Net Zero Action Plan
Health & Environment Committee

June 9, 2015
THE CLIMATE IMPERATIVE

Climate change poses a growing set of risks and challenges to cities.

Combating climate change needs to start locally.

Buildings generate over 80% of Cambridge’s total greenhouse gas emissions.

That is why it is Cambridge’s aim to achieve NET ZERO EMISSIONS from buildings.

Residents, universities, businesses and the City are collaborating to address the immediacy of the climate imperative.
Agenda

1. Taskforce Process
2. Historic GHG’s and Energy Use in Cambridge
3. Development of Strategies
4. Summary of the Net-Zero Action Plan
5. Implementation
NET ZERO
TASK FORCE

Jane Carbone,
Director of Development, Homeowner’s Rehab, Inc.
Caitriona Cooke,
Program Director, Conservation Services Group
Henrietta Davis,
Resident and former Mayor of Cambridge
Emily Grandstaff-Rice,
President (2014), Boston Society of Architects, Cambridge Seven Associates
Heather Henriksen,
Director of the Office for Sustainability, Harvard University
Shawn Hesse,
Architect, Sustainability Expert at Emersion Design
Marc Hoffman,
Resident and Energy Efficiency Advisor

Bill Kane,
Vice President of Leasing & Development, BioMed Realty
Andrea Love,
Resident, and Director of Building Science, Payette Architects
Paul Lyons,
Resident and President, Zapotec Energy, Inc.
Joseph Maguire,
V. P. of Development & Asset Management Services, Alexandria Real Estate Equities
Julie Newman,
Director of Sustainability, Massachusetts Institute of Technology
Tom Sieniewicz,
Resident and Planning Board member, City of Cambridge
Barun Singh,
Resident and Founder & CTO of Wegowise
Quinton Zondervan,
Resident and Executive Director, Climate Action Liaison Coalition
The Task Force defines net zero with respect to the city as a whole as:

A community of buildings for which, on an annual basis, all greenhouse gas emissions produced through building operations are offset by carbon-free energy production. Achieving the net zero objective relies on a combination of energy efficiency improvements, renewable energy production and, where necessary, purchase of carbon offsets or, potentially, credits (that meet specific criteria).

The definition does not include:
• Embodied emissions generated from the manufacture of building materials
• Building construction activities
• Occupant transportation and waste
CITY COUNCIL

Requests of Council:

1. Endorse the recommended set of actions

2. Endorse the recommended process that engages stakeholders over time
EARLY ACTION ITEMS

- Recommend update to the zoning ordinance for design of new buildings from LEED Silver to LEED Gold
- Advocate for an update to the State “stretch” building code which mandates better energy performance
- Adoption of a Building Energy Use Disclosure Ordinance
TASK FORCE OBJECTIVES

• Agreement on a methodology, strategy, targets, and timeline for achieving net zero emissions.

• Recommendations outlining short-term actions (1-3 years) and longer-term actions (4-10 years).

• Recommendations include direction on Regulation, Planning measures, Incentives, and Renewable Energy generation initiatives and Net-Zero Targets for new construction.

• Understanding the projected impacts of each action.

• Commitments of support or alignment from partners who are critical to the success of the plan.

• Agreement on an ongoing communication, reporting and accountability strategy.
Public & Stakeholder Input
Series of Short Primers on Energy, Policy, Renewables
Working Groups formed
Long list of ideas generated
Alignment & Analysis of Options
Prioritization
Recommendations

Early Action Items
Public Events

Research

Winter 2014
Spring 2014
Summer 2014
Fall 2014
Winter 2015
Spring 2015
The Net Zero Framework is a balance of:

- Defined Targets
- A process to adapt and respond to changes in the market and technology
- Costing & feasibility assessment when appropriate
- Regulations & incentives
- New construction & existing buildings
- Equally targets savings from all sectors (no one sector is punished)
Electricity and natural gas have been nearly flat over the last decade. Year to year, use has varied due to variations in weather and economic activity.

