

# City of Cambridge Getting to Net Zero Action Plan

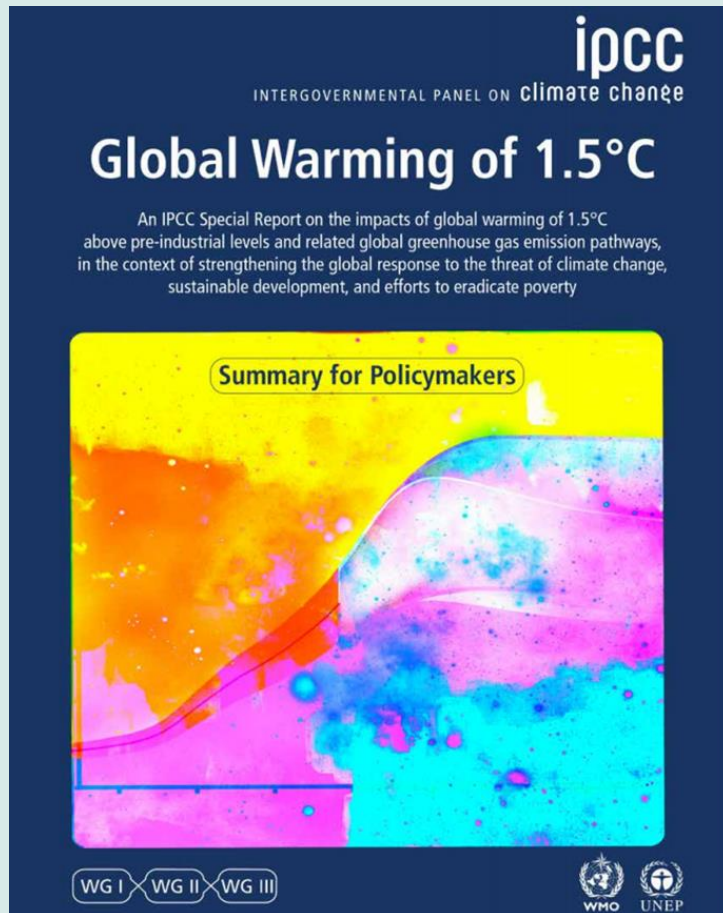
## Fiscal Year 2018 Progress Report

Health and Environment Committee Hearing

May 21, 2019

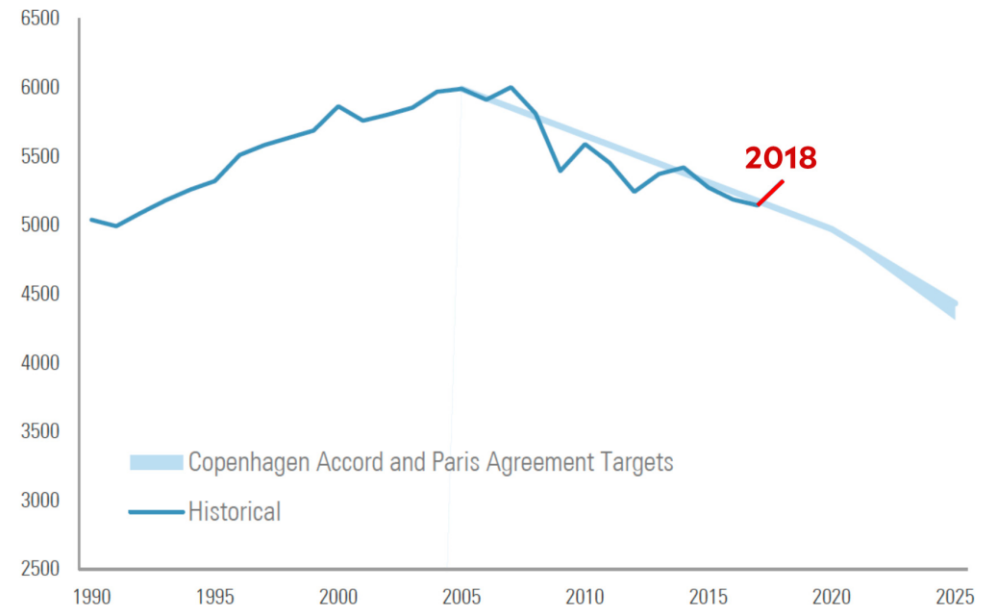


## Context: Emissions are Increasing



**Figure 6: US energy-related CO<sub>2</sub> emissions**

Million metric tons. Copenhagen Accord and Paris Agreement Targets assume reductions in energy-related CO<sub>2</sub> emissions proportional to the economy-wide GHG total



