Pacific Northwest
NATIONAL LABORATORY

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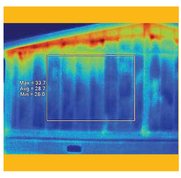
LAB HOMES

Lab Homes – Demonstrating and evaluating smart and retrofit technologies for energy savings

- Identical Experiment and Baseline research homes used to compare energy-saving and grid-smart technologies
- Advanced controls and monitoring systems measure incremental changes in energy use and environmental factors to determine the technology's effectiveness
- Simulated occupancy mimics human activity
- Studies underway to evaluate benefits of triple-pane windows, and examine the impacts of grid-smart appliances and electric vehicle charging on energy demand and use

To document the energy use and comfort of new technologies, such as windows, the homes are highly instrumented and controlled. Data are collected on inside and outside window temperatures, mean radiant temperature, solar insolation, room temperature and humidity, outside weather, and circuit level energy consumption. All data are collected and stored in the data acquisition system.

Lab Homes is a research platform for PNNL and its research partners to achieve highly energy-efficient and smart homes.



Researchers performed baseline testing to verify that the two homes were identically constructed. Heat loss through the walls was compared using an infrared camera and air leakage through the shell of the homes was characterized with a blower door. Heating, cooling and ventilation system performance was also measured.

Demonstrating tomorrow's efficient and smart technologies.

Visit us at: http://labhomes.pnnl.gov

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