



**REDUCE
EMISSIONS**



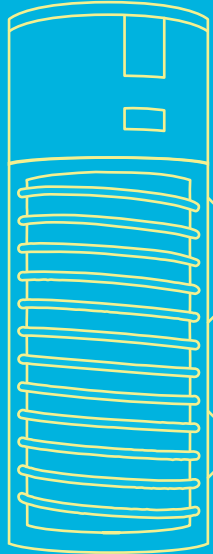
**SAVE
MONEY**



**SAVE
ENERGY**



**SMART
CONTROLS**



**DEHUMIDIFY
& COOL**

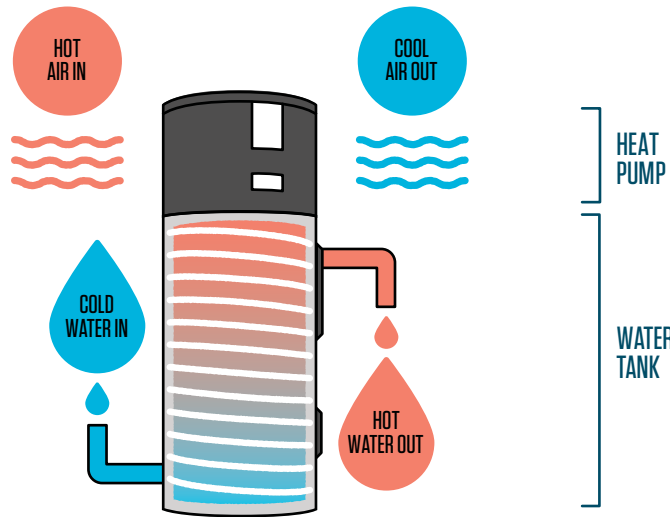
GUIDE *to* HEAT PUMP WATER HEATERS



Hawai'i Energy

HOW DOES A HEAT PUMP WATER HEATER WORK?

A heat pump, or “hybrid” water heater, is an efficient alternative to solar water heating.



This incredibly smart technology pulls in warm ambient air from outside of the tank to heat water and transfers cool air out. It is typically installed in a garage or closet – nothing on your roof. At nearly **twice the efficiency** as a conventional water heater, you **pay up to 40% less for energy!** You may even experience a cooling effect in the space where you keep your tank due to the air transfer.

EFFICIENCY

One of the primary metrics of a water heater’s performance is its Uniform Energy Factor (or UEF)*. The UEF is a measure of how much water a system of a certain size can heat in a given time period relative to how much energy it uses.

The higher the UEF, the more efficient.

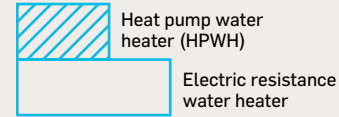
* Older water heaters may just have Energy Factor (EF) listed on labels. UEF is a new metric developed in 2015 that more accurately reflects water heating efficiency by incorporating standby losses.

UEF Rating
HPWHs 2.2 - 3.5+
Conventional water heaters 0.6 - 0.95

BENEFITS

COST SAVINGS

Operating costs can be up to 40% lower than the operating costs of a standard water heater.



Save
\$200-\$400
 or more per year,
 depending your hot water usage

Heat pump water heaters (HPWHs) are robust, and **can last much longer than conventional water heaters**, with standard warranties for many HPWHs lasting 10+ years.

FLEXIBILITY & FUNCTIONALITY

Many HPWHs have **integration features** that enable you to remotely control and monitor your water heater.



HPWHs provide **dehumidification** in the spaces in which they are installed (though they typically do not entirely replace dehumidifiers).



HPWHs can be installed in most places that any other hot water tank could be installed, although they **may require a few extra inches of clearance and adequate space for air circulation.**

GREENHOUSE GAS EMISSIONS



Using a HPWH results in **lower emissions** than using a traditional electric resistance or fossil fuel water heater. Plus, with today’s electric grid getting greener over time, emissions will decrease as time goes on.



HPWHs offer the **potential for zero greenhouse gas impacts** when paired with solar PV or 100% renewable electricity.

IS A HPWH A GOOD FIT FOR MY HOME?

If you answer yes to ANY of the following questions, then a heat pump water heater may be a good fit for your home.

Do you use an electric resistance water heater?

With today's energy prices, using a heat pump water heater instead of an electric resistance water heater will provide the greatest energy savings.

Do you want to reduce your home's greenhouse gas emissions?

HPWHs use significantly less energy than electric resistance heaters, reducing your home's greenhouse gas emissions.

Is your existing hot water tank over 10 years old or reaching the end of its useful life? Has it had maintenance issues or are you concerned about it failing?

Consider replacing your water heater before it fails or leaks all over the floor. A HPWH can replace your existing water heater, and the installation can be done by a plumber.

Do you have solar photovoltaic (PV) panels on your roof?

