

Measured Performance of Solar Water Heater & DHR System (Case Study of Model S3-60 GFX by Northeast Utilities)

Study Period: 145 days; November 17, 1996 to March 30, 1997.

Test Method: Sub-meters installed to monitor electricity & water consumption of all key subsystems.

GFX Model: S3-60 added to a home in Connecticut with an existing solar water heater.

Original System: Before GFX, the solar water heater provided about 927 kWh/yr or 16.4% of the family's annual hot water demand of 5627 kWh; then worth \$619 @ NE Utilities' rate of 11¢/kWh.

Special Conditions: Despite the GFX-Inventor's recommendations, water preheated by GFX was fed only to the existing high-efficiency electric backup storage water heater. Cold water fed to the plumbing fixtures and solar tempering valve bypassed GFX's coils; degrading performance in 3 ways:

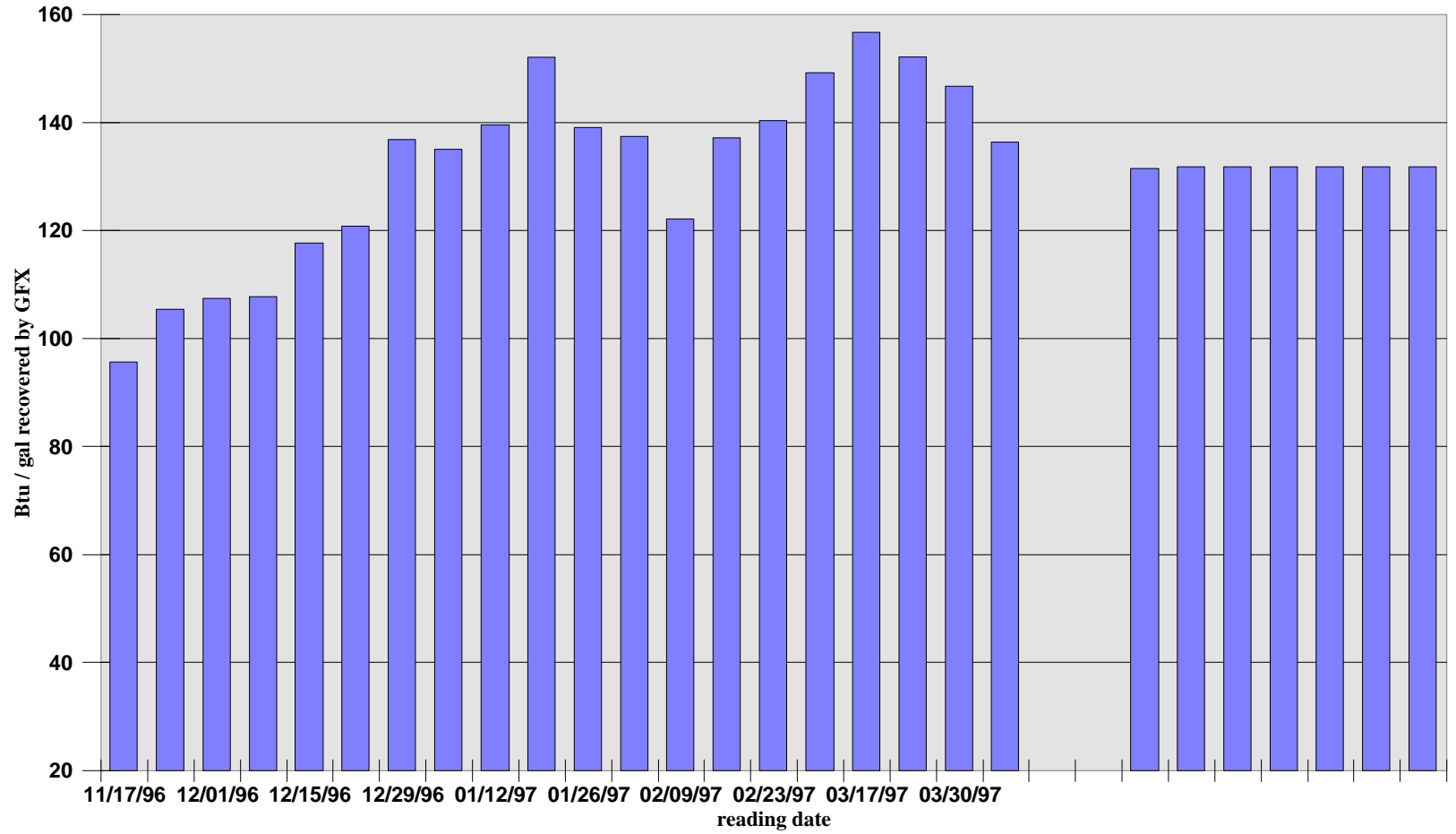
1. On sunny days, the solar tempering valve drew cold water instead of water preheated by GFX; thereby reducing the quantity of solar-heated water and increasing electricity consumption in the backup heater.
2. The S3-60 GFX was operated unbalanced to reduce heat recovered from showers & sinks.
3. Had GFX been operated balanced, its most efficient mode, the backup heater would have wasted less electricity and its *First-Hour Rating* would have tripled. (See www.gfxtechnology.com/tests.html)

