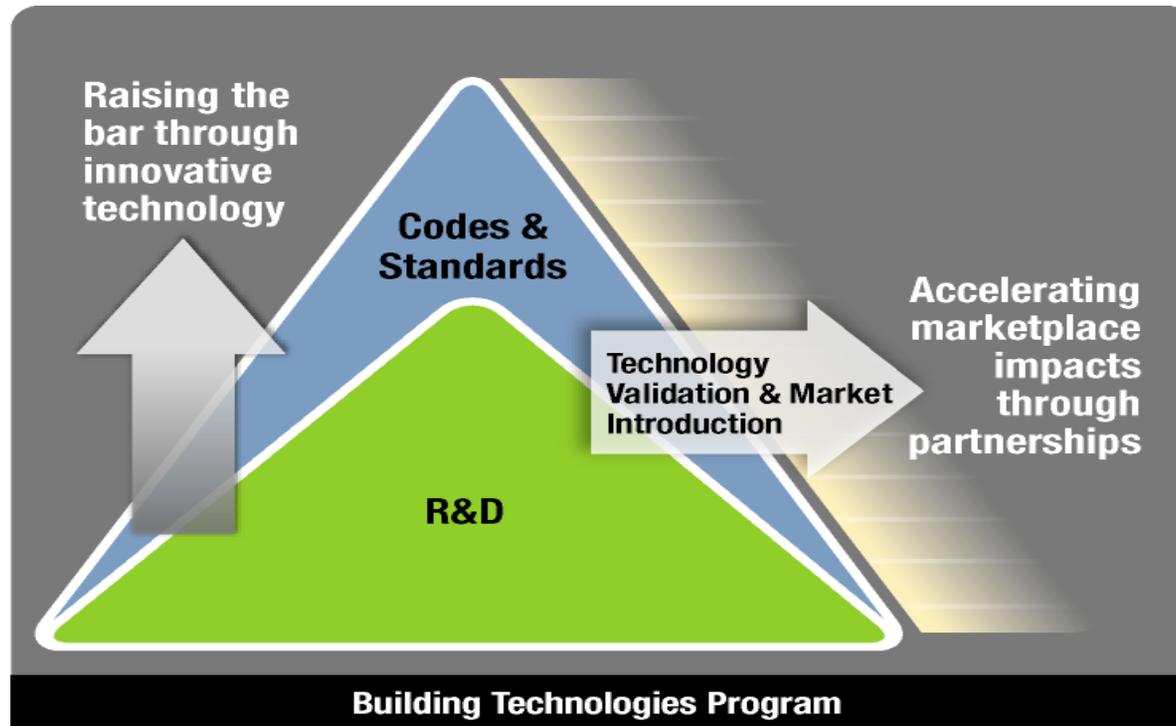




The Building Technologies Program and Building Energy Codes

Buildings Technologies researches and deploys new technologies to make homes and commercial buildings more affordable, energy efficient, and better performing.

Energy Efficiency & Renewable Energy



The investment in Buildings R&D yielded an ROI of 15:1 from 1978 to 2000.

