AEL&P

Shopper's Guide to Water Heaters

The water heater is the second largest energy user in your home. Only space heating takes more energy. The water heater can account for 14 - 18% of your home's total energy usage. Water heaters last 12 – 15 years, (and as few as six years). Since you'll have it a while, it's a good idea to take time to compare your water heater options **before** your tank fails. Older water heaters lose efficiency over time, and can be only 50% efficient, costing you more to operate. New water heaters are required to provide additional energy efficiency and will immediately save you money.

And remember, you will save even more by using hot water efficiently and by following a regular maintenance routine. See our pamphlet ***Guide to Saving Your Water-Heating Dollars*** for ideas and tips.

Electric or Propane?

Selecting the fuel source is an important consideration. Electric water heaters are advantageous because they can be located anywhere, including tight spaces, and do not require venting and other one-time installation costs. There is no chance of gases accumulating at the base of the tank or of carbon monoxide buildup. Gas heaters do heat water faster, and therefore, a smaller storage tank can be purchased. Price differences between the two tank types are also considerations.

Energy Efficiency

The yellow **EnergyGuide** helps you compare similar models to find the most energy efficient heater. Operating cost is based on the Energy Factor (EF); reflecting the standby heat loss and first hour recovery for each tank. Electric heaters have EF's ranging from about .82 - .94. Propane heaters, given flue losses, are less energy efficient and have EF's from .53 - .63.

Purchase the model with the lowest operating cost you can afford. You'll save over the life of your tank, especially if you purchase a quality product with corrosion and sediment control, and properly maintain your tank.

Fifteeen to thirty percent of the energy used by a standard water heater goes to keeping water hot when it's not being used. The most efficient models do the best job of lowering these stand-by losses by using better insulation and fittings.

Annual Operating Cost

Propane and oil costs are more volatile than the price for Juneau's hydro-based electricity. The Sept. 2002 cost of propane was $1.70/gal and increased to $1.85/gal in March 2003 for established customers. The March price for a new customer was $1.99/gal. The seasonally blended cost for 1000 kWh during the same period was $.0953/kWh. Residential base rates have increased by 2% over the last seven years.

Using the September pricing of propane, the operating cost between propane and electric versions is comparable. The March prices favor electricity significantly.

The following is based on formulas and data from the Gas Appliance Manufacturers Association. They test all water heaters to determine the Energy Factors. See every tank's ratings at www.gamanet.org.

Annual Cost of Propane at Various EF's

EF	$1.70	$1.85	$1.99
.53	526	573	615
.54	516	562	604
.55	507	552	593
.56	498	542	583
.57	489	532	572
.58	480	523	562
.59	472	514	553
.60	465	506	543
.61	457	497	535
.62	450	489	526
.63	442	481	518

Annual Cost of Electric Hot Warter at Various EF's

kWh = $.0953

EF	$	EF	$
.82	510	.89	470
.83	504	.90	465
.84	498	.91	460
.85	492	.92	455
.86	487	.93	450
.87	481	.94	445
.88	476		

Water Storage Tanks or "Tankless"?

Tankless systems, or "on demand" and "point-of-use" systems, are widely used in other countries. They are placed where the water is used and cost more to purchase. There's an unlimited supply of hot water, but the rate of flow may be less than desired. Pay attention to the rated temperature rise. Some models can only provide luke warm water in the winter.

While standby losses are removed from the operating cost, the energy required to heat the water is the same. The costs of these units make them less attractive when the payback period is calculated, compared with the most efficient storage tanks. However, they can be useful where the cost of plumbing is a factor.

How Storage Tanks Work

As hot water is used, electric storage tanks release lighter hot water from the top of the tank, while heavier cold water enters at the bottom of the tank. The tank is usually steel, and is coated with glass or enamel to help prevent corrosion. One or two anode rods provide additional corrosion protection.

Tanks are covered with insulation and enclosed in a steel jacket. Water contacts the two electric resistance elements controlled by thermostats to keep water temperature constant. They operate one at a time, but the lower unit does most of the work.

Sizing your tank

You don't want to run out of hot water, you don't want pay to store more than you typically use, and you don't want to pay for tank that's larger than you need.

The "First Hour Rating" is the key. This number is on the EnergyGuide label and reflects how much hot water your tank will deliver in a one hour period, starting with a full tank of hot water. Usually this rating is slightly more than the tank's storage capacity, but NOT ALWAYS. A larger tank doesn't necessarily give more hot water in a one hour period. Consider your household's typical peak hour demand for hot water. You could get away with a smaller heater by shifting some of your use to a different time of day.

If you use large shower heads, take longer showers, or enjoy a large tub, your usage will be greater. Use a gallon bucket and time one minute for a better estimate.

The following chart can help you size your tank. Assumptions: shower = 10 gallons/5 minutes, bath water is 5" deep; and estimate hand dish washing as 2.5 gal. x time.

Gallons of Hot Water Times Used = Gallons Required for Peak Hour

	Activity in gallons	In one hour	Gallons per hour
Shower	20 x	_____	_____
Bath	20 x	_____	_____
Shaving	2 x	_____	_____
Hand, face wash	4 x	_____	_____
Shampoo	4 x	_____	_____
Hand dish washing	Estimate	_____	_____
Auto dish washing	4 x	_____	_____
Food preparation	5 x	_____	_____
Auto clothes washer	32 x	_____	_____
Peak-Hour Demand			_____

Purchase energy-saving options

Storage water heaters lose heat from the tank and fittings. Purchase heaters with the best insulation (R-20 or higher). Buy heat trap fittings, which prevents hot water from moving into your hot and cold water pipes. These will improve efficiency by 6 – 8%.

Make your tank last

Installation and removal costs are a good portion of the cost of a tank, so the longer you keep your tank running efficiently, the better. Look for the best options for corrosion and sediment control to extend the life of your tank. You may be able to have a second rod installed in a model with a shorter warranty period for less cost than the "better tank." Tanks with curved dip tubes that release cold water in a swirling motion in the base of the tank, help control sediment buildup.