



**Department of Energy**  
Washington, DC 20585

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Over the past year, the Department of Energy has investigated whether it would be feasible to establish ENERGY STAR criteria for domestic water heaters. In April 2003, we issued a report on the options available to the Department, including the labeling of “conventional” (gas and electric tanked technologies) or, alternatively, pursuing the option of labeling any or all of the “non-conventional” technologies (solar, tankless, gas condensing and heat pump water heaters). After analyzing the market, the potential energy savings and economics of the various technologies, and considering feedback from stakeholders, the Department of Energy has decided not to establish ENERGY STAR criteria for domestic water heaters at this time.

This decision rests on several market and technical considerations making it impractical to consider labeling at this time, and the realization that labeling this product category prematurely could undermine some of the fundamental tenets of ENERGY STAR. The key reasons are as follows:

***Labeling conventional technologies would not offer sufficient market differentiation or savings to consumers.*** With Federal standards for water heaters increasing in January 2004, the incremental savings offered by the best performing conventional gas and electric products would be not be large enough to justify the awarding of an ENERGY STAR designation. ENERGY STAR is an appropriate differentiator of energy efficient products only for product groupings offering a broad range of energy performance levels within the given category. As the table below indicates, after the new standard takes effect, there will be only small differences between the best-performing products and those just meeting the minimum Federal standard, making an ENERGY STAR designation less meaningful. The margins between the top-performing gas and electric storage water heater models and the Federal standards are lower than for any other ENERGY STAR product criteria.

Product Class and Capacity (gallons)	Best-Performing Model (Energy Factor)	2004 Federal Standard (Minimum Energy Factor)	Improvement of Best-Performing Model Compared to Standard
Gas Storage – 40 gal.	.65	.594	9.4%
Gas Storage – 50 gal.	.65	.575	13.0%
Gas Storage – 75 gal.	.59	.5275	11.8%
Gas Storage – 100 gal.	.48	.48	0.0%
Electric Storage – 40 gal.	.95	.9172	3.6%
Electric Storage – 50 gal.	.95	.904	5.1%
Electric Storage – 75 gal.	.92	.871	5.6%
Electric Storage – 100 gal.	.91	.838	8.6%

Source: December 3, 2003 GAMA Product Directory

Conventional gas and electric storage water heaters are approaching the physical limits of energy performance, particularly electric water heaters with energy factors ranging to nearly 0.95. For electric water heaters, significant gains are only possible by using heat pump technology yielding energy factors greater than 1.0. Gas storage water heaters are near their physical limits as well. In order to achieve significant energy efficiency gains, manufacturers will have to pursue condensing or tankless technologies.

***Labeling “non-conventional” products would not insure product performance could be maintained or enhanced with ENERGY STAR compliant products compared to non-compliant models.*** The credibility of ENERGY STAR in the market place depends on the label representing only those products that save energy without sacrificing performance or customer enjoyment of the product. While many of the non-conventional products offer significant energy savings, the overall performance of the technology is either unproven, or too dependent upon other variables (such as climatic conditions or a home’s energy supply infrastructure) to offer a workable, straightforward labeling solution at this time.

***For most “non-conventional” technologies, purchasers would not recover their incremental investment within a reasonable time period.*** An important foundation of the ENERGY STAR program is it directs consumers to products providing proven energy savings within a reasonable payback period. Based on the analysis performed for our report, the non-conventional technologies demonstrated payback timeframes unreasonable for the average consumer, ranging from 3.6 years to 19 years.

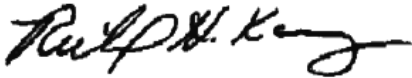
***Product availability and infrastructure for “non-conventional” products is not yet broad-based.*** Another key tenet of the ENERGY STAR Program is that a broad range of manufacturers and distribution channels exist for products designated as ENERGY STAR. The infrastructure to sell and service some of these products is not fully developed in most parts of the country, either because the product is new and not widely distributed (as in the case of heat pump water heaters), or because there is low demand for the product in much of the country due to economic considerations (as in the case of solar water heaters).

Despite the fact the Department does not believe it is appropriate to introduce an ENERGY STAR label for water heaters at this time, heat pump, gas condensing, solar and tankless gas water heaters are promising technologies that might warrant inclusion in the ENERGY STAR program at some point in the future. Each of these products has significant energy savings potential compared to conventional products. This is true even at relatively modest market penetrations. If these products eventually achieve widespread market acceptance, tremendous gains in energy savings and associated pollution prevention could be achieved.

Although the energy savings potential is great, the challenges associated with bringing these products into the mainstream are also great. The Department hopes over the next several years, the market for these products will more fully develop, leading to a more developed delivery infrastructure, increased reliability, improved performance and reduced prices, setting up the conditions where it would make sense to introduce an ENERGY STAR label for heat pumps, tankless, solar, and other newly developed water heaters.

The Department looks forward to working with product manufacturers and other ENERGY STAR partners to foster the development of water heaters that will meet the ENERGY STAR labeling principles and can be granted ENERGY STAR designation in the future.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard H. Karney". The signature is fluid and cursive, with a long horizontal stroke at the end.

Richard H. Karney, P.E.  
Manager, ENERGY STAR Program  
U.S. Department of Energy