METROPOLITAN
Community College

The Commercial Energy Code: Session 1

History of Building and Energy Codes

Instructor: Matt Belcher

Tuesday, January 10, 6-8p.m.

Housekeeping

- Attendees are muted upon entry
- Questions? Enter them in the chat box
- Webinar is being recorded – slides and recording will be sent to attendees
- CEUs available for AIA and ICC
- Email canderson@mwalliance.org with questions
- Course information available at: https://www.mwalliance.org/metropolitan-community-college-energy-code-course

Today's Agenda

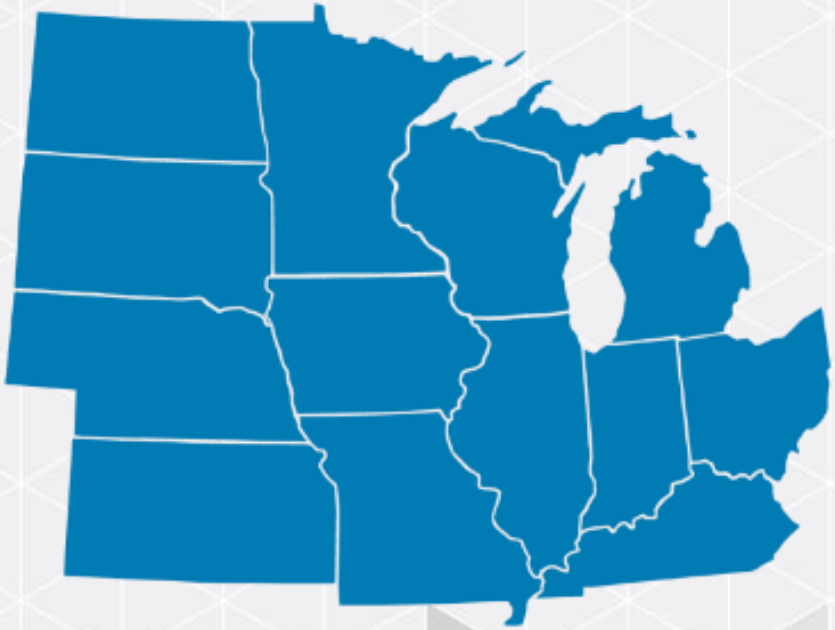
- Introductions
- Course Overview
- Building and Energy Code History
- Importance of the Energy Code and the Intersection with Other Building Codes
- Q&A

INTRODUCTIONS

About MEEA

The Trusted Source on Energy Efficiency

- Nonprofit membership organization with 160+ members
- Serves 13 Midwest states
- Resource and champion for energy efficiency
- Our mission: advancing energy efficiency in the Midwest for sustainable economic development and environmental stewardship



MEEA

MIDWEST ENERGY EFFICIENCY ALLIANCE

Nebraska Energy Codes Training Program

- Goal: prepare the Nebraska workforce for upcoming changes in construction best practices
- Residential and Commercial Energy Code
- Focused on providing training to builders, code officials, design professionals, public officials and students
- For more information, visit: https://www.mwalliance.org/nebraska-energy-codes-training-program

Our Instructor

Matt Belcher
matt@verda-solutions.com

VERDATEK
SOLUTIONS

Poll Question #1

- What is your profession?
  - Student
  - Academic
  - Residential Builder
  - Commercial Builder
  - Energy Rater/Consultant
  - Code Official
  - State/Local Government
  - Non-profit
  - Utility
  - Other (type in chat)

Poll Question #2

- How much experience do you have in the construction industry?
  - 0-5 years
  - 6-10 years
  - 11-15 years
  - 16-20 years
  - 21+ years

Poll Question #3

- How familiar are you with the commercial provisions in the 2018/21 IECC?
  - Extremely Familiar
  - Somewhat Familiar
  - Somewhat Unfamiliar
  - Not familiar at all

COURSE OVERVIEW

Course Overview

- Focus: Commercial Energy Code
- 8-week course, 1 class per week
- Tuesdays, 6p.m. - 8p.m.
- Final Exam: February 28

Course Schedule

January 10th – Introduction and History of Energy Codes

January 17th – Commercial Energy Code Basics

January 24th – Building Science

January 31st – Mechanical Systems *(guest lecturer)*

February 7th – IECC vs. ASHRAE

February 14th – Electrical: Lighting and Power Systems *(guest lecturer)*

February 21st – Comcheck Overview and Advanced Technologies

February 28th – Commissioning, Business Benefits, Marketing, Review and **Final Exam**

HISTORY OF THE BUILDING CODE

Code of Hammurabi – The First Known Building Code

- The Code of Hammurabi is a well-preserved Babylonian code of law from ancient Mesopotamia, circa 1754 BCE. The sixth Babylonian king, Hammurabi, enacted the code.

