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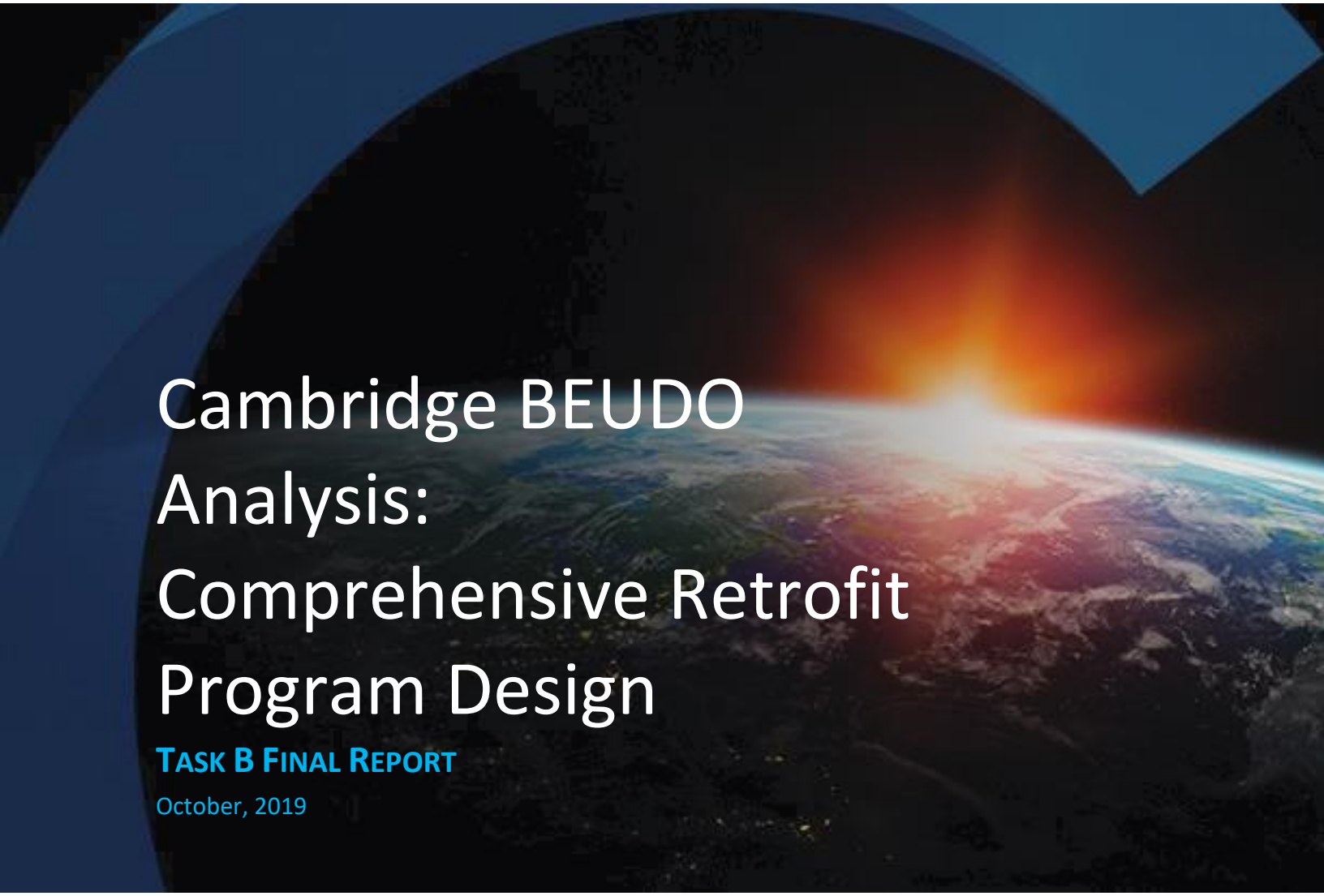

Cambridge BEUDO Analysis: Comprehensive Retrofit Program Design

TASK B FINAL REPORT

October, 2019

Prepared for:

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Introduction

Energy use in buildings accounts for over 80% of greenhouse gas (GHG) emissions in Cambridge.[1] In order to aid in planning for improved building energy performance, the City of Cambridge adopted the Building Energy Use Disclosure Ordinance,[2] or BEUDO, in 2014 to collect energy and water-related data from commercial and institutional buildings greater than 25,000 square feet (SF), and residential buildings with greater than 50 units per parcel. Combined, BEUDO-reporting parcels are responsible for over 70% of Cambridge GHG emissions from buildings. The City of Cambridge's Net Zero Action Plan[3] also suggests several actions to support energy reductions in large buildings in the City, including amending BEUDO to incorporate performance requirements, and implementing a voluntary comprehensive retrofit program. The City of Cambridge aims to achieve carbon neutrality by 2050, requiring aggressive levels of energy and GHG savings.

To achieve the goals of its Net Zero Action Plan and to encourage buildings subject to BEUDO to take steps to significantly reduce their energy use, the City conducted research, qualitative analysis, and stakeholder engagement to inform the **development of a voluntary, comprehensive retrofit program**. This work seeks to help building owners subject to BEUDO requirements best utilize Mass Save and other state or utility programs to achieve deeper energy retrofits. These retrofits can help BEUDO building owners meet and exceed potential BEUDO performance requirements and enable the deep carbon savings necessary to meet the City's climate mitigation goals.

The proposed comprehensive retrofit program is an initiative to provide resources to building owners to help them achieve significant energy savings. The program will be administered by the City in partnership with Eversource and BEUDO stakeholders together playing an active role in its development and implementation. Services will build upon Eversource's existing energy efficiency offerings through Mass Save with a greater emphasis placed on improving the customer intake process, conducting targeted outreach, education and training, and providing increased technical assistance for building owners. Eversource intends to provide an intake or "concierge" resource that will act as a guide and an advisor for achieving deeper energy savings. In addition, Eversource will facilitate a Cambridge-centric communication process that will include those intake resources, marketing material and project documentation services to inform BEUDO reporting customers of their program options, and a means of sharing best practices.

The engaged parties have drafted this Implementation Support Plan in an attempt to outline the intent to support efforts and provide resources towards mutually aligned goals. The current Implementation Support Plan, which was drawn up in coordination and a spirit of collaboration, represents this intention and does not constitute a legally binding arrangement.

[1] https://www.cambridgema.gov/CDD/climateandenergy/greenhousegasemissions/communityemissions

[2] https://www.cambridgema.gov/CDD/zoninganddevelopment/sustainablebldgs/buildingenergydisclosureordinance.aspx

[3] www.cambridgema.gov/netzero

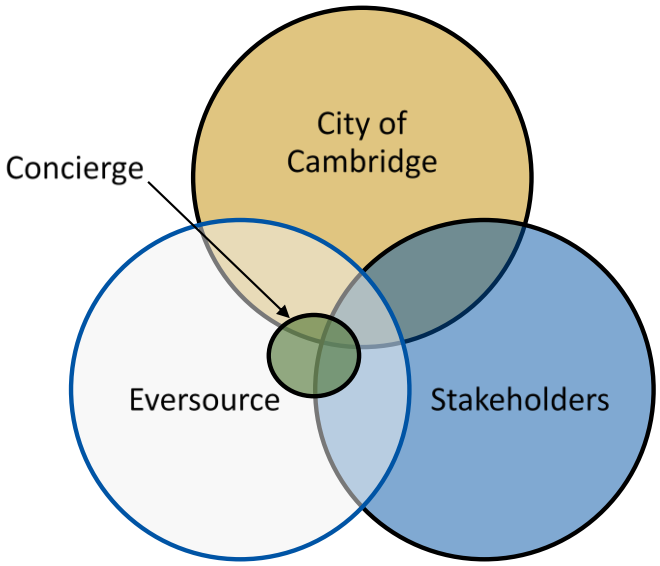


Figure 1. Proposed Alignment of Roles for the Comprehensive Retrofit Program

The voluntary comprehensive retrofit program includes three components, which are outlined further in this report:

- **Intake Process**: Builds upon and streamlines existing intake processes for accessing available energy efficiency and clean energy incentive programs, with a focus on identifying appropriate organizational contacts and entities to include in outreach.
- **Outreach, Education, and Training:** Provides outreach and education for property owners, corporate staff, facility managers, and tenants on the benefits of energy efficiency and available incentive and finance offerings in the Commonwealth.
- **Technical Assistance**: Helps building owners and tenants use programs and incentives which can drive more comprehensive energy efficiency and clean energy investments.

This report is structured in three parts and includes:

- A **process summary** of the research and stakeholder engagement used to inform the program design;
- The **structure of the proposed voluntary comprehensive retrofit program** that aligns with the City's Net Zero Action Plan, including desired improvements of the intake process, technical assistance, and training and outreach components of existing programs; and
- An **implementation plan with assigned roles and actions** for the City, Eversource, and building owners.

Process

In the fall of 2018, the City launched a series of interviews, desk research, four stakeholder workshops, and four focus groups to inform the development of a voluntary, comprehensive retrofit program. The Cadmus Group and the Institute for Market Transformation (IMT) were selected to help facilitate and guide this stakeholder-driven process. The approach was to build upon existing utility and state-level offerings for retrofits to facilitate deeper levels of energy savings in BEUDO buildings. The goals of the stakeholder process, best practices research of peer city programs, and data analysis of BEUDO buildings were to:

- Research the needs of the market through stakeholder interviews, workshops, and focus groups,
- Research state, local and national performance-based incentive programs,
- Engage landlords and tenants on barriers to deep retrofit implementation, and
- Develop a voluntary comprehensive retrofit program with stakeholder collaboration.

Real estate investment trusts (REITs), multi-family building owners, higher education campuses, commercial office property owners and their tenants, energy efficiency experts, utilities, city and regional actors, and laboratories were some of the major stakeholders involved in the process. Their feedback was captured through interactive facilitation methods and summarized in memos, slide decks, and concept mapping exercises. During the iterative process, stakeholders were kept informed of progress and given opportunities to provide feedback on the development of the voluntary retrofit program concept.

Intake Interviews

The stakeholder collaboration process began with four selected stakeholder interviews to inform the content of the workshops. Interviewees included representatives from the finance sector, an energy efficiency provider, a large tenant and commercial building owner, and an energy utility. The interviews were intended to gauge how familiar different stakeholders were with existing incentive and finance programs for energy efficiency and how the programs are utilized by BEUDO building owners. The information helped the City identify current successes and areas of opportunity along with program gaps that should be addressed by the retrofit program. Interviewees noted that there is confusion around what programs and sources of funding are available to building owners. Stakeholders also shared that there are barriers to deep retrofit implementation, including lack of customer participation or buy-in, competing priorities, timing of incentives, lack of flexibility in vendor selection, and uncertainty in anticipated energy savings over time.

Workshops

Beginning in November 2018, drawing upon the information from the intake interviews, the City of Cambridge held a series of four workshops with key stakeholders to inform the direction of the voluntary, comprehensive retrofit program.

Workshop 1 – November 2018: The first workshop sought to establish a collective group understanding of the City's objectives and existing and proposed energy efficiency program offerings in the 2019-2021 Massachusetts Three Year Energy Efficiency Plan.[4] The City and its consultant, The Cadmus Group, presented research on the perceived barriers to energy efficiency retrofit program participation. The workshop collected valuable feedback on stakeholder experience with existing energy efficiency and incentive programs and the needs that a voluntary comprehensive retrofit program

[4] http://ma-eeac.org/wordpress/wp-content/uploads/Exh.-1-Final-Plan-10-31-18-With-Appendices-no-bulk.pdf

should address to increase participation for BEUDO buildings. Stakeholders noted that key challenges to participation included:

- The misalignment of energy audit timing with building owner capital planning cycles
- Lack of staff capacity and technical proficiency to support energy audits, and
- Lack of general awareness on available programs.

Stakeholders expressed the need for improving program participation by increasing outreach to build awareness around existing programs, packaging incentives that address both energy and non-energy benefits, and benchmarking to provide indications of success or potential segments to target. An important outcome of this workshop was the participants' demonstrated interest in technical assistance or concierge services to help people and organizations interpret energy audits and connect them with local and state resources.

Workshop 2 – December 2018: This workshop provided stakeholders with an understanding of available pathways, incentives, and options for improving program delivery to meet the needs discussed in Workshop 1. The City and Cadmus presented research on the quantitative analysis of Cambridge BEUDO buildings' energy consumption to identify opportunities for energy reduction within Cambridge buildings and the potential programmatic pathways for incorporation into a retrofit program. Greater emphasis was placed on the purpose, priorities, and direction of a retrofit program to drive later iterations of the concept. The City and Cadmus presented a multitude of potential programmatic offerings and examples of how these programs work in the marketplace. The suite of eight pathways included:

- **Concierge Navigator:** Helping building owners and tenants navigate existing programs and connect them with resources including enhanced energy audits, capital planning coordination, and translating audit results into actionable measures.
- **Training and Workforce Development:** Trainings for building operators, including existing members of industry and new facilities personnel, as well as internal education on the benefits of energy efficiency retrofits to gain traction internally for longer payback projects.
- **Point-of-Sale:** Program to intervene and capture buyers' attention to encourage or require implementing energy conservation measures (ECMs) at property time-of-sale or changeover.
- **Bundling and Turnkey Solutions**: Packaging prescriptive incentives for common retro-commissioning (Rcx) measures for targeted facilities and expanding offerings like the National Grid Sustainable Office Design program[5] to other building segments.
- **Changes in Incentive Delivery:** Exploring alternatives to prescriptive rebates including pay-for-performance models and incentives for early replacement incentive delivery.
- **Green Bank:** Provide funding to seek low interest loans for efficiency upgrades and support for energy efficiency, renewable energy, and water investments with demonstrated returns on investment (ROI).
- **Beyond Efficiency:** A connecting point to building electrification, renewable energy generation, and the water-energy nexus.

[5] The Sustainable Office Design Program offered by National Grid is a tenant fit out program for commercial office space. The offering is a performance-based lighting design approach for energy cost savings in leased spaces. More information is available on the National Grid website: https://www.nationalgridus.com/ProNet/EE-Programs-Solutions/Lighting-Lighting-Controls

A "dot-ocracy" exercise showed that, among workshop participants, the three most preferred programs for further research and refinement were: **training and workforce development, the concierge navigator, and beyond efficiency**.

Workshop 3 – March 2019: The objectives of the March workshop were to revisit the stakeholder selected program concepts covered at the previous stakeholder meeting and note progress since Workshop 2. The Institute for Market Transformation (IMT) presented its Driving Efficient Energy Performance (DEEP) concept, a potential deep energy efficiency financing program that could particularly serve small and medium-sized buildings in Cambridge. Eversource also presented its custom retrofit program and other existing offerings. The discussion that followed these presentations identified existing opportunities within the existing Custom Retrofit Program and Equipment and Systems Performance Optimization (ESPO) Program for increased use and/or enhancement. These opportunities include an improved intake process, increased technical assistance capacity, and the provision of additional training. Eversource agreed to work with the City and stakeholders to build a more robust system of offerings that incorporates concepts of a concierge navigator model, technical assistance, and an improved intake process into the existing Mass Save program.

Workshop 4 – May 2019: This meeting sought to define the commitments and roles for the City, Eversource, and stakeholders for successful program rollout and to clarify near-term next steps for delivery of increased energy efficiency savings in BEUDO reporting buildings over the next one to two years. Throughout the series of workshops, the stakeholders articulated barriers to accessing energy efficiency programs and potential solutions to those barriers. Their feedback can be grouped into three primary retrofit program components or pathways: an improved intake process, additional education and training, and increased access to technical assistance. The City and Cadmus developed strategies and actions for these components to improve existing program processes that would then yield increased adoption of deeper energy retrofits. To create a viable program that built upon Eversource's existing offerings, roles for each participating stakeholder group were identified:

- **City of Cambridge**: Local outreach and other support related to stakeholder engagement, and hosting and maintaining resources.
- **Eversource**: Develop and administer a Concierge resource, whose role is to be a single point of contact that will act as a guide and advisor to engaged stakeholders and BEUDO-reporting building owners participating in the Support Plan.
- **Stakeholders**: Commit to implement energy efficiency building retrofits and leverage relationships and experience, and inform the development of the Concierge program.

Focus Groups

In March 2019, Cambridge, Cadmus, and IMT convened two focus groups, one with office tenants and another with multi-family building owners to supplement feedback from the workshops. Additionally, a lab tenant focus group was coordinated by the Compact for a Sustainable Future and observed by the City and Cadmus. Following the third workshop, Cambridge, Cadmus and Eversource convened a fourth focus group with key stakeholders to elicit feedback on the proposed program model. The responses from these groups helped inform the purpose and direction for the comprehensive retrofit program proposal. The focus groups included perspectives from wide variety of office tenants and multi-family building owners and included developers, architecture and engineering firms, tech companies, commercial office, co-working spaces, and laboratories. Participants expressed the need for consistent internal and external contracts for general efficiency program questions and resources to help with both making an "internal sale" on energy efficiency and increased building operator training.

Office Tenant Focus Group

The four tenants who participated were knowledgeable of local opportunities from Mass Save and Eversource to reduce their energy consumption. They rely primarily on their internal teams and outside consultants to investigate and implement energy-saving solutions. From their perspective, and perhaps due to their triple-net lease structure, engagement with landlords is typically self-initiated to get traction on a specific energy efficiency opportunity. The participants were interested in the concierge navigator concept and were generally open to landlords taking the initiative to explore whole building energy-saving opportunities. The participants felt these concepts could further lend themselves to landlord-tenant collaboration, green leasing, or peer learning. Feedback gathered from the tenants helped to further develop and refine concepts related to landlord-tenant outreach and whole building, long term planning.

Multi-Family Focus Group

During the multi-family focus group, the four organizational participants stated that they had taken advantage of the "low-hanging fruit" from Mass Save programs, but acknowledged that deeper retrofits are harder to implement as units turn over quickly. These building types prefer to implement measures that have paybacks of three years or less and larger investments are typically based on capital planning cycles, building needs, and expected returns. Similar to the office tenant focus group, the participants were interested in the concierge navigator concept because they desired consistency in knowing whom to contact for help with decision-making. Feedback gathered from the multi-family focus group helped to inform the development of concepts related to whole-building long term planning, targeted trainings for building operators, and the need for a single point of contact.

Lab Tenant Focus Group

The twenty plus attendees who participated in the Net Zero Labs (NZL) focus group meeting were all knowledgeable of the challenges and opportunities for improving laboratory energy efficiency in Cambridge. Participants identified ventilation and improved communication and collaboration between tenants and landlords as two significant opportunities for energy-use reduction in labs. From their perspective, opportunities to decrease energy-use related to ventilation included reducing ventilation levels in off-hours with improved technologies, sizing ventilation systems appropriately in the engineering phases of the project, and optimizing ventilation cycles on a case by case basis. Additionally, tenants should to communicate their sustainability goals to building owners very early in the planning process and improve their internal marketing and selling to gain internal buy-in for retrofit projects. Feedback gathered from the participants was intended to set the stage for future discussions and to help identify additional action items for the NZL working group.

Proposal Focus Group

In May 2019, between Workshops 3 and 4, Cambridge, Cadmus and Eversource held a focus group with five stakeholders who represent some of Cambridge's largest building owners and operators to collect stakeholder feedback on a straw proposal for the comprehensive retrofit program that was developed from the workshops and focus group sessions. Three pathways were highlighted, including improving the intake process, increasing technical assistance capacity, and providing additional training. The lab and commercial office attendees stressed the need to use available BEUDO data to target buildings with high savings potential (i.e., the lowest performing buildings), gain greater engagement with vendors, and pinpoint the right champion to lead energy efficiency activity at the building level. Focus group feedback was used to further inform the prioritization of elements and actions to include in the program, and to help identify potential contributions and roles stakeholders can fulfill as part of the program.

The comprehensive retrofit program design, presented below, was the result of a series of dialogues summarized above, best practices from other energy efficiency programs around the country, and Eversource's experience working with large commercial and residential buildings via Mass Save. The program structure builds upon the Mass Save program, with greater emphasis on improving Mass Save program intake for commercial and residential buildings impacted by BEUDO, increased access to efficiency incentives which go beyond the low-hanging fruit, and access to additional education and trainings.

Program Structure

Building on the stakeholder feedback and best practices research, this section introduces a proposed program structure for a voluntary comprehensive retrofit program for BEUDO buildings in Cambridge. The program is designed to address stakeholder needs for increased clarity and communication for energy efficiency offerings. In additional to the breadth of support Eversource will provide towards energy savings efforts, Eversource will provide a concierge or intake resource, to serve as a single point of contact that will act as a guide and advisor to engaged stakeholders and BEUDO reporting customers participating in the comprehensive retrofit program. The proposed program structure contains three components. These include:

- **Intake Process**: Builds upon and streamlines existing intake processes for accessing available energy efficiency and clean energy incentive programs, with a focus on identifying appropriate organizational contacts and entities to include in outreach.
- **Outreach, Training and Education:** Provide outreach and education for property owners, corporate staff, facility managers, and tenants on the benefits of energy efficiency and available incentive and finance offerings in the Commonwealth.
- **Technical Assistance**: Helps building owners and tenants use programs and incentives which can drive more comprehensive energy efficiency and clean energy investments.

Each program component includes a series of actions, which require a collaborative effort between the City of Cambridge, Eversource, and BEUDO building owners. The roles for each group are identified for each action; **the lead stakeholder for each action is indicated with an asterisk**. Actions are classified as either near-term, defined as occurring by June 2020, or medium-term, occurring between July 2020 and December 2022. This distinction helps identify what actions can be undertaken more immediately, and others which could inform the next Massachusetts Energy Efficiency 3-Year Plan and potentially be institutionalized for use across the Commonwealth, if successful. Readers can access the complete table outlining the program components and actions in the **Feedback Mapping Roles Matrix** appendix of this report.

Intake Process

The goal of the intake process component is to improve and expand efforts to enroll BEUDO-reporting buildings in energy efficiency programs and greenhouse gas reduction projects by identifying critical contacts for outreach. Both building owners and tenants expressed a need for consistent internal and external contacts for general energy efficiency program questions and identified a need for increased outreach and engagement from the Mass Save Program Administrators. This component seeks to address gaps in awareness of existing programs by identifying contacts and conducting outreach on energy efficiency and clean energy programs through multiple channels (see also Component 2: Outreach, Training, and Education). This component draws upon existing relationships between the City, Eversource, and building stakeholders and utilizes BEUDO data to target building subsegments for energy efficiency implementation. In addition to identifying contacts, this component also includes limited informational outreach.

The Intake Process component consists of six actions. These actions, and the accompanying roles for the City, Eversource, and building owners, include the following:

Near Term [July 2019-June 2020]

1.1 Identify Organizational Contacts: Enrollment in and engagement with energy efficiency programming is often contingent upon building owners and tenants having up-to-date program information. However, the person best suited

to manage the energy efficiency project process within each organization varies. To ensure each organization has the appropriate information and that this information reaches someone with the capacity to act, the City, Eversource, and building owners must work to identify these contacts. Stakeholders noted that having more than one contact within an organization also improves the likelihood of energy efficiency implementation, especially with smaller organizations where there may not be dedicated energy efficiency staff. Contact identification involves both specific contacts (e.g., BEUDO reporting contacts) and generating a database of the types of positions (e.g., facilities managers, regional management) associated with tenants and building owners for outreach. Consistent with existing energy efficiency implementation strategies and methodologies, Eversource uses energy consumption data to help target buildings for energy efficiency outreach, and aims to identify the appropriate contacts from those organizations.

- **City of Cambridge*:** Identify organizational contacts for outreach beginning with BEUDO-reporting contacts; maintain master list.
- **Eversource:** Identify types of organizational contacts (e.g. asset managers) for outreach based on experience with previous customers contacts to add to the master list.
- **Building Owners**: Identify appropriate internal contacts to receive correspondence from Eversource and the City about energy efficiency offerings. Contacts may include asset managers, facility managers, and tenants, among others. Analyze BEUDO data to identify targeted buildings for outreach.

1.2 List Design, Engineering, and Construction Firms: Design, engineering, and construction firms, as well as other vendors, frequently engage with projects that could benefit from energy efficiency incentives and programmatic offerings. By maintaining an internal list of firms working on such projects in the City of Cambridge, the City can be better positioned to conduct outreach to ensure they have the latest program information to share with building owners.

- **City of Cambridge*:** Maintain a database of design, engineering, and construction firms and vendors engaged in energy efficiency projects in Cambridge to periodically update on current energy efficiency offerings.
- **Eversource:** Periodically provide updated vendor lists to the City to add to the outreach database
- **Building Owners**: Annually provide the City list of firms involved with their energy efficiency projects to add to the outreach database

1.3 Identify Local Organizations: To facilitate conversations about energy efficiency and clean energy within the broader BEUDO building owner community, the City, Eversource, and BEUDO stakeholders should identify a series of local organizations positioned to engage this community. Both building owners and their tenants should be considered, as tenant operations also play a role in energy efficiency implementation. Local organizations, such as industry, professional, and trade organizations, have regular meetings at which the City or Eversource can present, or these contacts can be used to distribute information among their members. Membership of these organizations typically includes a wider range of positions, as opposed to strictly building operations or facilities staff, which is valuable in pitching energy efficiency within an organization. Other organizations for which contacts should be identified include the Chamber of Commerce or business improvement districts. Critical financial institutions and real estate brokers can also be identified.

- **City of Cambridge*:** Identify local organizations of which building owners may be a part, utilizing resources from the Chamber of Commerce and any existing business improvement districts; maintain a master list of contacts.
- **Eversource:** Support the identification of local organizations of which building owners may be a part.
- **Building Owners**: Provide contacts for local organizations of which their staff are members.

1.4 Improve Utilization of Existing MOUs: A number of larger building owners have existing Memorandums of Understanding (MOUs) with Eversource. These are strategic engagements with multi-year engagement periods, which outline commitments from both Eversource and the customers on budgets, incentives, and energy savings project targets. As part of a comprehensive retrofit program, Eversource will continue to engage existing MOU customers and look for ways to improve utilization by exploring deeper, more comprehensive approaches to building retrofits, manage and track projects planned for the next 1- 2 years, and ensure projects are completed.

- **Eversource*:** Continue to work with and work to increase energy efficiency program utilization among existing MOU customers by understanding projects in the queue, exploring comprehensive approaches, and tracking project implementation, consistent with the existing customer agreements.
- **Building Owners**: Increase program utilization by proposing and planning new projects, where applicable.

1.5 Develop and Maintain Relationships: The relationship-based structure of MOUs can be transferred to non-MOU customers as well. Eversource will engage BEUDO building owners that have been active in retrofit program stakeholder discussions by working to understand past program participation, building type, and any existing barriers. By developing and maintaining regular relationships between these building owners and Eversource, Eversource can encourage program participation and enlist customer commitments to comprehensive retrofits.

- **Eversource*:** Consistent with existing energy efficiency implementation strategies and methodologies for developing and maintaining relationships, Eversource will work to identify tailored, scalable approaches to engage a range of customers and, where deemed appropriate, analyze retrofit program engagement history and building types to facilitate this.
- **Building Owners**: Engage with Eversource and commit to undertaking additional building efficiency projects and confer with Eversource before beginning new projects.

1.6 Target New Buildings for Engagement: The existing BEUDO dataset can be used as the starting point to identify and engage BEUDO buildings with large potentials for energy savings. Eversource can leverage this data along with data on historical Mass Save engagement to identify and reach out to owners of buildings that have particular potential to further utilize Mass Save resources to reduce energy use and GHG emissions.

- **Eversource*:** Consistent with existing energy efficiency implementation strategies and methodologies for targeting new buildings for engagement, Eversource will work to identify tailored, scalable approaches to engage a range of customers and, where deemed appropriate, analyze BEUDO and Mass Save data to target and reach out to high-potential buildings for energy retrofits.
- **Building Owners:** Engage with Eversource and commit to undertaking initial building efficiency projects.

Medium-Term [July 2020-Dec 2022]

1.7 Track Building and Renovation Permits: New construction and renovation projects require contractors to file for permits from the City before beginning work on behalf of building owners. By tracking who files for these permits, the City can build out its contact list and conduct targeted outreach on related efficiency programs. However, by the time the permit is filed, it may be too late to influence the current project and would instead provide information for future projects undertaken by the building owner.

- **City of Cambridge*:** Maintain the list of projects for which permits have been filed and follow up with relevant energy efficiency program offerings.
- **Eversource:** Consistent with existing energy efficiency implementation strategies and methodologies, Eversource will work to continue customer engagement to drive program participation and where appropriate, maintain

engagement with this list, in the event there is opportunity for the New Construction team to assess energy savings and incentive potential.

- **Building Owners**: Before filing permits, building owners and/or their contractors should contact the City about available resources and incentives for the proposed project.

Outreach, Education, and Training

Throughout the focus groups and workshops, both BEUDO stakeholders and tenants had some unfamiliarity with the depth of available energy retrofit offerings in the Commonwealth. Within the tenant focus groups and workshops, stakeholders were unaware of the two available programs for tenants and some of Mass Save's new program models, such as the Equipment & Systems Performance Optimization (ESPO program) and called for additional training, education, and outreach. Beyond understanding program availability and which programs may best match facility needs, stakeholders also indicated that though energy efficiency and renewable energy projects deliver cost savings, they still encounter barriers making the internal pitch for energy investments, particularly for the types of longer-payback and higher expenditure conservation measures that could be included within a comprehensive retrofit. Stakeholders emphasized that additional outreach and education opportunities should be targeted towards financial officers and other corporate staff and not just property managers or facilities managers, who often interact more with the existing programs through Mass Save, Massachusetts DOER, and other existing offerings. This would help create more buy-in and a culture of energy efficiency throughout organizations.

In addition, as energy efficiency technology has matured, many energy conservation measures are now integrated with automated control software, advanced building management systems, and other emerging technologies. This dynamic is increasing the complexity of managing a building and delivering expected energy savings. Stakeholders also emphasized the need for expansion of training and education for building operators and continued workforce development to ensure that there is sufficient talent within the region to help support high-performing buildings.

Based on this feedback, the suggested solutions within the Outreach, Education and Training component include seven actions. These actions, and the accompanying roles for the City, Eversource, and building owners, include six near-term actions for completion by mid-2020 and one medium-term actions, which if successful could inform the next Massachusetts Three-Year Energy Efficiency Plan.

Near-term [July 2019-June 2020]

2.1 Resource Hub: The policy, incentive, and financing environment for energy efficiency and renewable energy in the Commonwealth is highly dynamic. Incentive and program availability can change with a new Massachusetts three-year energy efficiency planning cycle, regulatory, or policy changes. To help BEUDO building owners and tenants gain a comprehensive understanding of currently available options, the City of Cambridge will host web resources and materials with information about available programs in the Commonwealth for efficiency, energy optimization/strategic electrification, active demand reduction (ADR), and renewable energy. Eversource provides informational resources available via the Mass Save website and any supplemental resource or offerings available to the comprehensive repository, and Cambridge will add additional resources beyond the scope of the Mass Save program.

- **City of Cambridge*:** Maintain resources and/or documentation for available energy efficiency, electrification, and renewable energy programs in Massachusetts and make publicly available, through the City of Cambridge's Community Development Department Website.[6]
- **Eversource:** Provide materials that summarize Eversource offerings for energy efficiency, ADR and energy optimization, otherwise referenced as strategic electrification.

2.2 Digital Communication and Outreach: The City of Cambridge and Eversource will continue to collaborate to develop digital communication and marketing strategy using a Cambridge-specific marketing approach. As outlined in Actions 1.1 and 1.6, the Cambridge-specific plan can leverage BEUDO data to target retrofit candidates based on building type and EUI relative to other Cambridge buildings of that type. Information on energy efficiency programs should be included in the BEUDO reporting outreach package.

- **City of Cambridge:** Review existing communications (e.g., newsletters, reminders) to determine if there are opportunities to include energy efficiency program outreach
- **Eversource*:** Support energy efficiency marketing and social media efforts through the existing program framework, as deemed practicable and approved by Eversource marketing, and which may include Cambridge-specific considerations as part of upcoming marketing and outreach "refresh", include a community-based social marketing plan to market efficiency solutions to specific customer segments

2.3 Targeted Education: To build capacity, the City and Eversource are committed to developing and targeting trainings for tenants and small building owners to utilize the energy efficiency programs. Topic areas could include deep energy retrofits, renewable energy procurement, and how to "pitch" energy efficiency to internal leadership. Stakeholders indicated that there are limited windows to comprehensively address energy in tenant spaces, and that most work occurs during the fit-out process. As this window is short, increasing outreach and education to larger tenants is crucial to improving efficiency in those spaces. Tenants could be reached via the outreach channels identified in the Intake Process component, such as local trade, professional, or industry organizations. BEUDO stakeholders also indicated this outreach and education could be beneficial for larger facilities after major measures are installed to help staff understand the benefits of the system and operating parameters.

- **City of Cambridge*:** Support outreach efforts by Eversource and BEUDO stakeholders. This could include providing information about incentives and trainings in BEUDO reporting communications and helping to organize target outreach opportunities.
- **Eversource*:** Consistent with existing energy efficiency implementation strategies and methodologies, Eversource will work to continue engagement of small businesses on energy efficiency through a range of channels, including industry organizations, the Chamber of Commerce, Main Streets efforts and business improvement districts.
- **Building Owners:** Participate in outreach by sharing experiences with energy efficiency through industry organizations, the Chamber of Commerce, and business improvement districts and attending outreach events.

2.4 Industry Engagement: Architects, engineers, project designers and construction firms are actively working in buildings throughout Cambridge on retrofits, new construction and the design of tenant spaces. These stakeholders have an opportunity to incorporate best practices in energy conservation into their work and also reach smaller business and building owners who may not be engaged in Mass Save or other renewable energy programs. To help improve

[6] www.cambridgema.gov/EnergyRetrofitProgram

uptake of best practices, Eversource will develop targeted outreach and engagement with architects and engineers on available efficiency programs for new construction, retrofits, and tenant fit-outs, as is consistent with implementation support practice.

- **Eversource*:** Consistent with existing energy efficiency implementation strategies and methodologies, Eversource will work to continue, where appropriate, to conduct outreach to area architects, design firms, and engineers.
- **Building Owners:** Engage area architects, design firms, and engineers for input on efficiency approaches and encourage them to pursue educational opportunities.

2.5 Operator Trainings: The City of Cambridge is in discussions with Eversource about expanding their existing Building Operator Certification (BOC) training sessions being held in Boston to Cambridge stakeholders. This program helps building operators understand the latest best practices in building controls and would help deliver energy savings from improved efficiency in HVAC systems, lighting and other aspects of the day-today operations of buildings. The City and Eversource should utilize this existing momentum to broaden implementation in Cambridge.

- **City of Cambridge**: Work with Eversource to host BOC sessions for the City of Cambridge; provide guidance on tailoring to any Cambridge-specific content or needs
- **Eversource***: Consistent with existing energy efficiency implementation strategies and methodologies, Eversource will work to provide workforce development and training opportunities.
- **Building Owners**: Enroll building operators in training sessions once available

2.6 Peer Learning: There are many buildings within Cambridge that are already successfully reducing their energy usage and greenhouse gas emissions through investing in energy efficiency and renewable energy. These projects and the success of these investments are not always well known within the building community, to Mass Save, or to the City. The BEUDO stakeholders expressed that peer learning is critical to the uptake of new practices. The stakeholders shared that it is often easier to get buy-in for energy investments if there is a successful first-mover. Through this component, stakeholders and Eversource would develop case studies of buildings. In the short term, these case studies will describe projects completed using existing pathways, while case studies developed in the medium term will highlight projects which successfully completed the proposed comprehensive retrofit program process. These case studies would be shared via peer learning workshops with segment specific industry organizations (e.g. the Net Zero Labs Working Group or the Cambridge Compact) and online distribution.

Roles:

- **City of Cambridge**: Share case studies developed by the City, Eversource, and stakeholders.
- **Eversource**: Collaborate with stakeholders to develop case studies and lessons learned for successful retrofit projects.
- **Building Owners*:** Share and help develop case studies and lessons learned for successful retrofit projects to share with other internal (e.g. finance departments) and external (e.g. vendors) stakeholders

Medium-term [July 2020-Dec 2022]

2.7 Vendor Engagement: Construction vendors are a critical component of energy efficiency delivery and implementation, as they directly perform work on buildings throughout Cambridge. By engaging vendors on current energy efficiency programs and offerings, vendors can be better positioned to recommended incentives to customers or propose building solutions that decrease energy use. Some stakeholders expressed that, in previous communications with vendors, the building owners had to initiate the conversation about energy efficiency and incentives with their

vendors. By encouraging vendors to be proactive about energy efficiency, utilizations of programs may increase. Additionally, there is potential for the concierge to evolve into a vendor-driven model over time if the concierge demonstrates success in increasing uptake of energy efficiency retrofits, increasing the importance of engaging vendors early in retrofit program implementation.

- **Eversource*:** Consistent with existing energy efficiency implementation strategies and methodologies, Eversource will work to, where appropriate, provide vendors with up-to-date program offerings and when deemed practicable, coordinate directly with vendors to develop tailored outreach approaches to accelerate customer contact and enrollment

Technical Assistance

Throughout the workshops and focus groups, both BEUDO stakeholders and tenants expressed the need for additional technical assistance resources to help navigate Mass Save's programmatic offerings, noting the desire to have a single point of contact where building owners and operators can seek on demand technical support and guidance to help support the implementation of energy efficiency retrofits. Beyond navigating existing programs and connecting them with experts to provide to technical guidance and support resources, stakeholders expressed the need for assistance in translating the technical content provided in audits reports/investigations into capital planning actions. They also requested increased detail in audit reports and more detailed recommendations for implementing energy efficiency measures they receive from audit reports.

