DOE Residential Buildings Program

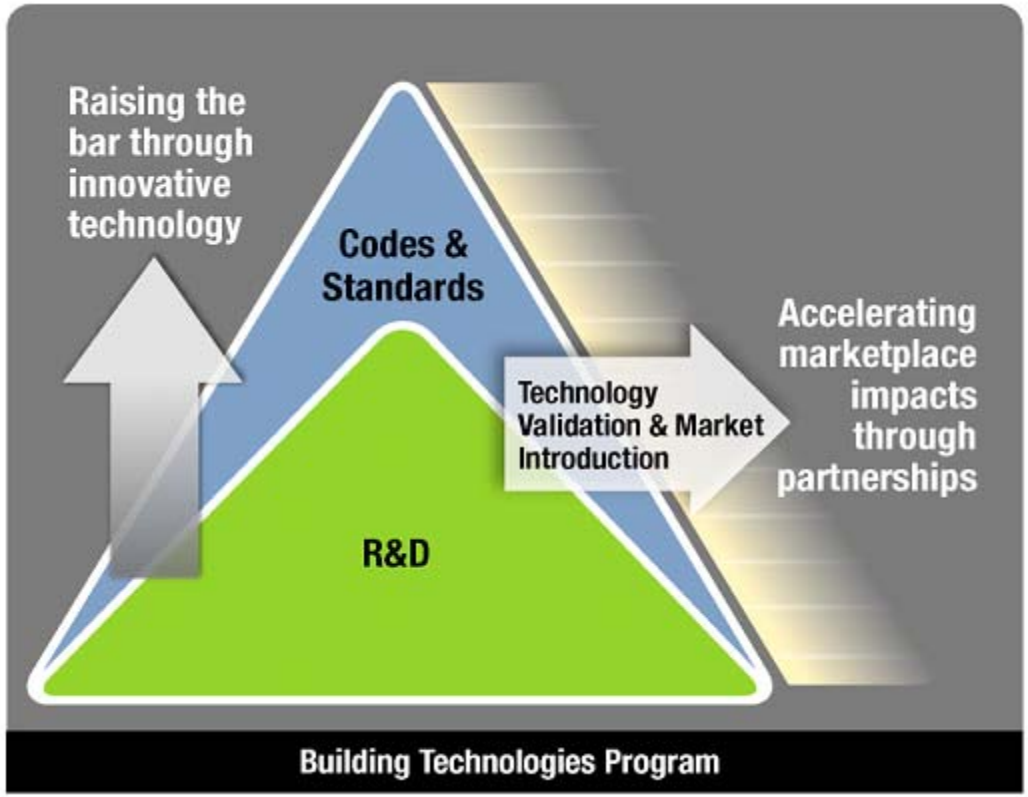
RESNET 2009

Edward Pollock

February 16, 2008

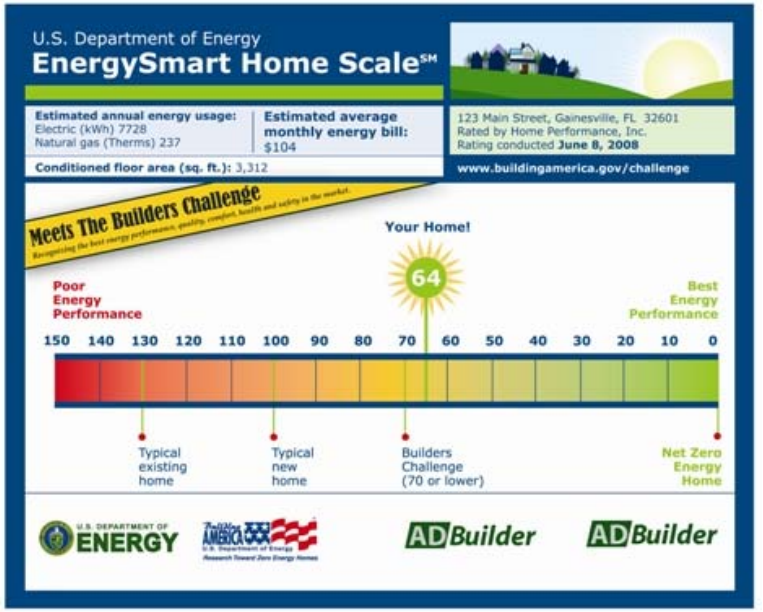
Building Technologies Mission

Develop technologies, tools, and standards for making residential and commercial buildings and appliances more energy-efficient, productive, and affordable.

