

City of Cambridge Net Zero Action Plan



Decarbonizing Cambridge

Overview of the Net Zero Action Plan

The Net Zero Action Plan (NZAP) was adopted by the City Council in 2015 following an 18-month stakeholder process to identify a phased set of actions to reduce greenhouse gas emissions from new and existing buildings and develop a renewable energy supply strategy for Cambridge buildings.

As part of the 2015 NZAP, the Task Force proposed that the whole suite of actions be reviewed every five years. Driven by the principles laid out in the Net Zero Action Plan and with extensive stakeholder input, both the full set of actions and the timeline of the original plan were revisited in the 2021 review. In addition, the process of reviewing and identifying adjustments to the plan considered the implications of actions with respect to equity and social justice; meaning the actions are to be implemented in a way that ensures resources are accessible to all residents and businesses and do not place undue burdens on vulnerable populations. In accordance with the governance plan, the study's purpose was to review the overall strategy to ensure that the framework continues to evolve in the desired manner.



Introduction to the NZAP

NZAP Task Force

A key element ensuring the continued forward-thinking of the Net Zero Action Plan (NZAP) is the plan's mandate that a detailed review of the whole suite of actions by a stakeholder Task Force. For this review, Task Force members included eight Residents/Advocates, eight Institutions/Property Owners/Developers, and nine Subject Matter Experts – a total of 25 Task Force members.

Residents

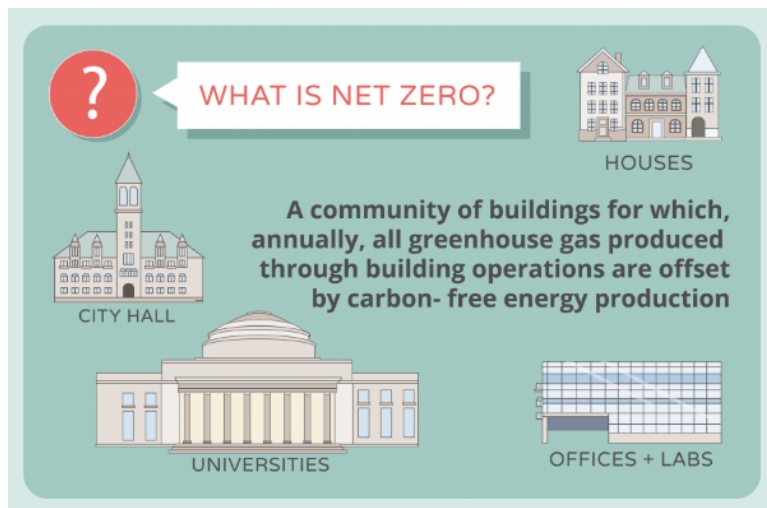
David Adamian,
CEO of Greener U
Gaurab Basu,
Physician
Peter Crawley,
CPAC Representative
Margery Davies,
Mother Out Front Representative
Henrietta Davis,
Former Mayor of Cambridge
Jan Devereux,
Former Vice Mayor/Representative of Green Cambridge
Adam Gould,
Representative of Youth Climate Activists
Kolin Loveless,
Representative from Neighborhood Nine

Institutions, Property Owners and Developers

Jane Carbone,
Director of Development for Homeowners Rehab
Deborah Donovan,
VP of Env., Health and Safety at Takeda
Tom Evans,
Executive Director, Cambridge Redevelopment Authority
Heather Henriksen,
Managing Director of the Harvard Univ. Office of Sustainability
Eli Herman,
Construction Manager for Akelius Real Estate
Rick Malmstrom,
Executive Director of Sustainable Operations for Alexandria Real Estate
Ben Myers,
VP of Sustainability for Boston Properties
Julie Newman,
Director of the MIT Office for Sustainability

Subject Matter Experts

Lauren Baumann,
VP of New Ecology
David Bisson,
Business Development Manager for Resonant Energy
Andrea Love,
Resident and Green Building Design Expert with Payette Architects
Chris Leary,
VP at Jacobs Architects
Paul Lyons,
Resident and CEO of Zapotec Energy
Steve Miller,
Energy Efficiency Consultant for Eversource
Gabe Shapiro,
Co-founder All-in-Energy
Tom Sieniewicz,
Resident and member of Planning Board
Jen Stevenson Zepeda,
Director of Research and Operations for Climable



Net Zero Action Plan

Defining Net Zero

Residents, universities, businesses and the City are collaborating to reduce energy use in buildings and increase access to renewable energy. Cambridge has set a "net zero" target for all buildings in the community, and has created a "Net Zero Action Plan" to outline strategies to help each building reach the net zero emissions goal. You can see how we define net zero in the graphic to the left.

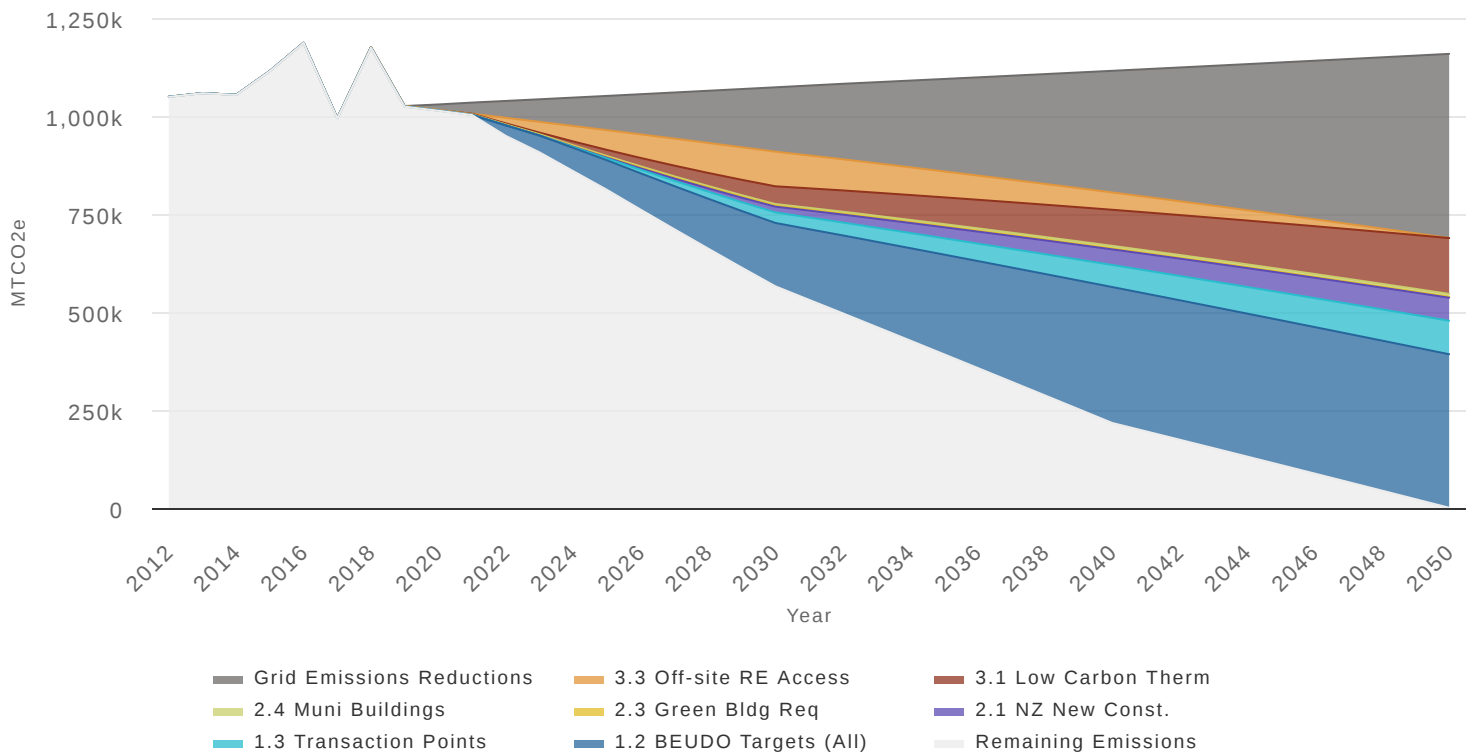
A community of buildings for which, annually, all greenhouse gas produced through building operations are offset by carbon-free energy production.

