SWEEP's Building Energy Codes Program

2014 Building Technologies Office Peer Review

SWEEP
SOUTHWEST ENERGY EFFICIENCY PROJECT

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

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Southwest Energy Efficiency Project

Project Summary

Timeline:

Start date: 9/1/2012

Planned end date: 8/31/2015

Key Milestones

1. Energy Code Implementation Planning: A Guide for Building Departments. 2Q 2013
2. Energy Savings Analysis Report for Utah amended energy code. 1Q 2013
3. 2012 IECC adopted in Phoenix, Tucson, Clark County, Utah, and other jurisdictions in home-rule states

Budget:

Total DOE $ to date: $198,700

Total future DOE $: $306,300

Target Market/Audience:

States: AZ, CO, NM, NV, UT, WY; Industry including building officials, builders, design professionals, trades; new and existing residential, commercial and multifamily

Key Partners:

AIA Chapters	PNNL/DOE
ASHRAE & Chapters	REEOs
BCAP	State Energy Offices
Manufacturers	USGBC & Chapters
ICC & Chapters	Utilities in SW

Project Goal:

Advance adoption of newer energy codes and standards that provide up to 30% savings compared to baseline and prioritize code compliance at the building department and among design and construction professionals

Purpose and Objectives

Problem Statement: The fast growing southwestern U.S. is dominated by home-rule environment where building codes and standards are adopted at the local level. This creates challenges with adoption, implementation, enforcement, code interpretation and different practices within each state. This project supports the goal of adopting newer energy codes and standards in the diverse market of local and statewide governance, and operates in some states where the state government provides little support or leadership on advancing newer energy codes. This environment filters down to building departments, design professionals, builders and can create a challenging environment to advance the energy code.

Target Market and Audience: Six very diverse states | 85,075[1] residential building permits in 2013 | consumed 2,349 Trillion Btu[2] annual energy use for buildings | population of 20.2 Million | six climate zones | audience of building officials, designers, builders, state offices | home-rule governance in AZ, CO, and WY

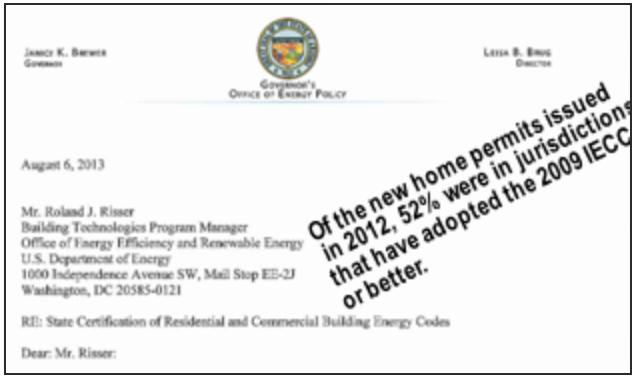
Purpose and Objectives

Impact of Project: Reduce building energy use by 30% in new residential and commercial construction by 2020. Drive states and localities to achieve at least the minimum requirements of ARRA, and transform the building industry to achieve high rates of energy code compliance.

The goal is to achieve adoption and compliance of the 2009 IECC/ASHRAE 90.1-2007 or later versions of the energy code in at least 70% or better of the jurisdictions. Because of the home rule nature in many of our states we measure achievements at the local level and compare with state construction activity. For example 95% of all new construction[3] in Colorado occurs in jurisdictions that have adopted at least the 2009 IECC.

Achievements toward goal:

a. Near-term 40% adoption of 2012 IECC in NV, AZ, and CO
b. Intermediate-term 50% construction activity to 2012 IECC
c. Long-term 70% construction activity in all six states to 2012 IECC



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Approach

Approach: Through a hands on approach we work with the building industry to advance energy code adoption, implementation, and compliance through the following activities:

- Collaborate, coordinate and engage with local stakeholders
- Establish coalitions and stakeholder groups to advance energy codes
- Leverage national tools and disseminate to advance code adoption
- Members of ICC, USGBC chapters and initiatives, e.g. 2030 District
- Create communication channels to disseminate key code information

We leverage:

Unconventional partners | Local State Presence | Collaborative Partnerships | Government Policies | DOE/PNNL Resources

This creates a unique equation to advancing energy codes across the Southwest.

Approach

Key Issues: There are similarities and differences between each state -

- Commercial lighting requirements are not being inspected in the field. We have teamed with ICC chapters to offer lighting specific training
- Funding for code compliance (plan review, inspection, enforcement), is a focus of two state collaboratives
- Amendments at the local level such as including HERS scores as a path or changes in prescriptive table values, creates education opportunities
- The economics of the newer energy code continues to be challenged, allowing the use of DOE/PNNL cost analysis
- State legislation and local ordinances have been proposed to remove energy code requirements, supporting the creation of stakeholder groups

Distinctive Characteristics: A local presence allows us to participate in stakeholder groups and work top and bottom approaches to drive code adoption and improve compliance

Progress and Accomplishments

Lessons Learned: During this period we encountered several barriers such as limits to efficiency for new residential construction, removal of energy code requirements for existing commercial buildings, lack of commercial construction data, and unclear national compliance methodology. We developed approaches for each of these barriers and in many cases adapted these often.

Accomplishments:

- 2012 IECC adoptions
  - AZ includes Phoenix and Tucson; CO includes Boulder, Parker, seven ski resort towns; NV – Clark County, Henderson; WY – Jackson, Teton County
  - UT commercial provisions
- 2009 IECC adoptions
  - AZ, CO, NV, WY,
  - Utah residential provisions 10% above 2006 IECC
- Xcel Energy study[4] – Residential new construction > 90 percent compliance

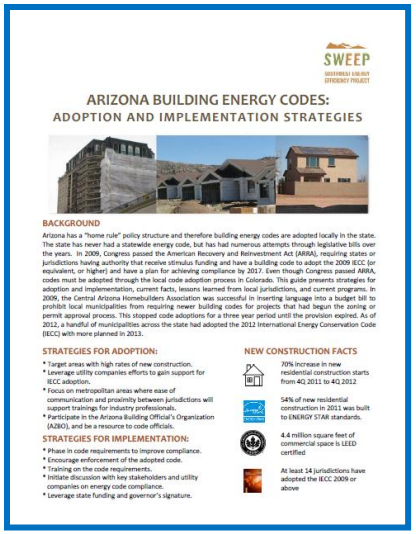
Progress and Accomplishments

Accomplishments:

- Colorado strategic study funded – Proposed to energy office by SWEEP
- SWEEP released report[5] in collaboration with the Colorado ICC Chapter on the process of phasing in requirements of the IECC
- Supported local AZ municipalities to retain ability to adopt more efficient residential energy codes[6]
- Developed energy code adoption and implementation strategies for each state
- NM utility included energy code training in their 2014 DSM plan

Market Impact: SWEEP impacted the market in a number of ways in our six states:

- 53% of new construction in Arizona occurs in municipalities that have adopted the 2012 IECC
- 12% additional new construction in Arizona occurs in municipalities that have adopted the 2009 IECC
- 6 large utilities provided funding for energy code training in CO, AZ, UT, and NV
- 76% of new construction in Colorado occurs in municipalities that have adopted the 2009 IECC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ARIZONA BUILDING ENERGY CODES:
ADOPTION AND IMPLEMENTATION STRATEGIES

BACKGROUND

Arizona has a "home rule" policy structure and therefore building energy codes are adopted locally in the state. The state has never had a statewide energy code, but has had numerous attempts through legislative bills over the years. In 2009, Congress passed the American Recovery and Reinvestment Act (ARRA), requiring states or jurisdictions having authority that receive stimulus funding and have a building code to adopt the 2009 IECC (or equivalent, or higher) and have a plan for achieving compliance by 2017. Even though Congress passed ARRA, codes must be adopted through the local code adoption process in Colorado. This guide presents strategies for adoption and implementation, current facts, lessons learned from local jurisdictions, and current programs. In 2009, the Central Arizona Homebuilders Association was successful in inserting language into a budget bill to prohibit local municipalities from requiring newer building codes for projects that had begun the zoning or permit approval process. This stopped code adoptions for a three year period until the provision expired. As of 2012, a handful of municipalities across the state had adopted the 2012 International Energy Conservation Code (IECC) with more planned in 2013.

STRATEGIES FOR ADOPTION:

* Target areas with high rates of new construction.
* Leverage utility companies efforts to gain support for IECC adoption.
* Focus on metropolitan areas where ease of communication and proximity between jurisdictions will support trainings for industry professionals.
* Participate in the Arizona Building Official's Organization (AZBO), and be a resource to code officials.

STRATEGIES FOR IMPLEMENTATION:

* Phase in code requirements to improve compliance.
* Encourage enforcement of the adopted code.
* Training on the code requirements.
* Initiate discussion with key stakeholders and utility companies on energy code compliance.
* Leverage state funding and governor's signature.

NEW CONSTRUCTION FACTS

70% increase in new residential construction starts from 4Q 2011 to 4Q 2012.

54% of new residential construction in 2011 was built to ENERGY STAR standards.