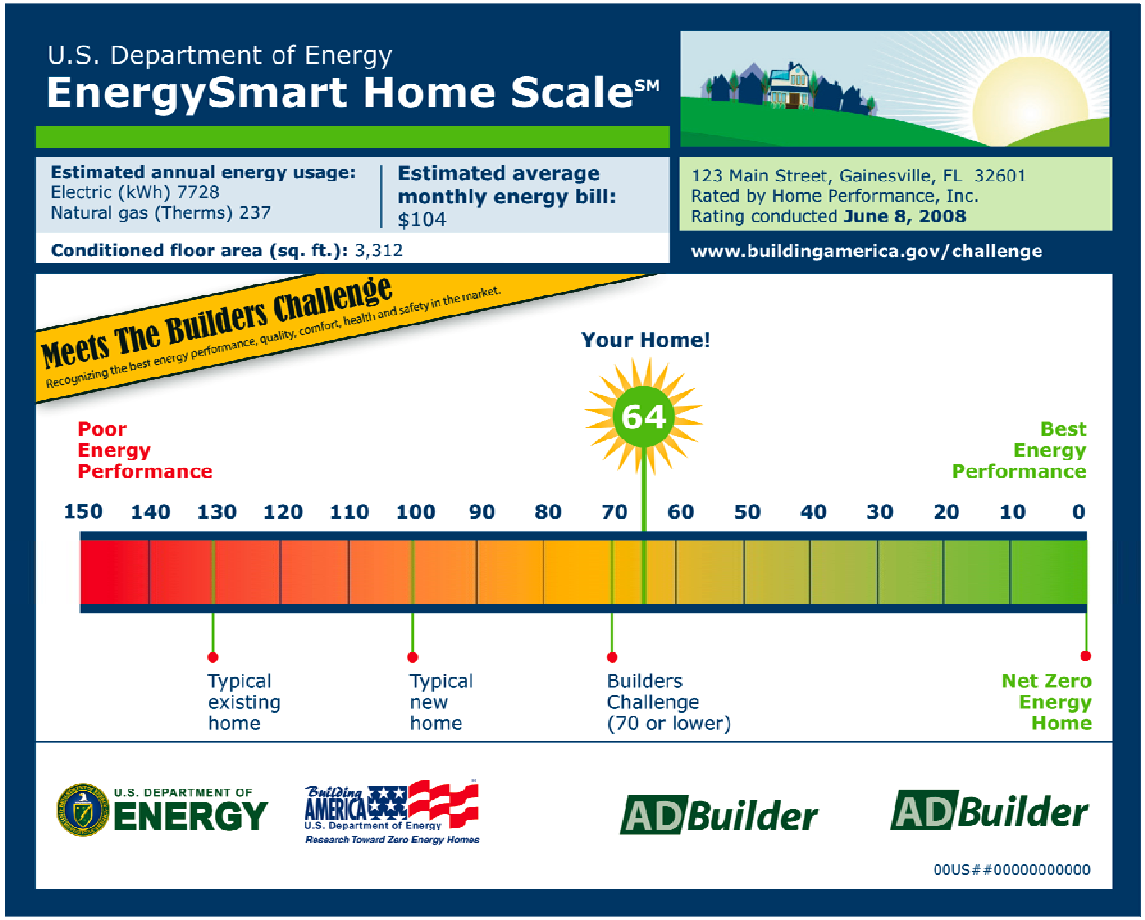


Builders Challenge Progress

- Secretary Bodman announced at the International Builders' Show on February 14, 2008
- Builders commit to constructing homes that rate 70 or less on the EnergySmart Home Scale
- 1000 labeled homes
- Over 200 Homebuilders registered
- 82 Verifiers registered
- 68 Program and Resource Partners registered

