

Stretch Energy Code Commercial Buildings FAQ

What is the stretch energy code appendix?

It is an appendix to the state energy code, created by the Massachusetts Board of Building Regulations and Standards (BBRS) that provides the option for cities and towns that wish to have an energy code for buildings that results in more energy efficient buildings than the base code that is otherwise mandatory for municipalities across the state.

How is the stretch energy code different than the existing energy code?

The stretch energy code is more stringent than the state's base building code. For commercial buildings, it is similar to the latest International Energy Conservation Code (IECC 2009), with enhancements that require about 20% greater building energy efficiency.

Why did the Commonwealth add the stretch energy code option to the state building code?

In Massachusetts, cities and towns are legally required to follow the state building and energy codes. Local codes are not permitted. However as concerns mount about rising energy costs, climate change, and national dependence on foreign energy sources, many municipalities have asked the state for a stronger state energy code or the right to adopt stronger codes at the local level. On the other hand, the state and the development community are concerned about having multiple inconsistent building and energy standards at the local level across the state. In balancing these tensions, the BBRS, working with the energy and environmental agencies, decided to adopt one alternative energy code, based on national standards, expert analysis and cost effectiveness to give communities an option to require stronger energy performance in buildings.

What are some of the expected benefits to a municipality of a more stringent energy code?

In addition to allowing municipalities to take meaningful action on energy use and climate change, the adoption of the more stringent and more performance based stretch energy code is anticipated to result in significant energy cost savings for local residents and businesses, and increase design and construction firm competitiveness in the growing green building marketplace.

Why is Cambridge considering adoption of the code?

The City Council approved the Cambridge Climate Protection Plan in 2002, which establishes goals to reduce greenhouse gas emissions that cause climate change. In Cambridge, over 80% of greenhouse gases emitted result from energy use in buildings. A stronger energy code would require buildings to be more energy efficient, thereby reducing the amount of electricity, natural gas, and fuel oil used and the emission of greenhouse gases.

In recent years, energy costs have risen significantly for residents and commercial property owners. While it usually makes financial sense for a property owner to take steps to improve the energy efficiency of homes and buildings, these improvements often do not go forward for a wide array of reasons. Standards can be an effective means of spurring the consideration and implementation of energy efficiency measures, reducing costs for current and future owners and renters, and mitigating energy costs for residents and the costs of doing business.

How would it be adopted by Cambridge?

In accordance with the BBRS rules, the adoption of the stretch energy code must be considered at a public hearing, subject to normal public notification, and approved by the City Council.

If Cambridge adopts the stretch energy code, when does it go into effect?

The BBRS regulations require a six-month concurrency period between adoption and implementation. In order for the stretch energy code to go into effect on January 1 of any year, it must have been adopted by the City Council by July 1 of the previous year. Similarly, to go into effect by July 1, adoption must take place by January 1 of that same year. The BBRS is limiting adoption dates to two a year to avoid confusion in the development community. Property owners may voluntarily choose to follow the stretch energy code during the concurrency period, but building inspectors would allow compliance through either the base code or the stretch code during that period.

If the state is making the statewide energy code more stringent, why should Cambridge adopt the stretch energy code?

The state's base code is a minimum standard. Technology is readily available to achieve significantly greater levels of efficiency. The stretch energy code would be about 20% more efficient than the state's base code. So it would save more energy and further reduce greenhouse gas emissions.

Codes also “even the playing field” for property owners and developers. Some choose to take advantage of short term savings by avoiding initial costs or passing on building operating costs to renters and lessees. If codes set a low standard, owners and developers that implement energy efficiency measures that have initially higher costs but later payoff with operating savings are put at a disadvantage relative to others.

What is the anticipated cost of implementing a more stringent energy code?

Initial adoption of a higher performance standard for buildings is likely to result in slightly higher first costs for construction, estimated to be approximately in the 1% to 3% range for commercial buildings. However, after energy cost savings on heating and electricity are included these higher performance standards save money. In addition, the electric and gas utilities in the state provide financial incentives that further reduce the upfront costs of high performance buildings, and allow for faster returns on the investment in energy saving measures. Case studies of commercial buildings following the energy efficiency recommendations on which the commercial code changes are based have shown paybacks of 1 to 2 years, when standard incentives from electric utilities are included on the benefits side.

What kinds of technical and financial help are available to property owners and contractors?

In addition to the trainings that will be offered by the state, owners and contractors will have access to the energy efficiency services, including financial incentives and loan programs, accessible through NSTAR and the Cambridge Energy Alliance.

What building types does the stretch energy code apply to?

