

Massachusetts Code Compliance Support Initiative (CCSI) and Commercial Compliance Study

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nationalgrid

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Agenda

- National Grid & Code Support Overview
- 2015 C&I Compliance Study Overview
- Study Scope & Methodology
- Results and Recommendations

National Grid Overview

- Northeast (MA, RI, NY) utility with approximately 3.3 million electric customers & 3.4 million gas customers
- Lead PA for the CCSI working on behalf of all the other 6 Massachusetts PAs
- National Grid oversees both CCSI implementation and evaluation



CCSI Classroom Training

<u>Audience</u>	<u>Topics</u>
<p><u>Commercial:</u></p> <ul style="list-style-type: none">■ Code Officials■ Design & Construction Professionals■ Energy Specialists	<ul style="list-style-type: none">■ Envelope and Building Science■ HVAC / Mechanical Provisions■ Lighting, Controls, and Electrical
<p><u>Residential:</u></p> <ul style="list-style-type: none">■ Code Officials■ Design & Construction Professionals■ HERS Raters / Energy Specialists	<ul style="list-style-type: none">■ Residential Energy Code: Overview■ Envelope and Building Science■ HVAC and Indoor Air Quality

Statewide Circuit Riders

<u>Audience</u>	<u>Type</u>	<u>Content</u>
<p><u>Commercial & Residential:</u></p> <ul style="list-style-type: none"> ■ Code Officials ■ Architects / Designers ■ Engineers ■ Construction Managers ■ Builders / Contractors ■ Material Suppliers ■ Building Owners 	<ul style="list-style-type: none"> ■ Phone call support ■ Office consultation ■ On-site consultation 	<ul style="list-style-type: none"> ■ Answers to general energy code questions / interpretations ■ Project specific code compliance consulting (conceptual plan and specification review) ■ Project specific code compliance verification (on-site physical observation / consultation)



CCSI Results-To-Date

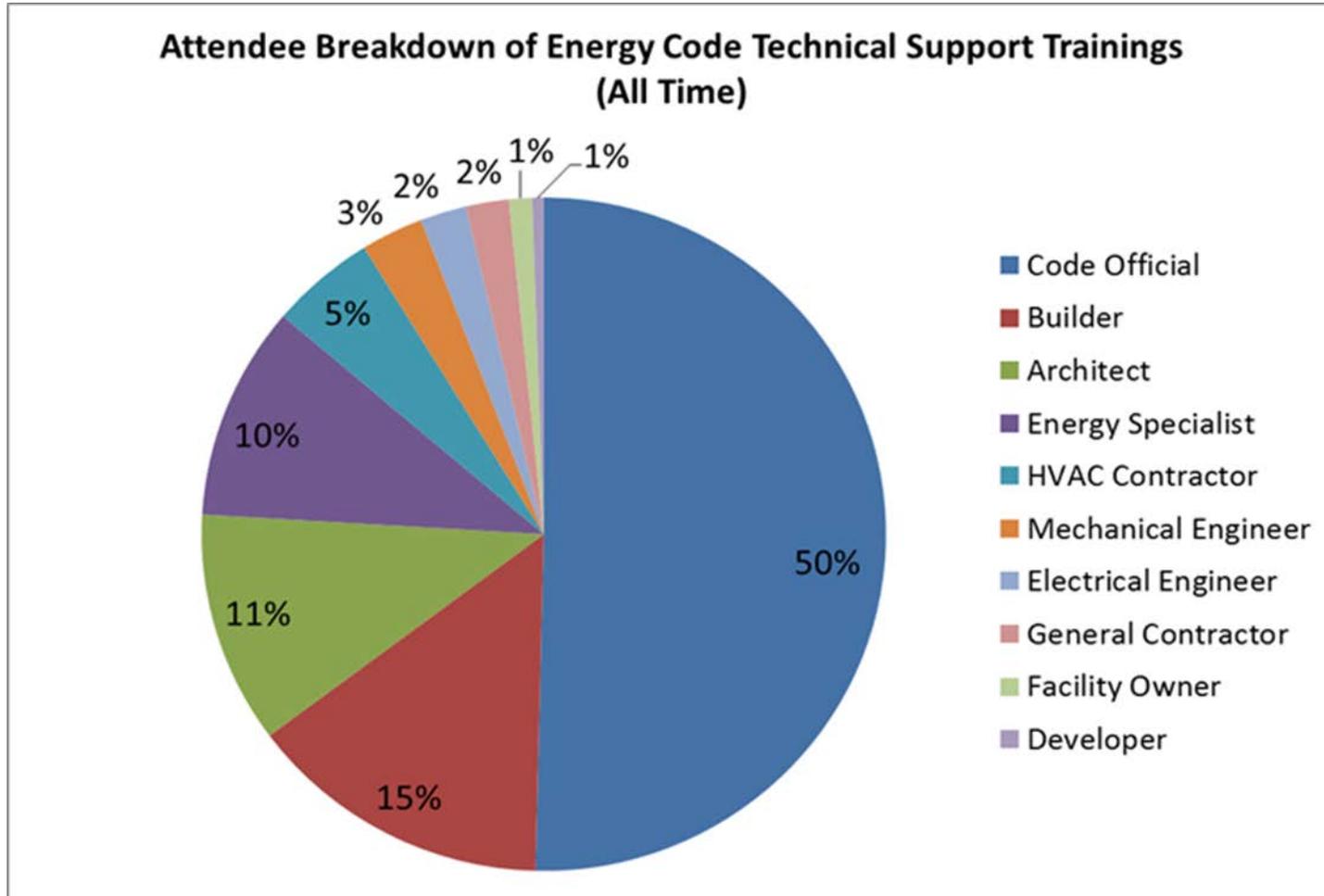
(May 2014-January 2016)

