

# Thermal Energy & Water Use

Thermal energy is the energy that gives substances their warmth. Steam has more thermal energy than liquid water, and water has more thermal energy than ice. When thermal energy is transferred, it moves from higher temperature to lower temperature. Thermal energy is transferred through conduction (direct contact), convection (flowing fluid), and radiation (waves of energy). Most home heating systems use convection to transfer thermal energy and heat rooms. Heating and cooling accounts for more than 40 percent the energy used in a home, and water heating is another 16 percent.

Heating and cooling systems are controlled by a thermostat. The temperature is set so that the heating system turns on if the air temperature falls below the setting. Programmable thermostats allow the homeowner to adjust the temperature for different times of the day, or when a cooler temperature is acceptable such as when everyone is away at work or school, or everyone is asleep under warm blankets. The program can be adjusted to begin warming the home just before the first person arrives, and to reduce the temperature after the last person is asleep or has left for the day. Programmable thermostats are available for all types of systems that will help you save money on your energy bill.

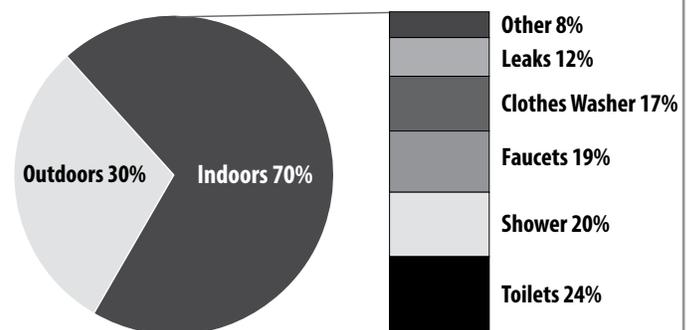
If you cannot install a programmable thermostat, you can adjust the temperature at night and when no one is home. If you do not set the temperature above 68 °F in the winter or below 78 °F in the summer, you will still be comfortable, yet make your energy bills more affordable.

Water heating is another large energy user, so using hot water wisely will help control this expense. Setting the temperature of the water heater to 120 °F will allow for hot showers, prevent accidental scalding, and save money. In addition, using a low-flow shower head and washing clothes in cold or cool water will help use less hot water. A tankless water heater is the most efficient way to deliver hot water when you need it. It does not have a tank of water to keep hot when it's not being used, so the heater only runs when hot water is needed.

The amount of water used in your home also impacts the amount of energy used by your home. Beyond heating the water, extensive amounts of energy are put into extracting, treating, distributing, and disposing of the water you use. The average American household of four uses about 400 gallons of water every day. Here are some great ways you can reduce the amount of water you use at home:

1. Turn off the water while brushing your teeth. You don't need running water to do a good job on those pearly whites!
2. Take showers instead of baths. Most showers use significantly less water than filling the tub with water. Try to limit your showers to conserve water and energy.
3. Don't use more water than needed when cooking. A box of macaroni and cheese does not need a giant stock pot full of water, and many things that are cooked on the stove in water can instead be microwaved, saving both electricity and water.
4. Use a high efficiency washing machine, which minimizes the amount of water used to clean clothes. Also, you can probably select the water level to match the amount of laundry you have placed in the machine, or even better, only run the washing machine with full loads.
5. Only run your dishwasher on pot scrubber when the dishes are really, really dirty. Instead, select "normal" for ordinary dish dirt.
6. Scrape your plates into the trash with a fork or knife instead of running them under a strong stream of water. Even better, scrape those food wastes into a bucket to use in composting or vermiculture (worm farming).
7. Keep a cover on your swimming pool or hot tub when it's not being used. Evaporating water must be replaced; this is especially important if you live in a dry climate.

## How Water is Used in the Home



Data: EPA