The stretch code appendix applies to both residential and commercial buildings. The commercial parts of the stretch energy code apply only to new construction. Renovations of existing commercial buildings do not trigger the application of the stretch energy code.

The stretch energy code would apply to the construction of new commercial buildings over 5,000 square feet in size, including multi-family residential buildings over 3 stories. Specialized

facilities with unusual energy usage requirements such as supermarkets, laboratories, and warehouses up to 40,000 square feet are excluded; they are covered by the base code. Specialized facilities over 40,000 square feet are covered by the stretch code unless a waiver is obtained from the BBRS. Other building types with unusual energy usage profiles can also apply for a waiver from the stretch code from the BBRS.

Does the stretch code apply to major renovation projects as well as new construction?

It does not apply to renovation projects in commercial buildings. Due to the wide variety in types and conditions of commercial buildings, at this time there are no widely-accepted standards for renovating such buildings, so only new commercial buildings are covered by the stretch code requirements.

Does the stretch code apply to minor additions to existing buildings?

Additions to existing buildings that are large enough to require code compliance are treated in the same way as new construction for commercial buildings. Addition projects can elect to follow the performance approach to code compliance or a simplified prescriptive path.

What happens to buildings not covered by the 'stretch' energy code?

Building types that do not fall under the stretch energy code scope, such as small commercial buildings under 5,000 sq ft, or specialized use buildings like small laboratories, will follow the existing base code requirements, which are also changing to the 8th edition of the MA building code in 2010.

What standards are the stretch code appendix based on?

The Commercial stretch code for buildings from 5,000 square feet to 100,000 square feet is based on a comparison to the current edition of the International Energy Conservation Code (IECC 2009), developed by the International Code Council¹ (ICC), which will also be the new base energy code for Massachusetts. The energy saving improvements above the commercial IECC code are based on the New Buildings Institute (NBI) Core Performance program for commercial buildings, recently revised and published as the Core energy code.² Above 100,000 square feet commercial buildings are required to show a percentage improvement below ASHRAE 90.1-2007 energy standards.³ This performance approach is also an option for smaller commercial buildings.

What is required for large new commercial buildings above 100,000 square feet?

The designed energy use in large commercial buildings is required to be at least 20% below the use expected based on the building code energy modeling standards contained in ASHRAE 90.1 2007,⁴ which is the latest version of the national model code for commercial buildings. This would be determined by computer modeling of the building, taking into account factors such as air sealing, insulation, and efficiency of the cooling and heating systems, ventilation, and lighting design. Builders have the flexibility to choose the set of energy efficiency features they prefer, as long as modeling shows that overall they yield the 20% reduction relative to the base ASHRAE 90.1-2007 requirements for the same building.

¹ The ICC website is: <http://www.iccsafe.org/>

² The Core energy code is available online at: <http://www.newbuildings.org/codes.htm>

³ The ASHRAE 90.1-2007 standard is readable online in a Java enabled browser at: http://openpub.realread.com/rrserver/browser?title=/ASHRAE_1/ashrae_90_1_2007_IP_1280

⁴ Specifically: ASHRAE Standard 90.1-2007 Energy Standard for Buildings Except Low-Rise Residential Buildings, Appendix G.

What is required for new commercial buildings between 5,000 and 100,000 square feet?

Builders of such buildings have two choices. First, they can use the same modeling as for buildings above 100,000 square feet, and meet the same standard of 20% below ASHRAE 90.1-2007. Alternatively, they can choose a set of “prescriptive” requirements for particular efficiency measures, based on the new base energy code for commercial buildings (International Energy Conservation Code 2009), supplemented by cost-effective energy saving enhancements taken from the Core Performance program developed by the New Buildings Institute.⁵ The Core Performance program and the newly updated Core Energy Code are nationally-recognized standards already in use by Massachusetts gas and electric utility companies as the basis for providing financial incentives to commercial building developers.

What would be required of small new commercial buildings, below 5,000 square feet?

Such buildings would be exempt from the Stretch Code requirements.

How are new commercial buildings with special energy needs handled?

Supermarkets, laboratories, and warehouses above 40,000 square feet in size must meet the performance modeling requirements of the stretch code that apply to regular commercial buildings greater than 100,000 square feet. Because these buildings often have large and unusual energy loads they are likely to be energy modeled, so meeting the standard of 20% below ASHRAE 90.1-2007 via energy modeling should be a straightforward compliance approach.

Supermarkets, laboratories, and warehouses below 40,000 square feet are exempt from the stretch code requirements, but must still meet the base energy code. Other specialty buildings could apply for waivers based on evidence that they have unusual energy loads, and that they are not typically built using energy modeling.

How do the benefits and costs from the commercial stretch code standards compare to the baseline code?