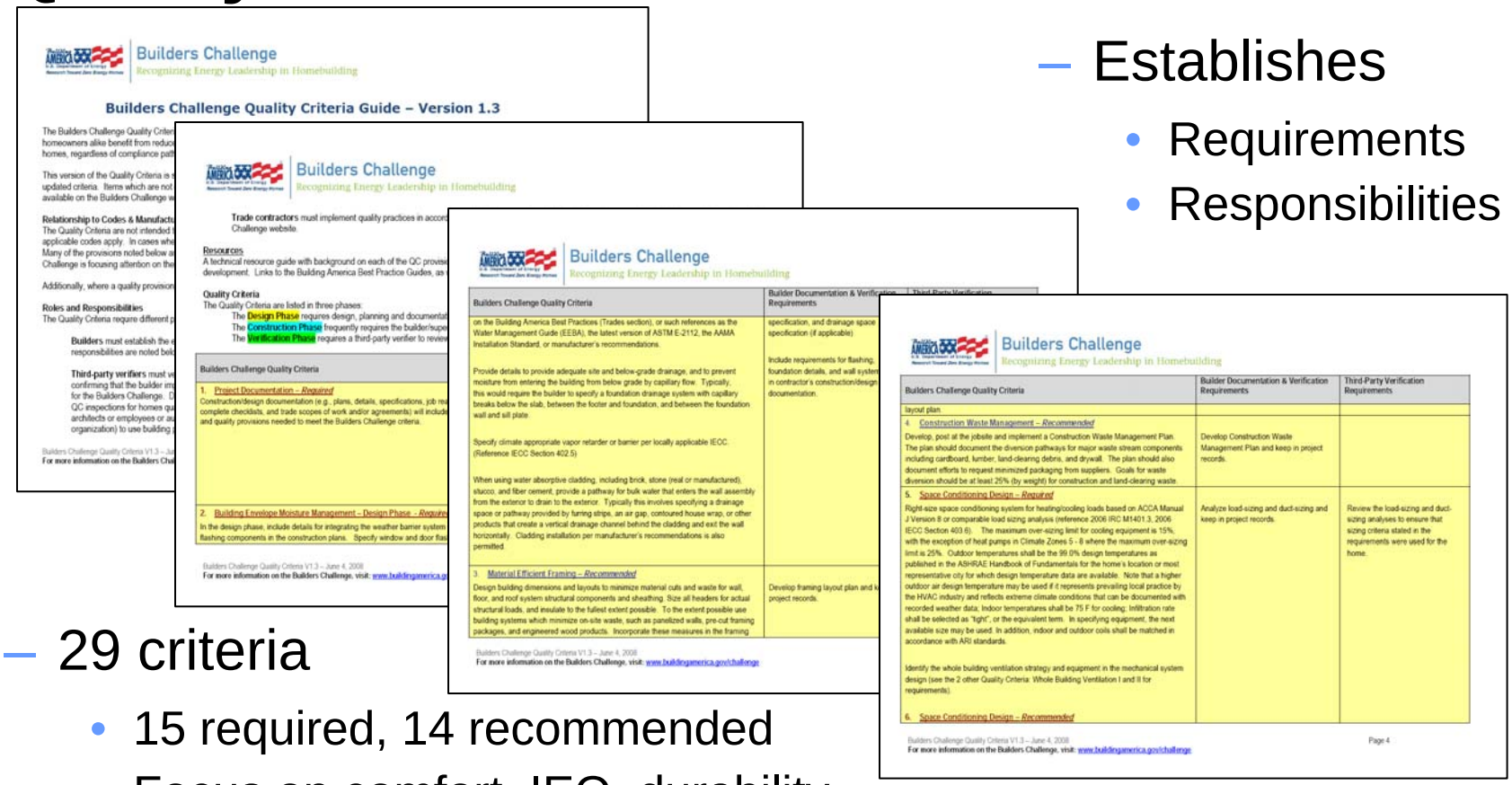


Builders Challenge



Drive demand:
Help homebuyers recognize that homes that meet the Builders Challenge represent the best energy performance, quality, comfort, health and safety available in the current housing market.

