**Stretch Energy Code**
**Commercial Buildings FAQ**

***What is the stretch energy code appendix?***
Chapter 115 Appendix AA of the Massachusetts State Building Code (MSBC) is referred to as the stretch energy code, created by the Massachusetts Board of Building Regulations and Standards (BBRS). The stretch energy code provides the option for cities and towns 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. The most recent August 12, 2016 amendments made to Chapter 13, Chapter 51, and Chapter 115 Appendix AA of the MSBC 8th Edition came into effect on January 1, 2017. These amendments upgrade Chapters 13 and 51 to the latest IECC 2015 and ASHRAE 90.1-2013 energy standards. For residential buildings, the stretch energy code also requires building owners to perform an Energy Rating Index (ERI) analysis using one of the approved pathways. Large area buildings over 100,000 square feet, as well as new supermarkets, laboratories, and conditioned warehouses over 40,000 square feet must now demonstrate energy use per square foot of at least 10% below the energy requirements of ANSI/ASHRAE/IESNA 90.1—2013 APPENDIX G Performance Rating Method on either a site or source energy basis. All other buildings are required to follow either Chapter 13 or Chapter 51 as applicable based on the use and occupancy of the building.

***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. In balancing these tensions, the BBRS 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.

***Why did Cambridge adopt 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 requires 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 are 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 was it adopted by Cambridge?***
In accordance with the BBRS rules, the adoption of the stretch energy code was considered at a public hearing and adopted by the City Council on December 21, 2009.

***What are some of the 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.

***When did the stretch energy code go into effect?***
The BBRS regulations require a six-month concurrency period between adoption and implementation. The City Council adopted the stretch energy code on December 21, 2009, and the code subsequently went into effect on July 1, 2010. Amendments to the stretch energy code made by the BBRS came into effect on August 12, 2016. All building permits and related construction and other documents filed after January 1, 2017 must comply with the amended provisions as described in Chapter 115 Appendix AA.

***If the state is making the statewide energy code more stringent, why did 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 is more efficient than the state's base code, so implementing it saves energy and further reduces 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 required for new commercial buildings below 100,000 square feet?***
For building permits filed after January 1, 2017, all new construction, renovations, repairs, and alterations of commercial buildings are subject to the provisions outlined in Chapter 13 of the MSBC. As per Chapter 13 Section C401.2, commercial buildings must comply with one of the following:

1. The requirements of **ANSI/ASHRAE/IESNA 90.1-2013**, as modified by C401.2.2 if following Appendix G and otherwise by C406.1
2. The requirements of **Sections C402 through C405**. In addition, commercial buildings shall comply with Section C406 and tenant spaces shall comply with Section C406.1.1.
3. The requirements of **Sections C402.5, C403.2, C404, C405.2, C405.3, C405.4, C405.6, and C407**. The building energy cost, or the total annual energy use on either a site or a source energy basis, shall be equal to or less than 85% of the standard reference design building. Source energy calculations shall comply with C401.2.2.1.
4. Residential-use buildings four stories or fewer may elect to comply with the standards set in **Chapter 51 Section N1106**.

New supermarkets, laboratories, and conditioned warehouses over 40,000 square feet are also subject to an additional stretch code requirement that is detailed in the following question.

***What is required for new large area and high energy use commercial buildings?***
For building permits filed after January 1, 2017, all new construction, renovations, repairs, and alterations of commercial buildings are subject to the provisions outlined in Chapter 13 of the MSBC. In addition to compliance with Chapter 13, Section AA103.2 of the stretch energy code indicates that all buildings over 100,000 square feet and new supermarkets, laboratories, and conditioned warehouses over 40,000 square feet shall demonstrate energy use per square foot at least 10% below the energy requirements of ANSI/ASHRAE/IESNA 90.1-2013 Appendix G Performance Rating Method on either a site or source energy basis. 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 the model yields at least a 10% reduction in energy cost relative to the base ANSI/ASHRAE/IESNA 90.1-2013 requirements for the same building.

***What building types does the stretch energy code apply to?***
The stretch code appendix applies to both residential and commercial buildings. The latest amendments to the stretch energy code dictate that all commercial new construction, alterations, renovations, additions, or repairs are now subject to Chapter 13 of the MSBC, which gives multiple pathways to meet energy efficiency requirements. The only building types that are subject to an extra provision set by the stretch energy code are those defined as large area or high energy use buildings. All buildings over 100,000 square feet and new supermarkets, laboratories, and conditioned warehouses over 40,000 square feet must demonstrate increased energy efficiency.