Source: Rhodium US Climate Service





# Carbon Neutrality by 2050



## Annual Report Process

- February CPAC Meeting: Present overview of action status updates
- March: Review report with City Manager
- April CPAC Meeting: CPAC vote to accept report and letter of review
- May: Report release and City Council Hearing



## Summary of Next Steps: Proposed Legislative Action

- *FY19*: Amend Article 22 of the Zoning Ordinance to Increase Green Building Requirements (Action 2.3) and Remove Barriers to Increased Insulation (Action 2.5)
- *FY19*: Submit amendments to the Building Energy Use Disclosure Ordinance to introduce performance requirements for BEUDO buildings (Action 1.1.2)
- *FY20*: Implement recommendations for a Height and FAR Bonus through zoning for buildings that achieve net zero emissions ahead of the required schedule (Action 2.2.2)
- *FY20*: Adopt a Rooftop Solar Installation Requirement for new buildings (Action 3.2)
- *FY20*: Adopt Net Zero Requirement for New Construction of Municipal Buildings (Action 2.4.1)



CAMBRIDGE



## FY19: Article 22 Amendments (in final review)

*For new buildings and major renovations over 25,000 square feet:*

- Increase standard from LEED Silver certifiability to Gold
- Add pathways for Enterprise Green Communities and Passive House certification
- Meet the requirements of LEED's Enhanced Commissioning credit
- Streamline and clarify review process
- Add "Pathway to Net Zero" narrative





## FY19: Article 22 Amendments (cont'd)

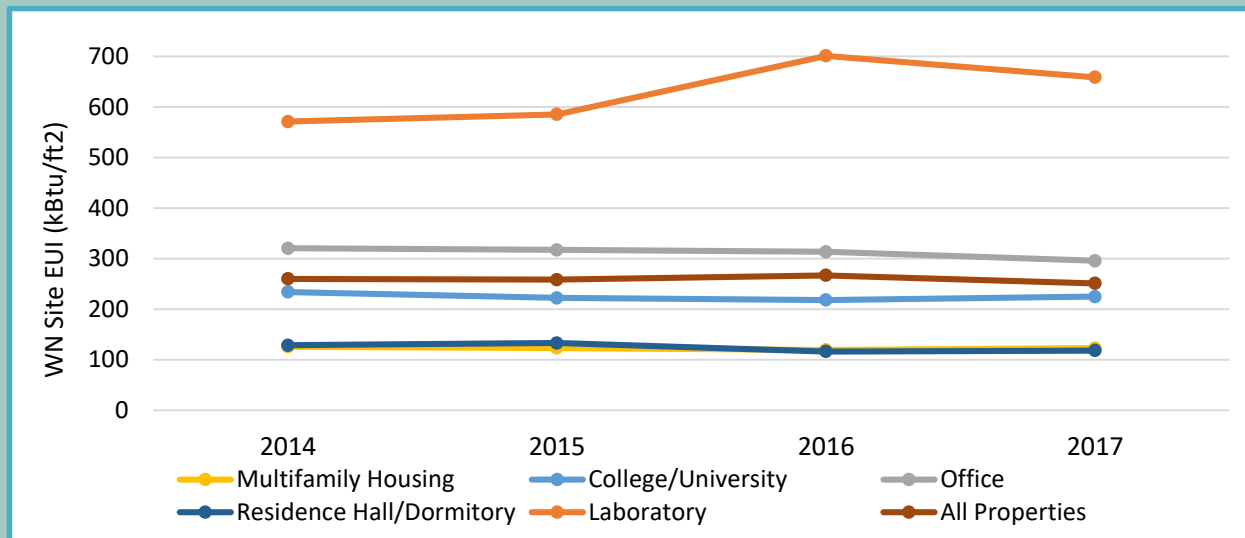
*For existing buildings seeking to add exterior insulation:*