Source: NSTAR
Although electricity use has been flat, CO2 emissions have declined as generation has become cleaner.

Cambridge CO2 Emissions from Grid Electricity

- 2003: 700K CO2 emissions
- 2012: 500K CO2 emissions (22% reduction)

New England Electric Generation by Fuel Type

- 2003:
  - Pumped Storage: 10%
  - Renewables: 10%
  - Oil/Gas: 27%
  - Nuclear: 6%
  - Oil: 14%
  - Coal: 31%
  - Natural Gas: 31%

- 2012:
  - Pumped Storage: 13%
  - Renewables: 10%
  - Oil/Gas: 31%
  - Nuclear: 10%
  - Oil: 42%
  - Coal: 31%
  - Natural Gas: 42%

Sources: NSTAR and ISO-New England.
### Estimated Energy Use by Space Type

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<th>Commercial Lab</th>
<th>Commercial Office</th>
<th>Hotel</th>
<th>Warehouse</th>
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<td>21%</td>
<td>12%</td>
<td>4%</td>
<td>&gt;8 Unit Residential 10%</td>
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<td>2-3 Family 9%</td>
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<td>Retail 2%</td>
<td>Hospital 2%</td>
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<td>4-8 Unit Residential 4%</td>
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<td>University Lab</td>
<td>Academic / Administration 6%</td>
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<td>1-Family 3%</td>
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<td>13%</td>
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<td>Gov't 3%</td>
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<tr>
<td>University Residential 6%</td>
<td>Athletics Museums Support 3%</td>
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<td>Other 1%</td>
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</table>
List of cities included in the report:

- Cambridge, MA
- Fort Collins, CO
- Austin, TX
- Boston, MA
- New York City, NY
- San Francisco, CA
- Vancouver, BC
- Seattle, WA
WHAT DETERMINES THE USE OF RENEWABLES?

- Access to renewable resources
  - Solar Conditions
  - Geological Conditions
  - Wind
- Age of building stock
- Load density and profile
REDUCTION

Onsite

Grid Scale

District Scale

Retrofits

Replacement

Engagement

TARGET

RENEWABLES

Solar & Geo Exchange

Onsite

CHP, Waste Heat Recovery, Heat-Pumps

Wind Farms, Hydro
ESTABLISHMENT OF WORKING GROUPS

Net Zero (16 Members)

- Regulations & Planning Approaches
- Incentives and Financing Tools
- Energy Supply and Offsets
- Engagement & Behaviour Change

Total of 32 Members
CAMBRIDGE EMISSIONS REDUCTION MODEL

Initial actions & programs take hold

Market saturation of incentives

NZE new construction + Deep Retrofits + Solar

70% REDUCTION BY 2040

Renewable Energy
Key Actions:
1. Retrofits to Existing Buildings
2. Net Zero New Construction
3. Energy Supply
4. Local Carbon Fund
5. Engagement & Capacity Building
5. ACTION PLAN

Energy Efficiency in Existing Buildings
Reduce energy use in buildings through retrofits and improved operations.

Net Zero New Construction
Require low carbon new construction.

Local Carbon Fund
Option to invest in a net zero community.

Renewable Energy Supply
Replace fossil fuels with low carbon energy.

Engagement and Capacity Building
Industry training and community involvement.
DETAILED ACTION PLAN

1. Energy Efficiency in Existing Buildings

1.1.1 Custom Retrofit Program
   Retrofit program built on performance outcomes

1.1.2 Additional BEUDO Requirements
   Add audit and retro-commissioning requirements

1.1.3 Upgrades at Time of Renovation or Sale
   Explore minimum upgrades at various trigger points

1.1.4 Operations and Maintenance Plan Requirement for New Construction
   Replicate success of TDM plans for building energy use.
2. Net Zero New Construction

