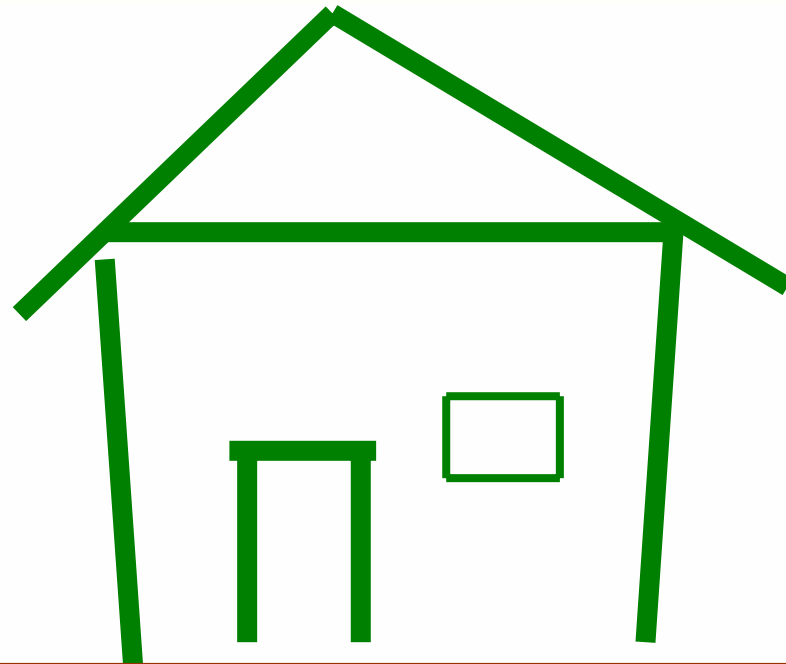


# **Green Building & RESNET Raters**

***Vera Novak, LEED AP  
Insulating Concrete Form  
Association  
vnovak@forms.org***

# Foundation of Green Building



**Energy Efficiency  
& Durability**

# Function of Buildings

Basic  
Shelter



Comfort



Curb Appeal



"I didn't actually catch anything, but I do feel I gained some valuable experience."