Net Zero Action Plan

Cambridge Emissions Reduction Strategies

The Net Zero Action Plan is designed so that each action has potential to reduce the City's GHG emissions over time. Not all actions will have an equal impact for reducing emissions, however, all of the actions work toward creating a more equitable and resilient Cambridge. Additionally, it is expected that actions at the state-level will also help reduce emissions through various grid focused strategies. Note that, like all Models like this graph are meant to portray rough estimates versus precise predictions.

Notably, the Targets associated with the Building Energy Use Disclosure Ordinance (1.2 BEUDO Targets, the blue wedge) are estimated to reduce emissions by approximately 7 million metric tons of carbon dioxide equivalent (MTCO₂e) between now and 2050. Together, the implementation of all NZAP measures has the potential to reduce emissions by approximately 12 million MTCO₂e.





Action on Pause



Action Stalled



Action Delayed



Action On Track

Legend

Implementation Status Indicators

To track the progress of each Action in the NZAP, Cambridge has assigned a graphic that will appear in the "Implementation Status" component of the Action Area. The implementation status means where Cambridge is at in working on the steps of each action as it relates to the timeline created for that action.

The parking sign (top left) indicates that the action is not currently in progress.

The red light (top right) indicates the action is stalled and is not currently making progress.

The yellow light (bottom left) indicates that the action is delayed in its timeline from 2021 but is making progress.

The green light (bottom right) indicates that the action is on track with the timeline set in 2021.

Legend

Equity and Resilience Badges

As part of the 5-year review, the City assessed NZAP actions to ensure the plan's benefits and burdens are equally distributed. In creating an updated structure of the actions in 2021, the overlap between the implementation of actions as well as the cross-cutting themes (issues that may be influenced by multiple actions) was taken into consideration. The cross-cutting themes were equity, energy resilience, the renewable thermal energy transition, electric transport, and local capacity. Each of these themes was heavily weighed when thinking through possible adjustments. The reason for continuously reflecting upon these issues was to create a set of actions that would enhance a fair and just clean energy transition, seek out opportunities to improve the energy resilience of the community while reducing reliance on fossil fuel-based energy, and ensure that a structure was in place and that resources would be available to implement this plan.

These badges seen in each Action Area overview indicate that the actions covered bring resilience and equity opportunities to Cambridge.



Resilience



Equity

Action Summary table

Action	Status	Equity	Resilience
1.1 Energy Efficiency (Existing Buildings)			
1.2 BEUDO Performance Requirements			
2.1 Net Zero Requirements for New Construction			
2.3 Net Zero Requirements for Municipal Buildings			
3.1 Carbon Free Energy Supply			
3.2 On-Site Renewable Energy Access			
3.3 Off-Site Renewable Energy Access			

Overview

Action Area 1: Energy Efficiency (Existing Buildings)

Over the past several years, Cambridge has experienced substantial growth, which has led to a significant increase in energy demand. The transition to a low-carbon energy supply cannot happen without the more efficient use of energy in existing buildings. As end-users switch from equipment that combusts carbon-intensive fossil fuels on-site to equipment that uses a lower-carbon electricity supply, such as heat pumps, induction cooktops, and electric water heaters, demand for grid-supplied electricity will continue to grow. Our goal is for the full decarbonization of the building stock in Cambridge, to achieve this it requires the implementation of efficient equipment and building envelopes across the board. Three actions within the Energy Efficiency Action Area are working toward increasing the efficiency of our buildings through a combination of mandatory and voluntary policy measures.

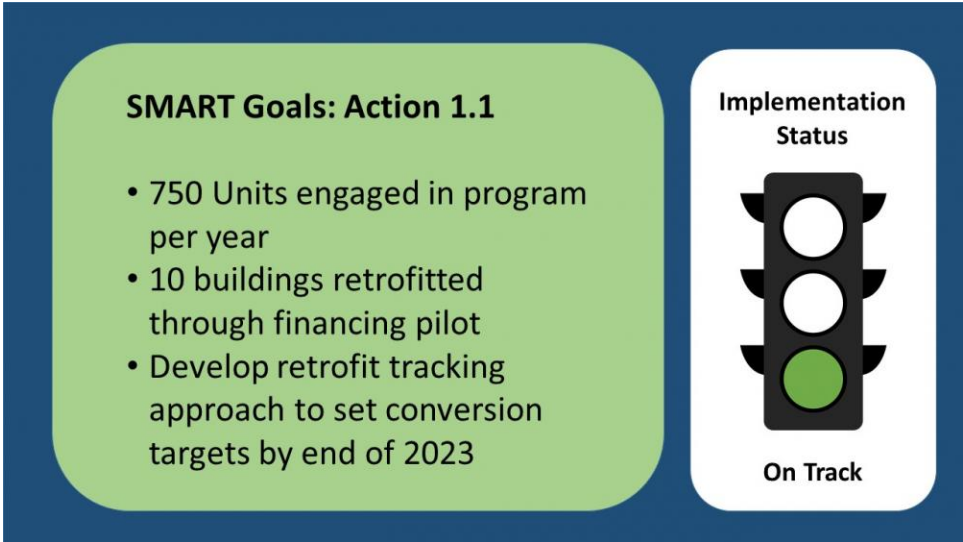
Action 1.1 Custom Retrofit Program	Action 1.2: BEUDO Emissions Reductions Requirements	Action 1.3 Upgrades at Transaction Points
Ensure small/ medium residential & small commercial buildings operate optimally and maximize energy efficiency.	Establish performance standards for commercial buildings of 50+ units. Represents over 50% of the square footage and 70% of GHG emissions.	Leverage transaction points to achieve energy improvements & decarbonization in a financially feasible way by tapping into financing streams that are only available at time of sale, lease, renovation, or permit application. <i>Grey to indicate commencement in 2023</i>

Custom Retrofit Program for Residential and Small Commercial

Action 1.1 Implementation Status

In FY22, staff evaluated the impact of the Multifamily Retrofit Advisor Program as part of the state Innovate Energy Efficiency grant reporting. The program was found to be successfully engaging the interest of multi-family building owners and occupants, but struggling to achieve retrofit results due to a combination of multi-party decision making and limited financing option barriers. As a result the program was redesigned to better integrate decarbonization services for both small and large residential buildings, include a more explicit emphasis on resilience and electrification, and pair with multifamily retrofit finance pilot offerings to increase follow-through.

