

HEAT PUMP WATER HEATERS

Your guide to gas-free water heaters.

Water heaters are typically the second highest source of energy use in residences behind heating and cooling systems. Water heaters with new energy-efficient heat pump technology are a highly efficient way to heat water, offering a reduction in energy usage and utility bill savings when compared to electric resistance water heaters.

BENEFITS OF HEAT PUMP WATER HEATERS (HPWHs)

- **Save Energy** | In comparison to their standard electric counterparts, HPWHs can be three times more efficient. HPWHs are also more efficient than gas water heaters — which suffer energy loss during the venting process and can be three to four times more efficient than traditional gas water heaters.
- **Save Money** | Energy efficient HPWH can reduce energy bills in new construction, single-family homes with gas storage water heaters by 15-24% annually.
- **Get Control** | With enhanced technology, users can create customized settings by day, week, or month, and even control temperature settings via mobile app.
- **Health and Safety First** | HPWHs avoid some hazards present with gas water heaters, such as gas leaks. Additionally, with gas water heaters, poor ventilation can also release toxic carbon monoxide and excess moisture into the home (which may result in mold and mildew).
- **Help the Environment** | Gas-powered water heaters emit greenhouse gases into the atmosphere when used. With increasing amounts of renewable

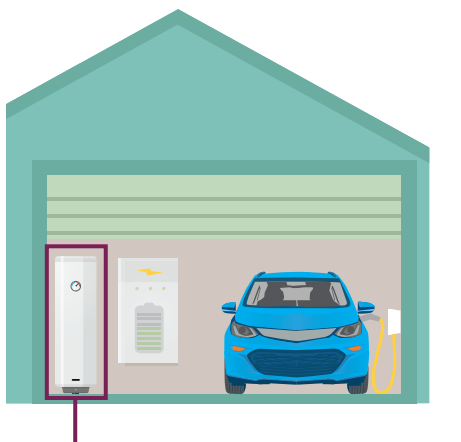


wind and solar resources, electric-powered HPWHs significantly reduce emissions and climate pollution.

OPERATING MODES FOR ADDED EFFICIENCY

HPWHs come with a variety of operating modes that maximize energy-efficiency while also keeping up with household demand or preferences. Operating modes help households balance energy costs with resident needs.

- **Heat Pump Only** | This mode 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 of response. It uses the heat pump to heat water but also allows the electric resistance heating element to engage under high-demand circumstances.
- **High Demand/Boost** | This mode is similar to Hybrid mode but the electric resistance heating element is energized sooner.
- **Electric Resistance Only** | This mode offers the greatest demand response but least energy efficiency. It constantly relies on the electric resistance heating element, similar to standard electric water heaters.
- **Vacation** | This “sleep” mode saves energy during times when residents are away from home for multiple days.



Heat pump water heaters pull heat from the air to heat the water.

HEAT PUMP WATER HEATERS

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

Consider installing a HPWH when your current water heater is close to the end of its useful life (10-12 years). If you are installing a rooftop photovoltaic system or an electric vehicle charger at your home, you may want to consider having the electrician run a 220/240V circuit from the electric service panel to the location of the water heater to be HPWH-ready.

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

The HPWH will continue to supply the remaining hot water in the storage tank, although it will no longer produce hot water because neither the heat pump nor the resistance heating element will work without electrical power. When power is restored after the outage, the water heater will automatically revert back to the most recent user settings.

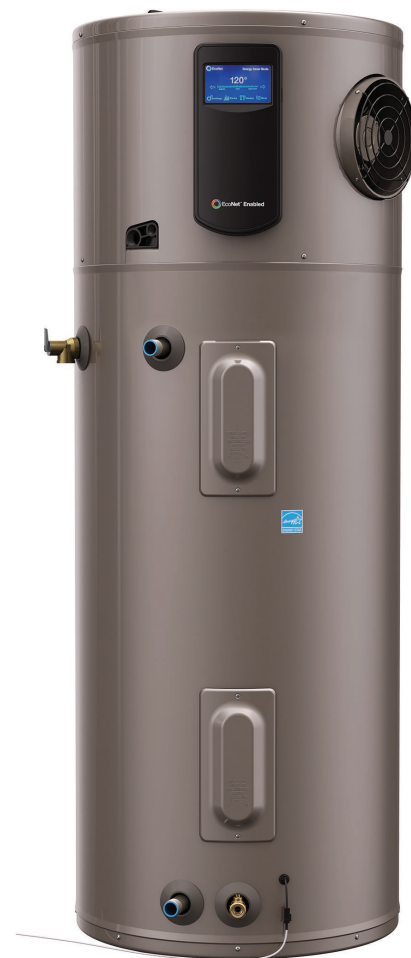
Why does a HPWH have a condensate drain?

As warm, moist air travels over the evaporator coils of a HPWH, some moisture in the air will condense, and the resulting condensate is removed from the unit through a condensate drain line. This condensate must be effectively removed to prevent damage. The simplest option for condensate management is a hose connected to the condensate line and pitched downward toward a drain in the floor or to the outside if there are no issues with yard drainage. Alternatively, a condensate pump can be installed to drain the water into a sink.

Tips for converting to a HPWH

Here are some aspects to consider when converting to a HPWH. Please be sure to consult a professional to ensure safe and effective installation and operation of your equipment.

- **Location** | Many heat pump water heaters can be installed in the same spot as a current standard electric heater. You can also take advantage of existing connections, such as cold-water supply, hot water outlet, electrical connection, and drain. For new locations, HPWH typically require at least 1,000 cubic feet of air-flow around them, making garages and basements ideal locations.
- **Electrical** | Most HPWHs require a dedicated 30-amp breaker and a 240V electrical circuit from the electrical panel to the location of the HPWH unit.
- **Sizing** | While a household of three to four people might utilize a 50-gallon gas water heater, the best option for the same household would be an 80-gallon HPWH. The bigger tank allows the HPWH to support higher water draw volume without the need to operate in the hybrid mode.
- **Sound** | Heat pump water heaters generate sounds 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 are aware they are operating.



FOR MORE INFORMATION

Contact CleanEnergyHome@sce.com

Sources

Residential Building Electrification in California, Energy and Environmental Economics, Inc., April 2019
<https://www.energy.gov/energysaver/articles/which-water-heater-right-you>
<https://news.energysage.com/pros-cons-electric-water-heaters/>
<https://www.waterheaters.com/avoid-dangerous-backdrafting-with-proper-water-heater-vent-installation/>