# Gaps in the Cave Concept





# Where did we go wrong?



**Efficient Supply/ Return?**

**Who needs flashing?**



# Consequences



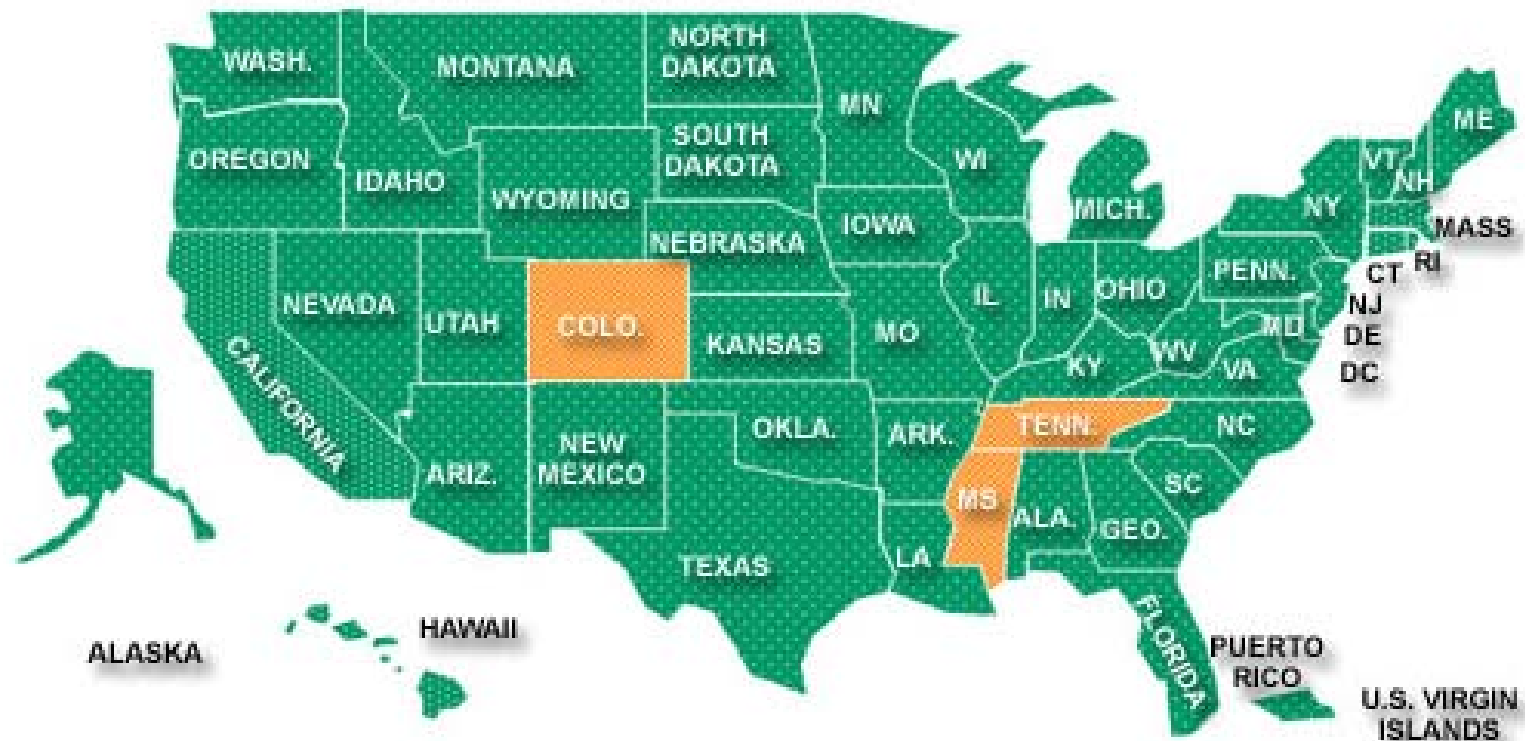
# Big Stick approach to Change

## ***Minimal Levels of Construction Quality – Codes***

- *IRC*
- *IECC –*
  - *Prescriptive*
  - *Performance*

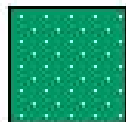
***Lowest Common Denominator –  
Leave No Building Behind***

