PA	Measure Eligibility	Delivery Model	Units Completed	Reported Metrics (average)	Incentive Summary	Savings Criteria	Cost Range
CNT Energy (IL)	Financing	Program staff provide turn-key project support	195 buildings, 12,643 units	\$188 MMBtu \$417/unit 2.2 MMBtu/unit <i>All fuels</i>	3% financing and the program helps owners identify rebates, tax credits, etc. through other sources		
Efficiency Maine (ME)	Performance	Consultants (program partners) provide turn-key project support. Savings estimates determined using prescriptive path or modeling path.	517 units	26% predicted energy savings <i>All fuels</i>	Free benchmarking, project rebates	Minimum 20% energy savings above baseline and 10% ROI	\$1,500-1,600 per unit up to 50% of project cost.
NYSERDA (NY)	Performance	Consulting engineers provide turn-key project support	526 buildings, 9,649 units	\$43/MMBtu \$1,099/unit 25.5 MMBtu/unit 26% measured energy savings, 89% realization rate <i>All fuels</i>	Assessment rebates, project rebates, performance incentives, enhanced rebates for low income, reduced rate financing	Minimum 15% energy savings above baseline and pass TRC. Bonus incentives for achieving 20% savings.	Up to \$100 per unit (affordable) or \$700 per unit (market rate) for installed measures. Additional \$150-300 per unit bonus for 20-29% savings. 0% interest funds transfer to building owner's bank covering 50% of remaining project cost
PSE&G	Performance	Consulting engineers provide turn-key project support	21 buildings	\$339/MMBtu <i>All fuels</i>	Project rebates, 0% on-bill financing	Measures must have simple payback of 15 years or less. Incentives reduce SP to 2-7 years	Typically covers more than 50% of the cost of the project

Notes on data used for metrics:

- Different programs target and record savings for different fuels, so a direct 1:1 comparison of MMBtu savings program to program may not be applicable.
- Data for different programs is representative of program-to-date information available through public records and some personal interviews and is therefore representative of varying periods of performance.
- With the exception of NYSERDA's measured energy savings and realization rate, all energy savings claims are gross savings at the site, based on predictive models using deemed savings, whole building energy simulations, or other engineering calculations.
- Data are from slightly different years. PSE&G and CNT are projects completed in 2012, NYSERDA is for 2008-2011, Commonwealth Edison and Austin Energy data are from 2011 and Energy Trust is from May 2011-May 2012

- Austin Energy program spending includes incentive of \$1,724,023 spending for MF Program Rebates and \$8,492 for the MF Duct Sealing Program.
- PSE program spending includes \$10,247,241 in electric expenditures and \$451,953 in gas expenditures.

APPENDIX C – EXAMPLE OF USE OF BENCHMARKING DATA

The following charts are currently available at www.wegowise.com. They are included here to illustrate how a repository of benchmarked buildings can be used to help inform program planning, design, and implementation. The charts overlay multi-family building data from both Massachusetts' and California's data sets in the WegoWise system. The units are dollars spent per bedroom on a monthly basis for natural gas in gas heated buildings (Chart C-1), electricity in buildings with air conditioning (Chart C-2), and water (Chart C-3). In addition to the obvious consumption profiles (i.e. higher natural gas costs during heating months in Massachusetts) there is useful information to be gleaned in terms of the size of the peak and the seasonal range of consumption (indicated by the shaded fields.) This type of information can help program planners in developing implementation strategies to specifically target the consumption profiles that are unique to their own building stock. As illustrated clearly in these three charts, the strategy for CA would be significantly different from the strategy for Massachusetts. The final chart showing water costs is included to illustrate the fact that water costs are a serious issue for many Massachusetts multi-family building owners and energy audits present an opportunity to help customers address these costs in tandem with energy efficiency improvements.