- 41 residential classroom trainings
- 20 commercial classroom trainings
- 18 residential webinars hours

- 1,541 attendees trained at residential classroom sessions
- 624 attendees trained at commercial classroom sessions
- 483 attendees trained at residential webinars

- Total participants to date: 2,648

CCSI Classroom Training Attendee Breakdown



Why is the utility involved?

- Less than ideal statewide energy code compliance rates in MA
 - Residential / 60%-65%
 - Commercial / 75%-80%
 - Baseline studies: expensive (~\$500K) but critical to understanding potential



CCSI Code Compliance Studies

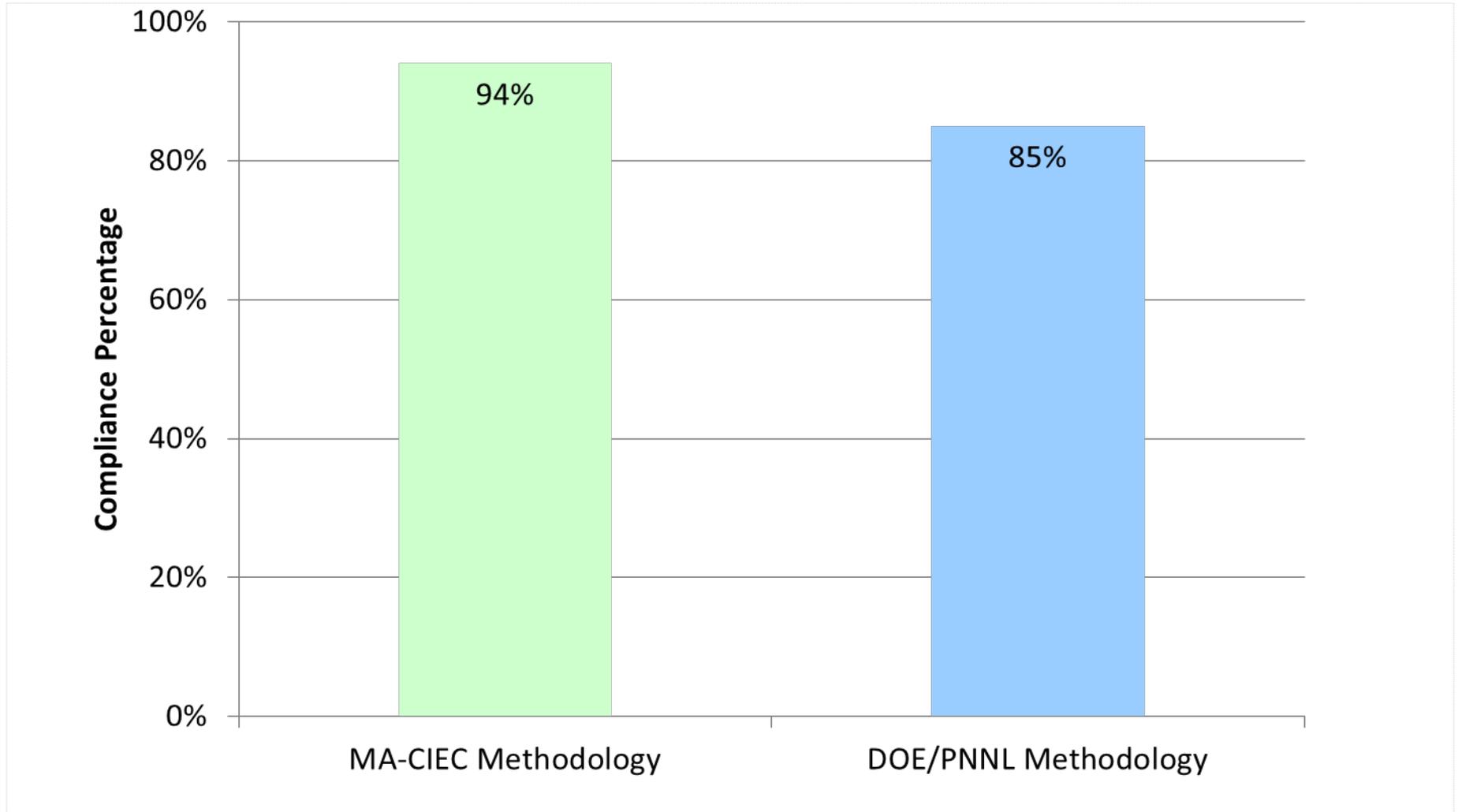
- 2011 / Residential baseline study (end of 2006 IECC)
- 2011 / Full residential baseline study (beginning of 2009 IECC)
- 2012 / C&I code compliance study (2006 IECC, beginning of 2009 IECC)
- 2014 / Code compliance from 2011 residential baselines
- 2015 / C&I compliance study (end of 2009 IECC)
- 2016 / Full residential baseline (end 2009 IECC / beginning 2012 IECC)
- 2016 / C&I Compliance study (just beginning planning)