# I-Code Adoption

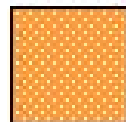


Click on state for I-Code adoption information

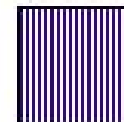
Updated: 02/08/08



One or more International Codes® currently enforced statewide



One or more International Codes® enforced within state at local level



One or more International Codes® adopted statewide with future enforcement date



# Motivation for Change \$\$\$\$

~~**“70's Oil Crisis”**~~ - **Energy COSTS \$\$**

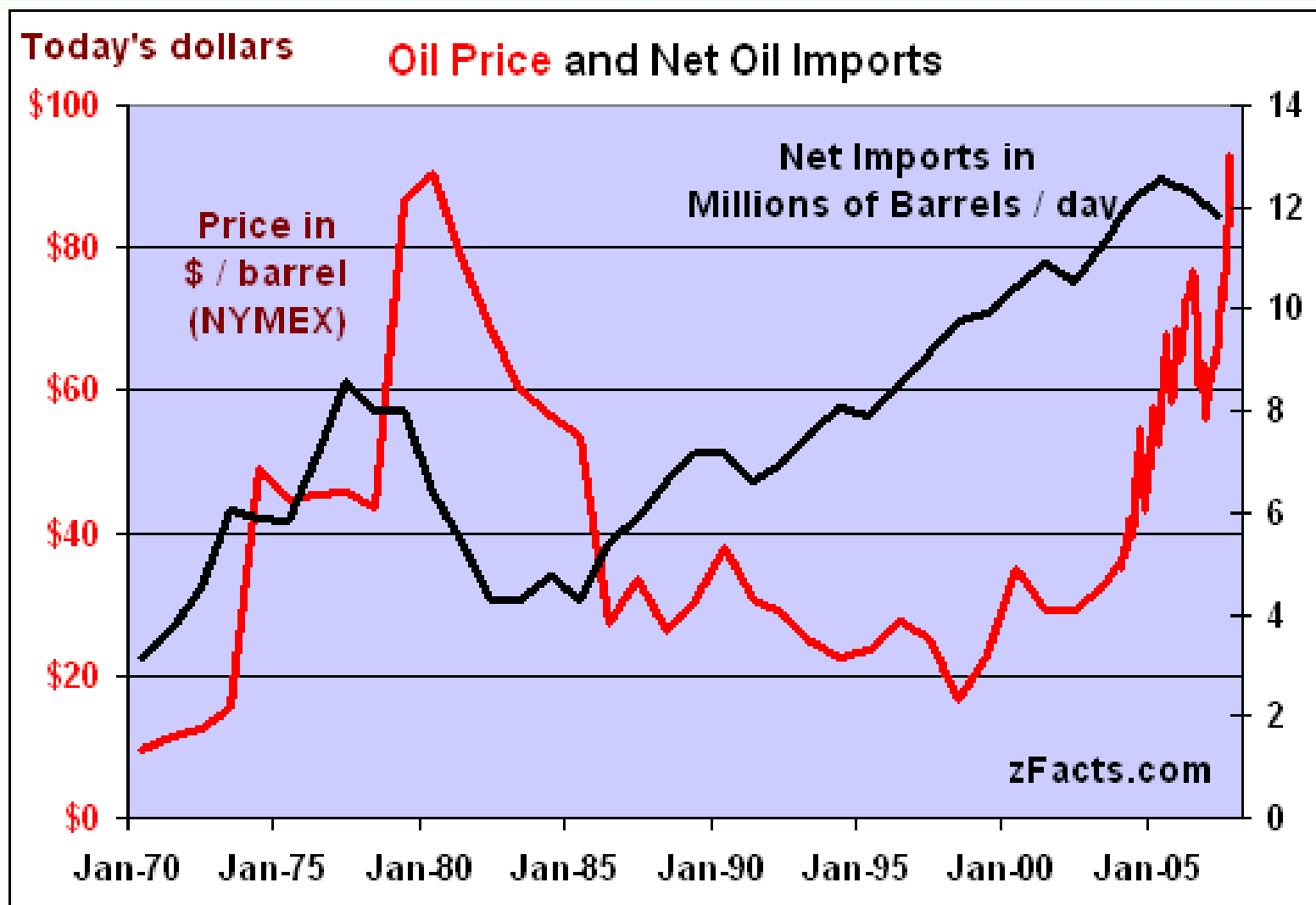


~~**Motivation for Energy Efficiency**~~

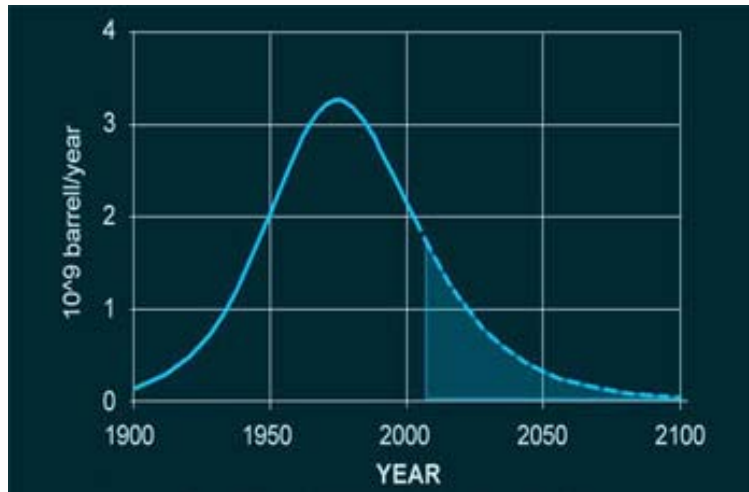


**Insulation R-Value Minimums**

# What's different this time?



# US Fuel Production



***US Crude Oil Production peaked in 1970's***

***US Natural Gas Production peaked in 1973***

- *heats  $\frac{1}{2}$  homes in United States and generate over 20% of our electricity.*

***US Coal Reserves - possible peak in 2035***

# Royal Dutch Shell – Jan 25, 2008

***“Shell estimates that after 2015, supplies of easy-to-access oil and gas will no longer keep up with demand.”***



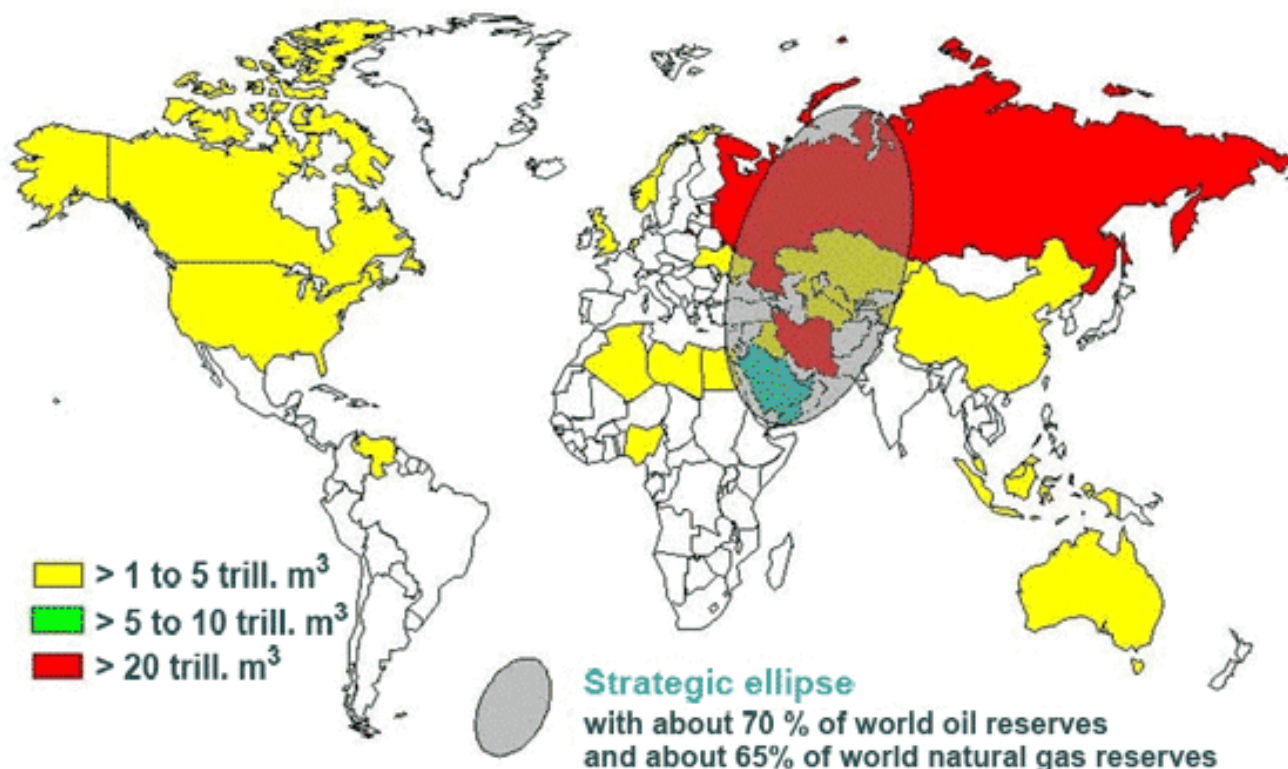
Jeroen van der Veer

***Jeroen van der Veer, Shell's chief executive, E-mail to Shell Employees, Jan 25, 2008***



# Dependence on Foreign Sources

Countries with natural gas reserves > 1 trill. m<sup>3</sup>



# Environmental Programs

- ***Architecture 2030.org***
- ***USGBC LEED***
- ***US Govmn't Energy Mandate***
  - *New Federal Buildings 30%*
  - *Existing Federal Buildings 20%*

