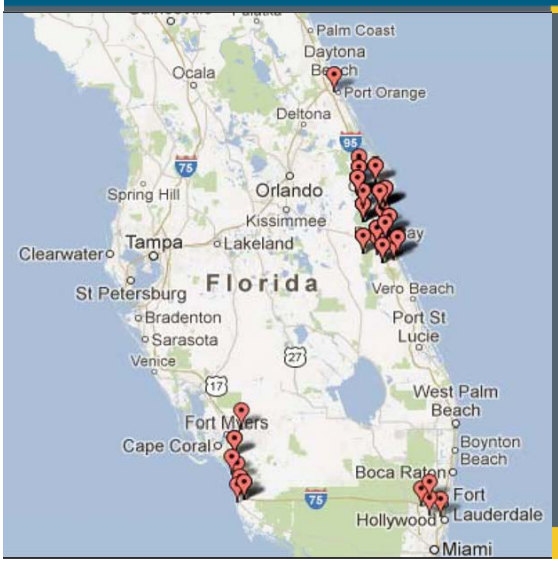

Building America Case Study
Technology Solutions for Existing Homes

Pilot Demonstration of Phased Retrofits in Existing Florida Homes

Central and South Florida

PROJECT INFORMATION

Building America Partnership for Improved Residential Construction, www.ba-pirc.org

Partners: Florida Power & Light (FPL)

Location: Brevard, Collier, and Palm Beach Counties, Florida

Application: Retrofit; Single-family

Number of Homes: 60

Age Range: 1958-2006

Applicable Climate Zone(s): Hot-humid

Year Tested: 2012-2013

www.informonitors.com/pdr/

PERFORMANCE DATA

Estimated Cost of Energy-Efficiency Measures (including labor):
$500 - $800 / house – Phase I
$10,000 - $12,000 / house – Phase II

Projected Annual Energy Savings:
10% - Phase I
40% - Phase II

Projected Energy Cost Savings:
$200/year per house – Phase I
$800/year per house – Phase II

Building America SM U.S. Department of Energy

The Florida Solar Energy Center (FSEC) and Florida Power and Light are pursuing a collaborative energy research /utility partnership to retrofit a large number of homes using a phased approach. The project is creating detailed data on the energy and economic performance of two levels of home retrofit – simple and deep. Acting as a pilot, this project is expected to provide the information necessary to significantly reduce energy use through much larger community-scale projects in collaboration with utilities, program administrators and other market leader stakeholders.

Site selection, preliminary audit, and four months of pre-retrofit energy end-use data have been collected/performed on 60 homes located in central and south Florida built from 1958-2006. The study aims to identify measured energy savings and peak demand reductions of the different retrofit levels and technologies. Pre-retrofit data is being used to identify and target where energy is being used.

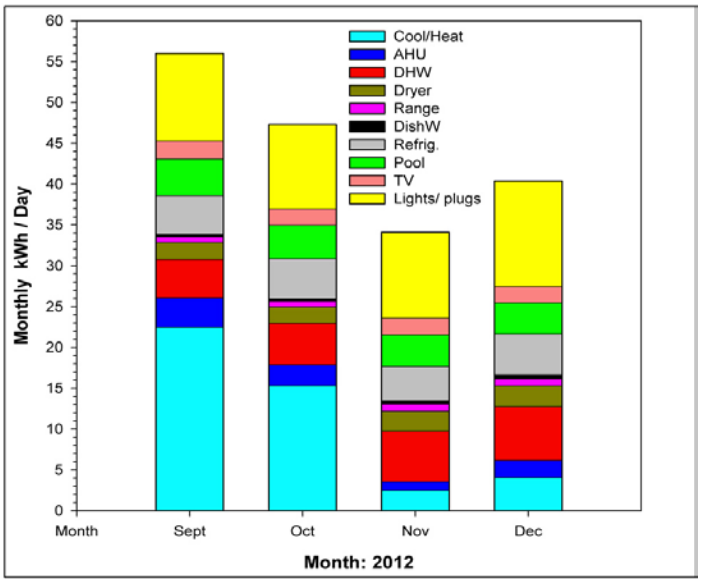

Figure 1 summarizes the average energy seen in the sample of retrofit homes from September – December 2012 for all end uses. The data reveal how house air conditioning drops with cooler temperatures and the marked seasonal variation in hot water energy use. In addition, energy use for refrigeration, clothes dryers, and television/ entertainment centers was relatively high for these homes.

