Building AMERICA U.S. Department of Energy

CARBNEWS

A MONTHLY UPDATE ON SWA'S PARTICIPATION IN THE U.S. DEPARTMENT OF ENERGY'S BUILDING AMERICA PROGRAM

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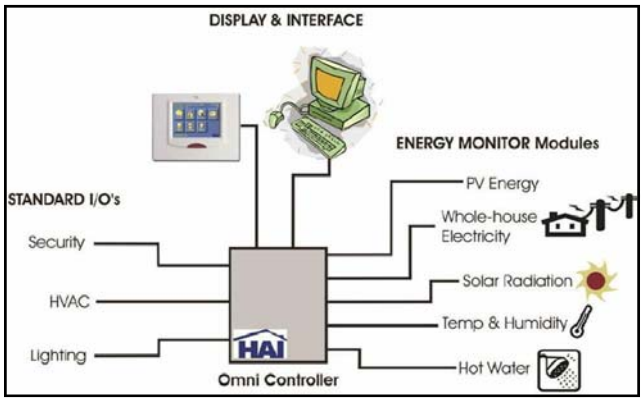
Getting a Handle on Home Energy Monitoring

Understanding how homeowners use energy--particularly electrical energy--is a necessary step for utility companies in long-term planning for generation and distribution. Reducing demand is also a critical part of the **U.S. Department of Energy's Building America** program in achieving its milestones for energy conservation. CARB partner **Veridian Homes**, working with Steven Winter Associates, Inc. (SWA) installed a whole-house electrical monitoring system (*photo at left*) developed by Whirlpool, which tracked total electrical use and could break down consumption by individual rooms and appliances. New research by SWA for the **New York State Energy Research and Development Authority (NYSERDA)** will build on what was learned by CARB in an effort to further understand and influence homeowner behavior. NYSERDA has asked SWA to look at the state-of-the-art in energy monitoring currently on the market and to design and develop a prototype system with **Home Automation, Inc.** (**HAI**, a leader in home automation that SWA collaborated with in the past). "NYSERDA wants to utilize energy monitoring as a way of educating homeowners about how they are using energy," explains SWA's Srikanth Puttagunta. Future directions will include not only electrical energy use, but also consumption of other utilities such as natural gas. Combining the monitoring system with the home's security system is a key component in the current research, notes Puttagunta. For example, a security monitor that also shows energy consumption might alert homeowners to an appliance inadvertently left on before they leave the home, or call their attention to a consumption pattern that appears out of the ordinary. "We are going to look at major appliances and various zones in the home, as well as hot water consumption and use of natural gas, and incorporate all of that monitoring information into a simple display," says Puttagunta. SWA will consider installing a prototype monitoring system in a CARB-builder house for observation and refinement.



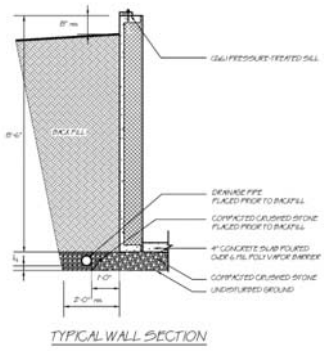
Schematic of the modular approach to the HAI Energy Monitor.

Sample display for the current HAI Web-Link II Monitor.

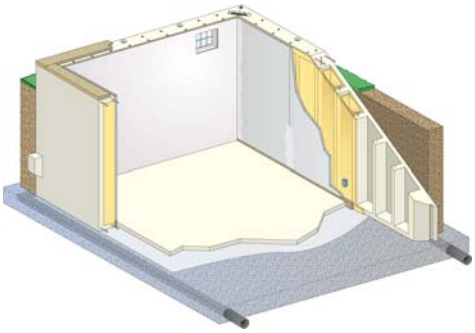
One Builder's Trip to ENERGY STAR

The advantages of building ENERGY STAR Homes is not lost on long-time CARB partner **William Ryan Homes**, which sees the market advantages of offering potential homeowners a house that can save on energy costs. One of the ways for a production builder like William Ryan is ENERGY STAR's Builder Option Package (or BOP). CARB is currently working with the builder to develop plans that will meet the BOP performance requirements as well as the Building America goal of 30% whole-house energy savings. This option gives the builder the specific things they need to do to get the ENERGY STAR label. (The other approach is to do an energy model and trying to meet or beat the HERS index of 85, which is 15% better than 2004 IECC). Both result in an ENERGY STAR certification. CARB began working with William Ryan Homes in Chicago in 2002. After reviewing a top-selling model, CARB made recommendations for improvements and developed testing plans in order to construct, monitor, and compare an improved prototype to a standard practice control house. Based on the relationship developed during those years, SWA was asked to conduct performance testing for numerous William Ryan developments in its Tampa division (one house takes shape from July to October, *left*). Performance testing began in August 2005 and is ongoing. Currently, more than 200 houses have been tested for infiltration levels, duct leakage, supply airflow, and bath fan performance. Based on the results, the builder has adopted SWA's recommendations to improve performance.

Building America Expert Meeting Changes the Market



Click on drawings to enlarge.



One thing leads to another. At least that's what happened when CARB member **Oldcastle Precast, Inc.**, attended one of CARB's **Building America** Expert Meetings in June 2004. The meeting focused on current CARB research and innovative uses of concrete technology for improving thermal performance, other energy-conserving features, and market opportunities. Oldcastle had supplied the precast concrete panel systems for a number of CARB projects (such as the Melrose development in the Bronx, New York, see *CARB News* October 2002) and at the meeting the company's interest was peaked when CARB presented findings on insulation systems for basement walls and insulated concrete wall panel systems. Also discussed were market opportunities for advanced concrete panels systems, specifically preinsulated concrete basements. Oldcastle approached SWA about helping to develop a new product (which underwent several iterations) and the installation guide to go with it. Oldcastle's Oasis Foundation Wall System is a ribbed precast 6000 psi concrete foundation panel with cavities filled with a 3" EPS foam L-cavity insulation liner (see diagram and wall section) with a 1" EPS layer over the concrete ribs. The interior side of the panels is finished with **Georgia Pacific's** Dens Armor Plus, a fiberglass-faced gypsum board that is installed in the factory. Thermal analysis revealed that the wall delivered a whole-wall R-value of 12. You can see the foundation system and download the installation guide at www.oasiswall.com.

www.carb-swa.com

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