

# **Energy Efficient Modular Research and Design Project Southern Tier Housing Corporation**

## **Project Description**

Southern Tier Housing Corporation (STHC) and its development partners, Kentucky Highlands Investment Corporation (KHIC), the University of Kentucky, and Stardust Ventures, LLC, will conduct energy modeling and design research which balances cost containment with exceptional energy efficiency in modular building construction. The research partners will evaluate all the known design and production inputs, plus cost and energy performance characteristics from the construction and operation of two occupied modular prototype residences to develop a more cost effective but high performing factory-built structure.

The prototypes are billed as Houseboats to Energy Efficient Residences (HBEER). Southern Tier and its partners see market opportunity in high quality, energy efficient housing and other structures like the prototypes but subsequent units must cost less to gain broad appeal. Total program costs are more than \$1 million with Cabinet awarding \$504,000 in matching grant funds.

## **Project Objectives**

- Produce energy efficient factory-built structures (modular, incl. pod and panel) that meet or exceed Energy Star or other recognized standard.
- Complete a life-cycle analysis of costs of structures compared to pre-1980 mobile homes.
- Complete energy monitoring and performance analysis of 2 occupied HBEER prototypes.
- Design a family of factory-built structures for single family, multi-family, classroom, professional/clinical or other suitable applications.
- Complete construction of four new energy efficient, factory-built structures that incorporate design features developed as a result of this project and are equipped with photovoltaic generation systems, at least two will be in the Kentucky TVA service area.

## **Time-line**

Project phases overlap during the design, analysis and construction of four modular units.

Project runs from May 2013 through June 2016.

**Phase 1** – Data Collection, Design and Engineering Review

**Phase 2** – Design and Engineering Optimization: Conduct an iterative design process with a goal of achieving the optimal cost and performance for at least 6 cost effective designs.

**Phase 3** – Implementation and Construction – Advise Stardust on the manufacture of 4 modular structures according to designs produced through the collaborative effort of the project partners.

(Four units constructed and placed April 2014 – April 2016)