

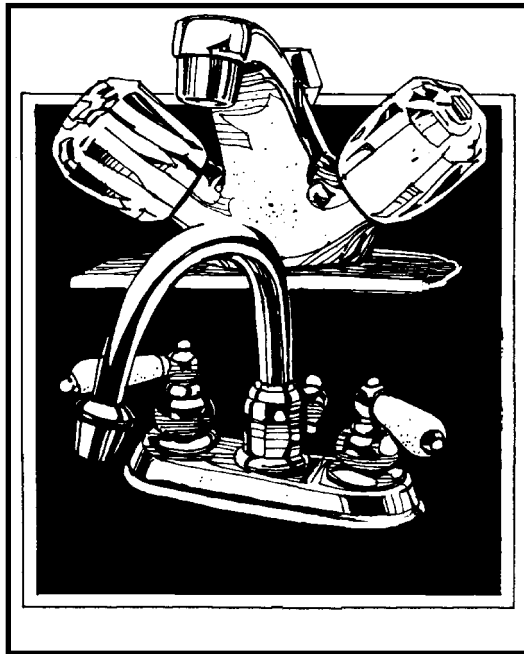
Energy Efficient Water Heating

The next time you pay your utility bill, divide the total amount by seven. The result is the amount you spend to heat your water. You may think this cost is a small price to pay for the convenience of a hot shower, but during the course of a year, this cost adds up.

Several measures can help you decrease water heating costs in your home. Some specific actions include reducing the amount of hot water used and making your water heating system more energy efficient.

Reducing the Amount of Hot Water Used

Generally, four destination points in the home are recognized as end uses for hot water: faucets, showers, dishwashers, and washing machines. Of course you do not have to take cold showers, dine on dirty dishes, or wear dirty clothes to reduce your hot water consumption. Less radical measures are available that will be virtually unnoticeable once you apply them.



Faucets and Showers

Simply repairing leaks in faucets and showers can save hot water. A leak of one drip per second can cost \$1 per month, yet could be repaired in a few minutes for less than that. And some apparently insignificant steps, when practiced routinely at your home, could have significant results. For example, turning the hot water faucet off while shaving or brushing your teeth, as opposed to letting the water run, can also reduce water heating costs. Another option

is limiting the amount of time you spend in the shower.

Other actions may require a small investment of time and money. Installing low-flow showerheads and faucet aerators can save significant amounts of hot water. Low-flow showerheads can reduce hot water consumption for bathing by thirty percent, yet still provide a strong, invigorating spray.

A quick test can help you determine if your shower is a good candidate for a showerhead replacement. Turn on the shower to the normal pressure you use, hold a bucket that has been marked in gallon increments under the spray, and time how many seconds it takes to fill the bucket to the one gallon mark. If it takes less than twenty seconds, you could benefit from a low-flow showerhead.

Because of the different uses of bathroom and kitchen faucets, you may need to have different water flow rates in each location. For bathroom faucets, aerators that deliver one half gallon to a

gallon of water per minute may be sufficient. Kitchen faucets may require a higher flow rate of two to four gallons per minute if you regularly fill the sink for washing dishes. On the other hand, if you tend to let the water run when washing dishes, the lower flow rate of one half gallon to a gallon per minute may be more appropriate. Some aerators come with shut-off valves that allow you to stop the flow of water without affecting the temperature.

Dishwashers

A relatively common assumption is that washing dishes by hand saves hot water. If properly used, an efficient dishwasher can consume less energy than washing dishes by hand, particularly when you only operate the dishwasher with full loads. Heating water for an automatic dishwasher can represent about eighty percent of the energy required to run this appliance.

Average dishwashers use eight to fourteen gallons of water for a complete wash cycle and require a water temperature of 140 °F for optimum cleaning. But setting your water heater so high could result in excessive standby heat loss. This type of heat loss occurs because water is constantly heated in the storage tank, even when no hot water is used. Furthermore, a water heater temperature of 120 °F is sufficient for other uses of hot water in the home.

A “booster” heater can increase the temperature of the water entering the dishwasher to the 140 °F recommended for cleaning. Some dishwashers have built-in boosters that will automatically raise the water temperature, while others require manual selection before the wash cycle begins. A booster heater can add about \$30 to the cost of a new dishwasher but should pay for itself in water heating energy savings in about one year if you also lower your water heater temperature. Reducing the water heater temperature is not advisable, however, if your dishwasher does not have a booster heater.

Another feature that reduces hot water use in dishwashers is the availability of cycle selections. Shorter cycles require less water, thereby reducing the energy cost. The most efficient dishwasher

currently on the market can cost half as much to operate as the most inefficient model. If you are planning to purchase a new dishwasher, check the EnergyGuide and Energy Star® labels and compare the approximate yearly energy costs among brands. Dishwashers fall into one of two categories: compact capacity or standard capacity. Although compact-capacity dishwashers may appear to be more energy efficient, they hold fewer dishes and may force you to use the appliance more frequently than you would use a standard-capacity model. In this case, your energy costs could be higher than with the standard-capacity dishwasher.

Washing Machines

Much of the cost—up to 90 percent—of operating washing machines is associated with the energy needed to heat the water. Washing machines do not require a minimum temperature for optimum cleaning. Either cold or warm water can be used for washing most laundry loads; cold water is always sufficient for rinsing. Make sure you follow the cold water washing instructions for your particular laundry detergent. Washing only full loads is another good rule of thumb for reducing hot water consumption in clothes washers.

