

Buying and Using Water Heaters

When shopping for a new water heater, there's more to consider than price and features. The amount you'll spend on energy to operate the appliance over its life far exceeds the purchase price. Spending a little more on an efficient appliance saves you money each month for years to come.

In older homes, water heating is second only to space heating for energy use. In newer homes, water heating may be the biggest use of energy.

Several programs have been developed to help you identify more efficient appliance models. The Oregon Office of Energy publishes monthly a list of high efficiency appliances (by model number) that qualify for the Oregon Residential Energy Tax Credit (see page 5). The tax credit is available to homeowners and renters for qualifying appliances installed in their principal residence or vacation home in Oregon. You take the credit on your state income tax. Your contractor can provide you with the paperwork. Submit your completed application to the Office of Energy well before tax time, as confirmation may take several weeks.

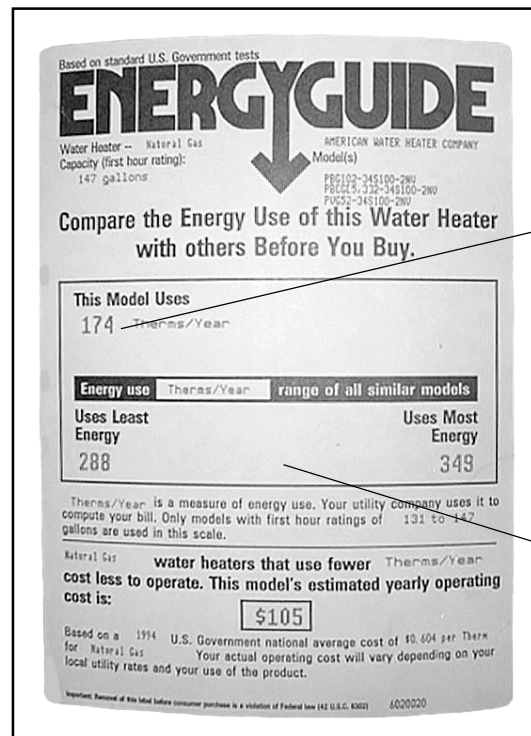
Although the efficiency standards are not as high as standards for the Oregon tax credit, the U.S. Environmental Protection Agency and U.S. Department of Energy sponsor Energy Star™ labels on efficient refrigerators, heating equipment, water heaters, computers and office equipment.

The yellow EnergyGuide sticker on most major home appliances in the dealer's showroom makes it easy to compare energy efficiency of different models.

The heart of the EnergyGuide label is the annual energy consumption, in therms or kilowatt

hours, that the appliance uses under typical operating conditions. Usage is based on standardized tests for typical household size and usage.

Efficient appliances usually cost more than regular models. How can you calculate whether spending extra money for a more efficient appliance is worth it? Use a "life cycle cost comparison" (see page 5). In addition to the purchase price, the calculation includes the energy bills you'll pay to operate the appliance over its life. The appliance with the lowest life cycle cost is the best investment.



For approximate cost in your home, multiply this number by the local utility rate.

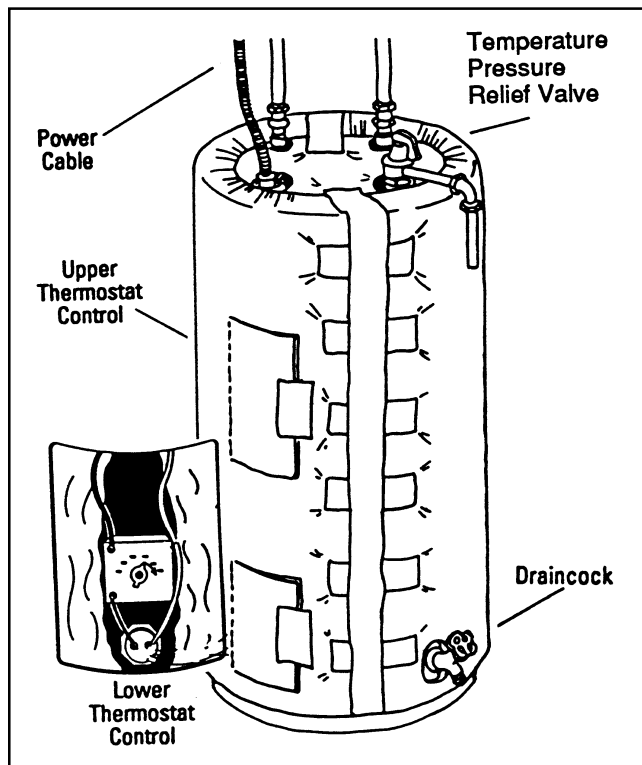
Scale shows efficiency compared to similar-sized models.

