



**Comments of Kevin Rose, Building Energy Technical Associate
Northeast Energy Efficiency Partnerships (NEEP)
To the Energy and Technology Committee of the Connecticut General Assembly
Regarding Senate Bills 352 and 357
March 4, 2014**

Senator Duff, Representative Reed, and members of the Committee:

On behalf of Northeast Energy Efficiency Partnerships (NEEP)¹, thank you for the opportunity to provide comment on Senate Bill 352, An Act Concerning the State Building Code, and Senate Bill 357, An Act Concerning Energy Efficient Building Standards and Product Efficiency Standards. NEEP was founded in 1996 as a non-profit whose mission is to serve the Northeast and Mid-Atlantic to accelerate energy efficiency in the building sector through public policy, program strategies and education. Our vision is that the region will fully embrace energy efficiency as a cornerstone of sustainable energy policy to help achieve a cleaner environment and a more reliable and affordable energy system.

Support for Adoption of the 2015 IECC as Required in SB 352

NEEP strongly supports the State of Connecticut's efforts to create a better energy future for its citizens by adopting the 2015 International Energy Conservation Code (IECC) as the basis of its building energy code. NEEP applauds the sponsors for recognizing energy codes as a cost effective source of long-term energy savings and for setting an aggressive target implementation date.

Connecticut and its citizens stand to benefit from the adoption of the 2015 IECC in many ways:

- The 2015 IECC is the final product of a well-developed, long-standing model code development process that involves the nation's leading experts in energy efficiency, building design and product performance professionals, state and local governmental officials, product manufacturers, architects and builders, including representatives from Connecticut.
- By adopting the 2015 IECC, the State of Connecticut will stay on track with its energy efficiency goals, and will provide benefits to its building and home owners and individual tenants for many years. New construction is the most cost-effective time to install better insulation, quality windows and doors, and efficient heating and cooling equipment that is properly sized. An up-to-date energy code that accounts for the latest in construction practices and technological advances ensures this. In addition, construction costs should be reduced through economies of scale, as suppliers and retailers reduce inventories and streamline production to meet these new energy targets.
- The adoption of the 2015 IECC will facilitate compliance and enforcement of the code, as many of the provisions are simpler and easier to apply than previous versions. Builders and code officials can take advantage of free trainings, free COMcheck and REScheck compliance software, and other support programs offered through the U.S. Department of Energy.

¹ [NEEP](http://www.neep.org) is a regional non-profit organization founded in 1996 whose mission is to promote the efficient use of energy in homes, buildings, and industry throughout the Northeast and Mid-Atlantic through regionally coordinated programs and policies that increase the use of energy efficient products, services and practices, and help achieve a cleaner environment and a more reliable and affordable energy system. The comments are presented by NEEP staff and don't necessarily reflect the views of NEEP's Board, sponsors or partners.



One specific recommendation NEEP would have on the bill is in relation to the Energy Rating Index (ERI) compliance pathway found in the 2015 IECC. The reference to the Home Energy Rating System (HERS) Index in Section 2a2B should instead refer to an ERI. While HERS will likely be the rating system used, the ERI defined in the 2015 IECC is a generalized version of the HERS Index designed to avoid the creation of an unintentional monopoly.

Recommendations for Energy Efficient Building and Product Efficiency Standards Contained in SB 357

It is important to note that the energy rating targets presented in Section 1 would be incompatible with SB 352 or any other change to the Connecticut's base energy code. For residential buildings, the ERI compliance path included in the 2015 IECC would require a HERS Index of 55—a more stringent requirement than the targets of 65 and 70 set in this section. For commercial buildings, the target of at least 20 percent below ASHRAE 90.1-2007 modeled energy requirements would also be at least as efficient (and likely less) than the commercial provisions of the 2015 IECC. As such, NEEP would recommend amending these energy rating targets to ensure that these standards remain above code. We also recommend that these standards be encapsulated in an appendix to the State Building Code. This would provide uniform, state-wide language for jurisdictions who would like to adopt these standards, thereby simplifying adoption, compliance, and enforcement. Please see our attached case study on the Massachusetts Stretch Code for more information, including a financial justification.

We support portions of Section 2, particularly phasing out the use of the Leadership in Energy and Environmental Design (LEED) rating system for state facilities in favor of the Energy Star Target Finder tool or ASHRAE modeling. However, NEEP recommends that new public school construction or substantial renovations instead meet the criteria established by the Northeast Collaborative for High Performance Schools (NE-CHPS), a regionally developed building and renovation protocol with a specific focus on educational facilities. Utilizing a point-based roadmap, NE-CHPS encourages school construction and renovation practices that will reduce carbon emissions, improve indoor environmental quality, reduce operational costs, and enhance occupant productivity. The protocol employs the Target Finder program to assess a designed facility's energy performance, an integral component of the point-based verification system. We also suggest simplifying the eligibility requirements given by subsection (a), if possible.