While many of Cambridge's larger and well-resourced building owners rely primarily on their own internal teams and outside consultants to investigate and execute energy-saving solutions to reduce operational costs, stakeholders emphasized there are many BEUDO-reporting building owners who could benefit from increased access to technical assistance. Many BEUDO-reporting buildings lack the organizational staff capacity or technical expertise necessary to navigate the current landscape of energy efficiency programs. They would benefit from a one-stop shop for organizations to request technical assistance, advisory services, or a concierge to help customers navigate existing programs and connect building owners and tenants with energy efficiency resources and guide them through the process. The City, Eversource and stakeholders will all play an active role in the development of these program components, with Eversource serving as the primary point of contact for service inquiries.

The technical assistance pathway includes four actions designed to address the need for stakeholders who may lack the organizational support or staff capacity to receive technical assistance and guidance necessary to undertake comprehensive building retrofits. These four actions are described below, as well as the accompanying roles for the City, Eversource, and building owners. They include one near-term action for completion by mid-2020 and three medium-term actions, which if successful could inform the next statewide Three-Year Energy Efficiency Plan.

Near-Term [July 2019-June 2020]:

3.1 Develop Cambridge-Based Concierge: Navigating the policy, incentive and financing environments for energy efficiency upgrades in the Commonwealth can be a resource and time intensive process for many BEUDO buildings. To help BEUDO building owners and tenants who lack staff or technical capacity to focus on energy efficiency retrofit measures, Eversource will develop a Cambridge-based intake support pathway otherwise referenced as a Concierge resource, to provide a single point of contact that will act as a guide and advisor to engaged stakeholders and BEUDO reporting customers participating in the support plan. The Concierge will work to quickly connect a customer to the appropriate Eversource Implementation team, program or participation pathway to develop and implement

comprehensive energy efficiency projects. The Concierge will be available on an ongoing basis if a customer or stakeholder runs into barriers or challenges in navigating the program or in defining further resource needs to achieve energy savings. The Concierge will also be responsible for the feedback loop necessary to ensure the Eversource Program Support Plan is meeting its intended goals.

This service will include a series of program components to fill the gap for organizations that lack the staff or technical capacity to undertake energy efficiency measures and promote comprehensive building retrofit guidance. The Concierge will include a Cambridge-centric communication process that will include dedicated intake center resources (i.e. 1-800 number or website), marketing materials, and project documentation services to inform BEUDO reporting customers of their program options and to share best practices. Eversource liaisons, account executives, and third-party energy efficiency consultants will be on-call to provide guidance throughout the process.

- **City of Cambridge:** Help to guide and inform the development of a Concierge program along with Eversource and BEUDO building owners.
- **Eversource*:** Consistent with existing energy efficiency implementation strategies and program methodologies, Eversource will endeavor to improve the customer experience and ease of engagement and as deemed appropriate will develop, in coordination with the Steering Committee and the City of Cambridge, and administer an intake pathway (otherwise referred to as the Concierge or Navigator in this document) tailored to the support of this plan.
- **Building Owners:** Help inform the development of the Concierge program by providing feedback throughout the near and medium-term phases of implementation; utilize Concierge services to implement additional energy retrofits.

Medium-Term [July 2020-Dec 2 022]

3.2 Building Prioritization Criteria: Together, colleges/universities and laboratories constitute over 52% of Cambridge's total building energy consumption, while offices and multifamily housing account for another 27% of total building energy consumption. When combined, the energy consumption associated with these property-use types comprise approximately 80% of total energy use in the City of Cambridge and represent a key target demographic for maximizing deeper energy savings in BEUDO buildings. Although colleges/universities and labs are already active and engaged in energy efficiency pursuits, stakeholders see opportunities to increase the uptake of energy efficiency retrofits by developing criteria for prioritizing buildings in large portfolios for energy retrofits. The prioritization criteria would identify a number of measures and attributes for implementation, and audits would be conducted across selected buildings within the portfolio. While some large building owners already possess the internal capacity to identify priorities within their portfolios, developing portfolio-focused building prioritization criteria can help some BEUDO stakeholders. Specifically, facilities managers could coordinate with Eversource to lock-in incentives aligned with current capital budget cycles and planned O&M and maintenance schedules for portfolios of buildings.

- **Eversource*:** Consistent with existing energy efficiency implementation strategies and program methodologies, Eversource will work to drive appropriate prioritization of targets, associated resources, offers and relevant programs to support cost effective delivery of projects at scale. .
- **Building Owners:** Provide support to Eversource on portfolio prioritization criteria development and implement criteria for portfolios to select buildings to enroll in program.

3.3 Segment-Specific Guidance: There are a variety of building segment types reporting to BEUDO within Cambridge, including colleges/universities, labs, offices, multifamily housing account for approximately 80% of building energy consumption while all the others (K-12 schools, hospitals, hotels, parking facilities, houses of worship and data centers)

are responsible for 20%. Each building segment type has its own unique set of challenges and needs that must be addressed in order to successfully reduce their energy usage and greenhouse gas emissions.

Large multifamily buildings and laboratories have different energy consumption profiles, and each requires a different set of actions to implement energy reductions. Stakeholders noted that building owners could benefit from the development and provision of segment-specific technical guidance for owners, including segment specific retrofit measures and engagement of segment-specific vendors. Segment-specific guidance and prescriptive actions that cater to multifamily buildings, offices, and laboratories and universities would allow more building owners to undertake energy efficiency retrofits. Ensuring the Concierge and Eversource's existing account managers are in sync internally, could help to identify common needs and issues among some of the larger building owners.

Eversource will help identify specific building and customer types and will guide them into the appropriate program types as certain customer/building types have unique programs and incentives associated with them, streamlining participation. The building type categorization is further defined in the Implementation Plan.

- **City of Cambridge:** Provide segment-specific resources through the appropriate sector-specific outreach channels and share lessons learned with BEUDO stakeholders from Cambridge's Multi Family pilot program.
- **Eversource*:** Consistent with existing energy efficiency implementation strategies and methodologies, Eversource will work to, where appropriate, develop segment-specific retrofit resources (e.g. air management lab program) and work with appropriate vendor pools to develop specific market approaches to accelerate customer contact and enrollment.
- **Building Owners:** Engage and collaborate with Eversource, where appropriate, to leverage information from completed retrofits to use in segment-specific approach development.

3.4 Whole-Building, Long-term Planning: Stakeholders consistently expressed the general challenge of working comprehensive energy efficiency measures into longer term planning cycles. Building owners could benefit from resources that help to ensure the timing of energy audit reporting is better aligned with their internal capital planning cycles. Implementing retrofits in occupied buildings, finding building downtime to implement energy efficiency measures, and coordinating internally with tenants were identified as common barriers that prevent BEUDO building owners and operators from taking actionable measures compatible with capital planning. Focus group participants were open to landlords taking the initiative to explore whole building energy-savings opportunities as these concepts could lend themselves to landlord-tenant collaboration, green leasing, or peer learning. Additionally, larger customers would benefit from the ability to "lock-in" incentives for longer term capital planning cycles when there is potential within each 3-year planning cycle. Beyond this timeframe requires further discussion with Eversource on incentive alignment.

To help BEUDO buildings and tenants better align their long-term planning cycles, the Concierge, with Eversource acting as the single point of contact will consider whole-building, long-term planning in building programs by connecting capital needs and energy efficiency retrofits, providing comprehensive building retrofit guidance, and providing enhanced incentives for multi-measure projects.

- **City of Cambridge:** Explore opportunities to expand the Cambridge Multifamily Pilot, which provides no-cost energy efficiency assessments and solar assessments to multifamily building owners, to other building segments.
- **Eversource*:** Review current projects under development with account executives/energy efficiency consultant team to document building type and implementation timeframes. Utilize the information to develop and provide enhanced incentives through the concierge for multi-measure retrofit projects to improve the cost-effectiveness and scalability and align with building capital improvement cycles.

- **Building Owners:** Coordinate with and include Eversource in internal capital planning meetings, where appropriate.

3.5 Explore Opportunities for DEEP Implementation: The City of Cambridge is working with IMT to consider opportunities for implementation of the Driving Efficient Energy Performance (DEEP) model for medium-sized building retrofits. DEEP is an alternative, no-money-out-of-pocket approach for owners that can be used to achieve compliance with the building energy performance standard being developed by the City. Owners opting for DEEP would be provided with both project funding and an installation contractor. Depending on the final program design, it may also be possible to use an owner's existing contractor. Costs will be repaid from the energy saved. In exchange for these benefits, the City will determine the target level of energy savings for the building and the corresponding energy conservation measures (ECMs) that need to be installed.

- **City of Cambridge*:** Collaborate with IMT and building owners to determine the feasibility of developing the DEEP program design, decide who will administer the program, and select the implementation contractor.
- **Building Owners:** Participate by signing up for program, installing measures selected by implementation contractor, and repaying cost of installed measures.

Implementation

This implementation plan identifies key considerations for the voluntary, comprehensive retrofit program, with an emphasis on near-term actions to be completed by the end of June 2020. Medium-term actions, which will occur from July 2020 through December 2022, are also identified. To guide implementation of the program, the City of Cambridge and Eversource should establish a standing implementation group to coordinate on shared actions and track implementation progress. The implementation group should include critical points of contact from the City and Eversource responsible for monitoring the roles for their respective organizations. Key stakeholders from the BEUDO reporting buildings should be invited to participate in a steering committee which will periodically provide feedback on the program development and execution process where relevant. The implementation group should convene on a regular basis agreed-upon between the City and Eversource, and the steering committee should convene quarterly.

The steering committee will also consider what aspects of the program have been successful and are worth proposing to incorporate into future Three-Year Energy Efficiency Plans. This would further operationalize innovate program successes and solidify them as part of state-wide energy efficiency efforts.

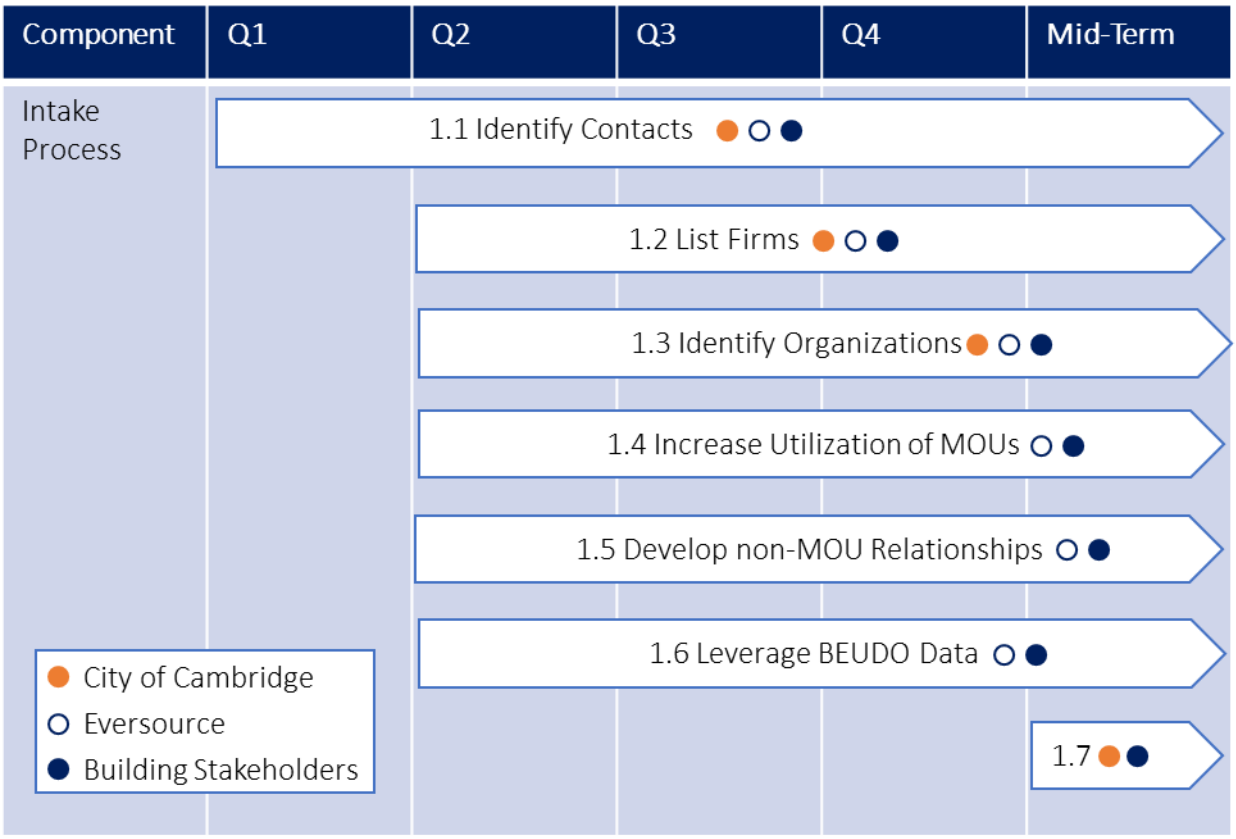
Sequence and Timing

Each program component is accompanied by an implementation timeline for the near- and medium-term actions outlined in the Program Structure section, below. The timelines should be cross referenced with the Program Structure section of the report for full explanations of the actions and the corresponding roles. The timeline within the figures denotes actions to be carried out in the first year of program implementation, FY 2020. The colored circles in the figures indicate if the City, Eversource or building owners are engaged in the specified action during the designated time (i.e., fiscal year quarter).

Intake Process

Year 1 of the intake process focuses on contact identification coordinated by the City of Cambridge and transitions into Eversource-led efforts into the medium term. The early identification of contacts enables the City and Eversource to undertake actions within the Outreach, Education, and Training component. Identifying appropriate contacts is a joint effort between the City, Eversource, and building owners, with the City maintaining the master list of contacts in Actions 1.1-1.3. The City will periodically involve Eversource and building owners to update the list of active design, engineering, and construction firms based on new projects and relationships.

Eversource's role in contact identification includes both leveraging contacts from previous energy efficiency engagements and analyzing BEUDO data to discern what building types or segments should be prioritized for energy efficiency engagement. This will enhance Eversource's ability to conduct actions 1.4 (Increase MOU Utilization) and 1.5 (Develop and Maintain Relationships).



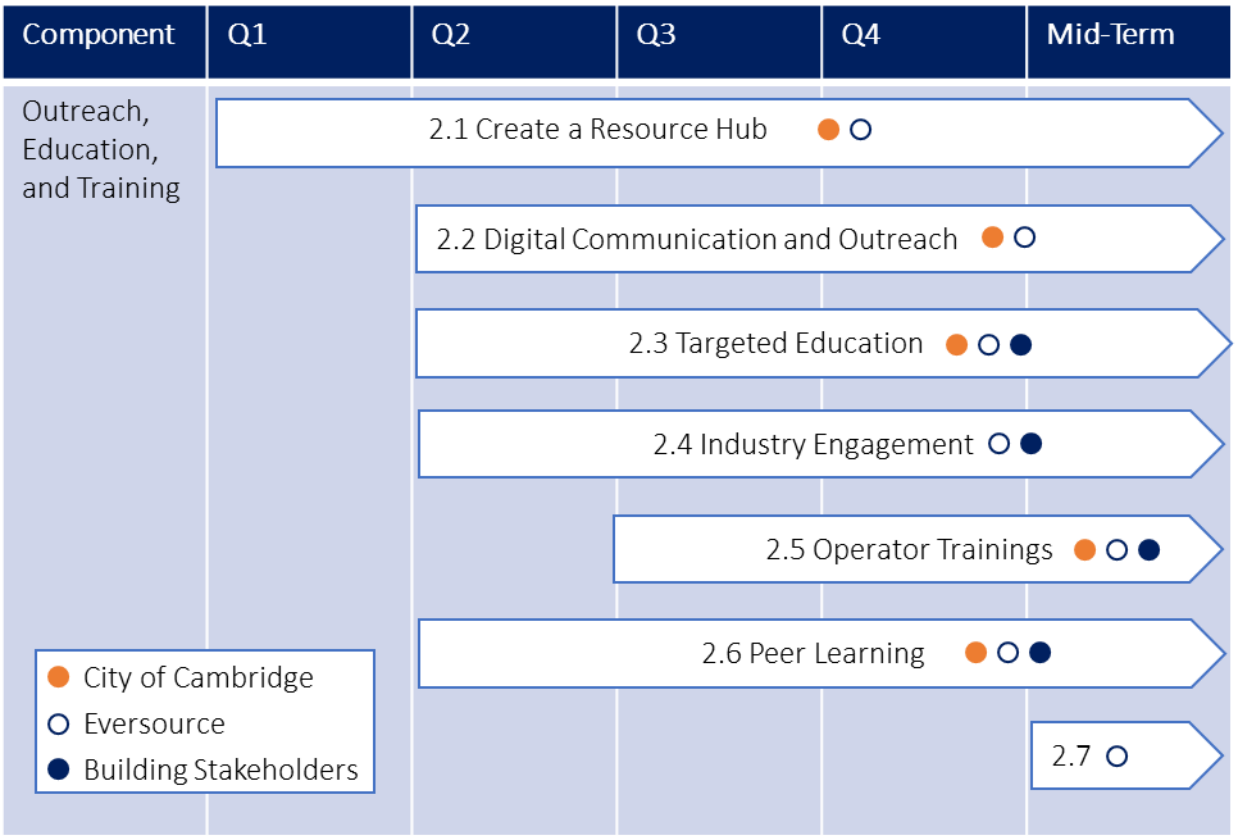
Outreach, Education, and Training

Actions within the Outreach, Education, and Training component begin in parallel with those in the Intake Process component and are largely coupled with and build upon the intake actions. Q4 and the subsequent medium-term are focused on the distribution of information and execution of workshops or trainings.

For the Resource Hub (Action 2.1), development of resources should begin in Q1 and materials should be hosted for the duration of the program. The City of Cambridge will host the Hub, enabling access to information on additional programs outside of the purview of Eversource's existing energy efficiency program offerings (e.g., water conservation and renewable energy). Eversource can prepare Eversource-specific resources for the Hub and host those in parallel as well.

Once resources have been established, Eversource, supported by other stakeholders, will develop an updated digital communication and marketing strategy and a series of educational programs or workshops. Educational programs will be shared with a diverse set of local organizations identified in the Action 1.3. Program development should begin in Q2, in parallel with contact identification, transitioning to execution of trainings in Q3 and into the medium-term.

Industry engagement and peer learning will begin in Q2 and continue through the medium term. Once resources have been complied, hosted, and the key contacts are identified, the architecture, engineering, design, and construction firms identified in 1.2 should be trained on efficiency programs, as well as vendors. Peer learning will begin by developing a case study template to share with stakeholders, guiding the development of case studies on successful comprehensive retrofit projects utilizing the retrofit program. Case studies will be incorporated into training materials as they are made available.



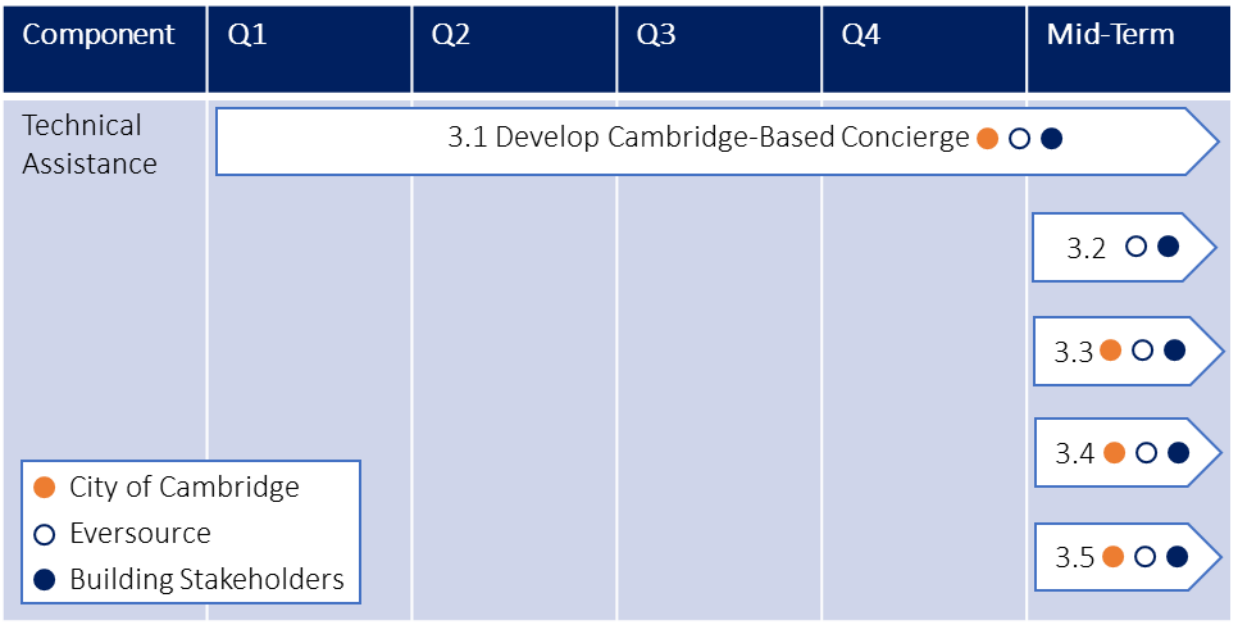
Technical Assistance

Within the Technical Assistance component, Eversource will focus on activities to develop the intake resource in Year 1, with support from the City of Cambridge and BEUDO building owner feedback. This primarily involves building out internal structure and the mechanisms by which customers can contact the concierge. Medium-term activities will focus on resource development and providing specific technical assistance as denoted by the mid-term actions.

Eversource's planned approach for technical assistance includes undertaking a segmented approach to BEUDO-reporting buildings to consider the activities, implementation strategies, and designated programs that exist currently for each individual customer, their activity within the BEUDO ordnance process to-date, as well as other characteristics that lend themselves to providing cost effective resources at scale. As such, within the Plan development process, the Stakeholders were put into three categories which took this and other considerations into account, to best support each group going forward, including:

- Program Development Stakeholders with an Eversource MOU
- Program Development Stakeholders without an Eversource MOU
- Additional Stakeholders Reporting to BEUDO

Means of addressing category-specific needs are further described in the accompanying Eversource Program Support Plan.



Conclusion

The City of Cambridge's Net Zero Action Plan suggests several actions to support energy reductions in large buildings in the City, including a performance requirement program, and a voluntary, comprehensive retrofit program. The City of Cambridge aims to achieve carbon neutrality by 2050, requiring aggressive levels of energy savings. In order to meet the goals laid out in the City's Net Zero Action Plan, the City Cambridge, Eversource, and BEUDO stakeholders have worked together to devise an Implementation Support Plan for the development of a voluntary, comprehensive retrofit program. The intent of the plan is to develop a tailored approach, with near-term and long-term actions, to facilitate energy savings projects with the City's Stakeholders and to provide support for those interested in participating in the Energy Efficiency programs, while improving the customer experience and engagement practices. Program participation may have the added benefit of helping customers meet future performance requirements of the BEUDO ordinance.

Eversource has confirmed its commitment to work with the City of Cambridge and all Eversource customers to implement a highly visible, creative and impactful approach to educating and enrolling customers into Mass Save programs with the goal to implement comprehensive energy efficiency projects, whose outcomes should help fulfill the BEUDO ordinance requirements.

Appendices

- Feedback Mapping and Roles Matrix
- Eversource Implementation Support Plan
- Pre-Workshop Memos
- Workshop Summaries
- Workshop Presentation Slides

Feedback Mapping Roles Matrix

Component	Action Short-Term Action (Present - June 2020) = Blue Mid-Term Action (July 2020 - December 2022) = Green	City ***Local Outreach and Other Support***	Eversource ***Program Development and Administration***	Building Owners ***Commit to Efficiency and Leverage Relationships and Experience***
1. Intake Process *Actions included here are intended to address the issues of lack of program awareness and need for program points of contact with whom stakeholders can interact. Tenants expressed need for consistent internal and external contacts for general energy efficiency program questions.*	1.1 **Identify the appropriate contacts**/types of positions (e.g., facilities, regional management) associated with tenants and building owners to ensure information on energy efficiency is received, first drawing upon BEUDO reporting contacts	Identify organizational contacts for outreach beginning with BEUDO-reporting contacts, maintain master list.	Identify types of organizational contacts (e.g. asset managers) for outreach based on experience with previous customers contacts to add to the master list.	Identify appropriate internal contacts to receive correspondence from Eversource and/or the City about energy efficiency offerings (e.g., asset managers, facility managers, tenants)
	1.2 Develop and **maintain a list of design, engineering, and construction firms working on building projects** to ensure they have the latest program information	Maintain list of design, engineering, and construction firms engaged in energy efficiency projects in Cambridge to keep informed of the latest program offerings	Provide updated vendor lists to the City for outreach	Annually provide list of firms involved with efficiency projects to add to the City's database
	1.3 **Identify local organizations** to target for outreach to local organizations to engage a broader owner and tenant audience with information on energy efficiency offerings. Organizations may include **industry, professional, and trade organizations, the Chamber of Commerce, business improvement districts, financial institutions, and real estate brokers** and utilize existing stakeholder relationships to distribute information.	Identify local organizations of which building owners may be a part, utilizing resources from the Chamber of Commerce and any existing business improvement districts.	Identify local organizations of which building owners may be a part, leveraging any past outreach conducted by Eversource.	Provide contacts for local organizations of which their staff are members.
	1.4 Increase **utilization of MOUs** among existing MOU participants, to include exploration of opportunities for comprehensive retrofit approaches.	N/A	Work to increase MOU utilization among existing MOU customers by understanding projects in the queue, exploring comprehensive approaches, and tracking project implementation	Increase existing MOU utilization by proposing and planning new projects, where applicable
	1.5 For non-MOU customers, **develop and maintain regular relationships** between building owners and Eversource to encourage program participation and enlist customer commitments in comprehensive actions	N/A	Analyze BEUDO data and building types to identify best approaches for a range of customers	Engage with Eversource and commit to undertaking additional building efficiency projects
	1.6 Identify potential new customers by **leveraging BEUDO and Mass Save data** to find high-potential buildings.	N/A	Analyze BEUDO and Mass Save data to target and reach out to high-potential buildings for energy retrofits.	Engage with Eversource and commit to undertaking initial building efficiency projects.

	1.7 **Track building/renovation permits** to conduct outreach on available efficiency programs, with the understanding this may only influence future projects	Maintain the list of projects for which permits have been filed and follow up with relevant energy efficiency program offerings.	Maintain engagement with projects, including opportunities for New Construction incentives	Before filing permits, building owners and/or their contractors should contact the City about available resources and incentives for the proposed project.
2. Outreach, Training, and Education *This need encompasses actions that can be taken to inform stakeholders of program offerings and help them take their next step toward energy efficiency implementation.*	2.1 Create a **resource hub** to host materials with **information about available programs in the Commonwealth for efficiency, electrification, and renewables,** including but not limited to Eversource offerings	Maintain resources and/or documentation for available energy efficiency, electrification, and renewable energy programs in MA	Create materials that summarize Eversource offerings for energy efficiency and electrification, tying to other local or state offerings where applicable	N/A
	2.2 Develop a **digital communication/marketing strategy** to target retrofit candidates	Review existing communications (e.g., newsletters, reminders) to determine if there are opportunities to include energy efficiency program outreach	Include Cambridge-specific considerations as part of upcoming marketing and outreach "refresh", include a community-based social marketing plan to market efficiency solutions to specific customer segments	N/A
	2.3 Utilizing outreach channels identified in Action 1.3, **provide targeted education to tenants and small building owners** on topics such as deep energy retrofits, renewable energy procurement, and how to discuss energy efficiency with internal leadership.	Support outreach efforts by Eversource and BEUDO stakeholders by providing information about incentives and trainings in BEUDO reporting communications.	Engage small businesses and tenants on energy efficiency through a range of channels, including industry organizations, the Chamber of Commerce, and business improvement districts	Participate in outreach by sharing experiences with energy efficiency through industry organizations, the Chamber of Commerce, and business improvement districts.
	2.4 **Engage industry, including architecture, engineering, and construction firms** with education on efficiency programs for new construction, retrofits, and tenant fit-outs.	N/A	Develop training materials and conduct outreach to area architects, design firms, and engineers.	Develop training materials and conduct outreach to area architects, design firms, and engineers.
	2.5 Expand **building operator training** sessions held in Boston to Cambridge stakeholders to help building operators understand the latest best practices in building controls	Work with Eversource to host BOC sessions for the City of Cambridge; provide guidance on tailoring to any Cambridge-specific content or needs	Utilize existing training materials for sessions held in Boston to create a series of training offerings in Cambridge	Enroll building operators in training sessions once available
	2.6 Leverage information on successful program use and retrofit implementation through **workshops and case studies to facilitate peer-learning**	Share case studies developed by the City, Eversource, and Stakeholders	Collaborate with stakeholders to develop case studies and lessons learned for successful retrofit projects	Develop case studies and lessons learned for successful retrofit projects to share with other internal (e.g. finance departments) and external (e.g. vendors) stakeholders
	2.7 **Engage more directly with vendors**, exploring ways in which the concierge could evolve to be a vendor-driven model, and	N/A	Provide vendors with up-to-date program offerings and coordinate directly with vendors to develop specific marketing	N/A

	educate and encourage vendors to recommend incentives or renewable energy to customers		approaches to accelerate customer contact and enrollment	
3. Increased Technical Assistance Capacity *This set of actions is designed to address issues for stakeholders with gaps in lack of organizational staff capacity or lack of technical expertise and promote comprehensive building retrofit guidance.*	3.1 Develop a **Cambridge-based concierge funded by Eversource**, including a series of pathways (1-800 number or website, liaison, account executive, energy efficiency consultant) to fill the gap for organizations lacking staff capacity to focus on energy efficiency	Guide and/or help inform the development of a concierge program	Develop, fund, and administer a concierge program by mobilizing technical assistance and investigation teams	Help inform the development of the Concierge program by providing feedback throughout the near and medium-term phases of implementation.
	3.2 Develop **criteria for prioritizing buildings in large portfolios** for energy efficiency retrofits and help organizations determine what buildings to prioritize and enroll in a program	N/A	Develop criteria for prioritizing buildings in large portfolios to consider the activities, implementation strategies, and designated programs that exist currently for each individual customer, their activity within the BEUDO ordnance process to-date, as well as other characteristics that lend themselves to providing cost effective resources at scale.	Provide support to portfolio prioritization criteria development and implement criteria for portfolios to select buildings to enroll in program
	3.3 Develop and provide **segment-specific guidance** (e.g., large multifamily, labs) for owners, including segment-specific retrofit measures and engagement of segment-specific vendors	Provide segment-specific resources through the appropriate sector-specific outreach channel, appropriate outreach channels and share lessons learned with BEUDO stakeholders through Cambridge's Multi Family pilot program.	Develop segment-specific retrofit resources (e.g. air management lab program) by analyzing BEUDO data by building type and energy use intensity (EUI) and work with its existing vendor pool to develop specific market approaches to accelerate customer contact and enrollment.	Engage and collaborate with Eversource, where appropriate, to leverage information from completed retrofits to use in segment-specific approach development.
	3.4 Consider **whole-building, long-term planning** in building programs by *aligning capital budgeting cycles with energy efficiency retrofits*, providing *comprehensive building retrofit guidance*, and providing *enhanced incentives* for multi-measure projects	Explore opportunities to expand the Cambridge Multifamily Pilot to other building segments	Review projects under development with account executive/energy efficiency consultant teams, documenting type and implementation timeframe and provide enhanced incentives for multi-measure retrofit projects	Coordinate with and include Eversource in internal capital planning meetings, where appropriate
	3.5 Explore opportunities to **implement the DEEP model**, an alternative, no-money-out-of-pocket approach to energy efficiency for building owners funded through energy savings from improved performance	Develop DEEP program design, decide who will administer the program, and select the implementation contractor	TBD	Participate by enrolling in program, installing measures selected by implementation contractor, and repaying cost of installed measures

Eversource Program Support Plan

Background

The Building Energy Use Disclosure Ordinance (BEUDO) was enacted by the Cambridge City Council on July 28, 2014. The ordinance is a key step in efforts to reduce Cambridge's greenhouse gas (GHG) emissions. Energy use in buildings accounts for about 80% of GHG emissions in Cambridge, with two-thirds of the total related to commercial, institutional, and large multifamily buildings. The ordinance is intended to address this problem by requiring owners [Stakeholders] of larger buildings to track and report annual energy use to the City and publicly disclose the data. Disclosure places the information in the marketplace, where various users such as potential property buyers, tenants, realtors, energy service providers, and others can use the data and to help create value for higher energy performing properties.[7]

Eversource, acts as a Program Administrator (PA) under the program framework and goals set forth in the Massachusetts Three-Year Energy Efficiency Plan (2019-2021) for customers within Eversource service territory, including those businesses that happen to be Stakeholders to BEUDO, ultimately with the intent to reduce GHGs. In this role, as PA, the Eversource Energy Efficiency team facilitates energy and demand reduction of customers through their programs which offer incentives to offset project costs as well as technical and resource assistance to calculate energy savings and drive implementation.

Given these natural synergies and alignment, the City and Eversource have worked together to come up with an Implementation Support Plan. The intent of the plan is to develop a tailored approach, with near-term and long-term actions, to facilitate energy savings projects with the City's Stakeholders and to provide support for those interested in participating in the Energy Efficiency programs, while improving the customer experience and engagement practices. That program participation may have the added benefit of helping customers meet the requirements of the BEUDO ordinance.

Plan Description

This Implementation Support Plan is the result of a series of meetings as part of the City of Cambridge's BEUDO Task B Analysis. This task seeks to develop a voluntary, coordinated, comprehensive energy savings program for the City of Cambridge that will result in assisting BEUDO buildings best utilize existing program offerings through Mass Save and other state/utility programs to achieve deeper energy retrofits.

Short term actions (Q4 19-Q2 20) include working with stakeholders that have been active in the workshop discussions in identifying buildings and projects to implement. Longer term actions include developing a plan to support the balance of the BEUDO reporting customers. The Implementation Support Plan provided below is a positive step and is expected to serve as a foundation for continued engagement and support for the City and its Stakeholders.

Eversource is in the unique position to support the City of Cambridge and its Stakeholders while working towards meeting electric and gas savings goals.

Implementation Support

Eversource intends to provide a Concierge resource, whose role is to be a single point of contact that will act as guide and advisor to engaged Stakeholders and BUEDO reporting customers participating in the Support Plan. The Concierge would work to quickly connect a customer to the appropriate Eversource Implementation team, program or participation pathway to develop and implement comprehensive energy efficiency projects. The Concierge would be available on an ongoing basis if a customer or Stakeholder runs into barriers or challenges in navigating the program or in defining further resource needs to achieve energy savings. The Concierge will also be responsible for the feedback loop necessary to ensure the Implementation Support Plan is meeting its intended goals.

[7] https://www.cambridgema.gov/CDD/zoninganddevelopment/sustainablebldgs/buildingenergydisclosureordinance.aspx

In addition, Eversource will stand up a Cambridge-centric communication process that will include dedicated intake resources, such as email and phone access to a single point of contact to act as a customer guide, marketing material and project documentation services to inform BEUDO reporting customers of their program options, through Mass Save and where appropriate through direct customer contact, and to share best practices.

The following details the specific actions regarding a segmented approach to BEUDO customers. For clarity, the Implementation Plan was designed in such a way as to consider the activities, implementation strategies, and designated programs that exist currently for each individual customer, their activity within the BEUDO ordnance process to-date, as well as other characteristics that lend themselves to providing cost effective resources at scale. As such, within the Plan development process, the Stakeholders were put into three categories which took this and other considerations into account, in order to best support each group going forward. The high-level near-term plan of action for each group is described below.

Group A: Stakeholders with an Eversource MOU

Eversource has an active relationship with several large BEUDO reporting customers through strategic long-term agreements already in place via an individually negotiated Memorandum of Understanding (MOU). The MOU outlines commitments from both Eversource and the customer on budgets, incentives and energy savings project targets. Typically, these MOU relationships constitute multi-year engagement periods and in some cases have been renewed over time.

For the MOU customer base, Eversource will continue to manage the projects in the queue, and continue to explore a deeper, more comprehensive project approach and will track all outcomes. The following table details customers and the associated Eversource teams, as of the date of this document.

Company	AE	EEC	MOU	Comments
Boston Propeties	PATRICK MCDONNELL	KEVIN LUBINGER	Y	Property Management
MITMCo	GREG SENOSK	CHRISTOPHER PATRICK	Y	Property Management
Harvard University	GREG SENOSK	CHRISTOPHER PATRICK	Y	University
MIT	GREG SENOSK	CHRISTOPHER PATRICK	Y	University

Group B: Stakeholders without Eversource MOU

The second subset of customers within the BEUDO dataset are customers who do not have a MOU with Eversource but have been active in the stakeholder discussions. These customers are a mix of building types and potential energy efficiency project opportunities. Some customers have participated in Mass Save programs, some have not. For these customers, and any interested customers of this size and type as is consistent with current implementation strategies and methodologies, Eversource will identify the appropriate internal staff contact, or assign staff, and initiate an outreach effort to each customer within 60 days of the Implementation Plan release. This outreach will include an understanding of past program participation, key contacts and building type. Eversource will seek to understand and remove any barriers for participation including resource constraints, financial or technical.