Summary of Measured Data Presented in Following Pages

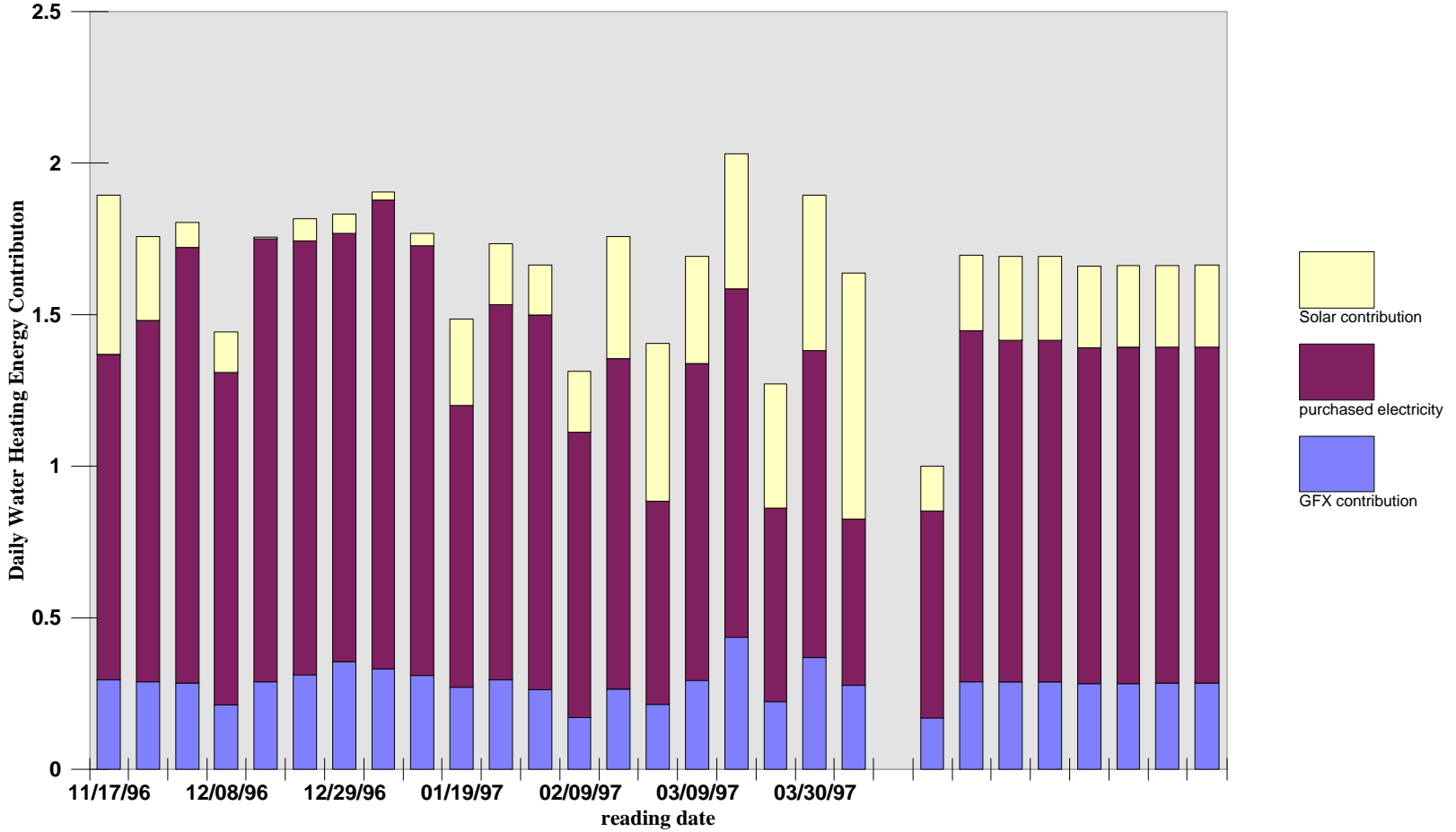
Cost Breakdown	Annualized Value of Electricity @ 11¢/kWh	Estimated Cost/Savings of Improved System*
Baseline Cost without Solar or GFX	\$619	Same
Actual Cost of Electricity from Utility	\$412 (66.6% of Baseline)	\$247 (40% of Baseline)
Standby Cost of High Efficiency Backup	\$148	N/A
Standby Cost of Tankless Backup	N/A	Negligible
Solar Savings	\$102	Same
Baseline Cost without GFX	\$517	\$369
GFX Savings	\$105 (20.3% of 517)	\$122 (33% of \$369)
Solar + GFX Savings	\$207	\$224
Net Savings	\$207 (33.4% of Baseline)	\$372 (60%)