Case studies of specific buildings by Massachusetts utility companies National Grid and NSTAR show that the savings in reduced energy costs far exceed the greater initial construction costs. If the costs are included in a mortgage, then owners would see immediate cash-flow savings. Moreover, the utilities offer generous incentives that make the efficiency improvements even more profitable. For example, on one mid-sized office building in Warwick, Rhode Island, the additional cost was \$91,000, while the annual energy savings were \$29,500, for a three year payback. But NGRID provided a rebate of \$63,100, reducing the initial cost to \$28,000, which is covered by the first year’s energy savings. More generally, we anticipate that any additional upfront costs incurred in construction should be recovered from energy savings with a payback after rebates of less than three years.

What categories do multi-family residential buildings fall into?

Residential multi-family buildings that are above 100,000 square feet and at least four stories tall have to follow the same performance path (20% better than the ASHRAE standard 90.1-2007) as other commercial buildings larger than 100,000 square feet. Residential buildings between 5,000 and 100,000 square feet and at least four stories tall would be classified with commercial buildings between 5,000 and 100,000 square feet. Multi-family buildings with one to three stories of any size fall under the residential stretch code standards. In the rare case of a

⁵ For more information please see the New Buildings Institute press release available here: <http://www.newbuildings.org/downloads/press/MAAdoptsStretchCode.pdf>

multi-family building of three stories or less that is larger than 100,000 square feet, the developer may elect to be treated either as a residential or as a commercial building.

What training and materials are available on these standards?

In addition to the websites referenced in the answer to the last question in this FAQ, the state will provide training on the IECC 2009 base energy code and an introduction to the stretch code appendix to all municipal code officials (at no cost), as well as to interested building professionals (at a cost). In addition, the major Massachusetts electric and gas utilities offer training on NBI Core Performance for commercial buildings.

How would the stretch code be implemented and enforced?

Once the stretch energy code is adopted by a town or city, it supplements the base energy code language and becomes the binding energy code language for building projects in that municipality. Implementation and enforcement of the code is similar to existing code, where the developer is responsible for submitting documentation of compliance to the Inspectional Services Department for review, and the building inspector conducts a site review.

How does the stretch code work with LEED buildings?

The commercial stretch code has two code compliance pathways. Both of these qualify for LEED new construction points, and require no additional work because of the stretch code. If pursuing the performance approach, then achieving the stretch code standard of 20% below ASHRAE 90.1-2007 uses the same baseline and modeling as the 2009 LEED program and qualifies for 5 out of 19 LEED energy and atmosphere points. Many LEED buildings will go significantly beyond these energy efficiency requirements, in order to obtain additional LEED points. Similarly meeting the stretch code through the Core Performance-based prescriptive approach qualifies for LEED points.

Does the stretch code require 3% renewable electricity or solar panels?

This question has come up because there is an option under the prescriptive path of the stretch code to meet the requirements of one section of the code with onsite renewable electricity generation. However, this is not a requirement, it is merely one of three options under this code approach, and there is also the alternative to meet the commercial stretch code requirements using the 20% better than ASHRAE 90.1-2007 modeling approach. The three options which appear in section 507 of the prescriptive code option for buildings between 5,000 and 100,000 square feet are:

- More efficient heating and cooling equipment – widely available and with utility rebates available to offset much of the incremental cost.
- More efficient lighting – also widely available and eligible for significant utility rebates.
- Providing at least 3% of the onsite electric load from onsite renewable generation – which qualifies for both large federal tax incentives and significant state renewable energy incentives from the Massachusetts Renewable Energy Trust (MRET).

Where can I find and read more about the stretch code appendix?

The stretch code appendix language is freely available on the Massachusetts BBR website.⁶ Also available on the BBR website is a 2-page summary⁷ of the code. In addition, the stretch

⁶ Stretch code language: http://www.mass.gov/Eeops/docs/dps/inf/appendix_120_aa_jul09_09_final.pdf

⁷ Stretch code 2-page summary: http://www.mass.gov/Eeops/docs/dps/inf/stretch_code_overview_jun05_09.pdf

code appendix 120.aa can be found with the rest of the Massachusetts energy code in the state bookstore. Because the stretch code is an appendix to the base energy code, it is best read together with the new base energy code document published as the International Energy Conservation Code, 2009 edition (IECC2009) available from the ICC website⁸ and other online bookstores.

Cambridge Community Development Department & Massachusetts Executive Office of Energy & Environmental Affairs, October 2009

⁸ The IECC 2009 code book is available for purchase from the ICC website at:
<http://www.iccsafe.org/e/prodshow.html?prodid=3800S09&stateInfo=fEadjxjbnWjcd baj172915>