

# 2005 National Workshop on State Building Energy Codes

June 29, 2005

## What's Happening in Their Neck of the Woods?

**David Cohan,  
Project Manager  
Northwest Energy Efficiency Alliance,  
Portland, Oregon**

**Topics:**

- Overview of codes training in the Northwest
- Serving Key target audiences

Northeast Energy Efficiency Partnerships, Inc.

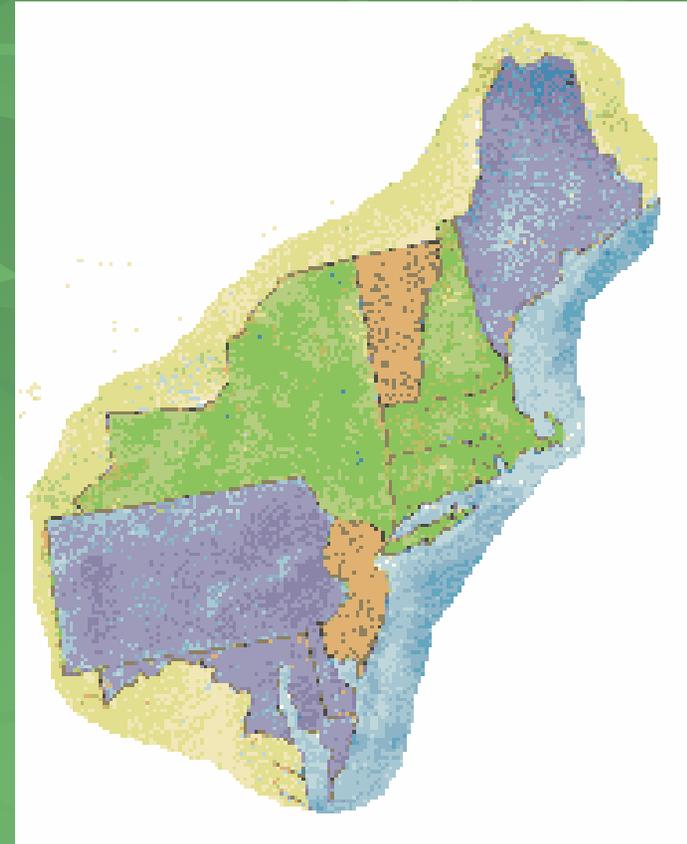


## 2005 National Workshop on State Building Energy Codes

Kevin Donahue

# What's Happening in the Northeast for Code Training?

June 29, 2005



# What's Happening in the Northeast for Code Training?



## DOE NORTHEAST

Connecticut

Maine

Massachusetts

New Hampshire

New York

Rhode Island

Vermont

## DOE MID ATLANTIC

Delaware

District of Columbia

Maryland

New Jersey

Pennsylvania



What's Happening in the Northeast for Code Training?



❖ **CREATING DEMAND FOR TRAINING**

❖ **TRAIN THE CONSUMER**

**High Performance Schools  
Selling WINDOWS**



What's Happening in the Northeast for Code Training?



# TRAINING APPROACHES

- ❖ **LECTURE AND ACTIVITY**
- ❖ **LECTURE FOLLOWED BY LAB OR FIELD EXERCISE**



What's Happening in the Northeast for Code Training?



# TRAINING APPROACHES

❖ **BUILDER FIELD GUIDE BASED**

❖ **TRAIN BY TRADE**

❖ **MULTI MEDIA / WEB BASED**



What's Happening in the Northeast for Code Training?



## Training Plans for 2005

Technical Conference in Fall

Regional Commercial “Train the Trainer” Program in August in PA

Field Evaluation with Blower Doors in NH

Training in CT, RI, MD, and VT.

Possible in ME, MA, DC

HPS and SELLING WINDOWS

Vermont Guidelines for Energy Efficiency Commercial Construction



# The Northeast Regional BEC Project 2005 Underwriters



- U.S. Department of Energy
- Massachusetts Electric
- Keyspan Energy Delivery
- Connecticut Light & Power
- United Illuminating
- Narragansett Electric
- Efficiency Vermont
- NSTAR
- Efficiency Maine
- Western Mass Electric Co
- Cape Light Compact
- Unitil / Fitchburg Gas and Electric
- Granite State Electric

