



## Builders Challenge

Recognizing Energy Leadership in Homebuilding

## High Performance Builder Spotlight

# Ecofutures Building Inc.

Boulder, Colorado

Ecofutures' qualified for the DOE Builders Challenge with a -3 HERS score, became Boulder's first net-zero energy home, and earned the highest ENERGY STAR rating of any Colorado home (97.7 out of 100 points).

## Net-Zero Energy Home is a First

Ecofutures Building Inc. is familiar with firsts. In 2005 Ecofutures built Boulder, Colorado's first net-zero energy home. In 2008 when the U.S. Department of Energy issued its Builders Challenge, Ecofutures became the first builder to qualify with a score literally off the scale, a -3 on the Home Energy Rating System (HERS) index. In March 2009, Doub completed a second net-zero energy home that qualified for the Builders Challenge with another -3 HERS score.

Over 3,100 people have toured Ecofutures' first Builders Challenge house, where company president Eric Doub lives with his family. The 4,600-square-foot, five-bedroom home has been equipped with extensive energy monitoring equipment. (Data can be viewed at [www.ecofuturesbuilding.com/systemsmonitoring](http://www.ecofuturesbuilding.com/systemsmonitoring).) Ecofutures installs energy monitoring systems in all its new and renovated homes.

"It feels great to help our clients future-proof their homes. Not only will their investments in energy efficiency and onsite renewables be more valuable year by year, as energy prices increase, but also as residents they will be more comfortable and healthier because of the 'build tight, ventilate right' approach."

**ERIC DOUB,**  
*president of Ecofutures Inc.*

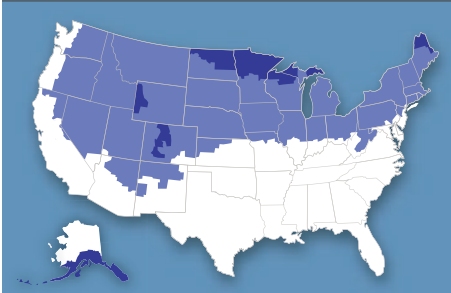
## A Tour of Energy Efficiency

The wall assembly includes 2x6 16-inch-on-center framing filled completely with 7 inches of Icynene spray-foam insulation and 1-inch rigid exterior EPS insulation. Insulated concrete forms create basement walls with an R-30 rating.

The attic is insulated to R-45 with Icynene foam sprayed on the underside of the roof decking, which insulates and air seals the attic while preventing thermal bridging between the conditioned space and the outdoors.

The windows have U-values of U-0.18 on the west- and east-facing windows and 0.12 on the north. The building envelope has tested at a very tight 0.09 natural air changes per hour.

### COLD & VERY COLD CLIMATES



## BUILDER PROFILE

**Builder:** Ecofutures Building Inc.

**Founded:** 1993

**Employees:** 12

**Development:**

Four certified Builders Challenge homes (two with -3 HERS ratings)

**Price Range:** The net-zero energy measures cost 7% to 8%

The house has radiant floor heating, which is rarely used. “Once you get into a snug home, where fresh air is being delivered but not in a drafty way,...you feel warm,” said Doub. His second net-zero energy home uses low-velocity forced air heated by hydronic coils containing solar-heated hot water.

The home has roof-mounted photovoltaic arrays totaling 8.9 kW to produce electricity and 12 roof-mounted solar thermal collectors for water heating.