The following table details customers and the associated Eversource teams in this subset. All remaining, unassigned customers will be assigned by the release of the Implementation Plan.

Company	AE	EEC	MOU	Comments
TD Bank	MIKE FITZGERALD	PAUL DEGNAN	N	BEA Program
Cambridge Hospital Alliance	BARRY MCDONOUGH	John Beaulieu	N	Hospital
Alexandria	PATRICK MCDONNELL	WILLIAM O'CONNOR	N	Lab
Biomed Realty	PATRICK MCDONNELL	WILLIAM O'CONNOR	N	Lab
Novartis	TORY KEMPF	WILLIAM O'CONNOR	N	Lab
Abcam		Q3	N	Lab
Avalon	GREG SENOSK	Marge Kelly	N	Multi Family
Homeowner's Rehab		Marge Kelly	N	Multi Family
Forest City		Marge Kelly	N	Multi Family
Equity Residential		Marge Kelly	N	Multi Family
CAI		Marge Kelly	N	Multi Family
WeWork			N	Office
Abt			N	Office
John Hancock			N	Office
EF Education			N	Office
Google			N	Office
Cambridge Innovation Center			N	Office
Jacobs	MICHAEL FITZGERALD		N	Office
JLL	PATRICK MCDONNELL	KEVIN LUBINGER	N	Property Management
CBRE		KEVIN LUBINGER	N	Property Management
Brixmor			N	Property Management
New England Development		Ivon Louis-Letang	N	Property Management CambridgeSide
Kimco			N	Property Management Memorial Plaza
Bank of America	PATRICK MCDONNELL	KEVIN LUBINGER	N	Retail
Umass Five Credit Union		Cambridge??	N	Retail
Equitable Bank		PAUL DEGNAN	N	Retail

Group C: Additional stakeholders reporting to BEUDO reporting customers

Remaining customers not addressed above will be engaged through an evaluation process of the BEUDO data. This analysis will take place within 90 days of the release of the Implementation Plan.

As is consistent with implementation strategies and methodologies for participating customers, Eversource will analyze the BEUDO data to identify customers to contact and enroll in the Mass Save programs. The data will be analyzed by building type and EUI. Specific building and customer types will have slotted into appropriate program types as certain customer/building types have unique programs and incentives associated with them, streamlining participation. Eversource will collaborate with external business partners/vendors, where deemed appropriate, to develop specific market approaches to accelerate customer contact and enrollment. A community based social marketing plan will be initiated to market efficiency solutions to specific customer segments. Finally, Eversource will look to facilitate access to financing for customers where up-front capital is an issue, as is consistent with current EE program practices to help customers address barriers to achieving energy efficiency savings.

Conclusion

Eversource is committed to work with the City of Cambridge and all Eversource customers to implement a highly visible, creative and impactful approach to educating and enrolling customers into Mass Save programs with the goal to implement comprehensive energy efficiency projects, whose outcomes should help fulfill the BEUDO ordinance requirements.

Pre-Workshop Stakeholder Memos

Workshop 1

To: City of Cambridge
From: Cadmus
Date: October 26, 2018
Re: BEUDO Task B Intake Interviews

Overview

This memo summarizes feedback provided through four initial intake interviews with key stakeholders to support the design of a comprehensive retrofit program for Task B of the Building Energy Use Disclosure Ordinance (BEUDO) with the City of Cambridge. Interviewees included representatives from the finance sector, an energy efficiency provider, a large tenant and building owner, and an electric utility. Interviewees were asked a series of questions pertaining to their experiences related to energy efficiency projects and offerings in Cambridge, barriers to program participation, and desired end products of the comprehensive retrofit program design process. These responses are intended to help shape the stakeholder workshops for Task B and identify areas for further research moving forward in this process.

Perception of Current Offerings and Net Zero Action Plan Objectives

Each of the interviewees was asked a series of questions to gauge their familiarity with BEUDO, the existing Mass Save offerings, and perceived feasibility of meeting the proposed BEUDO performance requirements as part of Cambridge's Net Zero Action Plan.[8] Interviewees indicated at least a general understanding of BEUDO, but mixed levels of understanding of Mass Save offerings. **Interviewees noted there is current confusion** on what programs, opportunities, and sources of funding are available to customers.

When asked about the feasibility of meeting the proposed performance requirements, stakeholders agreed that, because energy reduction measures become more difficult and involved as low-hanging fruit retrofits are implemented, BEUDO targets will require an increase in **customer intentionality and buy-in** to achieve the targeted savings.

- One stakeholder expressed concern at the **ability to maintain savings over time** to continually meet BEUDO performance requirements.
- One stakeholder noted that there is a mismatch of internal **capital planning cycles** and utility project capture cycles; by the time the utility is reaching out about projects at the end of the year to make end-year sales, funding has already been allocated elsewhere. Communication needs to happen early and often to ensure retrofits are undertaken.

Existing Program Challenges, Gaps and Potential Solutions

Challenges

Given their experience with energy efficiency offerings, interviewees were asked to identify challenges they have faced regarding the existing programs and any gaps in offerings they encountered. There was consensus that that generating **customer buy-in** and **appropriating capital resources** is a barrier.

Both the tenant-owner and service providers interviewed emphasized that most commercial building owners are "not in the business of facility management", highlighting that building retrofit projects are **competing for time and resources** with primary business interests and thus require compelling justification for approval. In a similar vein, it was expressed that participation in energy efficiency

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[8] The Net Zero Action Plan proposed an evaluation of building performance targets based on EUI, GHG emissions or ENERGY STAR. To meet the City's current 2050 net zero emissions target, this would require approximately 10-15% reductions in EUI performance over a 5-year time period. This target and a series of other policy proposals will be the subject of upcoming public processes.

programs needs to be easier and more accessible for customers, through **increased customer education** and **accessibility of program information.**

Interviewees also agreed that **financing for mid-size customers** is a gap that needs to be filled. An interviewee noted that smaller businesses have higher incentive rates in Mass Save offerings and larger businesses often have access to private financing, while mid-size customers fall in between. However, there was not consensus among interviewees when asked if the implementation of PACE financing would alleviate this issue for all customers, as the cost of capital can be expensive. Outside of smaller business customers, there has also been more limited uptake of the Mass Save Commercial Loan program due to the available alternative, competitive capital sources.

Proposed Solutions and Programs

Interviewees were asked if there were additional incentives or program offerings they would like to see incorporated into a comprehensive retrofit program. Stakeholders emphasized the need for increased education and accessibility of resources regarding program offerings and suggested that a retrofit program "**may not need to push anything extra special** for Cambridge, but instead **educate on how to take full advantage of existing offerings**". Because the most beneficial retrofit measures for buildings are determined on a case-by-case basis, interviewees emphasized that a proposed retrofit program needs to **maintain flexibility** for customers.

One interviewee proposed a series of additional programs and/or areas of focus:

- Programs that place an emphasis on **controls**, **active management**, and **proper O&M implementation;**
- Efforts to **promote duct sealing and insulation**, marketing the year-round benefits it can provide instead of focusing only on the winter months; and
- Improved incentives for equipment replacement as part of **strategic electrification initiatives.**[9]

In addition to financial incentives**,** stakeholders noted that PA offerings such as **the availability of technical assistance, engineering support services and facility manager training** should be highlighted as these resources are currently underutilized. Multiple stakeholders indicated value in tailoring programs, marketing, and distribution of information to each **market segment** (e.g., hotels, office, etc.).

Customers indicated the desire for the working group to investigate **natural gas and/or steam service program offerings**, as programs have predominantly focused on the reduction of electricity consumption. One interviewee also suggested the working groups explore the possibility of implementing **alternative taxation models** through the City as an incentive to facilitate broader buy-in, similar to Boulder's funding of supplemental initiatives via their climate planning tax.

When asked if there were **successful programs from other states or localities** that could be investigated for BEUDO application, interviewees highlighted the following:

- **Energize CT**
- **Small Business Energy Advantage (SBEA) loan program** in Connecticut, in which up to $100,000 for C&I customers and $500,000 for municipal customers is available at 0% interest to the borrower for a 48-month term. These loans are repaid on the electric bill and are available for energy efficiency improvements.
- **New Jersey PSE&G Clean Energy Future (CEF) program,** which, among other initiatives, provides nearly $2.5 billion for investment in various energy efficiency offerings. The program places an emphasis on low-income, multi-family, small business, and local government customers.
- **New York and Connecticut Green Banks**, which provide low-cost public capital with a high-leverage ratio of private sector dollars to support projects; and

[9] The utility term sheets have defined a new C&I heat pump target of approximately 17,000 units that will be supported in 2019-2021, though precise details remain under discussion. This further incentivizes utilities to pursue energy optimization.

- States with existing **C-PACE financing** with healthy participation rates (i.e. C-PACE in Connecticut, New York and Rhode Island).

Based on the workshop outcomes, these options can be explored in further detail.

Desired Process Outcomes

Near the conclusion of the interviews, interviewees were asked to identify the desired end products and outputs of a comprehensive retrofit program they would like to see, as well as suggestions for aspects of the stakeholder engagement process.

Comprehensive Retrofit Program

Desired outcomes surrounding a comprehensive retrofit program identified by stakeholders included:

- **Action** by the customers, with hopes that the retrofit program will produce an appetite for actual projects and mechanisms for buildings to recognize energy savings.
- Improved public **access to information**, with resources developed in a way that is simple and easy to maneuver, yet comprehensive and informative. This information should **highlight both financial and non-financial benefits** of retrofits and marketed through a broad range of marketing mechanisms such as direct mailers, email drip campaigns and online platforms (e.g. Google and Facebook).
- A means to address the lack of **tenant-landlord engagement** and split incentives issues.
- Elements that can help **improve ROI** for building owners.

Stakeholder Engagement Process

Interviewee feedback on elements they would like to see incorporated into the stakeholder engagement working group process included the following:

- Interviewees would like **more specificity** within workshops. One interviewee suggested participants come prepared to discuss questions received ahead of meetings and that pre-workshop homework exercises for stakeholders to consider be provided.
- Interviewees expressed the desire to leave with a **better sense of the programs and offerings** that will be available as part of the retrofit program.
- One interviewee recommended that later working group meetings (i.e. Meetings 3 &4) should have time set aside to **summarize progress made between the meetings** (e.g. address why certain proposals may no longer be under consideration) to update stakeholders on potential changes and help contextualize activities.
- Working group meetings should include **breakout groups by market segment** to identify segment “pain points” and ways to address them via energy efficiency.

Workshop 2

To: City of Cambridge
From: Cadmus
Date: December 6th, 2018
Re: BEUDO Task B Workshop 2 Research

Overview

As the City of Cambridge continues to explore facilitating the development of a voluntary, comprehensive retrofit program for BEUDO buildings, the next step is to review the shape the program could take, mapping to the needs the program should address. This memo seeks to:

- Summarize findings and next steps from Workshop 1,
- Provide additional quantitative analysis to direct program design,
- Summarize research on three topical programs in other jurisdictions that may be relevant to Cambridge based on the barriers and needs established thus far, and
- Include initial framing of discussion questions for Workshop 2.

Workshop 1 Findings

Workshop 1 was held on November 14, 2018 at MITIMCo. It introduced Task B to stakeholders and included research surrounding energy efficiency programs available for Cambridge buildings, proposed offerings in the 2019-2021 Three Year Energy Efficiency Plan, and perceived barriers to energy efficiency retrofit participation as described by stakeholders in initial interviews. To help inform the next stages of research, the purpose of the meeting was to:

- (1) collect stakeholder feedback on their experiences with existing energy efficiency and incentives programs and the needs that a voluntary comprehensive retrofit program should address to increase energy efficiency program results for BEUDO buildings, and
- (2) determine the focus areas for Workshop #2 research, including programs from other states and/or localities that may be relevant to Cambridge's potential comprehensive retrofit program.

In two breakout groups, stakeholders discussed barriers and needs associated with energy audits and efficiency measures including technical assistance, incentives for conservation measures, financing, timing, new technologies, outreach, and renewables. A full summary of the barriers and needs identified by stakeholders in both small group discussions is included in ***Table 1***. Responses generally emphasized three areas of focus: technical assistance, timing, and financing. Overall, the sense of stakeholders was not that the range of current Mass Save and state incentive and program offerings are lacking, but the means of implementing energy efficiency measures and program delivery could be improved.

Table 1. Summary of Barriers and Needs

Category	Barriers	Needs
Technical Assistance	• Audit providers lack the technical capacity to conduct comprehensive audits • Having a facility manager does not ensure an organization has capacity for strategic planning • Some confusion surrounding available incentives and assistance	• Translate technical content from audit reports into capital planning actions • More detail in audit reports and recommendations • Green workforce development for new equipment operations and maintenance (O&M) • Utilities to follow up on audits and connect building owners to program options • Having a person to call and speak with about program options • Clear, streamlined understanding of incentives available
Timing	• Energy audit report timing: Not getting information early enough in planning cycle • Hard to implement retrofits in occupied buildings • Difficult finding building downtime to implement measures • Few building-wide opportunities • Weather and season dependent • Internal tenant coordination	• Internal and City pressure to move projects along in alignment with carbon reduction goals • Early outreach to buyers during property changeovers and rehabs • Address replacements before emergency response is needed • Aligning timing of energy efficiency upgrade with capital improvement cycle
Financing	• Not having financing means to support energy conservation measures (ECMs) from audits, particularly for small to medium-sized buildings) • Defining a customer as small-medium doesn't necessarily equate to a small-medium size investment in energy efficiency (EE) • Difficult to secure funding internally; funding for energy efficiency is primarily through limited capital funds	

Other	• Staff capacity to commit to EE projects • Recent increase in Cambridge permit fees	• Package energy and non-energy benefits (e.g. water consumption) • Increased tenant awareness • Benchmarking to determine what segments to target • Pursue renewable energy (RE) and EE actions in tandem • Balance short vs. long-term EE projects

Given these barriers and needs, the following areas were identified for Workshop 2 research:

- Services that help **connect building owners and tenants with energy efficiency resources**
- **Enhanced energy audit process** that provides more detail in audits, timing that is better aligned with planning cycles, and resources to help translate audit results into actionable measures compatible with capital planning
- Capturing the attention of buyers and new tenants early in the process and implementing ECMs at **property time-of-sale or changeover**
- Energy efficiency **workforce development** and training
- Connecting a retrofit program to **benefits beyond energy efficiency**, including water, electrification, and renewables
- **Bundling** of energy efficiency measures and approaches

Cambridge Building Data Analysis

Cadmus has conducted research to begin to identify areas of focus for a comprehensive retrofit program, to include building segments and sizes that could be targeted. This quantitative analysis sought to understand how opportunities for energy reduction within Cambridge buildings might be prioritized. The needs expressed by stakeholders in Workshop 1 were mapped to these opportunities to begin to illustrate how and where a comprehensive retrofit program could best serve Cambridge buildings. The analysis considers the desire for Cambridge to maximize energy savings across the city, but also make undertaking energy efficiency projects accessible to a range of BEUDO buildings.

Methodology and Data Processing

First, Cambridge BEUDO-reporting buildings were classified based on square footage, and the sum of source energy use for each size set and number of buildings in each set was determined[10] (***Table 2***). A secondary analysis conducted on the basis of site energy usage found minimal differences in energy use proportions by building size and type when compared to source energy-based figures. **Buildings 100,000 sf and larger consume over 75% of building energy in Cambridge, and buildings between 100,000 sf**

[10] Analysis conducted using 2016 data reported to BEUDO

and 250,000 sf consume over 40% alone. However, small buildings constitute the majority of Cambridge properties, with nearly 60% of buildings occupying under 100,000 sf.

Table 2. Energy Use and Properties by Floor Area

Building Square Footage	Total Source Energy Use (kBtu)	Percent of Properties	Number of Properties
<50,000	7.74%	34.09%	194
50,000-100,000	14.61%	25.31%	144
100,000-250,000	40.95%	30.23%	172
250,000-500,000	30.90%	9.49%	54
>500,000	5.80%	0.88%	5
Total	**100.00%**	**100.00%**	**569**

To further understand where building energy in Cambridge is consumed, properties classified in the square footage sets were further divided among the self-identified largest use of the property (***Table 3***). Of all sizes and use types, **college/university buildings** between 100,000 and 250,000 sf are the single largest energy consumer, constituting **13.6%** of energy consumption. This is followed by **laboratories** between 250,000 and 500,000 sf at **11.2%.** It should be noted that buildings classified as college/university may also include lab space, as there was variation in the self-identification of these buildings.

Table 3. Source Energy Use by Property Use and Floor Area

Largest Property Use	<50,000	50,000-100,000	100,000-250,000	250,000-500,000	>500,000	Total	Number of Properties
College/University	2.30%	4.98%	13.60%	6.18%	0.00%	27.06%	155
Laboratory	0.90%	2.55%	8.09%	11.24%	1.79%	24.57%	41
Office	1.00%	2.77%	7.12%	6.12%	0.32%	17.32%	91
All Others	2.48%	2.50%	4.70%	1.78%	1.32%	12.78%	108
Multifamily Housing	0.80%	1.40%	4.96%	2.45%	0.33%	9.95%	128
Hospital	0.00%	0.00%	0.00%	1.51%	2.03%	3.55%	3
Hotel	0.00%	0.06%	1.14%	1.40%	0.00%	2.60%	9

Residence Hall/Dorm	0.27%	0.34%	1.35%	0.21%	0.00%	2.17%	34
Total	**7.74%**	**14.61%**	**40.95%**	**30.90%**	**5.80%**	**100.00%**	**569**

"All Others" is comprised of K-12 schools, parking, worship facilities, data centers and retail, among other uses

When considering the design of a comprehensive retrofit program, this data highlights opportunities to target office buildings, multifamily housing, and the diverse set of buildings classified here as "other" with a retrofit program.

Implications for Retrofit Program

Data suggests that **greater savings opportunities exist for buildings over 100,000 sf**, however stakeholders indicated that capacity-constrained buildings need additional support. This often correlates to buildings that are physically smaller or managers that maintain fewer properties and have less experience with energy usage and conservation. To achieve deep energy reductions in Cambridge and progress toward net zero goals, it is clear **that colleges/universities and laboratories must be addressed as they constitute over 50% of Cambridge's energy consumption**. Colleges and universities, however, are already actively engaged in the energy efficiency space, and labs pose unique energy efficiency challenges that are currently being explored with the Net Zero Labs Working Group.

Given these college/university and laboratory considerations, **office space represents the next largest target** for a comprehensive retrofit program, constituting 17% of energy consumption. When mapped to needs expressed by stakeholders at the last workshop, this segment would benefit from actions to **address timing-related issues**, such as integrating energy efficiency into capital planning cycles and capitalizing on building turnover/sale as a time to introduce and implement energy efficiency projects. There are also opportunities for a program to help **address the internal financing competition energy efficiency faces** and the complexities of tenant coordination for larger retrofit projects. Additionally, the age of buildings should be considered to determine if retrocommissioning or retrofits are most applicable. While retrocommissioning can be performed on both old and new buildings, retrofits are most beneficial to older buildings than less older buildings. Forty percent of Cambridge office buildings were built before 1975, and another 40% were built between 1975 and 1999, leaving 20% of office buildings built within the last 20 years.

"Other buildings" are a fragmented assortment of building types that individually represent a modest amount of total energy consumption, but collectively constitute nearly 13% of building energy use from BEUDO buildings. These buildings are predominantly small-medium buildings (under 100,000 sf) and include retail and schools. Other buildings may be served well by marketing of turkey programs and provision of technical assistance or concierge-type services to walk owners through energy efficiency options. Concierge services extend beyond traditional technical assistance by providing individualized support throughout the entire retrofit process. Interestingly, buildings identified as parking fall into this

category and comprise 1.8% of total Cambridge energy consumption. This may represent an untapped low-hanging fruit opportunity for energy reduction[11].

Lastly, **multifamily housing represents nearly 10% of Cambridge building energy use**. While Cambridge has a multifamily building pilot, it targets smaller properties, which would not report to BEUDO. The needs and management structure of small and large multifamily properties may be different, and this could be explored further by working with Cambridge staff to examine the motivation behind pursuing the existing pilot and determine what actions are most beneficial for multifamily buildings within BEUDO. It is possible that these larger buildings would benefit from energy efficiency actions similar to those applicable to office buildings. Also similar to office buildings is the consideration of building age when considering ECMs. 73% of multifamily housing stock in Cambridge was built before 1975, and 44% was built between 1950 and 1974. Only 11% of multifamily housing was built in 2000 or later. While renovations may have occurred over the years, it is worth noting that Cambridge multifamily housing stock is likely well suited to both retrocommissioning and retrofits.

Future analysis in the retrofit program development process could consider what other resources building owners and property managers of these building types engage with to identify areas where they could be easily engaged by energy efficiency marketing. Should Cambridge wish to pursue opportunities in each of these segments, they may **consider phased implementation of programs and resources to implement in stages over time**. The order of implementation would be determined based on whether Cambridge would first like **to prioritize breadth of engagement,** or **depth of energy reduction opportunity.**

Program Case Studies

Workshop 2 research also investigated programs and efforts pursed in other jurisdictions that may be relevant to the needs identified by Cambridge stakeholders for a retrofit program. Summarized here are the NYC Retrofit Accelerator, PG&E's Commercial Whole Building Pay for Performance Pilot, and findings from the Consortium for Building Energy Innovation.

NYC Retrofit Accelerator

The NYC Retrofit Accelerator is a city-funded program launched by the City of New York in September 2015 to provide "**free advisory services to help streamline the process of making building improvements" for privately-owned buildings in NYC**. The program was deployed to help buildings comply with retrocommissioning requirements and utilizes benchmarking data collected per local energy laws. The NYC Retrofit Accelerator targets buildings over 50,000 square feet and incorporates a number of elements that address many of the technical assistance-related needs identified by stakeholders in Cambridge.

[11] The City of Cambridge has 11 buildings classified as "parking." These buildings consumed an average of 2.3 million kWh per building in the reporting year.

The program staff are contracted by NYC and consist of a program manager and **six "efficiency advisors" who provide one-on-one assistance** to property owners and managers regarding energy efficiency and building improvements. The program also maintains a network of 12 "ambassadors," or organizations that help promote the services provided by the Retrofit Accelerator. Example organizations include the New York Association of Realty Managers, the New York City Energy Efficiency Corporation, and the Association for Neighborhood and Housing Development. Lastly, the Retrofit Accelerator is partnered with two utilities, ConEdison and National Grid, to further advertise their services.

Services for customers include **technical assistance, connecting with contractors, finding incentives and financing, building staff training, and general project support**. The Retrofit Accelerator provides educational resources on ways to save on heating, cooling, lighting, water, building envelope, and renewable energy. The website hosts the "NYC Incentive Map," similar to the Mass Save Application Portal, to sort available incentives by building type, opportunity, heating fuel, and program administrator. The **Green O&M Training Hub provides resources for a variety of facility operations and maintenance staff**. The Retrofit Accelerator directly offers one to two-day training sessions for building operators through the training hub, and also provides information on NYC-area courses for building operations and performance.

This program utilizes benchmarking and energy audit information to prioritize buildings and subsequently tailor marketing toward buildings that need the assistance. As of November 2017, 1,631 participants had completed projects, 343 were in progress, and an additional 3,261 had engaged with the program. Efficiency advisors found that it was important to **leverage existing relationships to reach participants** and that **specificity in project recommendations increased the likelihood of project uptake**. Additionally, they found that a **focus on specific upgrades** prevented participants from being overwhelmed and made ECMs implementable[12]. These lessons could merit an investigation of segment-specific outreach in Cambridge.

Key Takeaways

- Addresses the need expressed by stakeholders to have a contact for energy efficiency programs and a means of receiving clear, streamlined information about incentives
- Program could make energy efficiency more accessible to capacity-constrained building owners and operators

PG&E Commercial Whole-Building Pilot Program

Pacific Gas and Electric (PG&E), an electric and gas utility which serves a majority of California, implemented a **pay-for-performance (P4P) incentive model pilot for commercial buildings**, beginning in 2013. The program was relatively small (12 buildings) and addressed multiple measures, including retrofit, retrocommissioning, behavioral, and operational savings. The program was designed to target

[12] IMT. (2018). Successful Partnerships to Accelerate Efficiency: NYC Retrofit Accelerator.

small to medium commercial buildings (10,000-100,000 sf), which include office, retail, grocery, government, and educational facilities.

In a P4P model, incentive payment is received based on building performance over a designated period of time, as opposed to up front. In the PG&E program, a **hybrid payment structure included a portion of the incentive paid up front, and the remaining portion paid after the first year** based on energy savings compared to pre-implementation levels. While this program implemented a one-year performance period, limiting financial and performance risk, longer programs have an opportunity to incentivize more consistent savings with deeper retrofit measures.

Buildings were targeted for participation by taking existing energy data and screening for the consistency of historical data usage.[13] While this limits eligibility of buildings, better baseline data increases the reliability of savings estimates. The PG&E program **targeted 15% energy savings**. It has been suggested that P4P programs target a reduction of 10% or more compared to a baseline to differentiate energy savings from other energy use variations.[14] PG&E's requirements for participation included installation of at least three qualifying retrofit measures above code, 12 months of stable operations prior to the commitment date, and 24 months of stable building operations following implementation. Lessees must have three years remaining in their lease agreement. Verified results for this program as of early 2017 indicate **average kWh savings of over 20% and installation of four ECMs**. However, the verification of savings in the program has been involved and time consuming.[15]

According to analysis by the Natural Resources Defense Council[16], purely **P4P models may not be sufficient to overcome Massachusetts market barriers** experienced by existing P4P models, including high up-front costs for metering systems and a lack of qualified engineering firms. Additionally, feedback from stakeholders has been in favor of turnkey solutions, suggesting a preference for moving away from P4P options. Eversource has also moved away from P4P in the latest Energy Efficiency Three Year Plan with the latest retrocommissioning offerings. Thus, the applicability of P4P to Cambridge and its energy efficiency strategy is worthy of further discussion.

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[13] Numerous factors affect energy usage, including occupancy and thermostat set-point changes. When evaluating the feasibility of P4P for a building, it can be time consuming and expensive to normalize for these factors. Thus, buildings with consistent historical energy use make better P4P candidates, as payment is tied to the performance of a building against a pre-measure estimate based on historical data.

[14] NRDC. (2017). Putting Your Money Where Your Meter Is: A Study of Pay for Performance Energy Efficiency Programs in the United States

[15] GTM. (2015). PG&E's Pay for Performance Pilot is a Big Deal for Energy Efficiency

[16] NRDC. (2017). Putting Your Money Where Your Meter Is: A Study of Pay for Performance Energy Efficiency Programs in the United States.

Key Takeaways

- P4P is an alternative incentive delivery method that is designed to incentivize continued energy savings
- When applied in suitable buildings, P4P provides an opportunity for high energy savings
- This case study illustrates success with P4P in the same kinds of buildings identified as targets in the above quantitative analysis

Consortium for Building Energy Innovation (CBEI)

Active in Pennsylvania from 2011-2016, CBEI was "a multidisciplinary collaboration of universities, private sector technology companies, and economic development agencies formed to **focus on developing solutions to address the energy efficiency retrofit challenges in the small- and medium-sized commercial building (SMSCB) market"**[17] with the goal of targeting a 20-30% energy use reduction in buildings under 250,000 square feet. CBEI identified four focus areas to achieve such improvements, including **integrated design, technology packages, portfolio solutions, and workforce development**. While the integrated design and technology packages focus areas may be more applicable to the design of Mass Save offerings, portfolio solutions and workforce development aspects of the program incorporated efforts that could be adopted by a voluntary retrofit program in Cambridge. The role of CBEI was to research and pilot energy efficiency measures with the goal of producing implementable, scalable programs for commercial buildings.

Integrated Design and Technology Packages

Integrated design emphasizes the role aligning multiple buildings systems plays in generating more robust energy efficiency solutions. This primarily included research on simulation modeling and highlighted that modelers are often not included in smaller retrofit projects due to capacity constraints and lack of technical know-how. CBEI also conducted research to prioritize opportunities for energy efficiency and identified **building envelope (i.e. windows, walls and doors), HVAC, and sensing and controls** as key areas of focus. Within sensing and controls, CBEI also explored the role that **building automation** could play to improve existing equipment performance, while limiting the amount of new equipment needed.

Portfolio Solutions

The portfolio solutions focus of CBEI sought to address actions stakeholders with large portfolios could undertake to address energy efficiency. Targeting larger portfolios was a means of enabling a large number of retrofits to be performed by empowering managers with data and audit information across their building stock.

[17] Consortium for Building Energy Innovation

CBEI supported Philadelphia in implementing its benchmarking ordinance in 2012 and collaborated with incentive program administrators to create data-driven, targeted approaches for incentive delivery[18]. CBEI also helped develop and implement an **on-bill financing program pilot** with the Navy Yard Electric Utility[19], which includes offerings for renewables and combined heat and power to be financed through monthly electric bills.

Workforce Development

The workforce development focus of CBEI was intended to increase energy efficiency literacy among building owners, operators, managers, and regulators. The Department of Energy produced the Better Buildings Program guidelines, which are designed to "improve quality and consistency of commercial building workforce credentials."[20] CBEI built upon this to create a competency model for building energy auditors, building commissioning professionals, building operations professionals, and energy managers. This has helped **identify areas in which additional training should be developed and offered** to enhance building operations and retrofits.

CBEI collaborated with Pacific Northwest National Laboratory, the Building Owners and Managers Association (BOMA), and APPA: Leadership in Educational Facilities[21] to develop a Building Re-Tuning Training. This training, with options for buildings with and without building automation systems, is designed to **help building operators return buildings to their optimal performance**. The training was deployed nationwide in 2016, and actions identified in the training can help reduce building energy use from 5-25%.

CBEI also developed a **Broker Training Course**, which provides **energy efficiency education to brokers to represent building energy performance in transactions between owners and tenants**. Massachusetts was identified by CBEI as a market for the broker training and CBEI made contact with providers via the National Association of Realtors. At the conclusion of the CBEI term, the broker training program was planned to be taken up by the Certified Commercial Investment Member Institute (CCIM). In Cambridge, stakeholders identified the importance of property changeover as a time for implementing deeper energy efficiency retrofits, and a broker training may be an opportunity to introduce and educate on this concept.

Given the emerging trainings available to address workforce education and development, there are a number of ways Cambridge could support such programs. Options include **working with Eversource** to incentivize and support trainings for buildings with high energy use, **coordinating with trainers to tailor**

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[18] Targeting Rebate Program Customers with Benchmarking Data Analytics Methods

[19] On Bill Financing Case Study: PIDC and the Philadelphia Navy Yard

[20] US Department of Energy Better Buildings Workforce Guidelines

[21] APPA: Leadership in Educational Facilities is the organization formerly known as the Association of Physical Plant Administrators. APPA works at the interface of education and facilities management to deliver positive learning environments for students, faculty and staff.

training so it is responsive to the needs in Cambridge buildings, or partnering with organizations to **provide targeted outreach for training program recruitment**.

Key Takeaways

- Guidance exists on how to use benchmarking data to target buildings for energy efficiency projects
- Cambridge stakeholders have expressed interest in workforce developments such as the City of Boston Building Operator Controls (BOC) Training Pilot, and a variety of implementable trainings exist
- Utilities are committing to training and education in the latest Energy Efficiency Three Year Plan, so more training opportunities are on the horizon

Workshop 2 Discussion Questions

In Workshop 2, the intent of small group discussion is to shift away from discussion of barriers toward outlining how a retrofit program could address the specific needs of stakeholders and what it could look like. Ahead of Workshop 2, we would like stakeholders to consider the following questions and come prepared to share their thoughts:

- Based on your understanding of Cambridge buildings and the data analysis presented in this memo, where do you think a retrofit program should focus (e.g. building size and/or types)?
- Which of the needs identified from Workshop 1 resonate most with you? Which needs should a comprehensive retrofit program focus on addressing?
- Does your organization have any outstanding financing needs surrounding energy efficiency, and should a retrofit program seek to address financing needs?
    - Is the prospect of establishing a Cambridge Green Bank to finance energy efficiency projects one that should be pursued as part of this initiative?
- Do any of the programs from other jurisdictions seem valuable to replicate or consider for Cambridge?
- Are there any additional needs for a comprehensive retrofit program you can identify that this analysis has not yet captured?

Suggested programmatic offerings for a comprehensive retrofit program:

Type of Program/Service Offering	What services are potentially Included?	Barriers and/or needs addressed (Categorized by TA, Timing, Financing or Other)
Concierge Navigator Example: NYC Retrofit Accelerator	1. Services to help customers to navigate existing programs (e.g. NYC Retrofit style program) and connect building owners and tenants with energy efficiency resources 2. Enhanced energy audit process with more detail in audit 3. Services to help coordinate and improve timing alignment with planning cycles 4. Resources to translate audit results into actionable measures compatible with capital planning cycles	**Barriers addressed:** • TA – Audit providers lacking the technical capacity for comprehensive audits (e.g. HVAC technicians who lack the skills required to perform lighting audits) • TA – Facilities managers who lack capacity for strategic planning efforts (Small-Medium sized businesses) • TA – Confusion surrounding incentives and available assistance **Needs addressed:** • TA - Translating technical content from audit reports into capital planning actions • TA - On-call representatives and utility follow-up on audits • TA - More detail in audits • TA - Clear, streamlined understanding of incentives • Other - Benchmarking to determine what segments to target • Other - Increased tenant awareness
Training (cross-cutting) and workforce development (WFD) Example:	1. Building operations training and workforce training to build a pool of new facilities managers (e.g. Building Operator Controls training) 2. Internal education for building staff on the benefits of retrofits to help gain traction internally	**Barriers addressed:** • TA – Audit providers lacking the technical capacity for comprehensive audits (e.g. HVAC technicians who lack the skills required to perform lighting audits) • Financing – Difficulty securing funding internally • Other – Staff capacity for EE projects. A WFD training program could provide the training required for facilities managers as shortages of qualified personal is a barrier that has been noted.

Building Re-tuning Training developed by PNNL, BOMA and APPA		**Needs addressed:** • TA – Green workforce development for new equipment O&M • Other – Increased tenant awareness
Point-of-Sale	Program to intervene and capture the attention of buyers to encourage or require implementing ECMs at property time-of-sale or changeover	**Barriers Addressed:** • Timing – Energy audit report timing: information not provided early enough in planning cycle • Timing – Difficulties implementing measures in occupied buildings • Timing – Identifying building 'downtime' to implement measures • Timing – Dearth of building-wide opportunities • Timing – Internal tenant coordination • Financing – Difficult to secure funding internally
		Needs Addressed: • Timing – Internal and City pressure to move things along • Timing – Address replacements before emergency response is needed. • Timing – Early outreach to buyers during property changeovers • Other: Benchmarking to determine what segments to target
Bundling and Turn-Key Solutions Example: Boston Sustainable Office Design Program	1. This could include a package of prescriptive incentives for common retrofit measures for targeted facility types (e.g. office, multifamily, labs) 2. Tenants – Sustainable office design program – existing tenant-fit out program that offered bundled incentives for lighting packages – how could this be expanded?	**Barriers addressed:** • Timing - Weather and seasonal dependency • Timing – Internal tenant coordination • Financing - Lack of financing means to support ECMs from audits, particularly for small-medium sized buildings • Other – Increase in Cambridge permit fees (e.g. potential reduction in permit fee for buildings participating • Financing – Difficult to secure funding internally • Other – Staff capacity for EE projects and pursuit of incentives

		Needs addressed: • Other – Increased tenant awareness • Other – Pursuing RE and EE in tandem • Other – Balancing short vs. longer term EE projects
Changes in Incentive Delivery Example: PG&E Commercial Whole-Building P4P Pilot	1. Pay for Performance Pilot Models that incentivize: a. Deeper energy efficiency improvements (tiered incentive levels for higher reductions) b. Optimally uses hybrid approaches, where some payment is received upfront for cashflow 2. Early replacement incentive delivery for major building operating systems (e.g. boilers)	**Barriers addressed**: • Financing – Lack of financing means to support ECMs from audits, particularly for small-medium sized buildings • Financing – Defining customer as small-medium doesn't necessarily equate to a small to medium sized investment • TA – Having a facility manager does not ensure an organization have planning capacity for strategic planning • TA – Some confusion surrounding incentives and assistance
		Needs addressed: • TA – Translating technical content from audit reports into capital planning actions • Timing – Internal and City pressure to move projects along • Timing – Early outreach to buyers during sales/property changeover • Timing – Addresses replacements before emergency response is needed • Other – Deeper energy efficiency improvements
Cambridge Green Bank Example: Connecticut Green Bank, DC Green Bank	1. Funding mechanism for building owners to seek low interest capital loans for energy efficiency upgrades. 2. Service offerings could support energy efficiency, as well as renewable and water investments with demonstrated ROI allowing for comprehensive building upgrades.	**Barriers addressed** • Financing - Lack of financing means internal capital needed to support ECMs from audits, particularly for small-medium sized buildings • Financing – Defining customer as small-medium doesn't necessarily equate to a small to medium sized investment **Needs addressed:** • Financing – Difficulty securing funding internally • Financing – Funding for deeper energy efficiency improvements • Other – Pursuing RE and EE in tandem

Beyond Efficiency	1. Provides a connection point to building electrification 3. Enables coordination for City on Water/Energy Nexus and supports alignment between City and MassSave programmatic offerings.	**Barriers addressed:** • TA – Facilities managers who lack capacity for strategic planning efforts Timing – Few building wide-opportunities
		Needs addressed: • Other – Packaging energy and non-energy benefits • Other – Pursuing RE & EE in tandem • Other – Advancing building electrification • TA – Workforce development associated with management of fully-electrified buildings

Workshop 3

On December 18th 2018, the City of Cambridge held its second working group meeting as part of the City of Cambridge's Building Energy Use Disclosure Ordinance (BEUDO) Task B Analysis. Task B seeks to develop a voluntary, comprehensive retrofit program for the City of Cambridge to help BEUDO buildings best utilize existing program offerings through Mass Save and other state/utility programs to achieve deeper energy retrofits. These retrofits can help BEUDO buildings meet and exceed potential BEUDO performance requirements and also enable the deep carbon savings necessary to meet our mutual climate mitigation goals. In recognition of the urgency of these goals, the last two workshops will be more narrowly focused on fleshing out specific strategies that can enable more deep energy retrofits in BEUDO buildings.