We also support Section 3, which would clarify that the Commissioner of Energy and Environmental Protection has the authority to adopt new appliance efficiency standards, regardless of the status of standards adoption in California. Appliance energy efficiency standards are one of the most cost-effective tools for states to reduce energy and water use in our products while maintaining product quality and consumer choice. The 2013 Comprehensive Energy Strategy recognized the importance of state appliance efficiency standards, calling for the adoption of new state standards and for Connecticut to work with other states in this region to support more stringent federal appliance efficiency standards². We note that Connecticut's past leadership in adopting energy efficiency standards has helped transform markets in favor of more efficient products nationwide. Section 3 supports this by granting the Commissioner greater flexibility and authority to expedite the approval of state-level appliance efficiency standards. NEEP looks forward to working with DEEP and other stakeholders as it pursues new product efficiency standards in the coming year.

² Connecticut Department of Energy and Environmental Protection (DEEP), 2013 Comprehensive Energy Strategy for Connecticut, February 19, 2013, p. 29-30, http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf



Conclusion

Adoption of the 2015 IECC, as mandated by SB 352, serves several essential goals:

- Improves the thermal efficiencies of wall, roof, floor and basement construction, and of window and door performance that all combine to lower energy bills and provide healthier environments for owners and tenants of new and renovated buildings within the state;
- Improves thermal performance and corollary air infiltration requirements that reduce loss of energy by structures, thereby reducing the costs for equipment and systems necessary to heat and cool these new buildings and renovated spaces;
- Requires water heating and lighting efficiencies that will serve consumers through additional reductions in their utility bills;
- Will also reduce the need for utilities to construct additional generation and transmission capacity improvements to meet increases in electrical demand.

The benefits of these code changes will be immediate and continuing savings for both businesses and residences throughout the state. They also will hold down the increasing costs of energy from higher demand that would occur if not adopted, and reduce continued reliance on older and more expensive power generators, a leading contributor to high energy bills in our Mid-Atlantic and Northeast states.

NEEP wholeheartedly endorses adoption of the 2015 IECC as an essential component of the State of Connecticut's overall energy efficiency goals, and is available to assist in answering inquiries about any aspect of IECC adoption and implementation. NEEP also supports the spirit of SB 357, but recommend its modification as described above. Please do not hesitate to contact NEEP for technical support and assistance in these efforts.

Contact information:

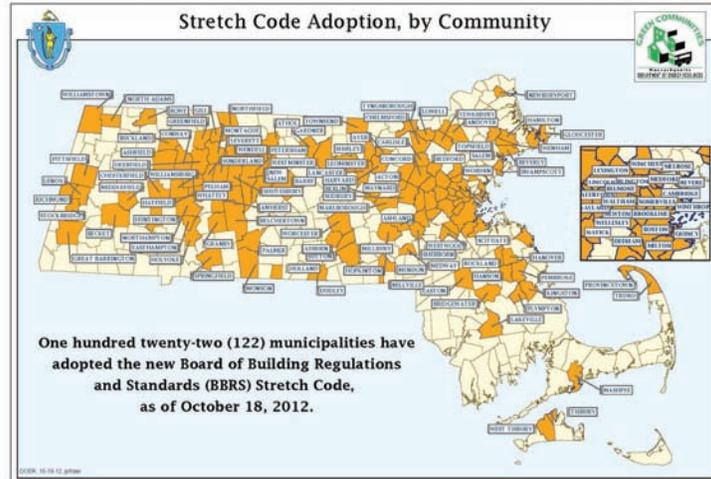
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MASSACHUSETTS STRETCH ENERGY CODE

Prior to 2008 in Massachusetts, according to [Massachusetts General Law chapter 143, section 98](#), any municipality that wanted to adopt a more stringent code had to demonstrate to the state Board of Building Regulations and Standards (BBS) that it was “reasonably necessary because of special circumstances.” However, upon the creation of the [Green Communities Act](#) in 2008, a program which provides funding to qualified municipalities for energy efficiency and renewable energy initiatives, Massachusetts communities began expressing greater interest in the appeals process

to adopt more stringent building energy codes. This pressure from Massachusetts’ cities and towns led to the state’s first beyond code appendix, the 120 AA “Stretch” Energy Code, in May of 2009. The [Stretch Code](#) (now the 8th edition, Appendix 115 AA) gives jurisdictions a straight forward path to adopt a more stringent enforceable code that is approximately 20 percent more energy efficient than the base state code. Massachusetts now implements the 2009 IECC with a voluntary Stretch Code, designed with the following criteria and stringencies:

- 40 percent carbon emission reductions compared to the 2006 IECC/ASHRAE 90.1-2004;
- Approximately 20 percent more efficient than the base energy code - the IECC 2009 for new construction;
- Greater emphasis on performance testing and prescriptive requirements, requiring that new residential construction achieve a [HERS score](#) of 65 or less for homes 3,000 SF and larger, and 70 or less for those smaller than 3,000 SF;
- It requires compliance with the ENERGY STAR® Qualified Homes Thermal Bypass Inspection [Checklist](#).