Source: "Energy Research at DOE: Was it Worth It", NRC 2001, Tables 3.1

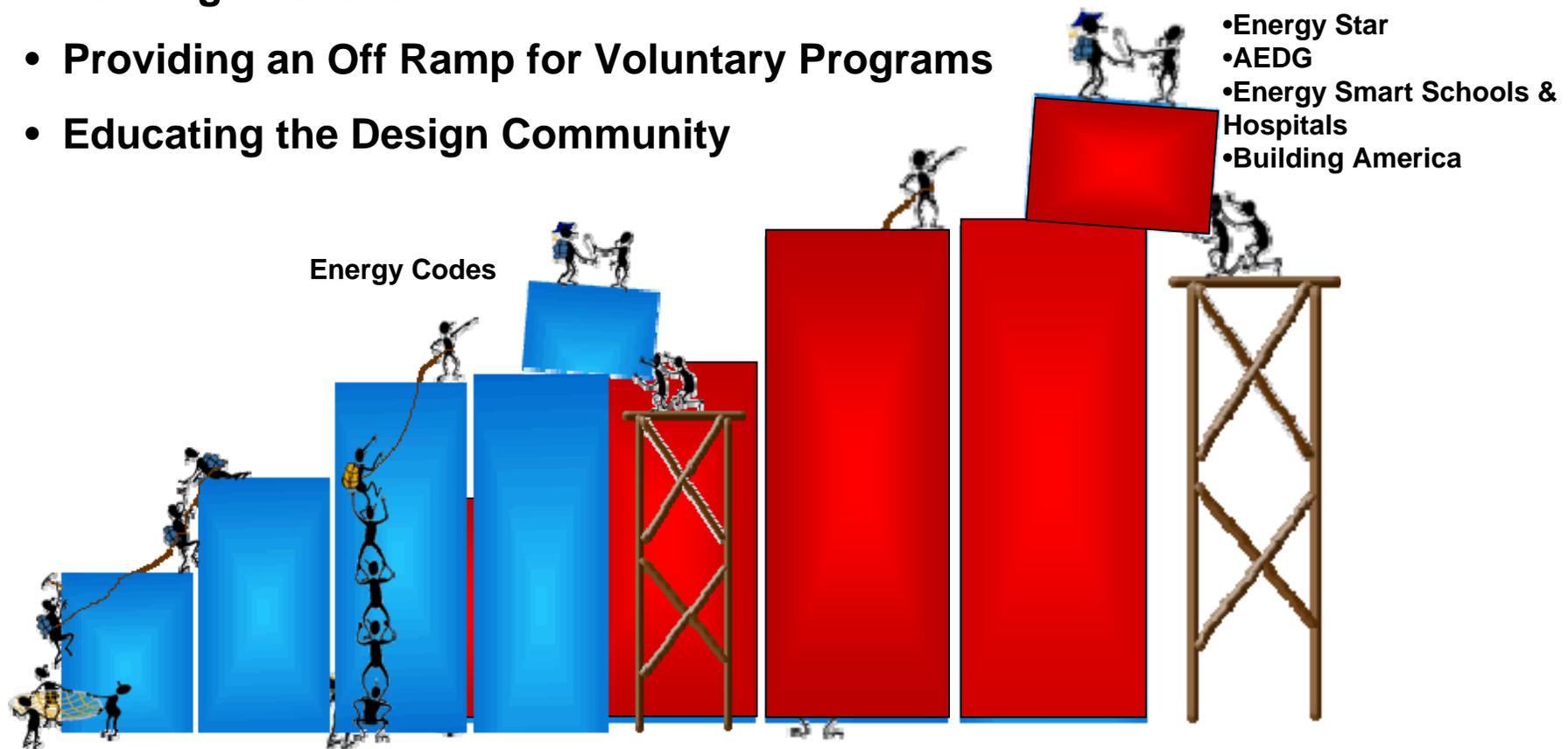
Raising the Bar

Energy Efficiency &
Renewable Energy



Codes:

- Locking in Success
- Providing an Off Ramp for Voluntary Programs
- Educating the Design Community