Sample EnergyGuide label for a water heater.



Efficient Use

- Set your water heater to 120°F. Temperature stratification in the tank typically results in 130°F water at the nearest faucet. Use a meat or candy thermometer to verify the hot water temperature. If it exceeds 130°F, lower the thermostat(s) on the water heater. For an electric water heater, turn off the power before adjusting the upper and lower thermostats. Gas water heaters have a colored knob on the gas valve to adjust the temperature. Wait a few hours and retest the temperature.
- Add an extra insulation blanket to older (pre-1989) electric or gas water heaters in garages or unheated basements. Look on the specification label for the date of manufacture. Retape or replace the insulation blanket if it's loose. For gas water heaters, be sure the insulation blanket does not block venting or air inlets near the burner area at the bottom. Follow the instructions that come with the insulation kit.
- Insulate the first 3 to 6 feet of both the cold and hot water pipes near your water heater. Use tubular foam insulation. At pipe elbows, cut the insulation at a 45-degree angle for a tight fit. (By the way, insulating all your hot water pipes probably won't save much energy. However, pipes located in the crawl space or attic should be insulated to avoid freezing.)

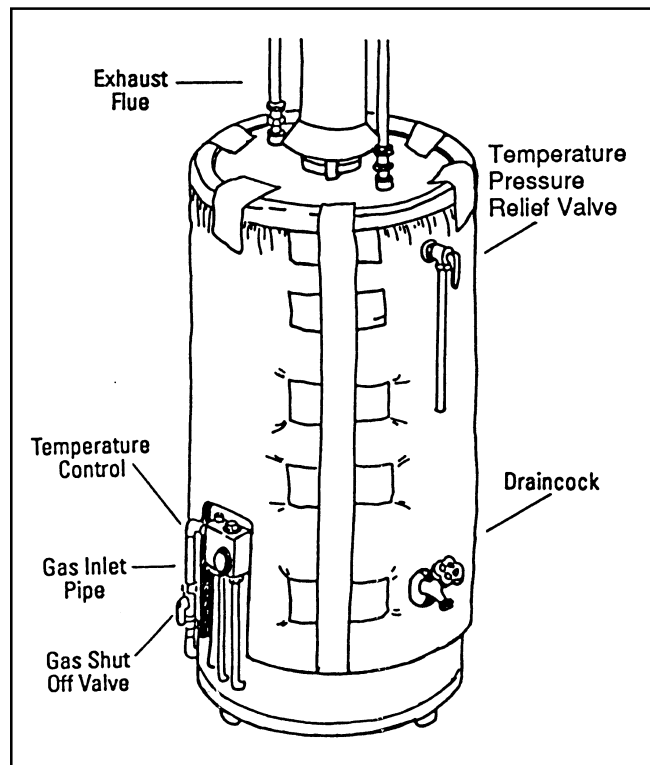


Temperature controls for an electric water heater.

- Install a timer to control when the water heater operates.

Proper Maintenance

- Check and drain sediment from the tank as needed—once or twice a year, depending on your water source. A rumbling or crackling sound is a sure sign of sediment buildup. If it hasn't been done regularly, you may need to flush the tank. Turn off the water heater circuit breaker or gas valve, shut off incoming water, and drain water from the tank. Then allow a few gallons of cold water to refill the tank and drain again. Repeat until drain water is clean. Turn the circuit breaker back on (for a gas water heater, turn the gas valve on and relight the pilot light) and allow the water to reheat.
- You can prolong the life of a water heater by checking the sacrificial anode every 3 to 5 years. This magnesium or aluminum rod reduces corrosion, extending the life of the tank. Read the manufacturer's instructions for your model.
- Check annually the operation of the temperature/pressure relief ("pop off") safety valve. The valve prevents buildup of dangerous pressures or very hot water in the tank. Place a pan underneath the water outlet and lift the lever to verify good flow. Be careful—the water is very hot. If