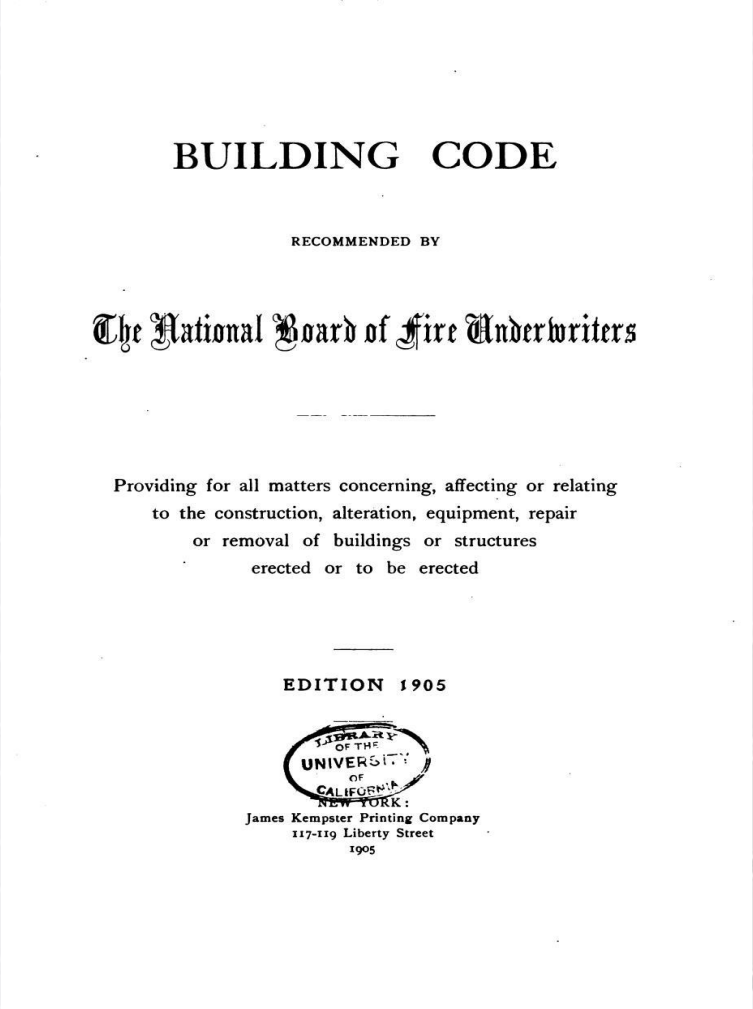
- The basic idea is an eye for an eye. Meaning if you build a building and it collapses and kills someone. The penalty is Death….

Building Code History

- The first building codes in the United States were established in **1625** and addressed fire safety
- Code specified materials for roof coverings
- In 1630, Boston outlawed chimneys made of wood and thatch roof coverings (thatch has other drawbacks but is a fairly good insulator)

Building Code History

- 1905 – the National Board of Fire Underwriters, a U.S. Insurance Group. Created the National Building Code
- Goal: minimize risks to property and building occupants



BUILDING CODE

RECOMMENDED BY

The National Board of Fire Underwriters

Providing for all matters concerning, affecting or relating to the construction, alteration, equipment, repair or removal of buildings or structures erected or to be erected

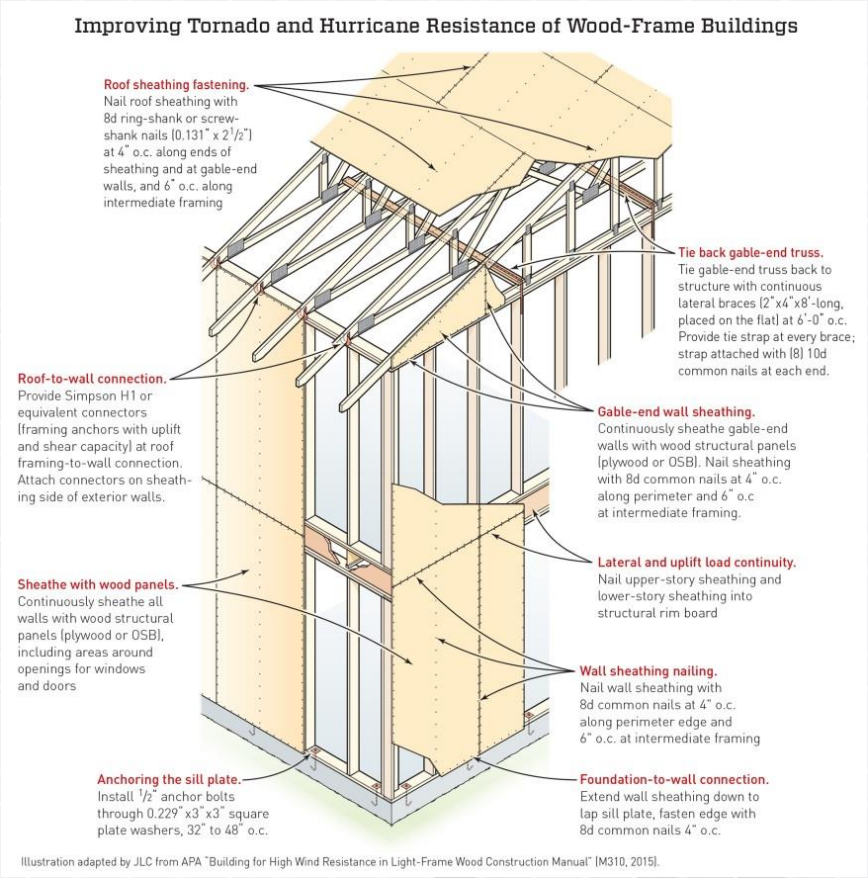
EDITION 1905

NEW YORK:
James Kempster Printing Company
117-119 Liberty Street
1905

Building Code History

- Reaction to disasters, both man made and natural, drive building codes
- After the great fires in London (1666) and Chicago (1871), building codes started addressing risks associated with close proximity