2015 C&I Compliance Assessment: Two Compliance Methods

- DOE/PNNL Methodology (ARRA)
 - Weight each provision by relative energy impact
 - Consistent with previous MA & other DOE studies
 - Enables assessment of compliance over time
- Custom (MA-CIEC) Methodology
 - Allows for partial compliance
 - Includes building envelope tradeoffs using COMcheck

Compliance Results



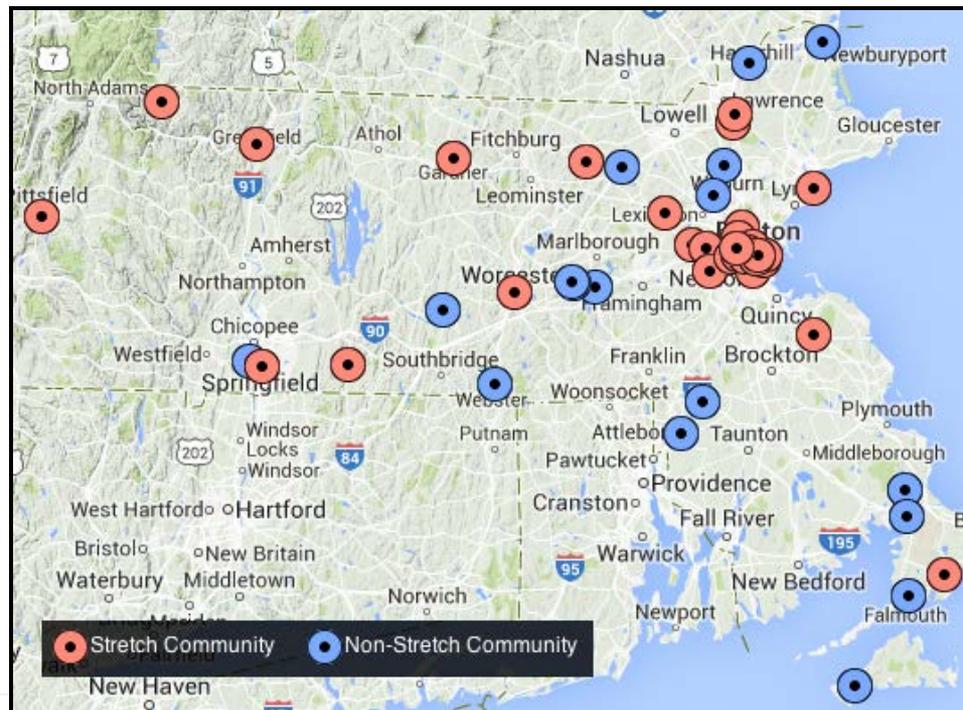
Compliance Over Time

- 2012 & 2015 Compliance Assessments

Project Year	Applicable Code	Site Count	Average Compliance (PNNL)
2009–2010	IECC 2006	48	82%
2011–2012	IECC 2009	27	76%
2013–2014	IECC 2009	50	85%

The MA Stretch Code

Site Location	Site Count	MA-CIEC Compliance	DOE/PNNL Compliance
Non-Stretch Code community	17	90%	84%
Stretch Code community	33	95%	86%
Grand total	50	93%	85%



Building Envelope Observations

- Lack of continuous insulation where required
- Fenestration details rarely supplied & difficult to determine
- Many prescriptive insulation requirements not compliant with code (above-grade wall, roof, etc.)



Lighting Observations

- Low compliance with daylighting requirements
 - ~50% compliance
- LPD largely compliant – increasing use of LEDs



- Despite high compliance, savings opportunities remain
- Existence of Stretch Code likely improves compliance
- Few differences between plan review and on-site verifications



Recommendations for Program Implementers

- Adopt modified code baselines
 - Baseline \neq Code all the time (could be better or worse)
- Targeted code training
 - Focus on installation quality!
- Promote high-performance building strategies
- Streamline future compliance studies



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