



STANDARD




ANSI/ASHRAE/IES Standard 90.1-2013
(Supersedes ANSI/ASHRAE/IES Standard 90.1-2010)
Includes ANSI/ASHRAE/IES Addenda listed in Appendix F

Energy Standard for Buildings Except Low-Rise Residential Buildings (I-P Edition)

See Appendix F for approval rates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the IES Board of Directors, and the American National Standards Institute.

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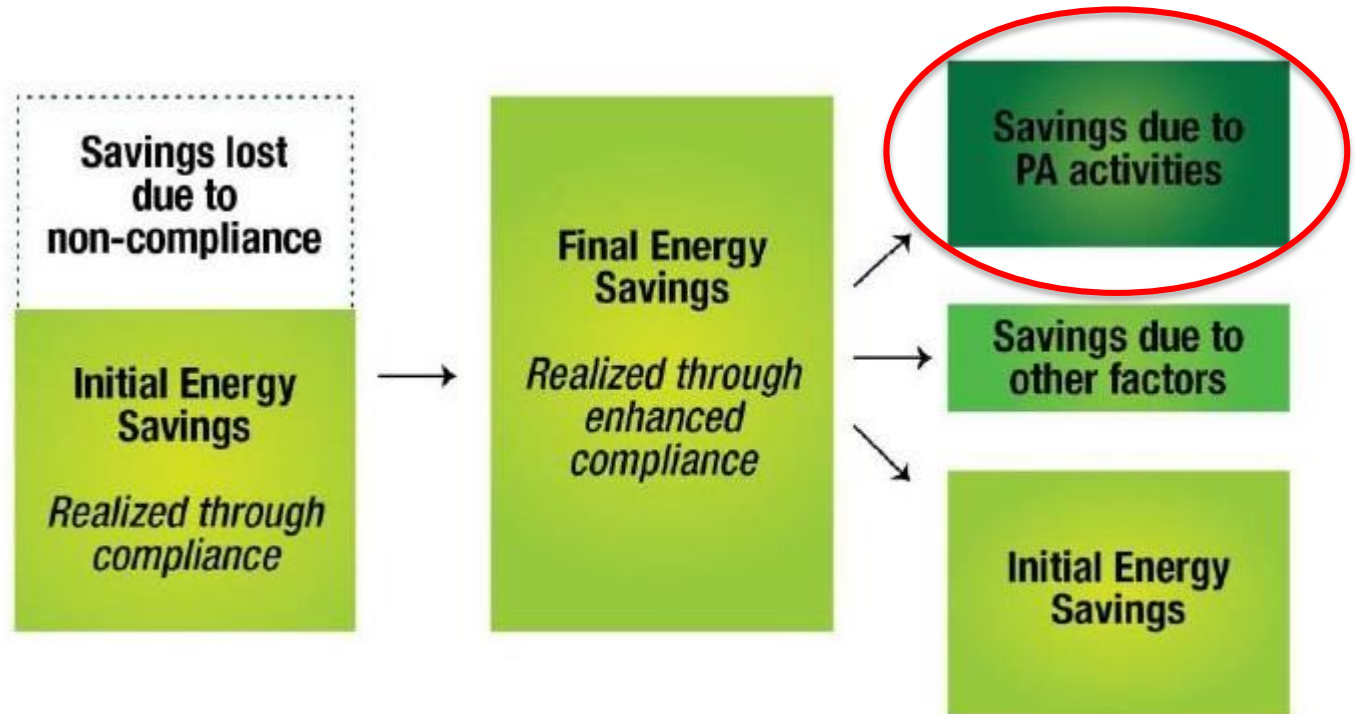


IL Energy Code Compliance Framework, Field Studies and Future Savings

SAG Call | September 26, 2018



Energy Code Compliance *Opportunities for Claimed Savings*



Source: *Attributing Building Energy Code Savings to Energy Efficiency Programs (2013)*, Institute for Market Transformation, Institute for Electric Innovation, Northeast Energy Efficiency Partnerships

Energy Code Compliance

Brief History of IL Claimed Savings

- Joint **statewide utility program** began in 2013
 - Energy code was 2009 IECC, moving to newly-adopted 2012 IECC
- **Deemed savings** were estimated
- Lack of state budget **prevented** full program implementation
- **Utility meeting** at MEEA in August 2017
 - Residential and commercial field studies
 - Collaborative

Energy Code Compliance

Opportunities for Claimed Savings

- Improved energy code compliance offers **significant savings** potential
- Solid **evidence of non-compliance** in many buildings
 - Compliance collaborative and market survey confirm this in IL
 - Three Midwest **residential baseline studies** have been completed in KY, MO, and MI
 - NE is in the analysis phase
 - All have identified significant savings opportunities
- Unique opportunity for utilities to support improved compliance and **claim resultant savings**





Study Framework



What and Why

Understanding Energy Code Compliance

✓	What		Why	Residential Baseline Field Study
✓	What		Why	Commercial Baseline Field Study
	What	✓	Why	Illinois Energy Codes Compliance Collaborative

What and Why

Understanding Energy Code Compliance

✓	What		Why	Residential Baseline Field Study
✓	What		Why	Commercial Baseline Field Study
	What	✓	Why	Illinois Energy Codes Compliance Collaborative

✓ **Who**

✓ **How**

✓ **How
Much**



Illinois

Energy Codes

Compliance

Collaborative

Code Compliance Collaborative

What and Why

- *What:* A **group of stakeholders** that come together on a regular basis to explore common interests and **address barriers** related to energy code compliance
- *Why:* To establish **a forum for** identifying and tackling obstacles to **improving energy code compliance**

