Session XII-B: Whole Buildings—Energy

Thursday, December 9, 2004
8:30 a.m. to 10:00 a.m.
Grand Ballroom – Palm

Session Chair:

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8:30 a.m. to 8:40 a.m.	Introduction Paul Shipp
8:40 a.m. to 9:00 a.m.	*"Manufactured Home Performance Case Study: A Preliminary Comparison of Zero Energy and Energy Star"* Mike Lubliner
9:00 a.m. to 9:20 a.m.	*"From Vital Signs to Practice: A Technology Transfer Case Study"* Walter Grondzik
9:20 a.m. to 9:40 a.m.	*"Toward Simple, Affordable Zero Energy Houses"* Jeff Christian
9:40 a.m. to 10:00 a.m.	*"Cold Climate Case Study: High-Efficiency North Dakota Twin Homes"* Dave Chasar

Manufactured Home Performance Case Study: A Preliminary Comparison of Zero Energy and Energy Star

Michael Lubliner and Andrew Gordon – *Washington State University*

Adam Hadley – *Bonneville Power Administration*

The Zero Energy Manufactured Home (ZEMH) Project employs innovative energy-saving technologies. A comparison (base) home was built to the Pacific Northwest's Energy Star Program requirements. Tests were conducted and remote monitoring equipment installed to track the energy performance of each home. This paper presents the field testing results, preliminary monitoring results, and a description of the technologies used in the home. The impacts of occupant behavior on energy use are also discussed.

From Vital Signs to Practice: A Technology Transfer Case Study

Walter Grondzik – *Florida A&M University*

Bruce Haglund – *University of Idaho*

Alison Kwok – *University of Oregon*

This paper describes the translation of an academic methodology for teaching building performance issues into the realm of professional practice. To paint this case study, the paper presents a brief history of the evolution of the Vital Signs Project through the Agents of Change Project and into Tool Days, describes efforts to adapt Vital Signs methods and philosophy to professional practice, and compares participant evaluation results from several Agents of Change and Tool Day workshops. Findings to date indicate that the Vital Signs approach to building evaluation provides successful, engaging training for audiences from a range of disciplines and settings. The success of the technology transfer is validated by the incorporation of Vital Signs methods into the everyday work of the practice in question.

Toward Simple, Affordable Zero Energy Houses

Jeffrey Christian – *Oak Ridge National Laboratory*

David Beal – *Florida Solar Energy Center*

Philip Kerrigan – *Building Science Consortium*

A long-term goal of the U.S. Department of Energy is the creation of zero energy houses by the year 2020. This paper focuses on the first of a series of six near-zero-energy houses constructed in east Tennessee as part of a project to build a true net zero energy house by the end of 2005. The features in the first house included airtight floor, walls, ceiling, and structurally insulated panels (SIPS); compact thermal distribution system with all ducts positioned inside the conditioned space; controlled mechanical supply ventilation; high-efficiency windows with 0.34 U-factor and 0.33 SHGC; 14 SEER 1.5-ton heat pump with two-speed indoor circulating fan; heat pump water heater integrated with the refrigerator/AC/dehumidification; compact florescent lightbulbs and Energy Star appliances; reflective hidden metal seam roof; and grid-connected 2 kWp solar photovoltaic.

Cold Climate Case Study: High-Efficiency North Dakota Twin Homes

Dave Chasar, Neil Moyer, Subrato Chandra, Lisa Rotvold, and Ralph Applegren

Florida Solar Energy Center

This paper describes a housing project in Grand Forks, North Dakota, that had the goal of achieving up to 50% energy savings over the 1993 Model Energy Code. Estimated combined gas and electricity utility savings over a computer model base case ranged from 25% on the Phase I homes to 35% on Phase II homes. The increased savings in Phase II came from the use of extruded polystyrene (XPS) foam sheathing and tankless gas water heating, which had simple paybacks of 8.3 and 13.3 years, respectively.