Chart C-1 | Multi-Family Building Billing Analysis (gas) with Gas Heat

Comparison of MA and CA Results

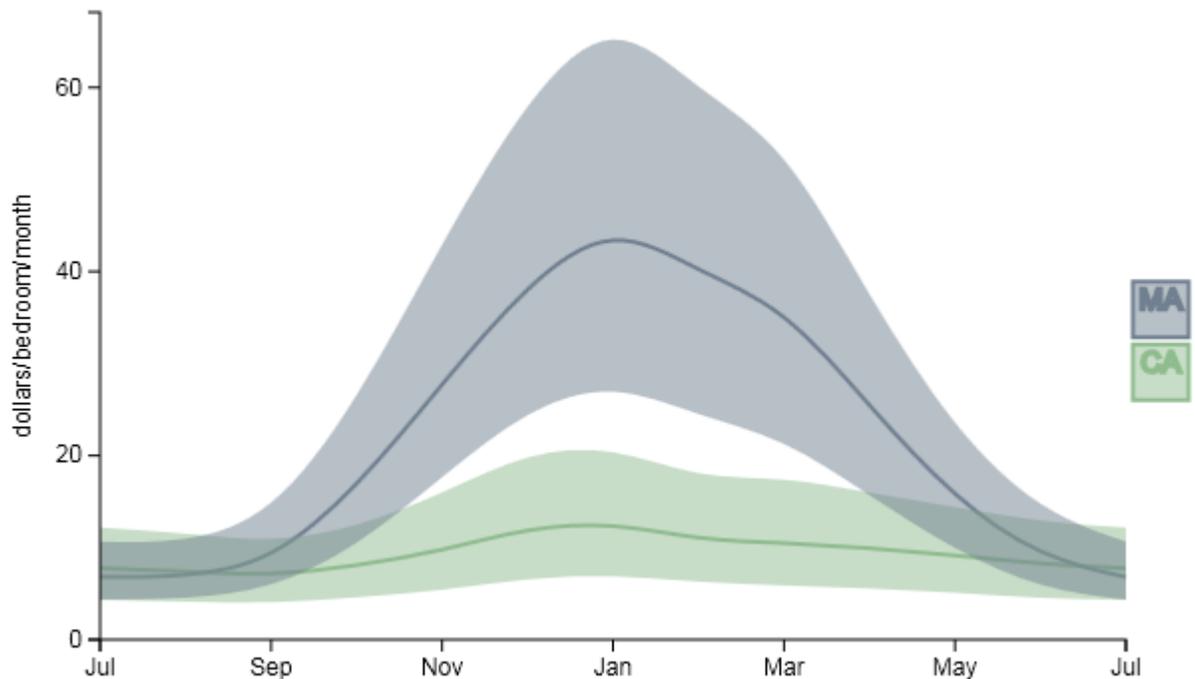


Chart C-2: Multi-Family Building billing Analysis (Electric) with AC

Comparison of MA and CA Results

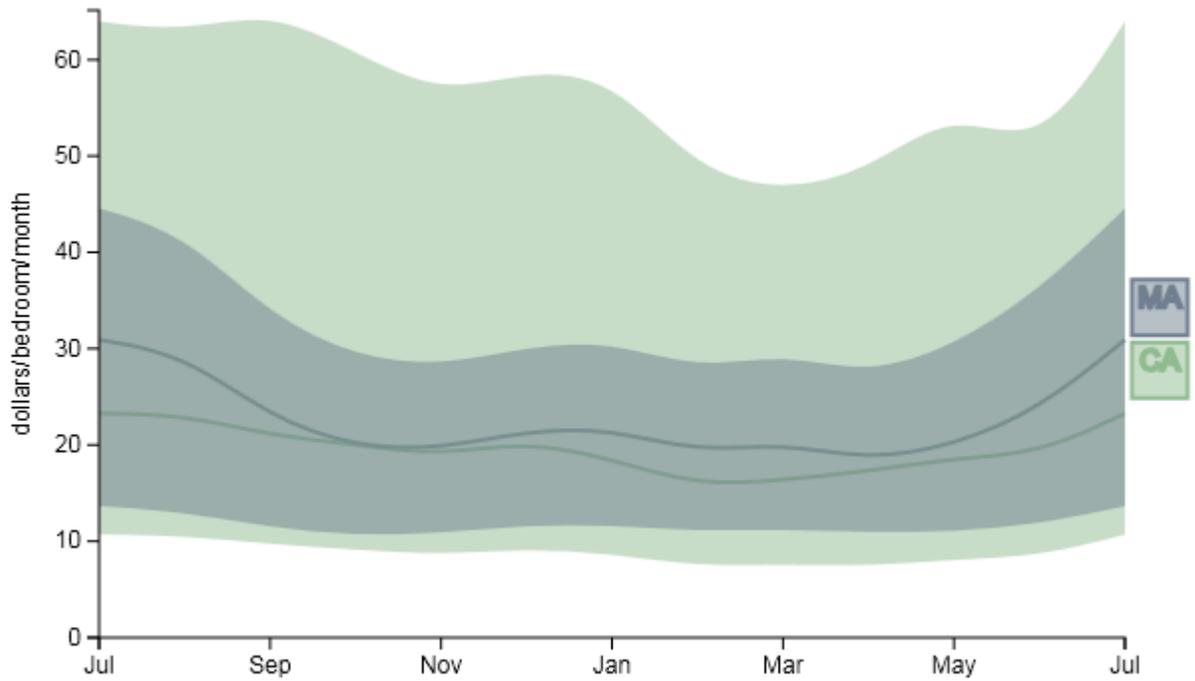


Chart C-3: Multi-Family Building Billing Analysis (water)

Comparison of MA and CA Results