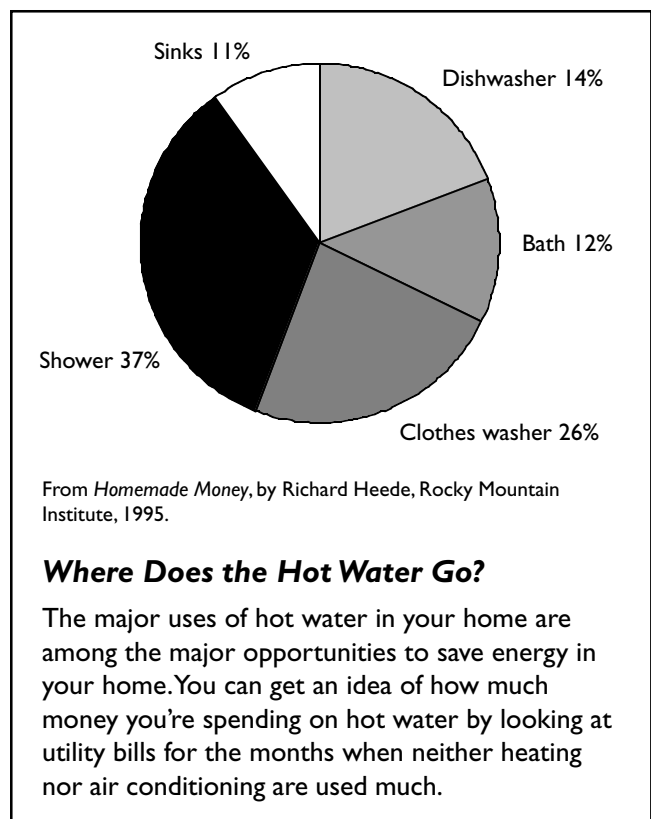
Temperature control for a gas water heater.

water drips from the pipe after operating the valve, trip it several times to get a better seal. If the pipe continues to drip, the valve might need to be replaced.

- If you run out of hot water regularly, here's what to check: For electric water heaters, use an electrical multimeter to verify operation of both top and bottom thermostats and heating elements when you turn the thermostat(s) higher. Replace as needed. With gas water heaters, be sure the gas flame comes on when hot water is being used. If not, call for service. If you have a gas water heater and you find many tiny metal flakes at the bottom of the tank, the heater may be near the end of its life. (The flakes are oxidized pieces of the metal heat exchanger inside the flue.)

Buying New

- Consider water heaters that qualify for the Oregon Residential Energy Tax Credit. They use at least 20% less energy than other models. Electric heat pump water heaters and certain gas and electric "tankless" or instantaneous models are eligible for the tax credit. If you're replacing your furnace at the same time, consider new water heaters that can supply both heat and hot water. The tax credit for qualifying water heating systems ranges from about \$200 to \$550.
- If you're shopping for a traditional storage tank water heater, buy a model with an Energy Factor (EF) equal to or better than:
 - .93 EF (4,720 kWh/year)—50-gallon electric
 - .60 EF (250 therms/year)—40- to 60-gallon gas
- Consider locating your new water heater closer to your most frequent hot water uses. You'll get hot water faster and waste less water.
- Don't buy a water heater bigger than you need. Your dealer or contractor can help you determine the model with the appropriate First Hour Rating based on your household's water use. If you already use water-saving showerheads and



Where Does the Hot Water Go?

The major uses of hot water in your home are among the major opportunities to save energy in your home. You can get an idea of how much money you're spending on hot water by looking at utility bills for the months when neither heating nor air conditioning are used much.

efficient dishwashers and clothes washers, a 40-gallon unit may be quite satisfactory.

- For households that use a lot of hot water, natural gas and oil water heaters may cost less to operate than electric models. Use the life cycle cost comparison on page 5 to determine whether switching fuels is a good investment. Be sure to include in the comparison costs for venting and piping. One- and two-person households won't use as much hot water as assumed in the EnergyGuide comparisons, so the savings for gas water heaters may be substantially less.
- If you are installing a gas (or oil) water heater in a manufactured home, the unit should be listed and labeled for that application.
- For a half-bathroom (no shower or bath) located at the opposite end of the house from the water heater, consider a 2- to 10-gallon "under counter" electric water heater. It provides hot water faster and is available in 110-volt models to simplify installation.

