PROJECT
facts

ENERGY EFFICIENT HOUSES
SCIES

ESTABLISHING ENERGY EFFICIENT STANDARDS FOR MANUFACTURED HOUSING

Project History

Owning a home is the great American dream. Manufactured homes fit this desire by offering the first time home buyer and fixed income families the opportunity to purchase affordable efficiently produced housing. In 1999, 21.4 million Americans (about 7.6 percent of the U.S. population) lived in 8.9 million manufactured homes. The Southeast region has the greatest concentration of these housing units - in South Carolina approximately 17% of all homes are manufactured houses and in some regions of the state, over 50% of new hookups are manufactured houses.

A spot energy survey of randomly selected manufactured homes conducted by the South Carolina Institute for Energy Studies (SCIES) showed a huge variation in energy costs (figure 1). Follow up studies conducted at a South Carolina retirement community showed that industry standards have made efficiency improvements in recent years (figure 2); however, variations in energy consumption patterns of houses built to similar standards sited side by side, continue to exist and show wide variation (figure 3).

The South Carolina Institute For Energy Studies, via a two-year study using energy bills of homes built to up-to-date standards, has developed a computer code where the energy consumption can be estimated via a five parameter model - insulation, weather conditions, home construction, infiltration, and consumer habits. Simulation studies can be run at the South Carolina Institute For Energy Studies. Reduction in energy consumption is shown to be easily achievable which ultimately saves money for the consumer.

PROJECT SITE

SOUTH CAROLINA INSTITUTE FOR ENERGY STUDIES
Clemson University
Clemson, SC

Figure 1

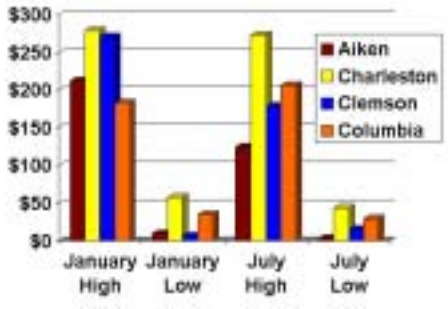
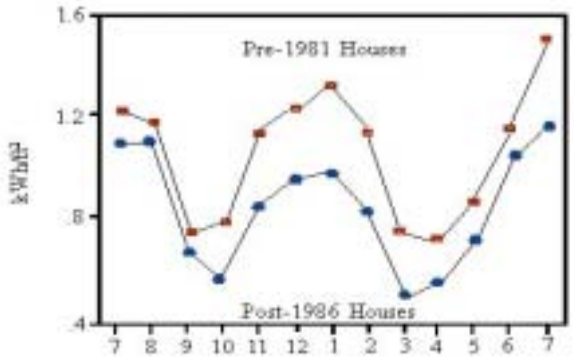
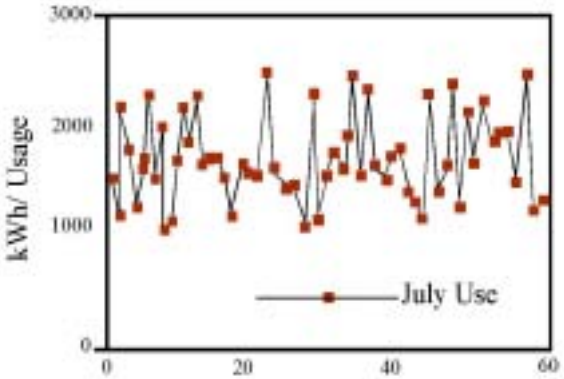


Figure 2



MONTH

Figure 3



HOUSE

ENERGY EFFICIENT HOUSES

Project Incentives

- Energy efficient houses reduce customer energy bills as well as the demand on utilities.
- Provide more disposable income for homeowners.
- Allow consumers to select design variables that produce an efficient and comfortable environment inside the home.
- Savings of up to 40% have been shown to be possible without major structural changes.

Making Manufactured Houses Energy Efficient--Manufacturing Pointers

- Ensure the marriage line and all the duct work are tightly sealed.
- Properly insulate the duct work beneath the floor.
- Caulk and seal air gaps around windows and door frames.
- Install the maximum allowable amounts of insulation and ensure there are no empty spaces.
- Install low emissivity, low U-value windows.
- Allow for passive heating and cooling of the house.
- Install energy efficient appliances.

Manufactured Housing Related Publications

Cai, Y., T. Wang, and L. P. Golan, *Mixed Convection of Heat and Moisture in the Crawl Space of Manufactured Housing*, National Heat Transfer Conference, Portland, OR, 1995.

Mueller, B. T., and L. P. Golan, *A Case Study. Energy Consumption Patterns in a Manufactured Housing Community*, Excellence in Housing Conference, Minneapolis, MN, 1995.

Mueller, B. T., L. P. Golan, and D. Fort, *Energy Efficient Houses-PROJECT facts*, Consumer Information Publication, Sponsored by the Department of Energy's Energy Efficiency and Renewable Energy Clearinghouse, South Carolina Energy Research and Development Center, Clemson, South Carolina, 1994.

Mueller, B. T., *Survey of Manufactured Homes*, Departmental Report, South Carolina Energy Research and Development Center, Clemson, South Carolina, 1992.

Energy Efficiency in Manufactured Homes, BANJO Video and Film Productions, 18 minutes, 1991.

CONTACT POINTS

Robert Leitner
Director
South Carolina Institute for Energy Studies
400 Klugh Avenue
Clemson, SC 29634-5711
(864) 656-2267
(864) 656-0142 (FAX)
rleitne@clemson.edu
www.clemson.edu/scies

Mark Dillard
Executive Director
Manufactured Housing Institute of South Carolina
P. O. Box 1781
West Columbia, SC 29202
(803) 771-9046
(803) 771-7023 (FAX)