4.4 million square feet of commercial space is LEED certified

At least 14 jurisdictions have adopted the IECC 2009 or above

Progress and Accomplishments

Market Impact:
- 14% of new construction in Colorado occurs in municipalities that have adopted the 2012 IECC
- DOE/PNNL residential energy cost analysis is primary tool used and requested during municipal code adoptions
- Two-thirds of all ICC chapter educational institutes only train to the 2012 IECC
- PNNL methodology used for evaluating energy savings for REScheck update
- **6.9 Trillion Btu** potential annual savings (from 2013 activity)[7]
- **36.1 Trillion Btu** potential annual savings in 2020[7]

SWEEP continues to drive the market by:
- Promoting training on sections of the 2012 IECC to support better compliance
- Working with code collaboratives to educate, inform, and transform industry
- Develop new state partnerships to support adoption and compliance goals
- Promote the importance of energy office funding to advance energy codes

Awards/Recognition: Two building officials in Southwest have been recognized as IMT energy code champions **|** Generally recognized as nonpartisan source for energy codes in Southwest

Project Integration and Collaboration

Project Integration: Utilizing our unique approach we maintain strong relationships with industry, government, and advocates to support a cohesive approach to advancing energy code. We empower state and local stakeholders to support the adoption and compliance of newer energy codes and standards.

Partners, Subcontractors, and Collaborators:

- BCAP, RECA, IMT, EECC, ASE, ACEEE, NASEO
- PNNL/BECP
- Building Professional Groups – AIA, USGBC, ASHRAE, ICC
- Utilities – APS, SRP, RMP, Questar Gas, Xcel, NV Energy
- Building Owners – NAIOP, BOMA
- Manufacturers across the building industry
- State Regulators, Municipal Agencies, State Energy Offices

Project Integration and Collaboration

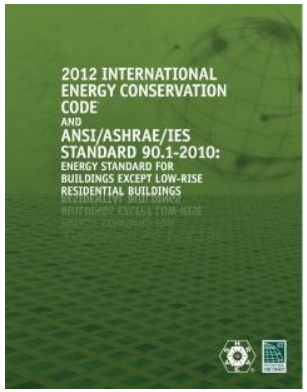
Partners, Subcontractors, and Collaborators:
- Local Advocates
- Industry Groups – ACC, NAIMA, NFRC, BPI, EECC
- Energy Professionals – energy raters, ESCOs
- REEO's, NBI

Communications: SWEEP looks for opportunities to convey the importance of energy codes through information sharing events including;
- EEBA Conference
- ICC Chapter Educational trainings
- Webinars
- Social Media
- Municipal government organizations
- RESNET conference
- AIA and USGBC Chapter events
- News print

Next Steps and Future Plans

Next Steps and Future Plans:

- Use lessons learned from legislature actions in Arizona to anticipate opposition in future states
- Focus on adoption of 2012 IECC and ASHRAE 90.1-2010 by state and local governments
- Provide webinars, meetings, presentations on the benefits of the 2012 IECC
- Create a southwest energy codes coalition modeled after NEEP and MEEA, hold teleconferences throughout year and one in person workshop
- Work with energy offices to fund energy code compliance studies
- Work with utilities to incorporate energy code compliance in commercial design assistance programs
- Data mine Reed Construction data for the Southwest to develop strategies for commercial energy code adoption and compliance



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4. Xcel Energy DSM Study, Colorado DSM Roundtable, August 21, 2013. http://bit.ly/Ql6Foh
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Project Budget

Project Budget: SWEEP received DOE funding in September 2012 for this project
Variances: One variance from original planned budget when funding was increased in FY13
Cost to Date: $198,700
Additional Funding: Current year funding of $125,000 from Energy Foundation and another foundation focused on building energy efficiency

Budget History					
Sept 2012 – FY2013 (past)		FY2014 (current)		FY2015 – August 2015 (planned)	
DOE	$305,000	DOE	$200,000	DOE	TBD

Project Plan and Schedule

Drive states and localities to adopt IECC and 90.1 Standard across six southwest state.

Project Schedule													
Project Start: 9/1/2012		Completed Work											
Projected End: 8/30/2015		Active Task (in progress work)											
	◆	Milestone/Deliverable (Planned)											
	◆	Milestone/Deliverable (Actual)											
		FY2013				FY2014				FY2015			
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)
Past Work													
National Collaborative Meetings		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Annual Energy Codes Meeting(BCAP)		◆				◆				◆			
State Compliance Strategies				◆				◆					
Code Implementation Report, Training				◆	◆								
Utility Energy Codes - webinar, presentation					◆								
Current/Future Work													
Colorado Code Collaboratives		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Nevada Code Collaborative		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Southwest Codes Collaborative									◆		◆		◆
Compliance practices webinar								◆		◆		◆	
Arizona Compliance Outline Plan											◆		
Energy Code Benefits report												◆	