

NREL Develops Method to Evaluate Accuracy of Home Energy Scoring Tool

Highlights in
Research & Development

Using data from existing homes, NREL researchers boost the accuracy of the new software tool.

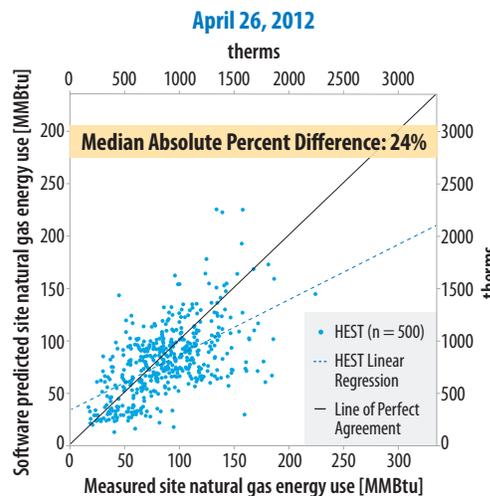
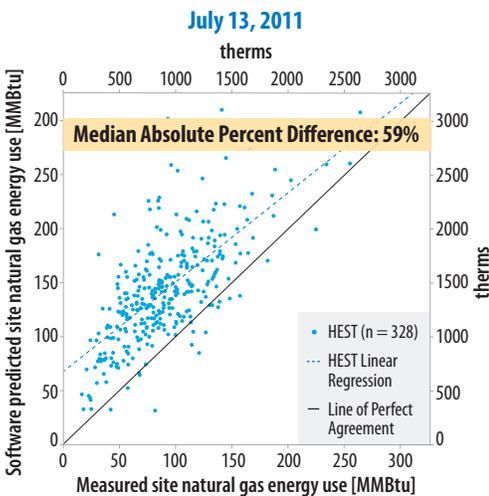
Analysts, home energy rating providers, and home performance contractors commonly use analysis software to predict the energy use of new home designs and the energy savings associated with upgrading older homes. Accurate predictions of energy use and savings are critical to achieving the nation's energy savings goals, as they inform decisions about which energy efficiency measures will deliver the most cost-effective savings.

To assess the accuracy of the U.S. Department of Energy's (DOE) Home Energy Scoring Tool, researchers at the National Renewable Energy Laboratory (NREL) developed a method for comparing the predicted energy use from the software to the measured energy use for large numbers of homes. Using data from NREL's Field Data Repository, which stores building characteristics and utility billing data, researchers devised software to automatically compare Scoring Tool predictions to the measured energy use.

Using information developed at NREL, the Home Energy Scoring Tool development team at Lawrence Berkeley National Laboratory was able to make improvements to the tool over time. What's more, the NREL team used statistical techniques to isolate key contributors to error in the software predictions, helping guide improvements to the tool.

NREL is now leading efforts to develop a standardized test method for software accuracy based largely on the methods and approach utilized in the Home Energy Scoring Tool assessment project. Working with the residential energy analysis software industry, NREL is currently testing data content and data transfer protocols for implementing the test.

NREL's assessment of and improvement in the accuracy of the Home Energy Scoring Tool, in addition to the development of a standard method of test based on the approach, contributes to industry's efforts to demonstrate accuracy in estimating energy savings in homes across the nation.



Improvement in Home Energy Scoring Tool natural gas energy use predictions over time. Predicted energy uses are plotted on the y-axis, with measured energy uses on the x-axis.

Key Research Results

Achievement

NREL developed a method to facilitate comparison of predictions from energy analysis software and actual energy use for large numbers of homes. NREL researchers used the new approach to improve the accuracy of DOE's Home Energy Scoring Tool.

Key Result

The results demonstrate the value of assessing the accuracy of energy analysis software using empirically based test methods based on large samples of homes.

Potential Impact

A standardized, empirical method of test based on a large sample of homes will improve the accuracy of energy analysis software, which supports DOE's goals of improving the efficiency of existing homes by 30% to 50%.

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Reference: Roberts, D.; Merket, N.; Polly, B.; Heaney, M.; Casey, S.; Robertson, J. (2012). *Assessment of the U.S. Department of Energy's Home Energy Scoring Tool*. 90 pp.; NREL Report No. TP-5500-54074. <http://www.nrel.gov/docs/fy12osti/54074.pdf>.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

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