

Summary of the Massachusetts Building Code Appendix 120.AA, 'Stretch' Energy Code

Appendix 120.AA known as the 'Stretch code', was adopted by the Massachusetts Board of Building Regulations and Standards in May 2009, as an optional appendix to the Massachusetts Building Code 780 CMR.

This optional 'stretch code' was developed in response to the call for improved building energy efficiency in Massachusetts. Towns and cities in the Commonwealth may adopt Appendix 120.AA in place of the energy efficiency requirements of the 'base' building code. In addition, the 'base' building energy code in Massachusetts will be updated in 2010 to the recently published IECC (International Energy Conservation Code) 2009 energy code¹. The 'stretch code' is similarly based on the IECC 2009 energy code, but with approximately 20% greater building efficiency requirements, and a move towards 3rd party testing and rating of building energy performance.

The stretch code may be adopted by any town or city in the commonwealth, by decision of its governing body following a public hearing. In a city the governing body is the city manager and the city council, or the mayor and city council². In towns the governing body is the board of selectmen. In order to be adopted, the appendix must be first considered at an appropriate municipal public hearing, subject to the municipality's existing public notice provisions.

Stretch code provisions

Residential - New Construction

New residential buildings 3 stories or less will be required to meet an energy performance standard using the Home Energy Rating System³ (HERS). The HERS index scores a home on a scale where 0 is a zero-net-energy home, and 100 is a code compliant new home (currently based on the IECC 2006 code). The HERS index has been in use for many years by beyond code programs such as Energy Star Homes, and LEED for Homes, and by the Federal IRS for tax credits and energy efficient mortgages. HERS ratings are performed by an independent HERS rater, working with the home builder, and then submitted to the local building code official.

The MA stretch code requires a HERS index of 65 or less for new homes of 3,000 square feet or above, and 70 or less for new homes below 3,000 square feet (this includes multi-family units in buildings of 3 stories or less).

A HERS index of 65 means that the home is estimated to use 65% as much energy as the same home built to the 2006 energy code, or a 35% annual energy savings.

Residential – Home renovations

Home additions and renovations have two options to meet the stretch code:

¹ The Green Communities Act of 2008 requires that Massachusetts adopt each new IECC within one year of its release, the IECC is updated on a 3 year cycle so the next version will be IECC 2012.

² Cities having a Plan D or Plan E charter have the City manager and city council as the governing body, other cities have a Mayor and city council.

³ For a summary of the HERS index see: http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS

Summary of "Stretch" Appendix to Mass. Energy Code, Adopted by BBR May 2009

ATTACHMENT B

Building category	Definition	Requirements based on energy performance (can do prescriptive instead where shown)	Alternative "prescriptive" requirement – specific efficiency measures	Source, comments	Benefit-cost modeling results
New residential	Single-family, multi-family of 3 stories or less	HERS index 65 above 3,000 ft ² , 70 below 3,000 ft ² , certified by HERS rater; follow Energy Star thermal bypass checklist	None	HERS rating = energy use as % of use under IECC code. Current Mass. code ~ HERS 99; soon-to-be-adopted IECC 2009 ~ HERS 92	Sample 3 bedroom home, estimate \$837/year savings (\$8,103 extra construction cost = \$527/year higher mortgage, but save \$1,364/year energy costs)
Residential additions	Expansions of existing living space	HERS 80 over 2,000 ft ² , HERS 85 under 2,000 ft ² ; certified by HERS rater (or prescriptive option)	Alternative path to a HERS - rating same as residential rehab below		3-bed home, estimate \$40/year savings (\$10,168 extra construction cost = \$661/year, but energy costs \$701/year lower)
Major residential rehab/alterations	Major alterations as in existing code – excludes storm windows, reroofing, doors, etc.	HERS 80 over 2,000 ft ² , HERS 85 under 2,000 ft ² ; certified by HERS rater (or prescriptive option)	Prescriptive option of Energy Star Homes program; insulation equal to IECC 2009 for climate zone 5	Quality air-sealing and insulation, EnergyStar windows	
Large commercial and large residential multi-family	Commercial above 100,000 ft ² ; residential 4 stories or more and 100,000 ft ²	Energy use 20% below ASHRAE 90.1 2007, determined by modeling	None	DOE, NGRID modeling show energy savings greater than 20%	
Medium commercial and residential multi-family	Commercial 5,000 to 100,000 ft ² , residential 4 stories or more and below 100,000 ft ²	Energy use 20% below ASHRAE 90.1 2007, determined by modeling	IECC 2009 with NBI Core performance: improved air sealing, insulation, lighting, etc.	Prescriptive based on New Buildings Institute program; used by utilities now for incentive programs	NGRID, NSTAR case studies. Example – 60,000 ft ² office bldg., \$91,000 extra cost, \$29,500 annual energy savings; and \$63,100 NGRID rebate
Small commercial	Below 5,000 ft ²	Exempt	Exempt		
Specialty commercial	Supermarkets, labs, warehouses below 40,000 ft ²	Exempt	Exempt	Other specialty buildings can apply for waiver	
Commercial alterations		Exempt	Exempt		

