Technical Assistance: Increasing Code Compliance

2014 Building Technologies Office Peer Review

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Rosemarie Bartlett rosemarie.bartlett@pnnl.gov
Pacific Northwest National Laboratory

Project Summary

Timeline:

Multi-year program in support of DOE statutory requirements

Key Milestones:

1. RES*check* Update Including Enhancements (Aug 2014)
2. 90.1-2013 Training Materials (Aug 2014)
3. Revised Compliance Methodology (Sept 2014)
4. 2015 IECC Training Materials (Dec 2014)
5. COM*check* Update Including Support for 90.1-2013 (Jan 2015)
6. State-Level Code Benefit Assessment (Feb 2015)

Budget:

Total DOE $ to date:

FY12	FY13	FY14
$3.9M	$1.8M	$1.8M

Total future DOE $: TBD

Target Market/Audience:

Policymakers, code officials, designers, industry, builders, home and building owners

Key Partners:

Code implementation stakeholders:
(e.g., states, national/regional organizations)

Program Goal:

Near-term goal is to assist states and localities in adopting, complying with, and enforcing the model energy codes resulting in higher-performing buildings that maximize cost-effective energy savings.

Mid-term goal is to achieve primary energy savings of 1.1 quads annually by the year 2020, representing a cumulative savings of 10.2 quads.

PNNL's Technical Support

Development

Standard 90.1

International Energy Conservation Code (IECC)

Analysis supporting DOE code proposals and Determinations

Adoption

Collaboration with stakeholders

State technical assistance

State-level energy & cost analysis

Code impacts analysis

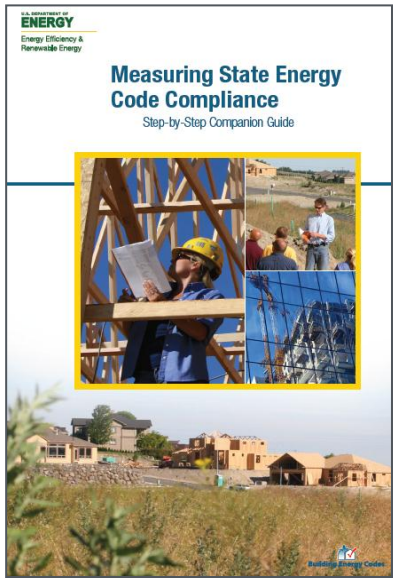
Compliance

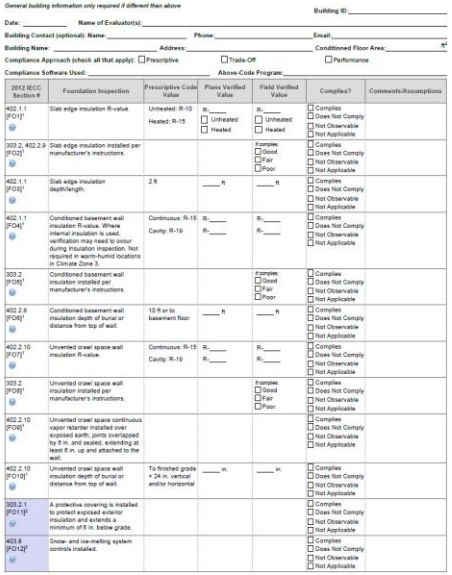
Guidance to states

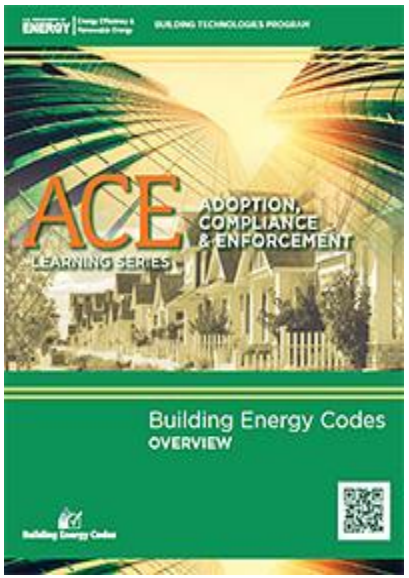
Compliance software tools & resources

Help Desk

Online and in-person trainings







REScheck

COMcheck

PNNL's Approach

Provide tools to increase code compliance and thereby realize actual energy savings

