RECOGNIZING ENERGY LEADERSHIP IN HOMEBUILDING

BUILDERS CHALLENGE

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

High Performance Builder Spotlight

Palm Harbor Homes - Bimini II

Plant City, Florida

Meeting the Challenge

In February 2008 Palm Harbor Homes was awarded the nation's first EnergySmart label for building a home that meets the U.S. Department of Energy's Builders Challenge criteria for energy efficiency. DOE Secretary Samuel W. Bodman placed the EnergySmart Home Scale (E-Scale) label on the home's electrical panel at the International Builder's Show in Orlando, Florida.

> "Being environmentally sensitive doesn't mean you have to give up comfort or spend a fortune to get the home you want."
>
> **MIKE DRAPER, FLORIDA DIVISION PRESIDENT, PALM HARBOR HOMES**

The 3,312 sq ft, 3 bedroom, 3½ bath home was built by Palm Harbor Homes, one of the nation's top producers of modular and manufactured houses. "We've always been dedicated to energy efficiency," explains Mike Draper, Florida Division President. "Quality is key with us; there's absolutely no reason why a modular home can't be as efficient or healthy as a stick-built house." When Palm Harbor Homes learned of the Builders Challenge they immediately joined the program. With guidance from the Building America Industrialized Housing Partnership (BAIHP), they were able to achieve their goals.

The Bimini II model achieved a great score of 57—indicating that the house is 43% more efficient than a home built to the 2006 International Energy Conservation Code. Even more impressive is the fact that the Bimini home was built for display at the 2008 International Builders Show and had to achieve this score in a very tight timeframe.

"I was confident the house would hit at least 70, the score needed to qualify" says Subrato Chandra, project director for the BAIHP. "But I wasn't sure how close it would be. Construction was so hectic that we didn't even run the final test until February 11—and the show opened February 13! It was very gratifying to see that the house did so well."

High Efficiency and a Solar Boost

The home achieves big energy savings with a very efficient 17 SEER / 9 HSPF heat pump (dual fuel) with programmable thermostat and extra snug envelope sealing ensured by Icynene spray foam insulation, which provides an R13 insulating value in the walls and R21 in the roof. The home's stylish exterior has lots of windows but double glazing, low emissivity, and vinyl framing ensure they keep out heat and humidity. Deep overhangs, a covered porch, and light metal roofing also minimize interior heat gain.

The builder had access to the Florida Department of Environmental Protection SunBuilt Program, which provides rebates and vouchers in exchange for pledging to offer solar as either a standard or optional new home feature. A drainback solar domestic hot water (SDHW) system integrated with a tankless water heater was chosen for the Bimini model.

BUILDER PROFILE

Palm Harbor Homes, Florida Division
www.palmharbor.com

Founded: 1977

Development: Bimini II

Square footage: 3,312 sq ft, 3 bedrooms, 3½ bath

Palm Harbor Homes constructs manufactured and modular homes at 14 U.S. facilities.

2007 net sales totaled over $661 million

2007 ENERGY STAR® Partner of the Year

2006 Gold Award, National Association of Home Builders Energy Value Housing Award

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

5/2008

BUILDER SPOTLIGHT

Palm Harbor Homes - Bimini II

U.S. Dept. of Energy Secretary Samuel W. Bodman secures the first EnergySmart label to the Bimini electrical panel box.

KEY FEATURES

- HERS Rating: 57 (43% more energy efficient that a typical new house)
- Solar drainback domestic hot water system with Rinnai® tankless back-up
- Icynene® spray foam insulation (R13 walls, R21 roof)
- Low-E windows, U 0.35 and SHGC 0.30
- 17 SEER / 9 HSPF heat pump (dual fuel) by Carrier® with programmable thermostat
- Properly sized, tight ducts in conditioned space
- Outside air ventilation
- Quiet exhaust fans
- Zero VOC paint and 75% reduced VOC caulks and sealants by Henkel
- ENERGY STAR® appliances
- Built for 140 mph wind zone

While somewhat more complex than other systems, the drainback SDHW performs well in northern Florida's periodic freezing temperatures. The roof-mounted collector system heats fluid that is pumped to a drainback tank where the heat is transferred to potable water that is then stored in an 80-gallon tank. A tankless water heater provides backup hot water as needed.

Indoor Air Quality

Outside air ventilation and quiet exhaust fans move stale air out of living areas. Zero VOC paint and 75% reduced VOC caulks and sealants were used to ensure that the homeowner would experience no smells or harmful effects due to chemicals. A central vacuum system was installed to make dust control easier for the homeowner.

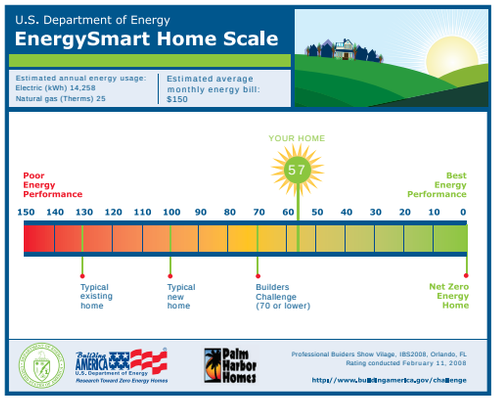
"We were very interested in receiving green certifications for the home," says Mike Draper, "Building green requires a house to be healthy as well as energy efficient, so we focused a lot of attention on indoor air quality and other environmental factors."

The Bottom Line

The Bimini II was certified a Florida Green Home by the Florida Green Building Coalition and meets Gold level standards in all sections except lot design, preparation, and development per the new NAHB National Green Home Building Program (nahbgreen.com). Equipped with ENERGY STAR appliances and compact fluorescent lighting, this two-story home demonstrates the very best in modular home building.

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 score 70 or less on the EnergySmart Home Scale (E-Scale). The first EnergySmart Home label was awarded to Palm Harbor Homes in February 2008 with a score of 57.



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 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.

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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.