Given the central role of the state MassSave program in incentivizing and delivering energy savings measures, the City of Cambridge and its consulting team conducted interviews with BEUDO stakeholders and Eversource to talk through opportunities to more fully utilize Eversource's Deep Energy Retrofit Program in context of the strategies which received the most interest at the last meeting (the Concierge Navigator concept, workforce development and training and going beyond efficiency). The consulting team also convened two tenant focus groups to further assess the barriers and opportunities for Cambridge buildings subject to BEUDO to pursue energy efficiency: one for offices and one for large multifamily.

The goal of the third working group meeting is to enable dialogue between the BEUDO stakeholders and Eversource to increase mutual understanding of the current MassSave deep energy retrofit program offerings and opportunities to improve these offerings to make them more accessible and impactful for BEUDO buildings. Resulting recommendations will serve as the basis for final program design for discussion during the fourth workshop in May. A high-level agenda of the third working group meeting follows:

- Welcome, introductions, and a recap of the prioritization results from the last workshop
- Presentation on existing offerings with a focus on Mass Save's Deep Energy Retrofit Program by Eversource
- Group discussion on the Deep Retrofit program and other offerings

In advance of the third working group meeting on Thursday, March 28, 2019 from 2pm-4pm at MITIMCo's offices, the project team has developed a set of conversation starters for consideration. If your buildings operators or property managers are planning to attend, please let us know in advance so we can ensure we have sufficient capacity to accommodate everyone. To prepare for a productive conversation, please consider the following questions in advance of the workshop:

- If your company has an Eversource Account Representative, who interfaces with the account representative from your team? We are most interested in understanding the person or persons role(s) or position(s) and encourage you to invite them to the workshop.
- Does your company have a Memorandum of Understanding (MOU) outlining energy saving and incentive commitments with Eversource? If so, how has the MOU influenced your energy retrofit activity?
- Are you aware of or has your organization used the Eversource Custom pathway for C&I to achieve deep energy retrofits?
- If you have utilized the Custom Pathway for C&I, what is your team's perspective on how this process might have been improved?

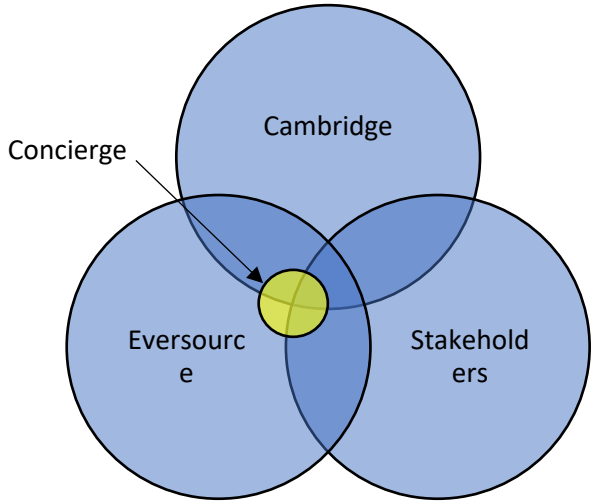
Workshop 4

Overview

During Workshop 3, Eversource presented on existing program offerings, including their **intake process, Custom Retrofit Program, and Equipment and Systems Performance Optimization (ESPO) Program**, that could support Cambridge's efforts to achieve deep energy reductions in BEUDO buildings. Further detail on existing programs is included in the first table below. The following table maps stakeholder feedback from Workshop 3 and the focus groups, provided through either discussion or in writing on the concierge navigator and the Mass Save program. This preliminary list is intended to **serve a starting point for development of a Cambridge comprehensive retrofit program straw proposal.**

High level findings from Workshop 3 indicated an interest in:

- Opportunities to streamline and/or optimize the **program intake process,**
- I**ncreased training and outreach on energy efficiency offerings** to vendors, finance, and design/engineering firms, and
- Provision of **comprehensive building retrofit guidance**, promoting multi-measure processes for whole buildings and incorporating capital needs assessments.

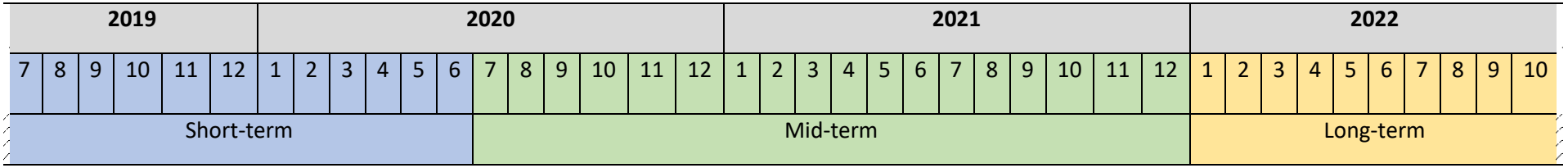


Opportunities are organized by groupings of the barriers and needs shared by stakeholders during Workshop 1. The three primary categories of needs and barriers included issues related to existing program awareness, needs for increased technical assistance, and additional training. The table organization also **considers feedback from the office, multifamily and labs focus groups**, which highlighted the need for assistance making the internal organizational sale for energy efficiency, increased building operator training, tenant engagement and having consistent contacts (internal and external) for energy efficiency needs.

As the straw proposal develops, areas for collaboration will also be mapped in a Venn diagram structure, noting efforts that will be led by the City, Eversource, Stakeholders, or a Concierge. This will also identify areas of collaboration between one or more groups. At this time, the concierge is planned to be housed within Eversource. The long-term potential for the concierge to be established as a separate entity will be reevaluated as the program evolves.

Suggested actions and areas of focus are denoted as happening in the short term, mid-term, or long term. **Short-term** refers to the present until July 2020, **mid-term** refers to July 2020 through 2021, **long-term** refers to 2022 and beyond.

Actions and programs developed during the short-term could be further developed and executed as pilots in the mid-term, creating the potential to be incorporated into the 2022-2024 Three Year Plan, if appropriate.



Existing Pathways Descriptions

Eversource currently offers two programs for energy efficiency retrofits: **Custom Retrofit Program** and **Equipment and Systems Performance Optimization (ESPO),** in addition to a suite of other incentives and offerings**.** Further detail on these two offerings are summarized in the table below.

To participate, stakeholders can either contact the **Cambridge liaison**, or utilize the **segment-specific intake process**. The segment specific intake utilizes account executives and energy efficiency consultants to walk participants through the process and arrange energy efficiency services.

Pathway	Current Opportunities & Workflow	Description
Custom Retrofit Program *Provides a "deep dive" into energy efficiency solutions using technical resource and study assistance through a preferred vendor. Ideal for capital projects.*	• Walkthrough Audit for ECMs • TA Study with Mass Save Vendor • Implement ECMs	• **Utilizes a customer relationship** with Eversource to optimize building operations and save energy. • Eversource can conduct a study on the facility to make recommendations and create an action plan. Eversource **typically funds half of the study, the customer pays the other half.** The customer portion ensures buy-in and dedicated resources from the customer to execute a project. • Eversource, the customer, and the vendor can create a custom retrofit project emphasizing comprehensive approaches ○ Entails **committing to an incentive amount, ensuring vendor follow through, conducting pre- and post-performance studies, and reviewing submittals** to evaluate the project.

		• Customers are **not required to work with preferred vendors** but can typically receive better incentives when partnering with preferred vendors.

ESPO
Offers low-cost/no-cost options for retrocommissioning buildings with existing BMS systems. Ideal for operations.
	• Building Assignment/Investigation
	• Implementation
	  ○ Low to No-Cost Operational Changes
	  ○ Tuning Systems
	  ○ Whole Building Tuning
		• ESPO examines current operating systems to **identify problems and low-cost/no-cost measures to improve performance** at no cost to the customer
		• Eversource will **fund 100% of retrocommissioning options**, to a certain level, and then will pay **additional incentives on a pay-for-performance (P4P) basis**.
		• Provides a pathway for building owners to receive incentives without cumbersome engineering calculations typically associated with a P4P.
		• Buildings **must have a BMS system** to participate and **need to pre-qualify** based on building type, use, and funding.
		• Three forms of optimization are available: **low-cost tuning measures, targeted tuning measures, and whole building and process tuning**.

New Straw Proposal Pathways

Need & Challenge	Action	Role	Timeframe
1. Improved Intake Process *Actions included here are intended to address the issues of lack of program awareness and need for program points of contact with whom stakeholders can interact. Tenants expressed need for consistent internal and external contacts for general energy efficiency program questions.*	1.1 Develop a **digital communication/marketing strategy,** potentially **leveraging BEUDO data** to target retrofit candidates	• City • Eversource	Short-term
	1.2 Develop and **maintain a list of design, engineering, and construction firms working on building projects** to ensure they have the latest program information	• City • Stakeholders	Short-term
	1.3 Conduct **outreach to local organizations** to engage a broader audience of building owners and tenants with information on energy efficiency offerings. Organizations may include **industry, professional, and trade organizations, the Chamber of Commerce, business improvement districts, financial institutions, and real estate brokers** and utilize existing stakeholder relationships to distribute information.	• City • Eversource • Stakeholders	Short-term

	1.4 **Identify the appropriate contacts**/types of positions (e.g., facilities, regional management) associated with tenants and building owners to ensure information on energy efficiency is received, first drawing upon BEUDO reporting contacts	• City • Eversource • Stakeholders	Short-term
	1.5 **Track building/renovation permits** to conduct outreach on available efficiency programs, with the understanding this may only influence future projects	• City	Mid-term
	1.6 Increase **utilization of MOUs** among existing MOU participants, to include exploration of opportunities for comprehensive retrofit approaches.	• Eversource • Stakeholders	Mid-term
	1.7 For non-MOU customers, **develop and maintain regular relationships** between building owners and Eversource to encourage program participation and enlist customer commitments in comprehensive actions	• City • Eversource • Stakeholders	Mid-term
	1.8 **Engage more directly with vendors**, exploring ways in which the concierge could evolve to be a vendor-driven model, and educate and encourage vendors to recommend incentives or renewable energy to customers	• Eversource	Mid-term
2. Increased Technical Assistance Capacity *This set of actions is designed to address issues for stakeholders with gaps in lack of organizational staff capacity or lack of technical expertise and promote comprehensive building retrofit guidance.*	2.1 Develop a **Cambridge-based concierge funded by Eversource**, including a series of pathways (1-800 number or website, liaison, account executive, energy efficiency consultant) to fill the gap for organizations lacking staff capacity to focus on energy efficiency	• City • Eversource • Concierge	Short-term
	2.2 Develop **criteria for prioritizing buildings in large portfolios** for energy efficiency retrofits and help organizations determine what buildings to prioritize and enroll in a program	• Eversource • Concierge • Stakeholders	Mid-term

	2.3 Develop and provide **segment-specific guidance** (e.g., large multifamily, labs) for owners, including segment-specific retrofit measures and engagement of segment-specific vendors	• Eversource • Concierge • Stakeholders	Mid-term
	2.4 Consider **whole-building, long-term planning** in building programs by *connecting capital needs and energy efficiency retrofits*, providing *comprehensive building retrofit guidance*, and providing *enhanced incentives* for multi-measure projects	• Eversource • Concierge • Stakeholders	Mid-term
3. Provide Additional Training *This need encompasses actions that can be taken after stakeholders are informed of program offerings and designed to help them take their next step toward energy efficiency implementation. Focus group participants expressed a need for resources to help with both making an "internal sale" on energy efficiency and increased building operator training.*	3.1 Host resources with **information about available programs in the Commonwealth for efficiency, electrification, and renewables,** including but not limited to Eversource offerings	• City • Eversource	Short-term
	3.2 Utilizing outreach channels identified in Action 1.3, **provide targeted trainings to tenants and small building owners** on topics such as deep energy retrofits, renewable energy procurement, and how to discuss energy efficiency with internal leadership.	• Concierge • Eversource • Stakeholders	Short-term
	3.3 Leverage information on successful program use and retrofit implementation through **workshops and case studies to facilitate peer-learning**	• Stakeholders • Eversource • City	Mid-term
	3.4 **Engage architecture and engineering firms** with education on efficiency programs for new construction, retrofits, and tenant fit-outs.	• Eversource	Mid-term

Roles Matrix

	City	Eversource	Stakeholders
Primary Role	***Local Outreach and Other Support***	***Program Development and Administration***	***Commit to Efficiency and Leverage Relationships and Experience***
Improve Intake Process	• Develop a marketing and communication outreach plan, in collaboration with Eversource where appropriate • Maintain list of design, engineering, and construction firms engaged in energy efficiency projects in Cambridge to keep informed of the latest program offerings • Engage tenants and small businesses on energy efficiency through industry and trade organization, chamber of commerce, or business improvement districts • Identify organizational contacts (e.g., asset managers, facility managers) for outreach • Track building permits and conduct outreach to those filing	• Develop a marketing and communication outreach plan, in collaboration with the City where appropriate • Engage tenants and small businesses on energy efficiency through industry and trade organization, chamber of commerce, or business improvement districts • Identify organizational contacts for outreach • Increase MOU utilization • For non-MOU customers, **develop and maintain regular relationships** between building owners and Eversource to encourage program participation and enlist customer commitments in comprehensive actions Engage directly with vendors • Utilize BEUDO data to target buildings by EUI and type	• Identify appropriate internal contacts to receive correspondence from Eversource and/or the City about energy efficiency offerings (e.g., asset managers, facility managers) • Periodically provide list of firms involved with efficiency projects to add to the City's database • Utilize existing relationships with financing institutions and trade/industry organizations to promote energy efficiency awareness • Increase MOU utilization, where applicable • For non-MOU customers, **develop and maintain regular relationships** between building owners and Eversource to encourage program participation and enlist customer commitments in comprehensive actions Commit to undertaking building efficiency projects

Increase Technical Assistance Capacity	• Guide/help inform the development of a concierge program • Explore opportunities to expand the Cambridge Multifamily Pilot to other building segments	• Develop and fund a concierge program by mobilizing TA and Investigation Teams • Review projects under development with account executive/energy efficiency consultant teams, documenting type and implementation timeframe • Develop criteria for prioritizing buildings in large portfolios • Develop segment-specific retrofit resources (e.g., air management lab program) • Engage segment-specific vendors • Provide enhanced incentives for multi-measure retrofit projects	• Provide support to portfolio prioritization criteria development • Implement criteria for portfolios to select buildings to enroll in program • Include Eversource in internal capital planning meetings, where appropriate
Provide Additional Training	• Maintain resources and/or documentation for available energy efficiency, electrification, and renewable energy programs in MA • Share case studies developed by the City, Eversource, and Stakeholders	• Create materials that summarize Eversource offerings for energy efficiency and electrification, tying to other local or state offerings where applicable • Collaborate with stakeholders to develop case studies and lessons learned for successful retrofit projects • Engage small businesses on energy efficiency through a range of channels, including industry organizations, the Chamber of Commerce, and business improvement districts	• Share and help develop case studies and lessons learned for successful retrofit projects to share with other internal (e.g. finance departments) and external (e.g. vendors) stakeholders • Engage small businesses on energy efficiency through a range of channels, including industry organizations, the Chamber of Commerce, and business improvement districts

Implementation Questions

- The City of Cambridge requests stakeholders **think deliberately about two implementation questions ahead of Workshop 4** to enable a productive conversation and transition ideas from concept to implementation.
    - ***What does the development and implementation of these pathways look like to you?*** To inform proposal development, we would like feedback on how stakeholders see their organizations participating in a comprehensive retrofit program and the kinds of actions that should be included (whether undertaken by the City, Eversource, or stakeholders).
    - ***What commitments are you willing to bring to the table?*** Implementation of a comprehensive retrofit program will require buy-in and commitments from the City of Cambridge, Eversource, and stakeholders. We would like to further understand what stakeholders are willing to contribute to the program and the kinds of efforts they would be willing to undertake as part of program implementation. Sample actions may include, but are not limited to:
        - Identifying organizational contacts to receive correspondence from Eversource and the City about program offerings
        - Developing case studies from successful projects to share with other organizations in Cambridge
        - Dedicating time to evaluate building portfolios and identifying near term candidates for comprehensive retrofits
    - ***Please provide two primary barriers for why your organization's buildings would be hesitant to participate in these proposed offerings.***

Workshop Summaries

BEUDO Task B Workshop 1 Notes

Existing Energy Efficiency Programs & Market Needs
November 14, 2018
MITIMCO

Attendees

Jeff Cook, Alexandria Real Estate (ARE)
Tom Bryte, ARE
Mike Swenson, BR+A
Seth Federspiel, City of Cambridge
Nikhil Nadkarni, City of Cambridge
Melissa Chan, Climate Protection Action Committee (CPAC)
Alex Levening, Cambridge Redevelopment Authority (CRA)
Stacia Sheputa, City of Boston
Ben Silverman, City of Boston
Steve Miller, Eversource
Roshan Bhakta, Eversource
Jaclyn Olsen, Harvard Sustainability Office
Sarah Holland, JLL
Cammy Peterson, MAPC
Maureen McCaffrey, MIT
Lauren Baumann, New Ecology
Scott Smith, Novartis
Nate Strong, Rise Engineering
Egan Waggoner, Cadmus
Kathryn Wright, Cadmus
Julie Curti, Cadmus
Kate Mueller, Cadmus

Background

This meeting, held on November 14th, 2018, is the first working group meeting as part of the City of Cambridge's Building Energy Use Disclosure Ordinance (BEUDO) Task B Analysis. This task seeks to develop a voluntary, comprehensive retrofit program for the City of Cambridge to help buildings best utilize existing program offerings through Mass Save and other state/utility programs.

Purpose

This meeting sought to:

- Establish a collective group understanding of Task B objectives and existing and proposed energy efficiency programs
- Present research on:
    - Existing energy efficiency programs available for Cambridge buildings
    - Proposed offerings in the 2019-2021 Three Year Energy Efficiency Plan
    - Perceived barriers to energy efficiency retrofit participation as described by stakeholders in initial interviews
- Collect stakeholder feedback on their experiences with existing energy efficiency and incentives programs and the needs that a voluntary comprehensive retrofit program should address to increase energy efficiency program participation for BEUDO buildings
- Determine the focus areas for Workshop #2 research, including programs from other states and/or localities that may be relevant to Cambridge's potential comprehensive retrofit program

Presentation

The City of Cambridge opened the meeting with an overview of the City's Net Zero Action Plan and the outcomes of Task A of BEUDO Analysis, which sought to develop energy efficiency performance

requirements for BEUDO buildings. The City introduced Task B, through which Cambridge seeks to develop a voluntary, comprehensive retrofit program that would help existing buildings achieve deeper energy savings.

The City gave a brief presentation on the Cambridge Multi-Family Retrofit Program as an example of the type of program a voluntary retrofit program could support. This program provided targeted outreach and engagement with Mass Save to engage 1,300-1,400 households with both Mass Save energy audits and a solar advisor assessment. The program highlights how a voluntary retrofit program could take the existing Mass Save program and make it work better for Cambridge buildings.

Cadmus presented research results on existing energy efficiency programs available to Cambridge buildings, proposed offerings forthcoming through the MA 2019-2021 Three Year Energy Efficiency Plan, and initial stakeholder feedback gathered from informal interviews with selected stakeholders related to barriers to energy efficiency participation. ***Presentation slides are attached.***

Presentation Questions and Comments

- One stakeholder noted the importance of determining what **segments of buildings to target** (e.g., institutional, medium-small commercial, etc.) and owners to engage as part of this process, in order to manage expectations for reductions in energy consumption.
- Another stakeholder noted that **renewable energy complements energy efficiency measures**, and that customers may have more contact with renewable energy initiatives, since they are actively seeking the revenue and savings renewable energy may offer. These conversations would be an opportunity to also introduce energy efficiency. To better engage stakeholders around energy efficiency measures and maximize program uptake, a voluntary retrofit program should consider utilizing additional pathways that complement energy efficiency.
- With respect to other statewide programs, one stakeholder noted that **MassCEC offers programs that complement Mass Save**, and that **DOER** sometimes **provides funding for innovative programs**. Cadmus noted the MassCEC Clean Heating and Cooling heat pump program and DOER Affordable Access to Clean and Efficient Energy initiative as examples of this.
- In response to a question, Cadmus and Eversource **clarified what was meant by streamlined retrocommissioning**, describing that retrocommissioning has historically been a data intensive, pay for performance program. Now that there is more available data on historical usage, retrocommissioning can be more prescriptive and streamlined.
- One stakeholder asked if there are **incentives for new ideas and technologies**. It was noted that there is a formal platform for new ideas and innovation processes through the Massachusetts Technical Assessment Committee (MTAC), and MassCEC incubator programs.
- One stakeholder also noted that the 2019-2021 Three Year Energy Efficiency Plan provides a new **municipal and community partnership strategy** to address ways in which communities can work with utilities to improve energy efficiency participation.

Break-out Group Facilitation Exercise

Purpose

The small group discussion's purpose was to collect stakeholder feedback on experiences with existing energy efficiency programs and to identify the needs that a voluntary comprehensive retrofit program should address to increase energy efficiency for BEUDO buildings.

Format

Stakeholders were broken into two groups of similar composition to participate in the facilitation exercise. Cadmus proposed three existing energy efficiency program areas for discussion: energy audits and technical assistance, conservation measure incentives, and financing. Groups were also provided an opportunity to suggest other areas for discussion. For each area, groups were asked to discuss the following questions:

- What has been your experience with accessing programs in this area?
- What parts of these programs have been helpful and/or advantageous?
- What barriers have you faced as you have pursued these energy efficiency programs?
- What existing needs should be addressed by a new program?

At the conclusion of the discussion, stakeholders were asked to consider what form a comprehensive retrofit program should ideally take and if there are any existing programs from other states or localities that should be investigated by the research team.

Notes from the two small groups have been combined and are organized below based on areas of discussion. Photos of the pin boards used during the exercise are included at the end of this document.

Group 1

The stakeholders recommended that Renewable Energy and Outreach be added as categories for discussion in addition to the original categories energy audits and technical assistance, energy conservation measures and finance. Ultimately, there was limited discussion on the topic of finance.

Energy Audits and Technical Assistance

- One stakeholder noted the upcoming **retrocommissioning program** proposed in the 2019-2021 Three Year Plan **as a big step forward**, which another stakeholder echoed and indicated that, while it is not perfect, it has been designed to remove as many barriers as possible.
- The group noted that **providers may lack technical capacity** to support energy audits. Engineers conducting audits tend to lean toward their specialties, so audits tend to lean toward HVAC and mechanical systems. Getting a whole-building energy audit tailored to needs can be difficult.
- Stakeholders also expressed **timing issues with energy audits** as the timing of reports prevent energy conservation measures (ECMs) from being implemented.
    - Stakeholders indicated that it is difficult to implement the suggested measures in occupied buildings.
- Some stakeholders expressed that **pressure from the City** and internal corporate pressure, help move projects along. Stakeholders indicated a need for **translating the technical content from audit reports** into their implications for **capital planning processes**. Instead of simply indicating a measure, details on how to think about and sequence investments would be useful. Such a concierge service would need to know both the technical and owner/operator perspectives to be effective.
    - The retrofit program would have to consider if there is a building size or portfolio size threshold for which these services would be useful. Though larger customers may have dedicated teams to implement efficiency measures, stakeholders also noted that just because an organization is large enough to have facility managers does not mean these

FMs have the capacity for strategic planning and long-term thinking: the **concierge model may be broadly useful**.

- `While audits are helpful for capital planning processes and spreading projects out over a longer period, **more detail in assessments** would be helpful.
  - For example, instead of stating that a chiller needs to be replaced, indicating that a chiller should be replaced in the next five years gives organizations more flexibility in capital planning and timing of replacements.

- Stakeholders also discussed the **role of vendors** in such a concierge service. While some stakeholders agreed engaging vendors because of their interactions with building owners/operators is useful, others noted vendor biases and sales motivations as a barrier to successfully using them to reach owner/operators.

Incentives for Conservation Measures

- One stakeholder proposed investigating **packaged incentives addressing both energy and non-energy benefits**, such as water use reduction that in turn saves energy.
  - The stakeholder noted the Cambridge current has some support for water incentives, but these are not necessarily paired with Mass Save. The multifamily affordable segment is interested in reducing water costs.
- One stakeholder expressed that the **existing forms for pursing programs are clear and that they have utilized Mass Save whenever possible**
- One property management stakeholder highlighted that conservation measures are difficult to implement based on whose name the meter is in. It is hard to get tenants to pursue measures and have found it is **more of an awareness issue than capacity issue**, and they have been trying to educate tenants on benefits.
- In addition to utilizing incentives, one stakeholder indicated the need for **green workforce development** to properly operate equipment to achieve the benefits. Other stakeholders echoed this, highlighting the **complexity of new equipment** and the detail and initiative required to properly operate it. Full utilization of the equipment effective requires data analysts, and organizations often don't have the budget and/or time to manage this.
  - The City of Boston recently launched a **Building Operation Certification Course**, a 16-week course fully reimbursed by the utility after participants pass an exam. The pilot targeted municipal buildings and is targeting institutional facilities next. There was a good deal of stakeholder interest in expanding this program.

Outreach

- One stakeholder had a question about the **type of outreach** used in the Cambridge Multi-Family Pilot program.
  - The City responded that there was not much targeted outreach, the program primarily utilized City events and Mass Save pathways.
  - The City of Boston noted it has successfully utilized more targeted outreach as part of the BERDO initiative in partnership with CLEAResult – this has resulted in a 36% conversion from outreach to pursuing an audit (36%)
- Stakeholders were also in support of **benchmarking** by either the utilities or the City to provide indications of areas of success or segments to target.

    - A utility representative noted they are currently looking at this data to identify target areas.

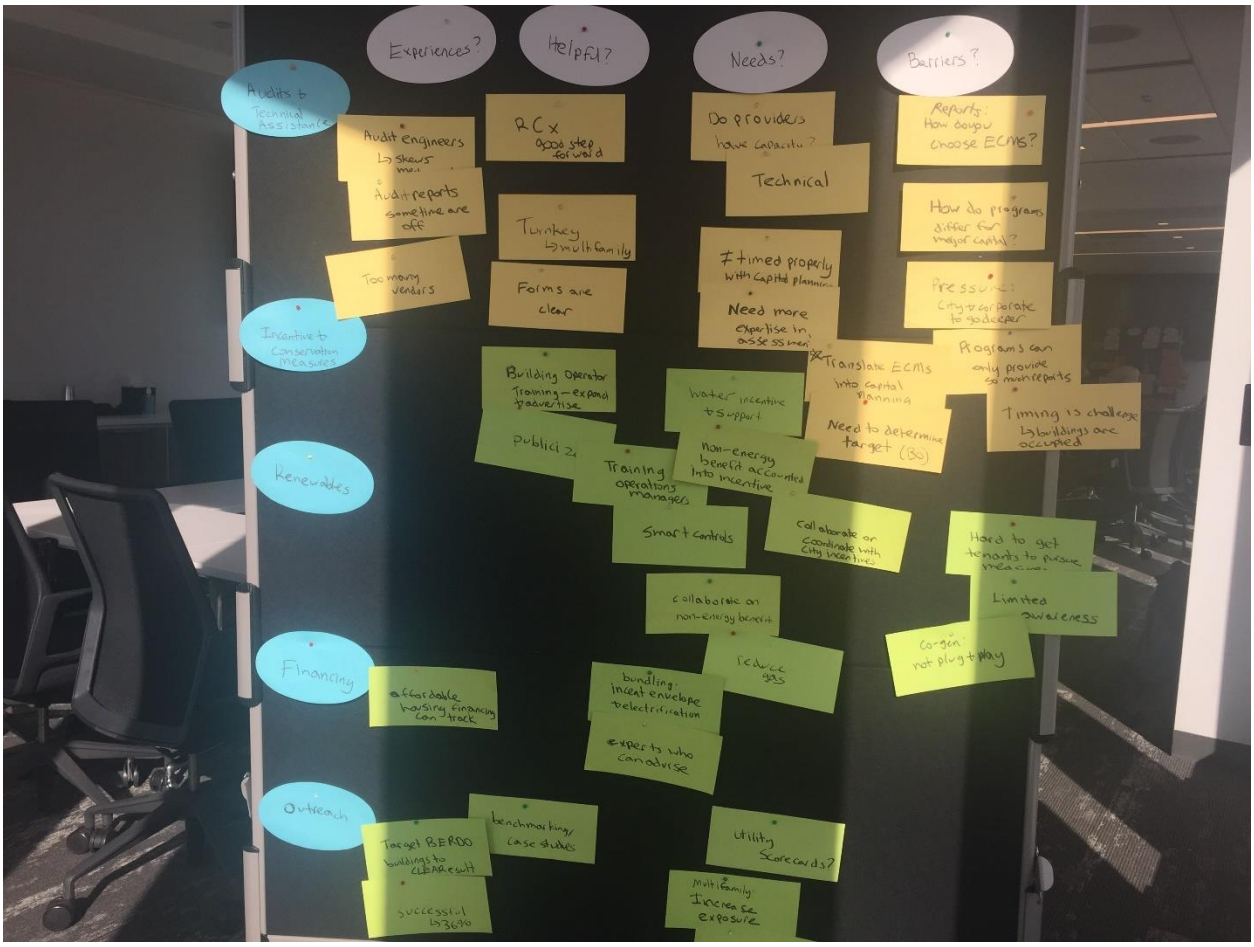
Renewables

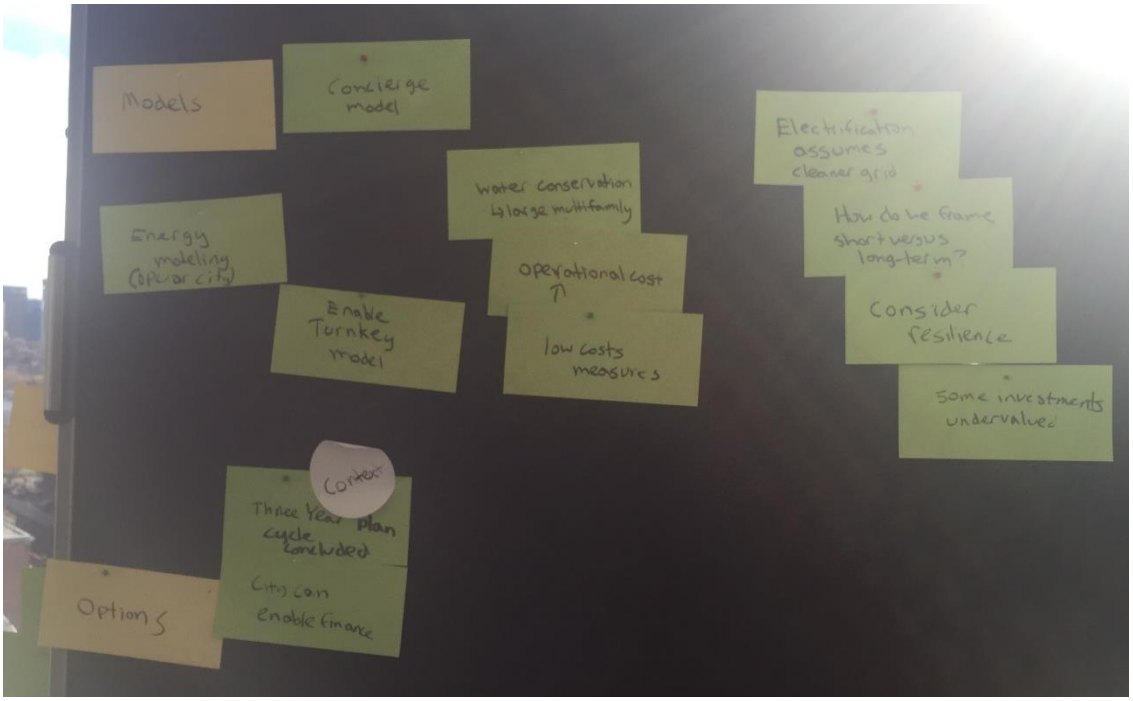
- Stakeholders proposed including a discussion of renewable energy and electrification as part of the retrofit program due to opportunities to **pursue renewables and energy efficiency in tandem**.
    - One stakeholder highlighted the challenging nature of renewable and distributed generation projects, citing a cogeneration installation: the commissioning, engineering, and ROI were all difficult, not "plug and play".
- **The City and Eversource should collaborate on non-energy benefits** for renewables and address electrification challenges, such as grid capacity.
- Another stakeholder suggested tying electrification and building envelope projects together.

Desired Outcomes and/or End Products of a Comprehensive Retrofit Program

- Stakeholders were in favor of a **TA or concierge service** to help people and organizations interpret energy audits and connect with resources
- Stakeholders also expressed interest in pursuit of **water or non-energy benefit programs** as there is a lot of interest in large multifamily buildings related to water, and they are willing to make investments in this area.
- One stakeholder indicated that electrification assumes a cleaner grid, so there must be a **balance between short vs. long term energy efficiency strategies**

Facilitation Pin-Board Photos





Group 2

The stakeholders recommended that Timing and New Technology be added as categories for discussion in addition to the original categories energy audits and technical assistance, energy conservation measures and finance.

Energy Audits and Technical Assistance

- Stakeholders noted that implementation of measures suggested in energy audits does not happen due to **timing and financing issues (**e.g. not getting the information early enough in the development cycle and not having the financing means to support them)
    - This was particularly noted **for medium and small-sized buildings**, who often do not implement measures from audits (vs. larger, more well-resourced buildings)
    - Additional barriers noted included the **staff capacity** of building staff
- One stakeholder indicated that many customers are meeting to discuss energy efficiency more frequently than the group might expect, but less frequently than larger institutions like Harvard and MIT. These **customers** often **don't know that the utilities' energy efficiency programs are available to help**, and **utilities may need to rethink their marketing strateg**y.
    - Stakeholders expressed a **need for utilities to follow up on audits**
    - One stakeholder noted that customers are often directed to the Mass Save website but would **prefer having a person to call and speak with**.

