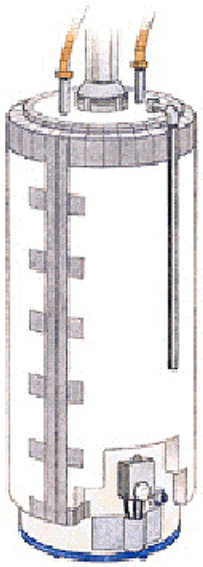
Domestic Hot Water & Use

Water heating is usually the second largest part of your energy bill. It accounts for approximately 14% of a home's total energy use. Hot water is used throughout the entire year; therefore, any energy conservation strategies to save hot water will go a long way.



A typical family of four, heating with natural gas, will spend about $200 a year for hot water. With electricity, it's about $450 a year. The following suggestions can easily reduce your water heating bill by one-fourth or more.

Insulate the water heater tank and hot water pipes
Insulating your water heater and pipes keeps heat from escaping and the project will easily pay for itself in less than a year. Before insulating your water heater, determine if additional insulation is needed. Newer water heaters may already have sufficient insulation and the manufacturers recommend against adding additional insulation.

Use foam wrap to insulate hot water pipes throughout the house. Also, insulate the cold water pipe for the first few feet nearest the heater. For safety, keep foam insulation three inches away from the heater drafthood and exhaust vent. Wrap your water heater tank with a blanket of fiberglass insulation. Water heater insulation kits are widely available at minimal cost. When wrapping a natural gas water heater, leave the top and the area near the bottom open so the pilot and burner can have air and the heater will draft properly. Leave the control panel on both electric and gas water heaters uninsulated.

Turn down the temperature
You don't need the water to be any hotter than 120 or 125 degrees Fahrenheit. Any higher setting not only wastes energy but also creates a risk of scalding, especially for children. If your water heater doesn't have specific temperature settings, use a cooking thermometer to measure water temperature at your sink or bath to determine how far toward the low setting you can turn it and still get water above 120.

> **Energy Myth:** You need really hot water to sterilize dishes and clothes.
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> **Fact:** Even at the hottest setting on your water heater, your dishes and clothes are not sterilized.

Repair or Replace
Industry statistics show that the average water heater lasts 12 years. With regular maintenance and routine repairs, some keep operating two or three times as long. As with HVAC systems, however, it's not always to your advantage to hang on to older units. Modern high-efficiency water heaters often can pay for themselves in energy savings within 3-5 years.

Almost all components on a water heater can be fixed or replaced except for the tank. Once the tank rusts through, there is no way to rescue the water heater. Replacement is the only solution.

Water heaters come with internal sacrificial anode rods to protect against rusting. An anode's sole purpose is to corrode away so the steel of the tank can't. Replacing the anodes every 3-4 years (more frequently if water is softened) will add considerably to the life of a water heater.

Another main cause of failure is overheating from sediment build-up inside the tank. Ask your plumber to inspect the anodes and sediment periodically. Sometimes this can be done as part of an annual service agreement.

Some plumbing firms also offer extended water heater warranties lasting 10 years or even a lifetime. If you plan to live in your home for quite some time, these warranties may be worth looking into.

If the unit is beyond repair, buy an energy efficient model.

About Water Heater Efficiency[1]

A water heater's efficiency is measured by its energy factor (EF). EF is based on recovery efficiency, standby losses, and cycling losses. The higher the EF, the more efficient the water heater. Electric resistance water heaters have an EF ranging from 0.7 and 0.95; gas water heaters from 0.5 to 0.6, with a few high-efficiency models ranging around 0.8; oil water heaters from 0.7 and 0.85; and heat pump water heaters from 1.5 to 2.0.

Although many consumers make water heater purchase decisions based only on the size of the storage tank, the first hour rating (FHR), provided on the Energy Guide label, is actually more important. The FHR is a measure of how much hot water the heater will deliver during a busy hour. The FHR is required by law to appear on the unit's Energy Guide label. Therefore, before you buy a water heater, estimate your household's peak-hour demand and look for a unit with an FHR in that range. Moreover, beware that a larger tank doesn't necessarily mean a higher FHR.