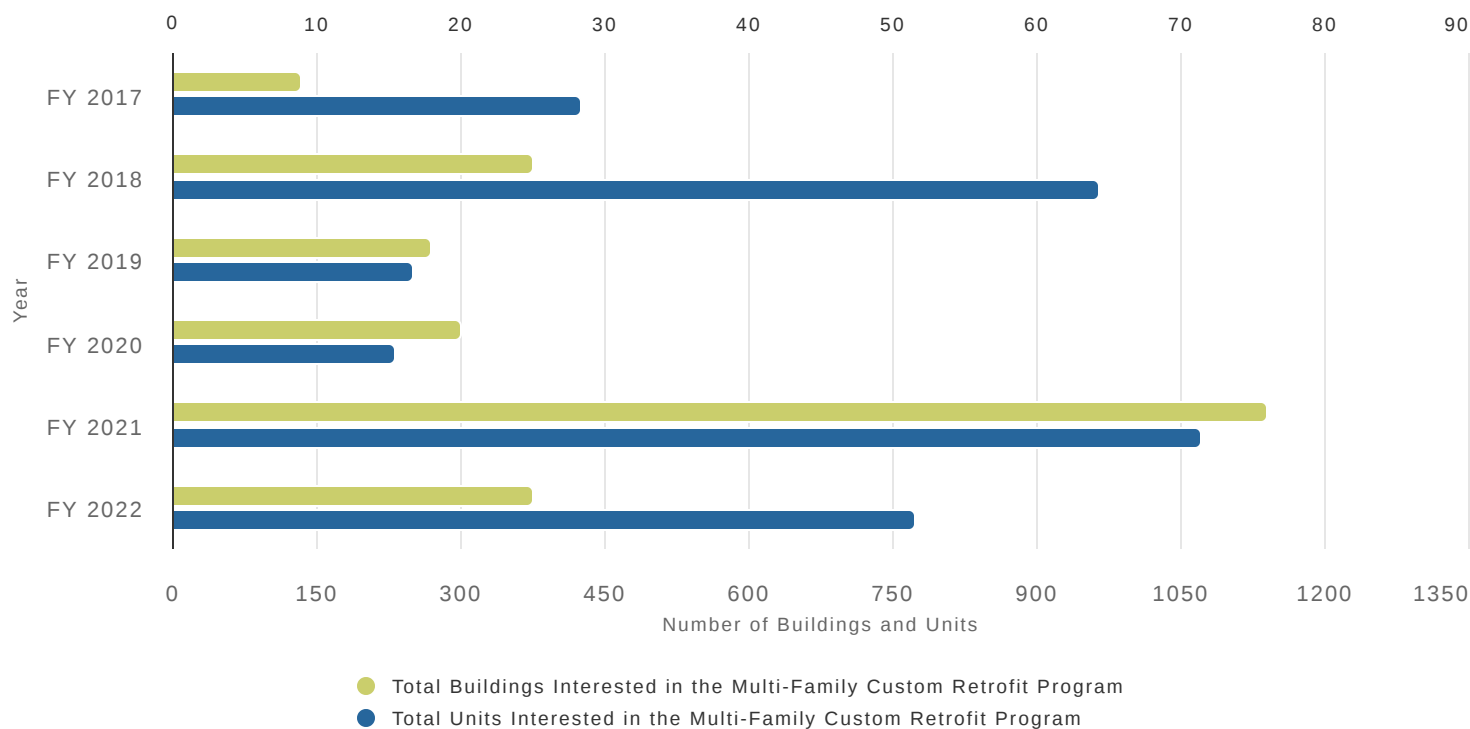
Staff also participated in the state Energy Efficiency Advisory Council process to update the 3-year energy efficiency plan for the MassSave utility rebate programs. In concert with neighboring communities, Cambridge advocated for improved services for multi-family buildings, increased incentives for electrification, and tracking program impacts based on GHG reduction. These recommendations were integrated into the plans which took effect in 2022.



Custom Retrofit Program for Residential and Small Commercial

Action 1.1 Progress

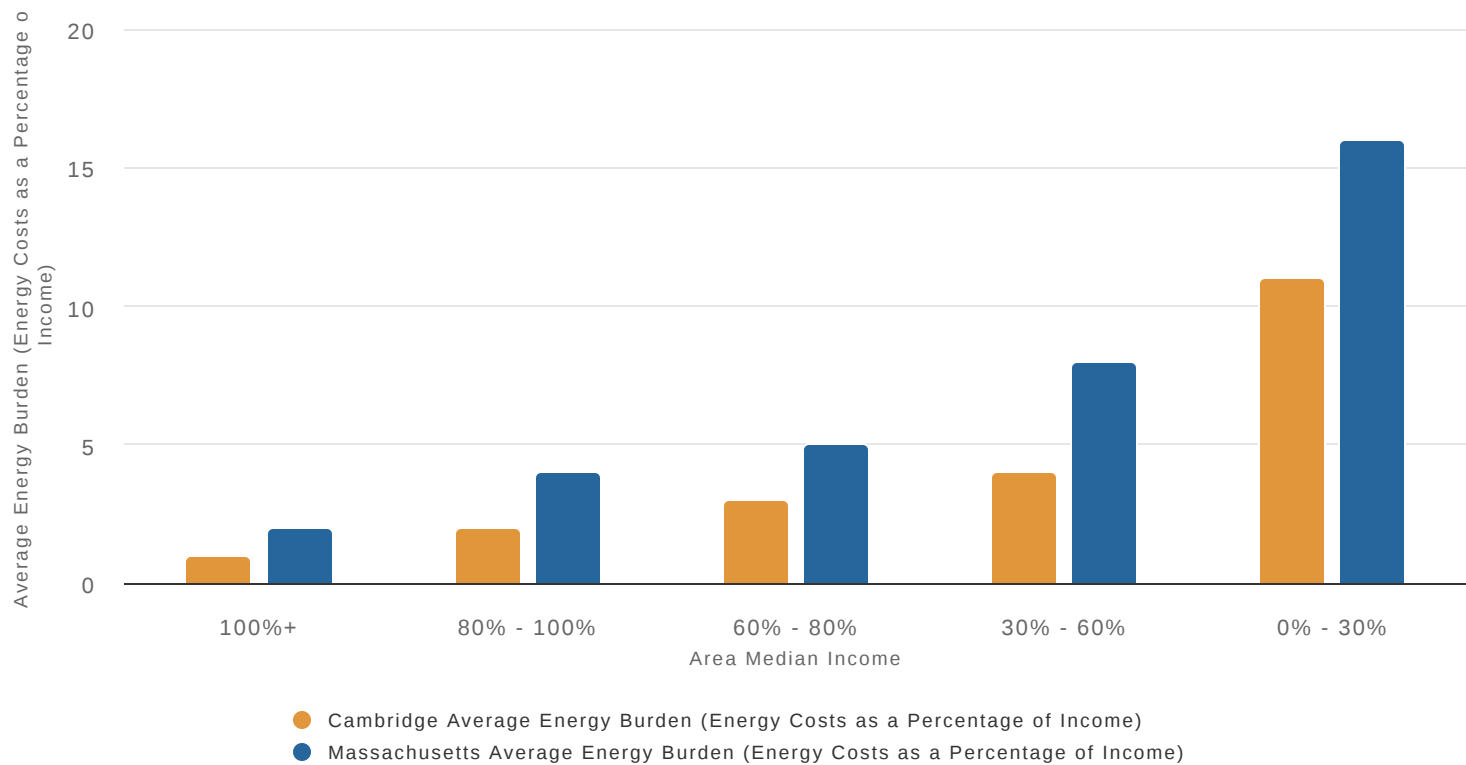
The Multi-Family Custom Retrofit Program is offered through the Cambridge Energy Alliance and works to assist residents with getting a Mass Energy Save Assessment, identifying opportunities for increased energy efficiency, and creating bids for retrofits. The program saw increased engagement in FY2021 due to receiving an Innovate Energy Efficiency Grant from The Massachusetts Department of Energy Resources. This grant allowed for expanded outreach opportunities, such as sending several targeted letters and hosting online webinars. In total, 2,800 letters were sent to residents of buildings with a high solar potential and 5,800 letters were sent to residents of multifamily buildings. The online webinars had a combined audience of 113 attendees. These tactics to increase outreach proved to be successful as FY2021 saw substantial interest in the program from Cambridge residents.



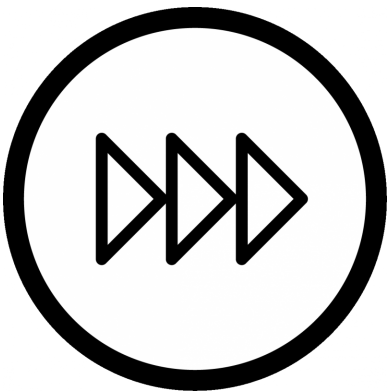
This data represents the total number of buildings and units by fiscal year that reached out to the [Multi-Family Custom Retrofit program](#).

Cambridge Energy Burden

This action is largely aimed at small to medium-sized buildings, which make up a small portion of Cambridge emissions compared to BEUDO buildings. Therefore, this action yields relatively low GHG reductions. However, this action is a priority due to the equity and resilience value it brings. By including buildings that house multi-family units and small businesses in energy efficiency efforts, this action helps reduce the burden of high energy costs. Energy Burden is defined as the percentage of a household's income spent on energy bills.



Data from the [Low-Income Energy Affordability Data \(LEAD\) Tool](#) from US Department of Energy.