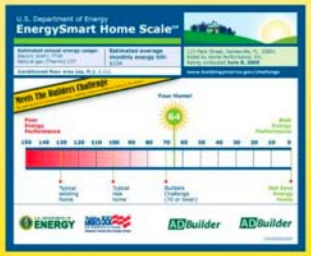
Quality Criteria List

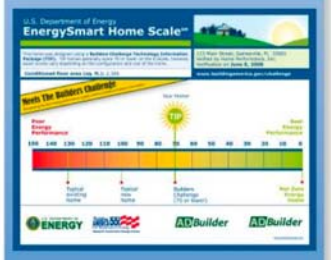


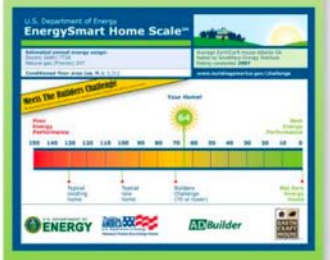
- Establishes
  - Requirements
  - Responsibilities
- 29 criteria
  - 15 required, 14 recommended
  - Focus on comfort, IEQ, durability
  - Organized by design/construction phase
  - Developed by industry experts under DOE leadership

How does it work?

	PERFORMANCE	PRESCRIPTIVE	PARTNER/HERS PROVIDER
		Builder chooses a Technology Information Package (TIP)	*Establishes equivalency and operations with DOE*
STEP 1	Builder and qualified third-party verifier register at **www.buildingamerica.gov**		
STEP 2	Third party **rates**, tests, and verifies that home is 70-0 on E-Scale and meets Quality Criteria	Third party tests and verifies that home meets the TIP and the Quality Criteria	Third party rates, tests, and verifies that home is 70-0 or equivalent on E-Scale and meets Quality Criteria
STEP 3	Third party submits required information to **DOE**	Third party submits required information to **DOE or partner program/ provider**	Third party submits information to **partner program/provider**
STEP 4	**DOE develops and gives E-Scale to builder**	**DOE develops and gives E-Scale to builder**	**Partner (or DOE) develops and gives E-Scale to builder**