ALTERNATIVE TECHNOLOGY WATER HEATERS

Point-of-use water heaters

Point-of-use water heaters are also known as "tankless" heaters because they have no (or only a tiny) storage tank. They are relatively small units that provide hot water on demand. They use gas or electricity for fuel, and can be installed near demand points, such as under kitchen sinks. They are often more expensive than a conventional water heater, but can cost less to operate since they don't maintain a tank full of hot water when not in use. A tankless heater typically provides 1 to 2 gallons of hot water per minute. Before installing a tankless water heater in your home, make sure its reduced capacity will be adequate for your needs.

Solar water heaters

A solar water heater typically includes collectors mounted on the roof or in a clear area of the yard, a separate storage tank near the conventional heater in the home, connecting pipe, and a controller. Solar water heaters can reduce the annual fuel cost of supplying hot water to your home by more than half.
Throughout the year, the solar system preheats the water before it reaches the conventional water heater. During the summer, it may provide all the required heat.

Desuperheaters

A desuperheater is an attachment to your air conditioner or heat pump that allows waste heat from that device to help heat domestic water. In hot climates, a desuperheater can provide most of a home's hot water needs during the summer.

Tips for Buying a New Water Heater

Choose a water heater with an appropriate first hour rating (FHR) by estimating your family's peak-hour demand for hot water.

Determine the appropriate fuel type for your water heater. If you are considering electricity, check with your local utility company for off-peak electricity rates for water heating. If available, this may be an attractive option to choose electric water heaters. Natural gas, oil and propane water heaters are less expensive to operate than electric models.

For safety as well as energy-efficiency reasons, when buying gas and oil fired water heaters, look for units with sealed combustion or power venting to avoid back drafting of combustion gases into the home.

Everything else being equal, select a water heater with the highest energy factor (EF). However, you should note that the EF of one type of heater is not comparable to another type. For example, an electric water heater with an EF of 0.9 may cost more to operate than a gas water heater with an EF of 0.7.

Whenever possible, do not install the water heater in an unheated basement. Also try to minimize the length of pipe running to your bathroom and kitchen.

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[1] http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic_12760

Fix leaky faucets

A hot water faucet leaking only one drop per second will waste 60 gallons of hot water a week and cost you about $35 dollars a year. Leaks can usually be fixed by replacing the tap washer. Turn off the water below the sink or tub (or at the main supply), take the faucet apart and replace the bad washers.

Install low flow aerators on faucets

Low flow aerators on faucets will save you money on both your water bill and water heating costs. They reduce the amount of water you use without a noticeable change in the flow. Aerators cost from one to five dollars. To install, simply unscrew the standard aerator at the end of the faucet and install the low flow device. If you don't have aerators, consider installing them—they are well worth the effort.

Install a water saving showerhead

A water-saving showerhead uses about two gallons of water a minute, which is about six gallons less than a conventional showerhead. They cut water consumption by 40 to 60%. This will save a typical household using gas to heat water over $25 a year and over $45 a year with an electric water heater. Water saving showerheads cost anywhere from $8 to $40 depending on the style and provide very comfortable showers.

Other easy hot water saving tips

- Take showers instead of baths. They use much less water. Close the drain next time you shower and you'll see that this is true.
- Don't let the hot water run while shaving.
- Turn your water heater down to the lowest possible setting if you are going to be away for a few days.
- Do as much household cleaning as possible with cold water rather than hot.
- Only run full loads in the dishwasher. Use the "air dry" (or energy saver) option if available. Heat drying is a high-energy user.
- If you buy a washing machine, get one of the new horizontal axis machines. They use 33% less water as well as half the energy.
- Rinse dishes in a tub of clean water instead of under hot running water.
- For electric water heaters, install a timer that can automatically turn the hot water "off" at night and "on" in the morning. A simple timer can pay for itself in less than a year.
- Install a heat trap above the water heater. A heat trap is a simple check valve or piping arrangement that prevents "thermosyphoning", the tendency of hot water to rise up from the tank into the pipes, thereby lowering standby losses.
- Drain a quart of water from your hot water tank every 3 months to remove sediment that prevents heat transfer and lowers the unit's efficiency.
- Locate the water heater as close as possible to the location where the largest volume of hot water is used. Since heat is constantly lost through hot water pipes, the shorter the pipe runs, the lower the heat loss.

Bibliography

- Source: http://www.eere.energy.gov/consumer/
- Minnesota Department of Commerce Energy Information Center, *Techniques, Tactics & Tips, Home Energy Guide to Hot Water*. Energy Information Center publications are available free.
- City of Chicago, Department of the Environment

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