Building Code History

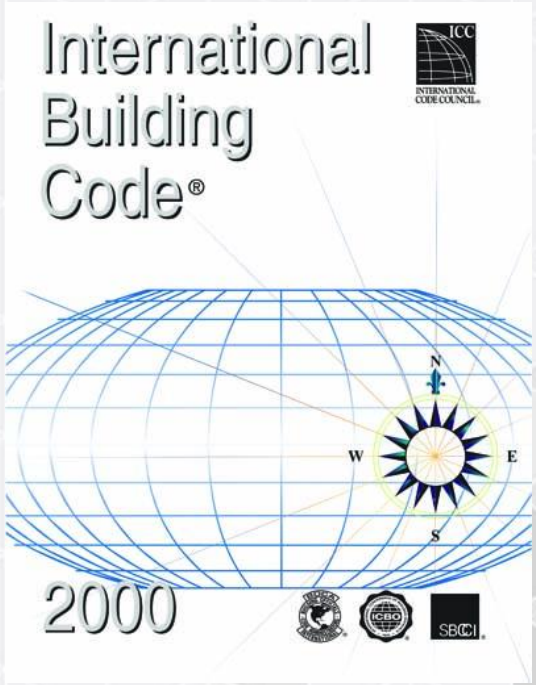


Building Code History

"Legacy Codes"

Building Code History

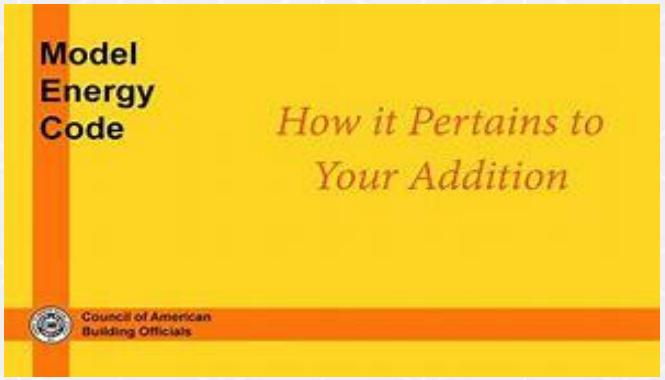
- The first edition of the International Building Code (IBC) was published in 2000 by the International Code Council (ICC)
- Combines the three model building codes published by BOCA, ICBO and SBCCI



THE ENERGY CODE AND BUILDING ENERGY EFFICIENCY

The Energy Code

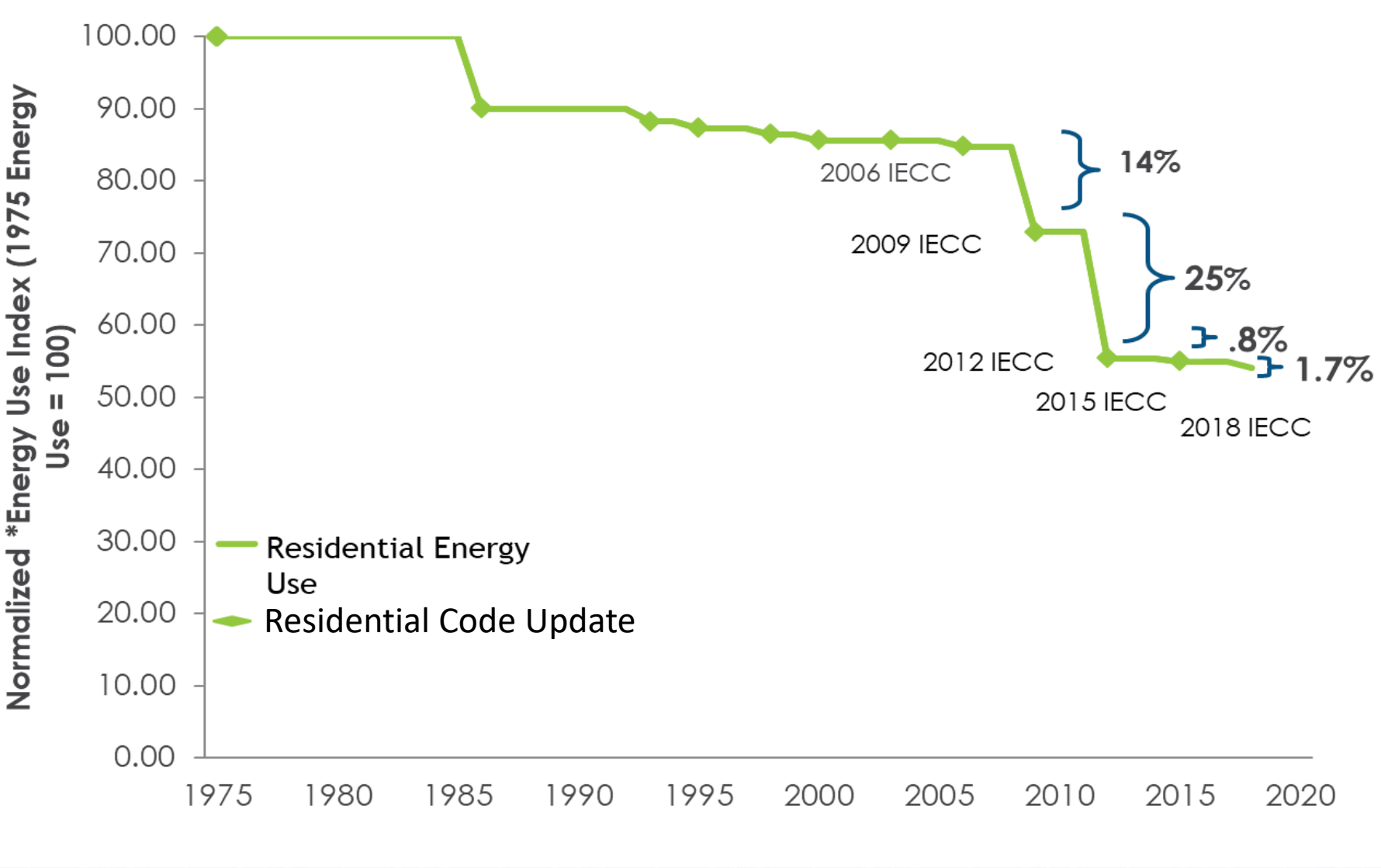
- Model Energy Code (MEC) developed in 1983 under a U.S. Dept of Energy Contract
- Editions of the MEC released from 1983-1995
- Title changed to International Energy Conservation Code in 1998



