

HEAT PUMP WATER HEATERS:

YOUR GUIDE TO ELECTRIC HEAT PUMP WATER HEATERS.

Water heating is typically among the top three largest energy uses in a home. Heat pump water heaters (HPWHs) provide a highly efficient way to heat water and can significantly reduce energy costs for homeowners. [1]

BENEFITS OF HEAT PUMP WATER HEATERS

- **Save Money:** Typically, HPWHs can reduce water-heating energy costs compared with conventional gas or electric tank water heaters.
- **Save Energy:** HPWHs are more efficient than gas water heaters. By eliminating combustion and venting losses, they can be up to five times more efficient than standard electric, gas and propane water heaters. [2]
- **Get Control:** With advanced controls and connectivity features, HPWHs allow users to customize schedules by day, week or month and adjust temperature settings remotely via a mobile app to help reduce costs or adjust to hot water needs.
- **Health and Safety First:** HPWHs improve home safety and occupant health by eliminating the risks of gas leaks and combustion-related emissions. They also reduce exposure to nitrogen oxides, which can worsen asthma and other respiratory conditions.
- **Help the Environment:** HPWHs improve air quality and reduce climate impacts by avoiding the greenhouse gas emissions and other pollutants associated with gas water heaters. As renewable energy generation grows, electric-powered HPHs can further lower a home's environmental footprint.



OPERATING MODES FOR ADDED EFFICIENCY

HPWHs come with a variety of operating modes that maximize energy efficiency while also keeping up with household hot water use or preferences. Operating modes help households balance energy costs with resident needs (120-volt heat pumps may have fewer modes than 240-volt heat pumps).

- **Heat Pump Only:** This mode usually offers the highest energy efficiency. It relies solely on the heat pump to heat the water.
- **Hybrid:** This mode maintains high energy efficiency while introducing flexibility. It uses the heat pump to heat water but also allows the electric resistance heating element to engage during periods of high hot water use.
- **High Demand/Boost:** This mode is similar to Hybrid mode, but the electric resistance heating element turns on sooner.
- **Electric Resistance Only:** This mode offers the fastest hot water recovery but the lowest energy efficiency. It constantly relies on the electric resistance heating element, similar to traditional electric water heaters.
- **Vacation:** This "sleep" mode saves energy during times when residents are away from home for multiple days.

When is it a good time to consider installing an HPWH?

Today! Plan for installing a HPWH before your existing water heater approaches the end of its useful life — typically around 10 years for conventional tank water heaters. It is best not to wait until your current unit fails, as emergency replacements can be more costly. HPWHs are available in both 120-volt plug-in and 240-volt models. If you are installing a rooftop solar system or electric vehicle charger, ask your electrician about running a 240-volt circuit to your water heater location to be HPWH-ready.

[1] Savings vary by household. Factors include hot water usage, utility rates, climate zone, equipment settings, and the type of equipment being replaced. When paired with rooftop solar (PV), savings may be even greater.

[2] ENERGY STAR Heat Pump Water Heater Guide (updated June 2024): HPWHs deliver hot water up to five times more efficiently than standard electric resistance, gas, and propane water heaters. Source: energystar.gov

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What happens to a HPWH in the event of a power outage?

If the power goes out, your HPWH will continue to deliver the hot water already stored in the tank. While no new hot water can be produced during the outage, the unit will automatically return to its prior settings and resume normal operation once power is restored. Note that modern gas water heaters with electronic ignitions, power venting or tankless configurations also do not operate during power outages — and tankless models provide no stored water at all.

Why does a HPWH have a condensate drain?

Like an air conditioner, a HPWH produces condensation as it operates. The condensate is removed from the unit through a condensate drain line to prevent water damage to the surrounding area.

TIPS FOR SELECTING A HPWH

If you are considering replacing your current water heater with a HPWH, keep the following factors in mind. Always consult a qualified contractor or installer to make sure your system is installed safely and operates efficiently.

- **Location:** HPWHs require sufficient airflow and service access to operate efficiently. Many models are suitable for existing water heater locations, like garages and utility rooms. Some models can be installed in smaller spaces using ducting or ventilation through louvers. Always follow the manufacturer's installation requirements for the selected model.
- **Electrical:** HPWH models are available in both 120-volt and 240-volt configurations. 240-volt units typically require a dedicated 30-amp circuit. 120-volt plug-in models may eliminate the need for a new electrical circuit. Always follow the manufacturer's requirements and consult a qualified contractor.
- **Sizing:** Residential HPWHs are available in a variety of tank sizes, typically 40–80 gallons. Households of 3–4 people often use 50–65 gallon models, while larger households may benefit from 65–80 gallon models. Because HPWHs heat water more gradually than gas units, a larger tank helps maintain hot water availability during peak demand. Consult a qualified professional or the manufacturer's sizing guidance.
- **Sound:** HPWHs generate noise at a low level, similar to the background noise from a portable fan (around 45 decibels). When installed in a separate living space, very few homeowners notice them operating. If installed adjacent to a sleeping room, sound-dampening measures such as a rubber mat may be advisable.

SOURCES

[Heat Pump Water Heaters | ENERGY STAR](#)

[ENERGY STAR Heat Pump Water Heater Guide, June 2024 \(energystar.gov\)](#)

[U.S. EPA Consumer Messaging Guide for ENERGY STAR Certified Appliances](#)