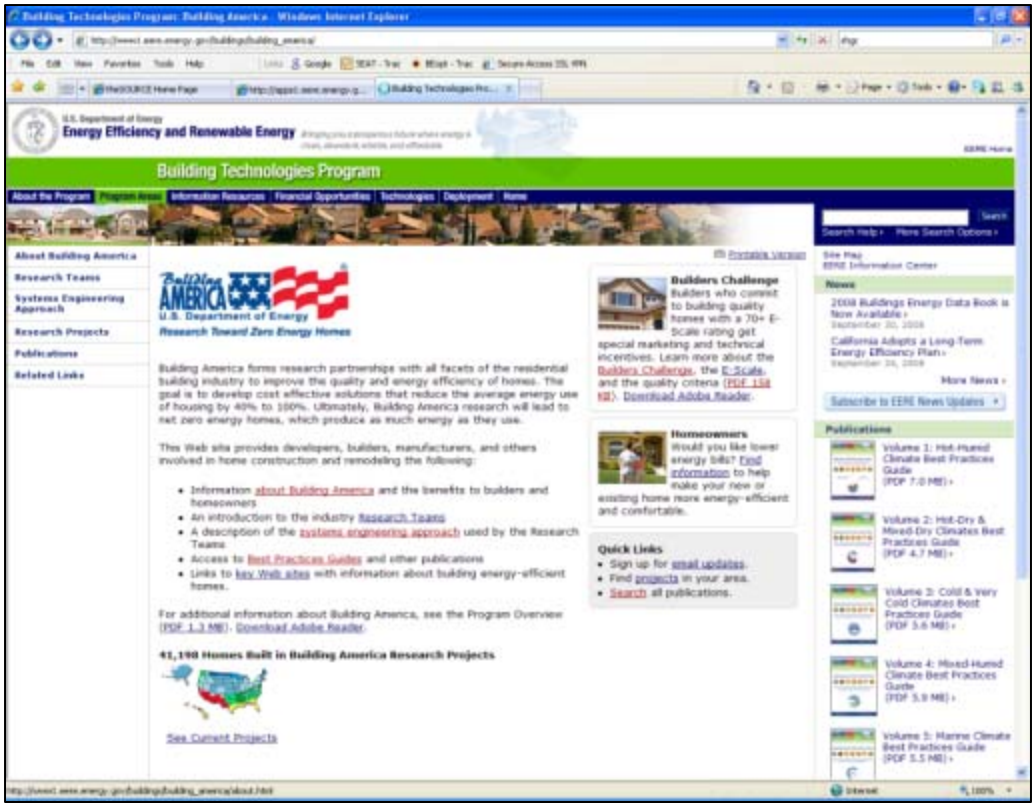
BC-TIP for Phoenix, AZ

- 7 TIPs available online
- More coming for other systems and cities
- Send us suggestions!

Climate Region: Hot-Dry Location: Phoenix Foundation Type: Slab	Minimum Builders Challenge Level		Premium Efficiency Level	
Heating Fuel:	Gas	Electric	Gas	Electric
Insulation				
Walls[1]	2×4 R-15	2×4 R-15	2×4 R-15	2×4 R-15
Roof	R-30	R-30	R-30	R-30
Slab	Uninsulated	Uninsulated	Uninsulated	Uninsulated
Windows[2]				
	Double-Glazed, Low-E	Double-Glazed, Low-E	Double-Glazed, Low-E	Double-Glazed, Low-E
U-Factor	0.35	0.35	0.32	0.32
Solar Heat Gain Coefficient	0.35	0.35	0.27	0.27
Lighting				
% Fluorescent Fixtures[3]	90%	90%	100%	100%
Heating				
Furnace, Efficiency Rating, AFUE	82		92.5	
Air-Source Heat Pump, HSPF		8.2		9.2
Air Conditioning				
Efficiency Rating, SEER	14		17	
Air-Source Heat Pump, SEER		14		18
(Builder-Supplied) Appliances				
	ENERGY STAR®	ENERGY STAR®	ENERGY STAR®	ENERGY STAR®
Water Heater				
	Tank/Gas	Tank/Electric	Tankless/Gas	Tank/Electric
Energy Factor, EF	0.59	0.95	0.77	0.95
Air Tightness				
ACH50	5.0	5.0	3.0	3.0
Ducts				
Location	Inside Conditioned Space	Inside Conditioned Space	Inside Conditioned Space	Inside Conditioned Space

[1] Framing factor shall not exceed 23%.
[2] Window area shall not exceed 18% of conditioned, above-grade floor area.
[3] Pin-based fluorescent fixtures or compact fluorescent lamps.

Technical Resources



www.buildingamerica.gov

Buyer-Focused Brochure

Take Control of Your Energy Future

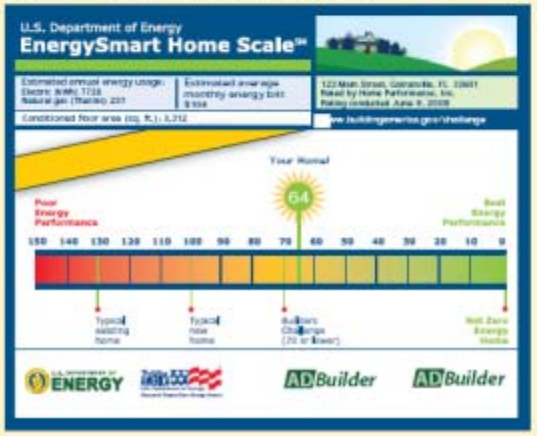
Choosing a new home is all about making the right decisions for you and your loved ones — selecting a neighborhood, a high-quality builder, and the features you value. You compare, ask questions, and make informed decisions about what matters most to you.

