

Implementing ERI as Building Code 147 Case Studies from Massachusetts



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MA ERI Timeline

2009

- IECC2009 with **HERS 75** compliance **option**
- MA Stretch code Local option **HERS 65/70**

2014

- IECC2012 with **HERS 65** compliance **option**

2016

- IECC2015 with **ERI 55** compliance **option**

ERI with IECC Mandatory provisions

405.7 RESNET Approved Software for the Home Energy Rating System (HERS).

Where the HERS rater verified index on the building is 75 or fewer points for the finished building together with a completed and HERS rater verified ENERGY STAR Thermal Enclosure Checklist. *The mandatory provisions of subsection 401.2 apply.*

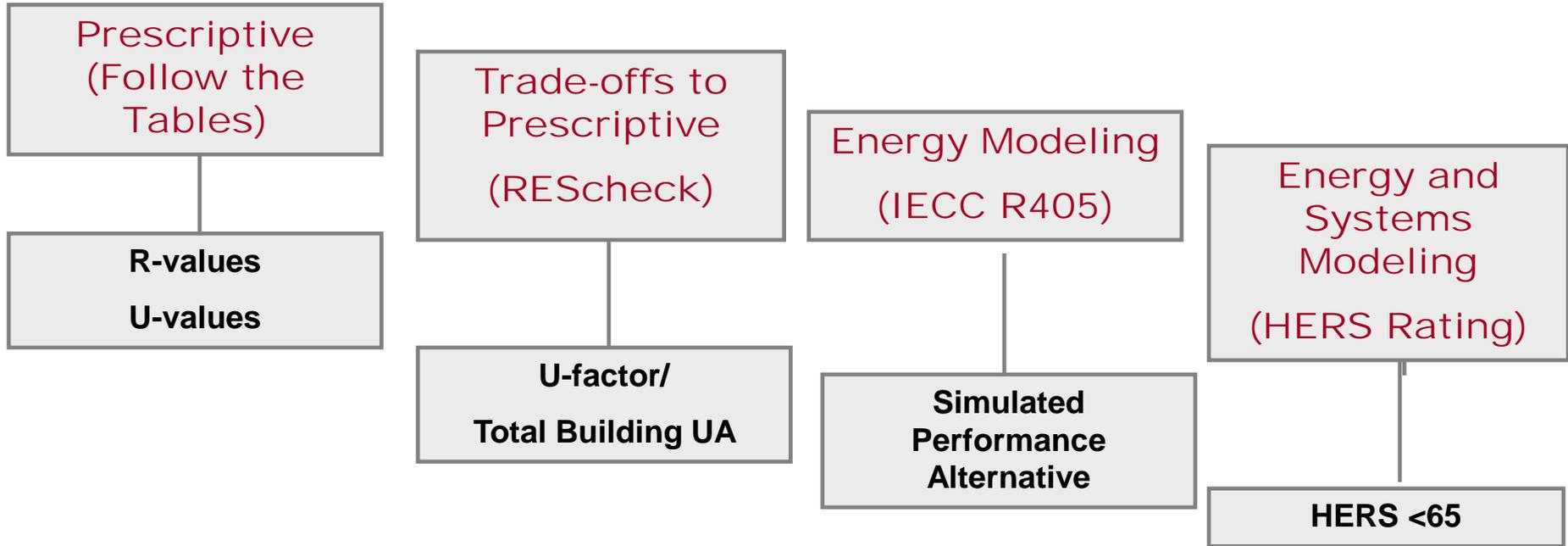
HERs Raters document

405.7.1 Documentation. The following documentation is required for energy code compliance under subsection 405.7:

1. For HERS compliance, a compliance report which includes a proposed HERS index of 75 or lower, a description of the building's energy features, and a statement that the rating index is "based on plans" will be required for issuance of a building *permit*. A copy of the final certificate indicating that the HERS rater verified index is 75 or less for the finished building together with a completed HERS rater verified ENERGY STAR Thermal Enclosure Checklist is to be submitted to the *building official* before the certificate of occupancy is issued.