- Continue to implement the latest codes/standards into RES*check* and COM*check*
- Use RES*check* and COM*check* to streamline the energy code compliance process
- Revise the compliance evaluation methodology based on stakeholder feedback
- Provide education and training materials in support of the most recent building energy codes
- Provide technical analysis of field-collected data

Key Issues and Distinctive Characteristics

Key Issues:

- Energy codes typically have a lower priority in jurisdictions than other codes as they do not qualify as life-health-safety
- Energy savings associated with the energy codes are only realized with actual compliance with the requirements
- As the codes become more complex, compliance challenges increase

Distinctive Characteristics:

- Leverage extensive codes domain knowledge across all key program areas: development, adoption, and compliance
- Expand the use of existing, successful compliance tools (RES*check* and COM*check)* to streamline the process and increase compliance
- Establish a quantitative relationship between investment and return related to energy code compliance

Progress and Accomplishments

Three key activities aimed at increasing energy code compliance

- Compliance tools (RES*check* and COM*check)*
- Streamlined compliance process
- Revised compliance evaluation methodology

Progress and Accomplishments
Compliance Tools

FY13:

- Implemented IECC and 90.1 mandatory requirements into the RES*check* and COM*check* user interfaces (previously only in reports)
  - Ensures submitters are aware of mandatory requirements
- Added additional support for difficult code requirements in COM*check*
  - Fan systems
  - Fenestration performance

FY14:

- Implement 90.1-2013 in COM*check* (including the new envelope tradeoff compliance option based on whole building energy simulation)

Streamlined Compliance Process

Realign and enhance current Check tools to

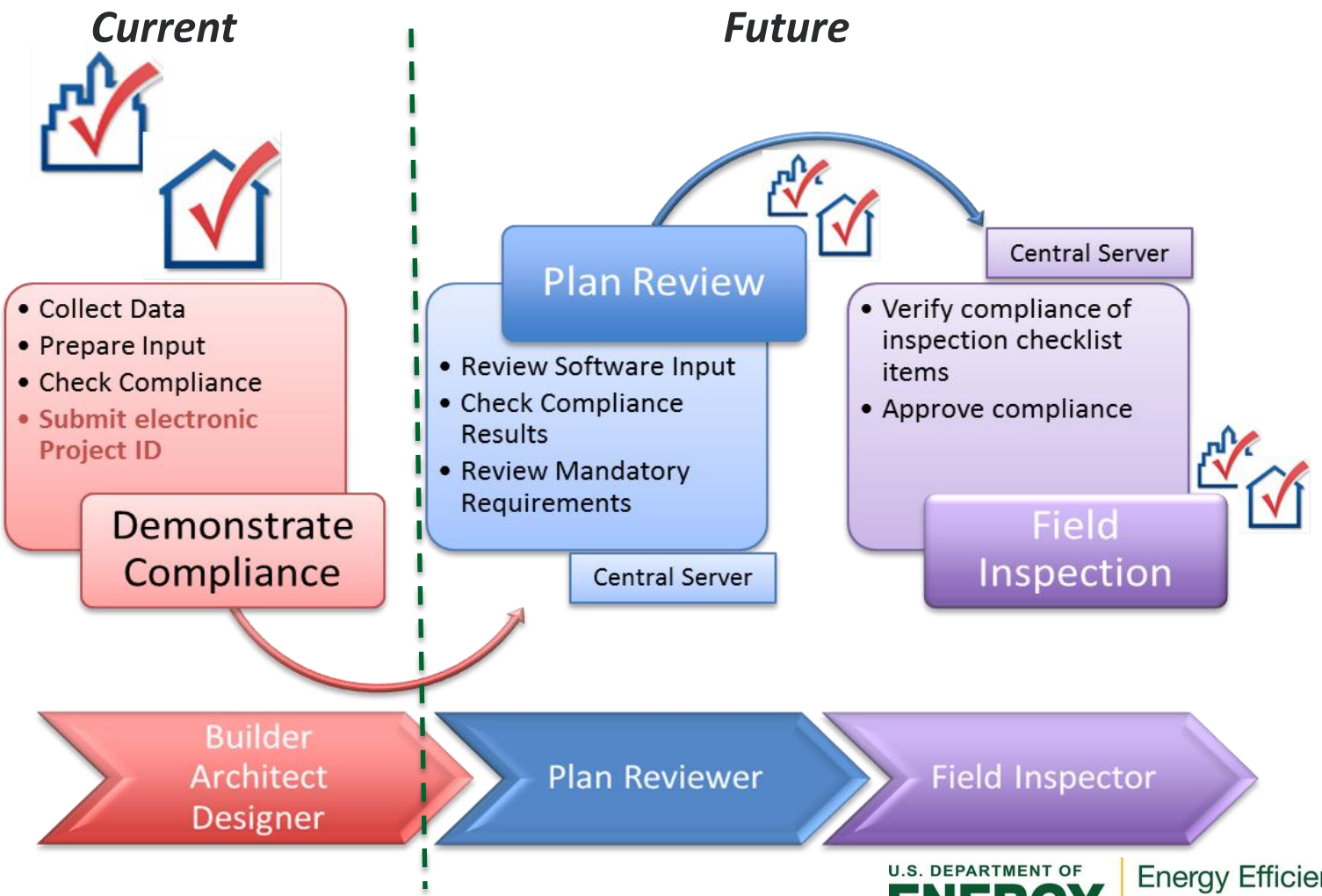
- Eliminate data duplication between various states of demonstrating, documenting, and ensuring compliance
- Maintain an audit trail of plan review and field inspection actions
- Enable access to project and compliance data for analysis