Custom Retrofit Program for Residential and Small Commercial Action 1.1 Next Steps, Challenges, and Opportunities

The City will be launching the decarbonization program that is the next iteration of the Multifamily Retrofit Advisor Program and Cambridge Clean Heat (see Action 3.1) in early 2023. In addition to more financing options through a pilot partnership with clean energy startup BlocPower, the program design will emphasize improved tracking and data access to measure results. This data will be integrated with the other Cambridge Energy Alliance program tracking information and shared via the Sustainability Dashboard.



Equity

Building Energy Use Disclosure Ordinance

Action 1.2. Implementation Status

The City Manager submitted draft amendments to the Building Energy Use Disclosure Ordinance (BEUDO) to City Council in November, 2021. These amendments would require all BEUDO properties to phase down their emissions in steps over time to reach net zero by 2050. Since then, the City Council, BEUDO property representatives, and other interested stakeholders have been continuing to negotiate the various aspects of the amendments, including compliance timeline, mechanisms, and exemptions.

In FY22 staff also established a new data platform for BEUDO reporting which allows for more streamlined reporting, analysis, and disclosure of data under the current ordinance and potential future performance requirements. A new, full-time employee was hired to manage the BEUDO reporting, data management, and compliance process.

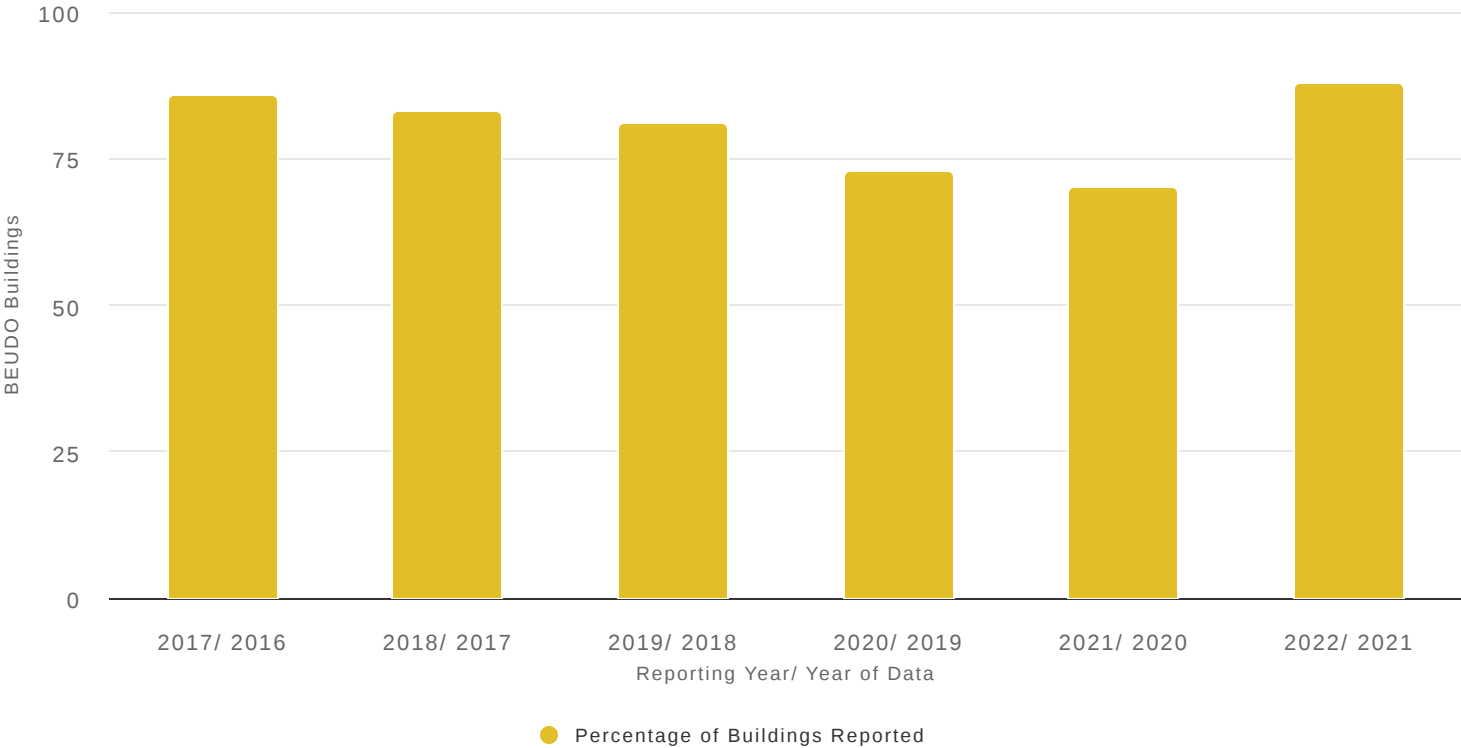
SMART Goals: Action 1.2 • BEUDO buildings achieve required annual emissions reductions • Resource Hub fully established by end of 2023	Implementation Status  Delayed
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Building Energy Use Disclosure Ordinance

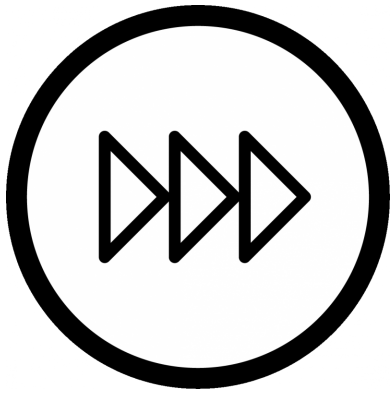
Action 1.2 Progress

The Building Energy Use Disclosure Ordinance (BEUDO) covers existing commercial buildings larger than 25,000 square feet and residential buildings of 50 or more units. The Performance Requirements track of this action requires all buildings subject to BEUDO to gradually reduce and achieve net zero emissions by 2050 or before. The intention of the BEUDO Resource Hub is to arm building owners with the knowledge and the tools to identify areas of improvement, take action, and achieve net zero emissions in their own buildings.

Cambridge has reached 65 BEUDO Customers for Large Commercial and Industrial Energy Efficiency Projects. There is a total of 150 projects completed or in progress! **This action saves 3,779,1906 gross kWh and 1,311,893 gross therms of energy annually. That's similar to the GHG emissions saved by taking 7,267 passenger cars off the road for a year.**



City of Cambridge BEUDO Retrofit Program, 08/2022



Building Energy Use Disclosure Ordinance Action 1.2 Next Steps, Challenges, and Opportunities

The City Council continues to consider the BEUDO amendments with the goal of adoption in the near term. Staff will support the amendment process and plan for implementation of performance requirements as appropriate, including determining regulatory details of such requirements. Staff are also working to flesh out the BEUDO Resource Hub to provide integrated and comprehensive technical support programs for BEUDO properties, building off of the current [Building Energy Retrofit Program](#) offered in partnership with Eversource. This will overlap with the decarbonization program described in Action 1.1 to provide new financing options to multifamily buildings in Cambridge.

Overview

Action Area 2: Net Zero New Construction

Cambridge has been a leader in green design and sustainability in new construction. The timeline for the proposed Cambridge net zero new construction targets will follow the development and release of the Massachusetts Net Zero Stretch Energy Code in 2022, which can be adopted by the City. In addition to operational emissions, Cambridge is working on addressing the wider and often unseen impacts of new construction by proposing to account for embodied carbon in new construction.

Action 2.1: Net Zero New Construction

Meet net zero targets for new construction by building sector while aligning with state initiatives and standards.

Action 2.2: Address Embodied Carbon through Green Building Requirements

Incrementally require higher standards of green building and energy efficiency for large commercial projects. Address embodied carbon in the construction and renovation of new and existing buildings.

Grey to indicate not yet started.

Action 2.3: Net Zero Requirements for Municipal Buildings

Commit to net zero and renewable thermal objectives in municipal buildings to showcase for others new technologies and how to achieve deep levels of savings through energy efficient design.



