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

Builders Challenge
Recognizing Energy Leadership in Homebuilding

U.S. DOE Builders Challenge – Frequently Asked Questions

What is the DOE Builders Challenge?

DOE has posed a challenge to the homebuilding industry to build an increasing number of high performance homes which achieve a 70 or better on the EnergySmart Home Scale (E-Scale). These homes will use at least 30% less energy than a typical new home built to code. The E-Scale allows homebuyers to understand – at a glance – how the energy performance of a particular home compares with others. Through the Builders Challenge, participating homebuilders will easily differentiate their best energy-performing homes from other products in the marketplace, and have a way to make the benefits of these homes clear to buyers.

The Builders Challenge is promoting the use of market-tested and cost-effective energy efficiency strategies. The Challenge will support, recognize, and reward builders for achieving higher levels of energy efficiency and meet specific quality criteria. DOE's goal is that, by 2030, new home buyers will have the option to buy a cost-neutral Net-Zero Energy Home (NZEH) anywhere in the United States.

When did the Builders Challenge begin?

DOE Secretary Samuel Bodman and DOE Assistant Secretary Alexander Karsner were joined by pioneering builders to announce the Builders Challenge on Thursday, February 14th, 2008, during the International Builders Show in Orlando, Florida.

What is the EnergySmart Home Scale (E-Scale)?

The E-Scale is an easy-to-understand tool that helps homebuyers and homeowners make smart energy decisions when purchasing, renting, or updating a home. It is designed to provide clear, objective answers to basic questions:

- How much will my energy bills cost?
- How many "miles per gallon" does this home get?
- How does it compare to a typical new home?
- How close is it to the "ultimate" – a Net-Zero Energy Home?

The E-Scale is equivalent to the well established Home Energy Rating System (HERS) Index, developed by RESNET, the Residential Energy Services Network. For more information on the technical rating system behind the E-Scale, visit the Residential Energy Services Network at www.natresnet.org/.

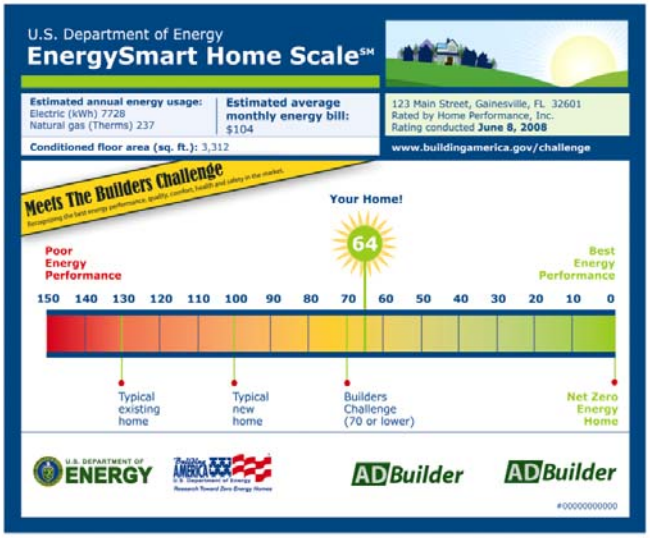
A 70 on the E-Scale indicates that a home is approximately 30% more energy efficient than a typical new home built to code. A 60 on the E-Scale would be 40% more energy efficient. The ultimate goal is to get to 0 – a Net-Zero Energy Home.

Estimated annual energy usage is the projected amount of natural gas and electricity used annually by a home.

Typical existing home represents the average energy performance of the existing housing stock.

Typical new home represents the energy performance of a home built to code (2004 IECC).

Energy Star is 85 on the E-Scale.



Estimated average monthly energy bill is the estimated average monthly costs for energy for the home.

Builders Challenge (70 or lower) represents the threshold at which a home must be built to comply with the Builders Challenge.