## THANK YOU





U.S. Department of Energy

**Building Energy Codes**



# *2005 Annual Conference* **What's Happening in Their Neck of the Woods**

## **Recent Events Affecting the IECC IRC, & Status of IECC 2004/2006**

**Darren Meyers, PE, CEM**  
**Manager Contracts & Consulting**  
**June 29<sup>th</sup>, 2005**



U.S. Department of Energy

**Building Energy Codes**

# Expected Outcome

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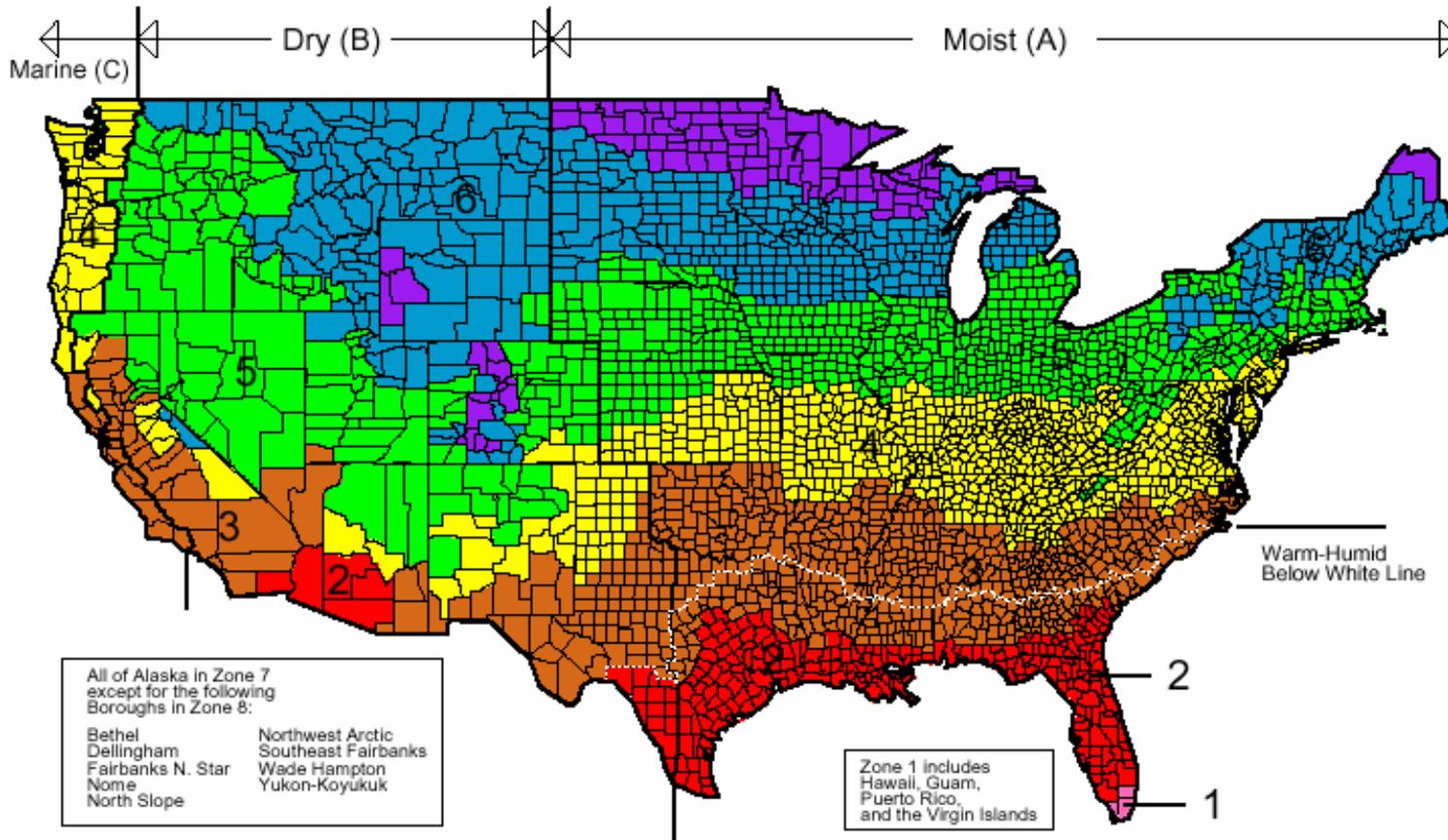
- **2004 IECC Supplement**
- **A better understanding of duct insulation trends across 2000-2003-2004 IECC and IRC**
- **A better understanding of IECC and 90.1 commercial envelope provisions**
- **Status of 2004/05 Code cycle (*2006 IECC*)**

# Envelope Requirements

(EC31-03/04 and EC48-03/04)

New climate zones created...33 consolidated to 8

Map of DOE's Proposed Climate Zones



# 2004 IECC Supplement

## *Substantially Reformatted*

### ■ 2003 IECC

- Ch 1 Administration
- Ch 2 Definitions
- Ch 3 Design Conditions
- Ch 4 Systems Design
- Ch 5 Component Design
- Ch 6 Simplified Design
- Ch 7 **90.1-2001**
- Ch 8 Simple Commercial
- Ch 9 Climate Maps
- Ch10 Referenced Std's
- Appendix

