Residential Carbon Footprint Labeling

Options for the
U.S. Department of Energy's Builders Challenge

Building AMERICA
U.S. Department of Energy
Research Toward Zero Energy Homes

Builders Challenge
Recognizing Energy Leadership in Homebuilding

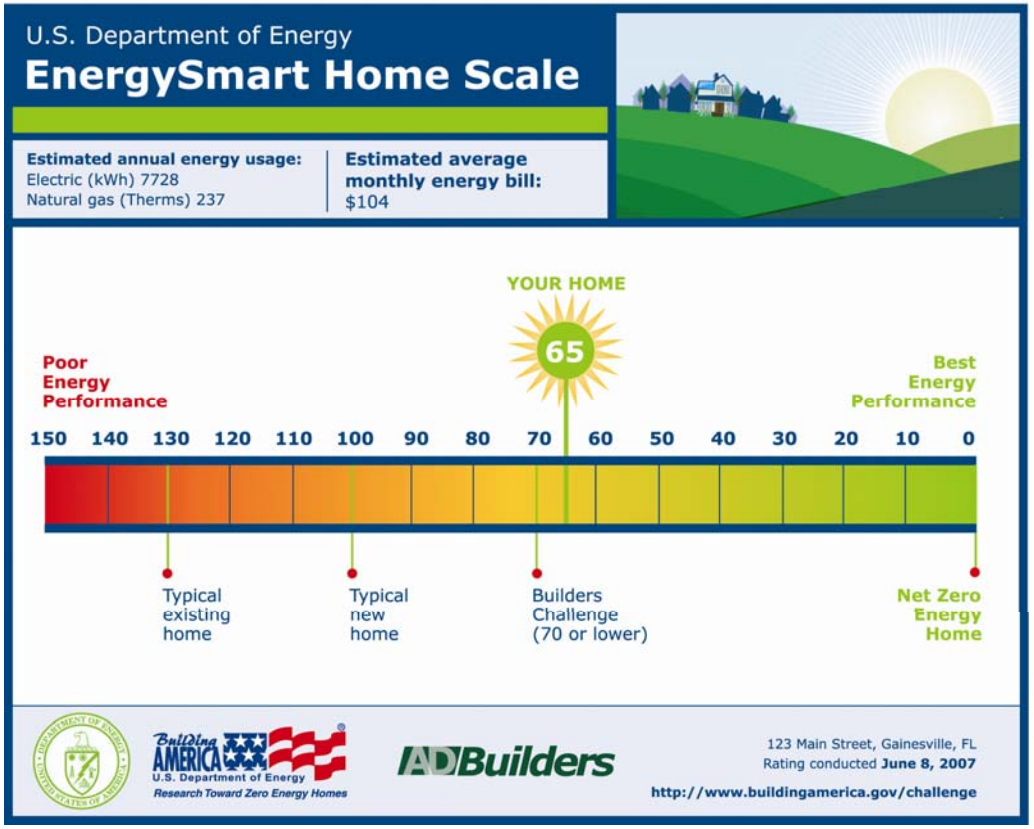
Objectives

- Explore sample of current initiatives
- Examine existing metrics used to measure carbon and other greenhouse gas emissions
- Determine relevant factors for incorporating carbon footprint metric into the Builders Challenge

Builders Challenge

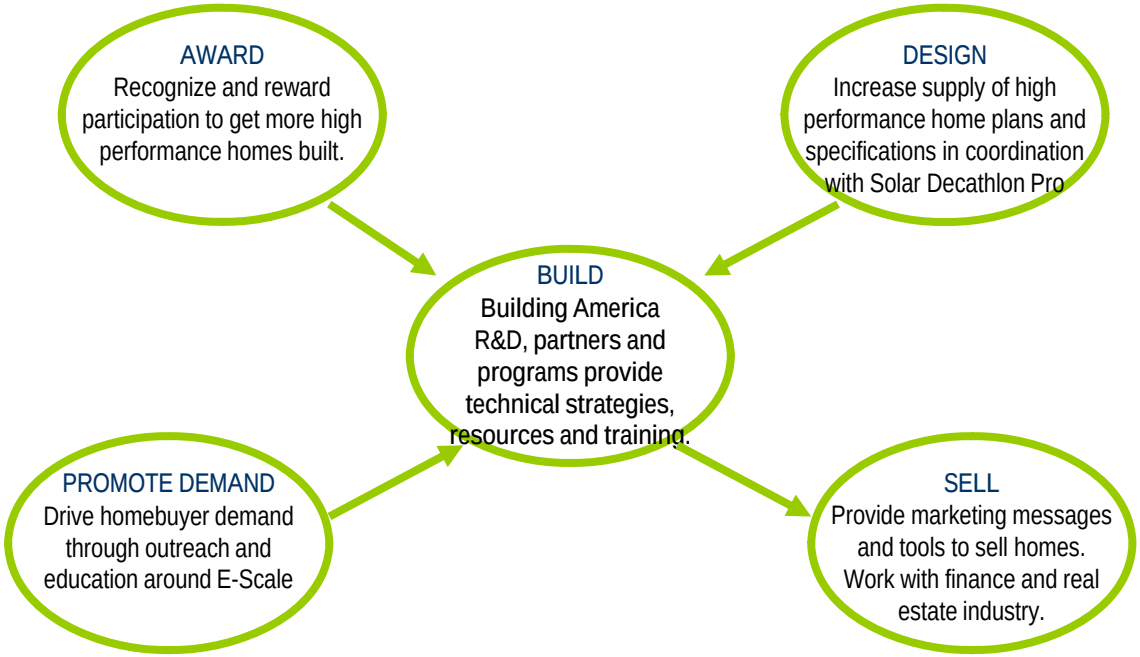
DOE has posed a challenge to the homebuilding industry – **to build 220,000 high performance homes by 2012**. Homes that qualify for the Builders Challenge must achieve a 70 or better on the EnergySmart Home Scale (E-Scale).

