

Recent Energy Efficiency Advances in Building Energy Codes

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American Council for an Energy-Efficient Economy

2011 National Symposium on Market
Transformation

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

Energy Code Minimums = “The Least Energy-Efficient Building You Can Legally Build”

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

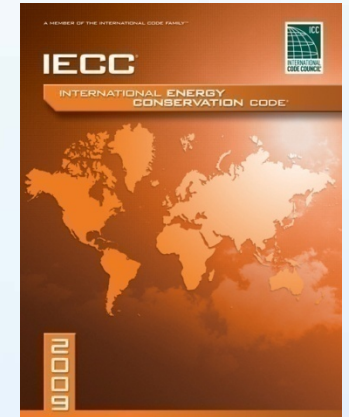
- 3-year development cycle (2009, 2012, 2015, etc.)
- ICC administers code change proposal process and does not advocate specific energy policies or goals
- Proposals must pass Development Committee and then final action votes by code officials

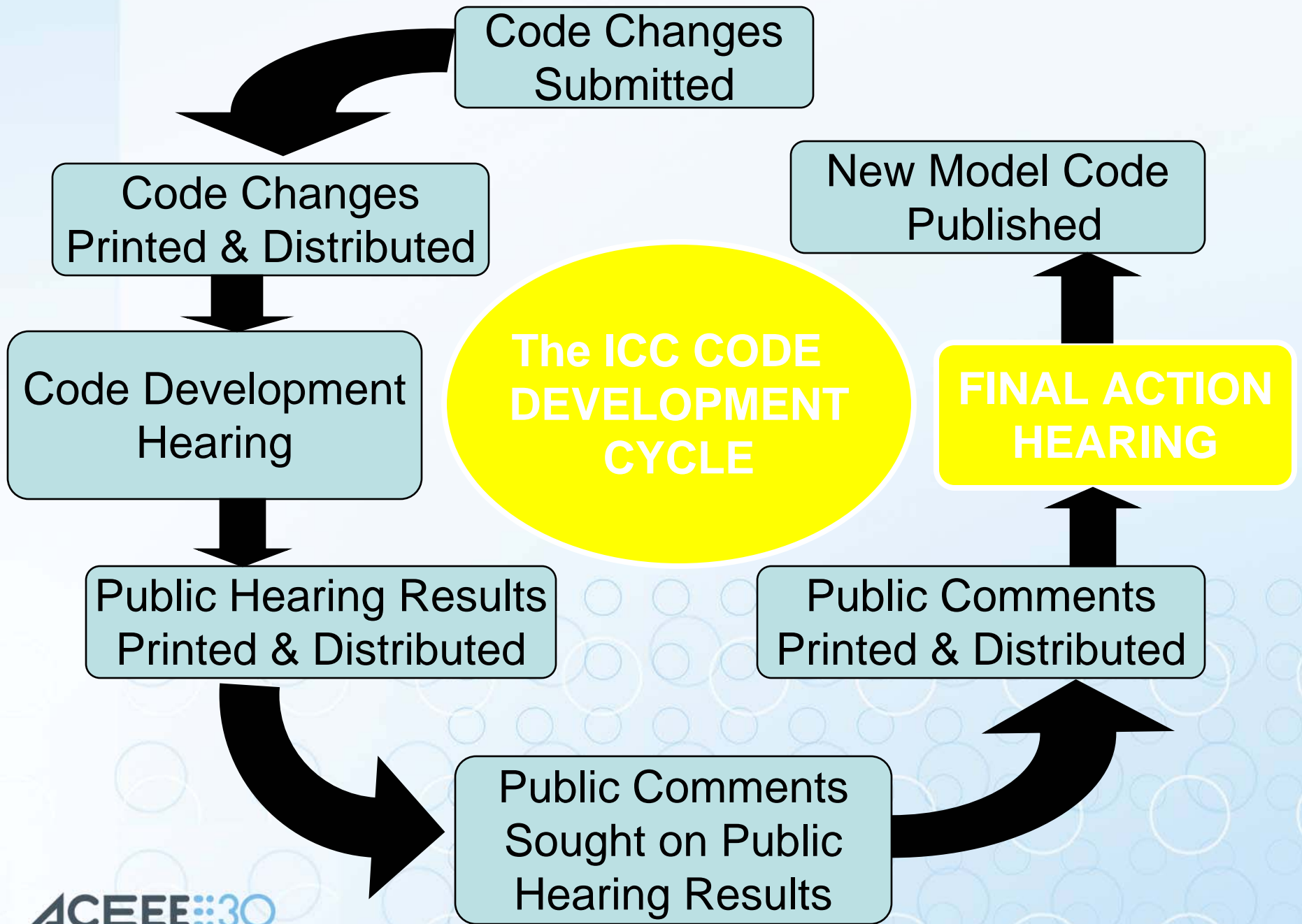
Model Commercial Energy Standard – ASHRAE Standard 90.1