How Efficient Are New Gas Water Heaters?

At typical Oregon energy costs: 60¢ per therm

	1990 average	1999 average
Gas water heater	300 therms	220 therms
Total annual cost:	\$180	\$132

Source: Oregon Office of Energy

Showers, Bathtubs and Sinks

Bathing is usually the biggest hot water expense.

Efficient Use

- Measure the flow rate of your showerheads to be sure they're "water saver" type: Set the water at normal temperature and volume. Hold a pan or bucket under the showerhead for 15 seconds. The number of quarts collected in 15 seconds is equal to the gallons per minute (gpm) flow rate. Flows greater than 3 gpm are wasteful.
- When you take a shower, try a lower water pressure setting.
- If you live in an area with high water pressure (above 60 PSI), consider installing a pressure regulator to maintain 40 to 60 PSI on incoming water lines to reduce water flow.
- Don't fill the bathtub deeper than needed. Every inch deep you fill the tub uses 5 gallons of water.

Proper Maintenance

- Clean particles from aerator screens and showerhead nozzles at least once a year. Unscrew from faucet or shower arm and hold upside down under flowing water. If possible, disassemble to clean. Soak in bleach solution if needed.

Shower or Bath—Which Uses Less Water?

It depends on how long you stand in the shower and how deep you fill the tub. The best way to answer the question is to take a shower with the drain plugged. When you're done with your shower, compare how deep the water is with how deep you would fill the tub for a bath.

- Fix drips. Replacing washers (or cartridges for single-lever faucets) takes less than 30 minutes. Hardware and home supply stores sell plumbing repair kits and replacement cartridges.

Buying New

- Save about \$10 a month by installing water-saving showerheads and faucet aerators. They're designed to give a powerful spray using as little as 1 gallon per minute.
- Single-lever faucets in showers/tubs and sinks can reduce water waste. They allow you to retain your preferred hot-cold setting without having to adjust separate valves each time. Avoid tub/shower valves that have only a temperature adjustment, not a pressure adjustment.

For More Information

Oregon Energy Line

Publications about home energy efficiency are available at no charge from Oregon Energy Line (sponsored by the OSU Extension Energy Program and the Oregon Office of Energy). Call **1-800-457-9394** and request a list of publications or state the topics you're interested in. Leave your name and mailing address on the message machine. Publications will be sent to you within 3 days.

Oregon Residential Energy Tax Credit

Major household appliances certified energy-efficient by the Oregon Office of Energy are eligible for a tax credit. The list of eligible models changes monthly. Tax credits are available for high-efficiency refrigerators, dishwashers, clothes washers, and water heaters, solar and geothermal heating equipment, photovoltaic systems, alternative fuel vehicles, sealing heating and cooling ducts, and beginning in 2000, fuel cells and wind systems. Contact the Office of Energy: **1-800-221-8035** or **www.energy.state.or.us**

Life Cycle Cost Comparison: Appliance Example

	Standard	Energy-efficient
Annual energy cost (from EnergyGuide label)	\$97.00	\$67.00
Fuel cost escalation multiplier for 10-year life ¹	X 11.07	X 11.07
Total energy cost over 10 years	= \$1,073.79	= \$741.69
Purchase price	+ \$500.00	+ \$600.00
Life cycle cost of appliance	\$1,573.79	\$1,341.69

The appliance with the lowest life cycle cost is the best investment.

¹Assumes you'll keep the appliance for 10 years, with a 5% annual inflation rate and 2% increase in energy costs per year.

Other Resources

Consult back issues of *Consumer Reports* and *Consumer Digest* for comparisons of appliance performance, features and reliability. Two books that include more complete discussions about appliances are:

Consumer Guide to Home Energy Savings, by Alex Wilson and John Morrill; Sixth edition, 1998; 274 pp.; American Council for an Energy Efficient Economy, 2140 Shattuck Ave., Suite 202, Berkeley, CA 94704; (510) 549-9914; ISBN 0-918249-31-7; \$7.95.

Home Made Money: How to Save Energy and Dollars in Your Home, by Richard Heede and Staff of Rocky Mountain Institute, 1995; 258 pp.; Brick House Publishing Co., Box 266, Amherst, N.H. 03031-0266; (800) 466-8642; ISBN 1-883178-07-X, \$14.95.



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