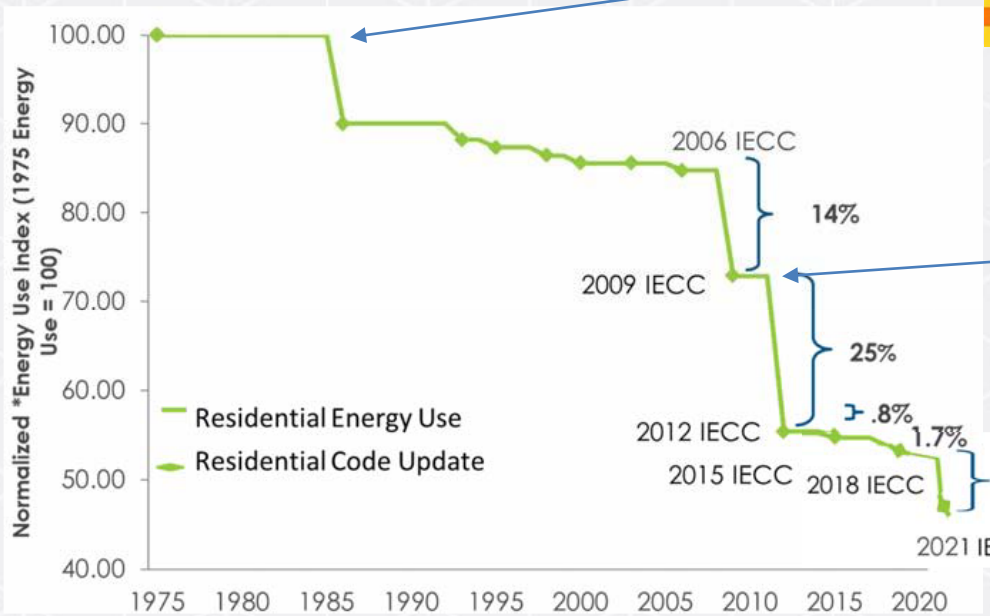
International Energy Conservation Code (IECC)

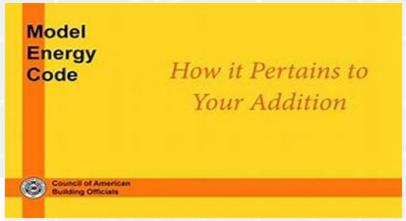
- Developed by the International Code Council
  - Robust stakeholder process
  - Proposed changes accepted from all parties
- New editions published every 3 years

