



Mr. Mark Sylvia, Commissioner
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

(delivered via email: stretchcode@state.ma.us)

Subject: Supplementary Comments on Mass. Stretch Energy Code Update

Dear Mr. Sylvia,

On behalf of Northeast Energy Efficiency Partnerships¹ (NEEP), thank you for the opportunity to provide comment on the update to the Massachusetts Stretch Energy Code. Though they have been formatted to stand alone, **these comments supplement those submitted by NEEP on [December 20, 2013](#)**; while some sections have been carried over and expounded upon, other sections do not reappear here.

NEEP encourages the Commonwealth to move in expeditious manner in developing and adopting the updated Stretch Code. **If no changes are made to the Stretch Code before the 2012 IECC goes into full effect on July 1, the Stretch Code will be essentially equivalent to the base code, thereby violating the concept behind its inception and causing confusion for Stretch Code communities.**

ORGANIZATIONAL BACKGROUND AND CONTEXT

Northeast Energy Efficiency Partnerships is a regional nonprofit organization that works to accelerate the efficient use of energy in homes, buildings and industry in the Northeast and Mid-Atlantic states. We are committed to this work because saving energy creates a stronger economy, a cleaner environment and a more reliable and affordable energy system.

NEEP's Building Energy Codes Project, one of its oldest endeavors, aims to achieve significant energy savings and greenhouse gas reductions in new construction, remodeling, and renovations by advocating for advanced building energy codes and code-related public policies, such as increased building energy code compliance. For over a decade, NEEP has worked to help states in the Northeast and Mid-Atlantic realize the high impact savings potential of compliance with strong building energy codes. NEEP has assembled its building energy policy recommendations into its [Model Progressive Building Energy Codes Policy](#), which includes a section dedicated to stretch codes.

NEEP has worked closely with Massachusetts since the inception of the Commonwealth's stretch code activities. NEEP was part of the original Stretch Code development team, and our facilitation of a unique coalition of stakeholders enabled its adoption. In addition, NEEP was the lead contractor in the writing of a model stretch energy code developed through stakeholder engagement. Several elements of this model stretch code—which states like Vermont are incorporating into their energy codes—are recommended for the Massachusetts Stretch Code update, as described in the sections below.

¹ These comments are offered by NEEP staff and do not necessarily represent the view of NEEP's Board of Directors, sponsors or funders.



SPECIFIC RECOMMENDATIONS

General:

- Aim for 15% savings beyond the base code: HERS 50/55 and $\geq 15\%$ below ASHRAE 90.1-2010
- Align with the 2015 IECC without delaying implementation of the new Stretch Code
- Create a roadmap for use in future energy code cycles

Residential:

- Add alternative compliance paths based on Energy Star Homes and Passive House
- Require sealed combustion appliances and mechanical ventilation to improve indoor air quality
- Add a multifamily (≥ 5 unit) HERS tier of 60 or less

Commercial:

- Add requirements for commercial gut-rehabs: $\geq 10\%$ below ASHRAE 90.1-2007
- Add simplified prescriptive path for mid-size buildings based on NBI Core Performance
- Adjust the Additional Packages section and add solar ready provisions to support renewables
- Add a source energy-based compliance alternative to support Combined Heat and Power (CHP)
- Align with ASHRAE 90.1-2013 lighting standards for substantial energy savings

These recommendations are explained below, organized in the format requested by the Department of Energy Resources DOER in their October 2013 [Stretch Code update webinar](#).

1. Core Concepts

Maintain core design approach of Stretch Code

NEEP supports maintaining the core design approach of the Stretch Code based around HERS and ASHRAE modeling. As base codes advance and the low-hanging fruit is picked, the gap between the Stretch Code and the base code should be expected to shrink. As such, **NEEP recommends that the updated Stretch Code provide roughly 15% savings beyond the base code**, as opposed to the roughly 20% gain represented by the current Stretch Code.