Your Home represents the verified annual energy performance estimate for a specific home. In this example, a home achieving a 65 on the EnergySmart Home Scale will use only 65 percent as much energy as a typical new home – 100 on the scale – saving about 35 percent in energy use on utility bills.

Net-Zero Energy Home A net-zero energy home annually produces with on-site renewable sources as much energy as it consumes. On-site renewable sources include energy collected on the site and used in the home (e.g., solar , wind). The site includes the home's footprint and the home site plan. The home should also provide an expected level of service and comfort.

Builders may place the E-Scale on or near the home's electric panel to show potential homeowners the energy performance achieved by that particular home or model. Participating builders and partner organizations can also:

- Place their logo on the E-Scale label
- Augment the rating with estimates of annual energy cost savings – which may help homebuyers get better mortgage terms
- Use the E-Scale in their marketing materials, within the terms of the EnergySmart Home Scale Usage Guidelines

What homes can be qualified under the Builders Challenge?

U.S. residential buildings of three stories or less are generally eligible to qualify for the Builders Challenge. Homes completed in 2007 or more recently can be qualified under the Builders Challenge if 1) they meet the minimum energy requirements, and 2) a third-party verifier was involved with the construction of the home and verifies compliance with the Builders Challenge Quality Criteria checklist.

How does a builder participate?

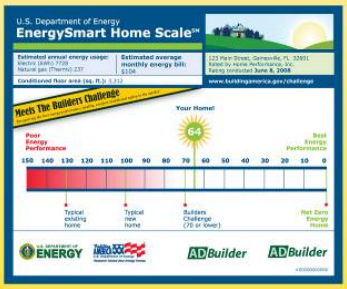
There are three different ways to meet the Builders Challenge:

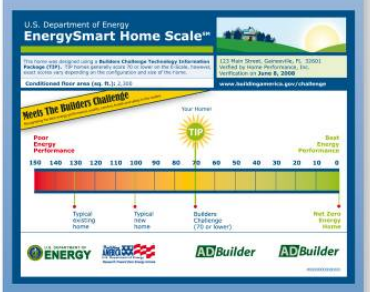
1. through the performance path
2. with a prescriptive Builders Challenge Technology Information Package (BC-TIP) which offers climate-specific energy packages
3. through a partner program

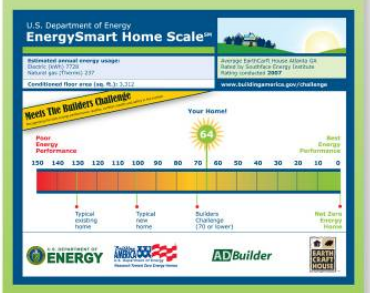
The performance path requires that the home be designed to perform between 70-0 on the E-Scale based on RESNET-accredited rating software. Also, all Challenge homes must meet the provisions of the Builders Challenge Quality Criteria (BCQC), a set of best building practices for durability, comfort, and IAQ. These provisions are available online at www.buildingamerica.gov/challenge

Additionally, all compliance paths require verification by third-party verifiers. HERS raters and DOE Building Consortia team members qualify as third-party verifiers for the Builders Challenge. Other professionals may be eligible to serve as verifiers, such as licensed engineers and architects or employees or authorized representatives of a utility or local building regulatory authority, if they have been trained by RESNET (or an equivalent organization) to use building performance testing methods and tools. Such professionals will be approved by DOE. These paths are outlined in the chart below:

	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**







What are the benefits for builders?

Builders participating in the Builders Challenge are meeting homebuyer demand for high quality, comfortable, healthy, energy-efficient homes while increasing customer satisfaction and reducing callbacks. And at the same time they're using the E-Scale to quickly communicate to their buyers the quantified energy performance of their home – in a way that can be compared to other homes. The Builders Challenge E-Scale serves to differentiate both the builder and the house, and carries the seal of the U.S. Department of Energy.