Conservation Measure Incentives

- Stakeholders noted **difficulties engaging within the medium and small C&I** building segments. Another noted that the model for small and medium sized customers becomes a **volume-based (i.e. volume-driven) business model** and a mass market issue. The volume-based goals for program delivery also don't incentivize program administrators and implementing partners working with small and medium-sized buildings on projects
- The utilities rely on segmentation by quartiles: the top 25% comes from 50 customers, while the bottom 25% has hundreds of thousands
    - The incentive process could be streamlined for smaller buildings
    - One stakeholder noted that **defining a customer as small-medium does not always equate to small or medium investments**, as some investments in small businesses can be $250k and above.
- One stakeholder brought up instances in which there was **confusion surrounding incentives and assistance**. In one example, a multifamily equipment replacement for a 35-year-old system did not end up qualifying for an incentive and, in another, a 40-year-old gas to steam furnace needed to be replaced, but as a small consumer, they could not find someone at the utility to assist them.
- One stakeholder stated that when customers seek out incentives, they often get **lost in the information on the Mass Save website**. Another has heard of customers trying as many as 3 times before ultimately giving up.
    - Other stakeholders expressed that the Mass Save process is not too difficult to use and that the incentives provide fair incentive rates

- Stakeholders suggested having a **specific point of contact to consult with customers** on what technologies are available to smaller customers. This may be especially helpful with respect to CPACE and strategic electrification initiatives.
    - RISE Engineering currently plays a role like this
    - This point of contact can **encourage proactivity**, particularly for small- and medium-buildings and help them move to non-lighting options
- A **clear, streamlined pathway and understanding of incentives** is needed alongside **crisp and concise marketing.** There could be more encouragement for customers to be more proactive in addressing lighting and non-mechanical systems
    - Marketing to encourage customers to act must be concise and crisp.
    -

Financing

- One stakeholder noted that **incentives and financing cycles have traditionally not lined** up with their internal decision-making process and financing cycles for many of the large energy users (e.g., labs).
    - Several stakeholders shared that it can be **difficult to secure funding internally** as projects are put in a queue of other projects and there can be internal division/silos and competing priorities. It can be difficult to make an internal sale for investments when there are other competing interests and decision-makers may be in other offices or locations within the company.
- Another stakeholder pointed to an **increase in Cambridge building permit fees** (in some cases by 50%) has been a barrier to project implementation, creating situations where the economics no longer made sense and projects did not happen.
- A stakeholder noted that once **PACE financing** is finalized, **MassDevelopment plans to offer a number of trainings, education and resources to market the program**, including:
    - Sponsoring webinars and outreach efforts to contact potential customers.
    - Developing resources on the requirements for property owners.
    - Implementing a 20-year term limit with more measures to be involved under the term limit.
    - Regionally selected where they will offer representation through in-persons meetings and webinars.
    - Targeted outreach to potential program participants (i.e. vendors, municipalities, installers) as the program is launched.
        -

Timing

- Numerous stakeholders highlighted **difficulty in finding building downtime to undertake energy efficiency measures** as a barrier. Retrofits to achieve deep savings are not quickly implementable, and deep retrofits often require the building to be unoccupied to be implemented.
    - Many buildings are 100% occupied, adding to the challenge
    - Ceasing operations, even for smaller projects, is especially difficult for labs or technology-dependent tenants like TV studios
    - There are **rarely building-wide opportunities to see an exit of operations due to long term leases**

- **Property changeovers** represent a key opportunity to implement projects. **Early outreach to potential buyers is critical**, and it would be beneficial to reach out about energy efficiency projects immediately after closing on property.
    - New potential owners/occupants may come from out of state, making clear and concise education on available programs and processes critical.
- Project implementation is **weather and season dependent**. Seasons dictate the timing of heating and cooling upgrades, and there is a small window of time in which upgrades can be completed.
    - Projects must be planned well in advance (e.g., in the fall for winter upgrades)
    - For buildings over 50,000 square feet, advanced **notice of a year or more** is required for action to occur, so planning needs to be done years in advance.
- Medium and small business often **replace equipment as part of an emergency response** (e.g., a heating system dies in the middle of winter) and they do whatever is available to quickly implement. Equipment **replacement needs to be addressed sooner**, before emergency situations arise.
    - The new upstream channel for new and replacement equipment in the 2019-2021 Three Year Plan addresses this to some degree.
- **Internal coordination amongst tenants** is also a barrier. For buildings with major baseloads, property owners/managers need to get buy-in from tenants to move forward with energy investments, which requires time and resources.
- Large housing projects also have refinancing windows and approval cycles whose timing doesn't often align with energy efficiency incentive programs.
-

New Technology

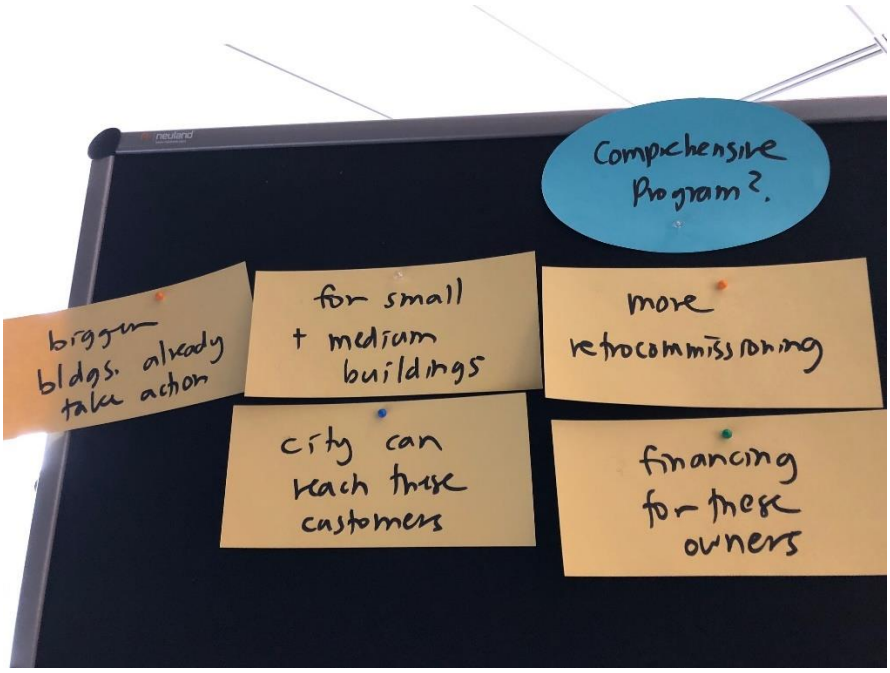
- One stakeholder cited an **issue with receiving incentives for a proven, but not commonplace, technology**. When the customer's organization was willing to fund a new technology ($1M), they were told this technology would not count towards the incentive.
    - It was noted that utilities have **minimum requirements for projects to qualify for incentives** as part of their responsibility to ratepayers. They have rules on how they can spend ratepayers' money and need to manage it effectively.
    - Incentive payments for newer technologies are often retrospective based on performance, which is hard to predict and an imperfect measure of a technology's efficiency since building occupancy and use vary widely
- Additional technology credits were added in February 2018, including alternative (renewable heating and cooling – RH&C) technologies like ground source heat pumps and air source heat pumps.
    - Stakeholders expressed that these technologies need to be part of the discussion, especially strategic electrification.
    - **Education and outreach on RH&C** needs to be implemented and advertised
- Several stakeholders cited a need to be updated on the best and newest technology options and program updates
    - A stakeholder noted that **MAPC does a good job of communicating new technologies**.

  - Another stakeholder noted that their **knowledge of new technologies comes from manufacturers and technology engineers** – the people who are designing and equipping the new technology.
  - This could be a potential role for Cambridge as well or for PAs to cover

Desired Outcomes and/or End Products of a Comprehensive Retrofit Program

- Program should have an **emphasis on small-medium customers** and addressing barriers to their participation (bigger buildings noted as already taking action)
- The City is well-positioned to **reach out to customers**: can direct customers to the proper resources and control permit fees.
- Stakeholders noted they would like to see a greater **push for retrocommissioning** and associated technical assistance/resources for those who need it
- Outstanding question: Because internal financing is often a challenge, should the retrofit program make **financing** part of the process?
- How do they have their tracing of devits? Working through design is easier for larger consumers, how do they work through the design?

Facilitation Pin-Board Photos



Concluding Thoughts

- Stakeholders suggested Cadmus research programs and initiatives in **Philadelphia, New York City, and Seattle.**
- Stakeholders also reiterated the importance of the turnkey model of retrofit delivery.
- The City of Cambridge noted the second workshop will focus on **understanding pathways for improving access to energy efficiency programs and uptake of measures**, including what resources can be brought to bear (e.g. performance-based incentives and financing) and identifying what models (e.g. concierge models or other potentials options) may be identified for potential consideration.

CADMUS

BEUDO Task B Workshop 2 Notes

Existing Energy Efficiency Programs & Market Needs
December 18, 2018
MITIMCO

Attendees

Scott Durkin, CW Services at the Broad Institute
Katie Gonzalez, Boston Properties
Michael Hearn, Boston Properties
Ben Meyers, Boston Properties
Maureen McCaffrey, MITIMCo
Amanda Strong, MITIMCo
Sarah Holland, JLL
Adam Jenning, AHA
Mike Swenson, BR+A
Dan Egan, Equity Residential
Carolyn Sarno Goldthwaite, NEEP
Stacia Sheputa, City of Boston
Brooks Winner, MAPC
Lauren Baumann, New Ecology
Steve Miller, Eversource
Sal Zinno, BioMed Realty
Ellen Katz, City of Cambridge
Seth Federspiel, City of Cambridge
Nikhil Nadkarni, City of Cambridge
Alex Harry, IMT
Egan Waggoner, Cadmus
Kathryn Wright, Cadmus
Julie Curti, Cadmus
Kate Mueller, Cadmus

Background

This meeting, held on December 18th, 2018, is the second working group meeting as part of the City of Cambridge's Building Energy Use Disclosure Ordinance (BEUDO) Task B Analysis. This task seeks to develop a voluntary, comprehensive retrofit program for the City of Cambridge to help BEUDO buildings best utilize existing program offerings through Mass Save and other state/utility programs to achieve deeper energy retrofits. As BEUDO buildings are responsible for over 50% of Cambridge building GHG emissions, they represent a key focus area for energy and emissions reduction.

Purpose

This meeting sought to:

- Provide stakeholders with an understanding of available pathways, incentives, and options for improving program delivery to meet the needs discussed in Workshop 1.
- Present research results on:
    - Workshop 1 overview, including stakeholder-identified barriers and needs,
    - Quantitative analysis of Cambridge BEUDO buildings' energy consumption, and
    - Potential programmatic pathways for incorporation into a retrofit program.
- Establish the purpose and direction of focus for a voluntary, comprehensive retrofit program and the objectives it should seek to accomplish (i.e. reduce city-wide energy consumption and/or improve energy efficiency accessibility).
- Consider the potential form for the program in context of state and local limitations.
- Understand what stakeholders identify as priorities for a retrofit program. This information will inform and direct straw proposal development for a voluntary, comprehensive retrofit program.

Presentation

The City of Cambridge opened the meeting with a high-level overview of the BEUDO efforts, including the Task B timeline. The City highlighted the purpose of this meeting was to discuss potential retrofit program pathways as a group to determine what voluntary services or program pathways can best meet the needs of BEUDO-reporting buildings and enable compliance with requirements that came out of Task A, as well as deeper energy retrofits. Cambridge also provided an update on Task A progress, mandatory performance requirements, noting that:

- A series of stakeholder driven summer meetings produced a straw proposal for the addition of performance requirements to BEUDO reporting buildings;
- The Net Zero Labs subcommittee is in the process of proposing lab-specific requirements, slated for early 2019, and
- The City is evaluating calendar year 2017 BEUDO data to help shape requirements and revise the straw proposal in 2019. The updated proposal will be circulated among stakeholders and will need to be adopted by the City Council.

Cadmus presented a summary of Workshop 1, highlighting the areas from Workshop 1 that were identified for future research. The results of a data analysis of Cambridge BEUDO reporting buildings was also presented, using reported energy consumption to identify potential building types for the focus of a retrofit program. Lastly, the presentation introduced seven potential program pathways for a retrofit program, identifying features these programs could offer and the types of barriers and needs expressed by stakeholders that such a program could address. These program pathways included:

- **Concierge Navigator**: Provide services to help customers navigate existing programs and connect building owners and tenants with energy efficiency resources.
- **Training and Workforce Development**: Offer building operations training on new, energy efficient equipment as well as proper operation and performance for existing equipment to attain energy savings.
- **Point-of-Sale**: Intervene and capture the attention of buyers to encourage implementation of ECMs at property time-of-sale or changeover. Time of renovation could be an alternative opportunity to encourage implementation of ECMs.
- **Bundling and Turnkey Solutions**: Create a package of prescriptive incentives for common retrofit measures within targeted facility types (e.g., office, multifamily, labs).
- **Alternative Incentive Delivery**: Investigate use of pay-for-performance or early replacement incentives for inefficient equipment.
- **Green Bank**: A city or regional funding mechanism through which building owners can seek low interest capital loans for energy efficiency upgrades.
- **Beyond Efficiency**: Couple energy efficiency and building electrification or enable coordination on programs related to the water-energy nexus. This could also explore opportunities to increase the renewable energy supply available to Cambridge buildings.

Presentation slides are attached.

Presentation Questions, Comments, and Discussion

Following the presentation, Cadmus and Cambridge addressed questions and comments from the stakeholder group, as follows:

- Stakeholders asked to clarify if the data analyzed include information for buildings outside of BEUDO, as BEUDO buildings generate over 50% of Cambridge GHG emissions. Cambridge and Cadmus clarified that this **data excludes buildings under 25,000 sf**, though the City does receive energy use information from those buildings in aggregate from Eversource and MassSave. The City also indicated that they are pursuing a separate set of interventions for smaller buildings, including a multifamily pilot with Eversource. They will leverage lessons learned from these actions, where relevant.
- Stakeholders expressed that **highest energy use does not indicate the greatest opportunity for energy savings.**
- One stakeholder indicated **that property changeover does not necessarily mean energy conservation measure (ECMs) can be implemented**. When a property is sold, the tenant leases may not expire at time of sale, or not all tenant leases expire at the same time in buildings with multiple tenants. Thus, property changeover does not mean vacancy, which is required for some deeper energy reduction measures.
- One stakeholder inquired whether money would be available for general programming at the City level, and if there has been any discussion of legal changes (e.g. green leasing practices).
    - The City replied that **incentives will not be directly available from the City**, but the City could capitalize and seed funding through a green bank, for example.
    - The City also noted it would be **difficult for the city the use tax dollars to fund ECMs in private buildings**, where those buildings will be the ones to recognize the energy savings, though there was further discussion about the degree of monetary savings from ECMS.
- There was a suggestion for building a **stronger partnership between the City and utility** to build upon existing program capacity, as the utility plays a major role in connecting user groups in the City. A stakeholder representing the utility expressed that, from this perspective, implementing a concierge-type service would be beneficial.
- One stakeholder **noted a decoupling of energy use and carbon**, though part of what Cambridge seeks to do is mitigate carbon. To reduce carbon emissions, the City can both reduce energy use from carbon-emitting fuels (e.g., natural gas, coal) or increase the amount of energy generated by renewable sources. This raised the question of how to account for renewable energy use while also accounting for scalability.

Large Group Discussion Facilitation Exercise

Purpose and Format

A single, large group discussion was facilitated to address higher-level considerations for a voluntary, comprehensive retrofit program, including focus areas and if there is a need for financing-related programs. The facilitator mapped the seven proposed program pathways on a pin board to capture feedback thematically. At the conclusion of the workshop, stakeholders participated in a “dotocracy” exercise, in which each stakeholder was allotted three sticker dots to express their preference for up to

three potential program pathways to include in a retrofit program. Stakeholders were permitted to place multiple stickers on a single program concept.

Program Focus

When asked what building types a retrofit program should focus on, stakeholders expressed there are some program pathways that are applicable to certain types of buildings and not others. As such, the discussion should incorporate both **building types and available offerings. A Program Administrator highlighted labs as an area of focus**, noting that this is an area they have yet to target through their offerings.

Stakeholders were also asked about what role the City should play in supporting a voluntary retrofit program. Responses **highlighted workforce development and outreach as key roles for the City.**

Concierge Service

While stakeholders were in favor a concierge-type service, they expressed the need for the **contacts (i.e. representatives) to be people visible within the community**, potentially embedded with the city or partner organization, as opposed to having a single utility Commercial and Industrial (C&I) representative. The program would also **need to be comprehensive and incorporate a range of ECMs**. One stakeholder expressed concern that a concierge service could become quickly overwhelmed with requests and that **multiple ambassadors who understand the range of building typologies would be necessary** to effectively meet the needs of customers.

To execute a concierge service, stakeholders suggested that **BEUDO data be used to target and engage building owners and managers**. A targeted program within a **specific building sector or focusing on low performing buildings could serve as a pilot** for later expansion to a range of building types. This could also **address timing and strategic use of resources**, for example, not conducting audits on buildings that will not be available for intervention (e.g., no upcoming turnover or tenant vacancies).

Training and Workforce Development

A stakeholder noted that meeting materials focused on building management and operations as areas for workforce development, but **contractors are also a key target for training**. If contractors offered more efficient options up front, the need for a concierge navigator would decline. Cambridge posed the question of how to get general contractors to promote energy efficient products. One stakeholder indicated that, for small and medium customers, the **contractors may not have energy efficiency goals in mind**, but instead budgetary constraints.

Stakeholders also expressed that workforce development can encompass **both short term and long-term changes**; both educating those currently working in the field and creating a pipeline of educated, informed workers into the future. While better-resourced buildings see longer-term training and pipeline development as the larger need, smaller buildings with fewer resources could benefit from shorter-term operator training courses related to high-efficiency equipment. The future workforce development model needs to include **education on both mechanical and information systems.** As building complexity continues to increase, building operators will require five to seven years of education and experience to enable to enable appropriate operations of buildings. This would require reaching back into **high school/technical schools through community colleges, continuing education**

and accreditation programs. Some nonprofits and community colleges, such as Roxbury Community College, are working on developing a similar program.

A City of Boston stakeholder shared information regarding the Boston Building Operator Certification (BOC) program with the stakeholders. In this program, the City set up the BOC training for buildings throughout Boston and is working on concierge services as well, conducting outreach for the BOC program to BERDO reporting buildings with high energy use while connecting buildings with Mass Save. The building owner/operators pay the upfront cost for the BOC, but after course completion and passing of the exam, the cost is reimbursed by the utilities.

Point-of-Sale

Stakeholders generally agreed that **point-of-sale programs would be a non-starter for their buildings** because of potential difficulties with coordination and unclear means of tracking property sales and changeover, although there may be exceptions for the multifamily sector, especially affordable multifamily housing. Within multifamily housing, financing agencies are entering at the point of sale and missing EE opportunities within the physical needs assessment. One stakeholder also **cautioned against asking too much of tenants** or potential property buyers as Cambridge is competing nationally for these owners and occupants. **Influencing the acquisition checklist** that companies use when making building purchases was noted as an alternative means of engaging at point-of-sale. This would include adding elements that relate to efficiency and potential for planning future efficiency upgrades to the checklist. Similarly, tenant-fit out checklists were suggested as an opportunity to include more efficiency measures. However, these lists vary organization to organization.

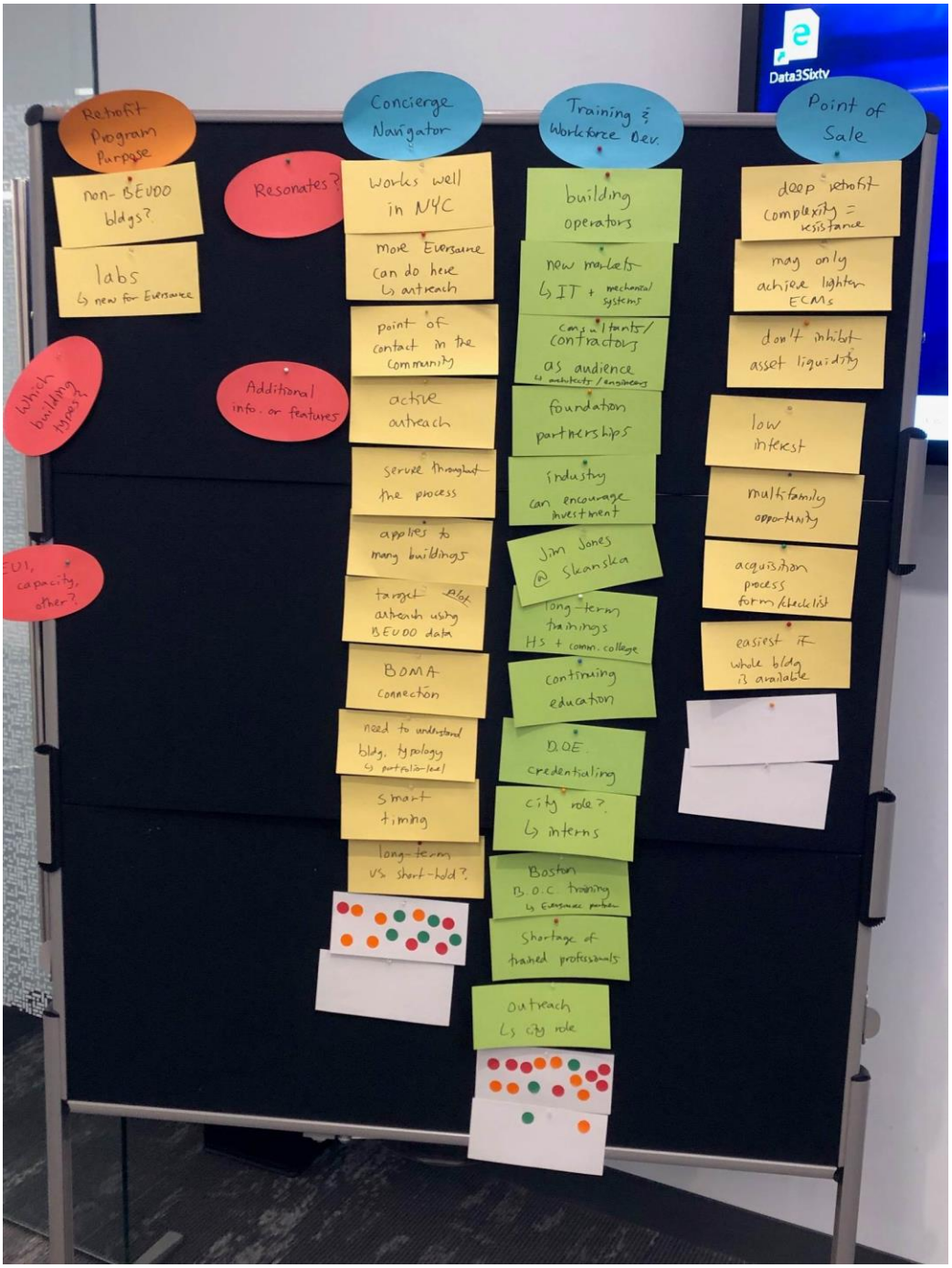
Green Bank

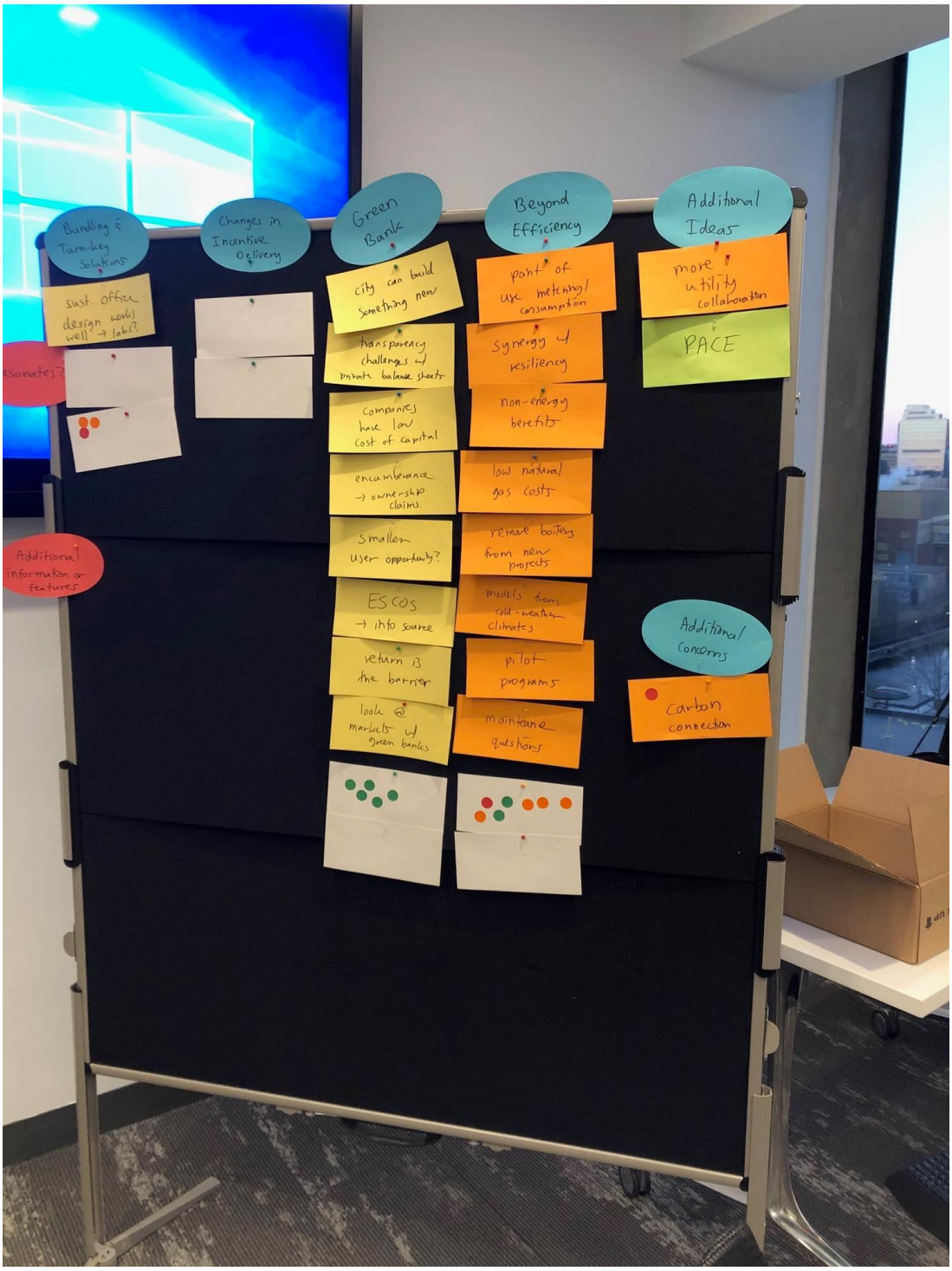
Stakeholders perceived a **green bank as a new and innovative** way to build off existing programs. The City expressed it would be open to both **a local or regional model**. One stakeholder noted a challenge is that many commercial real estate entities are unwilling to disclose their balance sheets to determine credit-worthiness, and that **most companies have a lower cost of capital than green banks** can offer. It was also noted that successful green banks and PACE financing programs in other states, like Connecticut, are **focused on small commercial properties**.

Beyond Efficiency

Stakeholders expressed that this program offering could have **synergies with resilience** and offer non-energy benefits such as resiliency and improved air quality; these elements could be weighted according to Cambridge's goals. Stakeholders also inquired about the **feasibility of electrification given the availability and low cost of natural gas**, though others noted that natural gas is not as cheap at the commercial scale. Lastly, stakeholders also raised the question about **the feasibility of charging tenants for utilities** in MA, as it is easier in other markets. Point of use water meters have declined water usage dramatically in DC and NYC. While there have not been challenges from tenants in New York or DC, but there are tenant protections in Mass which prevent some submetering and legislative action would be necessary to change the protections.

Pin-board Photos





Concluding Thoughts

- The "dotocracy" exercise **highlighted training and workforce development, the concierge navigator, and beyond efficiency** as the three most preferred programs for further research and refinement. Stakeholders also expressed moderate preference for the green bank concept.

    - Some of these program pathways may be better suited to BEUDO buildings than others. As research on mechanisms to achieve deeper energy savings continues to be refined, with a focus on BEUDO buildings, these program pathways preferences will be considered. However, the retrofit program will ultimately pursue pathways that enable the greatest savings for BEUDO buildings.
- Cadmus closed with providing a summary of plans for the upcoming months. The working group will re-engage and reconvene with stakeholders in March to continue to discuss the voluntary, comprehensive retrofit program and what end goals (i.e. services or programs) the working group should be working towards **to achieve deeper energy retrofits that can enable the requirements that came out of Task A**. In the meantime, **two focus groups will be convened** to further engage with tenant-landlord perspectives. Cadmus and IMT are currently recruiting for the focus groups and are accepting suggestions for tenants that stakeholders may recommend.

CADMUS

BEUDO Task B Workshop 3 Notes

Program Proposal Development
March 28, 2019
MITIMCO

Attendees

Jeff Cook, Alexandria
Kevin Slein, Biomed Realty
Katie Gonzalez, Boston Properties
Matthew Sexton, Boston Properties
Stacia Sheputa, City of Boston
Steve Miller, Eversource
Chris Patrick, Eversource
Bill O'Connor, Eversource
Frank Nitti, Harvard University
Sarah Holland, JLL
Ed Slein, JLL
Brooks Winner, MAPC
Wendy O'Malley, MassDevelopment
Maureen McCaffery, MITIMCo
Lauren Baumann, New Ecology
Nate Strong, RISE Engineering
Seth Federspiel, City of Cambridge
Nikhil Nardkarni, City of Cambridge
Ellen Katz, City of Cambridge, Department of Public Works
Susanne Rasmussen, City of Cambridge
Egan Waggoner, Cadmus
Kathryn Wright, Cadmus
Julie Curti, Cadmus
Kate Mueller, Cadmus
Mike Fitzgerald, Boston Properties

Background

This meeting, held on March 28th, 2019, is the third working group meeting as part of the City of Cambridge's Building Energy Use Disclosure Ordinance (BEUDO) Task B Analysis. This task seeks to develop a voluntary, comprehensive retrofit program for the City of Cambridge to help BEUDO buildings best utilize existing program offerings through Mass Save and other state/utility programs to achieve deeper energy retrofits. Workshop 3 was held to further refine program design, incorporating existing Eversource programs available for commercial building customers.

All presentation slides are attached.

Purpose

This meeting sought to:

- **Revisit the program concepts** covered at the previous stakeholder meeting and note progress since
- Learn from Eversource about its **Custom Retrofit Program** and other existing offerings
- Hold an in-depth conversation with stakeholders on Eversource's Custom Retrofit Program and the Concierge Navigator program concept **to identify existing opportunities within the program and areas for increased use** and/or enhancement
- Determine **areas of focus** for final program design for discussion at Workshop #4
- Work towards a shared goal and pathway for enabling deep energy retrofits in BEUDO buildings

Overview and Research Presentation

- Seth Federspiel from the City of Cambridge provided a welcome and meeting introduction, highlighting the City's goal of enabling **comprehensive, deep energy retrofits for large buildings**. Cambridge noted the desire to begin with **existing resources, such as Eversource's Custom Retrofit program** and emphasized Eversource's commitment to helping Cambridge meet energy reduction goals.

Cadmus Presentation

Kathryn Wright from Cadmus provided an overview of progress to-date, updates on developments since the second working group meeting, and framing for the alignment between the desired comprehensive retrofit program for Cambridge and existing Eversource programs.

- Cadmus reviewed the seven potential program pathways shared at Workshop 2, and the three for which stakeholders had expressed the greatest preference in the dotocracy exercise:
    - **Concierge Navigator**: Provide services to help customers navigate existing programs and connect building owners and tenants with energy efficiency resources.
    - **Training and Workforce Development**: Offer building operations training on new, energy efficient equipment as well as proper operation and performance for existing equipment to attain energy savings.
    - **Beyond Efficiency:** Couple energy efficiency and building electrification and/or enable coordination on programs related to the water-energy nexus. This could also explore opportunities to increase the clean energy supply available to Cambridge buildings.
- Cadmus shared that the project team had **convened a set of tenant focus groups with office and multifamily residential tenants** prior to Workshop 3. The Net Zero Labs Working also held a session for tenants in parallel. The focus group discussions will be incorporated with working group feedback to develop a straw proposal for the voluntary comprehensive retrofit program.
- The presentation also provided a framing to understand where there is or could be **alignment between the goals of a comprehensive retrofit program and the existing Eversource Custom program**, and where enhancements could further support Cambridge's emissions goals.
- Following workshop 3, Cambridge, Eversource and Cadmus/IMT will continue to work towards the shared goal of enabling deeper energy retrofits, incorporating stakeholder feedback (both verbal and written) from workshop 3 and the focus groups to identify potential pathways to compliment and improve Eversource's existing programs advance of workshop 4.

IMT DEEP Model

David Cohen from IMT provided a brief overview of Driving Energy Efficiency Programs (DEEP), a model developed by IMT to promote energy efficiency retrofits. Cambridge is exploring DEEP as part of the comprehensive retrofit program development as a potential option for small to medium-sized building owners to undertake energy efficiency measures without upfront costs.

- The DEEP model is similar to an Energy Service Company (ESCO) model, however **savings pay for the program and are reinvested in new projects** and program administration.
- The model utilizes a **portfolio approach to reduce risk**; the risk of any single building underperforming is mitigated so long as the overall portfolio is performing well.

- Additional detail and potential for a pilot in Cambridge will be investigated in parallel to Workshop 4.

Presentation Questions and Comments

Following the presentation, Cadmus and Cambridge addressed questions and comments from the stakeholder group, as follows:

- One stakeholder asked **how the DEEP program model would be funded**, and if it would involve a grants or foundation support.
    - IMT explained that **initial seed funding** would be required to initiate the program, and research had indicated this funding may be **sourced through philanthropic groups or "socially responsible investors"**.
    - Once the revenue stream is established, it can be used to cover program costs. IMT clarified that this is a concept that has yet to be implemented, but **pilot programs will provide insights into the extent that costs can be covered through the revenue stream**.
- Another stakeholder asked about **the commitment for small business owners to participate in DEEP**, and if there would be a contractual obligation.
    - IMT responded that, in addition to **allowing access to the building** for contractors to do work throughout the process, there would need to be a **legal obligation for businesses to continue providing savings back to the program**. One opportunity posed by IMT was a partnership with a utility in the form of on-bill financing with additional tracking sophistication.
    - Cambridge noted this commitment may not make this a good arrangement for larger buildings with tenant complexities, but could fit well for less-sophisticated, less-resourced buildings.
- One stakeholder asked if there would be a **mechanism for tracking projects going through Concierge Navigator**. The stakeholder suggested that documentation and case studies would be useful, and it would be interesting to see what certain types of projects require, the uptake of different measures, and the length of time it takes to go through the process.
    - Cambridge replied that Workshop 4 will be focused on implementation, and the form tracking could take is still TBD (e.g., through BEUDO reporting or Mass Save). They agreed that documentation would be beneficial.

Eversource Existing Offerings Presentation

Steve Miller, Energy Efficiency Consultant for Eversource, presented an **overview of two current pathways available to Eversource customers for comprehensive retrofits**:

- **Custom Retrofit Program:** Provides a "deep dive" into energy efficiency solutions using technical resource and study assistance through a preferred vendor. Ideal for capital projects.
- **Equipment and Systems Performance Optimization:** Offers low-cost/no-cost options for retrocommissioning buildings with existing BMS systems. Ideal for operations.

Path 1: Custom Retrofit Program

- The Custom Retrofit program **utilizes a customer relationship** with Eversource to optimize building operations and save energy.
- Eversource can conduct a study on the facility to make recommendations and create an action plan. Eversource **typically funds half of the study, the customer pays the other half.** The

customer portion ensures buy-in and dedicated resources from the customer to execute a project.

- If moving forward with a project, Eversource, the customer, and the vendor can create a custom retrofit project emphasizing comprehensive approaches, which entails **committing to an incentive amount, ensuring vendor follow through, conducting pre- and post-performance studies, and reviewing submittals** to evaluate the project.
- The program incorporates an RFP process for preferred TA vendors. Customers are **not required to work with preferred vendors** but can typically receive better incentives when partnering with preferred vendors.

Path 2: Equipment and Systems Performance Optimization (ESPO)

- ESPO examines current operating systems to **identify problems and low-cost/no-cost measures to improve performance.** This technical investigation is fully funded.
- Eversource will **fund 100% of retrocommissioning options**, to a certain level, and then will pay **additional incentives on a pay-for-performance (P4P) basis**.
    - ESPO provides a pathway for building owners to receive incentives without cumbersome engineering calculations typically associated with a P4P.
- Buildings **must have a BMS system** to participate and **need to pre-qualify** based on building type, use, and funding.
- Three forms of optimization are available: **low-cost tuning measures, targeted tuning measures, and whole building and process tuning**.

Presentation Questions and Comments

- In response to a question about new construction and tenant improvement, Eversource clarified that the options presented apply to retrofits, and the **new construction process remains the same as previous years.**
- A stakeholder noted that retrofit decisions are often driven by financials and cost-benefit ratios and asked how **consideration of carbon** is included in this offering or future ones.
    - Eversource responded that this is correct, most day-to-day **work is driven by kWh evaluation to include costs, savings, and investments**. They indicated that a transition to broader carbon considerations is on the horizon, but has not yet been implemented.
- Another stakeholder asked about the degree to which **holistic customer energy goals are considered when making inquiries**, and if other energy-related actions they are taking are discussed. For example, some customers may pursue solar projects without first considering energy efficiency.
    - Eversource responded that this connects with the concierge concept; when a customer calls, the concierge can inquire about what the building owner wants to achieve. The **concierge could serve as an "energy manager" type resource** for small to medium buildings.
    - Eversource also noted that coordination efforts will continue to grow as **new offerings from the Three-Year Plan related to demand response** come into effect.
    - Cambridge noted that the **Cambridge Multifamily Pilot took steps to address this** by informing building owners of both renewable energy and energy efficiency options when they apply for an energy audit.

- Eversource clarified that these **offerings are not exclusive to Eversource**, but available across Mass Save. Thus, National Grid, Unitil, Cape Light Compact and other PA customers have access to these offerings as well.

Group Discussion

Cadmus lead a facilitated discussion with two pinboards for notetaking:

- Pinboard one: **outlined the process for accessing the two Eversource incentive programs described in the presentation** described in the presentation
- Pinboard two: **collected additional feedback on experiences** with the Custom Retrofit Program, **potential alignment with the proposed concierge navigator** first presented in Workshop 2, **opportunities for enhancement** of the existing Custom Retrofit Program, and opportunities to **drive increased utilization** of the program moving forward.

Experiences

- Stakeholders shared their experiences using the Eversource Custom Retrofit Program and indicated they'd had **good success and positive experiences, especially with MOUs.**
    - One stakeholder elaborated on their MOU experience, stating they have used their MOU to identify both base building opportunities and tenant space opportunities. They also meet monthly with their account executive to coordinate implementation of agreed-upon measures.
- Coordination with tenants and **having the vacancy required to perform deeper energy retrofits remains a large roadblock**. Thus, actions suggested in energy audits often go un-implemented.
    - This is not strictly due to coordination issues, but also difficulty getting tenant buy-in for some measures, such as ventilation/airflow changes.
    - One stakeholder commented that **working on improvements to tenant spaces and equipment** could help get tenants on board.
- Another stakeholder noted that the Eversource Custom Retrofit Program system is robust at this point, and they believe Eversource is **working to partner with the community on energy efficiency where possible**.