Progress and Accomplishments
Streamlined Compliance Process (cont'd)

- Presented the concept to a total of over 100 stakeholders at four events
  - Idaho Codes Collaborative, Sept 2013
  - Nevada Codes Collaborative, Sept 2013
  - Nebraska Codes Collaborative, Sept 2013
  - NEEP Annual In-Person Codes Working Group, Oct 2013
- Overall, received positive response to the concept
- Some concerns expressed
  - Keep RES*check* and COM*check* easy to use and as unchanged as possible for existing users not yet ready to take advantage of additional functionality
  - Will be several years before some jurisdictions will be ready to take advantage of additional functionality
  - Provide project-specific checklists
  - Keep data secure

Progress and Accomplishments
Streamlined Compliance Process (cont'd)

PNNL's Compliance Tools Long-Term Strategy



Progress and Accomplishments
Streamlined Compliance Process (cont'd)

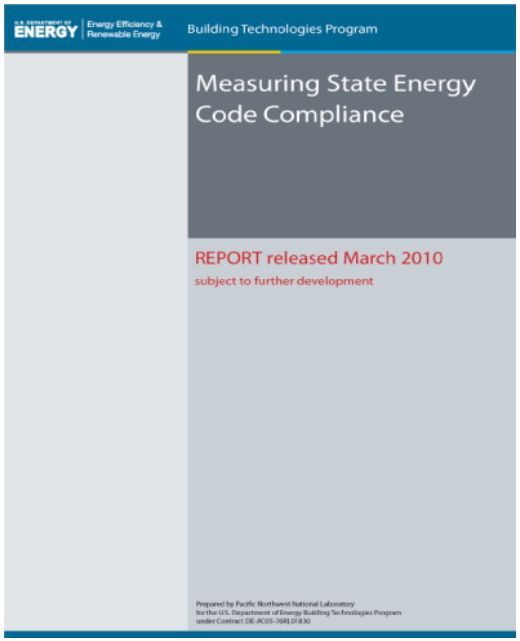
Data Benefits

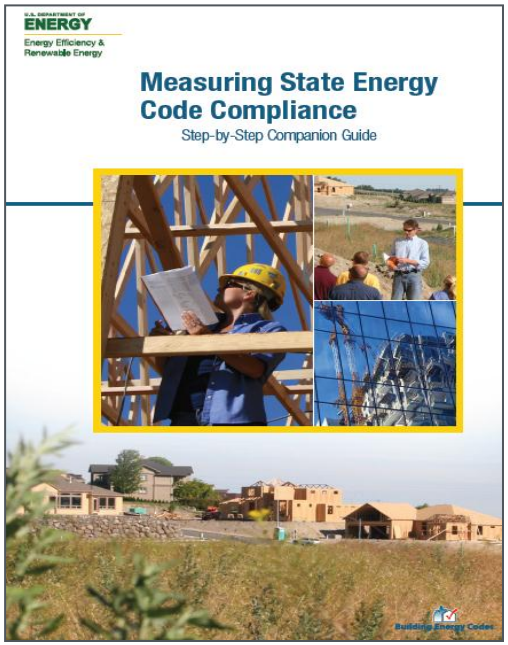
- Assess compliance across a jurisdiction, state, region, or nationally
- Identify problem areas associated with compliance and target training and technical support to resolve the issues
- Assess geographic construction trends