- Increase the allowable thickness of the additional insulation and wall assembly from 4" to 8"
- Decrease the allowable setback from 7' 2" to 3'
- Allow for Special Permit applications for exceptions to the above criteria



## FY19: BEUDO Amendments

Given that BEUDO buildings have decreased their energy consumption by approximately 1% per year, CDD has recommended to the City Manager that amendments to the Ordinance are necessary to improve building energy performance for Covered Buildings.





## FY19: BEUDO Amendments

*Through a consultant study and extensive stakeholder engagement, CDD is developing an amendment framework:*

- Set performance targets for BEUDO buildings that are in line with the Net Zero, science-based targets
- Acknowledge unique needs of different building types (eg, laboratories, campuses)
- Include exemptions for buildings that have achieved exceptional energy performance or have demonstrated hardship



## FY20: Net Zero Density Bonus

*Per Envision Cambridge, a density bonus could be an effective means to incentivize net zero buildings ahead of the required schedule. CDD is studying technical options for:*

- Net zero building energy efficiency standards
- Renewable electricity pathways and impact
- Implementation considerations



## FY20: Solar Installation Requirement

*On-site renewable energy helps lower emissions and increase resilience. CDD is studying technical options for:*

- Solar installation criteria
- Off-site renewable generation alternatives
- Implementation considerations



## FY20: Net Zero Municipal Buildings

*CDD and DPW are collaborating to establish criteria for net zero municipal buildings beginning in 2020*

- Recent projects (King Open, 859 Mass Ave, Foundry) have been designed to be fossil fuel-free
- CDD/DPW are pursuing 100% renewable energy municipal electricity supply
- Current projects in planning for post-2020 (Tobin) are targeting net zero





## Also in FY20: 5-Year Plan Review

*The Net Zero Task Force proposed that the whole suite of recommendations be reviewed every five years throughout implementation. These reviews will allow for the overall strategy to adjust based on changing economics, technology and stakeholder needs.*

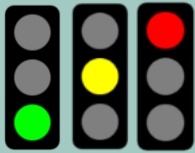
- Survey of current conditions
  - Science, policy, technology, and economics
- Program measurement and evaluation
  - Progress to date and metrics going forward
- Recommendations for Plan revisions
  - Timeline, resources, stakeholder roles



Net Zero + Net Positive Targets					Net Zero Municipal		Net Zero Residential 1-3 Units			Net Zero Commercial Multi-Family Institutional	
YEAR (fiscal year July - June)		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Action 1 - Energy Efficiency in Existing Buildings											
1.1.1 Custom Retrofit Program	Residential	Feasibility	Multi-Family Pilot		Review	Potential Multi-Family Program			Review		
	All					Feasibility	Custom Retrofit Pilot		Review	Custom Retro	
1.1.2 Additional BEUDO Requirements	Comm. + MF		Design		New Building Energy Use Disclosure Ordinance Req's				Review		
1.1.3 Upgrades at Time of Renovation or Sale	All			Feasibility		Potential T.O.S/R. Requirements			Review		
1.1.4 O+M Plan Requirement	Comm. + MF (New Const.)			Design		Required O+M Plan			Review	Required O	
Action 2 - Net Zero New Construction											
2.2.1 Market Based Incentive Program	Residential	Feasibility	Pilot Residential		Review	Pot. Net0 Incentive Program		Review	Potential Net+ Incentive Program		
	Comm. + MF			Feasibility	Pilot Commercial		Review	Potential Net0 Incentive Program			
	Labs				Pilot Labs		Review	Potential Net0 Incentive Program			
2.2.2 Height + FAR Bonus		Feasibility *		Potential H+FAR Incentive Program				Review	Potential H+FAR Incentive Program		
2.3 Increase Green Building Requirements in Cambridge Zoning Ordinance		Design	Stage 1 - New LEED Requirements			Review	Stage 2 - New LEED Requirements			Review	
2.4.1 Net Zero Requirement for New Construction of Municipal Buildings		Design	Net Zero Ready			Review	Net Zero Required			Review	
2.4.2 Renewal of Municipal Buildings		Design Action Plan		Pilot		Stage 1 - Building Renewal Strategy					
2.5 Removal of Barriers to Increased Insulation		Design	New Policy			Review					
Action 3 - Energy Supply											
3.1 Low Carbon Energy Supply Strategy		E.S.S. Study **		Implement							
3.2 Rooftop Solar Ready Requirement		Design	Solar Ready Requirement		Study	Potential Solar Requirement Version 1					
3.3 Develop a Memorandum of Understanding with Local Utilities		Develop MOU		Utility Collaboration					Review		
Action 4 - Local Carbon Fund											
4 Investigate Local Carbon Fund			Feasibility								
Action 5 - Engagement and Capacity Building											
5.1 Communication Strategy		Design		Im							
5.3 Net Zero Lab Standards		Feasibility ***	Dev. Standard	Pilot Standard 1			Implement Potential Standard			Review	

