Electric Resistance Water Heaters:
Least Expensive to Purchase - Most Expensive to Operate

A new storage type electric resistance water heater, which has a life expectancy of about 13 years, can be purchased and installed in a home for about $350. That sounds like a bargain, especially if you consider that a natural gas or propane-fired unit will cost about twice that much. But remember, once you install the water heater, you need to purchase the energy to heat the water. And at 17.3 cents per kWh, the average cost of electricity in New York State, it will cost about $850 per year to pay for the electricity the unit will consume to heat water for a typical family. Over the 13-year life expectancy of the heater, the total cost of electricity will be approximately $11,000.[1]

While a new natural gas or propane water heater is more expensive to purchase and install- a typical 30-gallon natural gas water heater can be purchased and installed for about $650, and a propane fired heater for about $700 - the cost of the fuel these units consume to heat water is much less than electricity. At the current state-wide average cost for natural gas of $1.60 per therm, it would cost $413.00 annually or $5,369 over the 13-year lifespan of the heater to buy the gas. The propane-fired heater would require about 283 gallons of propane per year at an annual cost of $637 (assuming a cost of $2.25 per gallon) and $8,281 over the 13 year lifespan.

Many homeowners in rural areas use fuel oil to heat their homes and electricity to heat water. While an oil fired water heater is even more expensive than a gas heater - about $950 to buy and install – it also is less expensive to operate than an electric resistance water heater. Annual oil consumption would be about 202 gallons at an annual cost of $519. That is an annual savings of $337 over the electric heater (assumes $2.57 per gallon for oil). But the life expectancy of an oil fired heater is only 8 years, adding to the overall cost of switching from an electric to an oil water heater. See Table 1 for a summary of these costs.

Even in an all-electric home there are less expensive water heating options than the typical storage tank electric resistance water heater. An electric heat pump water heater, while expensive to purchase, is less expensive to operate than even a natural gas water heater. For example, an electric heat pump water heater costs about $1,200 to purchase and install, but has an annual operating cost of just $292. And if you invest a bit more money to purchase a solar water heating system with electric backup it is possible to reduce annual electricity costs for water heating to as little as $260. A solar water heating system also has the added benefit of a long life expectancy, over 20 years. State and Federal tax credits are also available to help reduce the purchase cost of a solar or electric heat pump water heating system. Detailed information on federal tax credits for energy efficiency improvements can be found at **http://www.energytaxincentives.org/tiap-consumers.html.** Information on New York State tax credits is at **http://www.tax.state.ny.us/pdf/memos/multitax/m06_4c_6i.pdf**.

[1] Future prices not discounted or adjusted for inflation

Table 1: Comparison of Purchase and Operating Costs

Type of heater	Purchase & installation cost	Life expectancy	Cost energy/year	Energy costs over 13 years[1]	Total over 13 years[2]	Amount less than typical electric
Typical electric storage tank heater	$350.00	13 years	$856	$11,128	$11,478	
Natural gas storage tank heater	$650	13 years	$413	$5,369	$6,019	$5,459
Propane storage tank heater	$700	13 years	$637	$8,281	$8,981	$2493
Typical storage tank oil heater.	$950	8 years	$519	$6,747	$8,647[3]	$2,831
Electric heat pump water heater	$1,200	13 years	$292	$3,796	$4,412	$7,066
Solar water heater with electric backup	$3,000 **$1650**[5]	20 years	$260	$3,380	$4730[4]	$6748

Source: American Council for an Energy Efficient Economy

[1]Future prices not discounted or adjusted for inflation
[2]Includes purchase, installation and energy costs
[3]Includes cost of two oil water heaters since life span of an oil unit is 8 years
[4] While the total cost over 13 of the solar water appears much higher than the electric heat pump, keep in mind that at the end of this 13 year period the heat pump is at the end of its life, while the solar water heater has a life expectancy of at least 7 more years.
[5] After NY State and Federal tax credit

Don't wait for your current water heater to fail before shopping for a new one. Replacing a failed water heater puts you in crisis mode so that you will not have the time to make a well informed buying decision. And when you do replace your current water heater, choose a model based on the amount of energy it consumes, and not solely on its purchase price.

Cornell Cooperative Extension of Steuben County has Fact Sheets available on *Selecting a New Water Heater*, and on *Energy Efficient Water Heating* if you would like further information. You can also learn more about reducing water heating costs and other home related energy costs by visiting the New York Energy $mart website at http://www.getenergysmart.org/