

High Performance Builder Spotlight

Lakeland Habitat for Humanity

Lakeland, Florida



Affordable is More than First Cost

Home affordability isn't just the sticker price; it's also how much you pay each month to keep the home running. Claire Twomey, Executive Director of Lakeland Habitat for Humanity in Lakeland, Florida, learned this lesson when Building America partner and energy consultant Ken Fonorow pointed out to her that even though Habitat owners were getting mortgage payments of under \$200/month thanks to 0% interest loans, monthly affordability was still an issue because many were paying over \$300/month on their utility bills.

“People who know about energy efficiency want it, people would be willing to pay for it if they know about it.”

CLAIRE TWOMEY
LAKELAND HABITAT FOR HUMANITY

Innovations

Since 2001 the Lakeland Habitat affiliate has built about 50 homes that achieve savings of at least 34% compared to the Building America benchmark.

Cooling is one of the biggest users of energy and Building America research showed that heat gain was highest through the ducts, windows and ceilings. To minimize these, Lakeland Habitat uses interior and air handler closet ducts, Low-e windows with deep overhangs above for shading

where possible, and a radiant barrier under the roof decking. An ENERGY STAR refrigerator reduces the heat generated by appliances. Exhaust fans in the kitchen and bathroom help to reduce the latent (moisture) load generated by breathing, cooking, bathing, and washing clothes.

“The radiant barrier is like thick, flexible aluminum foil. It is very cheap, we just buy it in big rolls. You staple it to the inside of the roof between the rafters. It brings down the heat in the attic space by up to 40 degrees.” If the home's ductwork is located in the attic, the barrier provides the added benefit of reducing heat gains to the ducts so the air conditioner doesn't have to work as hard in the summer,” said Twomey.

Lakeland also uses a unique heat recovery system that captures heat from the hot water pipes to heat the home. “Our heating requirements are low here so this usually covers it,” said Twomey.

In addition to the energy improvements, Lakeland Habitat homes have the benefit of improved indoor air quality, durability, and comfort. Excellent indoor air quality is the result of sealed combustion heating (when gas is used), sealed duct systems, filtered outside air ventilation, ducted kitchen and bath exhaust fans to remove moisture generated by cooking and bathing, and adequate return air pathways from all bedrooms. Careful attention is paid to sealing the house's continuous air barrier by caulking and filling any cracks and penetrations in the walls, floors, and ceilings improves energy efficiency while also keeping out insects, pollen, and moisture. All HVAC duct joints are sealed with mastic and fiberglass mesh to reduce the risk of condensation on the ducts, a source of mold and rot.

BUILDER PROFILE

Lakeland Habitat for Humanity
www.lakelandhabitat.org

Founded: 1990

Number of Staff: 4

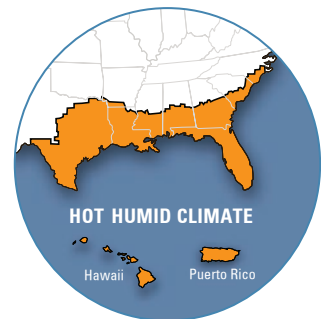
Number of Houses Built to Date: 50

Number of Houses Built per Year: 10

Construction Type: Wood frame on a slab, some steel framed

Energy Efficiency Status: First ENERGY STAR house in 2000, now all at least 30% higher than Building America benchmark.

This builder is described in Building America's Affordable Hot-Humid Case Studies.



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Keeping the airhandler and ducts in conditioned space such as this chase reduces outside air leakage and prevents temperature differences inside and outside the ducts, that can lead to condensation and mold problems.

KEY FEATURES

Radiant barrier

Double pane, vinyl frame, Low-e windows placed under 24-inch overhangs to limit solar gain

Houses oriented to limit thermal gain where possible

Ducts in conditioned space using a framed-in duct chase and interior air handler closet

Sealed ducts tested to ensure leakage below 5%

Heat recovery from hot water

Water-heater timers

Outside air vent ducted to the return side of the air handler

14 SEER air conditioner

Extensive air sealing of building envelope after dry in

Dollars and Sense

Lakeland has been able to achieve these savings for an estimated first cost of \$1,500, \$50 annually over 30 years at the 0% interest rates available to Habitat home owners. But an estimated annual energy savings of \$182 from the energy efficiency additions actually produce an annual positive cash flow of \$132.

According to Twomey little changes add up to big savings. “Mostly its small things, like caulking and adding a radiant barrier.

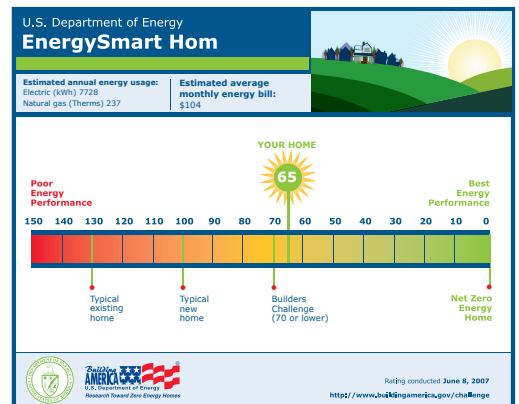
“We monitored our first house for five years and compared it to a house with the same square footage and same family size that was built 6 months earlier without the energy-efficiency changes. Utility savings were 60%. Dollar-wise, that equates to savings of at least \$150/month,” said Twomey.

U.S. Department of Energy Builders Challenge

DOE has posed a challenge to the homebuilding industry—to build 220,000 high performance homes by 2012. Homes that qualify for this Builders Challenge must meet a 70 or better on the EnergySmart Home Scale (E-Scale). 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 have an easy way to differentiate their best energy-performing homes from other products in the marketplace, and to make the benefits clear to buyers.

The figure to the right shows an E-Scale example. The E-scale is based on the well-established Home Energy Rating System (HERS) index, developed by the Residential Energy Services Network. To learn more about the index and HERS Raters visit www.natresnet.org.

To learn more about the Builders Challenge and find tools to help market your homes, visit www.buildingamerica.gov/challenge.



For more information visit www.buildingamerica.gov. The website contains expanded case studies, technical reports, and best practices descriptions.

The Building America Program

Building America is a private/public partnership sponsored by DOE that conducts systems research to improve overall housing performance, increase housing durability and comfort, reduce energy use, and increase energy security for America’s homeowners. Building America teams construct test houses and community-scale projects that incorporate systems innovations. The teams design houses from the ground up, considering the interaction between the site, building envelope, mechanical systems, and other factors, and recognizing that features of one component in the house can greatly affect others. More than 40,000 energy-efficient houses have been built by the seven teams to date.