Codes Compliance Collaborative

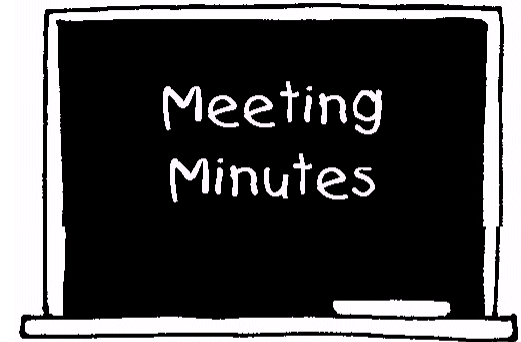
Collaborative Goals

- **Inform** stakeholders about upcoming baseline studies
- **Gather feedback** for baseline studies
- Identify **next steps** for the key areas needing attention for energy code compliance
- Gain commitment for **future participation**

Code Compliance Collaborative

What and Why

- **Formed** early 2017
- Part of startup of statewide utility **energy savings program**
 - Lack of state budget prevented full program implementation
- **3 meetings** February 2017
 - O'Fallon
 - East Peoria
 - Oak Brook



Codes Compliance Collaborative

2018 Progress to Date

- **Three in-person** Collaborative meetings
 - East Peoria
 - O'Fallon
 - Oak Park
- **Two web-based** Collaborative meetings
 - 1 residential meeting
 - 1 commercial meeting
- Conducted **survey of members** to identify biggest issues
- **Website** development is underway



Residential Field Study



Residential Study

Background

- In 2014 the US Department of Energy funded 3-year **residential energy code studies** in eight states
- Study goals
 - Establish compliance baseline, and **calculate potential savings**
 - Determine if **focused training & support** can improve compliance
- **Statistically significant** results at state level
- Collected data will be **anonymous**

Residential Study Sampling Plan



SAMPLE

Residential Study

Data Collection Process

- DOE established a **data collection protocol**
 - Randomized Sampling Plan
 - Key Items Must be Observed
 - Minimum of 63 Observations of Each Key Item
 - Single Visit to a Given Home
- Survey teams spend about **4-6 months** collecting field data
- Collaborative will **provide feedback and guide** the project

Residential Study

Key Items

- **Envelope Tightness**
(ACH50)
- **Window Solar Heat Gain Coefficient**
- **Window U-factor**
- **Wall Insulation**
(R-value and Quality)
- **Ceiling Insulation**
(R-value and Quality)
- **Foundation Insulation**
(R-value and Quality)
- **High Efficacy Lighting**
- **Duct Leakage**
(CFM25)
- **Manual J Data**
(not a DOE key item)
- **Manual D Data**
(not a DOE key item)



Residential Survey

Progress To Date

- Survey team is currently **recruiting buildings** by contacting jurisdictions and scheduling site visits
- **Currently in the field** as of late September 2018
- Targeting data collection completion for ~**March 2019**



Commercial Field Study



Commercial Survey

Overview

- Similar to the residential study, the commercial study will **survey high impact measures** and analyze the results
- Unlike the residential survey, the commercial survey is **not intended** to achieve the “statistical significance” label
 - **Too much variation** in use types and size to cost effectively survey
- Will survey 40-45 of the **most common** building use types
- Analysis is designed to identify **measure-level savings opportunities**

Commercial Study Sampling Plan



SAMPLE

Commercial Study

Data Collection

- Review Building Plans and Specs
 - Record values for ~35 key items
- Identify Compliance Path
- Collect Field Data
 - Building Insulation and Fenestration
 - Mechanical System and Controls
 - Lighting and Controls
- Blower door tests for smaller buildings (< 4,000 sf)



Commercial Study Process

Identify and Recruit Buildings

Obtain Permitting Data and Plans

Conduct Site Visits

Analyze Building- and Measure-
level Energy Impacts

Aggregate Results to Population

Commercial Study

Energy Impact Analysis

1

- Rely on DOE code-compliant prototype building EnergyPlus models to manage level of effort

2

- Simulate prototype building using as-built characteristics to estimate total energy impact

3

- Simulate prototype building with each key measure as-built to estimate measure energy impact

4

- Combine and weight building results to estimate population impacts

Commercial Study

Multifamily

- **Only high-rise** multifamily will be included in commercial study
 - Low-rise is being covered by DOE study led by EcoTope and Seventhwave
- Will consider multifamily building **utility programs**

Commercial Survey

Work to Date

- Sampling plan has been finalized
- Finalizing key items and energy analysis strategy
- Survey team to be in the field in **late Oct. / early Nov. 2018**
 - Complete data collection ~October 2019



Summary

Things to Consider

Illinois Energy Code

Code Update: 2018 IECC

- **Improves** code efficiency (improvement greater in commercial)
- Provides an opportunity for **deeper savings**

IEPA/SEDAC Training

- Establishes basic understanding of code, provides **foundation** for targeted, in-depth training
- Utility sponsored code training would **complement** IEPA training

Energy Code Compliance

Opportunities for Claimed Savings

- Studies **need to be completed** in order to understand energy savings potential
- Programs can be developed around specific **non-compliance measures** identified in studies
- Pre- and post- studies can be included to **identify specific opportunities** and evaluate program success

Questions?

Thank you!

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