# Public Awareness

- ***“Inconvenient Truth”***
- ***Passive Resistance***
  - *Climate Change – Storms, Fires, Extreme Weather*
  - *Power Outages*
  - *Durability – Mold*
- ***Homeland Security***
- ***Media - GREEN, GREEN, GREEN***

# What is GREEN?

## ***DEPENDS...***

***#1 Energy Efficiency (building heating/cooling and water heating)***

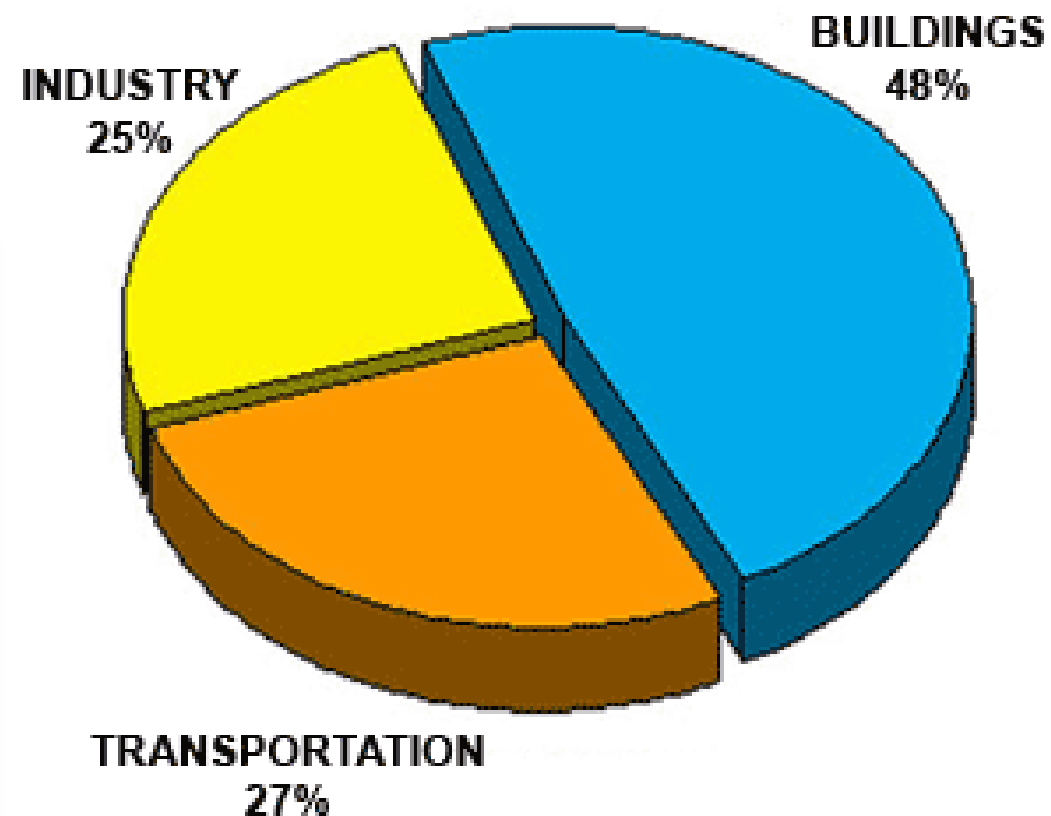
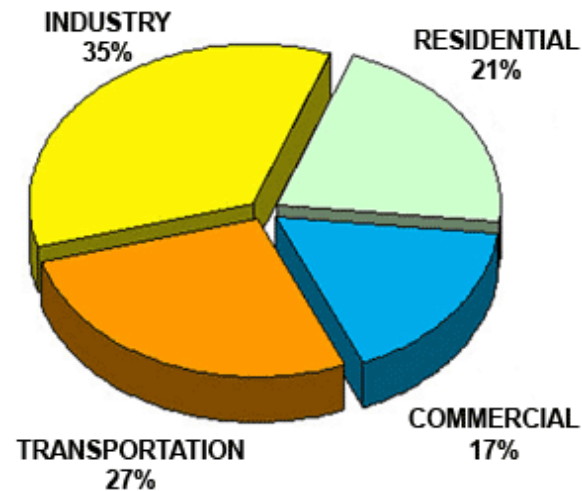
***#2 Durability***

***#3 and... site specific priorities***

- *Lot & site development*
- *Resource efficiency*
- *Water efficiency*
- *Indoor environmental quality*
- *Global impact*
- *Maintenance & education*