HPWHs run on electricity. If you already have PV panels on your roof that are generating more electricity than your home is currently consuming, then you can use the electricity from your existing solar panels to run your HPWH, decreasing or even eliminating your water heating expenses.

Do you have at least 750 cubic feet of open space?

HPWHs need to be located in a minimally warm area with enough open space for air circulation to operate efficiently. HPWHs will not perform efficiently if placed in mechanical closets; insufficient air circulation can lead to higher use of electric resistance backup heating, reducing efficiency and energy savings. HPWHs will cool the spaces in which they're located, so most Hawai'i homeowners choose to install them in a garage or an outdoor space.



SPACE

Heat pump water heaters come in a variety of sizes: usually 50, 65, or 80 gallon tanks. Depending on the tank size and model, they are typically 60-70 inches (5-6 ft.) tall and require at least 750 cu. ft. of open space to have sufficient air to absorb heat. Most systems are also designed to operate efficiently in ambient temperatures between 50 – 90 °F, so it is important to ensure they're situated in a place that's protected from the extreme heat. A garage or outdoor closet with ventilation is the recommended area in Hawai'i.

Additionally, the HPWH will cool and dehumidify the space it is in. Venting cold air outdoors or into another part of the home can be a nice benefit with many models.



NOISE & VIBRATIONS

HPWHs are often noisier than conventional water heaters — roughly as loud as a modern dishwasher or refrigerator (approx. 50 decibels), so they may not be appropriate to place near bedrooms or office spaces.



ELECTRICAL

If you currently have an electric resistance water heater, HPWHs can use the same hookups and electrical connections and you will be able to transition to a HPWH without an electrical upgrade.

If you are using a different fuel source to heat your hot water now and have a 100 amp electric panel, talk to your installer to see if an electrical upgrade is required.



OTHER

The HPWH will also likely need access to a floor drain or pump for managing condensate buildup.

COSTS & ASSISTANCE

Heat pump water heaters typically cost between \$1,700 and \$2,500, plus the cost of installation. (Installation costs may vary based on work or electrical upgrades that may need to be performed.) It will also depend on the specifics of your home and your home's hot water load. Homes that have less than 200 amp electrical service or lack sufficient panel space will likely incur additional costs for upgrading the electrical service or panel to accommodate a HPWH.

If you are planning to upgrade your electrical service for the HPWH,

make sure to tell your electrician if you are also considering installing other electric appliances in the future (e.g. electric vehicle chargers). Additionally, if you don't have a floor drain for removing condensed moisture, you may incur costs to install a condensate pump to move the moisture to an appropriate drain.

As you consider the upfront cost, remember that **your monthly energy bills can be as much as 40% lower** than with a conventional electric water heater.

FINANCIAL ASSISTANCE



INSTANT REBATE

HPWHs are eligible for an instant rebate of \$500 or more when you purchase from one of Hawai'i Energy's participating retailers. This rebate should be given to you at the time of purchase, with no applications required.

For details, visit HawaiiEnergy.com/heatpump.



TAX CREDITS

Heat pumps sometimes qualify for federal tax credits, based on their energy efficiency ratings. For the latest information, speak to your tax professional or visit the ENERGY STAR® website: www.energystar.gov/about/federal_tax_credits/non_business_energy_property_tax_credits

PREPARATION CHECKLIST

- 1. Confirm that a HPWH is the right fit for your home and your energy priorities.**
- 2. Understand the potential costs and plan how you will finance the project.**
 - Read the Cost & Assistance section of this guide to understand the typical costs associated with installation.
 - Check for/research any add-ons that may be required for your home, and factor those into your budget.
- 3. Shop around and learn all you can.**
 - Contact at least three companies (our recommended amount) to learn more about your options.
 - In Hawai'i, you have many choices – you can purchase your own tank from a hardware retailer and use their installation service, or contact a plumbing company to procure and install a HPWH for you. Use the Find A Contractor page on the Hawai'i Energy website as a starting point, and don't be afraid to reach out to family, friends, or neighbors.
 - Think about your warranty options before committing. You may see warranties being offered at every level, so whether it's from the manufacturer, the retailer, or the installer, be sure you understand what you get, how much they cost, and how long they last.
- 4. Prepare your home and schedule.**
 - Clean out (or prepare) the space where your tank will go.
 - Ensure the installer can access the area easily without potential injury.
 - If you need to divert condensate, plan out where your drain will empty, and make sure it will not cause additional damage to your property.
 - Schedule thoughtfully – a water heater replacement will require someone to be home and present while the contractor works. If you're upgrading your electrical service, be sure to schedule that before the water heater replacement.
- 5. Install a HPWH.** Talk to your installer about how long installation will take. HPWH installations can typically be done in a day.

ASK YOUR INSTALLER

During your conversation with installers, consider asking the following questions:

CONFIGURATION

What size water heater tank do I need?