- 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)





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

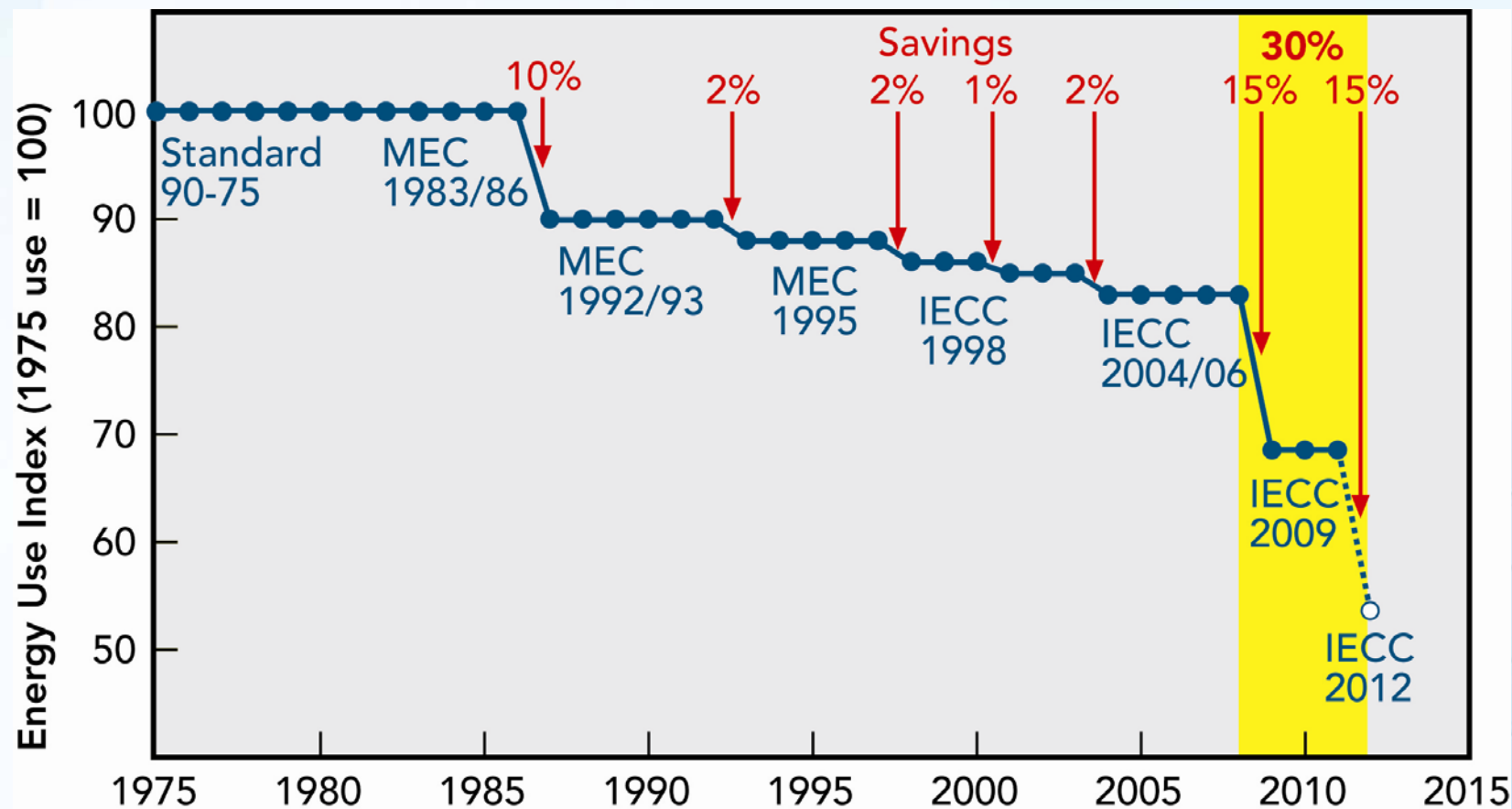
IECC Commercial Changes (Chapter 5)