Model Energy Code Improvement

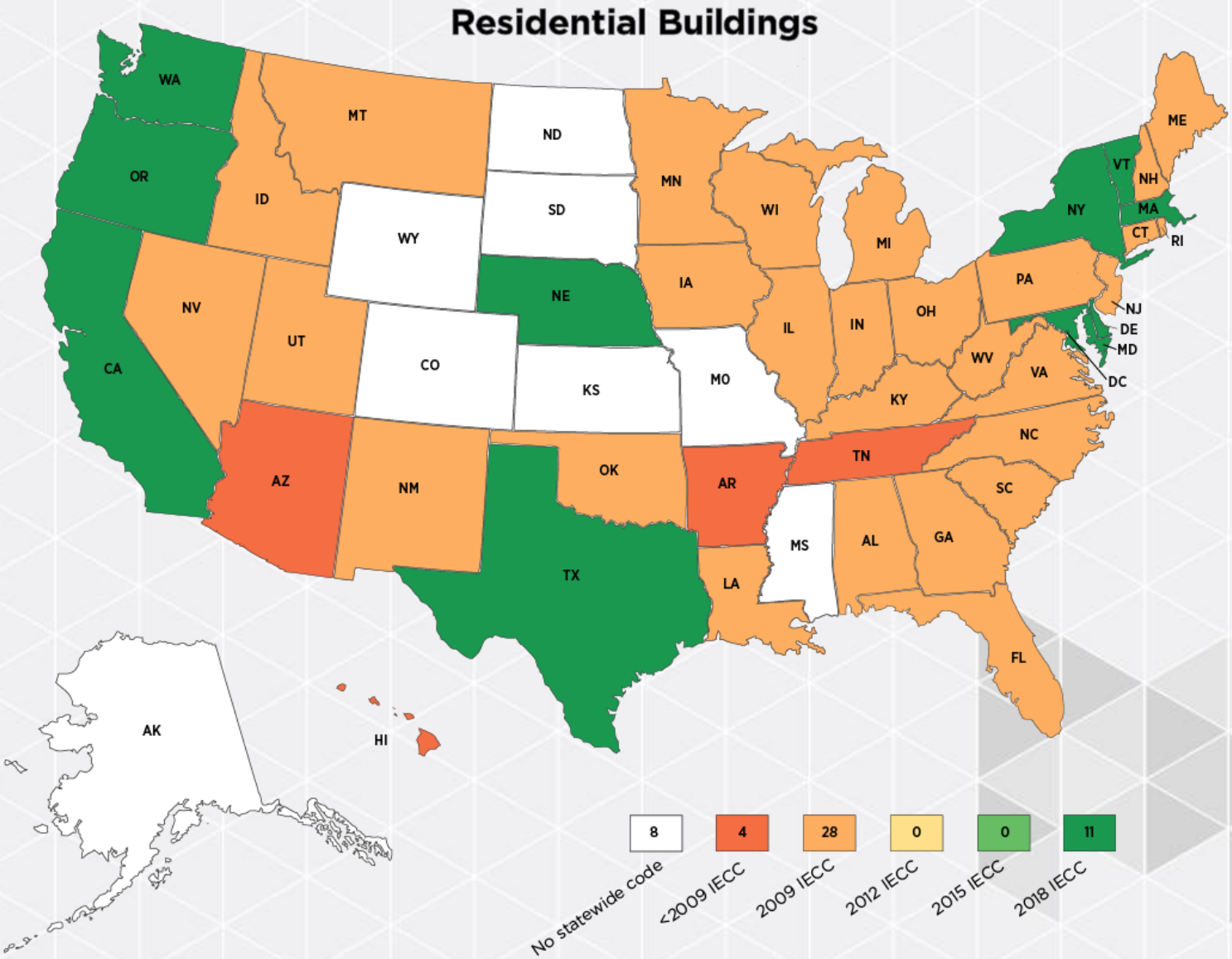


Energy Code Background

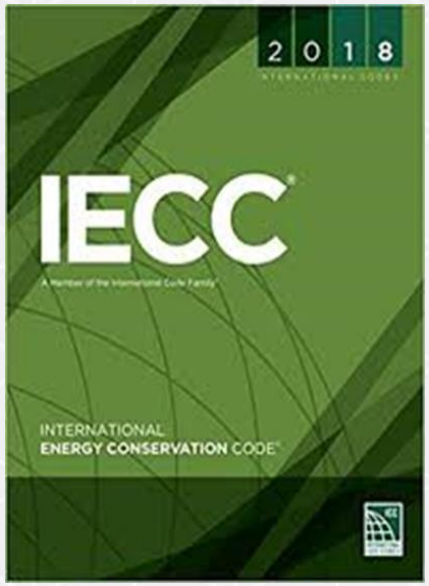




Model Energy Code Improvement

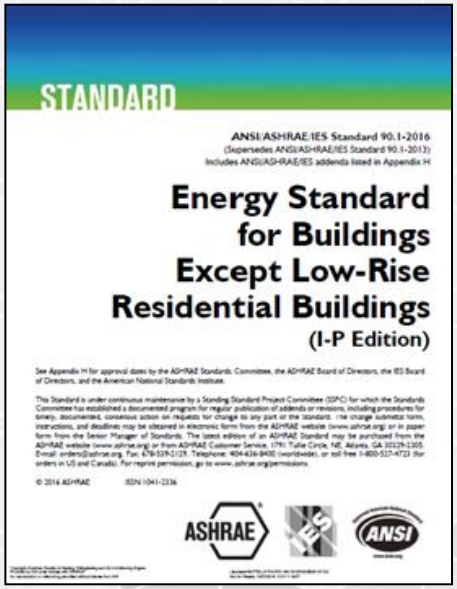


New in 2018: *Two* Commercial Compliance Options



ASHRAE 90.1-2016

Alternative Method to IECC



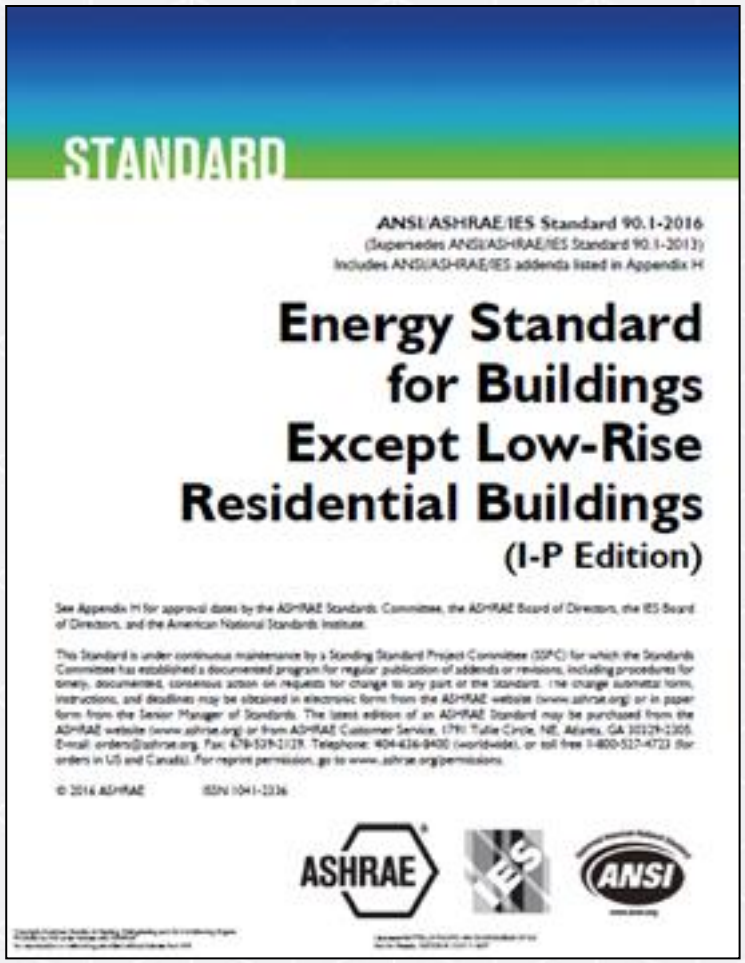
Key Energy Code Components

- Insulation R-value (ceiling, wall, foundation)
- Insulation installation quality
- Continuous air barrier/sealing and testing
- Efficient windows
- Mechanical ventilation
- HVAC system sizing location detailing
- Envelope testing
- Efficient lighting & verification testing