For residential buildings, decreasing the HERS rating thresholds for both new construction and additions/renovations by at least ten points will account for rising code baselines. To ensure that the Stretch Code is strictly stronger than the 2015 IECC, NEEP suggests changing the new construction HERS Index thresholds to 50 / 55. This proposed HERS Index architecture, supplemented by a multifamily HERS tier (explained below in the Suggested Improvements section) and two alternative residential compliance paths based on the Energy Star Homes and Passive House standards, is presented in the following table.



Potential Residential Compliance Paths

Construction Type	Conditioned Floor Area	Proposed Requirements	Requirement Bank
New Construction and Additions* * Can meet either NC (stand-alone) or renovation (whole home) standards ^Multifamily buildings must have ≥5 units	≥3,000 ft ²	≤50 HERS and [1,2,3]; OR [2,4]; OR [5]	[1] Energy Star Thermal Enclosure Checklist (Sections 3 and 5) [2] All fuel-fired mechanical systems used for heating must be sealed combustion [3] Mechanical ventilation in accordance with IMC2012 Ch. 4 [4] Energy Star v3.1 [5] Passive House PHPP heat demand ≤12 kBtu/ft ² /yr [6] Mechanical ventilation in accordance with IMC2009 Ch. 4 [7] Compliance with all mandatory items of IECC 2012, with option of EITHER 2012 IECC insulation levels (R402); OR fill existing cavities with insulation ≥ R-3.5/in
	<3,000 ft ²	≤55 HERS and [1,2,3]; OR [2,4]; OR [5]	
	Multifamily^ <3,000 ft ² ; OR <1,000 ft ² with kitchen	≤60 HERS and [1,2,3]; OR [2,4]; OR [5]	
Alterations, Renovations, and Repairs; or Additions* # Kitchen-less homes <1,000 ft ² are exempt	≥3,000 ft ²	≤70 HERS and [1,2,6]; OR [7]	
	1,000# - 3,000 ft ²	≤75 HERS and [1,2,6]; OR [7]	

For commercial buildings, NEEP recommends an analogous strengthening of ASHRAE modeling standards as shown in the table below. Requirements for major renovations should be added because **commercial gut-rehabs present a tremendous opportunity for energy savings but are currently completely exempt from the Stretch Code**. This proposed ASHRAE modeling architecture, supplemented by a simplified prescriptive path for mid-size commercial buildings based on the NBI [Core Performance Guide](#) (CPG), is presented in the following table.

Potential Commercial Compliance Paths

Construction Type	Conditioned Floor Area	Proposed Requirements
New Construction; OR Additions* with own heating system * ≥30% existing floor area	7k-100k ft ²	≥15% below ASHRAE 90.1-2010; OR Compliance with section 2 or 2&3 of NBI Core Performance Guide AND CPG MA Front End Amendments
	≥100k ft ²	≥15% below ASHRAE 90.1-2010
Renovations^; OR Additions* without own heating ^ per 780 CMR 34 or 93	7k-100k ft ²	≥10% below ASHRAE 90.1-2007 / ≤10% above 90.1-2010; OR Compliance with section 2 of NBI Core Performance Guide and CPG MA Front End Amendments
	≥100k ft ²	≥10% below ASHRAE 90.1-2007 / ≤10% above 90.1-2010



Align with the 2015 IECC

The delayed adoption of the 2012 IECC presents an opportunity to develop a new Stretch Code that can also be used with the finalized 2015 IECC. Since the state will be mandated to adopt the 2015 IECC relatively soon (within a year of its spring 2014 publication), **this update period should be used as an opportunity to align the Stretch Code with the oncoming 2015 IECC.** As discussed above, the Energy Rating (HERS) Index of 55 for Climate Zone 5 introduced as a new compliance path in the 2015 IECC should be considered when determining the new Stretch Code HERS thresholds. **However, NEEP strongly opposes waiting until the 2015 IECC is published before considering these changes.** The code language is currently available, and the 2015 IECC represents only a modest increase in efficiency over the 2012 IECC—particularly on the residential side—so the Stretch Code update timeline should not have to be extended to accommodate these changes.