***What kinds of technical and financial help are available to property owners and contractors?***
In addition to the trainings that have been offered by the state, owners and contractors have access to the energy efficiency services, including financial incentives and loan programs, accessible through Eversource and the Cambridge Energy Alliance. The Massachusetts Clean Energy Center (MassCEC) also offers a wide variety of rebates for building upgrades including air and ground source heat pumps, energy storage, solar hot water, and solar PV systems. For more information on the current rebate programs, please visit the MassCEC website.

***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 standards are the stretch code appendix based on?***
The MSBC is largely based on the International Building Code 2009 (IBC 2009), with supplementary information pulled from the International Existing Building Code (IEBC), the International Energy Conservation Code 2015 Edition (IECC 2015), the International Mechanical Code (IMC), and the International Fire Code (IFC). These building codes are developed by the International Code Council (ICC). For large buildings above 100,000 square feet and new

supermarkets, laboratories, and conditioned warehouses above 40,000 square feet, a performance of 10% below the ANSI/ASHRAE/IESNA 90.1-2013 standard is also required. This is also one of the available approaches for smaller commercial buildings. Additional information is available at the BBRS website.

***How is the stretch code implemented and enforced?***
The stretch energy code supplements the base energy code language and is the binding energy code language for building projects in Cambridge. 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 are new commercial buildings with special energy needs handled?***
Supermarkets, laboratories, and conditioned warehouses larger than 40,000 square feet must meet the performance modeling requirements of the stretch code. Because these buildings often have large and unusual energy loads, energy modeling is required for stretch code compliance to show a reduction in energy cost of at least 10% below the ANSI/ASHRAE/IESNA 90.1-2013 baseline model. Supermarkets, laboratories, and conditioned warehouses below 40,000 square feet are exempt from the stretch code requirements, but must still meet the base energy code outlined in Chapter 13 of the MSBC.

***What categories do multi-family residential buildings fall into?***
Residential multi-family buildings that are above 100,000 square feet and more than four stories tall have to follow the same path (10% below ANSI/ASHRAE/IESNA 90.1-2013) as other commercial buildings larger than 100,000 square feet. Multi-family buildings that are less than 100,000 square feet with one to four stories of any size fall under the residential stretch code standards. In the rare case of a multi-family building of four stories or fewer that is larger than 100,000 square feet, the developer may elect to be treated either as a residential or as a commercial building.

***How does the stretch code work with LEED buildings?***
For new and existing buildings, all levels of LEED v4 certification require a specific percentage below the ANSI/ASHRAE/IENSI 90.1-2010 standard. Should the building meet or exceed the stretch code (which is based on ANSI/ASHRAE/IENSI 90.1-2013), the building may also meet the requirements of LEED v4 and be eligible for LEED certification. See the U.S. Green Building Council website for more information on LEED certification requirements.

***Does the stretch code require renewable electricity or solar panels?***
The stretch code does not directly require renewable energy systems. Should the building owner elect to follow Compliance Path 3 under Section C401.2, then Section C407 must be addressed. There is an option under Chapter 13 Section C407.6.1.4.1 that allows for an increased HERS (Home Energy Rating System) Index Score as a trade-off for onsite renewable energy systems. The following Table summarizes these trade-offs:

Table C407.6.1.4: Maximum HERS Index Scores with Onsite Renewable Energy Systems

| Renewable Energy Source | Maximum HERS Index | |
|---|---|---|
| | New Construction | Whole House Renovations; Additions |
| None | 55 | 65 |
| Solar PV > 2.5 kW; or Renewable primary heating system | 60 | 70 |
| Solar PV & thermal DHW; or Renewable primary heating & solar thermal DHW | 62 | 72 |
| Solar PV & Renewable primary heating & solar thermal DHW | 67 | 77 |

This is not a requirement for all buildings, but may be applicable if Section C401.2 Compliance Path 3 is the selected method.

***Where can I find and read more about the stretch code appendix?***
The stretch code appendix language is freely available on the Massachusetts BBRS website. In addition, the amendment to the stretch code Appendix 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, 2015 edition (IECC 2015) available from the ICC website and other online bookstores.

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