Progress and Accomplishments
Compliance Methodology

Developed current methodology (March 2010)

- Developed as a method states could use for code compliance evaluations under the Recovery Act
- Used in 8 pilot studies in 9 states
- Used (in part) in several state compliance studies
- Received feedback from pilot study participants





http://www.energycodes.gov/compliance/evaluation

Progress and Accomplishments
Compliance Methodology (cont'd)

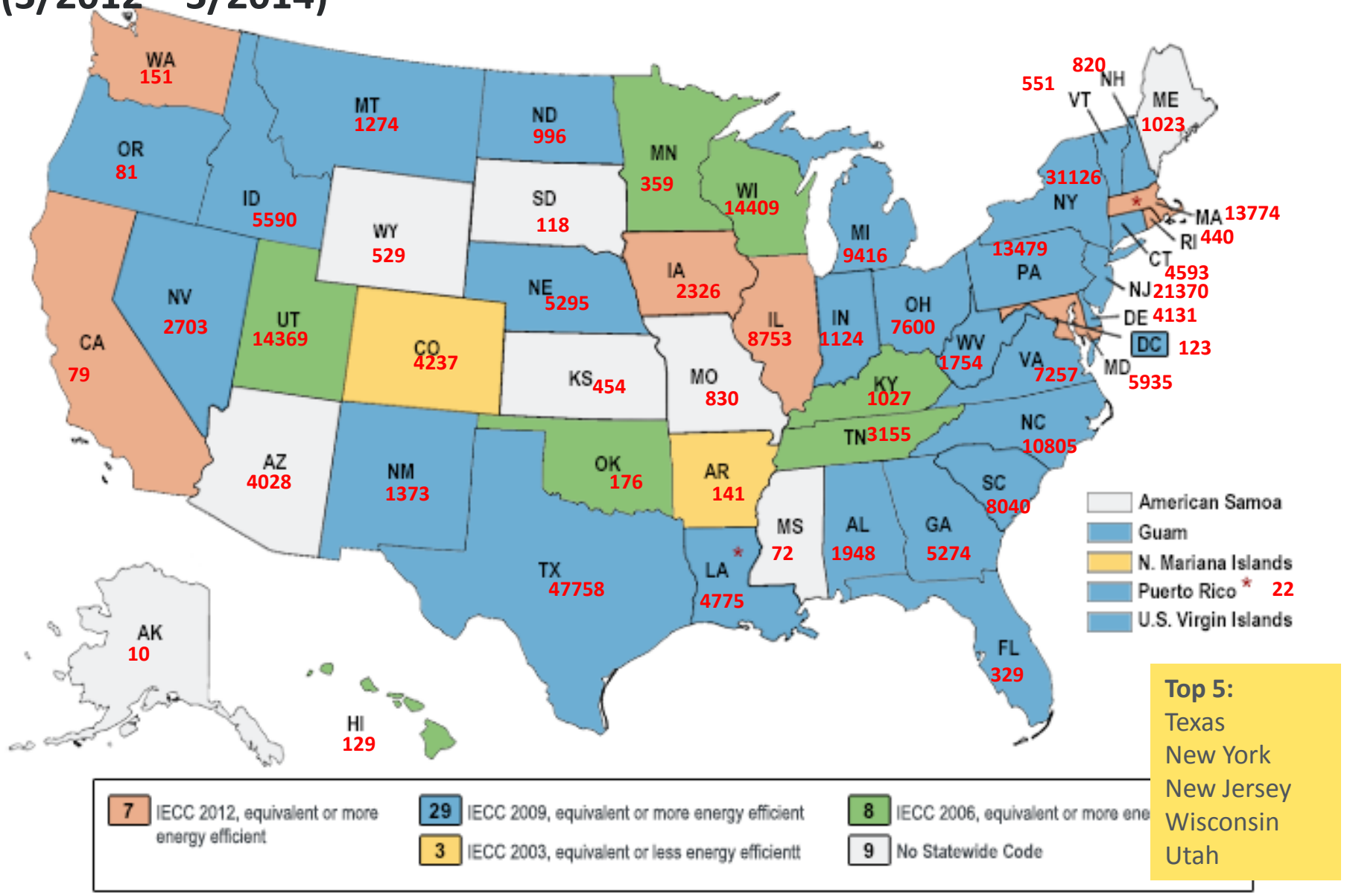
Received and reviewed stakeholder input on compliance methodology via Request for Information (September 2013)