* IECC is the International Energy Conservation Code. The Green Communities Act passed in June, 2008 requires that Massachusetts adopt the latest version of this Code within one year of its publication. IECC 2009 was published in January, 2009.

* ASHRAE is the American Society of Heating, Refrigeration and Air Conditioning Engineers.

Terrence F. Smith
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Cambridge Chamber of Commerce
Comments to the Cambridge City Council Health and Environment Committee
Hearing on Stretch Energy Code
December 9, 2009

Good evening Councillors. My name is Terrence F. Smith and I reside at 21 Manassas Avenue in Cambridge and I am the Director of Government Affairs with the Cambridge Chamber of Commerce at 859 Massachusetts Avenue. Thank you for this opportunity to comment on the proposal to enact the Stretch Energy Code in Cambridge.

In discussing Cambridge's actions regarding energy efficiency and global climate change we must acknowledge that Cambridge is not only a good place to live, work, visit, recreate and do business but that all of this is possible at a comparatively low environmental cost. Due to location, infrastructure and density development or redevelopment in Cambridge will be better for the environment on a global scale than development anywhere else. This requires great care in assessing the impact of any regulatory action related to development.

Cambridge has experienced significant investment in and attention to energy efficiency. Data from the most recent report from the City's Climate Protection Action Committee shows that residential natural gas use was cut almost in half between 1990 and 2005. This was accomplished as our population, housing stock and number of natural gas customers increased. We do not have a clear understanding what motivated this investment in energy efficiency but the results are significant and should be better understood.

Commercial and institutional property owners have made significant improvements and commitments to energy efficiency. The three largest Cambridge property owners, Harvard, MIT and the City, have made commitments to build any new projects as energy efficient as possible. New buildings, from small residential projects to major corporate headquarters have been built and renovated to meet the highest energy efficiency standards. This has been accomplished in an already complex regulatory environment. In fact, our regulations have in some cases prevented energy efficient improvements and this issue was raised in discussion by the Green Building/Green Zoning Task Force.

I have more than 25 years of experience working on energy conservation and efficiency issues and I have developed and implemented programs in two states and for a utility. Through this work I have learned that educating people about energy efficiency and providing subsidies are both important, but that what is of greatest importance is making it easy to do the work. A simple and standardized process makes it easier for property owners to invest in energy efficiency when designing a new construction or a remodeling project. The Cambridge Energy Alliance (CEA) was created was to make energy efficient investments easier for residents, businesses and institutions.

I am here tonight to ask this Committee to recommend to the Council that enactment of the Stretch Energy Code be delayed in order to gather additional information and analysis.