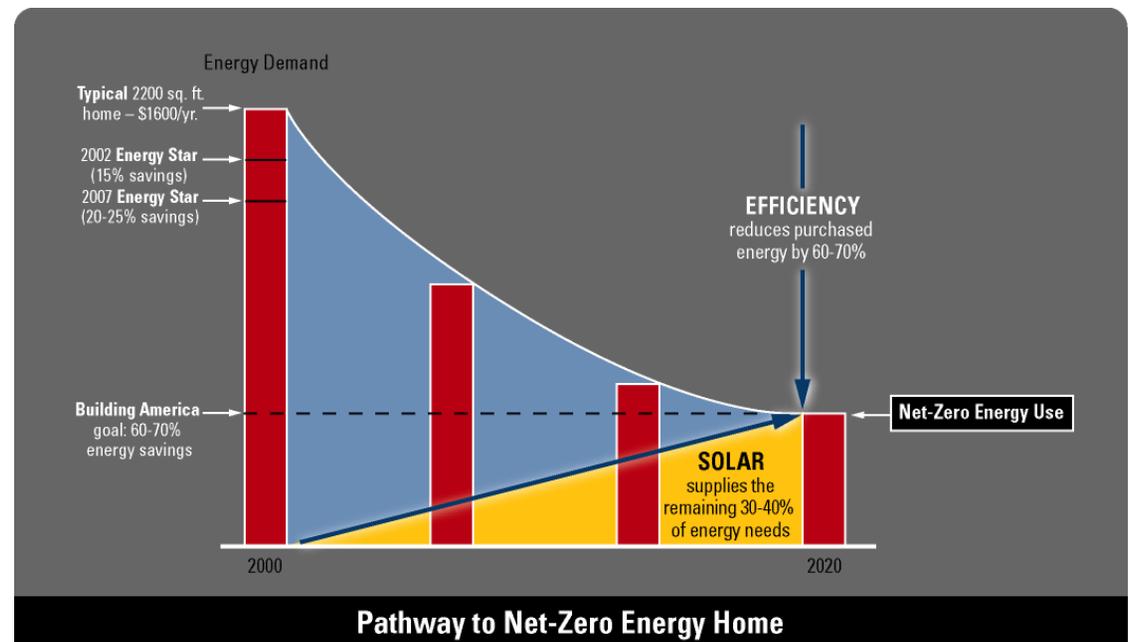
- Energy Star
- AEDG
- Energy Smart Schools & Hospitals
- Building America

Residential Integration Research: What is Building America?

Energy Efficiency &
Renewable Energy



- Public/private partnership conducting systems research to reduce energy use, improve performance, and increase durability and comfort leading to Zero Energy Homes.
- Over 40,000 houses saving 30% or more in heating and cooling energy built using Building America systems engineering approach



Building America Targets in the Next Five Years

Energy Efficiency & Renewable Energy



Target (Energy savings)	Marine	Hot-Humid	Hot-Dry/ Mixed-Dry	Mixed-Humid	Cold
30%	completed	completed	completed	completed	completed
40%	2008	2010	completed	2009	2009
50%	2011	2015	2012	2013	2014

Note: Target savings level is completed Stage 3 community-scale homes.

The Residential Integration subprogram goal is to develop integrated energy efficiency and onsite renewable power solutions that will be evaluated on a production basis in subdivisions to reduce whole-house energy use in new homes by an average of 50% by 2015 and 70% by 2020 compared to the Building America Benchmark, at neutral cash flow.

Builders Challenge

Energy Efficiency &
Renewable Energy



Builders Challenge Launched at the International Builders Show



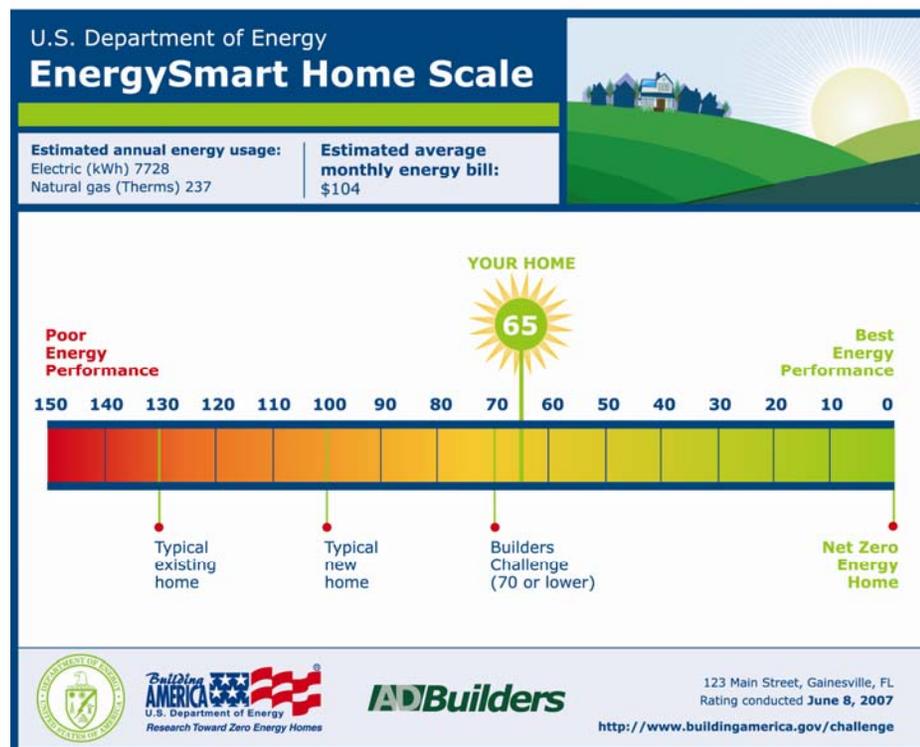
Secretary Bodman posts the first E-Scale on the Palm Harbor Green Home in the Professional Builder Show Village at the International Builders Show.

