

Gas Vs. Electric Water Heater

Gas Vs. Electric Water Heater Comparison Test:

Over the past two years, some electric utilities have claimed that residential electric water heating has the same economical value as natural gas water heating. The Municipal Gas Authority of Georgia, in partnership with the Energy Solutions Center, decided to test their claims.

The Energy Solutions Center is a commercialization and market development organization representing 31 utilities, 13 municipal authorities, and 30 equipment manufacturers. The role of the Energy Solutions Center is acceleration of the acceptance of natural gas technologies.

The water heater systems test was conducted under the engineering direction of Exelon Services Federal Group (ESFG). A series of tests were conducted using a Rheem natural gas water heater (model # 21V40-38), a Rheem electric water heater (model # 81V40D), and Rinnai Continuum Tankless water heater (natural gas). For all three water heating systems, the supply water temperature and pressure were identical. All three systems were installed in the same conditioned space and flow meters were used to ensure testing was performed under the same flow conditions.

Test #1, between the traditional electric and gas tank water heaters, showed natural gas water heating operating costs to be 35% less than the electric water heating system operating costs. The Rinnai Continuum Tankless water heating system costs 55% less to operate than the electric tank system and 31% less to operate than the natural gas tank system. This was based on typical usage of an average four-person household.

Test #2 measured delivery (how much hot water can you get from the tank before you run out). The natural gas tank delivered 36% more hot water than the electric unit. That's an extra 33.2 gallons of hot water for bathing, washing clothes and dishes.

Test #3 measured recovery (how much time does it take for the water heater to heat the incoming water to the desired temperature). The natural gas tank recovered 64% faster than the electric tank.

As you can see, natural gas water heating is the clear winner!

Summary of Results

Water Heating System	TEST #1	TEST #2	TEST #3
	Monthly Operational Costs	Hot Water Delivery(gallons)	Recovery Time (min:sec)
Natural Gas Water Heater (Rheem Model21V40-38)	\$16.20	95.5	21:35
Electric Water Heater (Rheem Model 81V40D)	\$25.05	62.3	61:04
Rinnai Continuum Tankless Water Heater	\$11.25	Continuous Hot Water	No Recovery Required

The testing procedures are derived in part from the “Test Procedures for Water Heaters” outlined by the Federal Register, Title 10 of the Code of Federal Regulations (CFR), Part 430. These regulations provide a standard for fair comparison between energy efficiency, energy use, and the annual operating cost of water heaters produced by different manufacturers.