Consult the EnergyGuide and Energy Star® labels when shopping for a new washing machine. Inefficient washing machines can cost three times as much to operate as efficient machines. Select a machine that allows you to adjust the water temperature and water levels for the size of the load. Also, front-loading machines use less water and, consequently, less energy than top loaders. Keep in mind that the capacity of front loaders may be smaller than that of most top-loading machines. Smaller capacity washing machines often have better EnergyGuide and Energy Star® ratings. However, a reduced capacity might cause you to increase the number of loads you wash and possibly increase your energy costs.

Faucets, showerheads, dishwashers, and washing machines are only destination points for hot water in your home. The journey of your hot water before it reaches these outlets has many opportunities for energy losses. Fortunately, you

can reduce the incidence of water heat loss from the point of departure to the point of arrival by applying a few basic measures.

Increasing Water Heating System Efficiency

Reducing hot water usage is primarily a matter of common sense and exerting a little extra effort to not be wasteful. Once you have applied a few simple, low-cost measures for reducing hot water consumption, you may want to consider water heating system improvements if you wish to further reduce your energy bill.

Lower Your Water Heater Thermostat

One simple step for reducing water heating energy costs is lowering the thermostat setting on your water heater. 120 °F is satisfactory for most household needs. When heated to 140 °F, water can pose a safety hazard such as scalding. For each 10 °F reduction in water temperature, water heating energy consumption can be reduced three to five percent.

If your dishwasher does not have a booster heater, lowering the water heating temperature is not recommended. Also, many dishwasher detergents are formulated to clean effectively at 140 °F and may not perform adequately at lower temperatures.

Install a Timer and Heat Traps

Another possibility for electric water heaters is installing a timer that can automatically turn the heater off at night and on in the morning. At a \$30 selling price and a do-it-yourself installation, a simple timer may pay for itself in energy saved in about one year. More expensive,

multi-setting timers are also available. Timers for gas water heaters are not as useful or cost effective as those designed for electric water heaters. This is because the pilot light supplies some heat during the night, offsetting some of the energy savings achieved by using the timer.

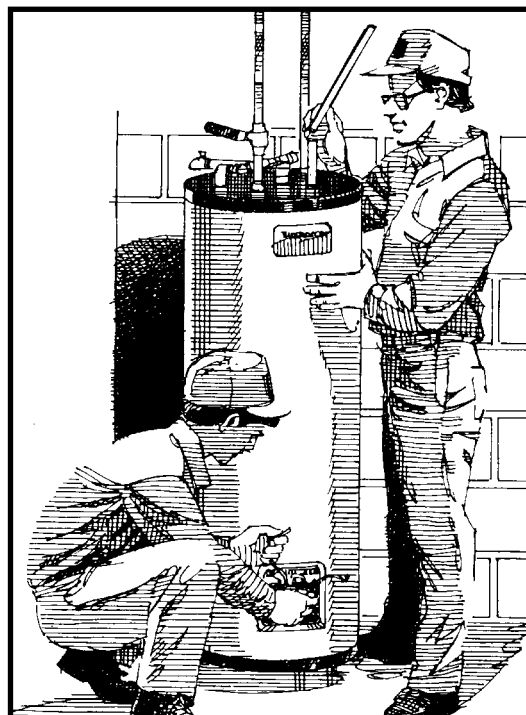
If heat traps were not initially installed with your water heater, adding them is another way of reducing water heating energy loss. Heat traps, or one-way valves, allow water to flow into the tank and prevent unwanted hot water flow out of the tank. Heat traps cost about \$30, but they may require professional installation, which could be expensive. However, if installed at the same time as a new water heater, heat traps are much more cost effective. Most new water heater models have factory-installed traps, saving you the time and expense of installing one yourself.

Insulate Hot Water Pipes and the Storage Tank

When you turn on a hot water faucet during cold weather, it may take several seconds for the water to become hot. This happens because the water travels through pipes from the water heater to the faucet, and some of the pipes may pass through unheated sections of the house, such as the basement. As a result, the hot water loses some of its heat to the surrounding space.

This heat loss can be reduced by insulating hot water pipes wherever they are accessible—especially in unheated areas. Use a quality pipe insulation wrap, or neatly tape strips of fiberglass insulation around the pipes. Eventually the water will cool, but it will remain warmer much longer inside insulated pipes.

Insulating your water heater storage tank is a fairly simple and inexpensive improvement that can help maintain the



water temperature at the thermostat setting. Some newer models of water heaters are well insulated and do not need an added layer, but a heater that is warm to the touch needs additional insulation.

Easy-to-install, precut blankets (or jackets) for electric water heaters are widely available and range in cost from \$10 to \$20. Your local utility company may offer them at a lower price, give you a rebate, or even install them at no cost. When properly installed, a water heater blanket on an electric water heater will pay for itself in energy saved within one year. Installation is more difficult on gas-fired heaters. Ask your local furnace installer for instructions.

If your water heater is at least seven years old, you should carefully evaluate your water heating needs and investigate the types of heaters that could replace your current one. Although most water heaters last ten to fifteen years, early investigation and timely replacement can ensure a wise purchase.

Simple Actions, Big Results

Some ways to save on water heating bills require greater financial investments than others. You may wish to consider the free or low-cost options before making large purchases. Also allow for circumstances that may be unique to your household when deciding on the appropriate options. For example, a small-capacity washing machine could meet the needs of a one-person household.

Although it is not feasible to eliminate water heating in your home, it is possible to substantially reduce water heating costs without sacrificing comfort and convenience. The tips in this publication can help decrease your costs for heating water.

Source: *Energy-Efficient Water Heating*, Consumer Energy Information: EREC Fact Sheets Energy Efficiency and Renewable Energy Network (EREN) U.S. Department of Energy.



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