# Building Sector

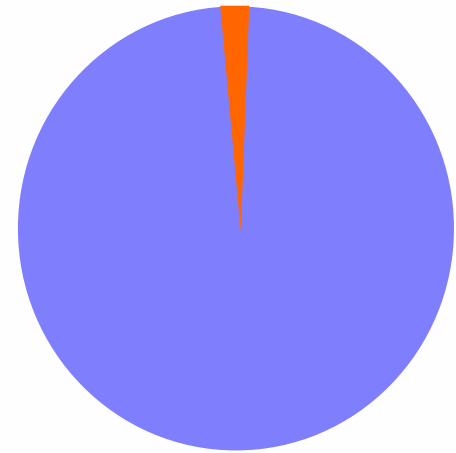


# Life Cycle of Building

## ***Total Environmental Impact Over Life of Residential Building***

***< 2% Embodied Energy  
for materials  
acquisition,  
manufacturing and  
construction accounts***

***98% Energy for heating /  
cooling & use***



# Life Cycle Calculations

***Life Cycle  
Inventory***

+

***Operating  
Energy***

---

***Years of Service Life***

# Short Service Life





# Opportunities for RESNET Raters

- 1. Energy Star for Homes***
- 2. USGBC LEED for Homes***
- 3. National Green Build Standard***
- 4. New Benchmarks***



# Energy Star

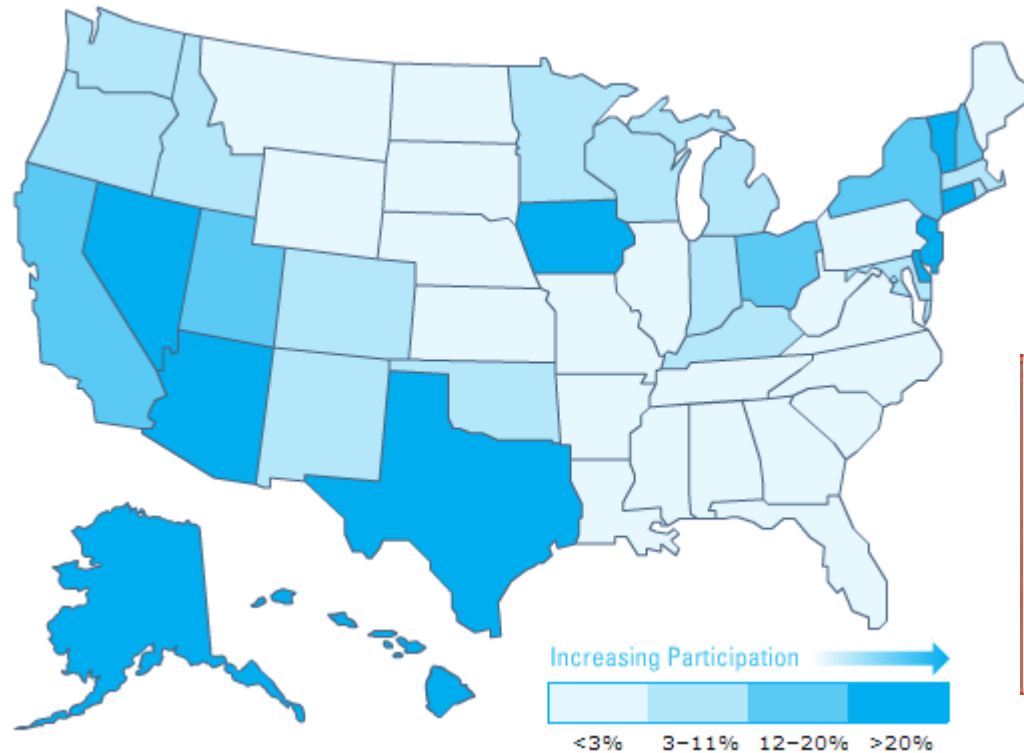
***1992 the US Environmental Protection Agency (EPA) introduced ENERGY STAR as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions.***