**The Bottom Line**

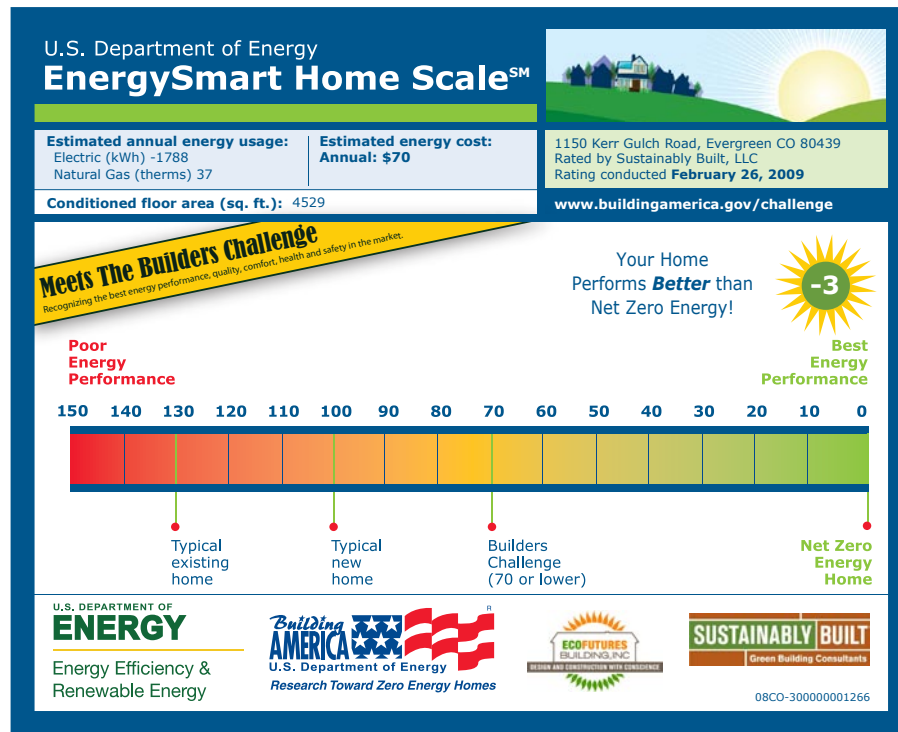
“I want comfort, health, durability, and value for my clients,” said Doub. “The net-zero energy measures cost 7% to 8% of the total home price. Our clients pay more in mortgage but less in energy so it’s cost neutral or even cash flow positive to live in a zero energy home at today’s energy prices.”



Eric Doub (right) kneels with other employees behind rolls of ¾-inch by 60-foot flex copper that serve as heat exchangers within the 6,000-gallon storage tank.

**U.S. Department of Energy Builders Challenge**

DOE seeks to give every consumer the opportunity to buy a cost-neutral, net-zero energy home anywhere in the U.S. by 2030. Homes that qualify for this Builders Challenge must achieve a 70 or less on the EnergySmart Home Scale (E-Scale) which is based on the Home Energy Rating System (HERS) index (www.natresnet.org). The E-Scale allows homebuyers to understand—at a glance—how the energy performance of a particular home compares with others.



To learn more about the Builders Challenge and find tools to help market your homes, visit [www.buildingamerica.gov/challenge](http://www.buildingamerica.gov/challenge).

**Energy-Efficient Features**

- **HERS:** -3
- **Walls:** 2x6 16-in. o.c.
- **Attic Insulation:** R-45 spray foam
- **Wall insulation:** R-34, 7-inch spray foam + 1-inch exterior XPS
- **Roofing Material:** Shingles from recycled nylon carpet
- **Foundation:** Basement, R-30 insulated concrete forms
- **Ducts:** In conditioned space, for ventilation only
- **HVAC:** radiant floor heating
- **Windows:** Alpen HeatMirror glazing and Fibertec frames. U-0.18 west and east, 0.12 north
- **Water Heating:** Roof-mounted solar flat-plate collectors feed a 6,000-gallon tank
- **Ventilation:** ERV with geothermal pre-heat/pre-cool fresh air intake.
- **Green features:** Formaldehyde-free cabinets and carpet, AFM Safecoat paints, salvaged hardwood flooring
- **Lighting:** 99% compact fluorescent lights
- **Solar:** 8.9-kW Sharp Photovoltaic array, solar thermal water heating