



U.S. Department of Energy
Energy Efficiency and Renewable Energy



Building Energy Codes

The Residential Code of the Future

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Building Energy Codes Program
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- future ('fyoo-ch&r) – *noun*
 1. September 28 thru October 2, 2005
 2. March 24, 2006
 3. Thereafter

- future ('fyoo-ch&r) – *noun*
 1. 2006 IECC – What will happen at the Final Action hearings?
 2. 2007 Supplement – Change proposals are due 24-March-2006
 3. Visionary future – General directions DOE or others might try to move the code



DISCLAIMER:

Nothing presented here is anything more than an idea, a prognostication, an opinion, or a mistake

(well, almost nothing)



(1) The 2006 IECC Future

The 2006 IECC *Future*

- No *major* changes made to 2004 Supplement at Feb/Mar Code Development hearings
- Original “floor mods” continue to be controversial (+R2 wall requirements in zones 3 and higher)
 - DOE’s original proposal had R13/R19 requirements
 - Modifications “from the floor” raised those to R15/R21 at the Sep-03 Code Development hearings; these survived Final Action to become part of 2004 IECC Supplement
 - Several proposals to roll back to R13/R19 rejected by IECC committee at Feb/Mar hearings
 - Anticipate “public comments” to overrule committee at Final Action hearings
- Predicted outcome:



➤ Why do the floor mods matter?

- Not much energy on the table (maybe 1% to 2% depending on location and wall type)
- Builders can be picky about wall construction
- IRC energy chapter still at R13/R19
 - First time IECC and IRC have differed substantially
 - States might selectively adopt one or the other
 - DOE tools will support...one? the other? both? neither?

The 2006+ IECC/IRC Future

- Possible future efforts related to IECC/IRC differences (not necessarily by DOE):
 - Scale IECC back to match IRC
 - Scale IRC up to match IECC
 - Convince ICC to merge IECC and IRC (have them managed by a single committee)
 - Embrace differences and chart parallel courses
 - IRC becomes the “baseline” model code
 - IECC becomes the “stretch” model code
 - What about DOE’s EAct-mandated “determinations”?



(2) The 2007 Supplement Future

The 2007 Supplement Future

- Possible DOE change proposals
 - Minor (or major) fix-ups
 - Minor efficiency improvements
 - Major efficiency improvements

The 2007 Supplement Future (Possible Fix-ups)

- Clarify conditioned crawlspace requirements/definitions
- Tweak performance path to align with latest RESNET/Tax-Credit goings on
- Tweak performance path to eliminate overhang free-rider
- Clarify fire blocking requirements under unvented, cathedralized attics

The 2007 Supplement Future (Possible Fix-ups, cont'd.)

- Revamp vapor retarder requirements
- Add trade-off limits to R-value requirements
- Remove or moderate credit for hydronic systems in oil-dominated regions (current free-rider issue)
- Other ideas?

The 2007 Supplement Future (Possible Minor Efficiency Improvements)

- Increase crawlspace wall insulation requirements in cold climates
- Extend basement insulation requirement to zone 3
- Require mastics or drawbands to supplement tapes on ductwork (a-la CA Title 24 language)
- Other ideas?

The 2007 Supplement Future (Possible Major Efficiency Improvements)

- Mandatory duct testing
- Mandatory whole-house pressure testing
- Limits on “bad glass” in the South
- Penalty for ducts outside conditioned space
- Mandatory HVAC sizing calcs and/or verification of refrigerant charge
- Down-weighting of HVAC credit against envelope
- Expanded scope of code
 - Lighting?
 - Appliances?
 - Other?



(3) The Visionary Future

➤ The state of the code today

- Still allows houses to consume energy
- Most components have plateaued (LCC-wise)
- Requires too much attention to achieve minimum efficiency (leaving little tolerance for efforts to achieve optimum efficiency)
- The *powers that be* only care about pass/fail (i.e., “How much better” buys the builder nothing at the code office)
- Code is rigid and legalistic, whereas achieving advanced performance requires imagination and engineering
- Code is legally and practically limited in scope
- No single entity controls the code

The Visionary Future

- So what might be done to the code?
 - Max out component requirements
 - Focus compliance on performance path
 - Expand scope to include more than HVAC & H₂O
 - Forge better linkages with beyond-code programs, tools, and marketing

The Visionary Future (Shall we max out component requirements?)

- Some components have room for improvement
- Most components are plateaued (or at least have potential returns too low to be worth the battles)
- Even with all components maxed out, we're nowhere near zero energy buildings
 - Code has limited scope
 - Code not designed to optimize, exploit interactive effects
- Conclusion: Some components can be improved but this is not the wave of the future

The Visionary Future (Shall we focus on the performance path?)

- Does allow accounting for interactions
- Code (and code officials) still don't care
- Infrastructure not there (yet) in much of U.S.
- Conclusion: More performance compliance is probably inevitable, but it won't lead the way to the future

The Visionary Future (Shall we expand the scope of the code?)

- To approach ZEB we must consider more than just HVAC and H₂O
- However, while the code might cover all energy end uses, it can't *legally* cover all house components
- Not all components can be *practically* regulated by the code (e.g., appliances not sold with the home)
- Conclusion: Expanded scope will help, but isn't likely to cover everything necessary for ZEB

The Visionary Future (Shall we forge linkages with beyond-code programs?)

- Allows consideration of things not covered by the code
- Builds on infrastructures developing in a (potentially) profitable business climate
- Gives meaning to “how much better”
 - Builder incentive
 - Consumer education
- Typically not easy to map beyond-code results (e.g., HERS ratings) to code compliance (based on equivalence of UA, energy, or energy cost)
- Conclusion: The Future Code must fit with beyond-code programs, but there is work to be done

The Visionary Future (Conclusions)

TBD