***1995 Energy Star for Buildings launched***



# Energy Star

***10x increase in 5 years***

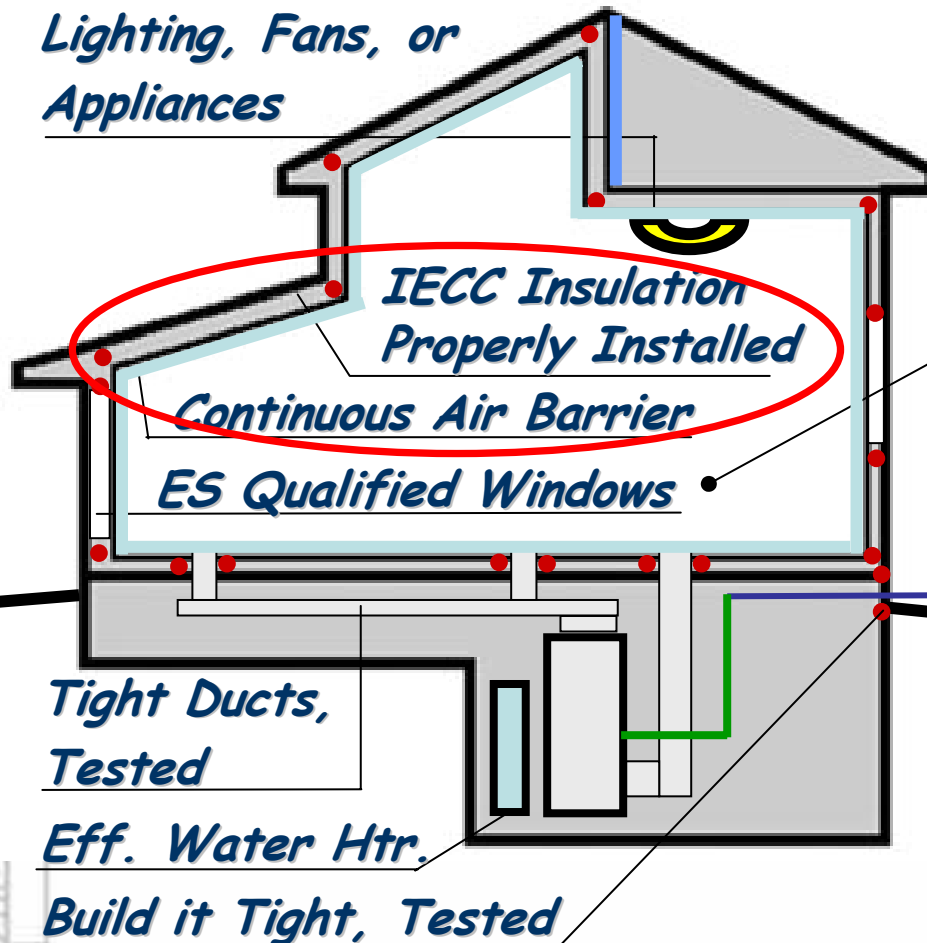


**Tax Credits Under  
the Energy Bill**



# New Energy Star Spec

*ENERGY STAR Qualified  
Lighting, Fans, or  
Appliances*



*IECC Insulation  
Properly Installed*

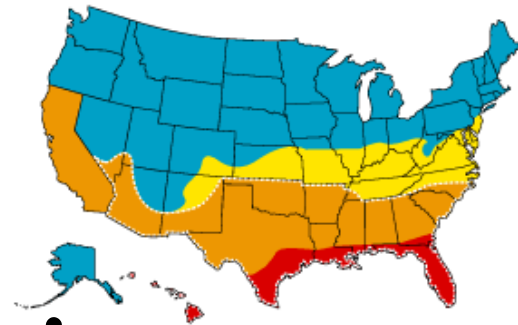
*Continuous Air Barrier*

*ES Qualified Windows*

*Tight Ducts,  
Tested*

*Eff. Water Htr.*

*Build it Tight, Tested*



- Northern  
Mostly Heating
- North/Central  
Heating & Cooling
- South/Central  
Cooling & Heating
- Southern  
Mostly Cooling
- Alternative  
Criteria Allowed

*Heating/Cooling  
Right-Sized ES Equip.*





**USGBC**

**USGBC Welcomes 10,000th Member**

**Former President Bill Clinton to  
Keynote Opening Plenary of  
Greenbuild Conference**



**New Energy Credit Required for All  
LEED Projects**

**USGBC and ICC to Collaborate**



# Energy is the KEY

## ***LEED New Construction***

### ***Energy & Atmosphere***

- *Credit 1 - Optimize Energy Performance*

***Up to 10 points out of possible 69***

***42% Energy Savings over  
ASHRAE/IESNA Standard 90.1-2004***



# USGBC LEED for Homes

## ***Release Fall 2007 – to date:***

- *540 homes have been LEED certified.*
- *32 LEED for Homes Providers*
- *12,940 registered projects*

## ***Possible 130 points***

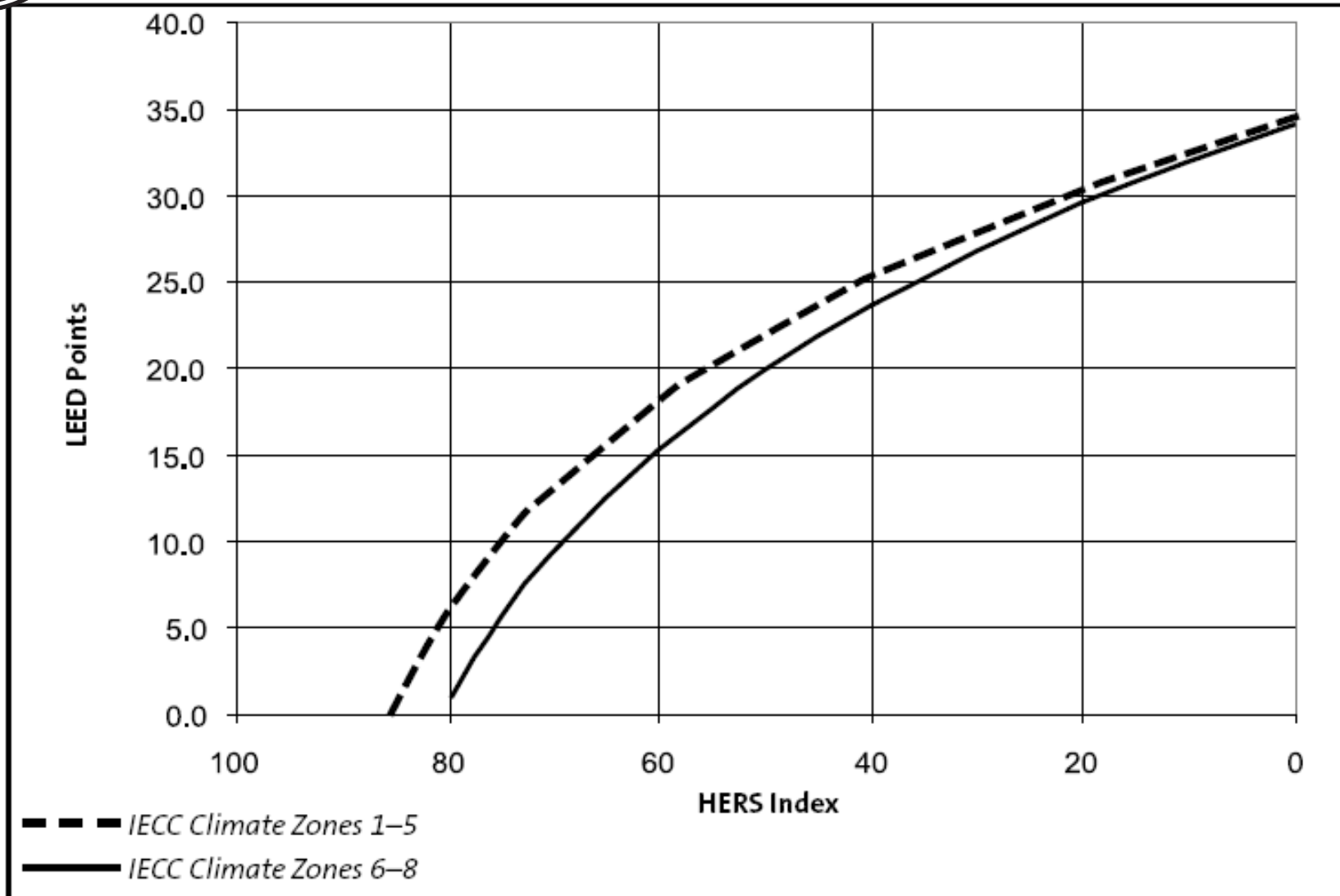
- *45 Certified, 60 Silver, 75 Gold, 90 Platinum*