### ■ 2004 IECC (supplement)

- Ch 1 Admin & Enforce
- Ch 2 Definitions
- Ch 3 Climate Zones
- Ch 4 Residential
- Ch 5 –**deleted (see Ch 4)**
- Ch 6 –**deleted (see Ch 4)**
- Ch 7 –**deleted (see Ch 8)**
- Ch 8 COM **90.1-2001**
- Ch 9 –deleted (see Ch 9)
- Ch10 Referenced Std's
- Appendix -deleted

# 2004 IECC Supplement Edition

- The latest set of comprehensive energy provisions published by ICC
- Reflects substantial reformat & content change
  - Improvements to utility and enforcability
  - Climate data harmonized among commercial/residential
  - A “paradigm shift” in compliance assessment
- Prepared in “stand-alone” format
  - Precedence established via '93 CABO MEC
  - Suitable for adoption
- Subject of rumor, innuendo and propaganda



# 2004 IECC Supplement Edition

*(Perhaps hysteria...At best, an uniformed opinion)*

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- 2004 IECC Supp.
  - Section 101.2 (Scope),
  - Section 202 (RESIDENTIAL BUILDING definition)
- 2004 IRC Supp.
  - Section N1101.2 (Compliance)
- Committee recommendations on EC19-04/05
  - IECC Committee recommendation, Part I: AM
  - IRC Committee recommendation, Part II: D
- Considered together, the decision on how to design IRC-buildings for energy conservation is left to the discretion of the builder/designer.

# 2004 IECC Supplement Edition

*(Perhaps hysteria...At best, an uniformed opinion)*

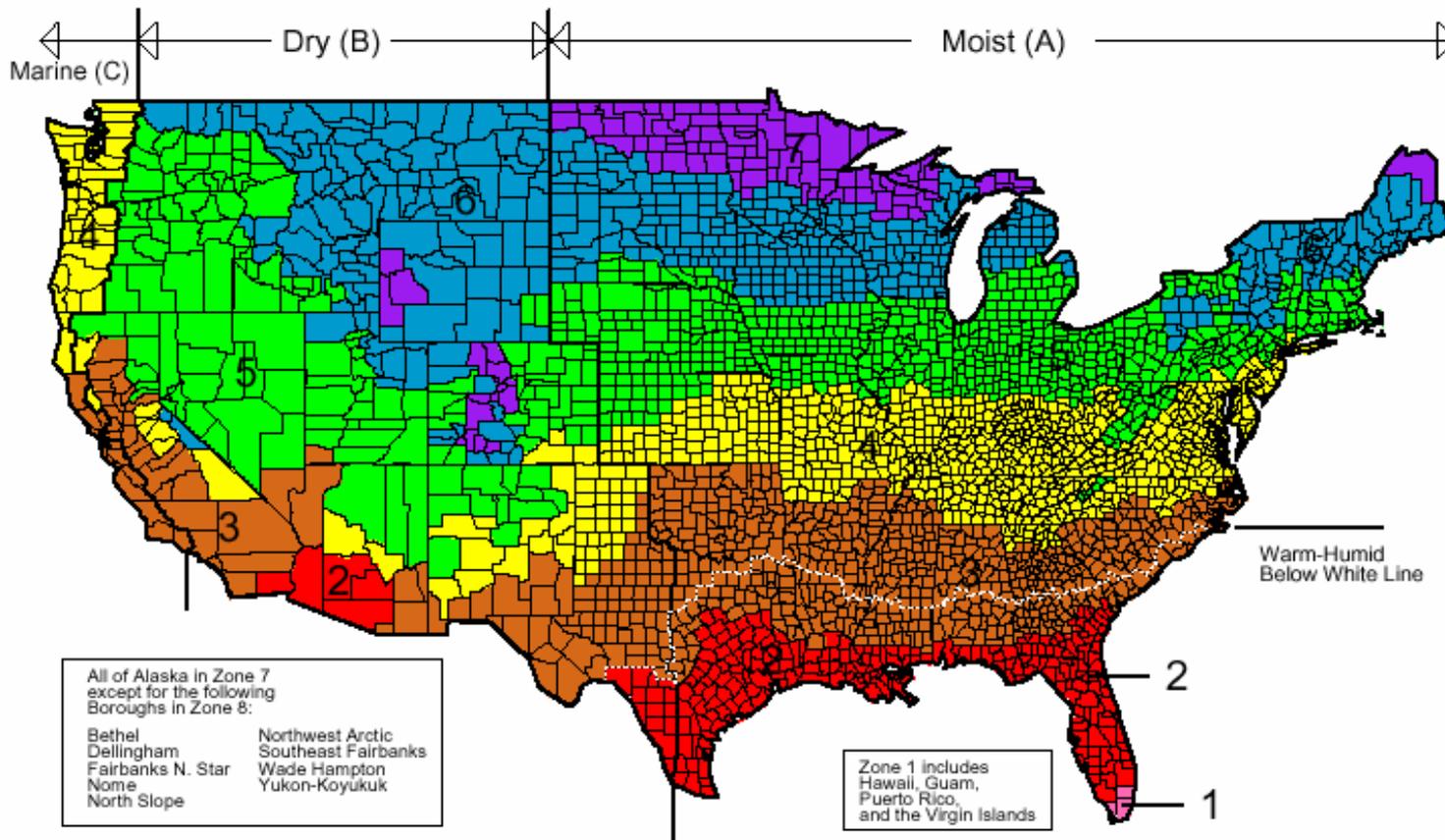
- 2004 IECC Supp. scopes R-3 buildings, and R-2 and R-4 buildings three stories or less in height.
- **IRC buildings are NOT covered by the scope of 2004 IECC Supp Edition.**
- Thus if EC19-04/05 recommendations are sustained: IRC says R-13. IECC says R-15. Is there more to this...?