Additionally, participating builders are recognized as Builders Challenge participants by DOE and given the opportunity to participate in program events and awards. All builder partners are provided access to the Builders Challenge Marketing Toolkit which provides an array of marketing tools for builders to promote their participation and raise consumer awareness of their high performance homes.

How will the Builders Challenge transform the housing market?

1. By providing Building America research results and marketing tools so builders can take the Challenge to build and sell cost-neutral high performance homes that are third party qualified to ensure the best energy efficiency, comfort, construction and indoor environmental quality on the market.
2. By driving consumer demand through national outreach surrounding the EnergySmart Home Scale (E-Scale) so all Americans can easily understand energy performance and costs when shopping for a new home.
3. By partnering with programs, non-profit organizations, real estate organizations, lenders, utilities and state and local governments to leverage and expand the existing green buildings infrastructure.
4. By creating other mechanisms such as a design competition to increase the supply of high-performance home plans.
5. By recognizing and rewarding participants who contribute to a critical mass of high performance homes through awards.

These elements are being implemented through collaborative efforts by the U.S. Department of Energy with states, building industry associations, building trades, colleges and universities, consumer organizations, rating organizations, realtors, utilities, lenders, and energy efficiency program sponsors. Most important of all is the voluntary participation of homebuilders across the United States.

How does the Builders Challenge relate to ENERGY STAR qualified new homes?

The Builders Challenge compliments and leverages ENERGY STAR for new homes. The Challenge allows homes and builders which go beyond ENERGY STAR's minimum energy threshold - which is 85 on the E-Scale in most of the country and 80 in Climate Zones 6-8 - to be recognized and identified with the E-Scale. In this way, the very best energy performing homes in the marketplace – many of which are already ENERGY STAR qualified homes – can receive the extra recognition of the Builders Challenge and the E-Scale, which allows home buyers to easily understand and compare a home's energy performance. The

Builders Challenge also incorporates a set of quality criteria for durability, comfort, and IAQ. Homes certainly can be qualified under both programs and are encouraged to do so. In fact, the Challenge's performance path relies upon the same HERS rating system which ENERGY STAR is based upon, so a single energy rating goes a long way towards qualifying a home under both programs.

How does the Builders Challenge relate to U.S. DOE's Building America program?

The Builders Challenge energy threshold and Quality Criteria for comfort, quality, and indoor environmental quality are based on over a decade of Building America Research and Development (R&D). The 70 E-Scale threshold required to meet the Challenge is 30% more efficient than a reference home based on the 2004 IECC. Building America field research with custom and production builders demonstrates that this level of efficiency is achievable at cost-effective levels anywhere in the United States. The Building America systems strategies are the basis for the prescriptive pathways (BC-TIPs) for meeting the Challenge in an effective manner. For more information on Building America, visit www.buildingamerica.gov.

How does the E-Scale compare to California's Title 24?

California's Title 24 is a part of a mandatory building code. The Builders Challenge is a voluntary qualification and labeling program. The Builders Challenge E-Scale provides a way for consumers to compare the energy performance of qualifying homes that meet a score of no greater than 70 on the scale. There is currently no easy translation from compliance with Title 24 to a point on the E-scale, although a rough comparison could be made on a given house using energy modeling software.

How does the Builders Challenge work in California?

In recognition of California's aggressive energy requirements for new homes, DOE is formulating a California-specific approach to how the Builders Challenge will function in California. Unlike most states in the U.S., an E-Scale of 70 will likely not be 30% more efficient than a typical new home in California, due to the requirements of Title 24. DOE's approach to the Builders Challenge in the state will recognize this fact, along with the fact that California has developed its own HERS Rating Standards. DOE will have its Builders Challenge approach to California finalized by the 2009 Pacific Coast Builders Conference (PCBC).

How will the Builders Challenge achieve Net-Zero Energy Homes?