Equity



Resilience

Net Zero Requirements for New Construction

Action 2.1 Implementation Status

In FY22, staff engaged in regulatory and legislative processes at the state level to advocate for robust net zero requirements for new construction and major renovations of buildings in line with the targets originally laid out in the Net Zero Action Plan. On the regulatory side, the state advanced a process to update the Stretch Energy Code and the Specialize, Opt-In Energy Code in compliance with the 2021 Climate Roadmap law. In response to a straw proposal released in early 2022, the City submitted comments urging the state to establish a true definition of “net zero” in the opt-in code that required high levels of energy efficiency with no fossil fuel use. On the legislative side, the City partnered with its neighbors and the Metropolitan Area Planning Council to advocate for the inclusion of a fossil fuel-free pilot program in the climate law that was ultimately passed in summer 2022.

SMART Goals: Action 2.1

- Adopt Net Zero Stretch Code by early 2023
- Adopt Fossil Fuel Free pilot by summer 2023
- Prepare resources to support developers when updates take effect

Implementation Status



On Track

Net Zero Requirements for New Construction

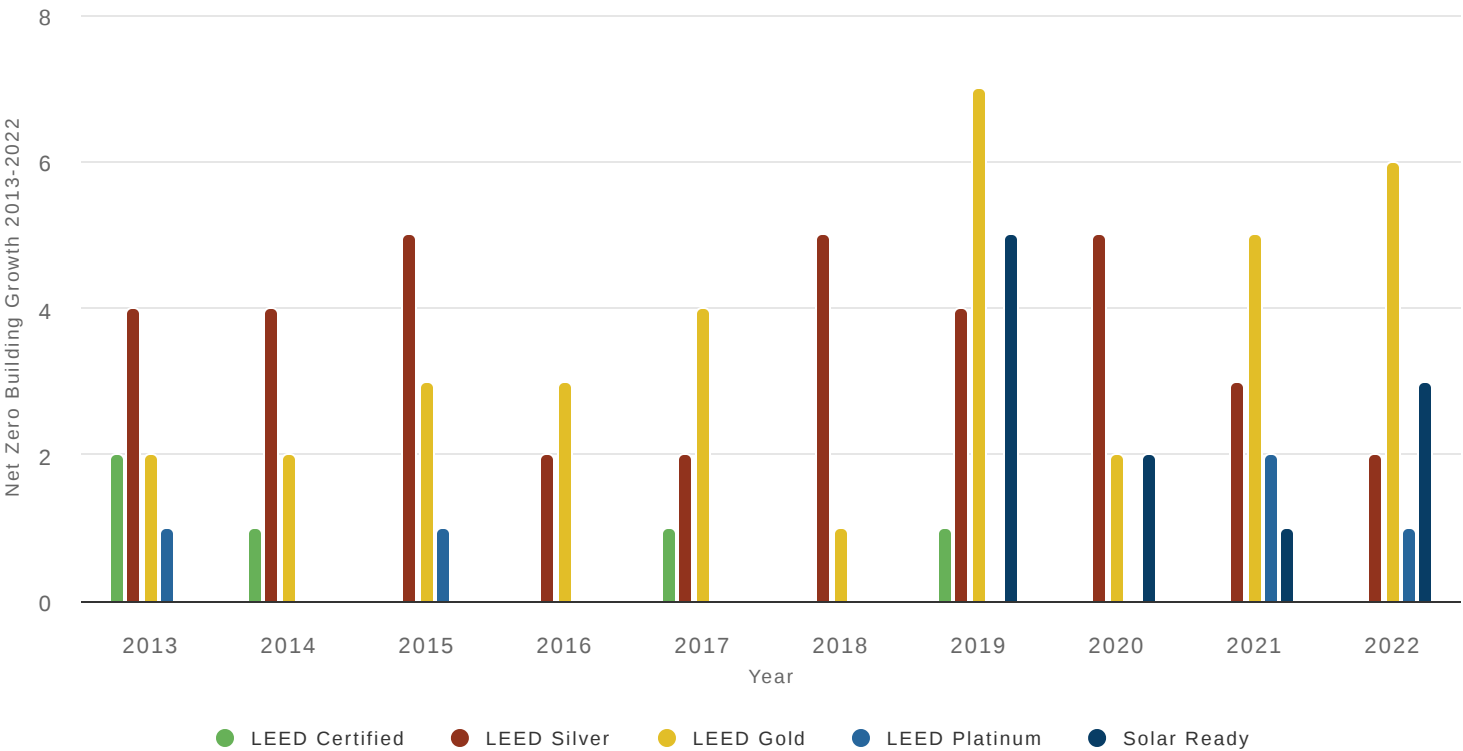
Action 2.1 Progress

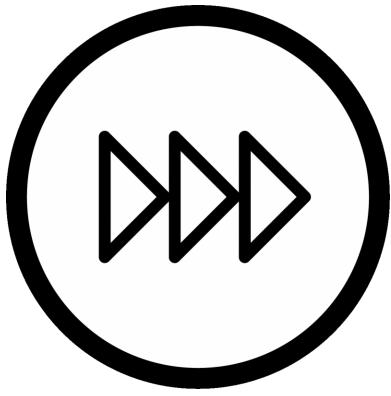
[Article 22](#), Cambridge's Green Building Requirements, ensure new buildings and substantial renovations are designed and implemented with environmentally sustainable and energy-efficient practices. New net-zero requirements will build off the progress that has already been made in this area.

Cambridge has used LEED as a framework to ensure new buildings meet high standards of energy efficiency, energy use, and sustainability. Over the years, Cambridge has experienced a steady growth of LEED Buildings including a significant number of LEED Gold-level buildings, the second highest rating in LEED certification. As of 2022, there are 10 LEED Certified, 45 LEED Silver, 62 LEED Gold, 8 LEED Platinum, and 38 Solar Ready buildings total. The Gross Floor Area (Sq. Ft.) of LEED buildings in 2022 is 27,201,606 (Sq. Ft.) and may continue to grow to advance net zero goals.

Over the last five years, Cambridge has added an average of nearly 1.6 million square feet of new buildings per year. Considering growth projections, in the decades to come many more millions of square feet of floor could be added, which makes this action significant in changing the trajectory of annual CO2 emissions. By implementing the net zero requirements for new construction, it is estimated the City will avoid over 100,000 MT of emissions annually by 2050.

[Article 22 Buildings in Cambridge](#)





Net Zero Requirements for New Construction Action 2.1 Next Steps, Challenges, and Opportunities

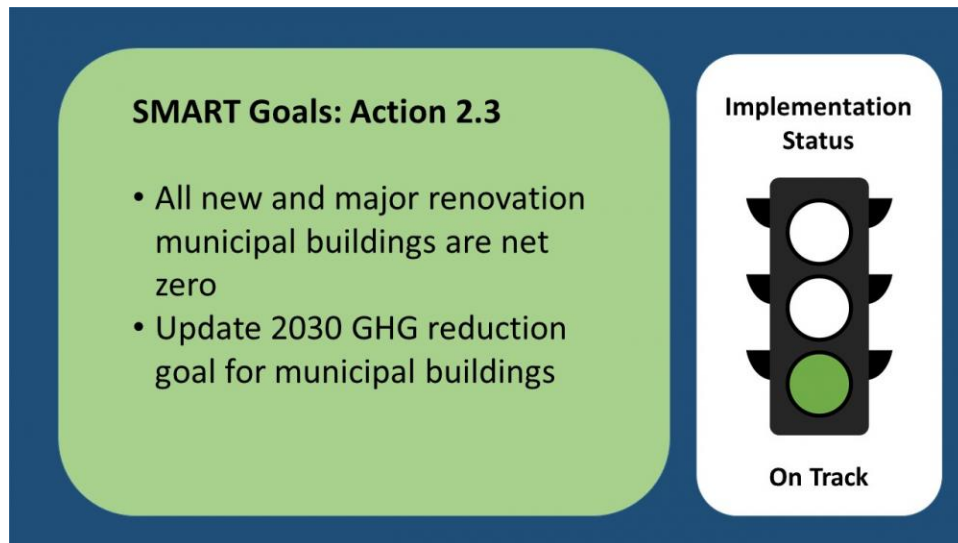
Since the end of FY22, the Specialized Energy Code has been released and is anticipated to be available for municipal adoption by the end of the calendar year. Staff will work with City Council to understand the process and options pertaining to adoption of this code, with the goal of adoption by early 2023. Simultaneously, staff will collaborate with Council to track the fossil fuel-free pilot authorization process, with initial guidance expected by the end of 2022 and final regulations by mid-2023. Effort will be made to integrate the two mechanisms to achieve net zero new construction consistent with the Net Zero Action Plan, and the original net zero new construction timeline will be revisited in context of the state pathways. Environment and Transportation Planning staff will work with Zoning and Development and the Inspectional Services Department to provide clear guidance and resources to building owners and developers to facilitate implementation of the net zero requirements.