Alignment with Concierge Navigator Model

- Eversource is working to build a more robust system that incorporates Cambridge-centric options. The concierge navigator model could provide an opportunity to **tie in the Cambridge-specific guidance and components**.
- A stakeholder noted that **many organizations need additional staff to undertake energy efficiency retrofits**, so a concierge navigator could help support that need and fill the resource gap.
- Another stakeholder shared that many of the facilities she interacts with are highly interested in solar but have not exhausted energy efficiency opportunities. **Properties with less experience in energy need holistic guidance on pursuing renewable and efficiency projects.**
- In terms of delivery, a concierge navigator could be a **vendor-driven program** or **hybrid of the small business program** to bring in cost effective measures.
- A stakeholder offered that the concierge navigator **could help gain better traction for and participation in the MOU model.** The MOU model provides a great impetus for energy efficiency implementation at high levels of the organization because it **lays out goals with a**

partner and a plan to execute through the year. This drives more organizational discussion than focusing on one-off projects.

Potential Program Enhancements

- A stakeholder suggested **training on program offerings for designers and engineers beyond Eversource's "qualified vendors**". Many building owners have existing relationships with engineers and designers, but will need them to understand the available options and how to navigate the process, which has historically been a stumbling block.
    - There is a need to **utilize contractors and technical professionals to help generate the demand** for these programs.
    - Another stakeholder identified a previous issue in which **vendor may not bring up incentives if customers don't first initiate** or include incentives in the RFP.
- A stakeholder identified a need to **"connect the dots" between capital needs assessments and energy efficiency**. For example, if a building is being re-roofed, the owner should consider what other energy efficiency upgrades could or should be done simultaneously while there is building access.
    - This can also help **transition away from strictly reactionary improvements** and consider longer-term planning for deeper energy efficiency measures.
    - Implementation requires more **direct interaction (technical assistance) with buildings** and information beyond what a concierge intake call can provide.
    - This is an **area in which MOUs can be helpful** because there is an ongoing relationship and familiarity with the building portfolio.

Opportunities to Increase Use

- A stakeholder suggested that a **holistic building assessment and comprehensive approach** in which multiple measures are considered may increase uptake. For example, if a portfolio of 10 improvements are considered and three are not cost effective yet seven are very cost effective, the retrofit investment is cost effective overall and deeper energy efficiency is achieved. **Bundling of measures was identified as an important outcome of MOUs** as well.
- Another stakeholder suggested developing a **list of segment-specific measures** for different building types, with **specialized vendors** that are familiar with the typical retrofits for these building types. These recommendations could be utilized within a custom program as well.
- Building owners could **utilize a portfolio approach** in which a number of measures and attributes are identified for implementation, and audits are conducted on these components across all buildings.
    - This could become part of building preventative maintenance and/or integrated with a segment-specific approach city-wide.
- A stakeholder suggested finding ways **to incentivize installation of equipment that exceeds the code requirements for energy efficiency**.
- A stakeholder shared the need for his organization's buildings to be **re-commissioned 2 – 3 years after construction due to changes resulting from tenant improvements and final building outfit**, and inquired if there are opportunities for Eversource to help with this.
    - The buildings could benefit from a "fresh look" from engineers that were not involved with initial construction or tenant improvement.

    - Eversource replied that **there are not incentives available for this** as it falls more into O&M rather than retrofit or energy efficiency improvements.

Shared Goals, Next Steps, and City Role

To move the process forward, Cambridge and Cadmus asked for additional feedback on the **shared goals of a comprehensive retrofit program, the next steps, and the role the City should play**. Attendees were encouraged to discuss energy efficiency goals internally within their organizations prior to Workshop 4.

- A stakeholder noted that there are an increasing number of **building owners are not locally based** and are unfamiliar with the available energy efficiency offerings. She suggested developing a way to **reach out to these new owners as they are buying buildings** to implement energy efficiency upgrades when the buildings are vacant.
    - The **City stretch code** could be utilized, as any building over 25,000 sf with a renovation of 50% or more of the building is reviewed by a City commission.
    - However, by the time the City is notified, it may be too late as building features may already be design. An alternative would be **outreach to the banking community, who provides financing for the improvements.**
- Another stakeholder suggested the possibility of **notifying applicants about incentives when building permits are filed for smaller renovation projects** (e.g., boiler replacement).
    - While this may be late in the process and very specific, this could serve as a **means of educating owners and operators** about incentives for future work.
- A stakeholder asked about the **future of the Eversource programs presented** and if they are both funded and planned to be implemented for the next three years. They were concerned that if Cambridge designs a concierge program around these programs, Eversource's programs might change or disappear.
    - Eversource responded that the **Three-Year Plan will not change during the three-year implementation window**, and beyond this timeframe the plans have tended to largely stay the same.
    - Year-over-year market transformation where costs and claimable savings for the utilities change (e.g., LED lighting) are the primary areas where things evolve.

Cadmus provided feedback forms to stakeholders for additional written feedback on what they would like to see within a comprehensive retrofit program, suggested next steps, and what role the City should play in encouraging further energy efficiency projects. Written feedback is collected and collated in Table 1.

Table 4. Stakeholder Feedback on Goals, Next Steps, and City Role

Goals for Retrofit Program	Next Steps	City Role
• Implementation of **carbon neutral buildings** en masse • Widespread implementation of **retrofits** • **Reducing carbon** while incorporating new buildings • Getting beyond "cost effective" thresholds to meet carbon goals • Additional **resources and training for building managers** on useful info to look at in BMS systems to avoid backsliding after an ESPO-type program • **Accessibility to program information** for architecture/engineering firms, contractors, owners, and prospective tenants •	• **Work with vendors** to expand these areas of opportunity • Potential PA assistance in **supplementing training** • Increase Eversource availability to serve customers via a concierge navigator • **Refine concierge processes** and establish a better understanding of outreach strategies for the concierge program • Engage design firms • Conduct more **outreach to banks and commercial real estate agents** because they are engaged with building purchasers early on • Get more owners involved with **MOUs** • Have stakeholders with large portfolios select 4 -6 buildings with which to begin energy efficiency evaluations and **identify buildings to enroll** from the start to build momentum • Create a similar **offering for medium customers**, akin to the Small Business Program • Provide **enhanced incentives** for participation for multi-measure projects • Develop a **digital communication/marketing** strategy	• **Provide clarity and advanced notice of requirements** and developments in the BEUDO process • Review/recommend **mandatory proposed requirements** • Develop progressive mandatory increases in efficiency while providing **robust support for voluntary programs** • **Reduce admin/process barriers** to energy efficiency • Serve as a **source of information** about programs and resources available to businesses and building owners, not just limited to Eversource programs • More involvement with **educating smaller business owners** • Provide **strong encouragement to implement efficiency measures** through bulk pricing, expedited permitting, recognition, etc. • List the engineering and architectural firms working on tenant projects • Facilitate **Eversource education programs** shared in Workshop 3 • **Enforce regulations sooner rather than later** to make sure current new construction does not have to make MEP upgrades while the building is still new • **Initially incentivize vendors and contractor**s – especially smaller contractors – to bring info on renewable energy to customers or recommend using incentives • **Encourage a Cambridge-based concierge** funded by utilities

Pinboard Photos

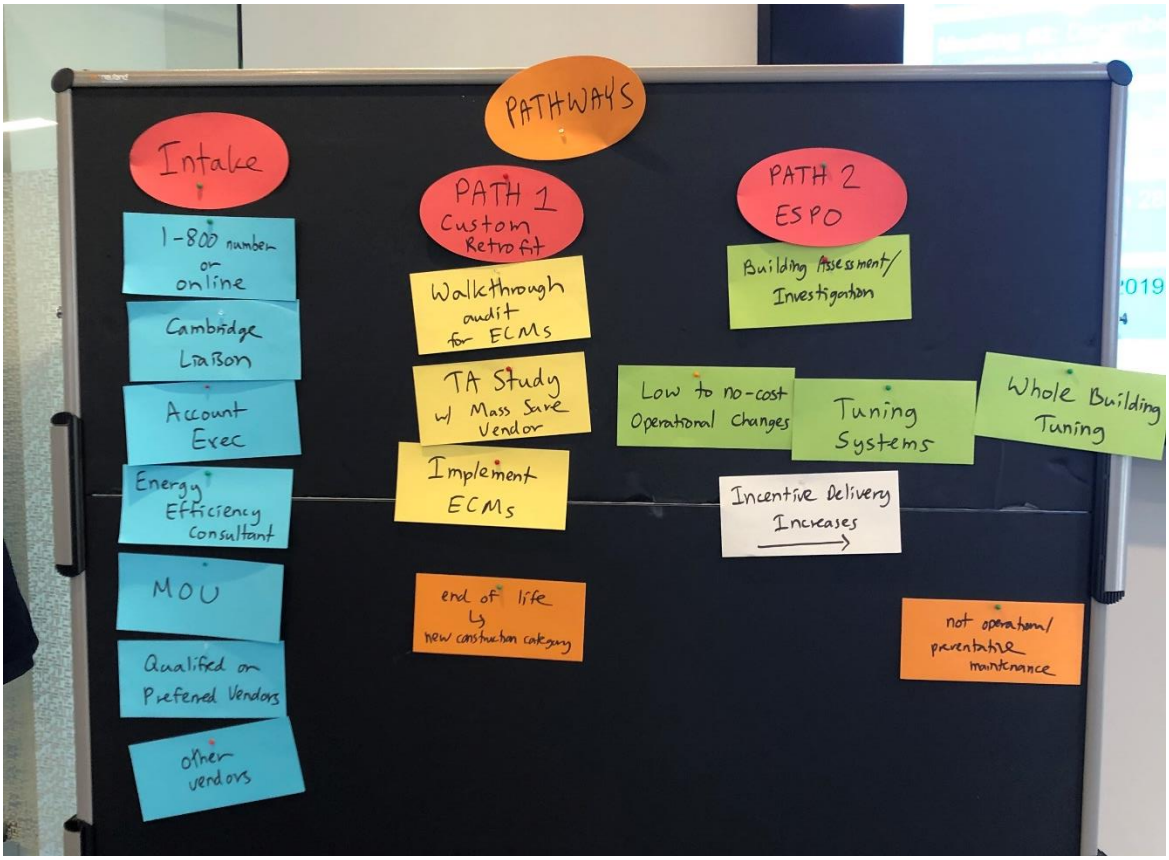


Figure 1. Eversource Retrofit Pathways

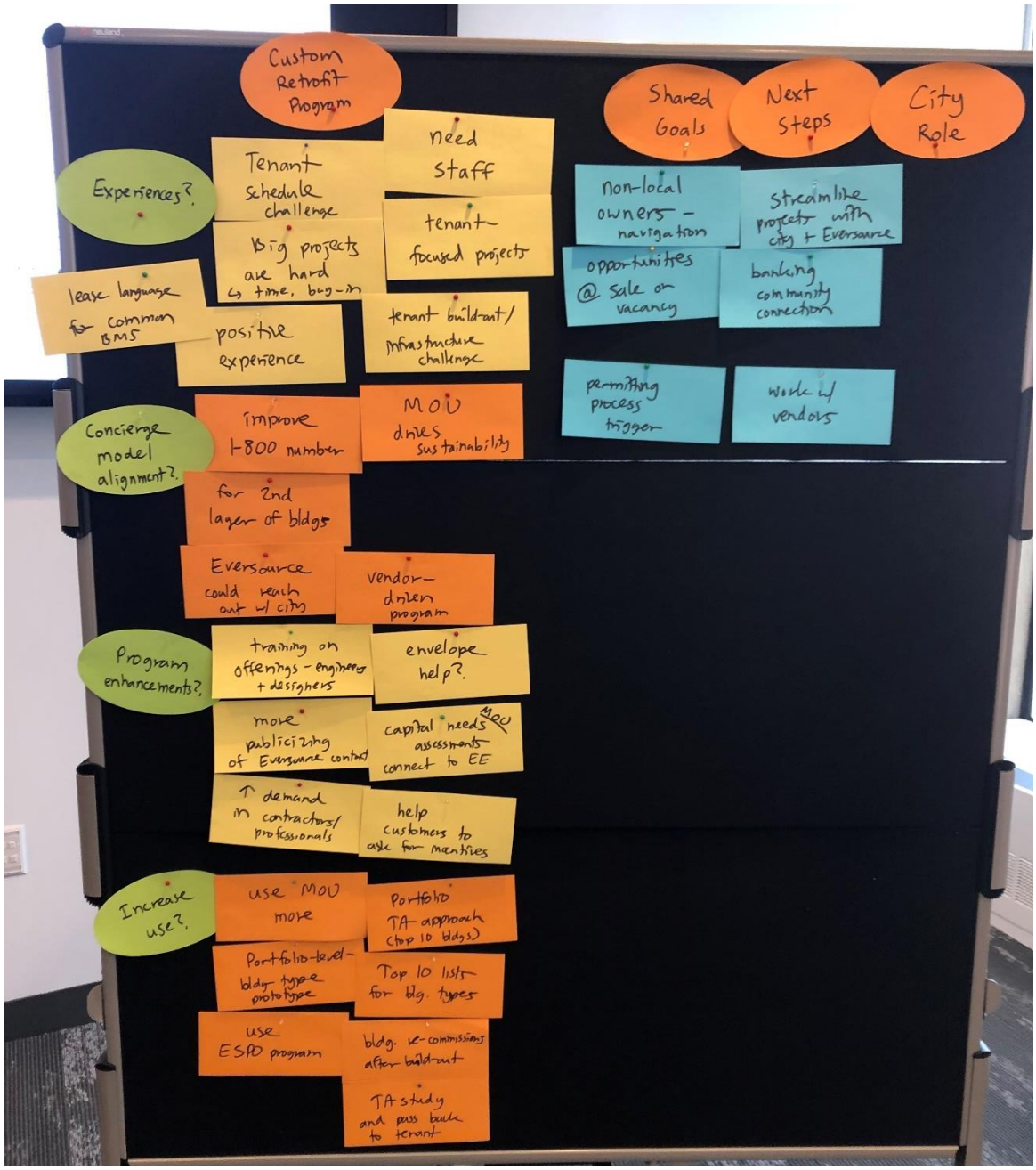


Figure 2. Custom Retrofit Program Discussion

CADMUS

BEUDO Task B Workshop 4 Notes

Voluntary Comprehensive Retrofit Program Structure

May 30, 2019

MITIMCO

Attendees

- Jeff Cook, Alexandria Real Estate
- Matt Sexton, Boston Properties
- Jonathan Mareno, Boston Properties
- Scott Durkin, C&W Services
- Steve Miller, Eversource
- Ed Slein, JLL
- Brooks Winner, MAPC
- Steve Lanou, MIT
- Maureen McCaffery, MITIMCO
- Lauren Baumann, New Ecology
- Wes Chilson, Novartis
- Nate Strong, Rise Engineering
- Ellen Katz, City of Cambridge, Department of Public Works
- Seth Federspiel, City of Cambridge
- Nikhil Nadkarni, City of Cambridge
- Susanne Rasmussen, City of Cambridge
- Egan Waggoner, Cadmus
- Julie Curti, Cadmus
- Kathryn Wright, Cadmus
- Kate Mueller, Cadmus
- Alex Harry (Remote), IMT
- +1 ? (Late addition; did not sign in)

Background

This meeting, held on May 30th, 2019, is the fourth working group meeting as part of the City of Cambridge's Building Energy Use Disclosure Ordinance (BEUDO) Task B Analysis. This task seeks to develop a voluntary, comprehensive retrofit program for the City of Cambridge to help BEUDO buildings best utilize existing program offerings through Mass Save and other state/utility programs to achieve deeper energy retrofits. Workshop 4 was convened to share a proposal for the voluntary comprehensive retrofit program structure and elicit feedback from stakeholders on both the structure and their proposed roles for program implementation.

Presentation slides and handouts are attached.

Purpose

This meeting sought to:

- Discuss and **refine the design of a comprehensive retrofit program** based on a series of priority actions identified through previous meetings and focus groups
- Define **commitments and roles** for the City, Eversource, and stakeholders for successful program rollout
- Clarify **near-term next steps** for delivery of increased energy efficiency savings in large commercial buildings over the next one to two years
- Provide an **update on the Task A analysis** regarding potential BEUDO performance requirements
  -

Program Pathways Discussion

Cadmus presented an overview of the **straw proposal development process**, outlining how needs and challenges raised by stakeholders in Workshop 1 have been mapped to potential actions and solutions proposed in subsequent workshops. In the review of this feedback, Cadmus developed three pathways for strategies and actions to improve the process: **improved intake process**, **increased technical assistance,** and **additional training.** Cadmus facilitators directed the group to a printout outlining actions and roles as part of the program pathways. Actions are divided between near-term actions for the next calendar year, and medium-term actions, which require more time or resources to incorporate and provide an opportunity to incorporate into Mass Save writ large. To create a viable program that builds upon Eversource's existing offerings and enables deeper energy retrofits across, roles for each participating stakeholder group were identified:

- **City of Cambridge**: Local Outreach and Other Support
- **Eversource**: Program Development and Administration
- **Stakeholders**: Commit to Efficiency and Leverage Relationships and Experience

Steve Miller of Eversource also presented on **Eversource's planned approach** for providing comprehensive and customer-specific energy solutions. **Three customer categories** and associated Eversource actions were outlined:

- Large Stakeholders with Eversource MOU
- Large Customers without Eversource MOU
- Additional Stakeholders Reporting to BEUDO

For each program pathway, Cadmus shared an overview of the actions and posed questions for feedback from stakeholders. Program feedback is organized by pathway below:

Improved Intake Process

- Emphasis on **performance based, targeted outreach** using BEUDO data
- Important to **identify appropriate contacts** and consider "multiple points of origin" for beginning the energy efficiency conversation
- Leverage **stakeholder building data** to help identify promising projects
- Suggestion to **include information about programs in the BEUDO reporting package**, as organizations are all looking at its contents
- Combine City roles in 1.1 (communication and marketing strategy) and 1.3 (outreach to local organizations) to look for patterns in data to determine the kinds of **businesses, neighborhoods or districts that should be targeted**, and may be able to engage a partner active in that segment
    - Stakeholders could **establish energy sub-committees within industry groups** to engage on energy efficiency topics and **encourage peer to peer outreach**

Increased Technical Assistance Capacity

- Consider **how a concierge may engage with the account managers** for larger buildings to ensure the concierge is in sync internally with existing staffing to customers
    - Could possibly help in **identifying common needs and issues** among large building owners
- **Define "energy efficiency retrofit"** (e.g., size, scale, type of project)

- Consider the need for 2.2 (develop criteria for prioritizing buildings in large portfolios) as many large building owners already possess the internal capacity to identify priorities within these portfolios
- Larger customers would benefit from the ability to "**lock in" incentives for longer term planning**
    - Eversource clarified there is potential within each 3-year planning cycle, but beyond that would require further discussion in the organization

Provide Additional Training

- Concerns about **hosting of resources**: Eversource likely can't do much to promote non-Eversource offerings (e.g., renewable energy and water conservation)
    - **Potential for City to "connect the dots" to align with other offerings** (e.g., renewable energy/"beyond efficiency") with an Eversource focus on EE

Implementation

- Stakeholders expressed Interest and soft commitments to **developing case studies and lessons learned** from project development. These include:
    - Create a **template and guidelines** to ensure consistency and appropriateness for a broad audience
        - These case studies could be shared in a **forum** amongst stakeholders and for the benefit of the City and Eversource
    - Use **contacts gathered in 1.4 (identify appropriate contacts) to share** and conduct outreach

Feedback Form Summary

At the conclusion of the workshop, Cadmus provided forms with which stakeholders could provide additional feedback on the programs. Feedback from the ten returned surveys is summarized below. Items mentioned more than once are bolded and contain the frequency of response in parentheses:

Additional Feedback	Additional Roles	Commitments	Other Things to Consider
• Concerns as Eversource acting as Concierge: Would prefer to see the concierge as a 3rd party funded by Eversource/City but not working under them, to promote non-EE offerings and navigate issues that may be sensitive to Eversource • Eversource should be the main channel for information; the City should not duplicate information to ensure there is a "one stop shop" (source: developer) • The information shared is better suited for smaller market players • Community Development Corporations are important audience for successful engagement but not reflected in the matrix • Use the list from 1.2 (design, engineering, and construction firms) internally, not externally	• Eversource assist city with cross-reference of quartile penetration data and BEUDO reporting data to highlight target sites • 3.4 engagement (A/E firms) should include vendors as well • Stakeholder action in 1.4 (identify appropriate contacts) to support "lessons learned" development and outreach	• **Sharing best practices and/or developing case studies (4)** • Providing names of EE firms they've worked with • **Identifying contacts for Eversource, including outreach to MASSBIO (2)** • Increase MOU utilization • Cannot make financial commitments but volunteer efforts are available • Leverage information from past projects to develop segment-specific guidance	• **Enhanced incentive rates, either to support priority areas for Cambridge or incentivize early participation (2)** • Remove 2-year payback rule and stretch to 5 years or less for implementation requirements • Don't over-ask ownership to fund "never ending goals" • Training program on systems after ECMs have been implemented, similar to Boston BOC program • Consider outreach to property management/third party engineering firms operation buildings on behalf of silent/absent ownership groups • Understanding levels of study/cost & ROI of projects • Commitment to longer term incentives to "lock in" with better foresight and increase likelihood of funding approval

BEUDO Large Multifamily Tenant Focus Group

March 12, 2019 from 1 – 2:30 pm

Attendees

- Tim Skarpa, Avalon Bay – Portfolio Maintenance Director for Boston Metro West
- Steve McGorty, Avalon Bay – Senior Maintenance Director for MA/RI Portfolio
- Dan Egan, Equity Residential – Head of Investment Acquisitions
- Eli Herman, Akelius Residential – Construction Manager

Background

- The City of Cambridge seeks to investigate the design of a voluntary comprehensive retrofit program to enable all buildings subject to the Building Energy Use Disclosure Ordinance (BEUDO) requirements to achieve significant energy savings and greenhouse gas emissions reductions in conjunction with existing state-level and utility-delivered offerings.
- Two focus groups are being convened, to further assess barriers and opportunities for Cambridge buildings subject to BEUDO to pursue energy efficiency. The feedback from this multi-family group will help inform the purpose and direction for the comprehensive retrofit program.

Key Takeaways

Organizations have taken advantage of the "low-hanging fruit" from Mass Save programs, but acknowledge deeper retrofits are harder to implement as units turnover quickly, or because companies have a preference to renovate all units at once.

- Property managers must **balance energy efficiency upgrades and additional cost per unit for upgrades**, as tenants are concerned about higher rent. Generally, projects with a ROI of 2.5 to 3-years or less are pursued.
- They also shared they are pursuing LED lighting projects, smart thermostat installations, and ceiling insulation in tenant spaces. One company pursued these improvements as units turned over but it was **more common to make tenant space upgrades across a building at the same time.**
- **Refinancing cycles did not drive investment decisions for these building owners**; investments are made based on capital planning cycles, building needs, and expected return; These companies did not need to tie capital to building assets. Participants did share seeing an increased desire in capital markets for green bonds.
- Participants expressed **interest in training and workforce development for building operations**, as operators may not be familiar with energy efficiency opportunities within their building, and have taken advantage of some trainings already, where available.
- Some participants have worked with CLEAResult and New Ecology for technical assistance and think **the value of a Concierge Navigator would be the consistency of knowing who to contact for help with decision-making**.

Survey Results

Are units separately metered?

- One participant indicated that they have buildings with separate meters and others with master meters and are switching to master meters where possible.
- Two participants indicated tenants pay their own utilities.

Group Discussion Facilitation Exercise

Rental Marketing

How important is sustainability?

- One participant's organization has its own asset development and construction group. They find it is critical to pursue LEED as residents are asking about it. **LEED is used as a marketing tool** and LEED Gold and Silver buildings are currently under construction. However, **the willingness of tenants to pay for this is variable**. Having already utilized Mass Save for low-hanging fruit improvements, they are actively investing in sustainability, though some benefits are easier to quantify than others.
- Other participants offered that they typically purchase older, occupied buildings and rarely do gut renovations. Instead, they **renovate common areas and units as they turn over**, which makes LEED hard to pursue.
- Participants are actively making sustainability more of a focus by **investing in less-intrusive upgrades** such as ceiling and piping insulation, LED lighting, and NEST thermostats.
- One participant includes a handout sheet on the countertop of all units at move in with stats about the property.

What are residents asking about?

- **Costs is typically the first question**; when prospective tenants see the LEED plaque, they are prompted to ask how much they will pay for that feature.
- Some tenants are **enticed by sustainability features** like rainwater harvesting, and this participant tries to showcase this to tenants.

Lease Administration

Do you consider the leases you offer to be green? More specifically, does your lease include energy-aligned language?

- Participants are **not currently providing green leasing**; these features are purely used for marketing at this point.
- To help eliminate the split incentive, one participant is **adding VRFs and refrigerant flow metering to units and make tenants responsible for heating usage**.
    - This reduces both overhead costs and base rent. The high efficiency systems and lower rent are marketing points as well.
    - Implementation is in process in a Cambridge building, so the lease terms are not yet determined.
- A participant noted that the concept of shared savings sounds great but is **hard to incentivize in practice.**
    - This is challenging in Massachusetts where tenants cannot be charged for shared utilities (e.g., water, heating) like in New York and Washington, D.C.
    - They have installed separate water meters in some buildings in other states, which has decreased water usage by 20%.
    - It was suggested that, if Cambridge is serious about conservation, tenants should pay for utilities.

Tenant Turnover

When units turn over, does improving the energy efficiency of the unit enter into consideration? At the unit level, what energy efficiency improvements are you implementing or considering?

- One participant noted that, because residential units turn over quickly, **it is difficult to implement upgrades at turnover**. It is preferred to have all units uniform in the type of upgrades they have. Some upgrades, like lighting, are quick and easy to implement.
- Another participant stated that they do **full gut rehabs at turnover**, to include appliances and flooring. Though they try to make changes where possible, insulation can only be added by losing square footage, or potentially changing exterior cladding.
- One participant turns over 30 – 40% of their apartments annually and try to turn them over as quickly as possible. Typical upgrades include low-flow plumbing devices and aerators.
- Building redevelopment includes bigger renovations of 600 units per year, including HVAC and new appliances. On average, this kind of renovation **occurs every 10- 12 years and takes 3 years from proposal to completion**.

Do you conduct outreach or education about new appliances or fixtures?

- Information on appliances is part of the initial information all residents receive, regardless of efficiency of the system.
- One a year, one participant's organization does **a resident outreach event focused on sustainability**, but it varies from site to site.

Resident Engagement

Do residents ask for help on energy issues? More broadly, do they share concerns about indoor comfort or maintenance of building systems?

- Residents **tend to only ask questions after receiving unexpected bills**. There is little interest in LEED compared to financially driven questions.

Has your organization taken advantage of wider whole-building Mass Save programs?

- Participants **first look at the whole building opportunities** and those outside tenant spaces including:
    - Lighting via Mass Save, which is important for common areas
    - Smart thermostats
    - VFDs for pumps
    - Boiler replacements
    - Co-generation
    - Attics in garden-style apartments
    - Investigating EV charging program

When do you, or building tenants, use Mass Save? What are the big challenges?

- **Most residents are amenable to Mass Save retrofits**. Leases give the right for the landlord to enter the apartment with proper notice to conduct renovations, which also includes communication of the benefits associated with the retrofit. This is not an issue 98% of the time.
    - One difficulty is when attics need to be accessed through closets, which involves moving closet contents. Some residents will move items and others will not.

- **Deep energy retrofits (DER) are difficult, if not impossible if units are occupied**. Renovations are limited to exterior cladding, including windows.
    - DERs also take time to plan, as long as 3 years.
    - The **best program for DERs includes offering incentives** for the best technologies. For example, if a building owner is considering installing double pane windows, the incentive would pay for the additional cost of triple pane windows because otherwise they would not have an advantageous payback.
- **Desired return on investment and payback varied by participant.**
    - One uses 8% as the rate of return, while others look for 6 – 7%
    - Another looks for 2.5 years/30 months as payback for a capital investment.
    - One will consider installing solar with an 8-year payback.
- **Challenges include upgrades that impact tenants' ability to conduct their day to day activities**, such as upgrading a central or split system. Shutting off water, heat, cooling, or electricity is very difficult.

Does your organization permit residents to use the Mass Save rental unit assessment program? If so, have residents taken advantage of these programs?

- One participant stated **this would be of interest**, and they would not be opposed to advocating for it if it is beneficial for the tenants or owners. [However, participants did note that it sounds like the items offered through Mass Save rental unit programs are equivalent to the upgrades they are already completing as part of their improvements.]
- One participant is **already using Mass Save for showerheads and aerators**, though they are not sure what other actions could be taken.

Refinancing

Are you refinancing the building in the next two years? If so, are you exploring any new energy efficiency opportunities?

- Participants stated that **refinancing is uncommon and not an idea they often entertain**. They are more likely to sell as opposed to refinance.
    - Most debt is unsecured and not backed by the assets they own.
    - Another participant will ask their parent company for funding for specific building capital improvements and will pay for the investment out of rent increases.
- A participant noted that low-income housing and affordable housing are more held to refinancing cycles.
    - This is when they perform major capital work or consider installing solar or new windows.
- Another participant noted that capital markets are **showing a desire for green bonds**, and they recently did one that is backed by buildings with green certification
    - The cost of capital could decrease if the cost of the bonds increases

If not refinancing, what drives the investment decisions?

- A majority of participant **investments are driven by return and capital**. They will undertake projects with a return whether or not there is capital available. Sustainability projects can be underwritten with a return of 6 to 8 years, while other buildings operations projects are funded by a different, fixed pool of capital.

    - The buildings work with a third-party consultant to underwrite their energy efficiency investments.
    - They call a 3rd-party to do a site survey to evaluate the asset and come up with a 1-, 3-, and 5- years capital plan on what they should do. They often decide to upgrade or sell the property.
        - They think of the increase in efficiency in their portfolio as enabling them to do other things.
- One participant currently does not have a program for investment planning but is developing one to **conduct an energy efficiency assessment on all their buildings**. The results of this assessment could inform capital improvement plans for the next 5 years or so.
- Another participant has a 10-year plan for investments in each building that includes actions for each year.

Outlining Solutions

Training and Workforce Development*: Offer building operations training on new, energy efficient equipment as well as proper operation and performance for existing equipment to attain energy savings.*

- Participants **emphasized the benefit of operator training** as operators have a variety of different backgrounds (e.g. automation, plumbing, etc.) so presenting standard knowledge on usage reduction is important.
- Training provides **both current and future benefits**; finding workers with training is currently difficult.
- The **recent A Better City training was "economically, a 'no brainer'"** at $1,800 per staffer, and the cost of which is being partially borne by utilities.

Concierge Navigator*: Provide services to help customers navigate existing programs and connect building owners and tenants with energy efficiency resources.*

- One participant **partnered with CLEAResult about a year ago, which has kept them abreast of Mass Save options and changes**. As part of this arrangement, CLEAResult provides informational and technical support, which goes hand-in-hand with Mass Save, keeping them abreast of changes to the Mass Save program and offerings.
    - This organization has a sustainability department, which enabled them to make this connection. They also have **analysts to perform energy consumption and carbon footprint modeling** and frequently have conversations about energy saving opportunities. They have already reduced energy consumption by 30% in many buildings, reducing costs.
    - They are also working to track sustainability and waste with a goal and focus on carbon reduction. The return on investment seems like a driver but they are primarily focused on sustainability.
- Another participant formerly worked for New Ecology and interacted with Mass Save. Due to turnover at Mass Save and the varied customer experiences with the C&I programs, this concept would be **beneficial to have a consistent person to consult with about energy efficiency decision making**.
- One participant's organization has an energy manager who oversees North American properties, though much of the effort is based in each city where construction managers develop with programs for each building.

  - There is an **interest in assessing energy and water use**, and they are currently developing capacity at their company to do so and developing working groups to lower usage more. They have a 30% carbon reduction goal over the next five years.

What is the best outreach method?

- **Operations directors are an important point of contact**, because site-level management may not understand the big picture or escalate issues, while VPs may not understand the technical aspects
  - **The challenge is determining who those people are** and locating the people at corporate offices to direct you to the proper contact.

Are there any trusted voices, trade groups, or associations you work with?

- BOMA, GBREB, trusted contractors (may not necessarily be Mass Save contractors)
- One participant highlighted that **contractors** that do the work that receives Mass Save incentives do a lot of the advertising and outreach and are therefore aware of the changes and updates to the program.
- One participant noted that Mass Save has improved communications compared to early on in the program.

***Beyond Efficiency**: Couple energy efficiency and building electrification or enable coordination on programs related to the water-energy nexus.*

- One participant gave an example of a Cambridge asset in which longer term planning was considered. The asset was **built with time beyond the next 10 – 15 years in mind**.
  - They are currently irrigating by reclaiming runoff from the site.
  - From an energy consumption perspective, the design and construction team is thinking years ahead of today. It would be helpful to have some sort of planning about how to think about investments over this time frame.
- The City of Cambridge requires LEED Gold for new buildings, and the City of Somerville requires reflective roofs or a justification if not installing solar.
  - The **challenge is smaller and older existing buildings**. There is a push to include solar wherever possible, as well as a transition to VRF central heating and cooling. However, both of these technologies compete for roof space, resulting in having to make a decision between the two.
- It would be helpful to **think more about how energy can fit into rehabilitation project projects**. For example, if resealing a roof, the project team should thing about air sealing and insulation as well as VRF and solar.
  - One suggestion was to **use permit applications as a means of marketing energy efficiency options** and making recommendations for low-cost or no-cost upgrades.
  - Another suggestion was for installing full-stack VRF and adding a chase with closets and VRF systems in each one.

Are there other actions the City could take?

- The City could develop a **task-force to serve as a resource for early design of gut renovations**. There is little knowledge of deep energy retrofits, so this could help show short- and long-term savings.

- **Building envelopes** need to be assessed in a holistic way, which will take significant effort and assistance
    - **Changes to zoning** may help with insulation (e.g., allowing the buildings to expand outwards 6”) to enable addition of insulation without reducing floor area
- **Maintenance teams need to be incentivized to pursue energy efficiency**, so the training concept is important.

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BEUDO Office Tenant Focus Group

March 12, 2019 from 1:00 – 2:30 pm

Attendees

- Betty Liu, Jacobs – Mechanical Engineer
- Shannon Chaulet, CIC – Assistant Construction Project Manager
- Alexander Wong Berman, Abcam – Environmental Health and Safety Manger
- Rebecca Silverman, Google – Program Manager

Background

- The City of Cambridge seeks to investigate the design of a voluntary comprehensive retrofit program to enable all buildings subject to the Building Energy Use Disclosure Ordinance (BEUDO) requirements to achieve significant energy savings and greenhouse gas emissions reductions in conjunction with existing state-level and utility-delivered offerings.
- Two focus groups are being convened, to further assess barriers and opportunities for Cambridge buildings subject to BEUDO to pursue energy efficiency. The feedback from this office group will help inform the purpose and direction for the comprehensive retrofit program.

Key Takeaways

- The tenants that participated are **typical of the office and lab occupants in the Cambridge market**. Their landlords represent publicly traded real estate investment trust (REITs). According to CBRE, typical asking rents in Cambridge are approximately $82.34 per square foot and vacancy is low at 4 percent (4Q 2018). With these market fundamentals in play, both tenants and their landlords are sophisticated and willing to explore innovative approaches to energy efficiency to maintain high performing spaces and positive tenant satisfaction.
- The tenants in the focus group are knowledgeable of local opportunities from MassSave and EverSource to reduce their energy spend.
- The companies represented **rely primarily on their own internal teams and outside consultants to investigate and execute energy-saving solutions** to reduce operational costs and boost employee health, wellness and productivity.
- Perhaps due to the triple net lease structure, **engagement with landlords is typically self-motivated**. In order to get traction on a specific energy efficiency opportunity within their office space, tenants typically need to initiate the conversation with their landlord.
- The participants were interested in the Concierge Navigator and Training and Workforce Development concepts. Generally, they were **open to landlords taking the initiative to explore whole building energy-saving opportunities.** The participants felt these concepts could lend themselves to **landlord-tenant collaboration, green leasing, or peer learning.**
- Regarding the deep retrofit concepts presented, the participants expressed **some concern with workplace disruption from construction, pass-through costs from landlord capital improvements, and a failure to reap the operational benefit of the improvement over the lease term.**

Survey Results

Were sustainability attributes a factor in your organization's decision to lease its current space?

- Tenants were largely not sure if the base building characteristics played a role in leasing decisions, either because they did not have that information or because the time of lease predated their time with the organization.
- One tenant noted that sustainability attributes were not explicitly part of the decision to lease, but the ability to make additional improvements to the space was a point of negotiation.
- Regardless of the base building, **tenants are motivated to make changes to their space to influence energy efficiency.**
    - All tenants have retrofitted their space or completed improvements separate from their landlord, including plug load switches and occupancy sensors.
- One tenant emphasized that their organization undertakes actions beyond energy, including water and waste management.

How would you rank energy efficiency in terms of priorities for deciding to lease office space? What other considerations are important?

- One tenant identified **energy efficiency** as a priority, followed by employee health and wellness. Their office is being used as an example of energy efficiency and H&W benefits for implementation in other offices across the country.
- Another tenant identified energy efficiency as a high priority, along with **waste management** through the addition of composting. This tenant also believed their organization to be conscious of sustainable sourcing of materials for tenant fit-outs.
- A third tenant identified **employee health and wellness** as a priority, for both sustainability and employee productivity.
- The last tenant expressed that sustainability is important for employee relations, but the determination of most important depends on who in the company you may ask. Key decisionmakers in the leasing process would likely identify energy and cost savings as a priority.

