## Under contract with the United States Department of Energy, Brookhaven National Labs confirms: U.S. energy guide (AFUE) ratings miss significant areas of energy loss.

AFUE (government efficiency) ratings can be off by 25% or more, an error that can under-estimate fuel consumption by up to 47%.

The independent study shows that a consumer who purchases a home heating system based only a comparison of AFUE ratings may actually spend as much as \$800 per year more on fuel with one system, compared to a second system with a nearly identical AFUE rating. This difference in real efficiency is determined by a characteristic of all heating systems called *idle loss*, a performance factor which is not evaluated for AFUE on units which provide both heat and hot water. Idle loss includes two primary areas of heat loss on conventional home heating systems: standby loss, and jacket loss. Also almost entirely neglected are draft regulator and room air losses.

In the study, the reduction of idle losses is identified as a primary factor in improving real system efficiency. Only when idle losses are reduced or eliminated is it possible for *real* efficiency to approach the AFUE rating of a heating product. In fact, significant idle losses may lead to *actual* efficiencies as low as 55%. This "real" efficiency rating may determine system performance even when the government AFUE rating is established in the 80-95 percentile range.

The study also reports that the cold start and cold finish operation of Energy Kinetics' System 2000 has the lowest overall idle loss and the best seasonal efficiency performance among *all* home heating systems tested, including highly rated condensing gas and oil systems.

The study revealed that outdoor reset controls save up to 5%, but need trial and error adjustments over the course of a heating season. By comparison, using proven Hybrid Energy Recovery, System 2000 *automatically* adapts to heating loads. The result is a home heating system that delivers the *best documented efficiency*.

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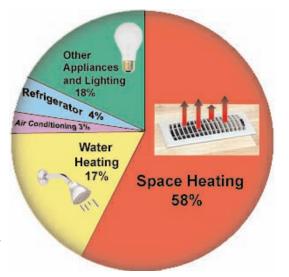
## REAL FUEL EFFICIENCIES<sup>1</sup> Comparison of fuel efficiencies among commonly available home heating systems AFUE rating =95% AFUE AFUE 90% =93% AFUE =89.8% =89.8% =87.5% 85% AFUE rating best <u>real</u> efficiency! =81% 80% 75% 9 a<mark>tin</mark>gs 置 mis-70% fuel GAS M ENC SING 65% 60% <u>§</u> ш 盔 55% 50%

How much of your fuel actually heats your home and makes hot water?<sup>2</sup>

**CAST IRON** 

with HOT WATER

Lab and field studies show you can cut your fuel bill over 30%, even if your heating system is rated at over 80% efficiency.



<sup>†</sup>This means that some AFUE efficiency ratings under-estimate fuel consumption by as much as 47%.

<sup>&</sup>lt;sup>1</sup> Data and conclusions are drawn from the report "Performance of Integrated Hydronic Heating Systems" (paper and presentation), prepared by Brookhaven National Laboratory, Upton, NY, under contract No. DE-ACO2-98CH10886 with the United States Department of Energy by Dr. T. Butcher; and Chimney Related Energy Losses in Residential Oil-Fired Heating Systems (1990). Available on request.

<sup>&</sup>lt;sup>2</sup> Above chart source data from Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 2001 Residential Energy Consumption Survey. New England and mid-Atlantic states.