# Action Summaries

FY18 Progress, Barriers, and Next Steps: FY18 Key Considerations:



Action status (on track, in progress, behind, or parked)



Action barriers (regulatory, institutional, resources)



Next steps

Data and additional context



## DETAILED ACTION PLAN

### I. Energy Efficiency in Existing Buildings

I.1.1 Custom Retrofit Program

I.1.2 Additional BEUDO Requirements

I.1.3 Upgrades at Time of Renovation or Sale

I.1.4 O&M Plan Requirement

*Reduce energy use in buildings through retrofits and improved operations.*





## Action 1.1.1: Custom Retrofit Program

### FY18 Progress, Barriers, and Next Steps:



Multi-Family Energy Pilot in implementation



Low conversion of building intakes to retrofits

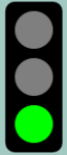


Pilot program evaluation and Custom Retrofit Program design



## Action 1.1.2: Additional BEUDO Requirements

### FY18 Progress, Barriers, and Next Steps:



Stakeholder process produced retrofit requirements straw proposal for ordinance amendment



Determining policy details and implementation logistics



Complete lab working group and begin regulatory process

**Legislative action:** Submit BEUDO amendments in FY19



## Action 1.1.3: Upgrades at Time of Renovation or Sale

### FY18 Progress, Barriers, and Next Steps:



Time of Renovation or Sale  
requirement feasibility assessment  
initiated through Zero Cities project



Avoid unintended consequences for  
property owners/tenants



Complete feasibility assessment in  
FY19 with policy recommendations  
**Legislative Action:** If feasible,  
develop regulatory proposal in FY20



## Action 1.1.4: Operations and Maintenance Plan Requirement

### FY18 Progress, Barriers, and Next Steps:



BEUDO process included the creation of O&M plan template



O&M plans are implemented on a case-by-case basis after occupancy



O&M planning is captured through Green Building Requirements; no need for further action