PRELIMINARY END-USE RESULTS

Refrigeration energy use is surprisingly high—nearly equal to the magnitude of water heating when second refrigerators areconsidered

The main television and entertainment center, seldom considered from an energy-efficiency perspective, was found to use a large amount of energy (approximately 750 kWh/year).

Homes that have pools show pool pumping to be another very large electrical load – 5.2 kWh/day.

For more information including access to monitored data, visit the project website at:

http://www.infomonitors.com/pdr/

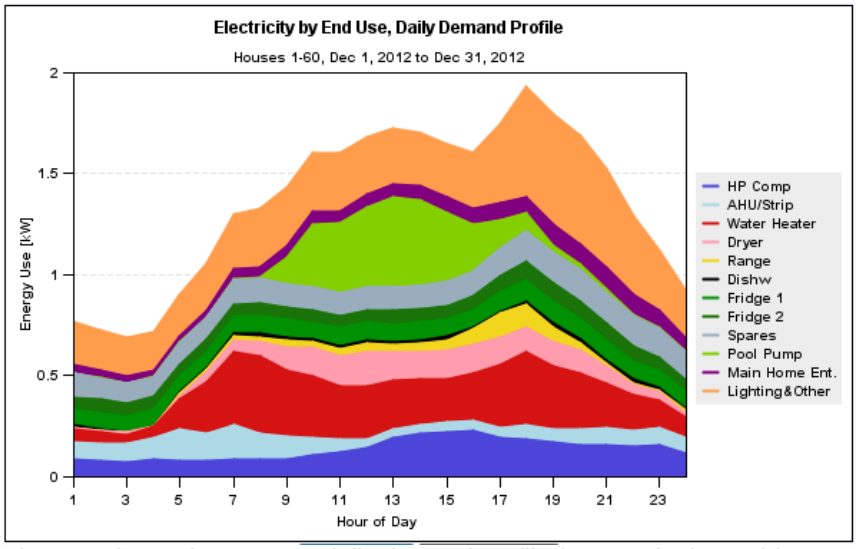

Figure 2 shows the average daily demand profile from each site and for each end use over the month of December.

All homes are slated to receive the simple pass-through retrofit measures. The simple retrofits are applicable to all homes and provide critical data to the design of Phase 2 deep retrofits that make a major impact on whole-house energy use, peak demand, and green house gas emissions. The deep retrofits would be performed on a subset of homes participating in Phase 1.

Table 1. Description of simple and deep retrofits

Phase I Simple Retrofits	Phase II Deep Retrofits
Hot Water Tank and Pipe Insulation	Upgrade to R-38 Ceiling Insulation
LED / CFL Lamps	Duct Testing and Sealing
Cleaning of Refrigerator Coils	Energy Star Refrigerator and Clothes Washer
Low Flow Showerheads	High Efficiency Heat Pump for Space Conditioning
Reduction of Pool Pump Hours	High Efficiency Pool Pump
Smart Power Strips for Home Offices and Entertainment Centers / Game Consoles	Heat Pump and/or Solar Water Heating

Lessons Learned (also see sidebar)

- Although air conditioning is large in September, no other single end-use load is otherwise dominant. (Figure 1)
- Other loads, which include lighting, computers, ceiling fans, and plugs, show a jump in December that is likely related to holiday lighting (Figure 1 and Figure 2).