You can probably replace your existing water heater with a heat pump water heater of the same size, but you should ask your installer if your current water heater is over- or undersized for your home's hot water load. If you are in between sizes, larger HPWHs tend to provide more efficient performance.

Do I have enough space for a heat pump water heater?

HPWHs need at least 750 cubic feet of air to efficiently heat water. If you lack sufficient space, or if you can only place the HPWH in a mechanical closet, you may need to add louvers to the closet door and/or vent the exhaust to another part of the house or outdoors.

Where will the condensate drain go?

HPWHs require access to a drain to manage condensate buildup. If a nearby floor drain is not available, a condensate pump to an appropriate drain may be needed.

How will the controls be set up? Will it have Wi-Fi integration or leak protection?

Ask your installer to explain the controls for your system and what additional features are available. While HPWHs work best when left to operate on their own, it is important to know how to adjust your system's settings to meet your household's needs. Many HPWHs also have Wi-Fi integration which allows for remote control of the HPWH through your smartphone or other digital device and enables more active monitoring of the system. Leak protection systems are also increasingly common, automatically shutting off water or sealing up areas surrounding a leak to prevent flooding.

COST

What is the installation price and what incentives are available? Who will apply for these incentives?

Make sure that you understand upfront who will apply for any incentives and when you need to apply (before vs. after installation).

Aside from annual electricity costs, what other annual costs can I expect (such as regular maintenance or parts)?

HPWHs use air filters that should be cleaned periodically by the homeowner to ensure efficient operation.

TIMING

How far in advance can we plan the installation, and how long does the installation take?

Be sure to communicate any time constraints and get a sense of your installer's availability. A heat pump water heater can often be installed by a professional, and an old unit removed, in about 3-5 hours. Ducting, difficult-to-access spaces, and other factors may increase the time needed for installation.

What should I do to prepare for the installation?

Make sure you understand from your installer if there is anything you need to do to prepare to have them working in your home.

Will I need an electrical upgrade?

If you live in an older home or lack space on your electrical panel, your home may need an electrical upgrade to ensure it can access enough power to support the HPWH. If you are replacing an old gas, oil, or propane heater, be sure to check with an electrician and your installer to ensure that your home has enough electrical capacity to support the load from the HPWH. If you are replacing an existing electrical system, you don't need to worry about an upgrade. If you do need an upgrade, be sure to work with a licensed electrician.

QUALITY ASSURANCE

Do you provide a warranty for the systems you install? What are the different warranty options?

Make sure you understand what is covered by any warranty offered by your contractor. Many HPWHs come with a 10 year warranty.

Have you participated in manufacturer training for the systems you would install, and can you provide references from past customers?

As with any home improvement project, it is important to ensure that your installer has the right training and a good track record.

Will you hire subcontractors? If so, what will they do? What are the names of these companies and how long have you worked with them?

Many HPWH installers sub-contract the electrical work. Some will even allow the homeowner to select their own electrician.

Will you provide training for me on how to properly operate and maintain the system (i.e., thermostat settings, cleaning air filters)?

HPWHs are relatively simple to operate, but there are a few differences compared to other water heating systems, and your installer should be a good educational resource. HPWHs use air filters that should be cleaned periodically to ensure efficient operation.

GETTING THE MOST FROM YOUR NEW SYSTEM

OPERATION

- **Set the water heater as low as you are comfortable.** The cooler the water is in the tank, the less heat will escape, and the more efficient the system will be. 120 °F is often a good base temperature.
- **Avoid changing the settings on your heat pump too frequently.** Changing the temperature settings, especially increasing the set temperature, will cause the system to work overtime, decreasing the system's efficiency. Once you have found a comfortable temperature setting the best way to manage your HPWH is to leave it alone.
- **Use the "Heat Pump (only)" mode whenever possible** to ensure you are maximizing the use of the heat pump system, rather than the electric resistance backup.
- Many HPWHs will have a "vacation" mode that should be used during extended absences to keep the system functional but significantly diminish energy use.

HOMEOWNER MAINTENANCE

- To keep your units operating efficiently, **clean or replace indoor air filters every 2-6 months**, depending on how dirty they are. To clean your air filters, simply wipe the filter with a damp cloth, or rinse it under running water and let it dry.
- Some HPWHs even have an indicator showing when the air filter needs to be cleaned. If you see this indicator come on, clean the filter as soon as possible.
- **Check the condensate overflow line periodically.** If you see water dripping out of the line, you likely have a blockage, and should follow the manufacturer's instructions to clean the line.

PROFESSIONAL MAINTENANCE

Maintenance requirements for HPWHs are minimal. Nevertheless, it is often advisable to schedule a maintenance check with your HPWH installer every few years (or at the installer's recommended interval) to make sure that everything is running smoothly.