- 376 comments from 39 commenters
- Commenters represent a wide range of stakeholders, including
  - Build/design community
  - States
  - Consultants
  - Inspectors/raters
  - REEOs
  - Utility organizations
  - Manufacturers
  - Advocates

Common themes in RFI responses:

- There are a number of roles for DOE to play in compliance evaluation
- Compliance evaluation is costly and lack of resources is a key barrier
- Modifications are needed to the existing compliance evaluation methodology
- RES*check*/COM*check* software is a good starting point for demonstrating energy code compliance
- More training is needed, especially for tradespeople and others who actually build the buildings

Market Impact: RES*check* Projects by State (3/2012 – 3/2014)

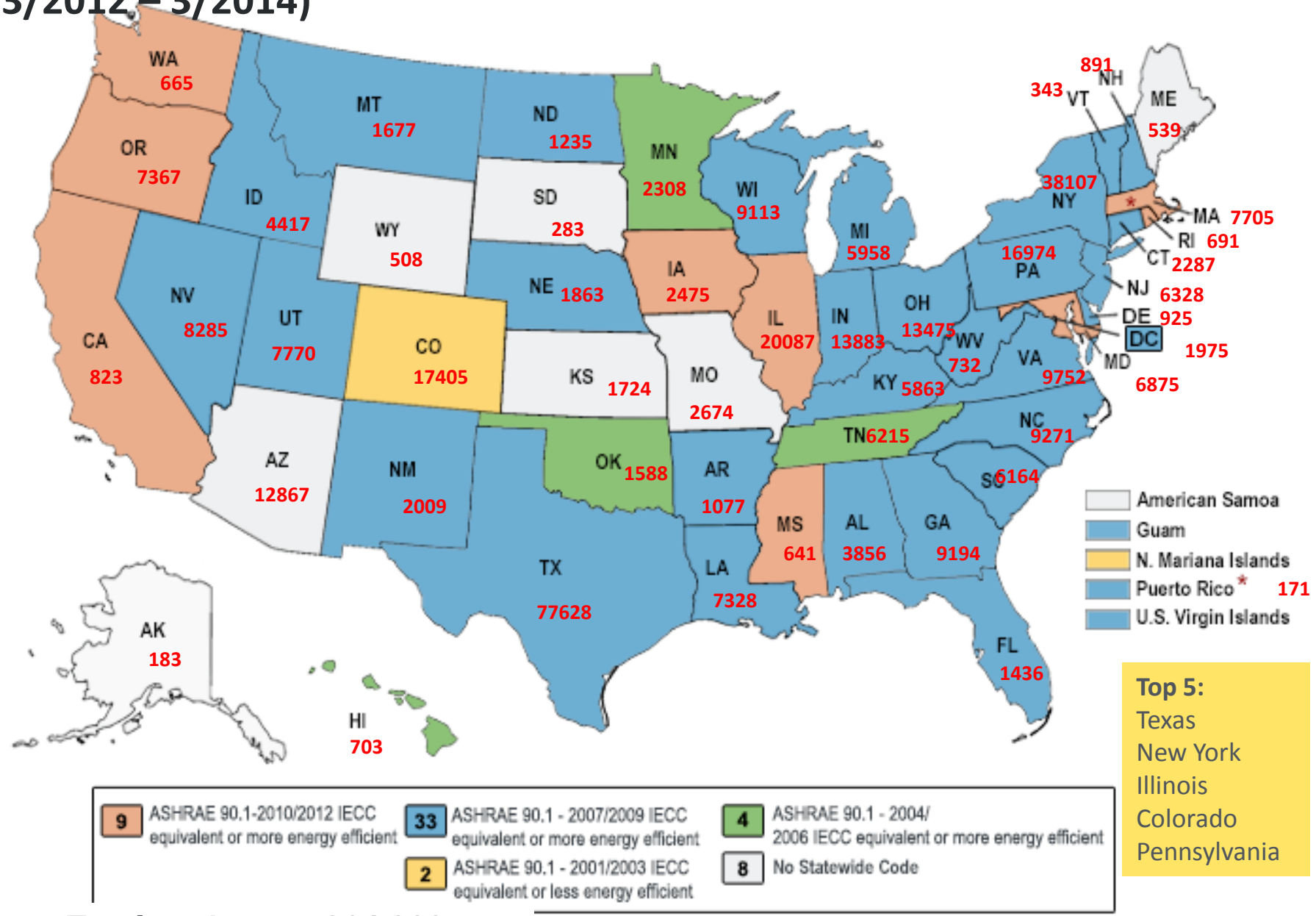


Top 5:
Texas
New York
New Jersey
Wisconsin
Utah

Total projects = 276,131

As of March 2014

Market Impact: COM*check* Projects by State (3/2012 – 3/2014)



Top 5:
Texas
New York
Illinois
Colorado
Pennsylvania

Total projects = 364,323

As of March 2014

Recognition

Compliance Tools

"…on the credibility aspect the fact that RES*check* and COM*check* are DOE tools is something the private side cannot match. Even in conservative states and users, they respect the credibility of DOE."

- Isaac Elnecave, MEEA

"…the COM*check* software has been a good and valuable resource for evaluating compliance with energy code…"

- Joe Chappell, Design Engineers

Compliance Methodology

- "The Iowa evaluators followed the BECP procedures and tools closely in completing site evaluations, and felt they were easy to use, clear, and understandable"
- "The checklists developed by BECP were valuable tools for third-party evaluators, and could be valuable tools for state and local staff involved in code compliance during their normal course of code enforcement"

Integration and Collaboration

- Provide objective information resources and technical guidance to states and localities to increase code compliance
- Actively engage stakeholders across the build community through various mechanisms to get immediate market feedback