The Builders Challenge is based on research from the Building America program, which is expected to achieve cost-neutral Net-Zero Energy Homes by 2020. "Cost-neutral" means that the added first costs of system enhancements (when amortized over a 30 year period) are equal to the monthly energy cost savings which result from these enhancements. While the Building America program develops and field tests the technologies needed to cost-effectively move to higher levels of efficiency, the Builders Challenge will promote the implementation of proven strategies that builders can implement in any climate region.

The Builders Challenge threshold begins at 70 on the E-Scale and will stay at this level until 2012. As Building America strategies that achieve greater efficiency levels become available, the Challenge threshold will move steadily closer to NZEH. By 2030, DOE anticipates that builders will have the methods and technologies to cost-effectively construct Net-Zero Energy Homes anywhere in the United States.

Is the Builders Challenge expected to have a large market share?

The real value of the Builders Challenge will be the impact on the entire housing market in gaining acceptance of new energy savings products and techniques. Experience from the Building America program shows that when first adopters demonstrate that a product can be used safely and effectively, the market penetration of the product increases rapidly.

The current market share of homes at 70 on the E-Scale is estimated to be just over 1.5% of annual new home production. Through Builders Challenge outreach and support to builders, and by driving consumer demand through education around the E-Scale, the market share is expected to rise to over 3%-5% of the new homes market. Every time the energy level moves closer to zero, we anticipate the market share to drop initially until the learning curve and comfort levels are achieved among builders and contractors. This will allow for market differentiation as well as higher levels of energy, cost savings, and carbon reductions.

How does the E-Scale relate to the International Energy Conservation Code (IECC)?

The quantitative basis of the E-Scale is the HERS Index. On the HERS Index, a score of 100 represents the current "code compliant" home. Each point lower than 100 is 1% more efficient than the code compliant home. The HERS Index is based on a reference comparison home, which incorporates the requirements of the 2004 International Energy Conservation Code (IECC) as well as other baseline building requirements such as federal minimum HVAC equipment efficiencies. Although future revisions of the IECC may increase performance requirements for new homes, DOE intends to keep its reference home tied to the 2004 IECC for the foreseeable future. The ultimate goal of the Challenge is widely available, cost-effective Net Zero Energy Homes by 2030, meaning that the building produces as much energy as it uses.

Does the Builders Challenge E-Scale apply to retrofits?

Yes, that is why the E-Scale goes beyond the typical new home that is built to code (100). A typical existing home would be above 100 on the E-Scale, and existing homes represent the vast majority of houses in the U.S. There is clearly a lot of room for energy efficiency improvements in existing homes, especially those homes with little/no insulation and older and less efficient HVAC systems. The DOE is working with Ecobrokers and the National Association of REALTORS to educate real estate agents, Home Performance with Energy Star contractors, and consumer education/outreach groups to ensure that the value of energy efficiency in terms of monthly operating costs, quality and maintenance is known. The E-Scale label, which is placed on or next to the electric panel, provides a record of the home's energy performance at the time of sale or retrofit of the home.

What about communicating the carbon footprint of the home?

Some partners, for instance those in the Northwest, are interested in including a carbon footprint on the E-Scale. DOE is considering options for including a carbon footprint as part of the Builders Challenge. For example, should the carbon footprint be based solely on the operational energy use of a home or, should it include the embodied energy in the building products as well? Another consideration is how to convert energy usage to carbon emissions within the context of a national program, since homes in some parts of the country utilize power from less carbon-producing energy sources (e.g., hydropower in the Northwest) while homes in other areas rely on fossil-generated power.

What about the Federal new home tax credit?

The Federal energy efficient home tax credit was extended through 2009. The U.S. Department of Energy and its partners support the renewal of Federal tax credits, which provide an additional incentive for high performance homes. This tax credit is based on surpassing the heating and cooling energy performance of a reference home, while the Challenge is based on whole-house energy usage. Despite this difference, in many cases Challenge homes will also qualify for this tax credit based on the home's energy rating. So builders can have their energy raters add the tax credit evaluation to a Builders Challenge home qualification, or vice versa. More information on the energy efficient home tax credit is available at: www.energy.gov/taxbreaks.htm

How does the Builders Challenge relate to other programs?