2018 IECC

- Advances Energy Code approximately 28% over 2009 IECC
- Residential and Commercial provisions
- Testing and verification required
- Equipment details and location identified.
- Design/performance verification of lighting controls
- Adds an appendix for “Solar Ready Zones”

Structure of Standard 90.1-2016



1. Purpose
2. Scope
3. Definitions, Abbreviations & Acronyms
4. Administration and Enforcement
5. Building Envelope
6. Heating, Ventilating and Air Conditioning
7. Service Water Heating
8. Power
9. Lighting
10. Other Equipment
11. Energy Cost Budget Method
12. Normative References

Normative Appendices A-H

- Appendix G – is a new compliance path!

Above Code (Stretch) Programs

- LEED
- Green Globes
- ASHRAE

Sample Energy Labels and Above Code Certification

LEED CERTIFICATION REQUIREMENTS

In order to achieve LEED certification, projects must earn points in these categories:

U.S. GREEN BUILDING COUNCIL LEED USGBC

Innovation
Introduction of novel features and procedures

Indoor Environmental Quality
Use of natural light and efficient air conditioning

Materials and Resources
Responsible construction waste management and sustainable sourcing of materials

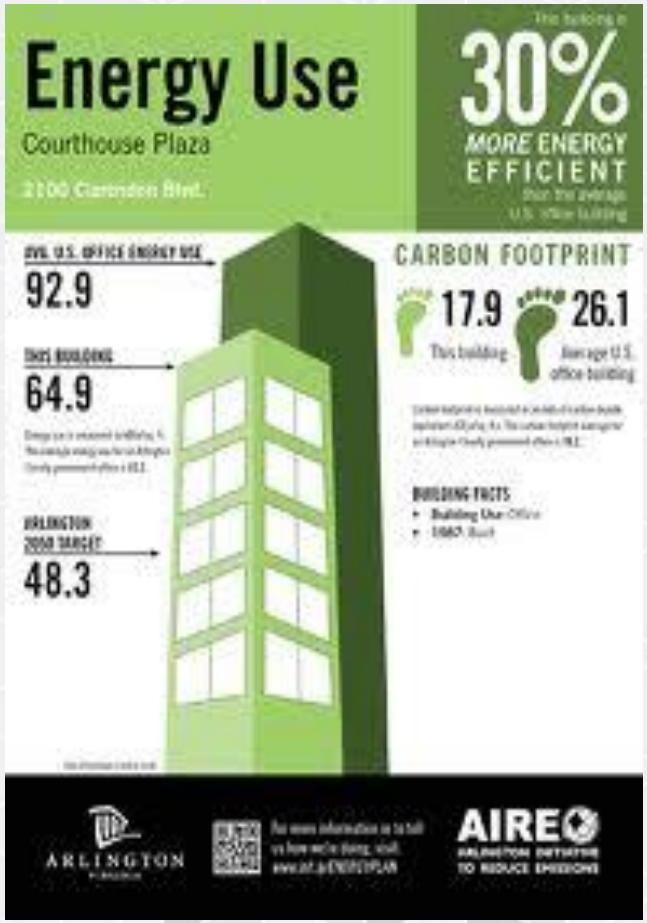
Location and Transportation
Land protection and access to public transporation and green vechicles

Sustainable Sites
Sufficient green open space and light pollution reduction

Energy and Atmosphere
Optimizing sustainable energy production and metering

Water Efficiency
Indoor and outdoor water reduction

Source: www.usgbc.org



Energy Star Program

- Launched in 1992 for appliances
- In 1995, EPA launched Energy Star for Homes
  - 30% more efficient than the Model Energy Code
- In 1996, Energy Star became formal partnership between EPA and DOE