DOE's goal is that by 2030, new home buyers will have the option to buy a cost-effective Net-Zero Energy Home (NZEH) anywhere in the United States.



Working with Stakeholders

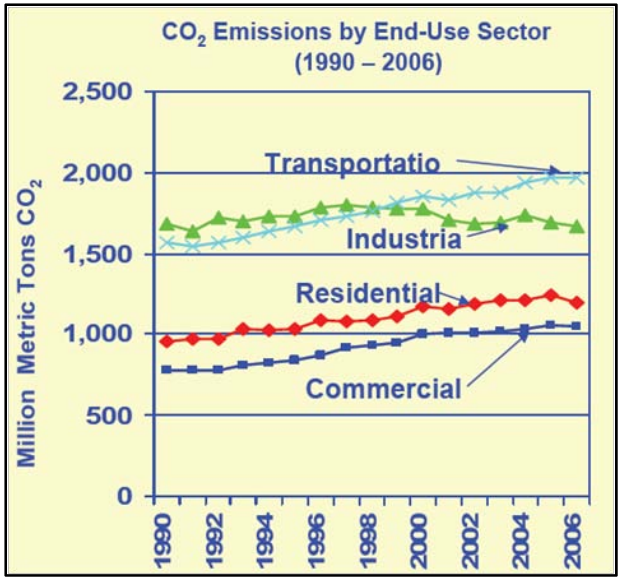
Builders Challenge Model



- Leverages existing programs and stakeholders
- Based on existing procedures
- Simplifies complicated concept for broad consumer use

Why Label Homes?

- UK 2007 Study (Conducted by LEK consulting) – 56% of consumers value carbon footprint information on products when making buying decision.
  - 44% would change buying behavior based on this information.
  - 15% said they would pay more for products with smaller carbon footprint
- Housing was responsible for 21% of energy-related CO_2 emissions in the US in 2005 (US Energy Information Administration)



Carbon Dioxide Emissions by End-Use Sector
Source: U.S. Carbon Dioxide Emissions from Energy Sources 2006 Flash Estimate, U.S. Energy Information Administration

Example Initiatives

- Walmart (Carbon Disclosure Project)
- The Carbon Trust
- The Carbon Reduction Institute
- Carbon Footprint for Housing Retrofits in Maine
- RESNET Carbon Footprint for Homes (and CarbonFund.org)
- Life Cycle Assessment Tools
- Carbon Estimation Calculators

Example of a Product Label Program of the Carbon Trust

Carbon Reduction Institute Labels for Corporations Accounting for and Managing their Carbon Emissions to Specific Criteria

Considerations for Developing a Carbon Metric for Homes

- Develop carbon accounting boundaries
  - Operational energy use vs. embodied energy
  - Maintenance over the lifecycle
  - Interaction between home and community
  - Components of Energy Use
- Other factors
  - Electric Power Generation Source
  - Carbon Offsets/Trading
  - Carbon Units
  - Other Greenhouse Gases
  - Visual/Design Issues

Walkers Potato Chips carbon intensity illustration

Operational v. Embodied

- Operational Energy Use
  - Would cover bulk of emissions
  - Software capability and source energy data exist
- Embodied energy
  - More complete emissions picture
  - Needs buy-in from manufacturers
  - As efficiency increases, embodied energy becomes a bigger concern

Establishing Other Parameters

- Ongoing maintenance of the home and its systems over lifecycle
- Interaction between home and community
  - Public Transportation
  - Length of commute
- Components of energy use
  - HVAC, hot water, lighting, appliances
  - MELs
  - Occupant behavior

Other Factors for Consideration

- **Electric Power Generation Source** - National standard fuel mix v. accuracy of regional, state, or utility level?
- **Carbon Offsets** - Total v. net (include purchase of offsets)?
- **Carbon Metrics** –
  - Total pounds of CO2 emitted per year?
  - Relative measure compared to baseline home?
  - Comparison metric (e.g. cars off the road, trees)?
- **Other Greenhouse Gases** – carbon dioxide v. carbon equivalent?

Visual/Design Issues

- Positive representation of low carbon footprint
- Simple and easy to understand for average consumer
  - HERS Index carbon scale?
  - Footprint graphic?
  - If using comparison metric, use graphic of cars or trees?
  - Grades or levels?

Summary

- **National standard** - Need to agree upon parameters for a reliable method for measuring carbon footprints in new and existing homes
- **Updates** - Need regular updates to data for accurate calculations
- **Upgrades** - Need "effective date" for accuracy that can be updated:
  - As source energy mixes change
  - As home owners make energy improvements

Recommendations

- Develop national metric with agreed upon norms over next year
  - Federal lead for national acceptance
  - Develop and finalize with stakeholders
  - Leverage and harmonize with related initiatives
- Make consumer-friendly
  - Focus on operational energy
  - Add carbon footprint to E-Scale for broad market acceptance

Contacts

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For information on the Builders Challenge, go to www.buildingamerica.gov/challenge