# Envelope Requirements (EC31-03/04 and EC48-03/04)

New climate zones created...33 consolidated to 24 (15 climates in U.S)

Map of DOE's Proposed Climate Zones

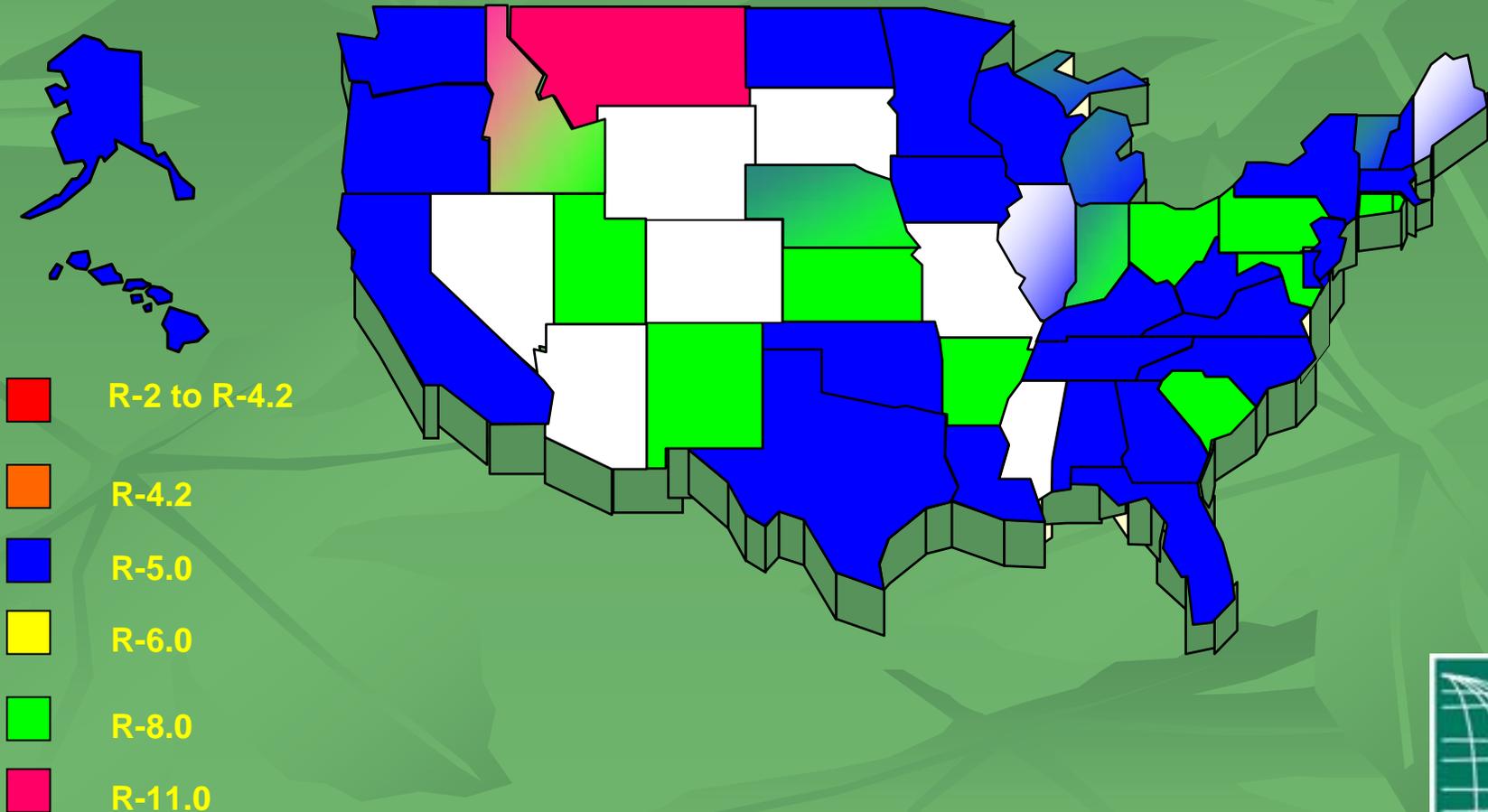






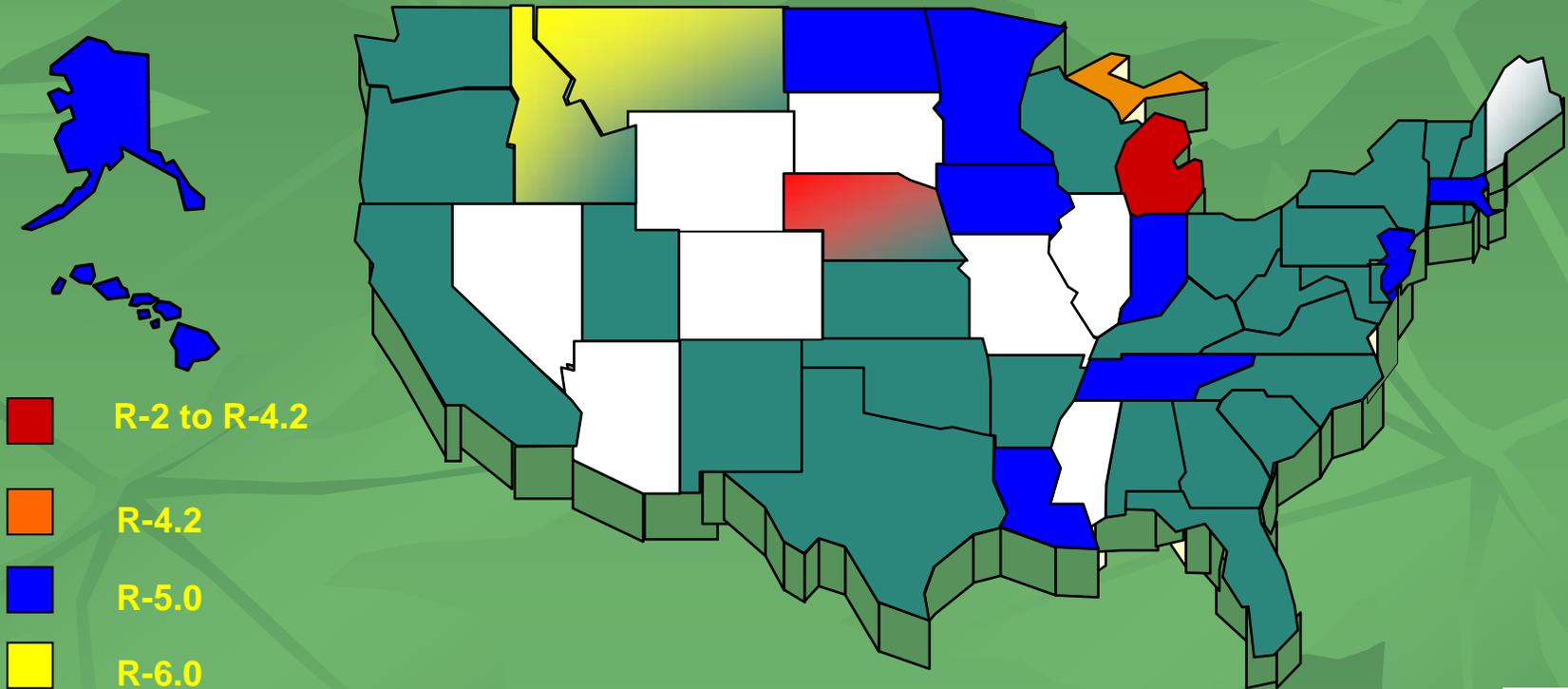


# Residential Duct *R*-Values “SUPPLY” (Unconditioned Spaces ~March 2005)



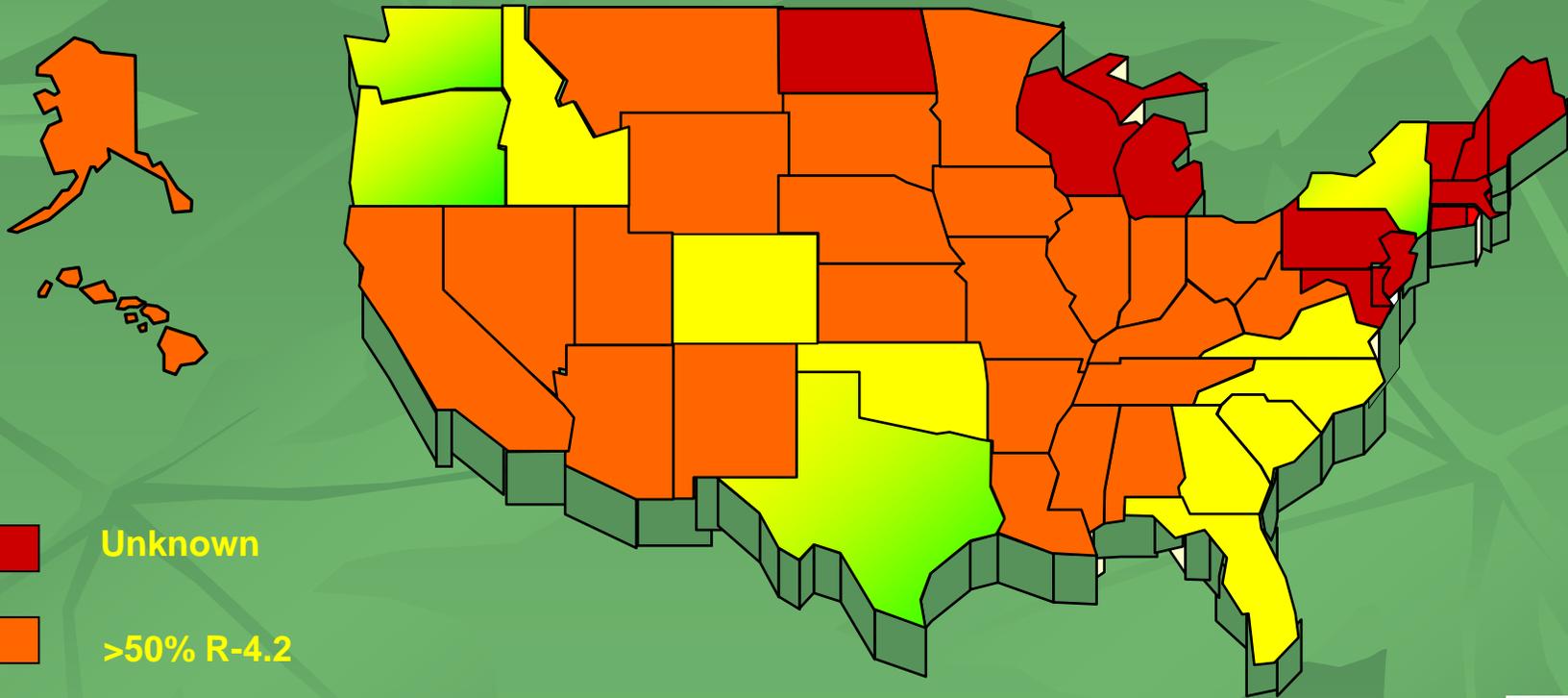
# Residential Duct *R*-Values “RETURN”