2.1 Create Net Zero Targets for New Construction
   *(See below)*

2.2 Net Zero Incentives
   *Develop market based incentive program*

2.2.2 Height + FAR Bonus
   *Explore height & FAR bonus as part of Citywide Plan*

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2. Net Zero New Construction (Continued)

2.3 Increase Green Building Requirements in the Cambridge Zoning Ordinance

2.4 Net Zero Requirement for New Construction + Deep Retrofits of Municipal Buildings

2.4.1 Net Zero Requirement for New Construction
    (Previous Slide)

2.4.2 Deep Retrofits of Municipal Buildings

2.5 Removal of Barriers to Increased Insulation
DETAILED ACTION PLAN

3. Energy Supply

3.1 Low Carbon Energy Supply Strategy
   Develop a city wide energy supply strategy

3.2 Rooftop Solar Ready Requirement
   Make new construction “solar ready” moving to a renewable energy requirement

3.3 Develop a Memorandum of Understanding with Local Utilities
   Create a framework for collaboration on Net Zero actions
4. Local Carbon Fund

Investigate Local Carbon Fund

Allow for investment in the Net Zero Action Plan
5. Engagement & Capacity Building

5.1 Communication Strategy
   Build awareness, partnerships and educate stakeholders

5.2 Develop Ongoing Capacity to Manage Getting to Net Zero Project
   Assign staff & consulting resources

5.3 Net Zero Lab Standards and Maintenance Plan Requirement for New Construction
   Work with industry to develop new processes that support net zero
# Net Zero + Net Positive Targets

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Program Wide Review – Every 5 Years

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**Action 1 - Energy Efficiency in Existing Buildings**

**Action 2 - Net Zero New Construction**

**Action 3 - Energy Supply**

**Action 4 - Local Carbon Fund**

**Action 5 - Engagement and Capacity Building**
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### SPECIFIC ACTIONS

**Net Zero + Net Positive Targets**

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**THE PATH TO A NET ZERO CAMBRIDGE**
# Short Term Actions

## Net Zero + Net Positive Targets

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## Market Based Incentive Program

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## Energy Supply

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## Engagement and Capacity Building

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**Notes:**
- *As part of Cambridge Master Plan process*
- **as happens in conjunction with Massachusetts clean energy initiative**
- ***externally led***
# MEDIUM TERM ACTIONS

## Net Zero + Net Positive Targets

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* As part of Cambridge Master Plan process
** In conjunction with Harvard Square study
*** Extent of work

### THE PATH TO A NET ZERO CAMBRIDGE

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## Long Term Actions

### Net Zero + Net Positive Targets

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### Action 1 - Energy Efficiency in Existing Buildings

#### 1.1 Custom Retrofit Program
- Residential
- Multi-Family
- Commercial
- Net Zero
- Net Positive

#### 1.2 Additional DEEDG Requirements
- Comm. + MF
- New Building
- Existing Building
- Net Zero
- Net Positive

#### 1.3 Upgrades at Time of Renovation or Sale
- Residential
- Multi-Family
- Commercial
- Net Zero
- Net Positive

#### 1.4 High-Friction Requirement
- Comm. + MF (New Condo)
- Design
- Implementation
- Net Zero
- Net Positive

### Action 2 - Net Zero New Construction

#### 2.1 Market-Based Incentive Program
- Residential
- Multi-Family
- Commercial
- Net Zero
- Net Positive

#### 2.2 Increase Green Building Requirements in Cambridge Zoning Ordinance
- Residential
- Multi-Family
- Commercial
- Net Zero
- Net Positive

#### 2.3 Net Zero Requirement for New Construction of Residential Buildings
- Design
- Planning
- Implementation
- Net Zero
- Net Positive

#### 2.4 Removal of Municipal Buildings
- Design
- Implementation
- Net Zero
- Net Positive

#### 2.5 Removal of Barriers to Increased Efficiency
- Design
- Net Zero
- Net Positive

### Action 3 - Energy Supply

#### 3.1 Low Carbon Energy Supply Strategy
- Study
- Planning
- Implementation
- Net Zero
- Net Positive

#### 3.2 Renewable Energy Supply Strategy
- Study
- Planning
- Implementation
- Net Zero
- Net Positive

#### 3.3 Renewable Energy: Understanding with Local Utilities
- Study
- Planning
- Implementation
- Net Zero
- Net Positive