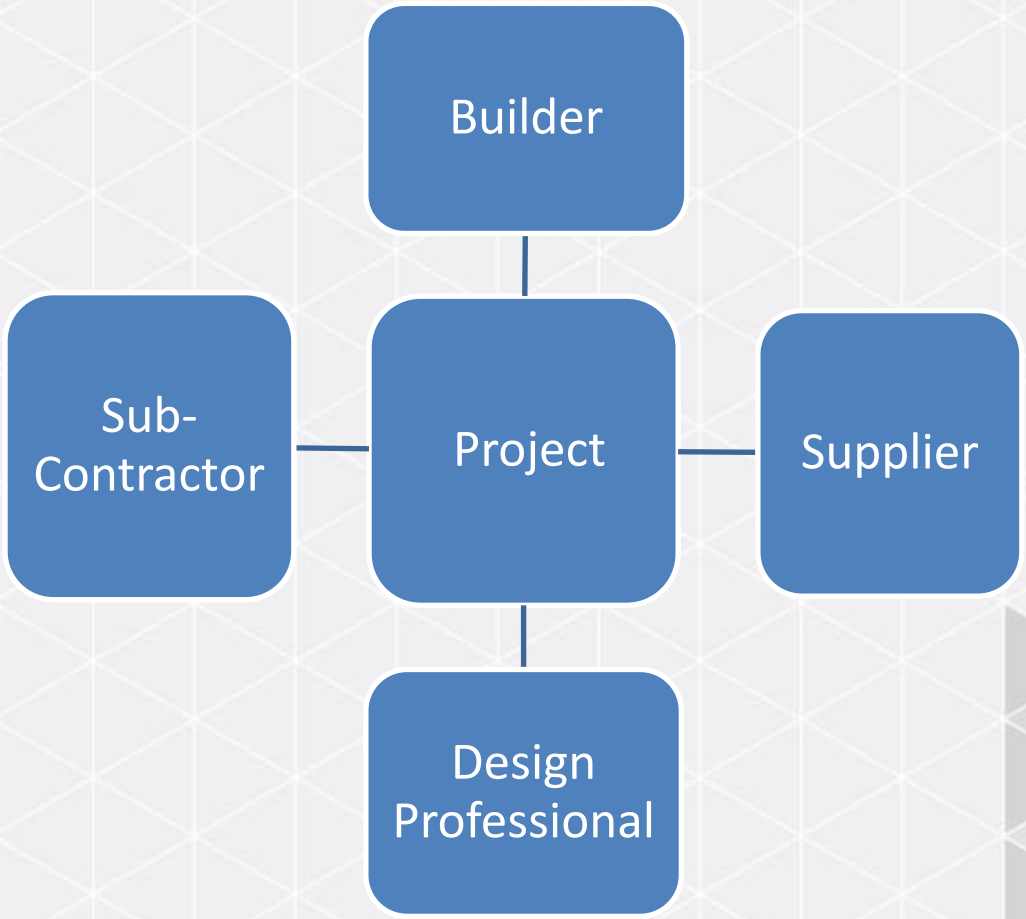
Holistic Approach to Building

- Site Planning and Design
- Resource Efficiency
- Energy Efficiency
- Water Efficiency
- Indoor Environmental Quality
- Homeowner Education
- Global Impact

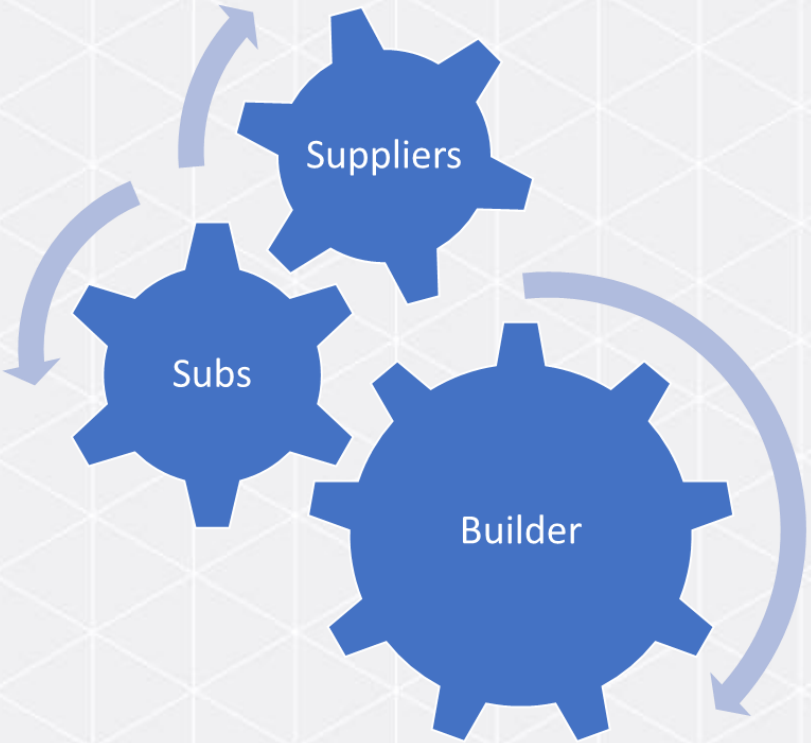
Establishing a Knowledgeable Team

- Begins with /Builder/Design Professional
- Customer/Client
- Building Trades
- Suppliers/Sub-contractors
- Certifications
  - LEED-AP
  - ICC

Establishing a Knowledgeable Team



Establishing a Knowledgeable Team

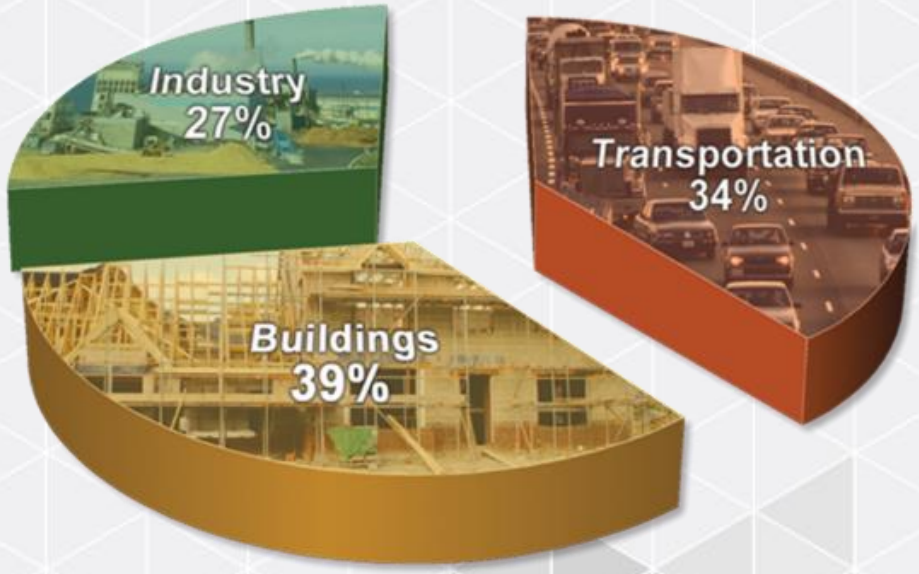


- It takes about 90 people directly and indirectly to construct an average building