“From tiny towns to major cities and suburbs in all regions of the state, Massachusetts communities recognize the benefits, for the economy as well as the environment, of making clean energy choices.”

- MA Governor Deval Patrick

The Stretch Energy Code is a voluntary code; towns and cities in Massachusetts may choose to remain on the base energy code or to adopt the Stretch Code as their mandatory energy code requirement. As of October 2012, [122 communities](#) in Massachusetts have voluntarily adopted the Stretch Energy Code. These communities range in size from Rowe, MA with a population of 351 people, to larger cities like Springfield and Boston. These adoptions show that Massachusetts is aggressive and forward thinking concerning energy savings and building codes. Although voluntary codes typically result in low implementation rates, Massachusetts has proven otherwise, and acts as a model for other states interested in pursuing advanced energy codes in their communities.

Lessons Learned From Massachusetts

There was no shortage of training for building code officials, designers, builders, and contractors in the years following the drafting of the Stretch Code. [Massachusetts' Department of Energy Resources' \(DOER\) Ian Finlayson](#) explained the outreach efforts, which occurred in 40 trainings focused on the 2009 IECC and the Stretch Code. The Center for EcoTechnology's training program expanded, offering 40 builder-focused trainings, 20 codes-focused trainings, 15 HVAC-focused trainings, and five Deep Energy Retrofits-focused trainings in 2011. Collaboration was also a crucial factor in the adoption of the Stretch Code. The Stretch Code was created by the BBRS with the assistance of key state energy personnel and NEEP. NEEP provided expertise while working on [New Buildings Institute \(NBI\)'s Core Performance](#), which served as the framework for the Stretch Code's commercial requirements. And finally, because the Green Communities Act includes building energy efficiency as a prerequisite for grants, the adoption of the Stretch Code was further incentivized for cities and towns across the state.

The progress seen in the state of Massachusetts demonstrates a rapid adoption of beyond code legislation. As Mark Lyles of NBI notes in his article [A Chance Encounter with the Massachusetts Stretch Energy Code](#), jurisdictions of all sizes in Massachusetts adopted the Stretch Code, suggesting a readiness of the market to adopt energy efficiency improvements many thought impossible before. This leadership should speak to other states across the country as it continues to save homeowners money, reduce carbon emissions, and create jobs for the Commonwealth - achievements that are possible for any jurisdiction ready to make energy efficiency a priority.



What Are The Savings?

The following figure represents a cash flow analysis for building a home to the 2009 IECC, the Stretch Code, and the Stretch Code with ENERGY STAR. Although the Stretch Code home has an increased up-front cost of \$2,949, both Stretch Code homes have annual cash flows between \$293 and \$389, with energy savings of over \$500 each year.

Massachusetts Stretch Code Improvement - Cash Flow

Baseline Home (2,672 SF)			
	2009 IECC	Stretch Code	Stretch Code with ENERGY STAR
HERS Index Modeled in REM/Rate	86	70	70
Improvement Measures (changes relative to baseline)	<ul style="list-style-type: none"> • Unconditioned basement • Floor (R30) • Walls (R21) • Ceiling (R38 G2) • Heating (80 AFUE) • Cooling (13 SEER) • Water Heating (.59 EF) • Duct Leakage (8%) • Infiltration, (7 ACH50) • Efficient Lighting (50%) 	<ul style="list-style-type: none"> • Ceiling (R38 G1) • Heating (94 AFUE) • Water Heating (.62 EF) • Infiltration (4ACH50) • Efficient Lighting (75%) • Exhaust Only Ventilation 	<ul style="list-style-type: none"> • Ceiling (R38 G1) • Heating (94 AFUE) • Water Heating (.62 EF) • Duct Leakage (6%) • Infiltration (5 ACH50) • Efficient Lighting (80%) • Exhaust Only Ventilation
Improvement Costs		\$2,049	\$2,155
HERS Rater Fee¹		\$900	\$900
HERS Rater Reimbursement²			\$650
ENERGY STAR Incentive³			\$650
Total Improvement Costs		\$2,949	\$1,755
Mortgage Interest Rate		6%	6%
Loan Term (years)		30	30
Annual Incremental Mortgage Payment		\$214	\$127
Annual Energy Costs⁴	\$3,970	\$3,463	\$3,454
Annual Energy Savings from Baseline		\$507	\$516
Annual Cash Flow		\$293	\$389

¹ Estimated MA ENERGY STAR Homes Program HERS Rater Fee (range is \$750-\$1500, but typically closer to \$750), includes cost of Thermal Bypass Inspection.

² HERS Rater Fees are reimbursed by the MA ENERGY STAR Homes Program by \$650-\$900 per unit, depending on the HERS rating achieved.

³ MA ENERGY STAR Homes Program may receive a minimum incentive of \$650

⁴ Annual energy costs based on November 2009 fuel costs. Costs for heating are based on natural gas prices, the least expensive heating fuel. With oil, savings would increase.