How is your metering managed? Who has access to the metered data?

- **Tenant spaces are separately metered.**
- **Visibility on data is not always clear, and the owner-tenant relationship can be difficult.**
    - One tenant expressed that their building owner sees the meter, who then issues bills
    - Another tenant stated their property manager has data on sensors through BMS, but as a tenant they may have to pay extra for this data. Their utilities are processed through their lease, so they don't explicitly see their utility data.
    - A third tenant says two departments have access to data, but it is simply the Eversource meter data.
- There are third-party organizations that provide services to help tenants access data and mediate the landlord-tenant relationship to promote data-sharing.

Group Discussion Facilitation Exercise

Green Leasing

- **None of the tenant participants had heard of green leasing.**
- Two tenants had personally seen copies of their lease but did not recall seeing green leasing language.
- It was noted that one of the landlords from which the tenants lease space utilize green leasing, so it is possible that those tenants may have green leasing and not know it.

Lease Negotiations

Does your lease include energy-aligned language? Did your organization push for amenities to improve energy efficiency before moving in? How was the process?

- Three tenants **did not push for amenities before moving in**.
- The fourth tenant's organization includes a design team that conducts an energy audit on the building prior to moving in, and found their landlord to be open to installation of supplemental equipment and had experience working with tenant design teams.
    - Improved energy efficiency included more post-lease work than pre-lease.

Does your organization have any concerns about discussing energy efficiency upgrades or opportunities during lease negotiation?

- One organization expressed they **try to find spaces that will enable them to implement their preferred energy efficiency upgrades** and designs. Before leasing, their team went to the space to ask questions about equipment and what tenants are permitted to do to improve energy efficiency.
- Tenants agreed that, by **leasing more space in buildings, they have more room to negotiate with their landlords** as the landlord wants to retain large tenants.
- Another tenant expressed **concerns about the costs of upgrades being passed along to tenants**. They had not yet experienced this in Cambridge, but did in an office elsewhere in the US. This is a concern that could play into resigning the lease.

Tenant Fit-outs

Did your landlord provide tenant fit-out standards for your organization to follow?

- Tenants were **largely unsure if their landlords had tenant fit-out standard** or what the standards might include, if they exist.
    - Two tenants suspected that, if their landlord did have standards, their organization exceeded them due to internal protocols or pursuit of LEED.
    - One tenant was unsure, but noted a building ban on space heaters.
    - Another tenant suspected no requirements beyond a ban on "unreasonable energy use".
- **While tenants did not have much information on tenant fit-out guidelines, they were familiar with tenant improvement funding and actions.**

  - Two tenants commented that they did conduct some retrofits for drywall and HVAC, and another expanded their operations space within the building.

Did you take advantage of the Eversource Sustainable Office Design program during your fit-out? Have you utilized other Mass Save or utility energy efficiency rebates?

- No tenants were familiar with the Sustainable Office Design program.
- **Two tenants had taken advantage of other energy efficiency rebates for lighting, including installation of all LED lights**, occupancy sensors, and plug load sensors.
  - One tenant specifically utilized the Mass Save Small Business Lighting Retrofit.
  - Tenants found these retrofits easy to implement without landlord involvement because they did not require changes to core building. Water retrofits, however, could not be conducted by one tenant because the restrooms are maintained by the property manager.

Landlord Engagement

Does your landlord provide any resources or training related to energy efficiency?

- One tenant was not personally sure but noted a colleague may have information on an energy efficiency program from their landlord. They found their landlord to be responsive to issues and will send technicians to check space perimeters.

Does your landlord communicate with you on energy efficiency or sustainability measures?

- Tenants noted that they do receive **limited communication from landlords**, though communication is largely focused on donation drives and programming, less about energy and sustainability.
- **Engagement on sustainability is driven largely by tenants**.
- One tenant has monthly meetings with their property management, but sustainability issues do not come up in this meeting. However, their property manager has offered to conduct an energy audit.

Who do you ask for help on energy issues?

- Tenants **primarily utilize an internal team**, with limited interaction with external consultants.
- **Tenants rely on their landlord for energy issues related to core building systems**, which can result in slow, limited progress.

Would your organization have concerns if your landlord took on major, building wide renovations? What are the concerns, if any?

- Concerns identified by the tenants included costs associated with renovations included **increased costs** to tenants, disruptive **noise**, additional construction related **energy use increasing monthly utility bills**, and concerns about **landlords or workers entering tenant space** due to confidential project.

- Tenants have found **property managers to be accommodating**, with maintenance typically conducted on weekends, not affecting day to day work.

Does your building have a green team?

- Two tenants indicated that their organizations or building have a green team.

Do you interact with other tenants on matters related to energy efficiency?

- Participants indicated they had **little to no interaction with other tenants**, though one participant noted their organization has worked with other tenants on waste reduction efforts, including implementation of polystyrene recycling.

Does your landlord share its Energy Star score data with you? Does your organization track any sustainability-related data?

- Three tenants said yes, **they receive this data from their landlord**. One did not know if they could access it, but assumed it was not a great score.
- One tenant noted their organization requires and internal, quarterly audit.
- Another tenant's organization is in the early stages of developing sustainability programs and is tracking data now to see what savings they are achieving and can make the case for future efforts.
- Tenants agreed that **landlords are generally open to providing information upon request.**

Lease Renewal

Are you planning on going through a lease renewal in the next two years? If so, are energy efficiency upgrades a consideration?

- One tenant in a position to consider a lease renewal and expressed that **energy efficiency is a low priority** for considering a renewal, as decisions will be mostly driven by cost ($/sf).
    - This tenant may ask for tenant improvement to maximize the flexibility to grow within the space and would consider energy efficiency improvements in this space, but **doubt incentives from Mass Save would be substantial enough to justify the investment.**

Program Descriptions and Discussion

Which, if any, of these programs do you think your organization could benefit from?

- One highlighted Training and Workforce Development as a means of **understanding local buildings and facilities operations** in contrast to nationwide standards and company goals. This would also be beneficial for data acquisition and maintenance.
- Concierge Navigator was noted as a potential way to **aid with energy audits** and serve as an **intermediary for tenants and landlords** when implementing ECMs.
- **Beyond Efficiency is less desirable because it is more expensive**. With WELL certification, for example, there are costs associated with recertifying which adds to overhead. However, if **landlords provided an incentive for certification** it may be more likely. A built-in incentive for

tenants (in the lease or elsewhere) to improve EE in their space would improve the building EE overall.

Are there ways these programs could be adapted to better serve tenants?

- One tenant offered that **green leasing** could have some potential by including clauses for energy efficiency improvements to be partially funded by landlords, who then achieve cost savings.
- One tenant suggested incorporating **opportunities for peer learning and knowledge sharing** within the program.
    - Another tenant added that this could also include **peer benchmarking** and sharing information on potential ECMs to consider for segment-specific improvement

Are there other potential program offerings you believe Cambridge should consider?

- One tenant had experience with clients in which the client presents what kinds of ECMs they would like to implement in the space, and the organization provides feedback on costs savings and payback for that measure. This tenant suggested that Cambridge may use this as a template and **integrate ECMs and with peer benchmarking from BEUDO data**.

When is the best time for your organization to consider implementing energy efficiency measures?

- Tenants each had **different thoughts on the best time to consider implementation**. One suggested far enough into the design process that one can discern what measures may be most beneficial and another suggested immediately after signing a lease and bringing on a design team for tenant fit-outs
- A third suggested right before signing a lease, to enable negotiation and incorporation of measures to include in the lease. This way, tenants can know if the building already has certain energy efficiency requirements and discern what fit-outs would be required, and for what cost, before committing to a lease.

Does your organization consult with outside experts on energy efficiency?

- One tenant consults with an internal engineering team.
- One tenant speaks with their landlord to see what their options for their space are.
- One outsources energy efficiency work to consultants.

Do you have any other comments or concerns to share?

- If major retrofits are happening, tenants want to have **transparency and understanding concerning the occupant impacts**. There needs to be occupant engagement related to timeline and how to mitigate any potential damage.
    - Preference for a one-month lead time.
    - This can be complicated in areas with mixed residential and commercial because night work cannot happen in residential areas.

- In light of disruptions**, it can be hard to articulate the benefits of energy efficiency work to people beyond facilities workers**, unlike amenity upgrades others can directly benefit from.
    - Payback and cost-benefit is an important factor.

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Existing Programs & Market Needs

Cambridge Comprehensive Retrofit Program

Working Group Meeting 1

November 14, 2018

Overview

- 9:00 am to 9:20 am – Welcome, Introductions and Overview of Task B Process
- 9:20 am to 9:35 am – Present Research on Existing State Energy Efficiency Programs
- 9:35 am to 9:45 am – Large Group Q&A on Research, Programs or Barriers
- 9:45 am to 10:50 am – Small Group Discussions on Experiences with Existing Energy Efficiency Programs
- 10:50 am to 11:00 am - Wrap-up and Next Steps for Task B

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Welcome

Introductions & Project Context

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Welcome and Introductions

- Welcome from the City of Cambridge
  Seth Federspiel, Net Zero Energy Planner

- Introductions:
  - What is your name?
  - What is your organization?

Net Zero Action Plan

Reduce energy use in buildings through retrofits and improved operations.

1. Energy Efficiency in Existing Buildings

1.1.1 Custom Retrofit Program

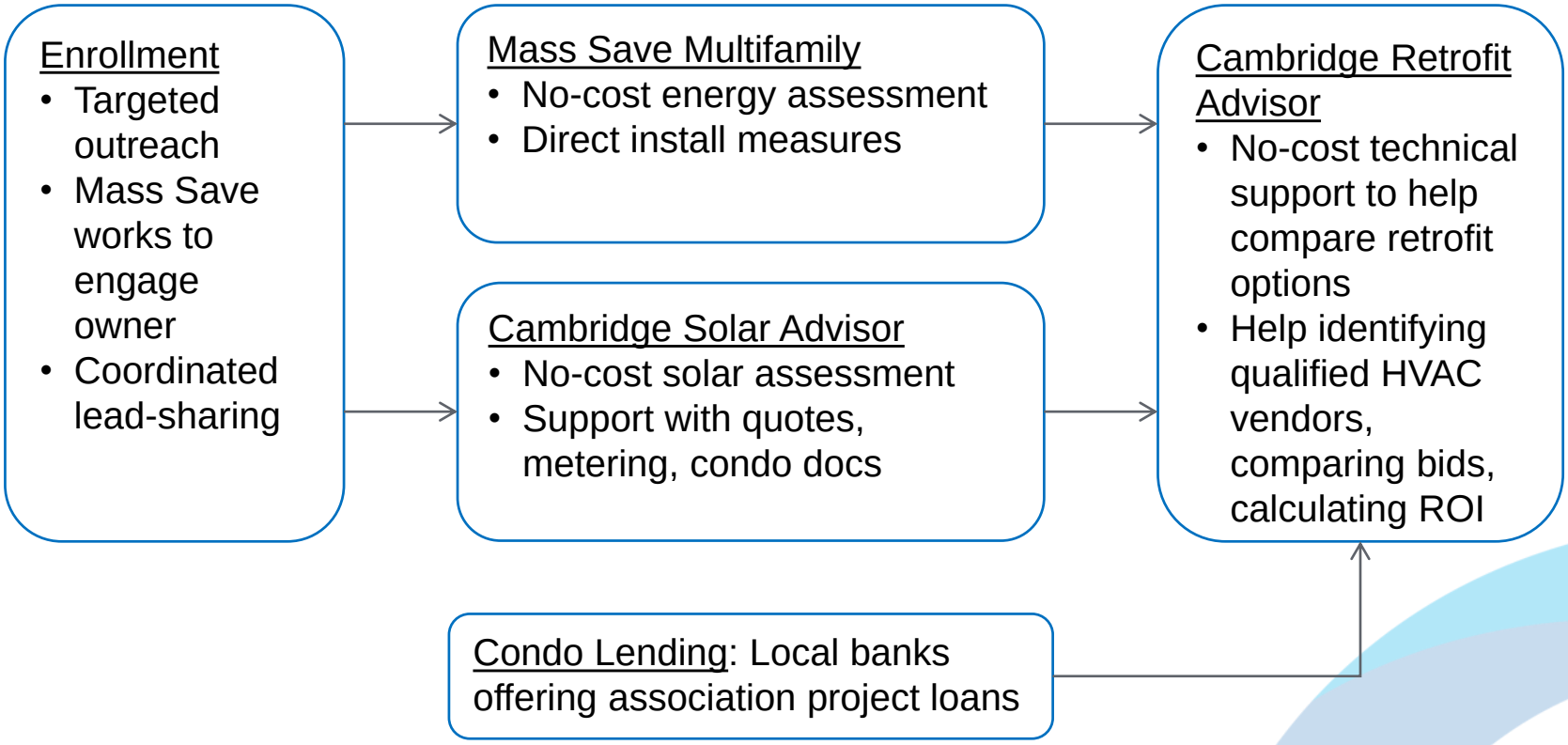
1.1.2 Additional BEUDO Requirements

1.1.3 Upgrades at Time of Renovation or Sale

1.1.4 Operations and Maintenance Plan Requirement for New Construction

Multifamily Pilot Workflow

- Launched in April 2017 through city-utility collaboration
  - Pilot has worked with 35 buildings (1350 units)



Overview of Working Group Process

Beginning Task B

Task A

April – July 2018

Created a proposed performance requirement structure

Task B

September 2018 – May 2019

- Voluntary comprehensive retrofit program
- Research needs of the market
- Performance-based incentive programs
- Landlord and tenant plug load issues

Task B Working Group Timeline

September 2018 – April 2019

Meeting #1: November 14, Location: MITIMCo	Identifying the needs of the market to refine approaches and strategies for a comprehensive retrofit program
Meeting #2: Dec (2nd/3rd Week) Location: TBD	Understanding pathways, incentives, and options for improving program delivery to meet the needs discussed in Workshop 1
Focus Groups: Jan 2019 Location: Virtual	Tenant & landlord focus groups to strategize means of overcoming split incentives and determine tenant motivations for energy efficiency participation
Meeting #3: Mid-March 2019 Location: TBD	Development of proposals for a comprehensive retrofit program
Meeting #4: Mid-April 2019 Location: TBD	Presentation of the finalized straw proposal for a comprehensive retrofit program

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Background Research

Program Offerings and Barriers

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Overview

Existing and Proposed Programs

Existing Programs	• Mass Save • Property Assessed Clean Energy (PACE) *Awaiting Final Release*
Proposed Offerings	• Three Year Energy Efficiency Plan *2019-2021 Updates*
Barriers	• Initial Stakeholder Feedback • Proposed Offerings to Address Barriers

Mass Save

Overview

- Services and incentives provided by MA utilities and EE providers
  - Supported by energy bill charge to customers
- **Energy Assessments & Technical Assistance**
- **Incentives**
  - Appliances
  - Heating & Cooling
  - Lighting
  - Remodeling
- **Project Financing**
  - Business, multi-family, and non-profit customers for **$5,000 – $500,000 up to 7 years** through Massachusetts Bankers Association partnership

Mass Save By The Numbers

Cambridge Participation and Savings Overview

Account Participation Ratio (2015)	7.51 – 10%
Unique Account Participation as % of Total Accounts (2011-2015)	16 – 20%
Gross kWh Savings as % of City Consumption (2015)	> 10%

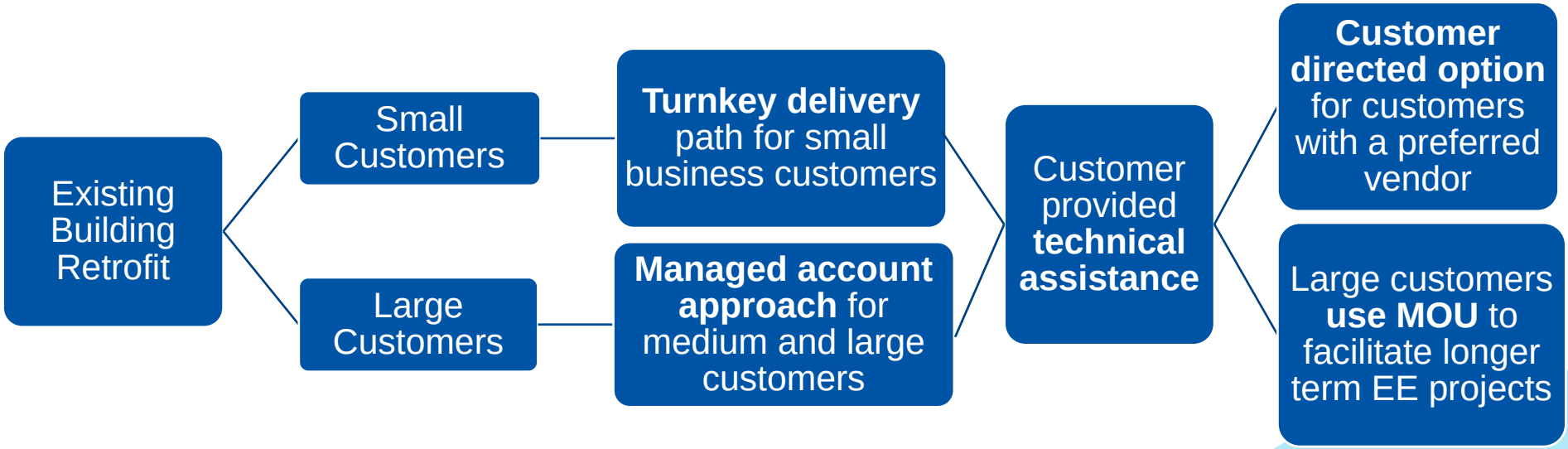
- Cambridge has historically seen above average participation and savings when compared to other cities in MA
- There **is still much work to be done** to achieve proposed BEUDO requirements and participation growth for a voluntary retrofit program to address

EEAC. 2017. "2015 Comprehensive Commercial and Industrial Customer Profile Report". http://ma-eeac.org/wordpress/wp-content/uploads/2015-Comprehensive-CI-Customer-Profile-Report-2.pdf

Program Pathways

Existing Building Retrofit

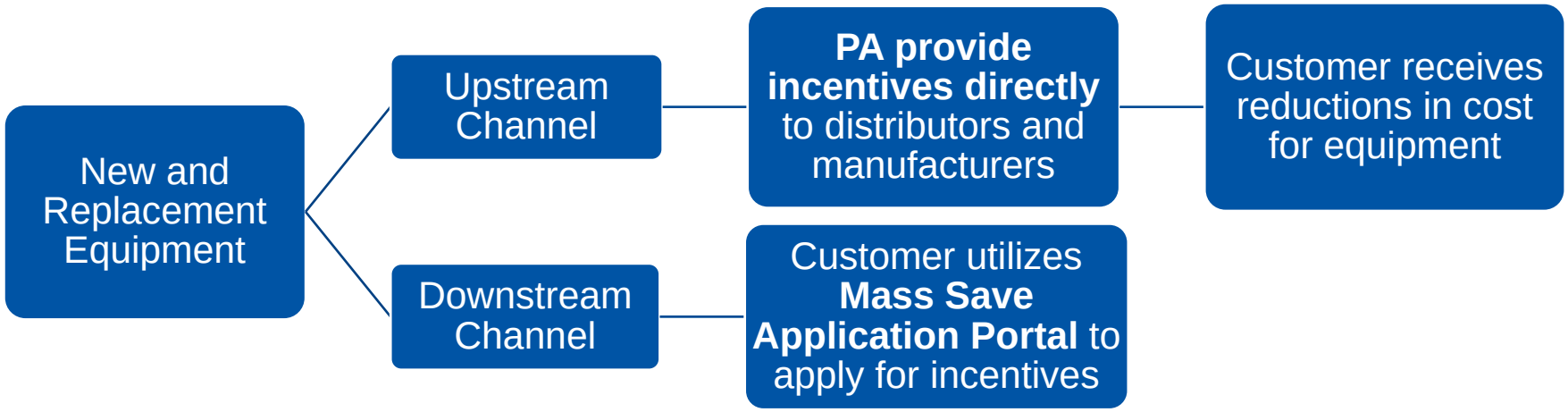
- Customer considering retrofitting facility and/or pursuing energy savings
- Customer offered varied incentives and resources



Program Pathways

New and Replacement Equipment

- Customer replacing or expanding facility equipment:



Three Year Energy Efficiency Plan

Plans will expand offerings in Mass Save

- Plan developed with EEAC and MA DPU
  - 2019 – 2021 plan submitted to DPU for approval on October 31st
  - EE programs administered by utilities (“Program Administrators”) operate in accordance with these plans
- New proposed C&I offerings for:
  - New Buildings & Major Renovations
  - **Existing Building Retrofit Initiative**
  - **New & Replacement Equipment**
  - **Active Demand Reduction**

Upcoming Program Additions

As part of 2019-2021 Three Year Energy Efficiency Plan

- **Energy Optimization**
  - Incentivize adoption of **high efficiency equipment**
  - **Expanded support for heat pumps** and gas heating, water heating, electric HVAC, and food service equipment
- **Streamlined Retrocomissioning (Q2 2019):**
  - Offering expedited, streamlined paths to HVAC optimization
  - **Reduce documentation** and **shorten time** for earned incentive delivery
- **Active Demand Management**
  - Incentivize load curtailment based on average performance
  - Summer and winter programs
  - “Technology agnostic” approach enables energy storage and other technologies to be incentivized

Property Assessed Clean Energy (PACE)

Available for Municipality Adoption Late 2018

- Means of financing in which loans are paid by a "betterment assessment" on property tax bill
- **Loan is attached to property**, not individuals
- Can be used to finance:
  - Improvements to reduce energy consumption
  - Renewable energy systems
  - Natural gas line extensions
- Commercial, industrial, or multifamily (5+ unit) properties are eligible
- Currently available in over 30 states + Washington, DC

Private Financing

Non-Mass Save or PACE Opportunities

- **Larger commercial entities** tend to have access to private lending opportunities
  - Existing bank relationships or lines of credit
- Credit-based lending for **institutions**:
  - Public entities (e.g., municipal & federal governments, housing authorities)
  - Colleges
  - Hospitals
- Larger projects requiring **higher capital investment**

Initial Stakeholder Feedback

Task B Intake Interviews

- Interviewed representatives from the **finance** sector, an **energy efficiency** provider, a large **tenant** and **building owner**, and an electric **utility**.
  - Focus stakeholder workshop content
  - Identify areas for further research
- Series of questions pertaining to:
  - **Experiences** related to energy efficiency projects and offerings in Cambridge
  - **Barriers** to program participation
  - Desired **end products** of the comprehensive retrofit program design process.

Identified Barriers

Stakeholder Interview Feedback

- Retrofit projects **compete for time and resources** with core business activities
- Gap in **funding opportunities for mid-size businesses**
- Difficulty **generating customer buy-in**
- Lack of **customer education** on breadth of incentives and **accessibility of program information**
- Need for **segment-specific** marketing, programs, and distribution of information

Barrier: Time & Resources

- Most commercial building owners are **“not in the business of facility management”**
- May **lack dedicated staff** for pursuit of EE
- Retrofits compete with primary business interests
- As a result, energy efficiency is often **not a customer priority**

Upcoming Program:
Expedited Paths to HVAC Optimization (Q2 2019)

- Introducing **streamlined implementation paths** based on previous results, offerings and/or historic data
- **Reduce documentation** and **shorten time** for earned incentive delivery

Barrier: Funding for Mid-Size Businesses

- Small businesses have **higher incentive rates** in Mass Save offerings
- Larger businesses have access to **private financing**
- Limited uptake of Mass Save Commercial Loan Program

Upcoming Program:
Experiments in Financing Energy Efficiency (Ongoing Pilot)

- Current National Grid pilot, with PA's receiving regular updates to assess for implementation by additional PAs
- Flexible **financing up to $1.5 million and 60 months**
- Use the energy efficiency incentive to buy down loan interest

Barrier: Customer Buy-In

- EE becomes **more involved** as “low-hanging fruit” measures are implemented
- Need **willing customers** to make progress toward BEUDO targets
- Appeal to both **“soft” interests** (e.g., occupant comfort) and “**hard” interests** (e.g., financials)
- Must convince stakeholders at **facility manager** and **executive levels** in order to produce results

Barrier: Education & Accessibility

- **Current confusion** surrounding what programs, opportunities, and sources of funding are available
- Historical focus on electricity, with limited attention given to **natural gas** or **steam** savings
- Need **improved access** to informational/educational resources

Upcoming Program:
Integration with Mass Save Application Portal

- Help customers **understand available opportunities** and simplify applications for incentives or services
- Useful only after stakeholders are initially made aware of Mass Save

Barrier: Segment-Specific Resources

- Most valuable and applicable actions vary building-by-building and segment-by-segment
- Segments each have **unique "pain points"**
- Historically good participation from institutional customers, but less from other segments
- **Packaging marketing and common implementation measures** may increase uptake

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- **9:45 am to 10:50 am – Small Group Discussions on Experiences with Existing Energy Efficiency Programs**
- 10:50 am to 11:00 am - Wrap-up and Next Steps for Task B

Breakout Exercise

Program Offerings and Barriers

CADMUS

Questions to Consider

Consider your experience with energy efficiency programs in the following areas:		
Energy Audits & Technical Assistance	Conservation Measure Incentives	Financing

- Are these the categories of services needed to achieve energy efficiency upgrades?
- Is the current delivery structure the most effective way to deliver savings?
- For each service area: What's parts have been **helpful** and where have you faced **barriers**?
- **Where else should we be looking** for examples of successful retrofit program components?
- What is **your desired outcome or end-product** of a comprehensive retrofit program?
    - What type of support would be most beneficial?
- What are your goals for participation in the comprehensive retrofit program development process?

Overview

- 9:00 am to 9:20 am – Welcome, Introductions and Overview of Task B Process
- 9:20 am to 9:35 am – Present Research on Existing State Energy Efficiency Programs
- 9:35 am to 9:45 am – Large Group Q&A on Research, Programs or Barriers
- 9:45 am to 10:50 am – Small Group Discussions on Experiences with Existing Energy Efficiency Programs
- **10:50 am to 11:00 am - Wrap-up and Next Steps for Task B**

Next Steps and Meeting Close

- **Workshop 2**: Understanding pathways for improving access to energy efficiency programs and uptake of measures, including:
  - Performance-based incentives
  - Financing
  - Concierge models and;
  - Other potential options
- Date: TBD (December 10-14 or 17-19)
  - Please respond to scheduling poll
- Do you have suggestions of strong program modules from other states for the team to investigate?
  - Share now or via e-mail.

Thank you for your participation

Any comments or questions?

City of Cambridge:

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Kate Mueller: katelyn.mueller@cadmusgroup.com

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CADMUS

Existing Programs & Market Needs

Cambridge Comprehensive Retrofit Program

Working Group Meeting 2

December 18, 2018

Agenda

Welcome, Introductions, and Context	2:00 pm – 2:20 pm
Overview of Research Results	2:20 pm – 2:40 pm
Research Q&A	2:40 pm – 2:50 pm
Large Group Discussion	2:50 pm – 3:45 pm
Identify Three Potential Program Pathways for Continued Research	3:45 pm – 3:55 pm
Wrap-up and Next Steps	3:55 pm – 4:00 pm

Agenda

Welcome, Introductions, and Context	***2:00 pm – 2:20 pm***
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Overview of Working Group Process

Beginning Task B

Task A

April – July 2018

Created a proposed performance requirement structure

Task B

September 2018 – May 2019

- Voluntary comprehensive retrofit program
- Research needs of the market
- Performance-based incentive programs
- Landlord and tenant plug load issues

Task B Working Group Timeline

September 2018 – April 2019

Meeting #1: November 14, Location: MITIMCo	Identifying the needs of the market to refine approaches and strategies for a comprehensive retrofit program
Meeting #2: December 18, Location: MITIMCo	Understanding pathways, incentives, and options for improving program delivery to meet the needs discussed in Workshop 1
Focus Groups: Jan 2019 Location: Virtual	Tenant & landlord focus groups to strategize means of overcoming split incentives and determine tenant motivations for energy efficiency participation
Meeting #3: Mid-March 2019 Location: TBD	Development of proposals for a comprehensive retrofit program
Meeting #4: Mid-April 2019 Location: TBD	Presentation of the finalized straw proposal for a comprehensive retrofit program

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Overview

Workshop 2 Research

Workshop 1 Summary	• Mapping barriers and needs • Areas identified for further research
Data Analysis	• Quantitative analysis of Cambridge BEUDO reporting building energy consumption • Suggested building types for program focus
Potential Program Pathways	• Overview of 7 potential alternative models for Cambridge retrofit program

Workshop 1 Summary

Overview

- **November 14, 2018**
- **Purpose:**
  - Collect stakeholder feedback on their experiences with existing energy efficiency and incentives programs
  - Identify barriers and needs a retrofit program should address
  - Determine the focus areas for Workshop #2 research
- Feedback highlighted **technical assistance, timing, and financing** as key barrier & needs areas

Workshop 1 Summary

What efforts should be targeted and what is the best solution to the barriers?

- Services that **connect building owners and tenants with energy efficiency resources**
- **Enhanced energy audit process**
- ECM implementation at **property time-of-sale or changeover**
- Energy efficiency **workforce development** and training
- Connecting a retrofit program to **benefits beyond energy efficiency**, including water, electrification, and renewables
- **Bundling** of energy efficiency measures and approaches

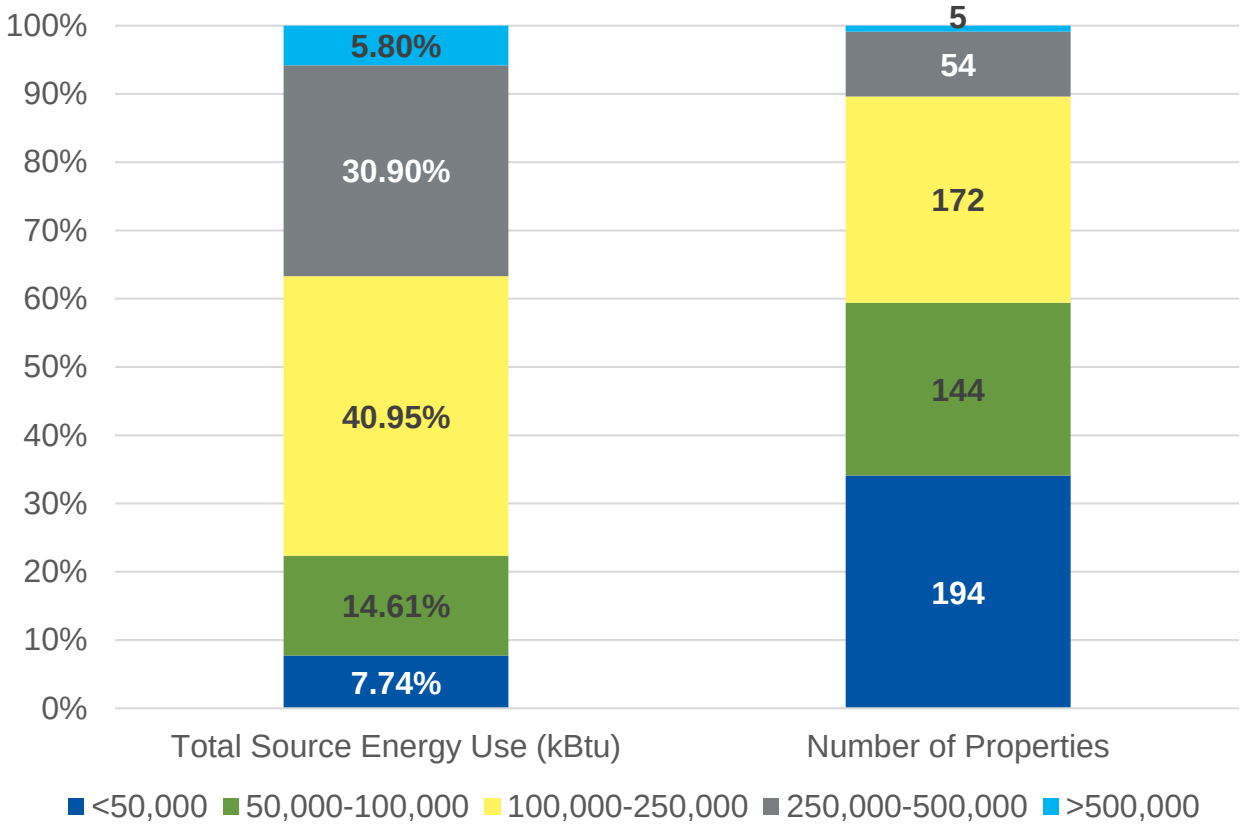
Data Analysis

Overview

- **Identify opportunities for energy reduction** within Cambridge buildings
- **Map needs** from Workshop 1 to these opportunities
- Balance **maximizing energy savings** Cambridge-wide and **making energy efficiency accessible** to a range of BEUDO buildings

Data Analysis

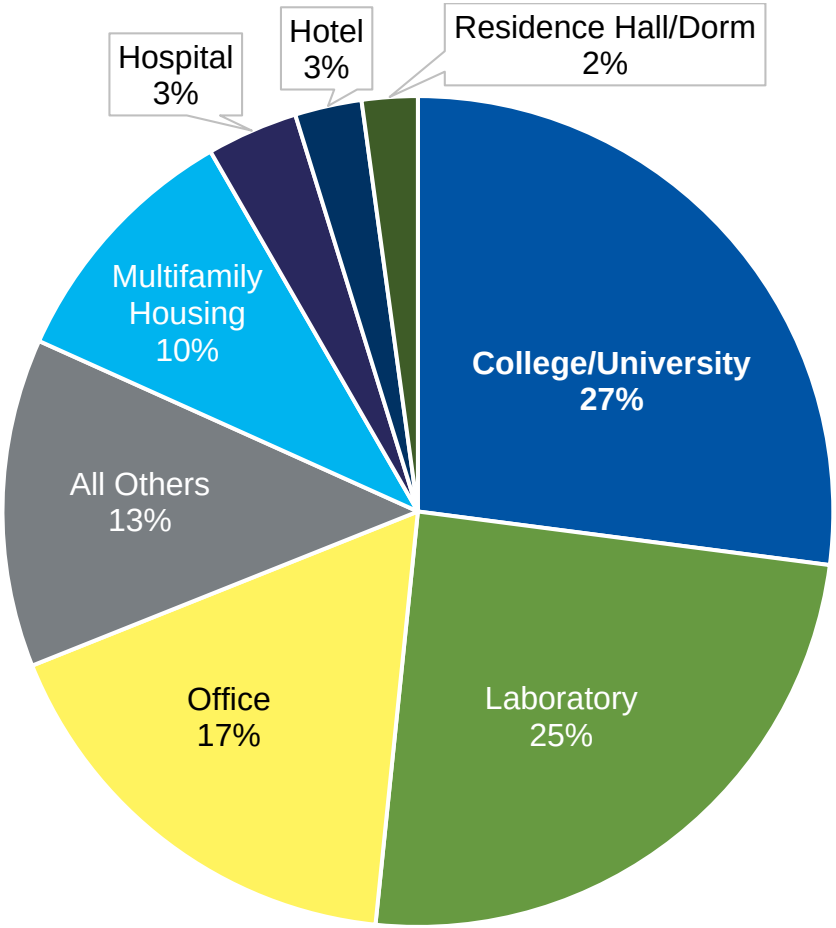
Energy Use and Properties by Floor Area



- Over 75% of energy consumption comes from buildings 100,000 sf or larger
- Small buildings (<100k sf) constitute the majority of properties (60%)

Data Analysis

Source Energy Use by Property Use Type



- Together, colleges/universities and labs constitute over 50% of Cambridge building energy consumption
- "All Others" is composed of K-12 schools, parking, worship facilities, data centers and retail, among other uses

Building Type	Pros of Focus	Cons of Focus
Colleges/Universities	• **Highest energy consumer** with reduction opportunities	• **Already active** and engaged in EE pursuits
Laboratories	• **Second-highest energy consumer** with reduction opportunities • Harness the work of the Net Zero Labs working group	• **Already active** and engaged in EE pursuits
Office Buildings	• **Address timing** related issues **and internal financing** competition	• Tenant **coordination** complexities
Multifamily Housing	• Utilize and **build upon existing** multifamily pilot program	• High **number of properties** to reach to achieve reductions
Others	• Implementation of **turnkey programs**, technical assistance/concierge type services • **Parking** as a savings opportunity	• **Fragmented** collection of building types may be hard to capture • Many small buildings


Concierge Navigator
Training & Workforce Development
Point-of-Sale
Bundling & Turnkey Solutions
Incentive Delivery
Green Bank
Beyond Efficiency
Potential Pathways

CADMUS

Concierge Navigator

Example: NYC Retrofit Accelerator

Services

- Help customers navigate existing programs and connect with resources
- Enhance energy audit process with more detail
- Help coordinate with capital planning cycles and improve timing alignment
- Resources to translate audit results into actionable measures

Needs and Barriers Addressed

- Technical Assistance
- Timing
- Other

Training and Workforce Development

Example: Building Re-tuning Training

Services

- Building operations training for new facilities managers
- Internal education of building staff on retrofit benefits to gain traction internally

Needs and Barriers Addressed

- Technical Assistance
- Financing
- Other

Point-of-Sale

Services

Program to intervene and capture buyers attention to encourage or require implementing ECMs at property time-of-sale or changeover

Needs and Barriers Addressed

- Technical Assistance
- Timing
- Financing
- Other

Bundling and Turnkey Solutions

Example: Sustainable Office Design Program

Services

- Packaging prescriptive incentives for common Rcx measures for targeted facilities
- Expansion of programs like the sustainable office design program to other building segments

Needs and Barriers Addressed

- Timing
- Financing
- Other

Changes in Incentive Delivery

Example: PG&E Commercial Whole Building Pay-for-Performance Pilot

Services

- Pay-for-performance models that incentivizes deeper EE improvements
- Early replacement incentive delivery

Needs and Barriers Addressed

- Technical Assistance
- Timing
- Financing

Green Bank

Example: Connecticut Green Bank, DC Green Bank

Services

- Funding to seek low interest loans for efficiency upgrades
- Support energy efficiency, renewable energy, and water investments with demonstrated ROI

Needs and Barriers Addressed

- Financing
- Other

Beyond Efficiency

Services

- Connection point to building electrification
- Coordination on water-energy nexus between City and Mass Save

Needs and Barriers Addressed

- Technical Assistance
- Timing
- Other

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Questions to Consider

- Based on the data analysis and needs, **what do you think the retrofit program priority should be?**
  - A program for buildings with **highest EUI or GHG intensity**, the **lowest capacity to act**, or one that can **help multiple building types go deeper on energy efficiency**?
  - Which categories of buildings identified in the BEUDO data should be the focus?