## ***Min. Performance Requirements of Energy Star for Homes***

- *Up to 34 points possible for Net Zero*
- *20 points for HERS 50*



# Energy Points - LEED Homes



# NAHB Gets in the Act

## ***2001 - NAHB pushed for Energy Efficient Tax Credit Legislation.***

- *Proposed \$1,250 for 30% energy efficiency above IECC 2000.*

## ***2005 - Energy Act -***

- *\$2,000 for 50% improvement over IECC 2003 (2004 supplement).*

## ***2006 - extended to Dec. 31, 2008***

## ***2008 - no proposed extension for residential new construction***

# National Green Building Standard



***2002 - 17 Local HBA Green Building***

***2005- NAHB publishes the Green  
Build Guideline.***

***2007 - 50 local HBA Green Programs***

***2008 – ANSI NAHB ICC-700***

***Green Build Standard***



# Guiding Principle

## ***Energy Efficiency***

- *Far-reaching environmental impacts*
- *Energy to heat and cool a home over its life far outweighs that to manufacture and construct it.*
- *Energy Efficiency is considered a priority in most existing green building guidelines/ programs.*
- *Protect homeowner from inevitable utility bill increases.*
- *Whole systems approach*

# Original Guidelines

## 3.2 PERFORMANCE PATH

An energy-efficiency line item with a “(PP)” preceding it is a line item likely to be used to calculate X% above IECC 2003. If a builder chooses to use the performance path—line item 3.2.1—to meet the guideline’s energy-efficiency requirements, then those measures with a “(PP)” cannot be used to obtain the 100 additional points from sections of your choice.

**3.2.1** Home is X% above IECC 2003

A. 15% (Bronze)

B. 30% (Silver)

C. 40% (Gold)

**37**

**62**

**100**

ResCheck Analysis

# Original Guidelines

## 3.3 PRESCRIPTIVE PATH

### 3.3.1 Building envelope

(PP)A. Increase effective R-value of building envelope using advanced framing techniques, continuous insulation, and/or, integrated structural insulating system. Measures may include but are not limited to:

- SIPS\*, or 8
- ICFS\*, or 8
- Advanced framing, or 6
  - Insulated corners and interior/exterior wall intersections\*
  - Insulated headers on exterior walls
- Raised heel trusses 2
- Continuous insulation on exterior wall 4
- Continuous insulation on cathedral ceiling 4

\* This line item also has a resource-efficiency benefit.

(PP)B. Incorporate air sealing package to reduce infiltration. *(All measures that apply to project must be performed.)*

10



NATIONAL  
GREEN BUILDING  
STANDARD™

# Task Force – Energy Efficiency

## ***Paradigm Shift – Think Outside the Box***

***Previous system awarded points for a short list of alternative building materials or improvements to the standard frame system.***

***Propose points be based on the merits of the building envelope, such as the continuity of the insulation, the air tightness, and the thermal mass.***



## ***Levels:***

- *Bronze, Silver, Gold, Emerald*

## ***Performance Path***

- *Minimum 15% above IECC*
- *Shall be used for Emerald Level*
- *Software in accordance with IECC 404*

## ***Alternate Bronze Level Compliance***

- *Energy Star qualified home*



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# NAHB ICC-700 Draft #2

## ***Prescriptive Path – Building Envelope***

- *Total UA – ResCheck*
  - *When insulation is used for qualification, must be Grade 1, third party inspected*
- *Insulation Installation –*
  - *Graded by a third party*
- *Thermal Mass*
- *Air and Thermal Barrier (Checklist)*
  - *More points for 3<sup>rd</sup> party verification*
- *Blower Door Test Performance Verification*