### Action 4 - Local Carbon Fund

#### 4.1 
- Net Zero
- Net Positive

### Action 5 - Engagement and Capacity Building

#### 5.1 Communication Strategy
- Design
- Net Zero
- Net Positive

#### 5.2 Net Zero Lab Standards
- Design
- Pilot Study
- Implementation
- Net Zero
- Net Positive

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* As part of Cambridge Master Plan process
** As part of Cambridge Square study
*** As part of Cambridge                 

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**The Path to a Net Zero Cambridge**
Engagement activities:

- All working group and Task Force meetings were open to the public.
- A mid-year report was published.
- A public forum featuring an external panel of net zero experts and offering the audience an opportunity to review and discuss preliminary Task Force recommendations.
- Consultation process with key stakeholders.
- A final Public Forum where the Task Force presented the 25 year action plan and recommendations to solicit public input.
SUPPORT FROM STAKEHOLDERS

Key Stakeholder meetings:

- Massachusetts Biotech Council
- Cambridge Sustainability Compact
- Climate Protection Action Committee
- Cambridge Chamber of Commerce
- Cambridge Historical Commission Staff
- Cambridge Department of Public Works
- Harvard and MIT
FISCAL YEAR 2016 ACTIONS

- Update Green Building Requirements (LEED)
- Develop Rooftop Solar Ready Requirement
- Removal of Barriers to Increased Insulation
- Develop a City-wide Low Carbon Energy Supply Strategy
- Establish Net Zero Labs Working Group
- Collaboration on research for Market-Based Incentives
- Begin Municipal Building renewal strategy
- Continue developing a MOU with Local Utilities
- Develop Communication Strategy
- Staff and Consultant Budget Approved
NOTES FROM MEETING No. 1

• Be ambitious - channel the community ambition
• Balance environmental & economic concerns
• Equality in responsibility across all sectors
• Start with a vision & work backwards
• Establish a clear mission, vision, and deliverables
• Identify early action items
• Attempt to figure out how to get there, not can we get there
THANK YOU

QUESTIONS?
1. ENERGY EFFICIENCY IN EXISTING BUILDINGS

Reduce energy use in buildings through retrofits and improved operations.
1. ENERGY EFFICIENCY IN EXISTING BUILDINGS

1.1.1 CUSTOM RETROFIT PROGRAM

Explore and develop new retrofit programs

- Work with utilities to adapt current incentive programs to take a performance based approach where incentive amount is determined by relative GHG reductions associated with a given retrofit project (e.g. $/ton)

- City staff currently in discussion with Eversource regarding a pilot retrofit program to MURB’s that could serve as a pilot for this performance-based approach.
1. ENERGY EFFICIENCY IN EXISTING BUILDINGS

1.1.2 ADDITIONAL BEUDO REQUIREMENTS

Require owners of buildings covered under Building Energy Use Disclosure Ordinance to submit energy management plans and to undertake retro-commissioning where appropriate.

- Require energy audits and retro-commissioning every five years for buildings that perform below a predetermined threshold.

- Building owners will have a better understanding of their building’s performance, supporting a shift toward more efficient, higher performing buildings.

- Require buildings that score below a certain percentile performance rating (i.e. as calculated by Portfolio Manager) to submit an Operations + Maintenance Plan up to every five years.

- The Operations + Maintenance plans would be similar to retro-commissioning plans, identifying opportunities to optimize building operations and shift to renewable / low-carbon fuel sources.
Initiate a study to explore a requirement for energy upgrades at the time of renovation permit or, if appropriate, time of sale of property.

- Renovations are an appropriate time to require upgrades, while investments are being made.

