



## Builders Challenge

Recognizing Energy Leadership in Homebuilding

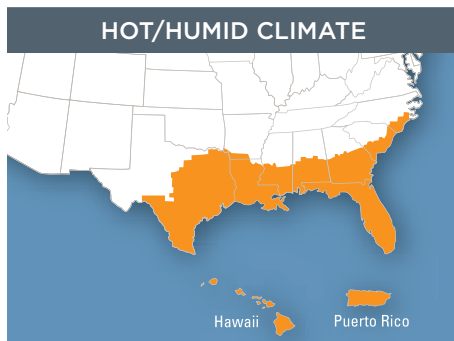
## High Performance Builder Spotlight

# GreenCraft

Lewisville, Texas

This Building America demonstration home by GreenCraft Builders in Lewisville, Texas, makes almost twice as much energy as its homeowner uses.

In October and November 2009, the TimberCreek Zero Energy House in Lewisville, Texas, opened as a Building America Demonstration House. “We had over 5,000 people, including builders and industry professionals, tour the home the first four weekends,” said Chris Miles, vice president of GreenCraft Builders, a custom home builder.



### BUILDER PROFILE

#### GreenCraft Builders, LLC

[www.greencraftbuilders.com](http://www.greencraftbuilders.com)

Chris Miles, Vice President

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**Founded:** 2006

**Number of homes built per year:** 3

**This House:** 2,538 sq. ft., done, 10/01/2009

**Price Range:** \$155 square foot

**Energy-Efficiency Commitment:** All Builders Challenge, all ENERGY STAR



“Our company’s goals include educating homeowners and other builders about energy efficiency and sustainability and building the best homes for our clients,” said Miles. TimberCreek demonstrates these goals. The 2,538-foot, three-bedroom, 2½-bath custom-built home showed a home energy rating score (HERS) of 56 without the solar photovoltaics and a HERS score of 1 with PV (with blower door tests of 1.4 air changes per hour at 50 pascals and duct leakage tests of 166 cfm at 25 pascals).

“We are trying to show the importance of building a house as a system. We pay attention to every single detail,” said Miles. And the details are impressive. It begins with the house design. The house is oriented for optimal cross ventilation and sun shading with a south-facing roof constructed to fit the solar panels and at a pitch for optimal solar angle. The homeowner asked for lots of natural light. The more than 650 square feet of windows are gas-filled and low-emissivity (U-values 0.29-0.27; SHGC 0.20-0.24) with composite frames that prevent thermal heat transfer.

The 2x6 24-inch-on-center wood framed walls are filled with R-21 open-cell spray foam. The exterior walls are covered with an R-5 rigid foam sheathing (polyisocyanurate) that is taped at the seams to provide an air barrier. Housewrap covers the foam sheathing to provide a drainage plane. The reflective paint on the metal galvalume roof cuts solar gain to the conditioned and unvented attic, which is insulated with R-30 open-cell spray foam under the roof deck.

Indoor air quality is maintained in the air-tight house with an Aprilaire controller system that cycles on every hour, to open a damper on an outside air intake, drawing in fresh air to circulate through the house. The air intake gives

the house a slight positive pressure, which helps to keep hot, humid air outside. Jump ducts provide air to the bedrooms, and bathroom and kitchen exhaust fans remove stale air per ASHRAE 62.2.

The home is heated and cooled with a commercial-grade Digital Scroll™ heat pump. This unit is rated at 14 SEER for cooling, and 8.5 HSPF for heating and has a modulating compressor allowing operation at 1 to 3 tons. The unit can also provide supplemental dehumidification separate from cooling.

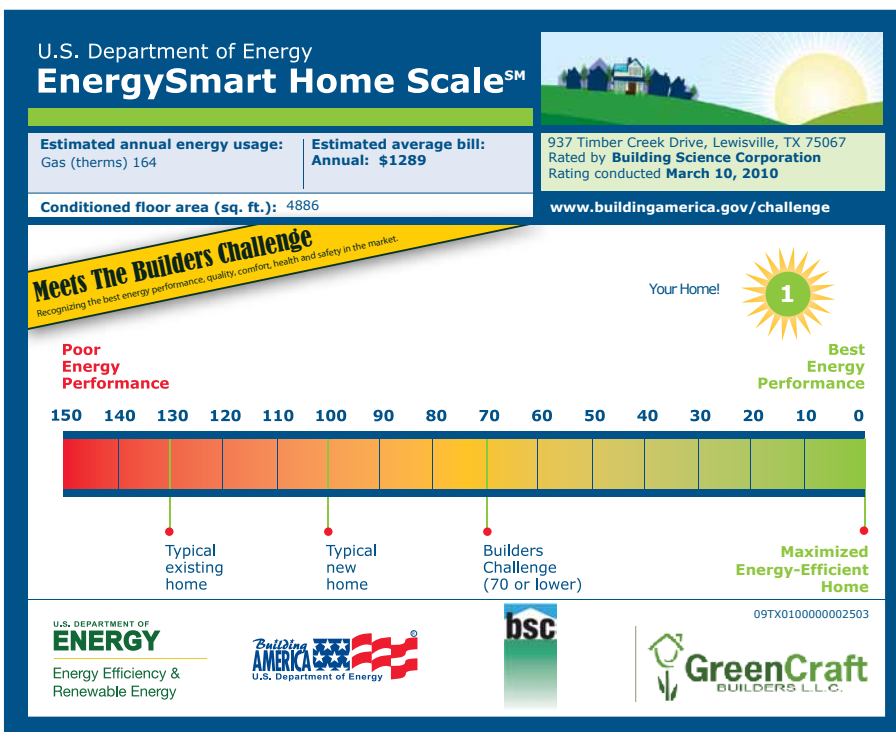
“The first priority is to make the house as efficient as possible. When we add the solar panels, it is a no-brainer that we have a net zero energy home,” said Miles. The 9-kW photovoltaic system has generated up to 1,300 kWh a month. The homeowner uses about 800 kWh a month, and earns utility credits on the rest.



To view videos see <http://www.timbercreekzeroenergyhouse.com/video/>

## 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](http://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).

## Key Features

- **HERS Score:** 56 without PV, 1 with PV
- **Blower Door:** 620 cfm at 50 Pa (1.4 ACH at 50 Pa)
- **Duct Leakage:** 166 cfm at 25 Pa
- **Heating and Cooling:** 8.5-HSPF, 14-SEER electric heat pump in conditioned attic
- **Ventilation:** Controlled fresh air intake
- **Ducts:** All in conditioned space
- **Water Heating:** Two 0.91-EF gas tankless heaters
- **Wall Insulation:** R-21 open cell spray foam with R-5 rigid foam sheathing on 2x6 24-inch-on-center advanced framing
- **Roof Insulation:** R-30 open-cell foam at the roof deck with radiant barrier
- **Attic Design:** Unvented, conditioned attic
- **Windows:** Composite-frame, gas-filled, low-e windows (U=0.29-0.2, SHGC=0.20)
- **Appliances:** ENERGY STAR refrigerator, dishwasher, and clothes washer
- **Lighting:** 17 CFLs, 32 LEDs, 1 tube skylight
- **Solar:** 9-kWh photovoltaic roof-mounted system (42 panels at 18-degree tilt)
- **Air Sealing Details:** Corners are caulked; framing is covered with 1-inch rigid foam insulation that is taped at seams, and covered with Tyvek ThermaWrap