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Building AMERICA SM
U.S. Department of Energy

Research that Works
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Habitat for Humanity in Houston, Texas: Building Energy Efficient Homes for Over a Decade

Since 1995, The **U.S. Department of Energy's Building America** program has provided technical assistance to Habitat for Humanity International and local Habitat affiliates interested in building energy efficient homes. Building America researchers help Habitat identify energy improvements that:

- are proven to be cost effective,
- are readily available in the market place,
- are appropriate for Habitat's volunteer construction crews, and
- do not place a maintenance burden on the homeowner.

Houston Habitat for Humanity

Building America began working with Houston Habitat in 1996 on the award-winning *Energy Affordable Home* program. In 1997, Building America certified the first Energy Star Habitat home, followed by a 100-home community of Energy Star homes in 1998. Houston Habitat has built more Energy Star homes than any other Habitat affiliate (300+) and was recognized with an Energy Star Homes Builder of the Year Special Recognition Award in 1999 and the Affordable Home Builder of the Year Award in 2006.

For three years, Houston Habitat has been receiving free home energy ratings from DPIS Engineering to certify their Energy Star homes (see specifications below.) Brannon King, DPIS Vice President, notes that three more Habitat affiliates have come to them for Energy Star ratings as a result of Houston Habitat's leadership.[3] Construction Manager Mike Owen notes that concern for long-term affordability and durability drive Houston Habitat's effort to build energy-efficient high performance homes. Owen says, "If we can make a house more affordable month to month, it effectively increases the home owner's income. And the attention to details in an energy efficient home enhance durability, especially the air sealing details which keep infiltration and moisture intrusion under control."

The Bottom Line

Owen estimates the cost of building Energy Star homes to be about $600 per house for higher efficiency air conditioning, better windows, extra foam, caulking, and insulation, and some additional staff time for quality control. This cost is offset by utility rebates, Owen explains, "We get about $600 to $800 per house for participating in our utility's builder incentive program for efficiency. If I can build an energy-efficient home and, at the end of the day, the net cost is $0 or I make money on it, why wouldn't I do that?"

RESNET
Residential Energy Services Network
www.natresnet.org

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Volunteer Energy Rater – Habitat for Humanity – Building America – RESNET

Through the RESNET-Building America-Habitat Partnership, RESNET-certified raters provide one pro-bono Energy Star rating to a Habitat affiliate in their community. Look for the "Volunteer Energy Rater" emblem above in RESNET's online rater directory at: www.resnet.us/directory/raters_builders.aspx

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

For more information on Building America's Partnership with Habitat for Humanity, see www.baihp.org/habitat

Systems and Appliances

- SEER 14 AC (straight cool) with dual stage compressor
- 80% AFUE Gas Furnaces (or Heat Pump)
- Every duct system tested to ensure leakage does not 6 cfm per 100 ft2 of conditioned space
- Passive Outside Air ventilation to return plenum
- Whirlpool Energy Star Refrigerator
- Energy Star Ceiling Fans

Enclosure

- 2x4 Frame construction with R13 insulation with R4 rigid insulation
- R-30 Ceiling insulation with radiant barrier
- Low-E, double pane, aluminum frame windows (SHGC= 0.37; U-Value = 0.51)
- Tankless Water Heaters

HERS Index Average = 82 (85 or less required for Energy Star)

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

Research and Development of Buildings

Our nation's buildings consume more energy than any other sector of the U.S. economy, including transportation and industry. Fortunately, the opportunities to reduce building energy use—and the associated environmental impacts—are significant.

DOE's Building Technologies Program works to improve the energy efficiency of our nation's buildings through innovative new technologies and better building practices. The program focuses on two key areas:

- **Emerging Technologies**
  Research and development of the next generation of energy-efficient components, materials, and equipment
- **Technology Integration**
  Integration of new technologies with innovative building methods to optimize building performance and savings

For more information contact
EERE Information Center
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www.eere.energy.gov

U.S. Department of Energy
Energy Efficiency and Renewable Energy

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PATH Partnership for Advancing Technology in Housing

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Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable