

Stretch Energy Code Residential 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. For residential buildings it is roughly equivalent to meeting the Massachusetts requirements of the National Energy Star for Homes (Tier 2) standard for new buildings and the Energy Star base standard for building renovations, and includes provisions for third party testing and rating of building energy performance.

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.

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.

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.

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. For new residential construction, third party verification would be required (optional for renovations), which would provide building owners and contractors with a way to ensure quality control of energy efficiency installations and ease the administration of the code for City inspectors.

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 kinds of projects trigger the stretch energy code?

New construction and renovations of residential buildings three stories or less would be subject to the residential portion of the stretch energy code. New construction projects would be required to use the Home Energy Rating System (HERS) and achieve an index level of 65 if the building is over 3,000 square feet in area or 70 if the building is smaller (see attached table).

Renovations projects would have two options. The ***performance*** approach requires achieving a HERS index of 80 for homes over 2,000 square feet and 85 for those under 2,000 square feet. The ***prescriptive*** approach requires measures listed by the Energy Star for Homes program, such as more efficient equipment, plus insulation at least equal to that required by the IECC 2009 code.

Applicability of the stretch energy code to renovation projects is limited to the extent of the work. For example, if windows are being replaced, then the windows must meet the code's standards and any exposed wall cavity must be filled with insulation to the required level. But the remainder of the building would not be required to be upgraded. Similarly, if a ceiling or wall cavity is opened, then the required level of insulation must be installed, but the remainder of the building's ceiling and wall cavities are not required to be upgraded with insulation. If you are replacing your boiler, you would be required to install one that meets the stretch code standard, but you would not be required to upgrade the buildings insulation. Also, certain work is exempt, including re-roofing, installation of storm windows, alterations involving less than 50% of light fixtures in a space.

If I'm doing a small remodeling project, like a kitchen or bathroom renovation, will I have to meet the stretch energy code?

If the work would normally trigger the base energy code, then it would trigger the stretch energy code. But only those elements that are being changed would have to meet the code requirements.

Do I have to achieve a HERS rating if my project is only a renovation of an existing building?

For a renovation, a HERS rating would be an option, not a requirement. The project could satisfy the stretch energy code through the performance track, which would involve a HERS rating, or the prescriptive track, which would require installing specified measures. Because the HERS rating is based on the performance of the whole building, in most cases it is expected that projects will use the prescriptive track.

Would Existing buildings or Historic buildings have to be upgraded to comply with the stretch code appendix?

The Stretch code appendix does not change the sections of the state base building code that apply to existing buildings and historic buildings. These sections have also remained unchanged in the base code between the 7th edition and the proposed 8th edition of the Massachusetts energy code. Specifically historic buildings listed in state or national registers, or designated as a historic property under local or state designation law or survey, or with an opinion or certification that the property is eligible to be listed, are exempt from both the base and the stretch appendix to the energy code.

As a residential property owner, how would I comply with the stretch energy code?

If the project involves new construction, then it must follow the performance track which is based on a HERS rating. If the project involves a renovation, it can comply by following either the performance or prescriptive track.

What is a HERS rating?

HERS is the acronym for Home Energy Rating System. It is a scoring system established by the Residential Energy Services Network (RESNET), a national non-profit organization recognized as a national standard by such organizations as the Federal IRS, EPA, and the Mortgage industry. The scoring index is a scale from 0 up to around 200, with 100 representing the score for a 2006 code standard new home of the same size and type compared to the new home being evaluated. A score of zero would represent a home that uses zero net energy (e.g., a zero net energy home). Each 1 point decrease in the HERS index corresponds approximately to a 1% reduction in energy consumption. For example, a home that achieves a HERS rating of 85 would be 15% more energy efficient than the standard new code built home in 2006. Older, unimproved homes typically have ratings well over 100. The lower the score, the more efficient it is. The score is determined by energy modeling of the buildings structure and systems by a certified HERS rater.

What training do HERS raters undergo? How do I find a HERS rater?

HERS raters are typically experienced building design professionals who additionally undergo an intensive one to two week training course and must rate 5 homes under the supervision of an existing certified HERS rater in order to be certified by RESNET. They must also be part of a HERS rating agency or organization that provides quality assurance, liability insurance and ensures that raters meet ongoing continuing education requirements.

How do I find a HERS rater?

NSTAR and the Cambridge Energy Alliance can assist contractors and owners in finding a HERS rater. They are also listed at <http://www.natresnet.org/directory/raters.aspx>.

What are the prescriptive measures that can satisfy the stretch energy code?

For residential projects, the prescriptive measures consist of the Energy Star Builders Option Package (BOP), which includes the Energy Star Thermal Bypass Checklist. The BOP describes the insulation and air sealing to cut infiltration for an efficient building envelope, efficiency standards for cooling and heating equipment, allowable leakage rates for ductwork, and standards for windows, water heaters, lighting appliances, and thermostats. Energy Star rated equipment, appliances, windows, and lighting that meet the standards. The thermal bypass checklist involves visual inspection of areas in the building where air leakage could take place to ensure that sealing is effective. Copies of the Energy Star for Homes BOP and Thermal Bypass Checklist can be found at http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.homes_guidelns.

What is the anticipated cost to the property owner of complying with the code?

In almost all cases, expected energy savings from complying with the stretch energy code will exceed the cost. New construction projects that are designed to meet the HERS rating targets can do so cost effectively, as many builders have already demonstrated through the voluntary Energy Star Homes program. In the case of building renovations there are more design constraints, but lower standards to meet. Typical projects involve adding insulation and air sealing and will see relatively rapid paybacks. If major equipment upgrades are selected, then the payback could be longer. However, for renovations, equipment such as boilers and furnaces would not be required to be replaced, although the owner may have other reasons to do so. The City has conducted energy modeling for a typical Cambridge triple decker to assess the cost of complying with the stretch energy code. See the discussion below.

Will implementing the stretch code save me money on utilities?

Yes. The stretch energy code is designed to tighten the building envelope and utilize efficient lighting, appliances, and equipment. As a result, the cost of heating, cooling, and electricity will decrease.

What low-cost interventions can I do to meet the stretch energy code?

For renovation projects, most projects will be able to meet the stretch energy code by adding insulation and performing air sealing, measures such as applying caulk and adding storm windows. For new construction, the stretch energy code would require incremental improvements in measures and equipment installed the cost of which will be quickly paid back in energy savings.

Has the City investigated the impact on residential buildings in Cambridge?

Since the Cambridge housing stock consists largely of multi-family buildings, the City asked the Vermont Energy Investment Corp., a non-profit energy organization that the Commonwealth of Massachusetts has used for energy expertise, to assess the impact on a triple decker building undergoing a major renovation. Using plans from an actual triple decker located on Magazine Street and assuming the project follows the performance path, the modeling indicates that it is relatively easy (e.g., add insulation and conduct air sealing) for the triple decker to achieve a HERS rating of 85. The energy savings each year exceed the cost of financing the improvements. The savings estimate was conservative and did not include any utility energy efficiency incentives or tax incentives in the cost of meeting the code requirements. A copy of the modeling results is available from the Community Development Department.

How could my contractor know how to meet the stretch energy code?

The state will hold trainings for contractors and City inspectors. We expect trade groups will also hold their own trainings. The City's Inspectional Services Department would provide information to all permit seekers about the need to comply with the stretch energy code.

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.

How would the stretch energy code be enforced?

The City's Inspectional Services Department will be responsible for enforcement of the stretch energy code in the same manner that it currently enforces the existing building and energy codes.

*Cambridge Community Development Department
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