

# Understanding Home Energy Ratings



WHITE PAPER





Introduced in 2006, the Home Energy Rating System (HERS) Index became the industry standard by which a home's energy efficiency is measured. It was developed by the Residential Energy Services Network (RESNET). Government agencies including the Department of Energy (DOE), Department of Housing and Urban Development (HUD) and the Environmental Protection

Agency (EPA) recognize the HERS Index as an official verification of energy performance.

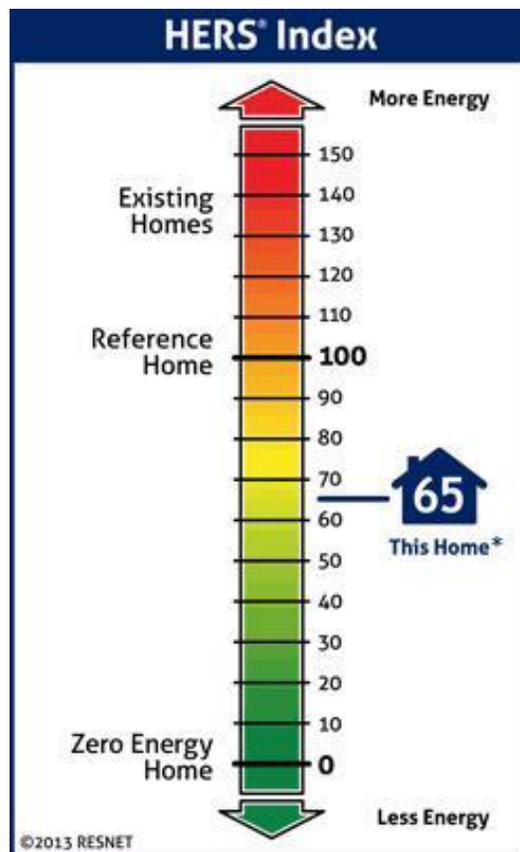
A critical topic presented at the 2016 RESNET Building Performance Conference, the premier national forum on home energy ratings, existing home retrofits, building codes and energy policy, was to develop a single, centralized software resource for obtaining a RESNET HERS Index. This capability will be available for use by RESNET accredited HERS software tools. This new resource will leverage the publically available, and broadly supported, EnergyPlus Building Energy Simulation Software. The RESNET Single-Source HERS Index Project will involve developing open-source software that provides a HERS Index and associated data per ANSI/RESNET/ICC Standard 301.

As part of its commitment to excellence, RESNET has committed to enhance the consistency of HERS Index scores. Consistency in calculating the HERS Index is currently challenged by lack of a robust tool input quality assurance, differences in how the standards are interpreted and implemented, and differences in how a limited number of inputs characterizing Minimum Rated Features are utilized to drive simulation engines.

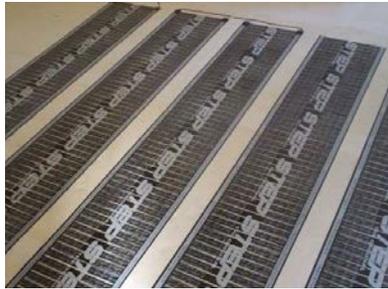
In the case of emerging, very successfully efficient products such as STEP Warmfloor's radiant heating systems, no software tools currently allow the inclusion of electric resistance heating, except for electric heat pumps. The EPA does not have any ENERGY STAR program for radiant or electric heating to-date. The HERS Index gives homeowners and buyers a standard by which they measure the energy efficiency of houses they currently own or are planning to buy. A home's HERS Index Score is also being used by builders to market their properties.

The U.S. Department of Energy has determined that a HERS Index Score of 130 would be the typical resale home, while a rating of 100 is awarded to a standard new home. The lower a home's HERS Index Score is, the more energy efficient is the home. A home with a HERS Index Score of 50 is 50% more energy efficient than a standard new home and 80% more efficient than the average resale home.

A HERS Index score of 0 is a Net Zero Energy Home. This home consumes only the amount of energy that it produces through renewable resources, such as from solar or wind power. As energy costs continue to climb, efforts to save on utility bills, increase home comfort and reduce our impact on the environment are now more important than ever before. To calculate a home's HERS



\*Sample rating representation.



By enhancing the HERS Index scoring methodologies and software, emerging products, such as STEP Warmfloor, can be included and recognized in the ratings process.

Index Score, a certified RESNET HERS Rater does an energy rating on a home and compares the data against a 'reference home'— a designed-model home of the same size and shape as the actual home, so the score is always relative to the size, shape and type of house being rated.

The U.S. Department of Energy (DOE) supports and participates in the model building energy code development processes administered by the ASHRAE and the International Code Council (ICC). DOE activities include developing and submitting code change proposals, conducting analysis of building energy efficiency and cost savings, and formulating underlying evaluation methodologies. RESNET commissioned the Florida Solar Energy Center (FSEC) and the Dillon Group, Inc. to conduct a study and analysis of the methodology and scoring systems related to the DOE Home Energy Score (HES) and the

RESNET Home Energy Rating System (HERS) Index. The intent of the study is to determine if a reasonable correlation between the two methods of scoring the energy efficiency of homes can be established and if the correlation between HES and IECC code compliance can be achieved.

The principle findings from the study clearly show the fundamental difference between HES and HERS. HES is a measure of only home energy use while HERS is a measure of home energy efficiency and relative performance. HES does not account for home size, the number of home occupants or energy use for lighting and appliances. As a result, there is no relationship between HES and accepted building energy codes or high-performance home programs like EPA's ENERGY STAR homes program or DOE's Zero Energy Ready Homes program, all of which focus on home energy efficiency and relative energy performance rather than absolute energy consumption

STEP Warmfloor's radiant heating system is not a constant wattage electric resistance heater. The STEP Warmfloor heating element is based on nanotechnology made of PTC (positive temperature coefficient) semi-conductive polymer. The electroplastics element is self-regulating which means that when the ambient temperature increases, the electrical resistance increases and the consumption of electricity decreases. By enhancing the HERS Index scoring methodologies and software, emerging products such as this, as well as others, can be included and recognized in the ratings process, benefitting homeowners, buyers and builders.