February 14, 2008, Orlando , FL – U.S. DOE Secretary Bodman posed a challenge to the homebuilding industry – to build 220,000 high performance homes by 2012.

Homes that qualify for the Builders Challenge must be between 70 and 0 on the EnergySmart Home Scale (E-Scale) as well as Quality Criteria.

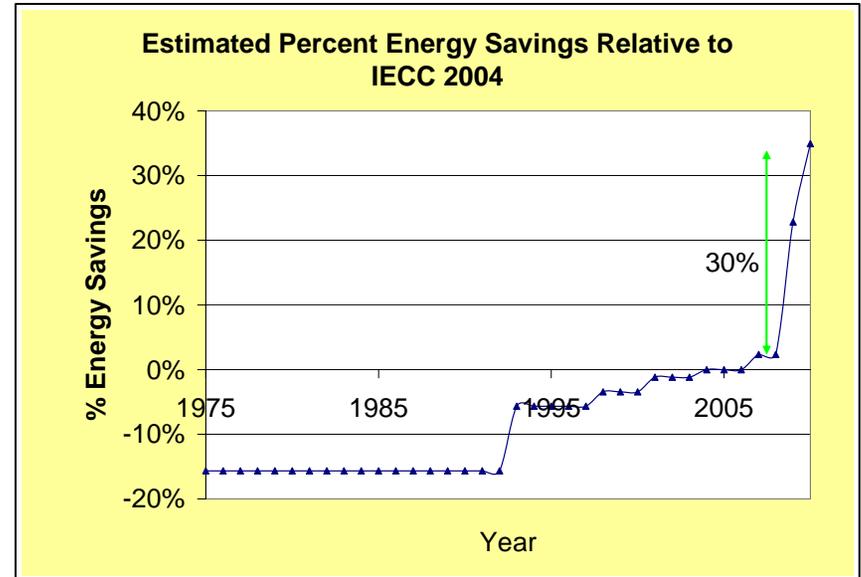
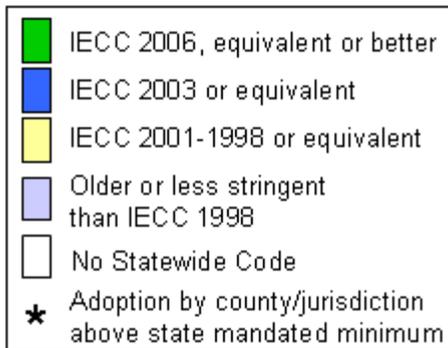
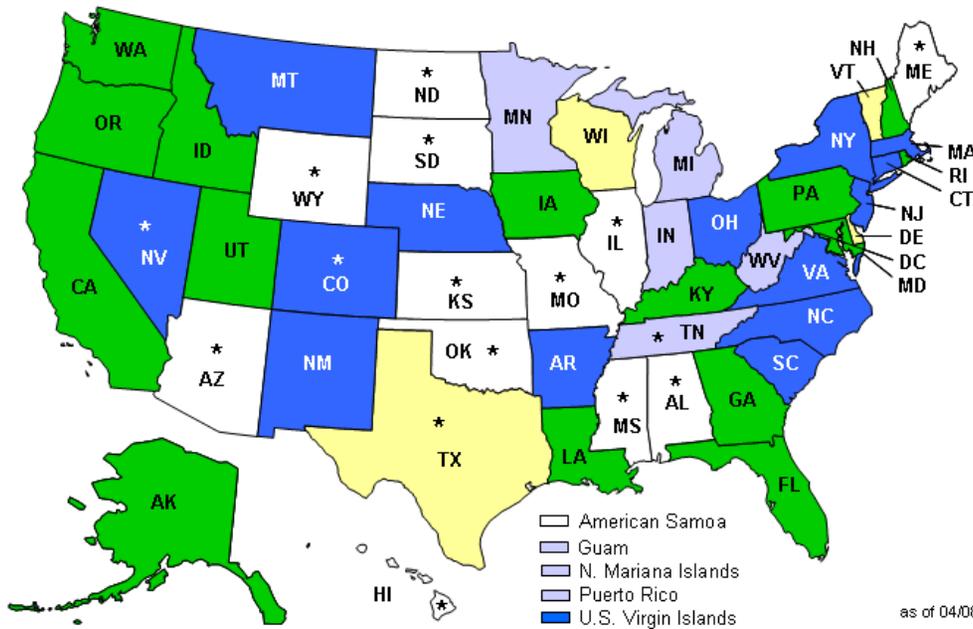
Energy performance threshold of 70 chosen because:

- Cost neutral with readily available materials
- Meets EPACT Federal Tax Credit in most regions



Residential Building Codes: DOE is working to improve the IECC 30% by 2012

Energy Efficiency & Renewable Energy



DOE (EERE) is committed to advancing the residential energy code by 30%

Current Residential IECC proposals result in significant energy savings

Energy Efficiency &
Renewable Energy

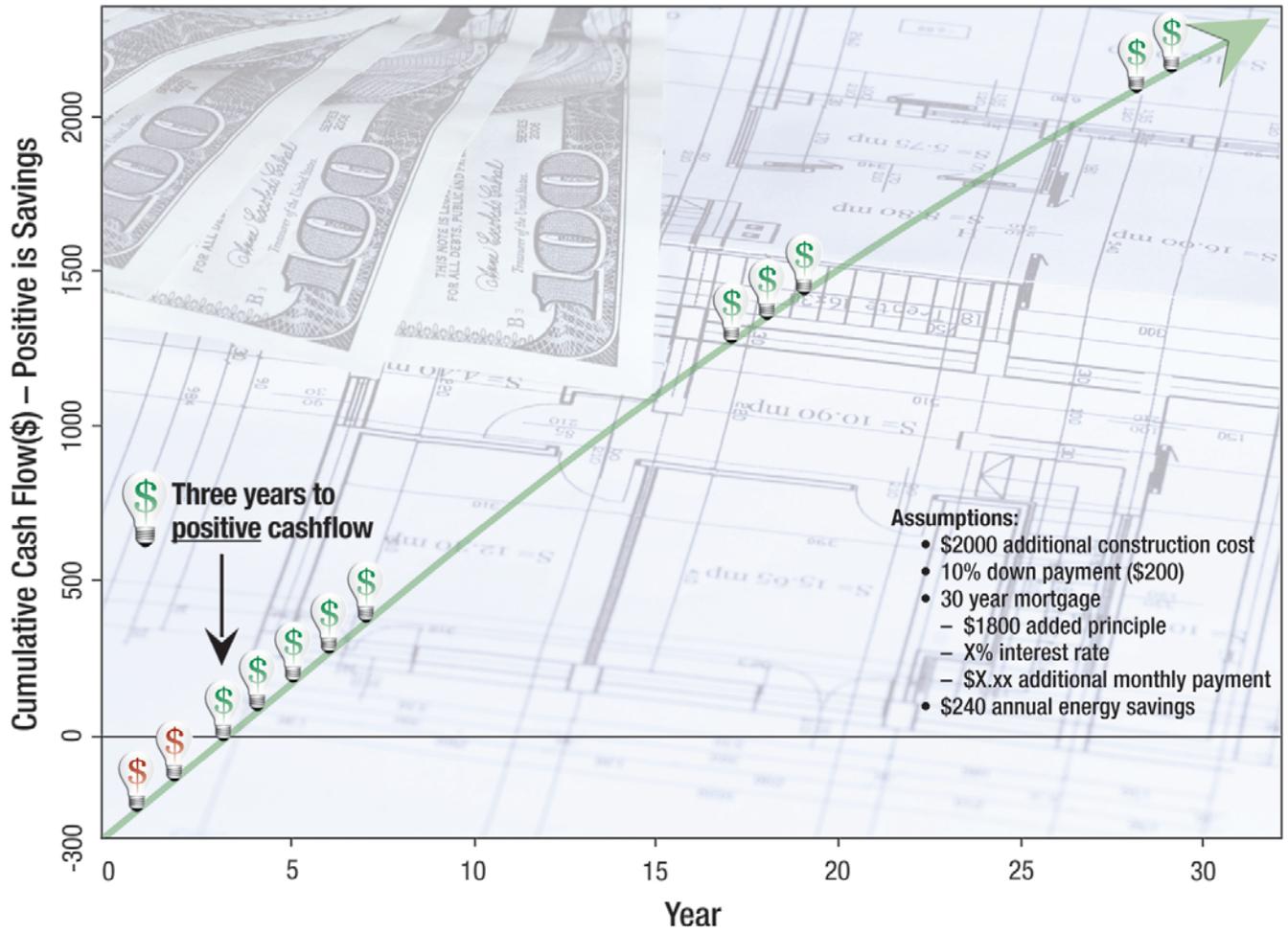


- Mandatory duct testing (8% to 12% savings)
- 50% of lamps high efficacy (4% savings)
- Lower fenestration U-factors in southern U.S. (3% savings)
- Mandatory electronic ignition on gas water heaters (2% savings, but probably violates NAECA preemption)
- 2% limit on fan electricity use (2% savings, but may violate NAECA preemption)
- SHGC lowered to 0.30 in southern U.S. (1% savings)

Positive Cashflow < Three Years

(Package Improving IECC 2009 20%)

Energy Efficiency & Renewable Energy



The First Steps Toward Achieving A Net Zero Energy Building

Energy Efficiency & Renewable Energy



30%

Advanced Energy Design Guide for K-12 School Buildings
Achieving 30% Energy Savings Toward a Net Zero Energy Building

Developed by:
American Society of Heating, Refrigerating, and Air-Conditioning Engineers
The American Institute of Architects
Illuminating Engineering Society of North America
US Green Building Council
US Department of Energy

- Easy-to-follow recommendations by climate zone for each geographical region
- Recommended products that are “off-the-shelf” and readily available
- How-to tips for implementing the recommendations
- Case study examples to illustrate real-life advanced energy approaches
- Additional bonus strategies for savings beyond 30%
- A prescriptive path for LEED® energy efficiency credits

The First Step Toward Achieving A Net Zero Energy Building

Recommended Products for Energy Savings are “Off the Shelf” and Readily Available

30%

The *Advanced Energy Design Guide* series provides a sensible approach to easily achieve advanced levels of energy savings without having to resort to detailed calculations or analysis. The four-color guides offer contractors and designers the tools, including off-the-shelf technology, needed for achieving 30% energy savings compared to buildings that meet the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1-1999. The energy savings target of 30% is the first step in the process toward achieving a net zero energy building, which is defined as a building that, on an annual basis, draws from outside resources equal or less energy than it provides using on-site renewable energy sources.

Small Office Buildings
The *Advanced Energy Design Guide for Small Office Buildings* focuses on office buildings up to 20,000 ft², the bulk of the office space in the United States, and provides benefits and savings for the building owner while maintaining quality and functionality of the office space. The first in this energy-saving series.