- Participate with NASEO, BCAP, and the REEOs in the National Energy Codes Collaborative
- Provide training at key events and collect participant feedback on BECP resources
- Communicate planned activities in meetings, webinars, and on program's website
- Leverage extensive codes domain knowledge internally across all key BECP areas: development, adoption, and compliance
- Collaborate across BTO programs including CBI (e.g., fenestration performance in COM*check*) and Building America (Codes and Standards Innovation)

Next Steps and Future Plans

Compliance Tools

- Implement 90.1-2013 in COM*check*
- Implement 2015 IECC in RESc*heck*

Streamlined Compliance Process

- Develop code officials' user interface
- Revise database structure to accommodate plan review and field inspection data

Compliance Methodology

- Revise current methodology based on stakeholder feedback, including an energy metric
- Request stakeholder feedback on revised methodology
- Finalize revised methodology for state energy code compliance

REFERENCE SLIDES

Project Budget

Project Budget: see table below

Cost to Date: $640K (October 2013 through March 2014)

Budget History					
FY2013 (past)		FY2014 (current)		FY2015 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
$1.8M	$0	$1.8M	$0	TBD	$0

Project Plan and Schedule

Project Schedule													
		Completed Work											
		Active Task (in progress work)											
	◆	Milestone/Deliverable (Originally Planned)											
	◆	Milestone/Deliverable (Actual)											
	FY2014				FY2015				FY2016				
Task	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	
Current/Future Work													
Q4 Milestone: RES*check* Update Including Enhancements													
Q4 Milestone: Revised Compliance Methodology													
Q4 Milestone: 90.1-2013 Training Materials													
Q1 Milestone: 2015 IECC Training Materials													
Q2 Milestone: COM*check* Update Supporting 90.1-2013													
Q2 Milestone: State-Level Code Benefit Assessment													