C Improved system would substitute a tankless heater for the tank-type backup (to eliminate standby loss) and operate GFX in its most efficient mode to minimize hot water supplied by the solar-tank and backup heater.

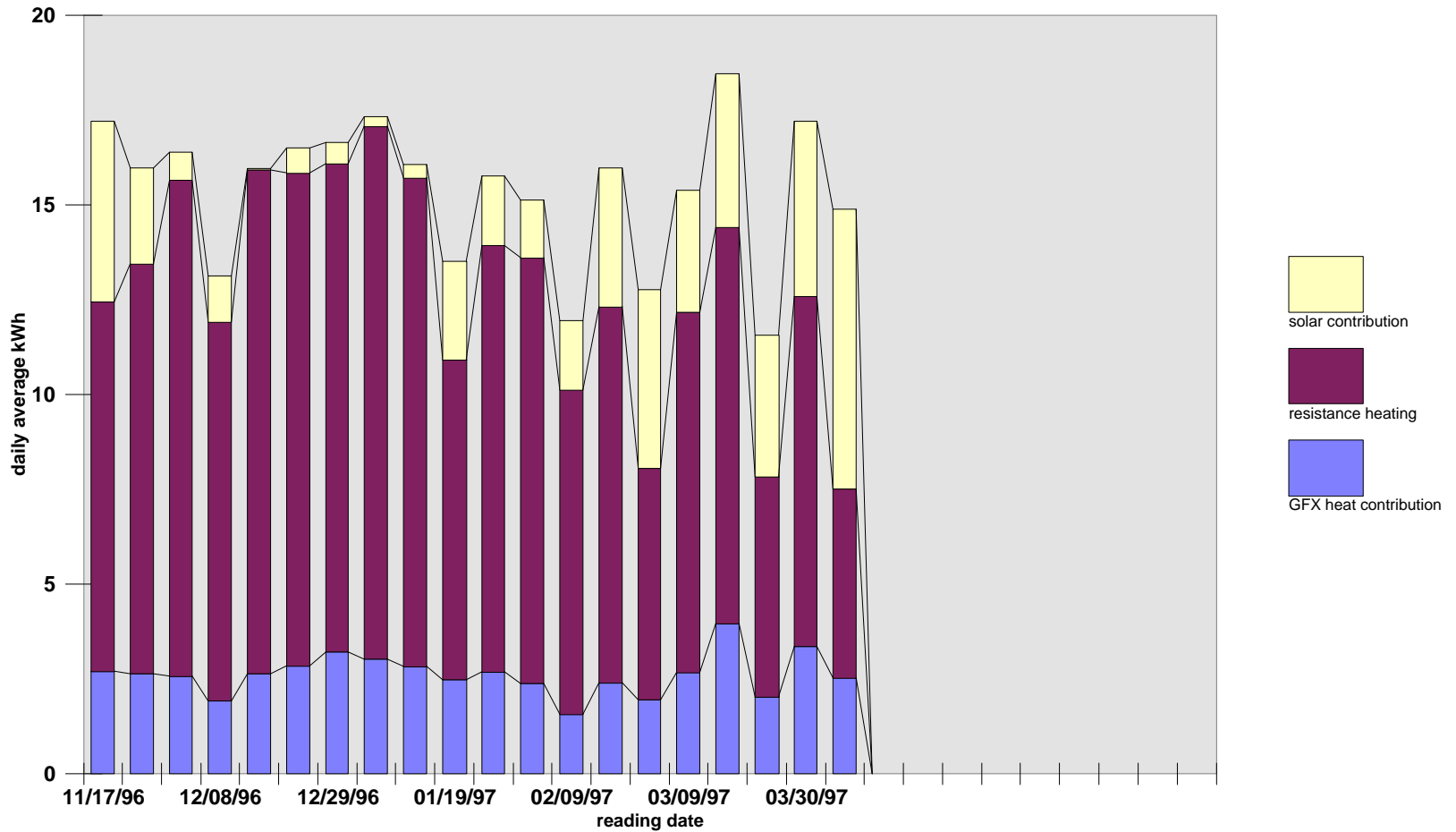
Sayko: GFX kWh recovered vs. gallons o



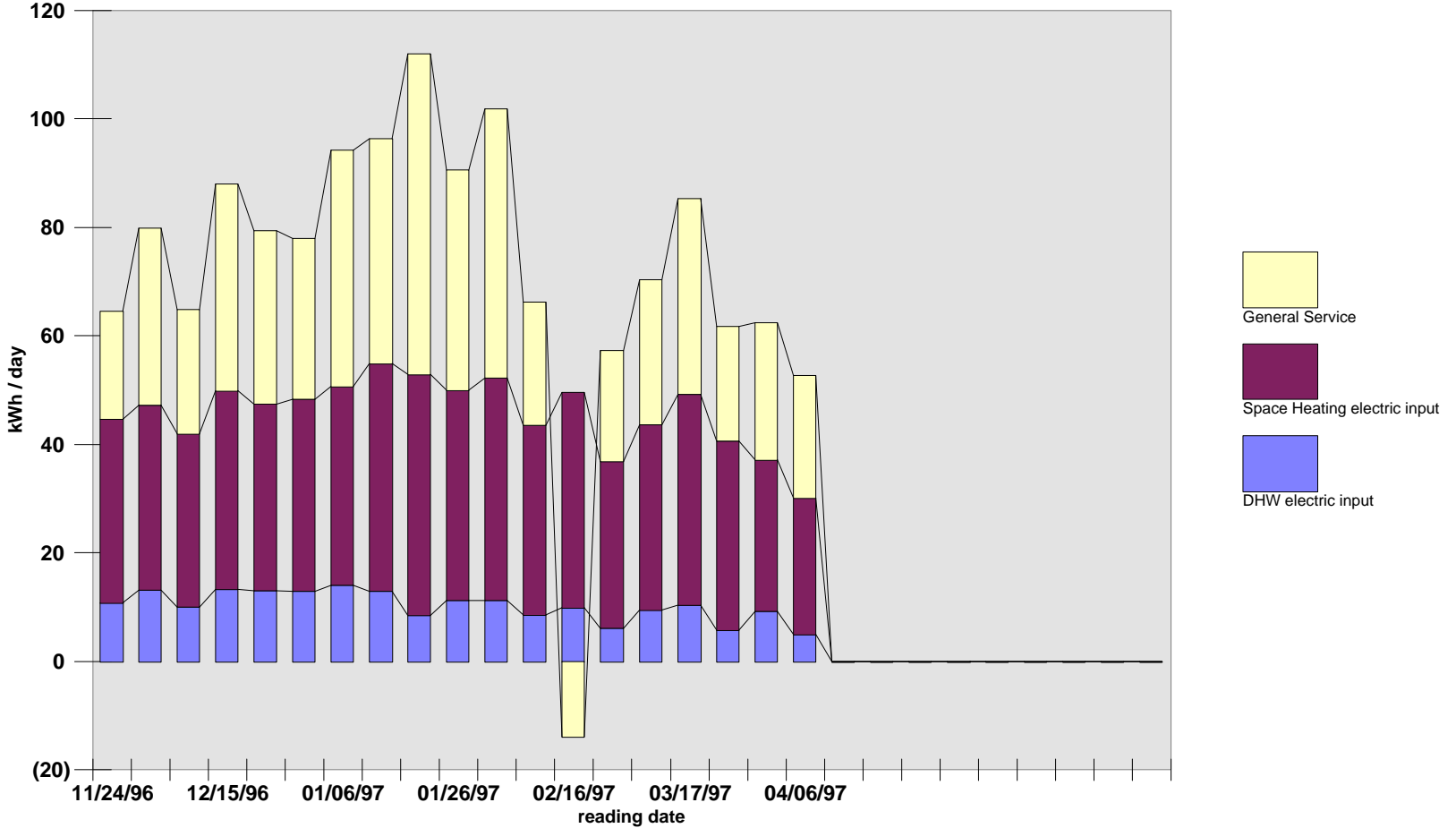
Daily Water Heating Costs & Savings



Energy inputs to Sayko's water heater



Sayko - household electricity usages -



Btupergal

03/09/97	199,820	154,975	12,258	288,289	467,944	1,015	7,983	132	17,143	36.3
03/17/97	200,474	155,272	12,338	288,675	468,664	1,119	8,647	132	17,190	30.4
03/23/97	200,847	155,482	12,373	288,837	468,976	1,161	8,923	128	17,225	35.0
03/30/97	201,294	155,682	12,439	289,167	469,593	1,243	9,482	130	17,283	42.4
04/06/97	201,677	155,865	12,475	289,444	470,107	1,306	9,944	138	17,370	na