Small Retail Buildings
The *Advanced Energy Design Guide for Small Retail Buildings* focuses on retail buildings under 20,000 ft², the bulk of the retail space in the United States. It addresses typical retail building uses: retail (other than shopping malls); strip shopping centers; automobile dealers; building material, garden supply, and hardware stores; department stores; drugstores; liquor stores; and home furnishing stores; equipment, and wholesale goods (except food).

Awards: USGBC 2005 Leadership Award, Stars of Energy Efficiency Honorable Mention Award (Alliance to Save Energy), Best Sustainable Practice Award Honorable Mention (SBIC)

Sponsoring Partners:

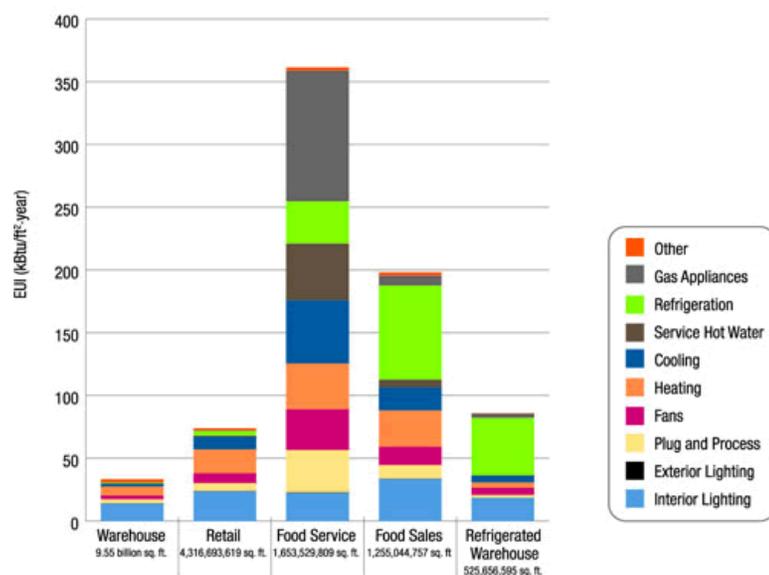
Retail Energy Alliance

Energy Efficiency &
Renewable Energy



- DOE invites retailers to join Alliance
- Alliance designed for bottom-line & energy savings

Energy Use Intensity (EUI) by Commercial Building Subsector



REA Steering Committee:

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Best Buy
- Food Lion
- Home Depot
- Illuminating Engineering Society of North America (IESNA)
- JC Penney
- Kohl's
- McDonald's
- Staples
- Target
- Wal-Mart
- Whole Foods Market