But what about energy? Today, more and more buyers value energy efficiency in their new homes – as a way to control their energy bills, reduce carbon emissions, and help preserve our natural environment. Yet, until now, there has been no easy way to compare the energy performance of different homes.

That is where the EnergySmart Home Scale (E-Scale) comes in. Brought to you by the U.S. Department of Energy, the E-Scale lets you compare the energy performance of homes on the market, simply by comparing a number rating. And like your car's MPG, it is a number worth knowing – a number that can put you in control of your energy future.

Make smart choices with the E-Scale

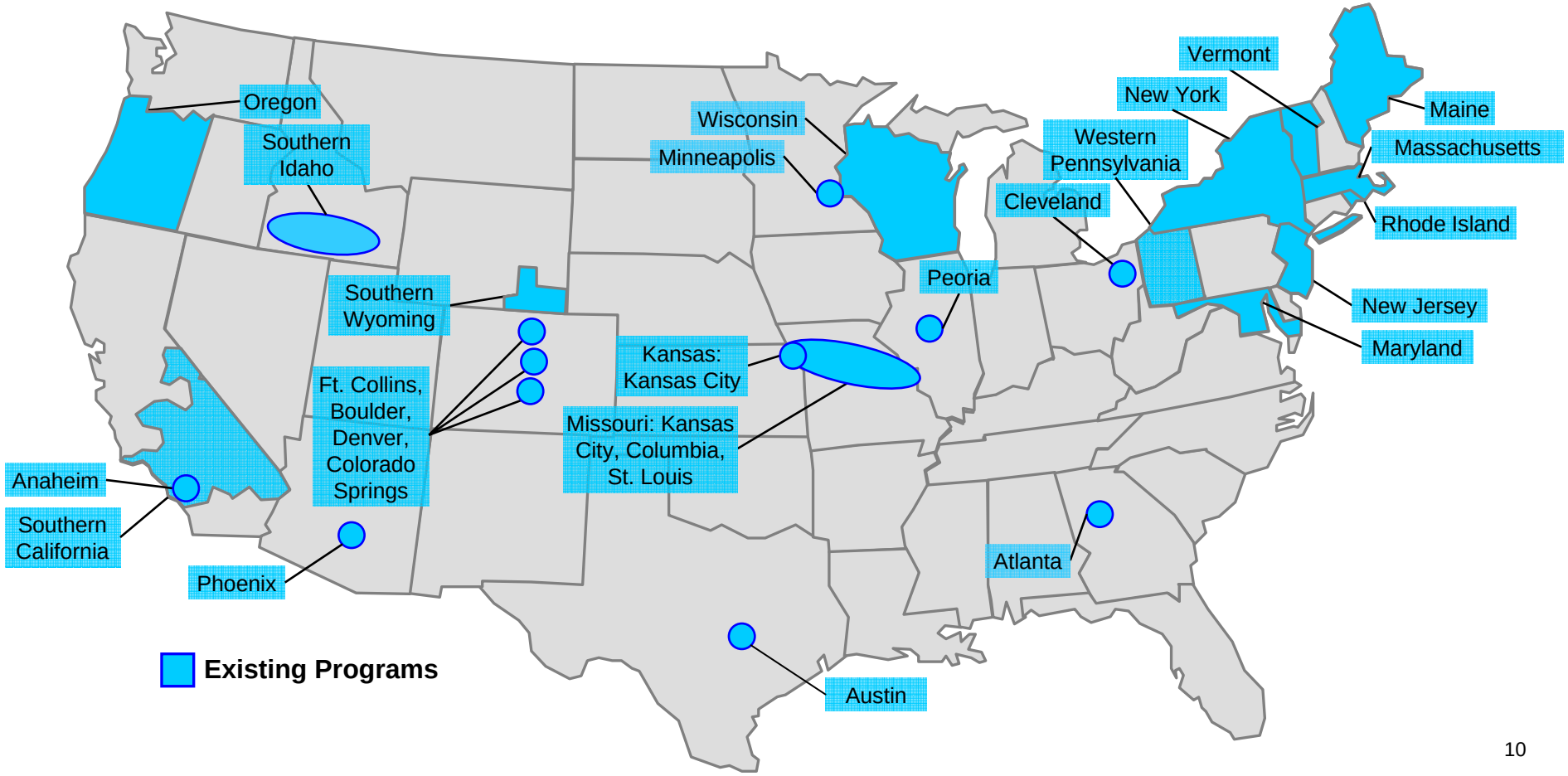
Look for the EnergySmart Home Scale (E-Scale) to compare the energy performance of home models. The lower the number, the more energy – and energy dollars — you'll save.