The Stretch Code is a departure in precedent in Massachusetts which has operated with a single statewide building code for more than 40 years. The single code, modified on a regular basis, is well understood by the building community and regulators. The Stretch Energy Code is a major change from common practice. This action not only complicates a well understood process specific to energy issues but adds complications to making the decision to build or remodel.

Residential property owners will experience the greatest impact from enacting the Stretch Energy Code because the majority of building permits are for residential projects. The November 23, 2009 report from Community Development suggests that compliance with the Stretch Code can be accomplished at a relatively modest cost. However, this analysis fails to quantify how this additional regulatory burden may affect the decision to act or not act given the often complex process a homeowner must go through even for minor home improvement work.

Before the Council enacts this Code the Council should understand what work is being done by Cambridge homeowners and how this Code will impact these decisions. It would be useful to understand what drove the significant investment in residential efficiency the City has experienced over the past twenty years absent either special regulations or significant public or utility incentive programs.

Delaying action will provide the City and the Council the opportunity to understand the current environment for residential construction, renovation and energy efficient investment including the experience the CEA has had in marketing its services. This will also give Cambridge the opportunity to learn from the experience of other communities that enact this code which will allow for better service to residents should the City enact the Stretch Code.

The impact on commercial development is more complicated and less understood. I again note that almost any project built in Cambridge will have less of an impact on the environment than a project built elsewhere. It is important to understand the costs and benefits specific to the types of projects built in Cambridge to determine the impact of enacting this Code on commercial development.

As you know the City, through the Zoning ordinance, has built a regulatory framework that encourages property owners to work through the Special Permit process rather than build as of right in most commercial areas of the City. This process requires review of a wide variety of factors, including transportation, energy, environment, open space, and infrastructure, as part of the permitting process. Assessing the cost to meet requirements of the Stretch Code should be done in light of the costs necessitated by the Special Permit process.

The Council should also understand both technical and cost issues specific to laboratory facilities and mixed use development meeting this code. These are the types of facilities we are most likely to see in Cambridge. The examples provided by the State were for modest sized projects that are not typical in Cambridge.

My last concerns relate to State actions. The CDD report mentions responses by “the state” to a number of questions. The Massachusetts Energy Office is responsible for promoting the Stretch Code and is the source of most, if not all, of these answers. However, the Energy Office will have a limited role in the actual implementation of the Stretch Energy Code.

Interpreting the Code will be the responsibility of our Inspectional Services Department and of the State’s Board of Building Regulations and Standards (BBRS). It is my understanding that BBRS will not rule on interpretations of the Code until it is enacted by a community and specific cases are brought before it. By waiting Cambridge can learn from the experience of other communities rather than being the test case.

The second state agency that has a role in this is the Massachusetts Department of Public Utilities. The CDD report notes that an open issue is what incentives will be available to ratepayers in communities that adopt the Stretch Energy Code. This is framed as a technical issue but precedent would suggest that either higher base case or lower or different incentives may be required in communities that pass the Stretch Code. Enacting the Stretch Energy Code before the DPU completes its decision-making process could result in reducing the incentives available for energy efficiency work in Cambridge. Waiting until the DPU acts in January 2010 will provide the Council a clear idea on what incentives will be available to Cambridge residents and businesses.

By delaying action into next year the Council will have the opportunity to request and receive information to better inform your decision. You have the opportunity to learn why we have seen significant investment in residential energy efficiency and receive additional analysis on current activity around both residential renovation and new construction, commercial construction and the cost and benefit issues specific to the type of commercial development we see in Cambridge. Delay will also give the City the opportunity to learn from the experience of other communities, understand how the DPU will treat incentive programs in Stretch Code communities and ensure that this is in fact the best action for Cambridge.

While I believe the Council would be prudent in delaying action I also believe City staff should receive whatever training is available to better understand this Code. This will be useful in staff interaction with residents, property owners and the building and design community whether the City enacts the Stretch Energy Code or not.

Thank you for this opportunity to speak to you this evening.