Lighting R&D

Energy Efficiency &
Renewable Energy

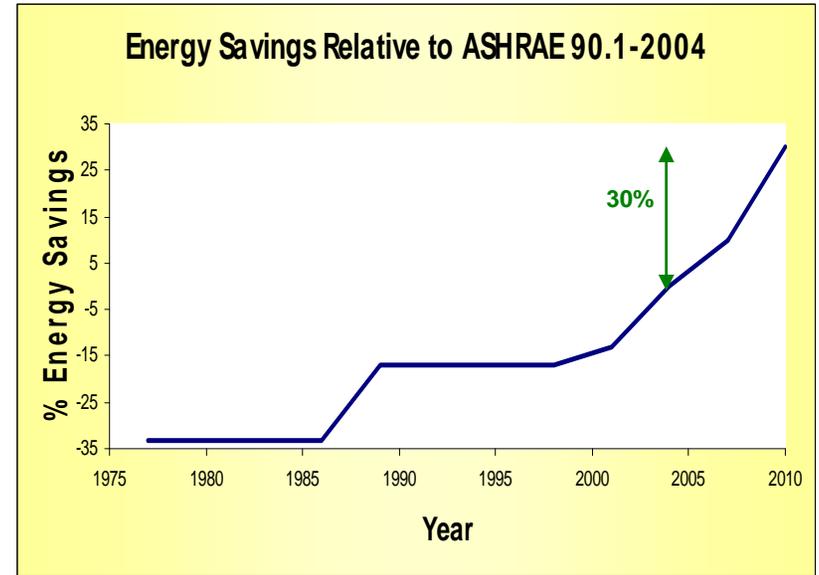
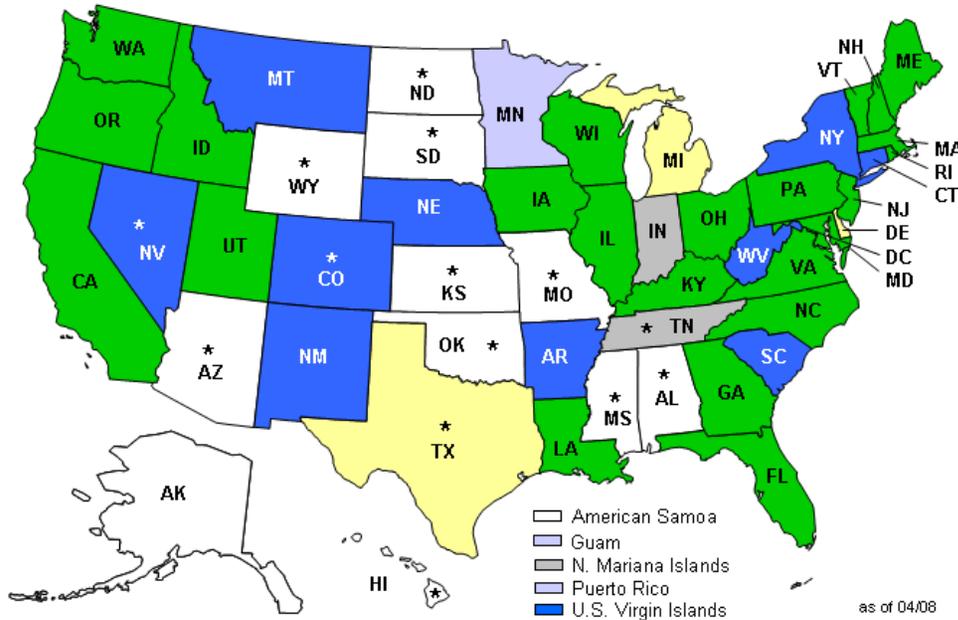


- Lamps with higher CCT appear brighter than those with lower CCT,
- Actual light output of higher CCT lamps decreased,
- Maintain equivalent perceived brightness & visual acuity



Commercial Building Codes: DOE and ASHRAE teamed, building the foundation to achieve 30% savings in new commercial buildings by 2010.

Energy Efficiency & Renewable Energy



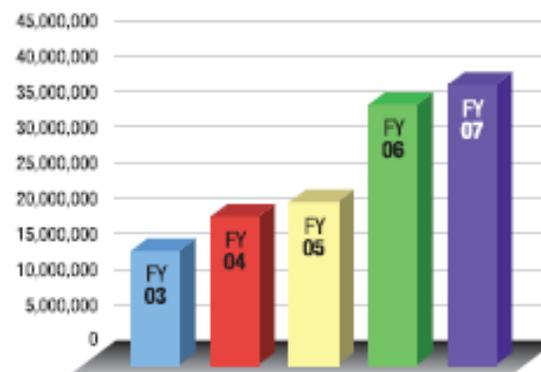
DOE is working with ASHRAE to achieve 30% more energy efficiency relative to Standard 90.1-2004 by 2010.

Technical Assistance to States

Energy Efficiency &
Renewable Energy



- Technical Assistance to States - 30 states have received support for energy savings estimates and software customization since 2000.
- DOE software tools simplify & clarify residential and commercial code compliance
- DOE's building energy codes website www.energycodes.gov (avg 3.3 million hits per month)
- Training: Live web training (7,600 in FY07) Self-paced, on-line training (25,000 trained in FY07)
- Building Code Assistance Project provides energy code advocacy assistance to the states.
- State grants – Advanced Building Energy Codes Solicitation was issued in FY08



Website Use Continues to Grow

www.energycodes.gov is the portal to all of BECP's free code compliance and training materials. It averaged over 3.3-million hits per month in FY07.