## DETAILED ACTION PLAN

### 2. Net Zero New Construction

2.2.1 Market-based Incentive Programs

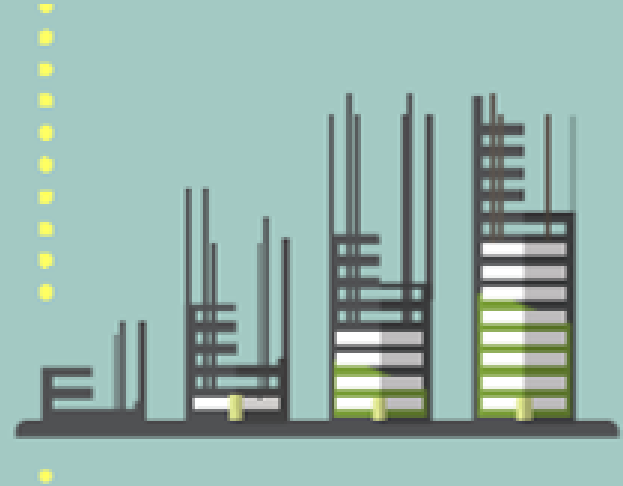
2.2.2 Height + FAR Bonus

2.3 Increase Green Building Requirements in Cambridge Zoning Ordinance

2.4 Net Zero Municipal Buildings

2.5 Removal of Barriers to Increased Insulation

*Enable low carbon new construction.*



## Action 2.2.1: Market Based Incentive Program

### FY18 Progress, Barriers, and Next Steps:



Completed feasibility study of market incentives for new buildings



Policy constraints of revenue neutrality and no additional penalties



Prioritize height and FAR bonus for new buildings and consider market mechanisms for existing buildings



## Action 2.2.2: Height and FAR Bonus

### FY18 Progress, Barriers, and Next Steps:



Delayed by Envision Cambridge but now moving forward independently



Needs to be prioritized in context of other density-related policies



Complete technical study in FY19  
**Legislative Action:** Pursue recommended density bonus in FY20



## Action 2.3: Increase Green Building Requirements in Cambridge Zoning Ordinance

### FY18 Progress, Barriers, and Next Steps:



Previously delayed requirements are ready for implementation following additional stakeholder engagement



Finalizing compliance pathway criteria details and review process



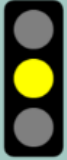
**Legislative Action:** Zoning amendment package will be brought to City Council before the end of FY19





## Action 2.5: Removal of Barriers to Increased Insulation

### FY18 Progress, Barriers, and Next Steps:



Previously delayed requirements are ready for implementation following stakeholder engagement



Potential opposition to reducing setback limitations

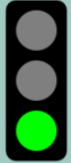


**Legislative Action:** Zoning amendment package will be brought to City Council before the end of FY19



## Action 2.4.1: Net Zero Requirement for New Construction of Municipal Buildings

### FY18 Progress, Barriers, and Next Steps:



New municipal buildings being constructed to achieve net zero-ready



Detailing net zero definitions in anticipation of requirements



Continued development of definitions for net zero standard for 2020

**Legislative Action:** Adopt muni net zero new construction standard in FY20



## Action 2.4.2: Renewal of Municipal Buildings

### FY18 Progress, Barriers, and Next Steps:



Continued implementation of  
Municipal Facilities  
Improvement Plan



Resource limits to achieve  
multiple institutional goals



Continue implementation and  
tracking of results



## DETAILED ACTION PLAN

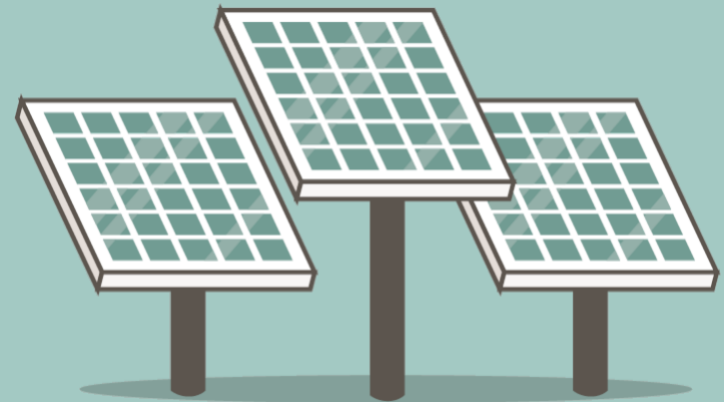
### 3. Energy Supply

3.1 Low Carbon Energy Supply Strategy

3.2 Rooftop Solar Ready Requirement

3.3 Develop a Memorandum of Understanding with Local Utilities

*Replace fossil fuels with low carbon energy.*



## Action 3.1: Low Carbon Energy Supply Strategy

### FY18 Progress, Barriers, and Next Steps:



Implementation of multiple study recommendations in progress



Coordination among regional entities for successful action



Continued implementation



## Action 3.2: Rooftop Solar Ready Requirement

### FY18 Progress, Barriers, and Next Steps:



Solar Ready adopted in state building code requirements and being included in Special Permit proposals