Net Zero Requirements for Municipal Buildings

Action 2.3 Implementation Status

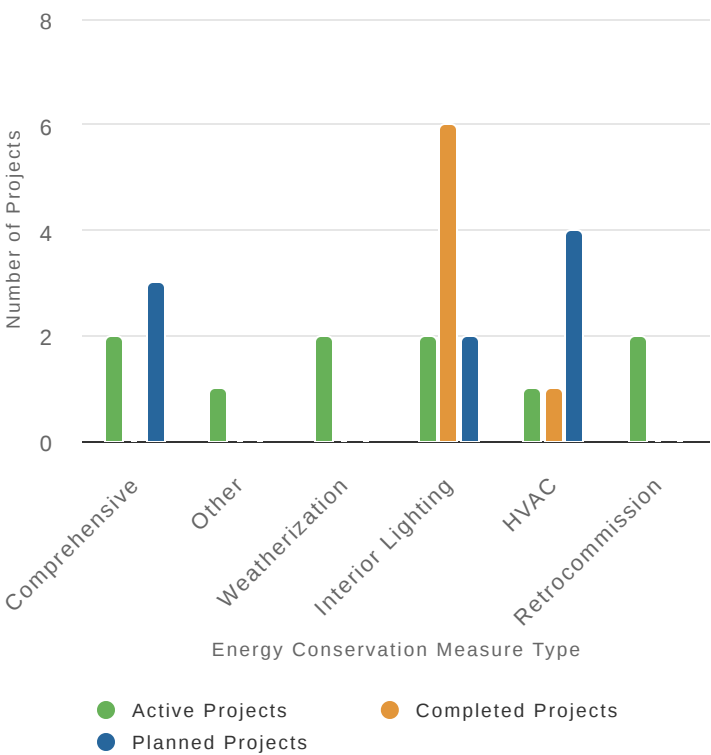
Cambridge Municipal new construction projects continue to follow a net zero emissions standard, with the fossil fuel-free Tobin school complex breaking ground in 2022. Existing buildings also continue to undergo retrofits prioritizing energy efficiency and electrification. In fiscal year 2022, there were several municipal buildings across the City that understand energy conservation measures and upgrades. These completed projects consisted of a range of lighting upgrades, HVAC electrification, envelope upgrades, and a major renovation. The Foundry Works building, and the Lexington Avenue Firehouse had comprehensive energy conservation measure upgrades, while the Cambridge Public Library, Kennedy-Longfellow and the Morse School, and the War Memorial Recreation Center all had LED lighting upgrades.



Net Zero Requirements for Municipal Buildings Action 2.3 Progress

To demonstrate leadership, the City has for several years been designing and constructing new municipal buildings to be fossil fuel free and, since 2020, required to achieve net zero emissions. This demonstrates Cambridge's ability to grow and increase the square footage of new buildings without increasing overall emissions. This commitment to the net zero and renewable thermal objectives will continue and provide a showcase for others for new technologies and how to achieve deep levels of savings through energy efficient design.

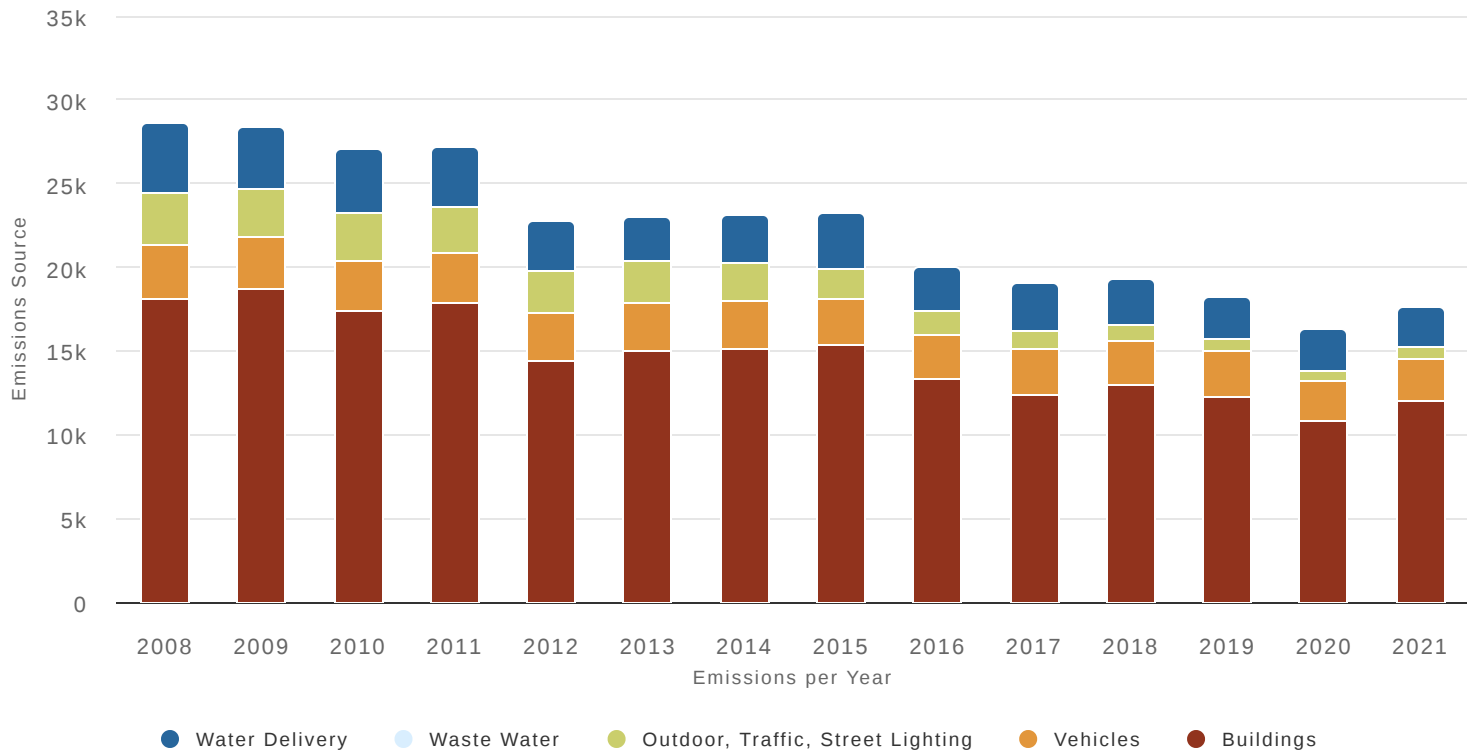
Between 2020-2025, Cambridge is planning a total of 20 energy projects in municipal building sites to be fossil fuel free. In Fiscal Year 2022, 7 energy conservation measure projects have been completed in municipal buildings- 5 Interior Lighting projects and 2 Comprehensive projects. These projects were spread across many buildings from the Cambridge Public Library, Morse and Kennedy-Longfellow Schools, and the Lexington Avenue Fire House. These projects have saved 831,652 kWh of electricity and 2,206 therms of gas! The gas savings are lower due to the majority being interior lighting projects.