- The sale of property can also be an opportune time to invest in building improvements if buildings have amassed equity.

- A market analysis can determine an appropriate scope of retrofit, which building types would be included, and whether the retrofit would be the responsibility of the buyer or the seller.

- Typically, any requirements at time of renovation or sale target only poor performers within a given building class or use. (e.g. bottom 20% in a Portfolio Manager use category)

- If favorable, the City could increase the performance improvement thresholds at time of renovation or sale of property.
1. ENERGY EFFICIENCY IN EXISTING BUILDINGS

1.1.4 O+M PLAN REQUIREMENT

Require submission of operation and maintenance plans as a condition of permitting.

- As a condition of building occupancy, applicants must submit energy management plans detailing how building operations will meet the intent of the energy efficient design.

- The City should establish a template for energy management plans based on existing frameworks that are common in the commissioning industry and are designed for simplicity and effectiveness.

- Objective is to ensure future existing buildings perform optimally.

- Intent is to align requirements for these proposed O+M Plans with the plans contemplated for poor performing building as part of the new BEUDO requirements in action 1.1.2.
Require low carbon new construction.
2. NET ZERO NEW CONSTRUCTION

2.1 CREATE NET ZERO TARGETS FOR NEW CONSTRUCTION

Set targets for net zero new construction in Cambridge by building type / sector.

<table>
<thead>
<tr>
<th>Type:</th>
<th>Municipal</th>
<th>Residential</th>
<th>Multi-Family</th>
<th>Commercial</th>
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<tr>
<td>Target Year:</td>
<td>2020</td>
<td>2022</td>
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<td>2025</td>
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- These target dates are proposed as policy goals for both industry and Cambridge staff to work toward.

- Regular meetings should be held with stakeholders to evaluate the evolving state of technology and construction practices as they relate to targets dates identified below.

- Cambridge staff will consult with industry and other key stakeholders at least two years in advance of proposing regulations requiring buildings to be net zero.
2.2.1 MARKET BASED INCENTIVE PROGRAM

Provide a compelling incentive package to encourage private developers to exceed energy efficiency requirements.

- To achieve net zero buildings in ten years, financial mechanisms can motivate the market and accelerate innovation. (e.g. A performance fee and rebate system that rewards projects on a sliding scale based on energy performance.)

- The performance fee and rebate model relies upon fees and refunds based on the performance of a particular project. A formula determines the fee amount, and the refund amount is based on thresholds of energy performance.

- The approach should be initially tested by way of a limited pilot in residential sector first for new construction and major renovations where there is less complexity and shorter construction cycles.

- Incentive program in place by sector until the year when net zero construction is mandated.

- Once net zero new construction becomes a requirement, the incentive program can be modified to reward projects that are net-positive.
2. NET ZERO NEW CONSTRUCTION

2.2.2 HEIGHT + F.A.R. BONUS

*Provide a compelling incentive package to encourage private developers to exceed energy efficiency requirements.*

- To generate early action the City can explore the potential impact of offering additional floor area allowance and extra height to projects that achieve net zero emissions.

- Projects will need to demonstrate and commit to net zero emissions through their design in order to meet eligibility requirements for additional FAR award.

- A performance deposit should be held until 24 months following occupancy.

- Projects will also have to agree to share learnings on how net zero was achieved in their projects.

- This approach should be investigated in the context of other land use studies.
2. NET ZERO NEW CONSTRUCTION

2.3 INCREASE GREEN BUILDING REQUIREMENTS IN CAMBRIDGE ZONING ORDINANCE

**Increase minimum green building requirements on a regular basis starting in 2015**

- The incremental scaling up of green building requirements, benchmarked with real-world examples and cost benefit analysis, over time leading up to the specific net zero target dates identified for each building type.

- This includes a shift to LEED Gold city wide.

- With a distinct focus on energy efficiency and GHG emission reduction, the policy should require projects to pursue a prescribed number of LEED energy efficiency points, and enhanced commissioning requirements.