Code Officials enforce

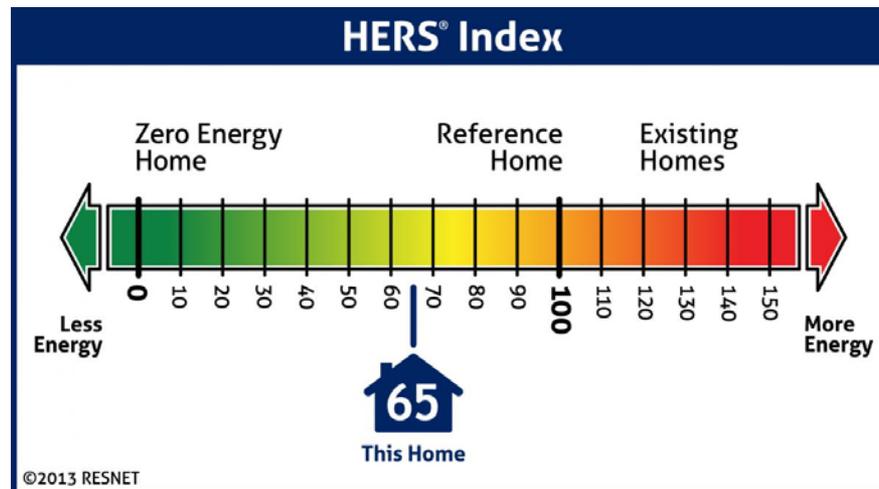
Residential Compliance: 4 Options



Which was most common for new single-family construction in MA in 2013?

2013 Code compliance path rank:

1. HERS rating <65/70/75
2. REScheck: IECC2009
3. Prescriptive: IECC2009
4. No IECC R405 performance

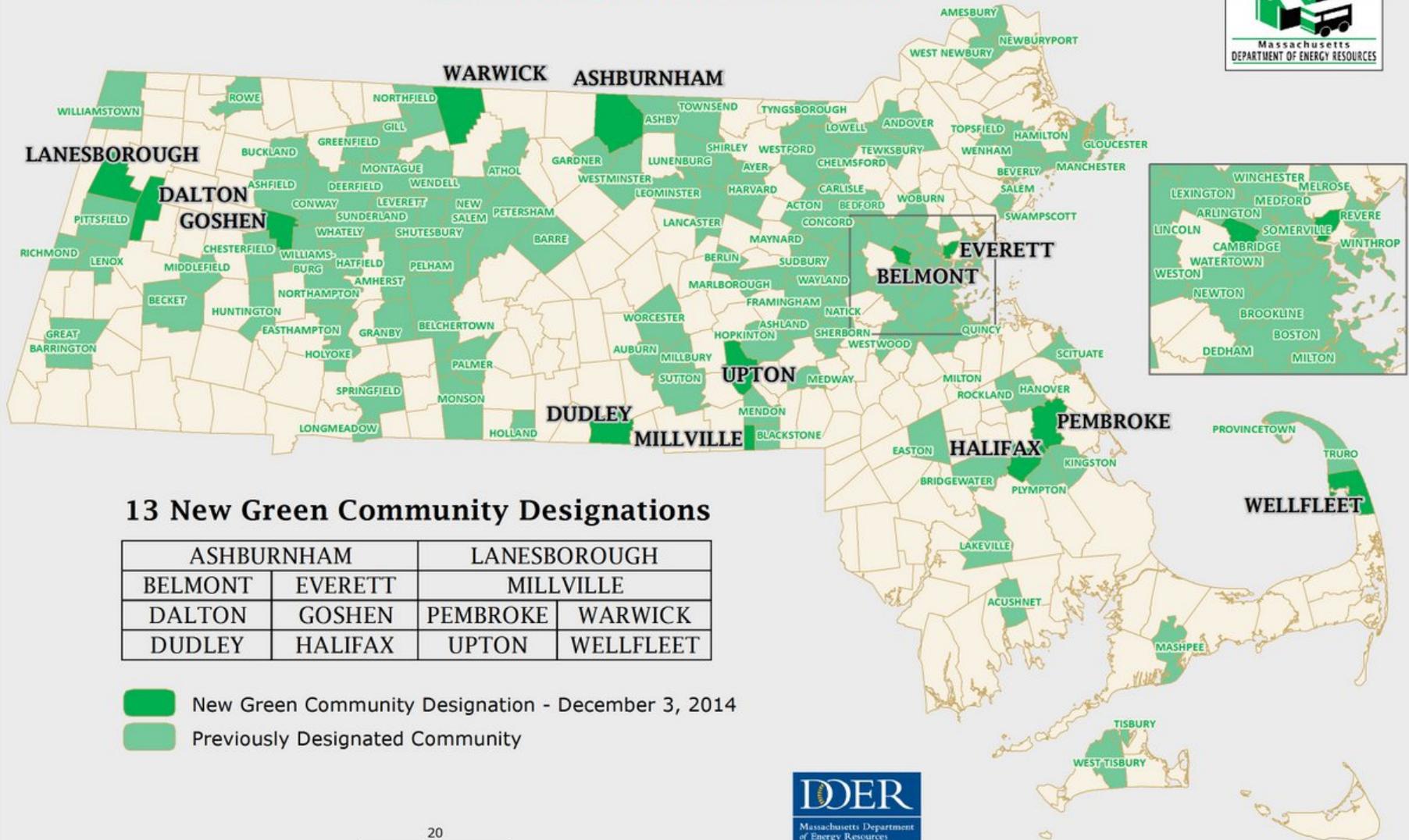


Lessons Learned – ERI Code



Green Community Designations:

**GREEN COMMUNITY DESIGNATIONS REACH
ONE HUNDRED THIRTY-SIX**



13 New Green Community Designations

ASHBURNHAM		LANESBOROUGH	
BELMONT	EVERETT	MILLVILLE	
DALTON	GOSHEN	PEMBROKE	WARWICK
DUDLEY	HALIFAX	UPTON	WELLFLEET

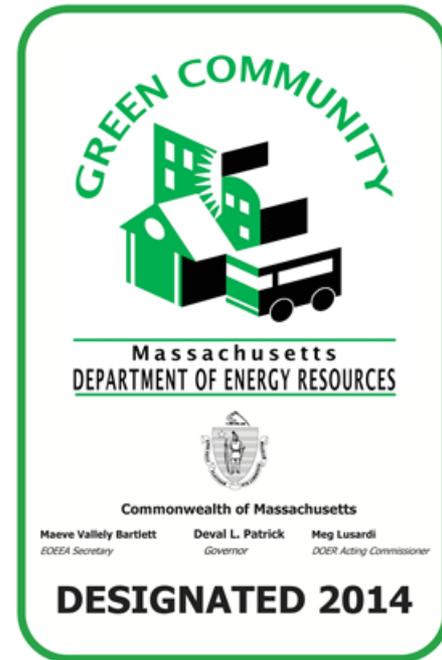
- New Green Community Designation - December 3, 2014
- Previously Designated Community