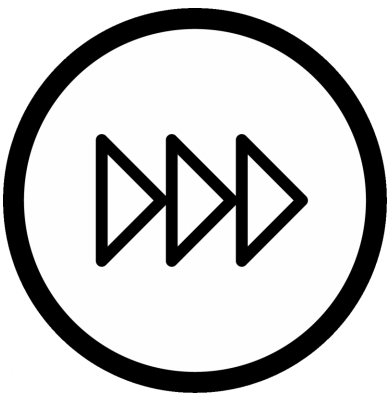
Cambridge Net Zero Requirements for Municipal Buildings Project Status Data FY22

Cambridge Municipal Greenhouse Gas Emissions

Cambridge Municipal GHG Emissions



Cambridge Municipal GHG Emissions



Net Zero Requirements for Municipal Buildings

Action 2.3 Next Steps, Challenges, and Opportunities

The City will continue with both net zero new construction and strategic renovation approaches in FY23, with 14 projects planned. Some planned projects include comprehensive energy conservation measures for the Lafayette Firehouse and the Fire Headquarters, and weatherization measures for City Hall Annex, Lombardi Building, and the Lexington Avenue Firehouse. Additionally, there are other projects planned for the Moses Youth Center, Peabody School and the Cambridge Public Library. Achievement of net zero emissions from all-electric municipal buildings will be facilitated by an expected procurement of 100% renewable electricity, which will come online within a couple of years. Specific consideration of opportunities to address embodied carbon will be made, informed by research for community-wide embodied carbon reporting standards under Action 2.2.

Overview

Action Area 3: Low Carbon Energy Supply

Increases in building efficiency must be combined with decarbonization, or elimination of fossil fuels, from the energy supply to buildings to achieve net zero emissions. Successfully decarbonizing the energy supply systems will require a combination of approaches over time. This section focuses on three main components: electrification of thermal systems; local (on-site) renewable energy supply; and procurement of renewable energy from acceptable sources outside of the City (off-site renewable electricity).

Action 3.1 Carbon Free Energy Supply

Continue to support the electrification of individual buildings' heating and hot water systems, as well as enable low-carbon district energy systems where suitable. Engage and lead on planning for an equitable, effective transition to renewable thermal energy supply.

Action 3.2: On-Site Renewable Electricity Access

Promote on-site renewable energy systems and provide support to building owners who may install these types of systems. May include rooftop photovoltaics (PV), solar thermal, battery storage or fuel cells – systems capable of supplying renewable electricity to the host building

Action 3.3 Off-Site Renewable Electricity Access

Adopt City's Off-site Renewable Energy Criteria to guide corporate entities and others to enter into renewable power purchase agreements that meet the standards of the City. Provide residents and small businesses access to renewable energy through aggregation.



Equity



Resilience

Carbon Free Thermal Energy Action 3.1 Implementation Status

In FY22, the City continued to offer the [Clean Heat Program](#) to help small residential homeowners understand and pursue decarbonization of their heating and hot water systems. The program experienced steady use as illustrated in the progress section below. To expand support for multifamily building electrification, as explained in Action 1.1, the Clean Heat Program is being incorporated into a more comprehensive decarbonization program to cover a range of energy efficiency, electrification, and resilience measures and include financing.

Progress also continued on organization of the [Neighborhood Energy](#) community microgrid initiative.

SMART Goals: Action 3.1

- Establish fossil fuel free conversion rate targets for buildings by end of June 2023
- Complete feasibility study for geomicrodistrict by June 2024
- If feasible, install pilot serving 500 units plus two public buildings in 2025

Implementation Status



On Track

Carbon Free Thermal Energy

Action 3.1 Progress

Transitioning buildings to renewable thermal systems will be an important part of achieving progress on Cambridge’s Net Zero goals. Electrification, using heat pumps and heat pump water heaters, enables buildings to eliminate fossil fuel use, instead using electric systems that can be powered by renewable electricity. **Heat pump units can provide both heating and cooling.**

The number of installations of heat pump units have been increasing over the past few years, which means potential greenhouse gas emissions reductions for Cambridge.

The City has the potential to take advantage of positive equity impacts because district energy systems enhance localized, more reliable energy resources, which is of the greatest benefit to vulnerable households that face increased risks from heating interruptions – for example, households with young children, or infirm or elderly members. Removing fossil fuel combustion from inside of homes is also a key equity benefit by addressing a major source of indoor air pollution. Cambridge is working towards spreading the economic benefits of these strategies equitably through increasing engagement with the [Cambridge Clean Heat Program](#).

The number of heat pump units are represented as a cumulative number.

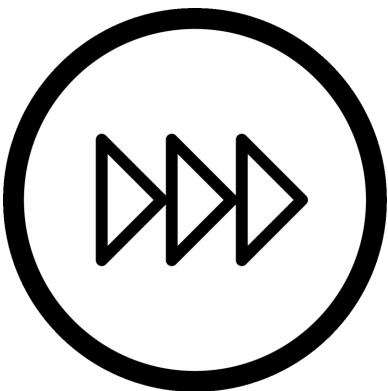
Cambridge Electrical Permit Database, 2022.

Carbon Free Thermal Energy

Action 3.1 Progress

The graph shows the volume of interest in the Cambridge Cleat Heat Program.

Cambridge Clean Heat Program Engagements, 2022.



Carbon Free Thermal Energy

Action 3.1 Next Steps, Challenges, and Opportunities

In addition to launching the more comprehensive decarbonization program as a next step for Cambridge Clean Heat, in FY23 the City will further the development of the Neighborhood Energy pilot by completing technical and economic feasibility assessments for candidate buildings and by facilitating a community-led process to shape implementation.

In the district energy space, staff have been following the deployment of the Eversource Geomicrodistrict pilot and potential lessons for shared geothermal systems in Cambridge. Staff applied for a federal Department of Energy grant that could fund a feasibility study for a pilot geomicrodistrict in Cambridge beginning in FY24. The application was made in partnership with a number of organizations that can advance the conversation around district energy deployment in Cambridge with or without the grant award, which will be announced in March 2023.



Equity



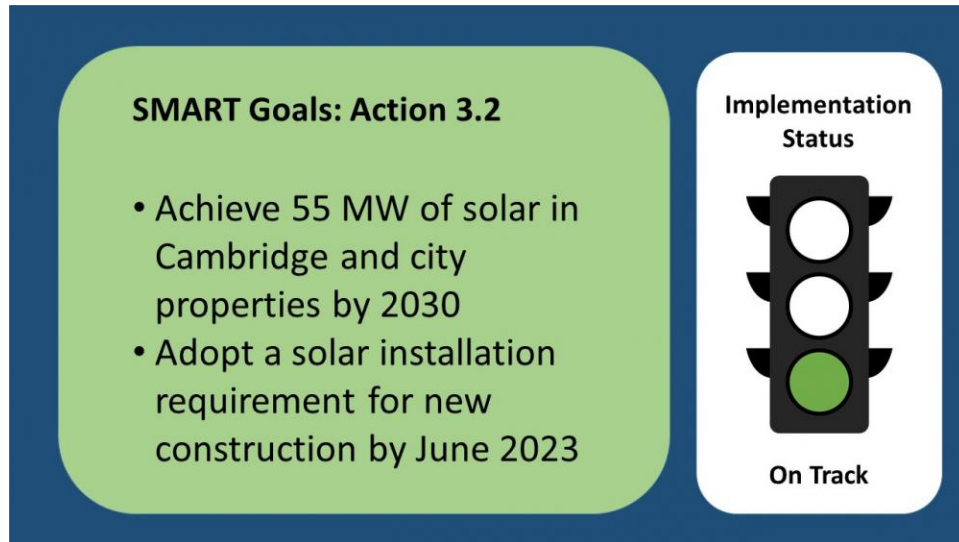
Resilience

On-Site Renewable Energy Access

Action 3.2 Implementation Status

In FY22, staff worked with a consultant to complete the design of a potential community solar program with the goals of enabling solar installations on more Cambridge roofs while giving low-income and other Cambridge residents the ability to realize electricity bill savings from solar. The program would identify and aggregate large, unutilized roofs and offer their owners lease payments and potential electricity savings in exchange for hosting solar installations. These installations would then generate discounted electricity to be made available to low-income residents and other people unable to install solar on their own homes.

