Building America *Technical Highlight*

NREL's Field Data Repository Supports Accurate Home Energy Analysis

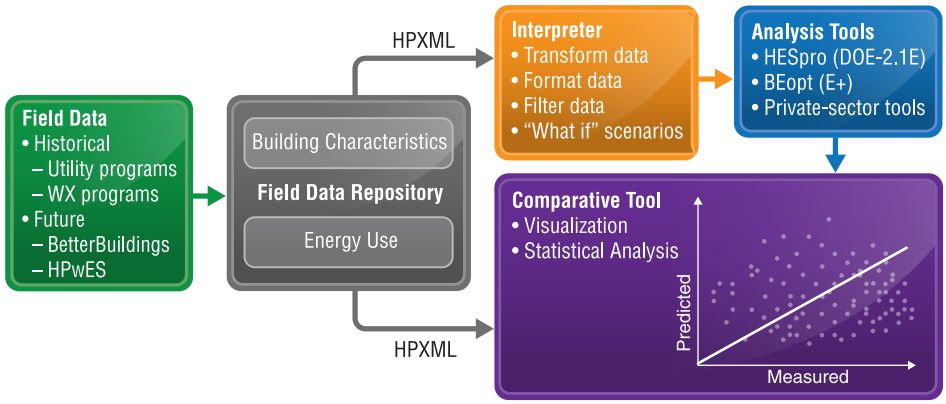
The Residential Buildings Research Group at the National Renewable Energy Laboratory (NREL) has developed a repository of research-level residential building characteristics and historical energy use data to support ongoing efforts to improve the accuracy of residential energy analysis tools and the efficiency of energy assessment processes.

The Field Data Repository currently includes data collected from historical programs where residential building characteristics (building geometry, insulation levels, equipment types, etc.), generally collected through energy audits, have been connected to measured energy use. With an emphasis on older homes, the repository contains datasets from Home Energy Rating System (HERS) providers, home performance contractors, utility program managers, researchers, and others. In the future, new data from current programs will also be added to the repository.

The objective of this project is to create a robust empirical data source to support the research goals of the Department of Energy's Building America program, which is to improve the efficiency of existing U.S. homes by 30% to 50%. Researchers can use this data source to test the accuracy of building energy simulation software and energy audit procedures, ultimately leading to more credible and less expensive energy analysis.

Engineers at NREL have utilized the Field Data Repository to compare predictions from DOE's Home Energy Saver software to measured energy use. The findings from this work helped the developers of the software identify key changes that ultimately improved the accuracy of the tool.

Comparisons of predicted and measured energy use across populations of homes allow researchers to examine trends that cannot be observed in single-home comparisons. These trends are useful in identifying potential issues that warrant further research, which could ultimately improve the overall accuracy of analysis tools and energy audit procedures.



Field Data Repository process. *Illustration by Al Hicks/NREL*

Key Research Results

Achievement

NREL's Residential Buildings Research Group has developed a repository of robust residential building characteristics and historical energy use data to improve the accuracy of residential energy analysis tools.

Result

The Group utilized the Field Data Repository to compare predictions of energy use from simulation tools to measured energy use. These comparisons helped improve the accuracy of DOE's Home Energy Saver residential building energy simulation software.

Benefit

The Field Data Repository will improve the accuracy of residential building energy analysis and support future research.

Funding Support

This research was sponsored by the U.S. Department of Energy's Building Technologies Program.

The Field Data Repository will be used to answer important research questions such as:

- On average, how well do simulation tools predict energy use?
- What information about a home must be collected to accurately estimate energy savings from retrofit measures?
- How can we identify retrofit-candidate homes from bulk utility billing data?

If you are interested in contributing data to this project, please contact Dave Roberts at NREL (david.roberts@nrel.gov).

For more information

Polly, B.; Kruis, N.; Roberts, D. (2011). Assessing and Improving the Accuracy of Energy Analysis for Residential Buildings. DOE/GO-102011-3243. July 2011. *www.nrel.gov/docs/fy11osti/50865.pdf*

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

DOE/GO-102012-3513 • February 2012

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 10% post consumer waste.

Prepared by the National Renewable Energy Laboratory (NREL), a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy; NREL is operated by the Alliance for Sustainable Energy, LLC.