20
Miles



**Local Stretch code adoption
driven by the MA Green
Communities Program**

Modest financial incentive
Significant code training
Big Community Recognition



**ERI use by builders was driven
by local Stretch code adoption
(Mandatory) not Base code
(optional path)**

Utility new construction
incentives help to address
cost concerns

MA Ekotrope analysis - 2012

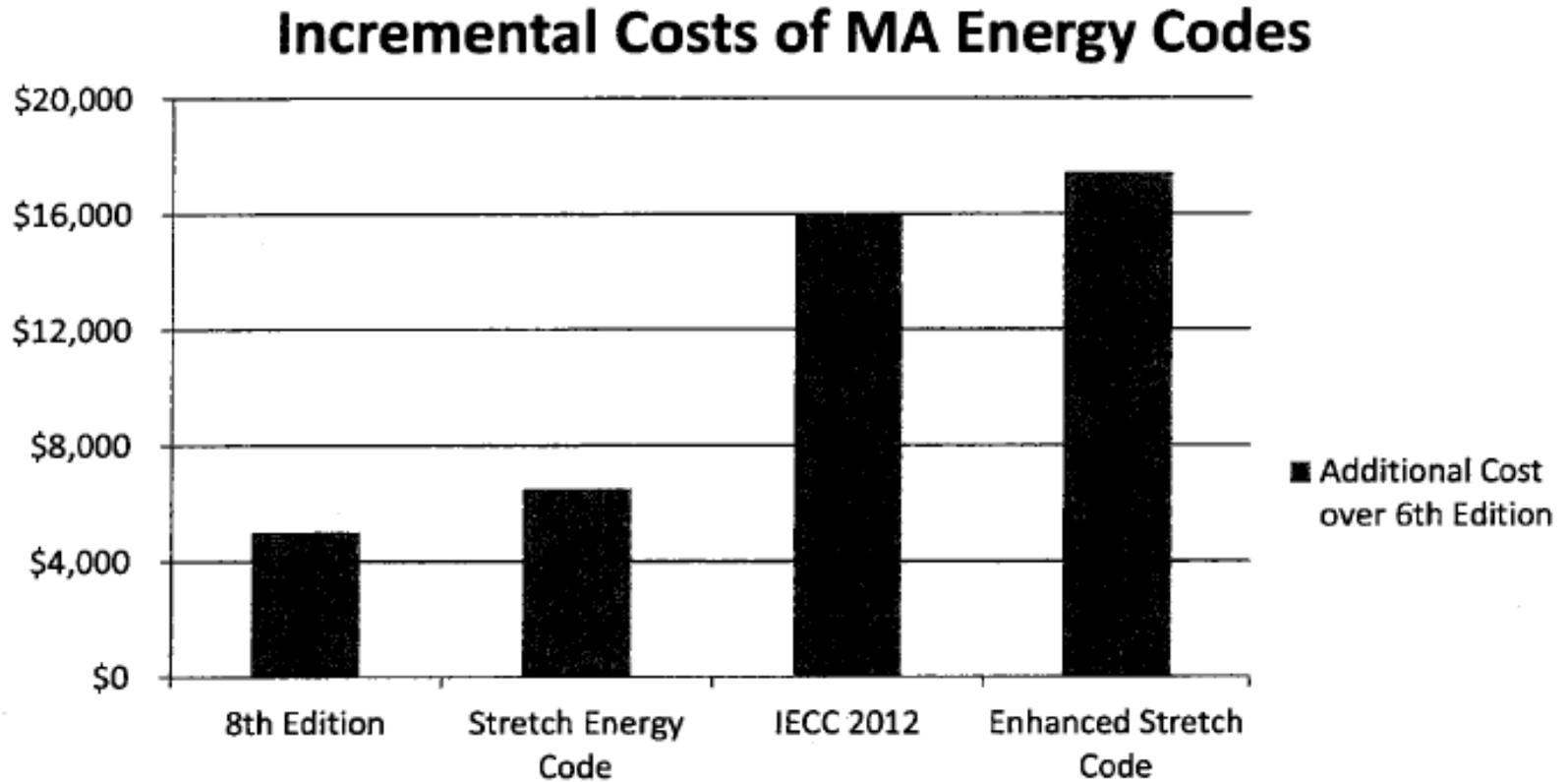


Figure 1 - Incremental costs of various MA Energy Code paths

ERI & Renewable Energy

N1106.4 (R406.4) ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value listed in Table N1106.4 when compared to the *ERI reference design* **prior to credit for onsite renewable electric generation.**

Add:

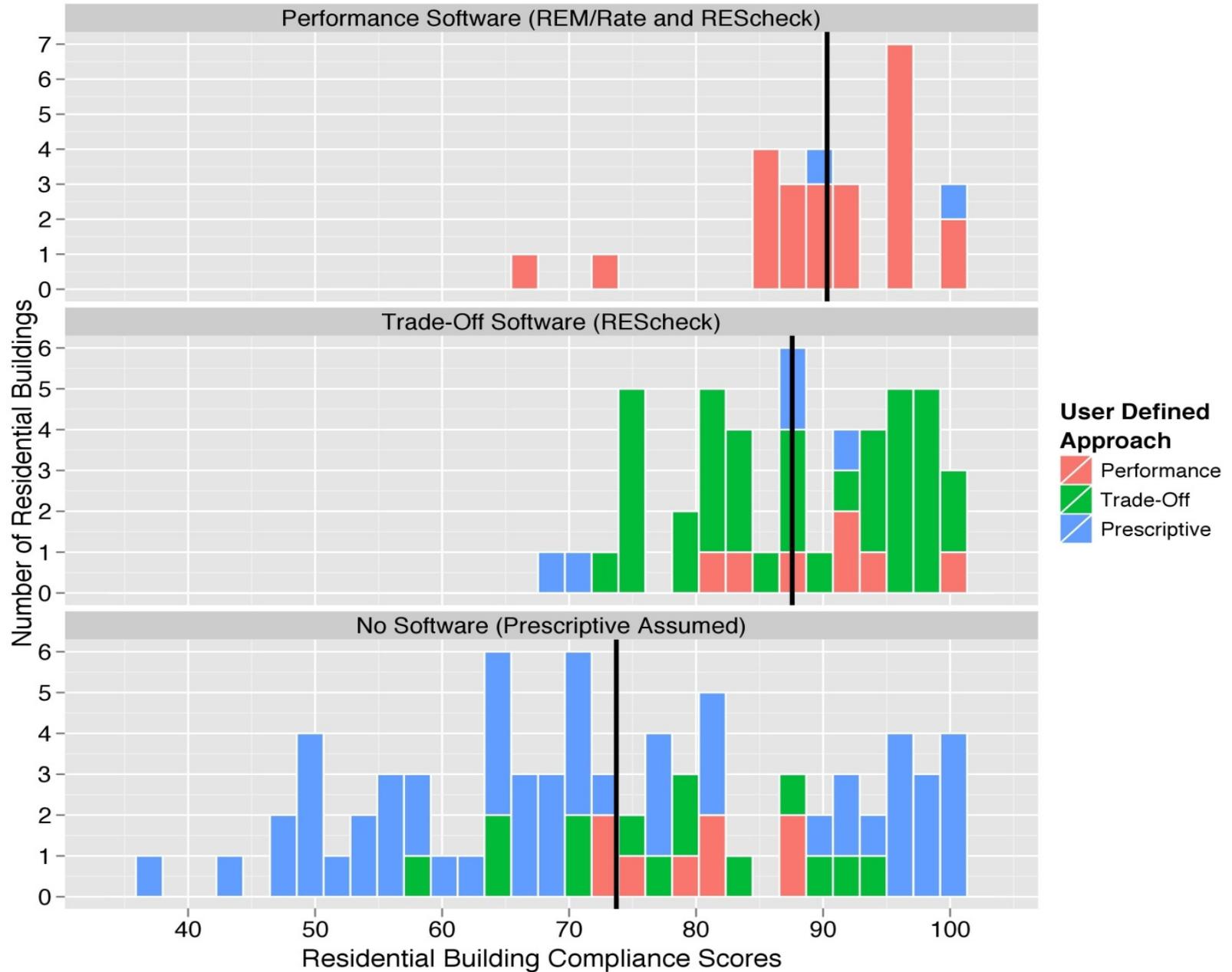
N1106.4.1 Trade-off for onsite renewable energy systems. New construction following N1106.3 or existing buildings and additions following N1107.3 may use any combination of the following renewable energy trade-offs to increase the maximum allowable HERS rating for each unit separately served by any combination of the following:

Solar photovoltaic array rated at 2.5kW or higher shall offset 5 HERS points.

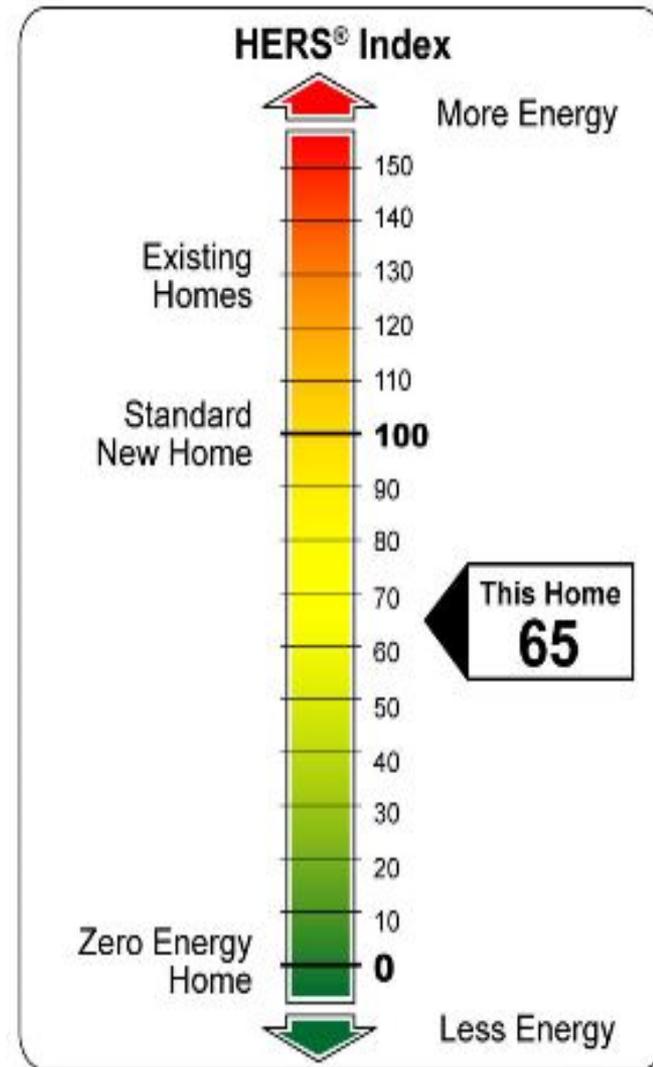
Clean Biomass Heating System, solar thermal array, or geothermal heat pump, or a combination of these systems, operating as **the primary heating system shall offset 5 HERS points.**

Solar thermal array for primary domestic hot water heating or a *Clean Biomass Stove* shall offset 2 HERS points.

Residential compliance - by software



ERI as a pathway to Zero Net Energy



Hillside Center – Newburyport - 62 units – Net Zero



Stretch Code resources

- The Stretch appendix 115.aa is available on MA DPS's webpage:

<http://www.mass.gov/eopss/docs/dps/8th-edition/115-appendices.pdf>

- Additional supporting resources:

<http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/stretch-energy-code-information.html>

- 2 –page summary is available here:

<http://www.mass.gov/eea/docs/doer/green-communities/grant-program/stretch-code-summary-jun20-2011.pdf>

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