

UNIVERSITY OF CENTRAL FLORIDA
Energy Efficient Building Technologies and Zero Energy Homes

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Description: The project consists of two elements: 1) the construction of two flexible research homes at FSEC to conduct research on advanced building energy efficiency technologies under controlled conditions; and 2) a staged, field retrofit study in a small number of unoccupied homes to measure and document the effectiveness of a series of retrofit measures that can be deployed using current technology. The project will also conduct an annual meeting where other FESC participants, other university members and utility, industry, the U.S. Department of Energy and other stake holders who will be briefed on plans and progress. Inputs from meeting participants will be sought.

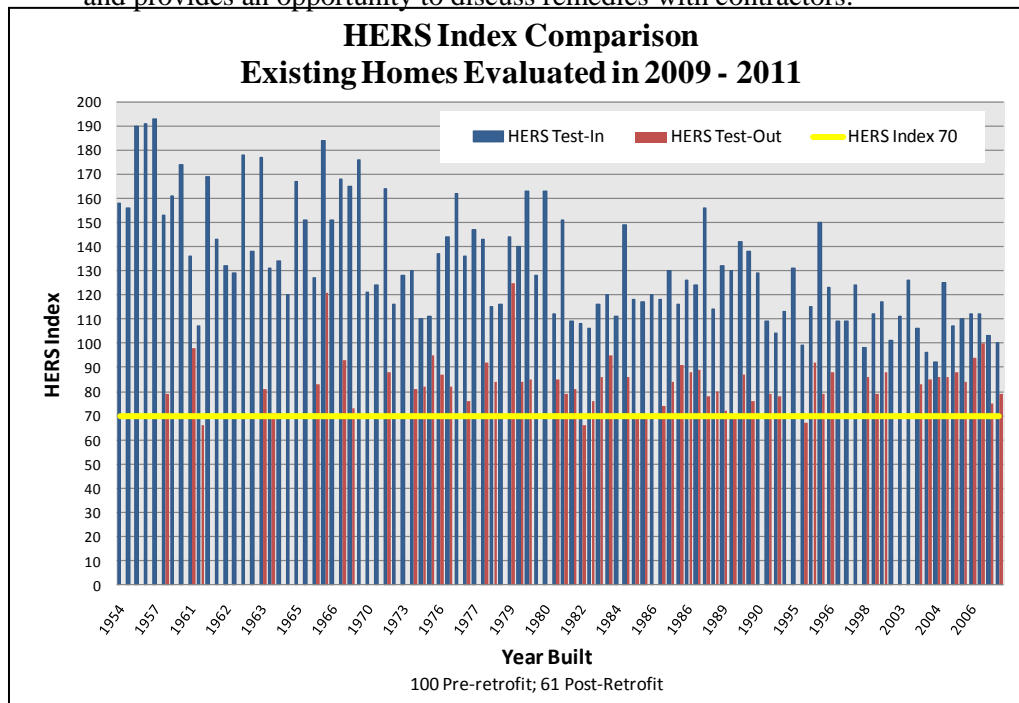
Budget: \$ 1,224,000

Universities: UCF/FSEC

Progress Summary

April 2011 status:

- A. Technical assistance for government and non-profit residential retrofits, with the FSEC technical support largely funded through Building America, and local retrofits funded by block grants. Key findings:
- 100 Homes Analyzed
 - 65 Retrofits completed
 - 27 Retrofits in progress
 - 8 Lost from study after initial analysis
 - Mostly: single family detached, cmu or frame, single story, built 1954 - 2006, 754 – 2408 sf, split-system forced air mechanical systems are the norm.
 - Poor HERS results were largely related to duct leakage.
 - Ducts were leakier at post retrofit in 12% of the cases.
 - Average annual projected whole house energy savings is 24%, \$467.
 - Lack of return air ducts in the bedrooms creating depressurized main bodies is common and provides an opportunity to discuss remedies with contractors.



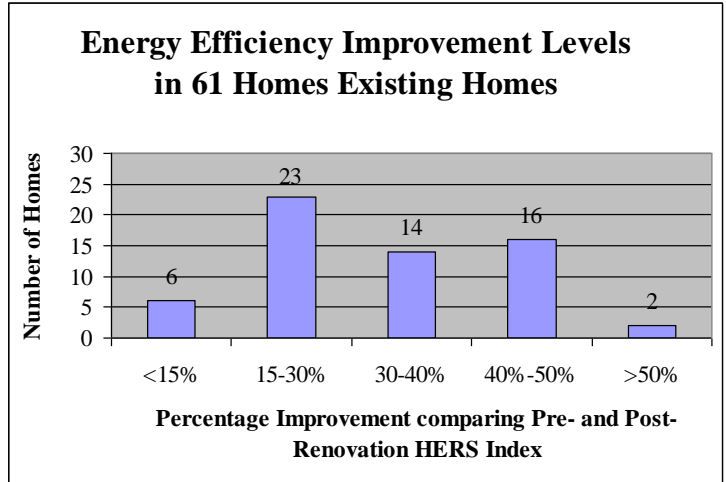
- 32 Homes Achieved 30% or more improvement in HERS Index

B. Flexible residential test structures:

Construction of the flexible residential test structures was completed in December. Instrumentation was ordered and will be installed next quarter. A preliminary measurement of temperature during passive load conditions indicates the buildings track each other well. A number of DOE staff toured the facility when they visited the Florida Solar Energy Center in January, after FSEC had been awarded a four year research contract in which the facility will play a significant role.

“As we address greenhouse gas emissions, we have to look at retrofitting existing homes. This facility will be instrumental in researching the impacts of home energy efficiency improvements in hot climates,” said Mr. David Lee, U.S. Department of Energy’s Director of Residential Building Programs.

Right: Cutting the ribbon at the opening of the Flexible Residential Test Facility are (left to right) Robin Vieira, Director, Buildings Research at Florida Solar Energy Center; David Lee, U.S. Department of Energy’s Director of Residential Building Programs; James Fenton, Director, Florida Solar Energy Center.



HERS index (the lower the better) for before and after retrofits by year of construction



Completed flexible residential test Structures on FSEC campus