2. Suggested Improvements

Further streamline commercial prescriptive code

NEEP's proposed simplified commercial insulation standards (see our December 20 comments) and NBI CPG-based prescriptive performance path detailed in the preceding Core Concepts section help to achieve this goal. We would support a more streamlined prescriptive code provided that its development would not further delay the Stretch Code update process.

Support renewable energy integration

The existing Additional Efficiency Package section could be adjusted to promote renewables. For example, the new stretch could require more than one of these packages (as expected in Vermont's stretch code) or convert more easily achieved packages, such as the lighting power density package, into prescriptive requirements; the latter option would be more effective, especially if the three packages added to the 2015 IECC version of this requirement are transferred to the Stretch Code. In addition, NEEP recommends that the updated Stretch Code provide solar-ready provisions. Renewable energy HERS tradeoffs could be used to help promote investment in renewable energy infrastructure, but load reduction and efficiency should remain higher priorities. The projected Vermont residential stretch code, for instance, includes HERS Index backstops that must be reached by efficiency alone before renewables are considered.

Improve indoor air quality requirements

NEEP recommends that all new or replacement fuel-fired mechanical systems used for heating be sealed combustion, which eliminate backdrafting concerns, tend to be more efficient, and are readily available off the shelf. By using a dedicated outside air source, sealed combustion also eliminates the need for make-up air ducts, which are sources of uncontrolled air leakage. We also support efforts to clarify ventilation standards for tight homes in the same spirit as the mechanical ventilation amendment made to the state's 2012 IECC adoption.

Support Combined Heat and Power (CHP)

NEEP suggests that the Stretch Code mirror the 2015 IECC by adding the high efficiency service water heating Additional Efficiency Package Option, which can be met by using CHP. The strategies described in the renewable energy section could also be used to help to promote the use of CHP.



To further advance CHP, a source energy-based compliance alternative to the standard ASHRAE modeling target should be added. Source energy metering and monitoring is consistent with Energy Star Portfolio Manager, and section 603.3.6 of the International Green Construction Code is a potential source of CHP code language.

Add a HERS tier for Multifamily units

As mentioned in the preceding Core Concepts section, a third residential HERS tier for small homes in multifamily buildings (≥ 5 units) could be added to compensate for known hot water modeling shortcomings in for these units. Alternatively, a HERS 50/53/55 system or other similar system would ensure that all homes built under the Stretch Code are strictly more efficient than those built to the 2015 IECC. However, the creation of this tier is only appropriate if RESNET does not make any adjustments to their multi-family modeling protocols as has been discussed.

Align with latest ASHRAE lighting standards

Significant energy savings can be attained by meeting or exceeding the ASHRAE 90.1-2013 lighting standards, such as lighting power density allowances. Due to the rapid advances in lighting technologies, these steadily strengthening requirements have been largely uncontroversial. Adopting these changes would also help maintain alignment with the 2015 IECC, which uses the 2013 lighting power densities.

Use best practices from around the country

As alluded to above, NEEP is currently assisting Vermont as it develops its first stretch code alongside its new 2015 IECC-based building energy codes. We are also working with Rhode Island on a residential stretch code. We promote collaboration between these efforts as well as others regionally and nationally, and we are happy to act as the conduit for conveying this information.

3. New Suggestions / Areas for Improvement

Create a roadmap for future code cycles

An energy code roadmap should be developed through collaboration with Stretch Code stakeholders like NEEP to help shape future versions of the Stretch Code. The goal of this roadmap should be to maintain an appropriate efficiency level beyond the base code while guiding the Commonwealth toward zero-net energy construction practices.

Sincerely,

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