Recent Energy Efficiency Advances in Building Energy Codes

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Session 2B: Transforming the Market with Building Codes and Standards
Today’s Topics

• Review Current Energy Code Policies and Processes
  • National Policies
  • Model Energy Code Development
• Review 2012 IECC Code Advocacy Campaign
• Changes to IECC and ASHRAE Standard 90.1
• Historical Energy Efficiency Improvements in the Model Energy Codes

Current National Building Energy Code Policies

Energy Conservation and Production Act, Sec. 304 (42 USC 6833)

DOE required to do a “determination” of latest model codes (IECC and ASHRAE 90.1) when published

If new codes save energy, states have 2 years to:

• Adopt the commercial energy code or one equally stringent
• Consider the residential code and inform DOE of intentions to adopt

No penalties for non-compliance
National Model Energy Code Development

Model Residential Energy Code – IECC
• 3-year development cycle (2009, 2012, 2015, etc.)
• ICC administers code change proposal process and does not advocate specific energy policies or goals
• Proposals must pass Development Committee and then final action votes by code officials

Model Commercial Energy Standard – ASHRAE Standard 90.1
• 3-year development cycle (2007, 2010, 2013, etc.) on a “continuous maintenance” basis
• Developed according to ANSI “consensus” procedures
• Proposals referred to technical subcommittees for approval and then to full SSPC 90.1
• ASHRAE Board encourages improvement goals (i.e. 30%) for cycle
Why Is the IECC So Important?

- National Model Energy Code of Choice
- 40+ States and D.C.
- Cited throughout federal law for:
  - National private and Federal housing initiatives
  - Energy Independence & Security Act of 2007 (EISA)
  - Energy Conservation & Production Act, as amended
    - National benchmark for single family homes, townhomes, low-rise condominiums & apartments
  - Manufactured Housing (HUD 24 CFR 3280)
  - Energy Efficient Mortgage Programs (FHA, VA, Fannie & Freddie)
The ICC CODE DEVELOPMENT CYCLE

- Code Changes Submitted
- Code Changes Printed & Distributed
- Code Development Hearing
- Public Hearing Results
  - Printed & Distributed
  - Public Comments Sought on Public Hearing Results
- Public Comments Printed & Distributed
- New Model Code Published
- FINAL ACTION HEARING
Highlights of 2012 Code Campaign

• Increased energy policy need among advocacy stakeholders for big savings in new construction spurred two-cycle campaign

• Improvement goal of 30% was set following ASHRAE example; “Targets” in national legislation a factor

• Technical proposals from wide range of stakeholders; much coordination by DOE and others

• Partial progress with 2009 IECC with 15% efficiency gain

• Advocates reached out to new players in energy code arena – progressive local governments and states

• Result: 2010 IECC 30% more efficient than 2006 IECC
Final Action Hearing on 2012 IECC

October 27-31, 2010
Charlotte, NC

• Energy efficiency dominated agenda

• Over 300 proposals to amend (improve) IECC were heard, debated and voted on

• Local Governments were crucial: ONLY “Government Members” VOTE at ICC Final Action Hearings
IECC Residential Changes (Chapter 4)

• Mandatory air infiltration tests in all homes to ensure building envelope efficiency
• Duct testing to a tighter duct leakage standard
• Stronger insulation and glazing efficiency requirements
• Minimizing waste of heated water: keeping pipes "short and skinny," or insulating them to avoid waste
• The elimination of separate energy requirements in International Residential Code (IRC). IRC will now reference IECC for energy efficiency
IECC Commercial Changes (Chapter 5)

- Compliance option choices of high performance lighting, high performance HVAC equipment, or onsite renewable power generation
- Continuous air barriers for the building envelope
- Commissioning requirements for HVAC systems
- Increased efficiency of the opaque thermal envelope provisions
- Increased fenestration efficiency
- Mandated automatic daylighting controls for buildings with a window-to-wall ratio over 30%; skylights and daylighting controls for spaces over 10,000 ft² in certain building types
- Added efficiency requirements for cooling towers
- Increased minimum efficiency requirements for certain HVAC equipment
- Increased HVAC piping insulation provisions
ASHRAE Standard 90.1-2010

- **Title, Purpose & Scope**: Can now address plug and process loads
- **Envelope**: Continuous air barriers; Minimum daylighting area in some spaces; new vertical window orientation flexibility
- **Lighting**: Updated lighting power density (LPD); auto controls for daylighting; new exterior lighting criteria; more alterations criteria
- **HVAC**: Most equipment efficiency improved; better chillers; heat recovery; expanded economizer coverage to more climate zones; new IEER criteria
History of US Residential Energy Code Efficiency Improvements (DOE BECP)
History of US Commercial Energy Code Efficiency Improvements (DOE BECP)

- Std. 90A-1980
- 14% savings
- Std. 90.1-1989
- Std. 90.1-1999
- Std. 90.1-2004
- Std. 90.1-2007
- Std. 90.1-2010
- 30% savings

Energy Use Index (1975 use = 100)

- 1975
- 1980
- 1985
- 1990
- 1995
- 2000
- 2005
- 2010
- 2015
Conclusion

• The past two IECC and ASHRAE code cycles have produced more efficiency gains than in the previous 30 years!

• The campaign to achieve these gains has built a new community of advocates and stakeholders for further development and state adoptions

• Energy codes likely to grow in importance as an energy policy tool and can provide market transformation opportunities to EE Program Administrators
Thank You for Your Attention!

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