For those looking to install solar directly, the City continues to offer the [Sunny Cambridge](#) solar quote comparison tool and technical support.

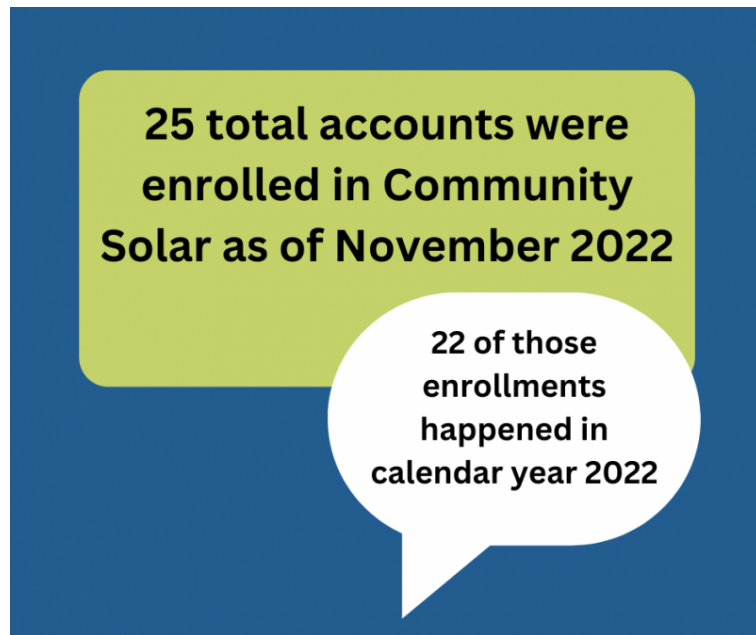


On-Site Renewable Energy Access Action 3.2 Progress

Cambridge will continue to pursue a requirement for onsite renewable energy generation for new buildings, with a focus on solar. The purpose of this requirement is to ensure that suitable new buildings and, in the future, existing buildings have access to on-site solar generation or could easily be retrofitted at a later date where feasible.

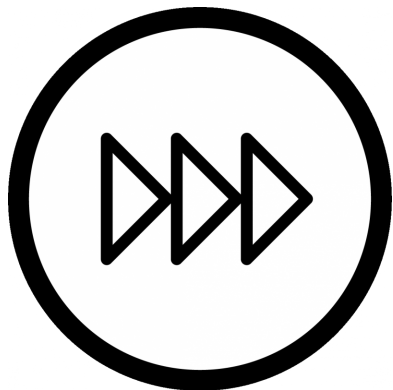
Since the Net Zero Action Plan was introduced in 2015, there has been an increase in rooftop solar permits issued. As of 2022, a total of 861 on-site rooftop solar permits have been issued: 9 for commercial buildings and 852 for residential buildings. **As of 2021, Cambridge has the potential to produce 9,121.6 kWh of solar energy from these on-site solar projects. 63% of that capacity was added after the NZAP took effect!**

Cambridge's cumulative installed solar capacity.
Cambridge 3.2 Data, 2022.



Community Solar Access Action 3.2 Progress

Over 40,000 electricity accounts participate in the Cambridge Community Electricity Program. All the Cambridge Community Electricity Program participants pay a \$0.002 charge on each kWh of electricity they use and their collective impact has added over \$2 million dollars to our Renewable Energy Fund. In March 2022, a new 243kW local solar project was installed on Graham and Parks School using Renewable Energy Fund money. This solar project is collectively “owned” by all the Cambridge Community Electricity Program participants! It is expected to generate at 280,000 kWhrs of energy per year.



Rooftop Solar Requirements Action 3.2 Next Steps, Challenges, and Opportunities

Staff are currently reviewing the community solar program design with the goal of laying the groundwork to launch the program in 2023. In FY23, staff will also work with City Council to design a solar installation requirement for new buildings that is compatible with the previously adopted green roof ordinance.



Equity

Off-site Renewable Electricity Access

Action 3.3 Implementation Status

In FY22, staff submitted off-site renewable electricity criteria for consideration by City Council as part of the larger BEUDO amendments (See Action 1.2). That amendment process is ongoing. The City also continued to administer the Cambridge Community Electricity (CCE) aggregation program for approximately 40,000 residential and commercial accounts. CCE rates have remained stable thanks to the long-term contract even as global energy prices have risen significantly, saving Cambridge customers a cumulative \$22.5 million. And in spring 2022, the City completed the installation of a 243 kW solar installation on the Graham and Parks school funded by CCE participants and producing renewable energy on behalf of all participants. Furthermore, 1,404 aggregation participants have opted up to 100% renewable energy through the 100% Green Plus option offered by the aggregation program from Massachusetts Renewable Energy Certificates.

SMART Goals: Action 3.3

- Launch community solar program in 2023
- Install 5.5 MW of community solar in Cambridge by 2023

Implementation Status



On Track

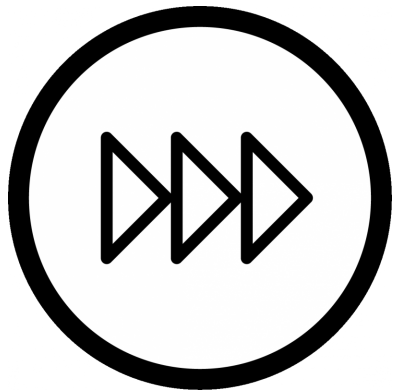
Off-site Renewable Electricity Access

Cambridge Data, Activity through June 2022.

Action 3.3 Progress

This action aims to provide residents and small businesses access to renewable energy through aggregation, leveraging the combined purchasing power of the community, in addition to direction for corporate entities and others to enter into renewable power purchase agreements that meet the standards of the City. The program began in 2017 and is making great strides in progress.

There has been a general increase in customers each year. The total number of customers from July 2021-2022 have used 36,928,2434 kWh of renewable energy from this program. This program has allowed customers to save money while operating: As of June 2022, residential and business accounts have experienced \$22,513,097 in savings compared to Eversource Basic Service.



Off-site Renewable Electricity Access Action 3.3 Next Steps, Challenges, and Opportunities

Staff are currently pursuing options to increase the default percent of renewable electricity from purchaser-caused renewable energy sources in the aggregation, which is up for renewal at the end of 2023. These strategies can support the development of new renewable energy facilities while also ensuring greater rate stability for Cambridge residents. Part of the BEUDO amendment process is to understand the balance between clean electricity from the state grid and additional renewable electricity sources, and to create mechanisms for BEUDO buildings to opt-in to renewable electricity aggregation opportunities.



Resilience



Equity

Overview

Action Area 4: Financing and Capacity Building

This revised action is aimed at providing building owners the resources they need to make informed decisions about energy improvements and a means to access financing or funding for their projects. Further, this action is intended to lay the groundwork for various aspects of an enhanced Community Choice Aggregation program (CCA 3.0). The CCA 3.0 model is intended to allow residents and businesses the opportunity to own distributed energy resources (DER) using “green bond” financing to purchase the distributed energy systems and have customers opt to buy shares in the DERs, thereby conferring an ownership share to the participants and allowing the participants to realize the cost savings that occur with DER installations. By buying shares in DERs, customers can participate in DER ownership without high upfront capital costs or good credit, or even participate as renters. CCA 3.0 resolves to disengage from, rather than mitigate the impacts of fossil fuel power plants by planning and facilitating voluntary investment in local renewable energy and energy efficiency technologies. Furthermore, CCA 3.0 facilitates voluntary investment in small DERs on homes and businesses that reduce demand for grid and pipeline resources, rather than centralized renewable generation that adds to infrastructure demand. CCA 3.0 achieves equitable energy ownership, as opposed to equitable consumption of energy.

Action 4.1: Local Carbon Fund (Enhanced Community Aggregation Program)

Create a single point from which financial and technical resources may be deployed in order to support the emissions reductions in the other actions, thereby creating greater flexibility and coordination of compliance with those actions.

Grey to indicate not yet started