*(Unconditioned Spaces ~March 2005)*



- R-2 to R-4.2
- R-4.2
- R-5.0
- R-6.0
- R-8.0
- R-11.0

# Current Duct R-Value Stock (~March 2005)



- Unknown
- >50% R-4.2
- >50% R-6.0
- >50% R-8.0

**OPAQUE BUILDING ENVELOP COMPONENTS REQUIREMENTS**  
**IECC Chapter 7 vs. IECC Chapter 8**

CLIMATE ZONE <i>IECC Ch. 8 more efficient</i> <i>IECC Ch. 7 more efficient</i>	1 (90.1)	2 (90.1)	3 (90.1)	4 (90.1) EXEPT MARINE	5 (90.1) AND MARINE 4	6 (90.1)	7 (90.1)	8 (90.1)
<b>ROOFS — (90.1 NON-RESIDENTIAL)</b>								
Insulation entirely above deck	R-15ci (R-15ci)	R-15ci (R-15ci)	R-15ci (R-15ci)	R-15ci (R-15ci)	R-20ci (R15ci)	R-20ci (R15ci)	R-25ci (R-15ci)	R-25ci (R-20ci)
Metal building w/ R-5 thermal block	R-19+R-10 (R-19)	R-19 (R-19)	R-19 (R-19)	R-19 (R-19)	R-19 (R-19)	R-19 (R-19)	R-19+R-10 (R-19)	R-19+R-10 (R-13+R-19)
Attic and other	R-30 (R-30)	R-30 (R-30)	R-30 (R-30)	R-30 (R-30)	R-30 (R-30)	R-30 (R-38)	R-38 (R-38)	R-38 (R-38)
<b>WALLS, ABOVE GRADE — (90.1 NON-RESIDENTIAL)</b>								
Mass	NR (NR)	NR (NR)	R-5.7ci (R-5.7ci)	R-5.7ci (R-5.7ci)	R-7.6ci (R-7.6ci)	R-9.5ci (R-9.5ci)	R-11.4ci (R-11.4ci)	R-13.3ci (R-13.3ci)
Metal building	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13+R-13 (R-13)	R-10, 36in. (R-10,36in.)	R-13+R-13 (R-13+R-13)	R-13+R-13 (R-13+R-13)
Metal framed	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13+R-3.8ci (R-13+R-3.8ci)	R-13+R-3.8ci (R-13+R-3.8ci)	R-13+R-7.5ci (R-13+R-7.5ci)	R-13+R-7.5ci (R-13+R-7.5ci)
Wood framed and other	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13 (R-13)	R-13+R-7.5ci (R-13+R-7.5ci)
<b>WALLS, BELOW GRADE — (90.1 NON-RESIDENTIAL)</b>								
Below grade wall	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	R-7.5ci (R-7.5ci)	R-7.5ci (R-7.5ci)
<b>FLOORS — (90.1 NON-RESIDENTIAL)</b>								
Mass	NR (NR)	R-5ci (R-4.2ci)	R-5ci (R-6.3ci)	R-10ci (R-6.3ci)	R-10ci (R-8.3ci)	R-10ci (R-8.3ci)	R-15ci (R-8.3ci)	R-15ci (R-12.5ci)
Joist/Framing (Steel)	NR (NR)	R-19 (R-19)	R-19 (R-19)	R-19 (R-19)	R-19 (R-19)	R-30 (R-30)	R-30 (R-30)	R-30 (R-30)
Joist/Framing (Wood-framed)	NR (NR)	R-19 (R-19)	R-19 (R-19)	R-19 (R-19)	R-19 (R-30)	R-30 (R-30)	R-30 (R-30)	R-30 (R-30)
<b>SLAB-ON-GRADE FLOORS — (90.1 NON-RESIDENTIAL)</b>								
Unheated slabs	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	R-10, 24in. (R-10,24 in.)
Heated slabs	R-7.5, 12in. (R-7.5,12in.)	R-7.5, 12in. (R-7.5,12in.)	R-7.5, 12in. (R-7.5,12in.)	R-7.5, 12in. (R-7.5,24in.)	R-7.5, 24in. (R-10,36in.)	R-10, 36in. (R-10,36in.)	R-10, 36in. (R-10,36in.)	R-10, 48in. (R-10,48in.)
<b>OPAQUE DOORS — (90.1 NON-RESIDENTIAL)</b>								
Swinging	U-0.70 (0.70)	U-0.70 (0.70)	U-0.70 (0.70)	U-0.50 (0.50)				
Roll-up or sliding	U-1.45 (1.45)	U-0.50 (0.50)	U-0.50 (0.50)	U-0.50 (0.50)				