- 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

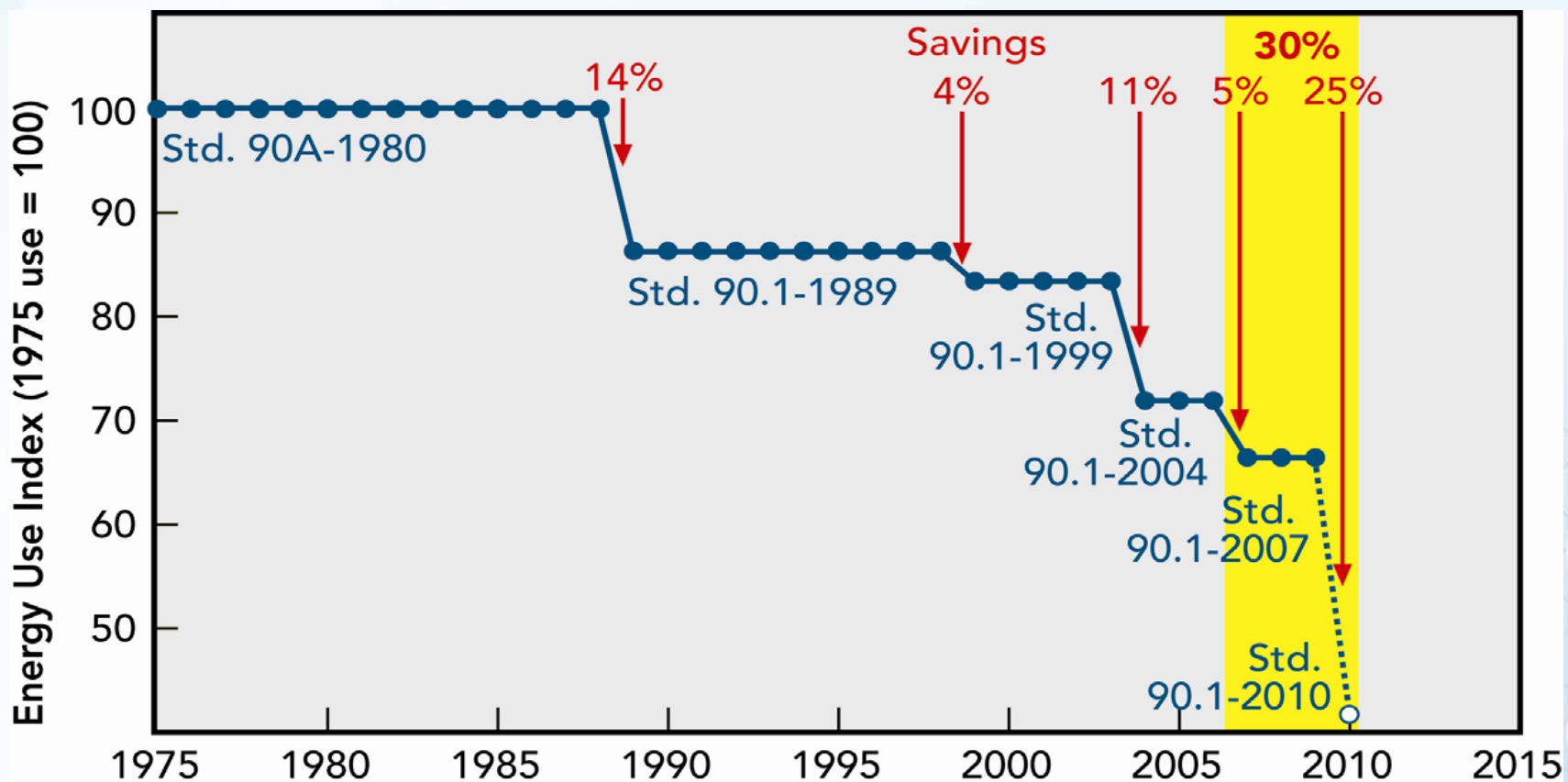
ASHRAE Standard 90.1-2010

- 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)



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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