- The green building requirements in the Cambridge Zoning Ordinance currently apply to buildings 25,000 square feet or larger.

- Requiring incremental improvements in advance of the net zero targets sets industry on a trajectory to realize deep energy efficiency savings and better equips them to achieve the referenced targets.
2. NET ZERO NEW CONSTRUCTION

2.4.1 NET ZERO REQUIREMENT FOR NEW CONSTRUCTION OF MUNICIPAL BUILDINGS

Introduce bold targets for new construction and energy performance improvements for existing municipal buildings.

- Establish a formal policy that new construction of municipal buildings should target net zero.

- Buildings must be designed to optimum energy efficiency standards such that all or a high percentage of energy loads could be met by renewable sources.

- Once there is improved local capacity, all new construction should achieve net zero (target date 2020), five years ahead of citywide requirement.

- Long term, require new construction to be net positive, (i.e. producing more energy than it consumes on an annual basis) exceeding the citywide requirement for net zero buildings.
2. NET ZERO NEW CONSTRUCTION

2.4.2 RENEWAL OF MUNICIPAL BUILDINGS

Introduce bold targets for new construction and energy performance improvements for existing municipal buildings.

- Develop a phased municipal building improvement strategy where
  - (1) greenhouse gas reduction is a priority when constructing facility improvement projects and
  - (2) operational improvements are implemented to achieve targets established and tracked by the Cambridge Department of Public Works.

- The strategy will involve continuous self-evaluation requiring increased performance levels as technology and local capacity is improved.

- Continue to implement municipal building improvement strategy that is informed by new technology and best practices, and track improvements (GHG reduction) annually.

- Continue to implement municipal building improvement strategy that is informed by new technology and best practices, and track improvements (GHG reduction) annually.
2.5 REMOVAL OF BARRIERS TO INCREASED INSULATION

Resolve policy barriers to improving insulation of buildings

- Explore with advice from the Planning Board, Cambridge Inspectional Services the best method of allowing external insulation in built-out compact residential neighborhoods in a manner sensitive to historic preservation principles.

- Evaluate the success of the policy changes.

- Interview stakeholders and review planning approval if necessary to determine if the barrier removal has resulted in the desired outcome.

- Revise strategy if required.
Replace fossil fuels with low carbon energy.
3. ENERGY SUPPLY

3.1 LOW CARBON ENERGY SUPPLY STRATEGY

Define how the City will support the broad implementation and development of renewable and low carbon energy in Cambridge.

- The City will review what role(s) it can play in the procurement of additional green power supply through lobbying the State to increase the Renewable Portfolio Standard (RPS).

- The City will also review the potential for customer aggregation as a tool to further increase the supply of renewables to meet Cambridge municipal and residential needs, potentially in combination with non-profit or commercial energy users.

- Determine what the potential is for generating heat and electricity at the block, district, and city scale is and where in the city is best suited for such applications.

- The medium-term time horizon is the opportune time for City to consider developing or partnering on the expansion or development of district energy systems. This also the time horizon that a pilot for a small smart grid or block scale energy storage could be implemented.

- The development of larger smart grids and district scale energy systems could occur by 2025 and beyond.
3.2 ROOFTOP SOLAR READY REQUIREMENT

**Develop “solar ready” requirements and explore renewable energy requirements.**

- All new buildings should be ‘solar ready’ –
  - Designed to accommodate the installation of roof-mounted solar panels both photovoltaic and solar thermal.

- The requirements should be implemented with discretion in order to account for the ability of the roof to collect solar e.g. shading and large numbers of required roof penetrations would be considered.

- Explore the feasibility and financial implications of a solar energy generation requirement, e.g. 5-10% of a given building’s energy load.

- Undertake a feasibility analysis of applying the requirements for solar ready to major roof replacements.

- Investigate increasing renewable generation requirements.
Cities can collaborate with utilities on projects of mutual interest that have resulted in energy use and emissions reductions.