## TRANSLUCENT BUILDING ENVELOP COMPONENTS REQUIREMENTS IECC Chapter 7 vs. IECC Chapter 8

CLIMATE ZONE <i>IECC Ch. 8 more efficient</i> <i>IECC Ch. 7 more efficient</i>	1 (90.1)	2 (90.1)	3 (90.1 '3c')	4 (90.1) EXEPT MARINE	5 (90.1) AND MARINE 4	6 (90.1)	7 (90.1)	8 (90.1)
<b>VERTICAL FENESTRATION</b> — IECC's 40% MAXIMUM VALUE vs. (90.1's NON-RESIDENTIAL 50% MAXIMUM VALUE)								
<b>SHGC – ALL FRAME TYPE S</b> (FOR 90.1 SHGC = "ALL" ORIENTATIONS AND * = MODIFIED USING TABLE 5.5.4.4.1)								
SHGC: PF < 0.25	0.25 (0.19)	0.25 (0.17)	0.25 (0.20)	0.40 (0.25)	0.40 (0.26)	0.40 (0.26)	NR (0.36)	NR (NR)
SHGC: 0.25 ≤ PF < 0.50	0.33 (0.25)*	0.33 (0.23)*	0.33 (0.27)*	NR (0.33)*	NR (0.35)*	NR (0.35)*	NR (0.49)*	NR (NR)
SHGC: PF ≥ 0.50	0.40 (0.30)*	0.40 (0.27)*	0.40 (0.31)*	NR (0.39)*	NR (0.41)*	NR (0.41)*	NR (0.56)*	NR (NR)
<b>U-FACTOR</b> (FOR 90.1 U-FACTOR = "OPERABLE")								
<b>Framing Material other than Metal, with or without metal reinforcement and cladding</b>								
U-Factor	1.20 (1.22)	0.75 (1.22)	0.65 (1.22)	0.40 (0.46)	0.35 (0.46)	0.35 (0.46)	0.35 (0.46)	0.35 (0.35)
<b>Metal Framing with or without thermal break</b>								
Curtain Wall/Storefront U-Factor	1.20 (1.22)	0.70 (1.22)	0.60 (1.22)	0.50 (0.46)	0.45 (0.46)	0.45 (0.46)	0.45 (0.46)	0.45 (0.35)
Entrance Door U-Factor (90.1=SWING)	1.20 (0.46)	1.10 (1.27)	0.90 (1.27)	0.85 (0.47)	0.80 (0.47)	0.80 (0.47)	0.80 (0.47)	0.80 (0.39)
All Others U-Factor <sup>1</sup> (90.1=OPER)	1.20 (0.46)	0.75 (1.27)	0.65 (1.27)	0.55 (0.47)	0.55 (0.47)	0.55 (0.47)	0.50 (0.47)	0.50 (0.39)
<b>SKYLIGHTS</b> — 3% MAXIMUM VALUE vs. (90.1's 5% NON-RESIDENTIAL MAXIMUM VALUE)								
<b>Glass</b>								
U-Factor	1.60 (1.98)	1.05 (1.98)	0.90 (1.98)	0.60 (1.17)	0.60 (1.17)	0.60 (1.17)	0.60 (1.17)	0.60 (0.98)
SHGC	0.40 (0.36)	0.40 (0.36)	0.40 (0.61)	0.40 (0.39)	0.40 (0.39)	0.40 (0.49)	NR (0.64)	NR (NR)
<b>Plastic</b>								
U-Factor	1.90 (1.90)	1.90 (1.90)	1.30 (1.90)	1.30 (1.30)	1.30 (1.10)	0.90 (0.87)	0.90 (0.87)	0.60 (0.61)