The residential marketplace has several national programs related to energy efficiency and sustainability. The Challenge is driving increased market penetration and recognition of high performance homes in a way that supports and leverages existing programs. For example, the Builders Challenge already has partnerships with the EarthCraft House program and the Environments for Living program. In each of these cases, DOE and its partners have established an equivalent "tier" in these performance programs which automatically qualifies homes at this level for the Builders Challenge. This allows the Challenge to compliment these programs and bring additional recognition to their builders who are constructing high performance houses.

And programs don't have to be national to partner with the Challenge. DOE is currently in discussions with many local home performance programs, including utility-sponsored programs and local green building initiatives. Please contact us if you're interested in learning more.

What about NAHB's National Green Building Standard?

The Builders Challenge goal is to "put the EE" in GrEEn. By working with and supporting efforts like the NGBS, the nation is much more likely to achieve cost-effective and affordable energy-efficient homes. Much like the NGBS Bronze level achieves at least ENERGY STAR® performance levels for energy, an NGBS Silver rating achieves an energy efficiency level that meets the Builders Challenge under certain conditions. Builders who achieve NGBS Silver or higher may be eligible for the Builders Challenge and can take advantage of its benefits including the E-Scale, marketing toolkit, and national recognition by the DOE and the Secretary of Energy. DOE is currently working with NAHB to explore a joint performance package which meets both program requirements.

Is there any third-party verification of Builders Challenge qualified homes?

Yes, third-party Verifiers who are registered Challenge partners serve to confirm both energy- and quality criteria-related aspects of the home. RESNET-certified HERS raters and DOE Building Consortia team members qualify as third-party verifiers for the Builders Challenge. Other professionals may be eligible to serve as verifiers, such as licensed engineers and architects or employees or authorized representatives of a utility or local building regulatory authority, if they have been trained by RESNET (or an equivalent organization) to use building performance testing methods and tools. Such professionals will be approved by DOE.

Does the E-Scale just measure electric usage?

The E-Scale is fuel-neutral and takes into consideration all types of energy including natural gas, propane, oil, and renewables. Different modeling software can be used to develop the E-Scale rating for a house, all of which comply with RESNET (www.natresnet.org) standards. These software packages do have capabilities to model the fuel use, efficiency, and the operating cost of wood-based systems like a wood stove. In general the more that is known about a heating system (rated efficiency, cost of wood), the more accurate the modeling result will be. The E-Scale is able to show the energy consumption and energy saving data for these types of systems, as long as they are modeled in the energy analysis software.

How do I "take the challenge"?

Builders, verifiers, manufacturers, and several other types of partners should begin by registering online at www.buildingamerica.gov/challenge. By registering as a Challenge partner you will be able to participate in the Challenge program, including gaining access to the Builders Challenge Marketing Toolkit with sample ads, press releases, and Challenge logos.

For builders - when you are ready to qualify homes, choose the path that is right for you: performance, prescriptive BC-TIPs, or through a partner program. Work with a third-party verifier to submit information on each home and DOE will send you a customized EnergySmart Home Scale. Builders also receive a special recognition letter from DOE upon qualifying their first Challenge home.

If you have questions, contact Builders Challenge at 301-889-0017 or builderschallenge@newportpartnersllc.com.

I'm not a builder, how can I get involved?

Everyone in housing from raters to manufacturers is invited to participate. You can register online, electronically sign an agreement with DOE and receive marketing materials. There will be many other opportunities that come up – including awards, events, case studies, etc. - and as a partner we will update you and turn to you first.

How do I get more information?

For more information:

- visit www.buildingamerica.gov/challenge
- email builderschallenge@newportpartnersllc.com
- call 301-889-0017