Added

City of Cambridge

Richard C. Rossi • City Manager

Executive Department

Lisa C. Peterson • Deputy City Manager

June 27, 2016

Board of Building Regulations and Standards
Department of Public Safety
The Commonwealth of Massachusetts

Re: Massachusetts Energy Code Update

Dear Members of the Board,

On behalf of the City of Cambridge, I am submitting comments regarding the updating of the Massachusetts State Building Code and Stretch Energy Code. Cambridge previously submitted comments on March 28, 2014. Cambridge was an early adopter of the Stretch Energy Code in 2009. We believe it has contributed to making our building stock more efficient, including helping us meet our Green Communities goal of reducing municipal energy use by 20% in five years in 2014.

The Massachusetts State Building Code and Stretch Energy Code are integral to the Green Communities program and efforts to meet the greenhouse gas (GHG) emissions reduction targets set by the Global Warming Solutions Act. The City of Cambridge shares increasing global concerns about the crisis of climate change and the many challenges it presents. This crisis threatens the ability of the planet to support secure, healthy, productive, and enriching live for current and future generations. Since adopting our first Climate Protection Action Plan in 2002, the City has committed to a range of initiatives to support sustainability and move the community toward greater resilience to climate change. In Cambridge, buildings in particular are both the problem and the solution for addressing climate change: we estimate that close to 80% of our GHG emissions results from building operations and, as a sign of our thriving economy, new buildings seem to be sprouting up every day. The State Building Code and Stretch Energy Code are among our strongest tools to reduce the GHG impacts of our built environment.

The proposed State Building Code revisions support a number of ongoing emissions reduction efforts in Cambridge. Our Net Zero Action Plan aims to reduce GHG emissions from the built environment by 70% by 2040 on the pathway to becoming a net zero GHG emissions community.[1] We therefore urge you to maintain or strengthen the following base code revisions:

1. **C402.3 to ensure solar readiness of major renovations and new buildings constructed in Cambridge.** The Net Zero Action Plan has set a goal of reaching 20MW of installed solar in Cambridge by 2020; up from 4.5MW installed today. Solar readiness is a crucial step to meeting these installation goals. We recommend that solar readiness also be required for commercial buildings with 4 stories and above, as much of the development we are seeing is higher than 3

[1] For more information, see www.cambridgema.gov/CDD/Projects/Climate/NetZeroTaskForce

stories and represents significant solar potential. Based on a review of existing literature, we have found the additional cost of solar readiness for residential buildings to be in the $300-$600 range.[2]

2. **C405.10 to ensure electric vehicle service equipment capability.** To reach the City's and Commonwealth's goals of at least 80% GHG emissions reductions by 2050, the vehicles driven in our community will have to transition off of fossil fuels. Vehicle electrification helps meet GHG goals while also reducing local air and noise pollution. Cambridge has over 16 public charging stations, including 4 installed by the City. The stations are well utilized; in 2014, half of the locations were used for over 300 charging sessions each, and the busiest station was used for nearly 1,500 charging sessions. Additional charging infrastructure in both residential and commercial buildings is essential to enabling the widespread adoption of electric vehicles. Indeed, while the 4% readiness proposed may be sufficient to support the Commonwealth's 2025 targets for EV adoption, these buildings will be in use long after 2025 and hence charging capacity beyond this 4% is likely to be needed. The code could allow 1% of spaces to be ready for fast DC charging as an alternative. In the residential base code, we support **N1104.2 (R404.2) to ensure residential EV service equipment readiness**, but recommend that this requirement be based on the number of parking spaces, not the number of units. This requirement need not apply to buildings that do not have dedicated parking spaces, as is the case for many buildings in Cambridge.

3. **C401.2.2 to require a source energy performance rating approach.** The current Stretch Energy Code has been problematic in regard to on-site co-generation and district energy. This is due to the site energy basis of the code. A source energy approach would recognize the GHG emission reductions and thereby support the use of district energy. We believe the ability to deploy more district energy solutions is critical to moving toward lower carbon intensity and in the direction of our Net Zero emissions goals. There is already a significant amount of on-site co-generation in Cambridge and interest among developers in this technology. We also have a district steam system in East Cambridge, as well as campus steam systems at the universities.

4. **C407.6.1.1 to verify building energy performance.** Third-party rating systems are essential to ensuring that the intended energy performance of buildings will be achieved. Energy modeling is the most effective means of predicting building energy performance. We support the incorporation of the HERS rating and employment of third-party raters for residential buildings. As there is no analog on the commercial side, we encourage the development of some type of verification of commercial building construction to ensure that commercial buildings achieve high energy performance.

Given the importance of the Stretch Energy Code to meeting Cambridge's and Massachusetts' GHG reduction targets, it is essential that the proposed Stretch Energy Code is maintained. Furthermore, while the new base code should be commended for "lifting the bottom" in building performance, the revised stretch code should maintain the same quality of ambition and incremental progress over the revised base code as the version it is replacing. To be a useful tool for Green Communities and achievement of the Global Warming Solutions Act targets, and meet the goals of the Cambridge Net Zero Action Plan,[3] the stretch code must be continually strengthened to create net positive benefits and establish a gap between

[2] Chesterman Group (BC): $300; Edmonton Green Home Guide: $400-$900; NRCan: $302; BC Solar Hot Water Ready: $200-$500; Builder Specifications for Solar Ready Homes-Are You Ready?: $280

[3] See www.cambridgema.gov/CDD/Projects/Climate/~/media/37FF332A1FE7421D9C63079C8C39AEBD.ashx

itself and the base code. The proposed version of the code does not provide sufficient requirements for existing buildings, new small and medium commercial buildings, and some new residential buildings. To remedy these shortcomings, we suggest the following improvements:

1. **Set Simple Requirements for Alterations to Existing Buildings.** Alterations of existing commercial buildings 5,000 sq. ft. or larger could be required to comply with one of the additional efficiency packages options in Section C406, within the space affected by the alteration, unless petitioned and deemed impractical by the authority having jurisdiction. Existing homes could be required to achieve a HERS rating of 75 or lower, which is a modest improvement from the current stretch code's 80/85 requirement based on home floor area.
2. **Set Efficiency Targets for New Small and Medium Commercial Buildings.** The threshold for compliance with the proposed 10% requirement should be lowered to 50,000 sq. ft. An efficiency level of 5% beyond ASHRAE 90.1-2013 could be required for buildings between 10,000 sq. ft. and 50,000 sq. ft.
3. **Set Efficiency Requirements for All New Residential Buildings.** Homes using the HERS option of Section R406 to demonstrate compliance with the base energy code could be required to achieve the threshold for compliance by efficiency alone (that is, achieve a HERS Index of 55 or lower before factoring in credits from renewable/alternative energy).

The City sees the Massachusetts State Building Code and Stretch Energy Code as fundamentally important policy tools for the advancement of our climate change and energy goals. Energy use in buildings is our largest source of GHG emissions. Since municipalities in Massachusetts do not have the option to establish our own energy codes, we rely on the Commonwealth to provide continually updated, effective energy codes that will contribute to making communities more sustainable. We therefore urge you to keep Massachusetts moving forward by maintaining all improvements to the base code and supporting a new and stronger stretch code.

Sincerely,

Richard C. Rossi

Richard C. Rossi
City Manager
City of Cambridge