IMPORTANCE OF THE ENERGY CODE AND INTERSECTION WITH OTHER CODES

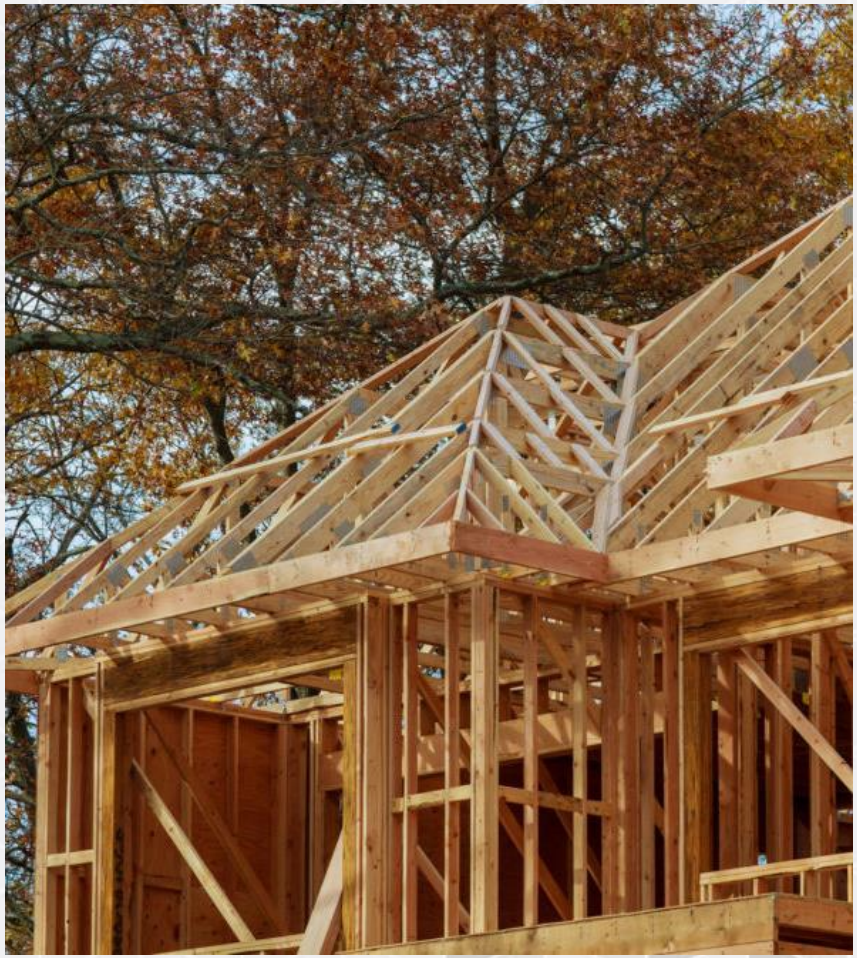
Why are Energy Codes Important?

- Reduce energy use of buildings
- Impacts energy use for the life of a building
  - Most cost-effective to implement during initial design and construction
- Benefits building owners and operators by guaranteeing a minimum of efficiency
- Health and resilience benefits to building owners and occupants



The Energy Code is Everywhere

- Unlike most other codes, the energy code directly impacts the work of many disparate building trades and systems, including:
  - Framing/Envelope
  - Plumbing
  - HVAC
  - Electric
  - Moisture management
  - Concrete
  - Caulking



IECC and IBC

- Chapter 13 in the International Building Code (IBC) references the energy efficiency requirements found in the IECC

IECC and IMC

- Whole-house mechanical ventilation required by energy code

- Ventilation rate and equipment requirements in the International Mechanical Code (IMC)

Looking Ahead:

- IECC changes to The National Energy Standard as of 2024.
- Uses 2021 IECC as a baseline.
- Introduces Carbon Impact into the conversation.
- On a trajectory for Net Zero Energy as of 2030.

Questions?

- Submit a question in the chat or unmute yourself to ask a question

Review Questions – Session 1

Why was the energy code originally created?

a. To increase sale of insulation
b. To modernize codes
c. To manage the energy use of buildings
d. To increase construction of power plants

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How often are the ICC Codes updated?

a. Every two years
b. Every three years
c. Every four years
d. Every five years

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Review Questions – Session 1

Which of these are an “Above Code” Standard?

a. EnergySTAR
b. ANSI
c. BOCA
d. Morse Code

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Review Questions – Session 1

Why Do “Above Code” Standards Exist?

a. To separate good builders from bad ones
b. To create guidance for incorporating new technology
c. To generate additional tax revenue
d. To give building officials more options

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Continuing Education Credits

- Participants will receive continuing education credits from the **International Code Council** and **American Institute of Architects**.

- AIA LU|HSWs: 2.0
- ICC CEUs: 0.20

Next Week

- January 17, 6-8p.m.
- Topic: Commercial Energy Code Basics
- Contact Matt with questions: matt@verda-solutions.com

Upcoming Training: The Intersection of Building Codes and Energy Codes

- Free
- Virtual
- **Thursday, January**
- **10a.m. – 11:30a.m.**
- ICC and AIA CEUs provided

- Register here: https://www.eventbrite.com/e/483837660467

Duct and Envelope Tightness (DET) Verifier Training and Train-the-Trainer

- Free
- In-person in Lincoln, NE
- Become DET certified in 2 days or learn to train others in 3 days!
- **Tuesday January 24 - Thursday 26**
- **9a.m. – 5p.m.**
- ICC/AIA CEUs and certificate provided

For more info or questions contact Corie Anderson at canderson@mwalliance.org

SEE YOU NEXT WEEK!