



Energy-efficient water heaters

FACT SHEET



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Chances are your water heater is quietly performing its job making hot water. Water heaters are dependable and rugged appliances, lasting 10 years or more. However, when they wear out they usually do so suddenly. This can catch shoppers off guard and lead to emergency decisions that don't factor in the energy aspects of these appliances.

Since a water heater is the largest energy user in a typical Wisconsin home behind space heating, it pays to learn about what types of water heaters are available and how efficient they are. This fact sheet will explain some of the basics.

TYPES OF WATER HEATERS

Conventional Tank

Conventional or storage tank water heaters heat large volumes of water inside an insulated tank and heat it with electricity or by combustion—using natural gas, oil, or propane. All conventional tank heaters include thermostats, which automatically shut off the heating element once the desired water temperature is reached.

One disadvantage of storage water heaters is that heat is lost through the walls of the tank, even when hot water is not needed. Energy-efficient units minimize these standby losses by heavily insulating the tank walls. Adding an insulating blanket to almost any conventional water heater can increase its efficiency.

The two types of combustion heaters commonly available are naturally-vented and power-vented units. Naturally or atmospherically-vented water heaters vent out the chimney. Power-vented models use a fan to vent exhaust out the side of the home.

Power-vented water heaters are safer than naturally-vented units because they are not subject to backdrafting, which draws hazardous exhaust gases back into the home. Power-vented water heaters also have fewer standby losses than naturally-vented water heaters.

Electric water heaters are typically much more expensive to operate than those powered by natural gas or other fossil fuels—making a combustion water heater a smart choice if it's available to you.

Combination

Combination units are primarily large-capacity boilers providing both hot water and space heating. They can recover hot water faster for larger homes and appliances, such as whirlpool bathtubs. Properly sizing these units is especially important to ensure they can provide enough heat for both water and space heating. High-efficiency combination units can be more efficient than separate space and water heating systems of comparable efficiency.

Instantaneous/Tankless

Instantaneous or tankless water heaters are designed to heat a continuous stream of water on demand without losing energy to standby losses. These units can supply a limited amount of hot water for an unlimited amount of time. Proper sizing is extremely important to ensure enough hot water can be provided to meet the home's needs. Whole-house models are available to serve simultaneous uses, while single-point models typically heat water for a single application such as a remote bathroom. Tankless water heaters typically operate at higher efficiencies than conventional tank systems.

Condensing

Condensing water heaters can be found in either conventional tanks or in tankless models. Different burner technologies allow them to burn fuel very efficiently—resulting in reduced energy costs.

Solar

Solar water heaters use the sun's energy to preheat cold water before it is sent to a conventional water heater. Typically, roof-mounted solar panels collect the sun's energy which is transferred to an antifreeze loop. The antifreeze loop heats the cold water through a heat exchanger. Solar water heaters can save 40 to 70 percent per year on hot water costs in Wisconsin. These heaters have a life expectancy of over 20 years and meet nationally established industry standards. It is best to arrange for a certified solar site assessor to visit your home to see if it is suitable for a solar installation and to learn about available solar water heater types.



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SHOPPING FOR A WATER HEATER

Before purchasing a water heater, it's important to consider the way you use hot water. Ask yourself these questions:

- How much hot water does your household typically use each day? Estimate how much hot water you need at peak times, then choose a water heater that can meet this demand. The ability to meet hot water demand is given by the water heater's first-hour rating, not by its storage tank capacity. In fact, the larger the storage tank, the more energy will be wasted due to standby loss.
- Are there ways that you can reduce total hot water demand? Small changes around the house, such as installing low-flow shower heads and faucet aerators, repairing dripping faucets, doing laundry with cold water, or taking showers instead of baths can dramatically reduce your hot water consumption.
- Can you reduce the temperature of the water you use? Most applications need water to be no more than 120°F.
- What is your budget for purchasing and operating a water heater? There is often a trade-off between purchase and operating costs: The more expensive the water heater, the less it costs to operate. Energy Guide labels provide information on relative efficiency, first-hour rating (FHR), and operating costs.
- What kind of fuel is available for your home? If you have both electricity and natural gas, switching to a water heater that burns natural gas (or another fossil fuel) is often much cheaper than electricity in the long run. Savings vary, especially for customers on time-of-use rates.
- If you already have a direct-vent, high-efficiency furnace, choose a power-vented or sealed-combustion water heater and seal off your chimney to reduce whole-house heat loss through the opening in your roof.

Another tip is to look for the Energy Factor (EF). The higher the EF the more efficient the model. Look for 0.64 EF or higher on conventional tank gas water heaters, 0.80 EF or higher on tankless water heaters, and 0.93 EF or higher on electric water heaters.

Focus on Energy recommends that you contact a qualified contractor, plumber or reliable appliance store to help you determine the water heater that's best for you.

WHAT IS YOUR WATER USE?

It might surprise you to learn how much hot water you and your family use in a typical day. Consider the following average hot water use. How does your water heater compare? The answers can help you decide the size and type of water heater that's best suited for your needs.

HOT WATER USE AND WATER HEATING COSTS FOR VARIOUS ACTIVITIES				
ACTIVITY	TYPICAL HOT WATER USE (gallons)	TYPICAL USES PER WEEK	ANNUAL COST (\$) GAS WATER HEATER	ANNUAL COST (\$) ELECTRIC WATER HEATER
Shower	10	15	\$77	\$148
Bath	20	15	\$153	\$296
Laundry (top loading)	12	6	\$37	\$71
Laundry (ENERGY STAR front loading)	5	6	\$16	\$30
Automatic dishwashing (older)	12	4	\$25	\$48
Automatic dishwashing (ENERGY STAR)	7	4	\$15	\$28
Hand dishwashing	4	5	\$11	\$20

*BASED ON 1.25 DOLLARS/THERM AVERAGE GAS COST, 12 CENTS/KWH ELECTRICITY RATE, 0.64 GAS WATER HEATER ENERGY FACTOR, 0.93 ELECTRIC WATER HEATER ENERGY FACTOR, 60°F DIFFERENCE BETWEEN COLD AND HOT WATER TEMPERATURE

LEARN MORE

Focus on Energy

Contact Focus to learn more about smart energy choices.

focusonenergy.com

The American Council for an Energy Efficient Economy helps you choose the best water heater for your home.

aceee.org/consumerguide/waterheating.htm

This top-rated science and technology site shows how conventional water heaters work.

home.howstuffworks.com/water-heater.htm

Click on Water Heating in the quick links section to see what the US Department of Energy says about various water heaters.

eere.energy.gov/consumer