Questions to Consider

- In thinking about the needs identified in Workshop 1 that resonate with you the most, **which of these program concepts would you recommend focusing on developing further**? Why?
- For each program concept:
  - What additional information or features would you like to add?
  - What would you like to modify?
- Do you see options that could be combined?
- Are there concepts that should be taken off the table?

Questions to Consider

Optional

- What types of financial needs would your organization have in implementing some of the retrofits we're talking about, including deeper retrofit projects, and how could a financing program help address those needs?
- Do any of the programs from other jurisdictions seem valuable to replicate or consider for Cambridge?

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“Dotocracy” Exercise

- Narrow down potential pathways for continued research, including definition of:
  - Goal
  - Target Audience
  - User Experience
  - Program Administrator
  - Alignment with Existing Programs
  - Scale
- Use your **three sticker dots** to express preference for up to three programs that you would like to see potentially included in a retrofit program
- You may place multiple stickers on one program concept

Agenda

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Next Steps

September 2018 – April 2019

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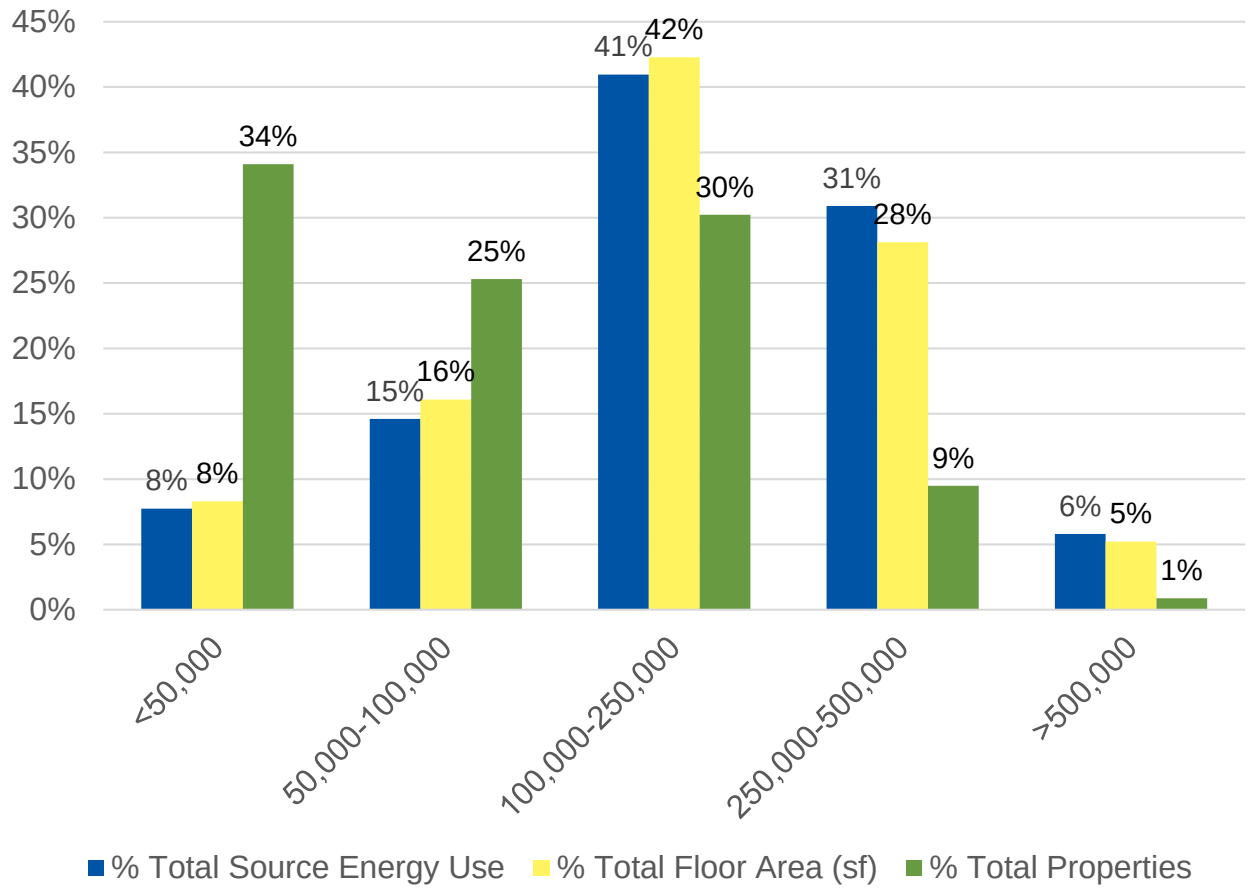
Appendix

Supplemental Figures

CADMUS

Data Analysis

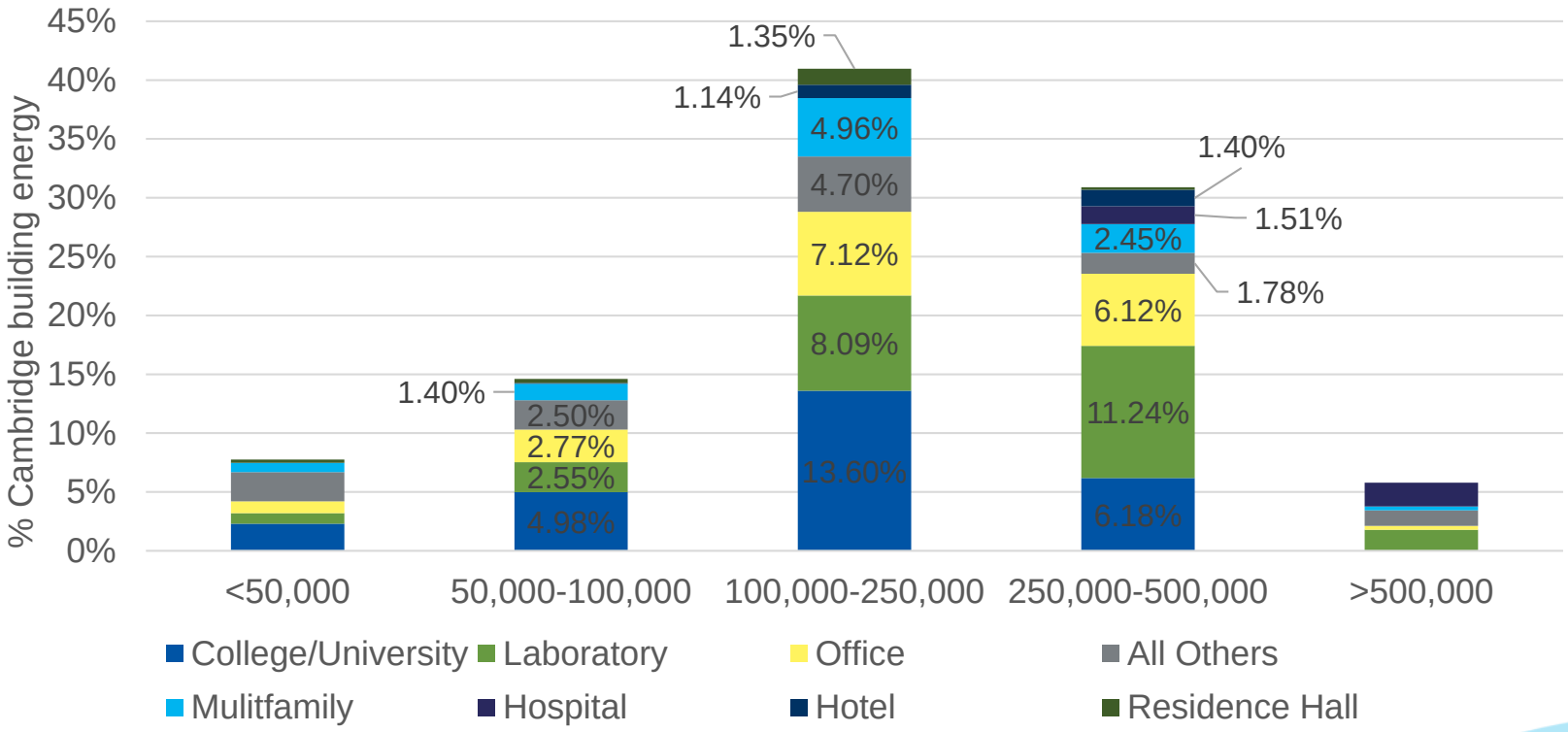
Energy Use and Properties by Floor Area



- Over 75% of energy consumption comes from buildings 100,000 sf or larger
- Small buildings (<100k sf) constitute the majority of properties (60%) but less floor area

Data Analysis

Source Energy Use by Property Use and Floor Area



- *"All Others" is composed of K-12 schools, parking, worship facilities, data centers and retail, among other uses*

CADMUS

Program Proposal Development

Cambridge Comprehensive Retrofit Program

Working Group Meeting 3

March 28, 2019

Agenda

Welcome, Introductions, and Review Results	2:00 pm – 2:25 pm
Results Q&A	2:25 pm – 2:30 pm
Presentation on Existing Programs	2:30 pm – 3:00 pm
Existing Programs Q&A	3:00 pm – 3:10 pm
Group Discussion on Offerings	3:10 pm – 3:55 pm
Wrap-up and Next Steps	3:55 pm – 4:00 pm

Agenda

Welcome, Introductions, and Review Results	***2:00 pm – 2:25 pm***
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Task B Working Group Timeline

September 2018 – April 2019

Meeting #1: November 14, Location: MITIMCo	Identifying the needs of the market to refine approaches and strategies for a comprehensive retrofit program
Meeting #2: December 18, Location: MITIMCo	Understanding pathways, incentives, and options for improving program delivery to meet the needs discussed in Workshop 1
Focus Groups: Jan 2019 Location: Cadmus Office	Tenant & landlord focus groups to strategize means of overcoming split incentives and determine tenant motivations for energy efficiency participation
Meeting #3: March 28, 2019 Location: MITIMCo	Development of proposals for a comprehensive retrofit program
Meeting #4: May 2019 Location: TBD	Presentation of the finalized straw proposal for a comprehensive retrofit program

Introduction

- Facilitate **deep energy retrofits** that go beyond BEUDO requirements and business-as-usual
- Complement BEUDO requirements with a **voluntary program** to achieve savings targets and beyond
- Focus on **Eversource's Custom Retrofit Program**
  - Utilize **existing programs** and offerings where possible
  - Facilitate **collaboration** between Cambridge and Eversource
  - Identify opportunities for Eversource to improve programs to be more **accessible and beneficial** for stakeholders

Overview

Workshop 3 Research

Workshop 2 Feedback Summary	• Review preferred program options resulting from Workshop 2 discussion
Program Models	• Concierge Navigator • Eversource Custom Retrofit Program • DEEP Model

Number of Votes from Dotocracy Exercise

CADMUS

Tenant Focus Groups

- Convened a **series of stakeholder focus groups** to supplement feedback from workshops
- Further inform the direction and focus for the final program recommendations

Multifamily Residential

Office

Labs

Program Descriptions

Overview of Stakeholder-Selected Options

Concierge Navigator	Training and Workforce Development	Beyond Efficiency
• Help customers **navigate existing programs** and connect with resources • **Enhanced energy audit process** with more detail • Help **coordinate with capital planning** cycles and improve timing alignment • Resources to **translate audit results** into actionable measures	• **Building operations training** for new facilities managers • **Internal education of organizational leadership** (e.g., CFO) on retrofit benefits to gain traction internally	• Connection point to **building electrification** • Coordination on **water-energy nexus** between City and Mass Save • Implementation of **renewable energy** technologies

Training and Workforce Development

Stakeholder Feedback

- Both a **short term and long-term challenge –** existing staff need more training and workforce pipeline requires development or operator training and workforce pipeline
- **Internal buy-in** from leadership and/or empowered energy management department are **needed to create culture to support energy efficiency**
- **Eversource offers a series of trainings,** which the City will continue to investigate in addition to program development

*To **learn more** about current training offerings, email **info@masssave.com***

*Include **"C&I Training and Workforce Development"** in the subject line*

Beyond Efficiency

Stakeholder Feedback

- Program offering could have **synergies with clean energy** and **offer non-energy benefits** such as improved air quality and resilience

- Consider the **feasibility of electrification given the availability and low cost of natural gas**, though natural gas is not as cheap at the commercial scale

- Support **long-term planning** for energy investments over asset's life

Concierge Navigator

Stakeholder Feedback

- **A targeted program** within a specific building sector or focusing on low performing buildings **could serve as a pilot**
- **Ambassadors** who understand the range of building typologies can **provide customized support**
- The program would also need to be **comprehensive and incorporate a range of ECMs**
- Need to **facilitate internal selling** to produce buy in, as well as initiate **tenant-landlord conversations**
- **Address timing** and use of resources **for opportunities identified via audits**

Reference Program

Beyond Efficiency and Concierge Navigator

Cambridge Multifamily Pilot

- Provides no-cost **energy efficiency assessments** and **solar assessments** to multifamily building owners
- Layers consideration of renewables with Mass Save
- Shared outreach and marketing

Concierge Navigator

Connections with Mass Save

Stakeholder Need	***Eversource-Mass Save Custom Retrofit Program Opportunity***
Program ambassadors and contacts	Eversource provides an **"account executive"** for some organizations
Access to range of ECMs	Program is **integrated with Mass Save** ECM offerings and can **offer solutions customized** to building needs
Pilot opportunities	Eversource has **funding and interest** in interesting in updating existing offerings to **accommodate Cambridge needs**

Driving Efficient Energy Performance (DEEP) Fundamentals

- Achieve deep energy savings over time = >25% average across all participating buildings
- Begin with small buildings, with goal of including all significant commercial and large multifamily building/ownership types
- No upfront cost to participants
- Savings pay for program and are reinvested in new projects (variant of a revolving loan fund).
- Portfolio approach. Costs and savings tracked across entire cohort.

IMT
INSTITUTE
FOR MARKET
TRANSFORMATION

Agenda

Welcome, Introductions, and Review Results	2:00 pm – 2:25 pm
Results Q&A	***2:25 pm – 2:30 pm***
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Comprehensive and Customer-Centric Energy Solutions

Mass Save® Statewide Efforts

- Mass Save® is –
  - Eversource, National Grid, Unitil, Cape Light Compact and other Mass Save® program administrators (Gas Companies)
- New 3 year energy efficiency plan, mandated by the Green Communities Act approved for 2019-2021
  - Aggressive efficiency/carbon goals
  - Invest **$2.8B** in rate payer funds
  - Deliver **$8.6B** in customer benefits
  - $970M C&I Investment 3YP

mass save
Savings through energy efficiency

Eversource Delivers to Business Customers

EVERSOURCE

EECs with experience in business segments

Resources to address barriers to EE

Tailored, independent studies

Customized solutions & incentives

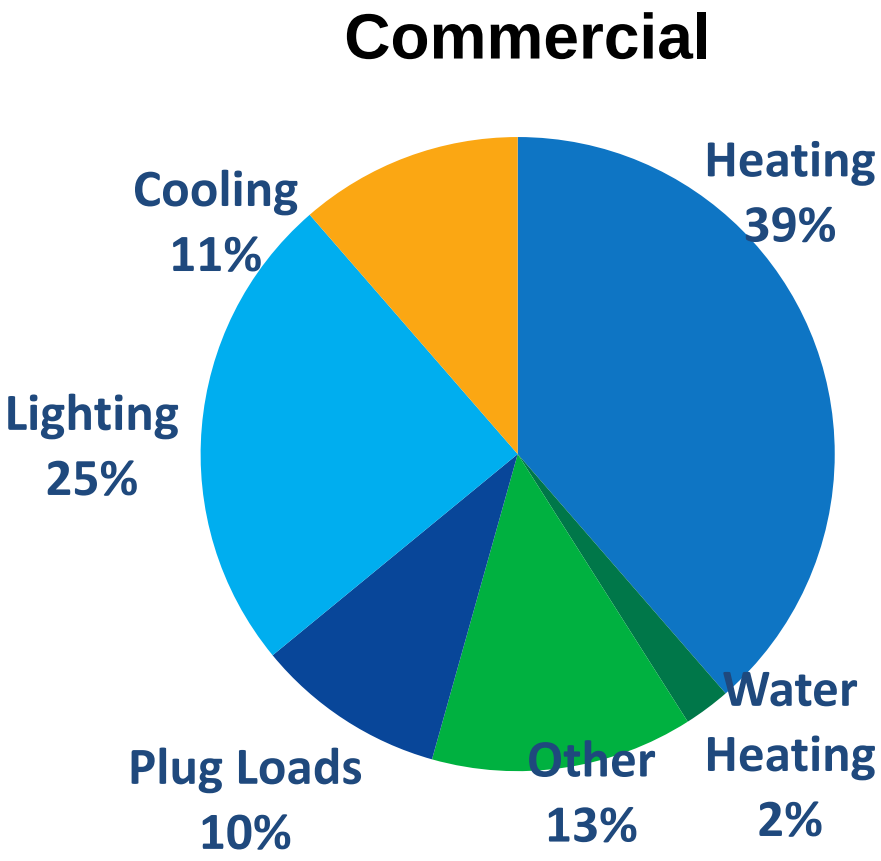
Pathway Options

- Engagement options are designed to address participation barriers and to “best-fit” a customer’s need
  - Custom or Prescriptive Paths available
  - Targeted segment offerings
  - Small Business framework

Customer Decision

Typical Energy Use Breakdown

EVERSOURCE



Cambridge Compact – Comprehensive Energy Retrofit Strategy

EVERSOURCE

- Today
  - Actionable Solutions
  - Deliver Results
  - Set an example for all city businesses
- Tomorrow
  - Strategic Partnerships; Thinking Big
  - Strategic Electrification
  - Create Cambridge Centric Solutions

Cambridge Compact – Comprehensive/Custom Energy Retrofit Strategy for Existing Buildings and Businesses

EVERSOURCE

2 Potential Paths

- Custom Retrofit
  - Broad Solutions
  - Technical Resource and Study Assistance (otherwise referenced as TA)
  - Energy Efficiency Team partnering with vendor bench
  - Deep dive
- Equipment & Systems Performance Optimization
  - Retro Commissioning
  - Low Cost/No Cost
  - Prescriptive/Targeted Systems/Whole Building

Custom Retrofit

- Customer and AE/EEC partnership
- Eversource mobilizes a vetted energy engineering team (TA Vendor)
- Energy team meet with Facility staff to set expectations, perform an initial walkthrough, identify potential ECM’s
- Energy team prepare proposal for full evaluation
- Energy team perform TA Study and present energy savings opportunities.
- Implementation

Engineering – Preferred TA Vendors

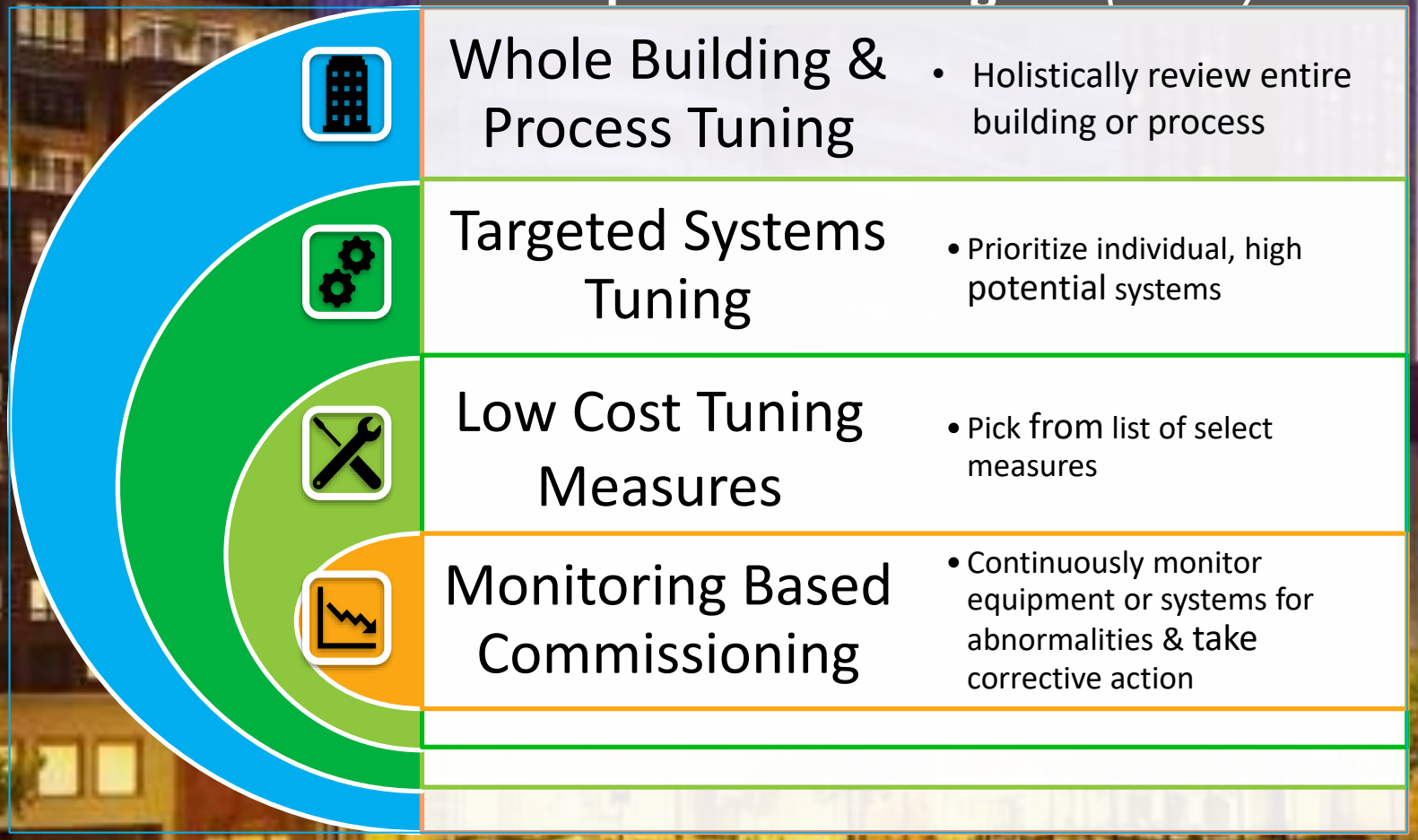
EVERSOURCE

- (15) Preferred TA Vendors
  - (10) Generalist Vendors
    - Available to work on wide variety of retrofit projects
  - (5) Specialized Vendors
    - Industrial Processes
    - Compressed Air
    - Commercial and Industrial Refrigeration
    - Labs & Bio-medical

- Resources are deployed based on customer/facility needs
- EEC's can guide selection

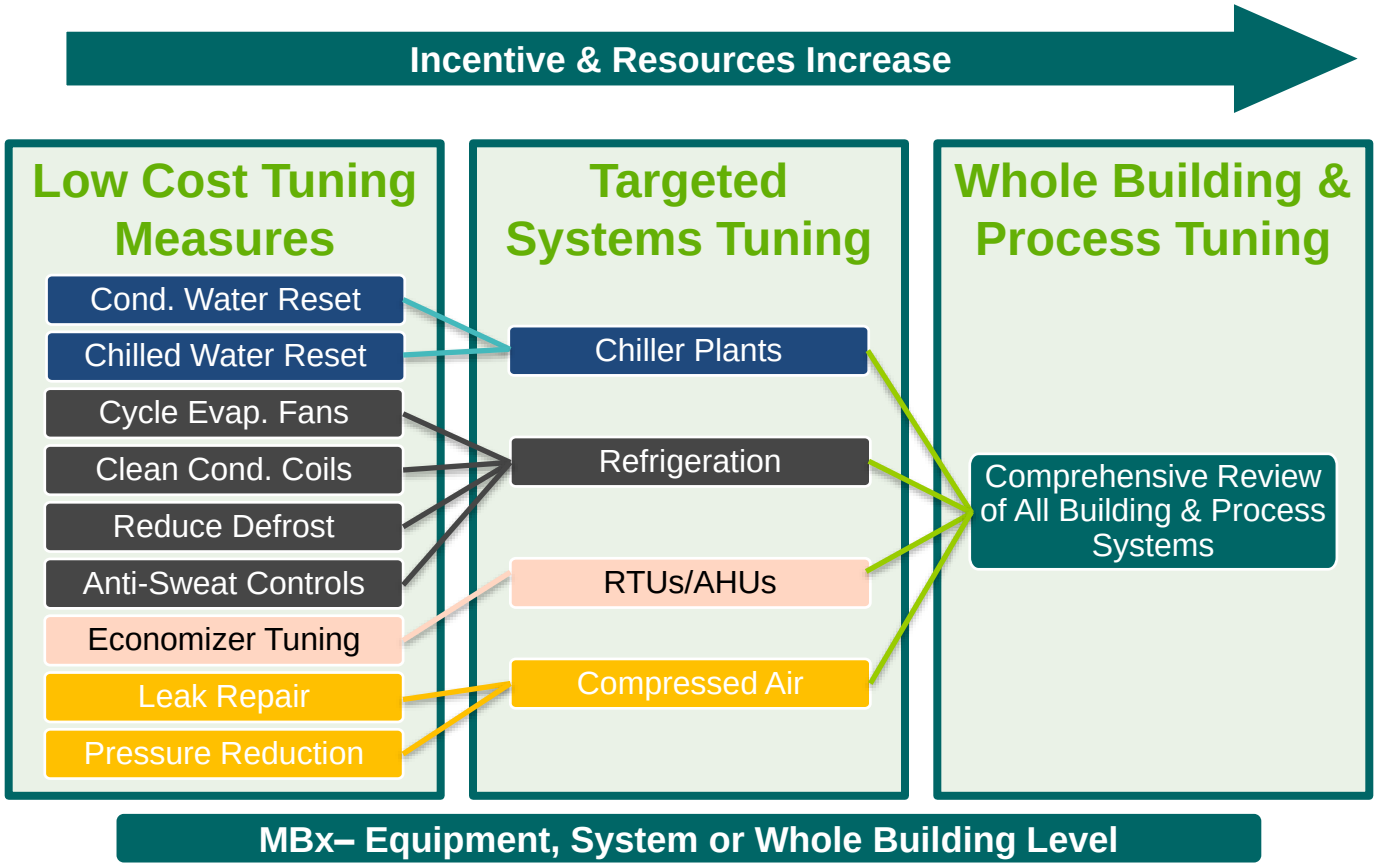
Retrofit Options Through System Optimization

EVERSOURCE



ESPO Track Relationships

EVERSOURCE



How to Participate?

Available throughout Cambridge

- Contact your Cambridge liaison
  - Steven.Miller@Eversource.com
    - 781-441-3502

Eversource Segment-specific

- Account Executives/Energy Efficiency Consultants available to walk you through the process and arrange
- Preferred Energy Engineering Firms
- Qualified 3rd Party Energy/EHS teams
- Other related EE services

University

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- 774-276-5613

Christopher Patrick, Energy Efficiency Consultant
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Barry McDonough, Account Executive
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William O'Conner, Energy Efficiency Consultant
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- 781-441-8596

John Beaulieu, Energy Efficiency Consultant
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- 781-441-8568

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Concierge Navigator

Connections with Mass Save

Stakeholder Need	***Eversource-Mass Save Custom Retrofit Program Opportunity***
Program ambassadors and contacts	Eversource provides an **"account executive"** for each organization
Access to range of ECMs	Program is **integrated with Mass Save** ECM offerings
Pilot opportunities	Eversource has **funding and interest** in interesting in updating existing offerings to **accommodate Cambridge needs**

Stakeholder Interviews

Intent

- Conversations with Eversource and the BEUDO stakeholders to identify:
  - **What steps can be taken** to encourage deeper energy retrofits through Eversource's Custom Retrofit Program
  - Range of **options are currently available** to stakeholders through existing MassSave programs
  - Where **improvements can be made** to make the programs more efficient and achieve deeper energy reductions in Cambridge buildings.

Stakeholder Interviews

Feedback Summary

- Stakeholders identified areas where the program is working well and opportunities for improvement in the program:

Need robust audits to **ensure management confidence** in investments

Need for increased utility **outreach & engagement**

Connect audits with **potential level of savings** from ECMs

Opportunity to utilize **third-party vendors for audits** in Mass Save

Eversource **MOU partnerships** have been successful

Agenda

Welcome, Introductions, and Review Results	2:00 pm – 2:25 pm
Results Q&A	2:25 pm – 2:30 pm
Presentation on Existing Programs	2:30 pm – 3:00 pm
Existing Programs Q&A	3:00 pm – 3:10 pm
Group Discussion on Offerings	3:10 pm – 3:55 pm
Wrap-up and Next Steps	***3:55 pm – 4:00 pm***

Task B Working Group Timeline

September 2018 – April 2019

Meeting #1: November 14, Location: MITIMCo	Identifying the needs of the market to refine approaches and strategies for a comprehensive retrofit program
Meeting #2: December 18, Location: MITIMCo	Understanding pathways, incentives, and options for improving program delivery to meet the needs discussed in Workshop 1
Focus Groups: Jan 2019 Location: Cadmus Office	Tenant & landlord focus groups to strategize means of overcoming split incentives and determine tenant motivations for energy efficiency participation
Meeting #3: March 28, 2019 Location: MITIMCo	Development of proposals for a comprehensive retrofit program
Meeting #4: May 2019 Location: TBD	Presentation of the finalized straw proposal for a comprehensive retrofit program

CADMUS

Program Proposal Development

Cambridge Comprehensive Retrofit Program

Workshop 4

May 30, 2019

Agenda

Welcome, Introductions, and Review Results	2:00 pm – 2:10 pm
Group Discussion on the Implementation of the Custom Retrofit Program	2:10 pm – 3:45 pm
Next Steps and Task A Update	3:45 pm – 4:00 pm

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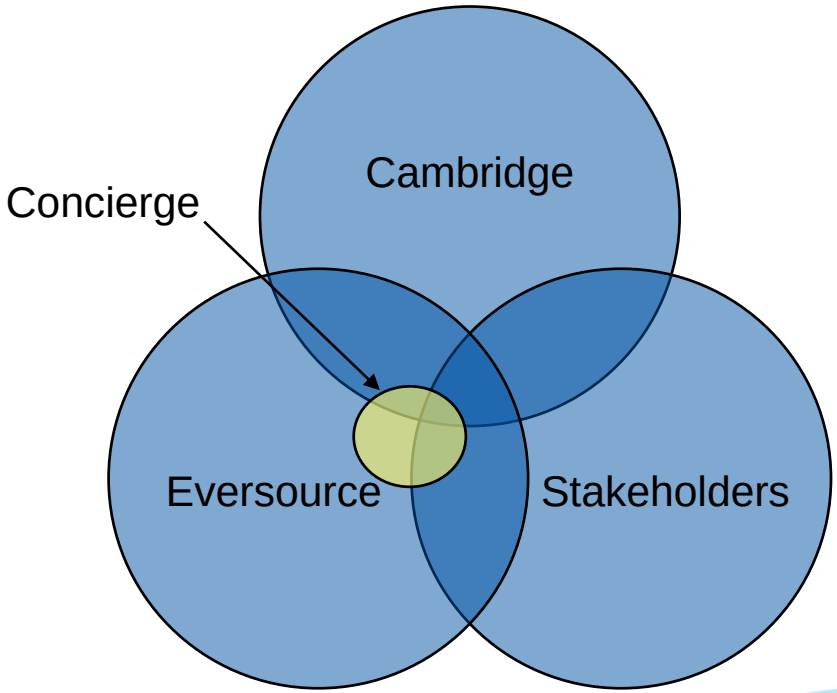
Objectives

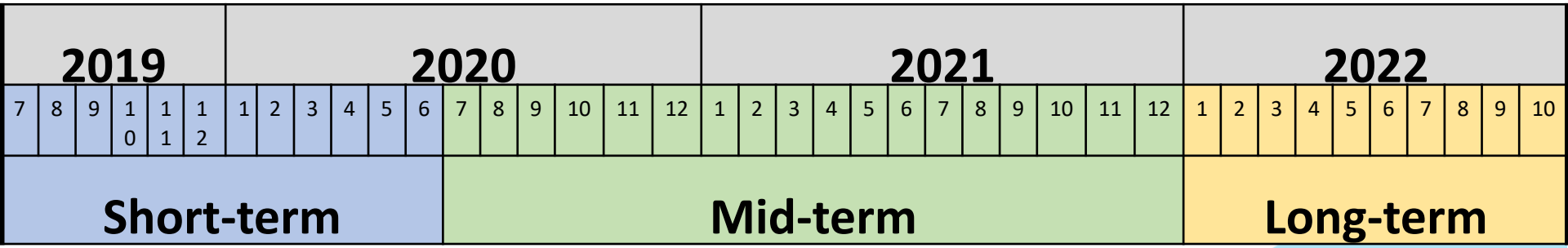
- Share information on current comprehensive retrofit program straw proposal development
- Solicit feedback to inform:
  - Prioritization of elements and actions to include in the program
  - Roles stakeholders may be able to fulfill as part of the program



Strategies to Address Challenges

Feedback for Energy Efficiency Retrofit Implementation

- Highlighted Areas for Improvement
  - 1- Improve Intake Process
  - 2- Increase Technical Assistance Capacity
  - 3- Provide Additional Training
- Timeline for Strategy Implementation



Existing Programs

Eversource Offerings

- **Custom Retrofit Program**
  - Provides a “deep dive” into energy efficiency solutions using technical resource and study assistance through a preferred vendor
  - *Ideal for capital projects*
- **Equipment & Systems Performance Optimization (ESPO)**
  - Offers low-cost/no-cost options for retrocommissioning buildings with existing BMS systems
  - *Ideal for operations and optimization*

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Strategy 1: Improved Intake Process

- Actions included here are intended to address the issues of lack of program awareness and need for program points of contact with whom stakeholders can interact.
- Tenants expressed need for consistent internal and external contacts for general energy efficiency program questions.

Strategy 2: Increased Technical Assistance Capacity

- This set of actions is designed to address issues for stakeholders with gaps organizational staff capacity and/or technical expertise
- Promote comprehensive building retrofit guidance

Strategy 3: Provide Additional Training

- This need encompasses actions that can be taken after stakeholders are informed of program offerings and designed to help them take their next step toward energy efficiency implementation.
- Focus group participants expressed a need for resources to help with both making an “internal sale” on energy efficiency and increased building operator training.

Comprehensive and Customer-Centric Energy Solutions

May 30, 2019

Eversource Delivers to Business Customers

EECs with experience in business segments

Resources to address barriers to EE

Tailored, independent studies

Customized solutions & incentives

Cambridge Compact – Comprehensive Energy Retrofit Strategy

- **Stakeholders with Eversource MOU**
  - Understand projects in the queue
  - Explore deeper/comprehensive approach (1.6, 2.4)
  - Track and document project implementation (3.3)

- **Stakeholders without Eversource MOU**
  - Analyze building type
  - ID and remove barriers to program participation (1.7, 2.1)
  - Develop customer segment solutions using existing programs, TA/Investigation, engineering bench & vendors (2.2, 3.1)
    - Lab/Office/Property Management/Retail
    - Tenant/landlord and non-profit initiatives (1.3, 1.4)

Cambridge Compact – Comprehensive Energy Retrofit Strategy

Additional stakeholders reporting to BEUDO

- Sort data by EUI/building type (1.1)
- ID program category (eligibility for specific program tracks and associated incentive levels) (1.7, 2.3, 3.1, 3.2)
- Develop a vendor focused approach (1.8)
- Utilize a Lending Tree financing model (2.4)
- Create building type suite of comprehensive offerings (2.4)
- Create a community based social marketing plan (1.1, 3.1)

How to participate?

Available throughout Cambridge

- Contact your Cambridge liaison
  - Steven.Miller@Eversource.com
    - 781-441-3502

Eversource Segment-specific

- Account Executives/Energy Efficiency Consultants available to walk you through the process and arrange
- Preferred Energy Engineering Firms
- Qualified 3rd Party Energy/EHS teams
- Other related EE services

Implementation

- Which of these actions are most critical to you in a new program?
- What actions would you be willing to commit to and how?
- Do you feel that there are other actions that should be on this list?
- Is there anything that you believe could be removed from the list that are less relevant to larger buildings?

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