Sample Consumer Ad

Home Performance with Energy Star

- Currently approximately 12,000 homes improved a year



Benefits of an Aggressive Residential Energy Efficiency Program

- Goal is to develop the infrastructure to enable retrofit of 5 to 10 million homes a year
- Employ 250,000 to 500,000 well paying green jobs that cannot be exported
  - Train 100,000 contractor/home energy analysts and 200,000 ancillary services trades
- Provide an economic stimulus of $50 to $100 billion per year
- Increase savings by 0.25 to 0.50 quads per year (Goal of 3 quads per year by 2020)
- Estimated savings of $36 billion annually for America's home owners by 2020
- Reduction of carbon emissions by 180 million metric tons compounded annually by 2020

Recovery Act of 2009

- $1,500 tax credit for home retrofit
- $5 billion for Weatherization Assistance
- $3.1 billion for State Energy Program
- $3.2 billion for EE block grants
  - $2.8 billion based on existing formula
  - $400 million for competitive awards
- $6 billion for HUD grants
- $6 billion for innovative technology loan guarantees
- $500 million for green job training
- $2.5 billion for energy efficiency research

What can we do to help States use these funds effectively?

- Funds go to States as grants
- Complete work on retrofit standards
- Templates for various approaches
- Guides for establishing a program
- Technical support to the State offices, financial institutions and trades
- Training
- Business development
- Marketing to homeowners
- Most important is a sustainable national program

BESTEST-EX Objective

- **Test ability of analysis methods with utility bill true-up to predict energy savings.**
  - **Method to be basis for software certification**
- **Compare energy savings predictions based on:**

Approximately-known base-case inputs calibrated to pre-retrofit utility bills	versus	Explicitly-known base-case inputs used to generate “utility bill truth standard”

Where … to calculate savings predictions, explicitly known inputs for specific energy savings measures are applied to both base cases.

Forms at RESNET

- Bestest- EX
  - Monday 6:30 - 9:30p.m., in room Toulouse A
- Recovery Act – metrics, definitions and opportunities
  - Monday 7:30 – 9:00p.m., in room St. Charles B
- Recovery Act – Discussion of ways to help States use grant funds effectively
  - Tuesday 7:30 – 9:00p.m., in room St. Charles B

Residential Policy Recommendations

- Increased funding for:
  - Component research
  - Building America research in all climate zones simultaneously
  - Training for designers, builders, trades and marketing
- Policy changes:
  - National change in home assessment to include values of energy savings
  - Energy efficient mortgages
  - EnergySmart Home Scale and other energy efficiency metrics included in Multiple Listing Service
  - Require audits at time of sale to upgrade to minimum efficiency level
  - Direct DOE to do a study on the most effective way to promote and finance energy efficiency in bulk (loan guarantees, tax credits, utility bills, etc.)