# NAHB Green Building Program

## ***Targets all builders/ developers***

- *On-line sign-up, self-scoring check-list*  
[www.nahbgreen.org](http://www.nahbgreen.org)
- *NAHB nationally trained Certified Green Professional (CGP)*
  - [www.nahb.org/CGPinfo](http://www.nahb.org/CGPinfo)
- *\$150 fee (higher for non-members)*





NATIONAL  
GREEN BUILDING  
STANDARD™

# How to Become a CGP

## **Required Courses**

- [Green Building for Building Professionals](#)
  - \$395.00 members , \$445.00 non-members
- [Business Management for Building Professionals](#)
  - \$195.00 members , \$245.00 non-members

*OR hold an NAHB designation*

***Minimum of two years of building industry experience***

***Adherence to the CGP Code of Ethics***

## **Graduation Fees:**

- \$145.00 members, \$245.00 non-members

## **Annual Renewal Fees:**

- \$50.00 members, \$75.00 non-members

## **Continuing Education Requirement**

- *a minimum of twelve hours of continuing education every three years.*

# NAHB ICC-700 vs Local Programs?

***NAHB ICC-700 – Voluntary, Flexible,  
Market Driven, National  
Benchmark, Green Build Standard***

***Local HBA's – 850***

- *50 currently have Green Programs*
- *Co-Brand NAHB ICC-700*

***LEED-H targets the top 25%,  
architect driven***

# Beyond Minimum – US

## ***Building America Program***

- *Min. 40% better than IECC*

## ***Passive House***

- *<1.24 Kwh / ft<sup>2</sup>*

## ***Architecture 2030***

- *Carbon Neutral in 2030*

# Architecture 2030.com

***NOW - 50% reduction on  
new / old buildings***



Ed Mazria

***60% in 2010***

***70% in 2015***

***80% in 2020***

***90% in 2025***

***Carbon-neutral in 2030***

# Regional Programs

## ***Austin Climate Protection Plan***

- *Homes to be zero energy capable by 2015 – ie min 65% improvement over energy code*

## ***SMUD – Solar Smart Homes***

- *31% – 38% better than Title 24*



# Building Products

## ***Insulating Concrete Forms (ICFs)*** ***Structural Insulated Panels (SIPs)***

### Energy Star Thermal Bypass Checklist

uninsulated in Climate Zones 4 and 5.)

#### **Best Practices Encouraged, Not Req'd.:**

1.5 Air Barrier At All Band Joists (Climate Zones 4 and higher)

1.6 Minimize Thermal Bridging (e.g., OVE framing, SIPs, ICFs)

#### **Requirements:**

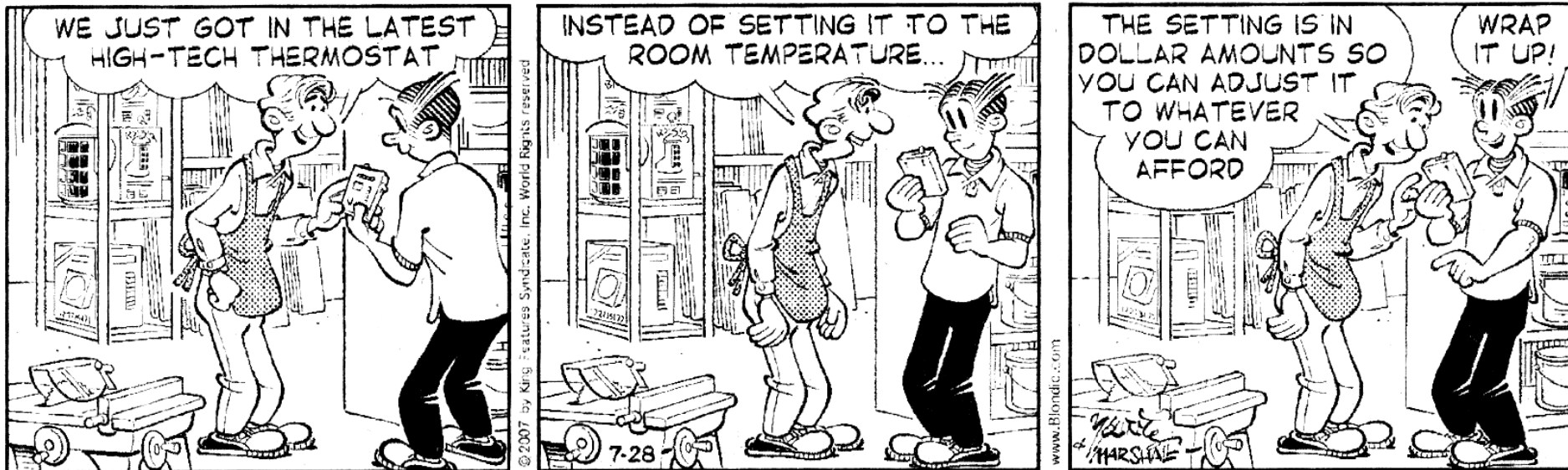
# More GREEN Opportunities

- ***HVAC Diagnostics – System Design***
- ***Durability – Building Science***
- ***Water Efficiency***
- ***Indoor Air Quality***

# So many opportunities....

**BLONDIE**

Dennis Young & John Marshall



**Vera Novak**

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**801.484.2042**