SHGC	0.35 (0.34)	0.35 (0.39)	0.35 (0.65)	0.62 (0.34)	0.62 (0.62)	0.62 (0.58)	NR (0.71)	NR (NR)

**Code Changes  
Submitted by 8-20-04**

**Code Changes  
Submitted by 3/06**

**Code Changes  
Printed & Distributed 12/04**

**2004 Supplement  
Published ~ 7/21/04**

**2006 Editions  
Published 2/06**

**Open Public  
Hearing 2/05**

**2004/2005  
I-CODE DEVELOPMENT  
CYCLE**

**Final Action  
Hearing 9/05**

**Public Hearing Results  
Printed & Distributed by 5/05**

**Public Comments  
Printed & Distributed by 8/05**

**Public Comments  
Sought on Public  
Hearing Results until 6/05**

# 2003/2004 IECC Code Cycle

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- **54 proposed changes submitted by 26 proponents**
- **7 Changes included IRC Part II coordination**
- **Changes by Outcome**
  - (13) Approved as submitted – 24%
  - (7) Approved as modified – 13%
  - (24) Disapproved – 44%
  - (10) Withdrawn – 19%

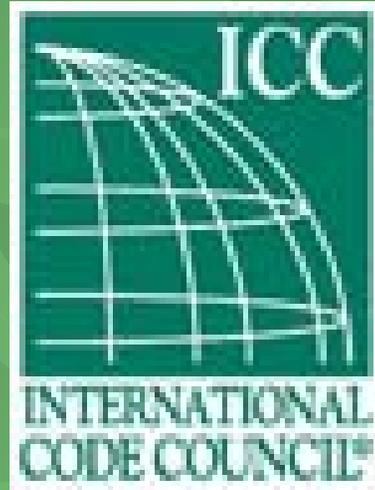
# 2004/2005 IECC Code Cycle

- **101 Proposed Changes by 34 proponents**
- **37 Changes include IRC Part II coordination**
- **Changes by Chapter**
  - (5) Chapter 1: Administration & Enforcement
  - (3) Chapter 2: Definitions
  - (2) Chapter 3: Climate Zones
  - (46) Chapter 4: Residential Energy Efficiency
  - (45) Chapter 8: Design for Commercial Buildings
- **70 Public comments to 27 Items**
  - (12) EC16 (R-13 v. R-15) IECC...D
  - (13) EC19 (Sum of insulation) IECC Pt. I - AM; IRC Pt. II - D
  - (10) EC22 (*U*-factor Math) IECC Pt.I - AS; IRC Pt. II - D
  - (2) EC57/EC60 (Commercial 40% Glazing v. 50% Glazing)

# Thank You!

*Consider me your resource to ICC*

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**5203 Leesburg Pike, Suite 600**  
**Falls Church, VA 22066**  
**1-888-ICC-SAFE x4307**  
**703-931-4533**  
**[www.iccsafe.org](http://www.iccsafe.org)**

# What's Happening in Texas?

Presented by the  
Energy Systems Laboratory  
Texas A&M University System

# The Five Questions?

- Who?
- What?
- When?
- Where?
- How?