

Excerpts From: *Extraordinary Water Heat Recovery Device*, Energy Design Update (EDU), Vol. 16, No. 12, December, 1996.

Here is a product that will challenge our resident skeptics... Not only does it save 30%-50% of a home's total water heating energy consumption, it also effectively triples the heating capacity of the water heater...the GFX file has been on my desk for over a year in the pile marked "*more data needed.*" Although the engineering principles seemed sound, there was no good documentation of actual performance to support the inventor's fantastic claims... Until now. Virginia Power sponsored an extensive series of tests at Old Dominion University that confirm [its] performance figures. In fact, the final report indicates that the GFX can match or exceed the performance of an add-on heat pump water heater at a fraction of the installed cost.

**“30%-53% reduction in water heating energy”**

Researchers at Old Dominion tested the GFX with three 50-gallon electric water heaters -- a plain-vanilla heater, a State Duron high-efficiency heater, and a stone-lined high-efficiency unit. When subjected to three different 24-hour usage schedules, the GFX saved an average of 57% of total energy use with daily reductions ranging from 2.6 kWh to 6.2 kWh (see Figure 3).

**NOTE:** A December 1996 report funded by the U.S. DOE was not available to EDU in 1996. It compared 7 types of energy efficient electric water heating systems, including heat pumps. (See [www.gfxtechnology.com/bundles.html](http://www.gfxtechnology.com/bundles.html)) A subsequent field evaluation by PP&L measured savings between 774 to 2347 kWh/yr, depending upon shower use. (See [www.gfxtechnology.com/showerhead\\_vs\\_gfx.html](http://www.gfxtechnology.com/showerhead_vs_gfx.html))

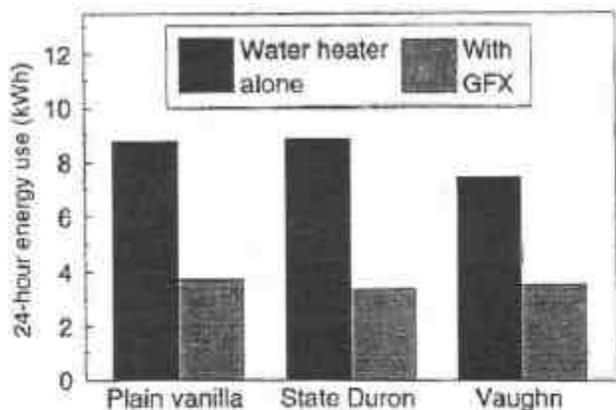


Figure 3 — When tested with three different electric water heaters in nine separate tests, the GFX reduced daily water heating energy consumption up to 57%.

**“Outperforms heat pump water heater”**

The Old Dominion GFX study was part of a larger project to evaluate several electric water heating technologies, including heat pump water heaters. When the results for the GFX are compared to those for heat pump water heaters, the GFX looks better. For the three electric heaters tested, the measured energy factor was higher with the GFX than with an add-on heat pump water heater (see Figure 4).

These results do not conclusively show that the GFX will outperform a heat pump water heater in the field, however, because of complexities like batch usage and water temperature. Nonetheless, given the much lower cost of the GFX, it appears to be a practical alternative to heat pump water heaters.

**“Gives an electric water heater the capacity of a gas heater”**

The most difficult benefit to swallow is that a GFX can increase the effective capacity of an electric water heater more than 300%, giving a conventional electric heater more capacity than a similar size gas water heater.

One of the drawbacks of electric water heaters, compared to gas heaters, is their relatively low first-hour rating - a theoretical estimate of how much hot water a heater can put out under a specified draw schedule in one hour. Without GFX, the three 50-gallon water heaters had measured first-hour ratings between 46 and 60 gallons, which is typical. But when the GFX was added, the effective first-hour rating of the three heaters jumped to 180 gallons for two of the three heaters, giving them more than double the capacity of typical 50-gallon gas heaters (see Table 1).

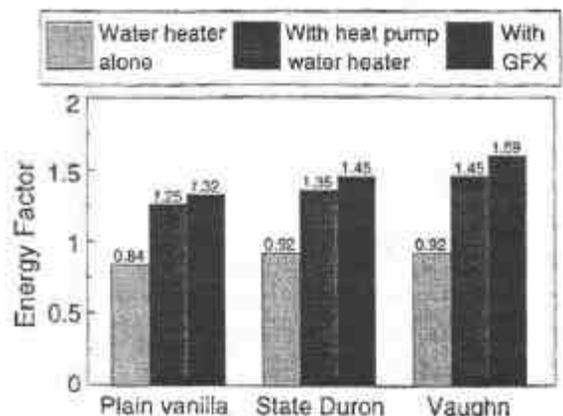


Figure 4 — With a GFX installed, the effective energy factor of the electric water heaters was boosted as much as 72% and showed slightly better performance than a heat pump water heater.