- The declaration and definition of this collaboration can impact its effectiveness so a formal agreement on how the City of Cambridge, Eversource and Veolia can work together is recommended.

- Short term, develop a memorandum of understanding (MOU) based on areas of mutual interest and have senior officials meet regularly to monitor and manage progress.

- Explore if there is benefit to including the state government and regional partners to this collaboration.

- Medium term and long term, senior officials meet regularly to monitor and manage progress and further develop the MOU as new priorities and projects develop.
4. LOCAL CARBON FUND

Option to invest in a net zero community.
Where it is not possible or is exceptionally challenging for individual projects to achieve net zero emissions through the combination of efficiency and renewable energy generation, an alternative approach is to introduce a locally managed carbon fund.

Introduces the option, as an alternative to achieving net zero, to purchase carbon offsets on a voluntary basis.

The proceeds of the carbon fund will support Cambridge-based greenhouse gas reduction initiatives and renewable or low-carbon energy projects.

The objective of the fund should be to create a vehicle that is easy to use as a method to achieve net zero emissions over the short and medium term.

In contrast to traditional offset frameworks, which typically are limited to supporting large-scale projects, a local carbon fund should be structured such that it can support a range of Cambridge-based emission reduction projects regardless of the scale of the project.
Industry training community involvement.
5. ENGAGEMENT AND CAPACITY BUILDING

5.1 COMMUNICATION STRATEGY

*Develop a comprehensive long-term communications strategy around the Cambridge Net Zero objective.*

**Short Term**

- Establish a communications network wherein partners and advocates use existing communications channels to engage the community around the net zero initiative. Partners with existing networks are trusted voices, whose endorsement can be invaluable in terms of generating support for the initiative.

- Develop (with the assistance of a public relations firm) a strong brand identity for the project such that the overarching project and related initiatives are easily recognizable by residents, visitors, and community members.

- A focus of this strategy should be to build upon the success already achieved to date in Cambridge and to celebrate the leadership of the very progressive development and real-estate community.
5. ENGAGEMENT AND CAPACITY BUILDING

5.1 COMMUNICATION STRATEGY

**Develop a comprehensive long-term communications strategy around the Cambridge Net Zero objective.**

**Medium and Long Term**

- Ensure that programs that rely on community uptake are communicated to their intended audiences in a simple and engaging manner. Program uptake is often closely tied to awareness and clarity of messaging.

- Maintain open channels of engagement with residents and businesses, such that their ideas are incorporated into the work, and their voices are heard.

- Use communications tools and campaigns to translate complex information to a format that is accessible and relatable to community members.

- Develop competitions, challenges and/or rewards program to generate buzz around net zero initiatives.

- Report regularly on progress toward target.
5. ENGAGEMENT AND CAPACITY BUILDING

5.2 DEVELOP ONGOING CAPACITY TO MANAGE GETTING TO NET ZERO PROJECT

Assign and commit to specific roles and responsibilities for implementing the Cambridge net zero initiative over the long term.

- Short term, develop action plan, assign roles and responsibilities and create a reporting structure.

- Medium term, conduct interim reviews, reports and refine the action plan.

- Long term, ongoing measurement, public reporting and process refinement.
5. ENGAGEMENT AND CAPACITY BUILDING

5.3 NET ZERO LAB STANDARDS

Through stakeholder engagement, develop new standards for lab operations that support lower energy use.

- Building on Cambridge’s strength as a center of research and innovation, the development of new industrial hygiene standards that, for example, could lower ventilation standards and reduce other energy uses could be critical in achieving net zero labs.

- Develop a working group of industry stakeholders, research institutions and industrial hygienists to collaborate on new standards for reducing energy use that can be trialed without compromising safety or research integrity.

- Once the consensus is developed on new potential standards there will need to be pilots to test their effectiveness of the interventions and refined.

- Over the long term there will be a need for ongoing refinement of the standards as technology and practices develop.