Solar installation requirement under initial consideration



Not all buildings subject to state code



Complete solar installation requirement technical study in FY19

**Legislative Action:** Pursue recommended installation requirements in FY20





## Action 3.3: Develop a Memorandum of Understanding with Local Utilities

### FY18 Progress, Barriers, and Next Steps:



Pursue project-specific collaboration in place of overarching MOU



Privacy concerns around data sharing



Leverage Energy Allies collaboration with utilities

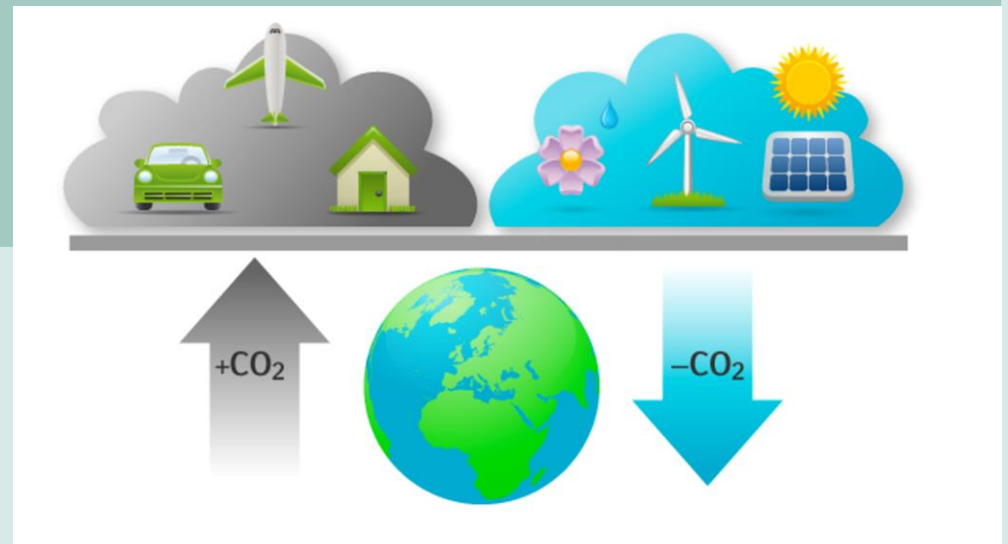


## DETAILED ACTION PLAN

### 4. Local Carbon Fund

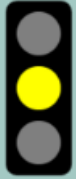
Investigate Local Carbon Fund

*Option to invest in a net zero community.*



## Action 4: Investigate Local Carbon Fund

### FY18 Progress, Barriers, and Next Steps:



Feasibility study complete but behind implementation schedule



Uncertainty regarding Fund utilization and scale of administrative costs



Conduct “virtual pilot” to test Fund concepts and inform design



## DETAILED ACTION PLAN

# *Community engagement and capacity building.*

## 5. Engagement & Capacity Building

5.1 Communication Strategy

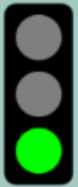
5.2 Develop Ongoing Capacity to Manage Getting to Net Zero Project

5.3 Net Zero Lab Standards and Maintenance Plan Requirement for New Construction



## Action 5.1: Communication Strategy

### FY18 Progress, Barriers, and Next Steps:



Implementation of multi-faceted communication strategy ongoing



Broaden community awareness of Net Zero Action Plan



Action-specific stakeholder engagement activity



## Action 5.2: Develop Ongoing Capacity to Manage Getting to Net Zero Project

### FY18 Progress, Barriers, and Next Steps:



On track with implementation of NZAP management and reporting structure



Ensure continued coordination among partner institutions



Complete annual report review prepare for Program Wide Review





## Action 5.3: Net Zero Lab Standards

### FY18 Progress, Barriers, and Next Steps:



In progress through Compact for a Sustainable Future workplan



Diversity of laboratory uses and energy needs



Proposal for laboratory pathway for BEUDO compliance and additional benchmarking



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# Thank You!

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