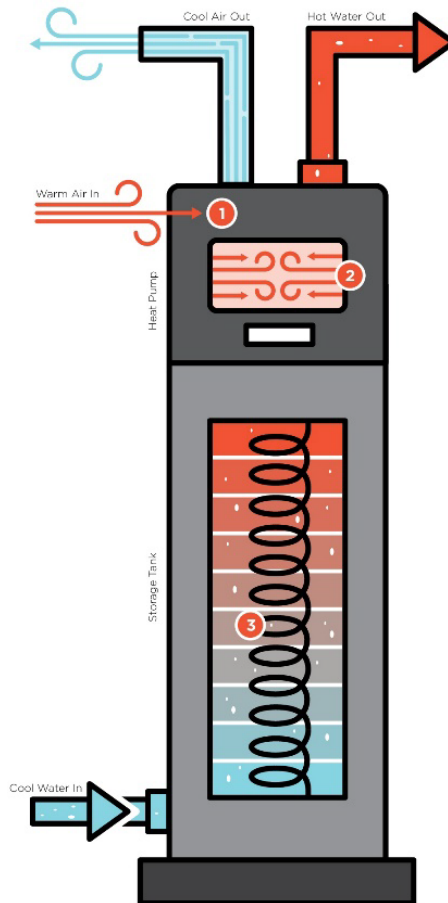


Residential Heat Pump Water Heaters: Replacing a Gas Water Heater

What is a heat pump water heater (HPWH)? Many homes in Berkeley use natural gas to heat water. Heat pump water heaters are high-efficiency water heaters that use electricity instead of gas and therefore have the potential to use renewable energy. Heat pumps work like a refrigerator in reverse — they use electricity and a refrigerant to take heat from the air and transfer it to the water in the tank.

Why get a HPWH?

- **High Efficiency:** Heat pump technology is two to three times more energy efficient than a gas storage water heater, with potentially lower operating costs and lower utility bills. Over a 30-year period, an average Californian could reduce their energy usage by 30%, and their greenhouse gas emissions by 50% or more with a HPWH powered by photovoltaic panels compared to high-efficiency gas tankless alternative.
- **Renewable Electricity:** Reducing your natural gas usage and transitioning to using renewable electricity in your home can significantly reduce your carbon footprint. Consider installing on-site renewables like [rooftop solar panels](#), or purchasing clean electricity through providers such as Alameda County's [East Bay Community Energy](#).
- **Safety:** Heat pumps eliminate indoor natural gas combustion, improving air quality and safety.



HOW DO HEAT PUMPS WORK?

By transferring heat rather than creating it, heat pumps deliver hot water **3-4 times more efficiently** than conventional water heaters.

- 1 Heat pump pulls warmth from the air.
- 2 Warm air is compressed, increasing its temperature.
- 3 Condenser coils transfer heat to the water.



Considering a HPWH?

1. Plan ahead: Emergency replacement when your water heater fails does not allow sufficient time to switch to a HPWH. Plan ahead to create time for considering a heat pump system. The typical life span of a gas storage water heater is 10-15 years.

Whenever conducting electrical upgrades, consider increasing panel capacity for all future projects, such as solar panels, an induction cooktop, or electric vehicle charging. When completing an extensive home renovation, please note heat pump technology is available for space heating systems as well. Measures like these are the best pathway to an emissions-free home powered by renewable electricity.

2. Understand installation requirements: *Heat pump technology is relatively new to the mainstream market, and specifications below may change as equipment and practices adapt. Please confirm these specifications with an experienced contractor for the model you select.*

- a. **Location:** HPWHs need extra space to ensure sufficient airflow (700 ft³ or more is recommended, with 6" clearance above and around), or a louvered door if located in a closet, and a place to drain condensate. The best locations include unconditioned areas, such as a garage or basement, due the cooling effect on air around it.
- b. **Electrical:** HPWHs typically require a dedicated 30-amp circuit and 220/240 V breaker. If there is not sufficient capacity, an electrical panel upgrade may be required.
- c. **Tank Size:** Due to the longer heating time, a larger tank is recommended for HPWHs. Extra capacity in the tank allows for the equipment to run in heat-pump only mode, and avoid the less efficient electric resistance backup mode.

3. Hire a Qualified Professional: This technology may require a plumber and an electrician for installation. Hiring professional(s) with prior experience with the equipment is key to ensuring it runs efficiently and that it meets Building Code requirements. Information on high efficiency models can be found under Other Resources.

4. Permit and install: Apply for permits from the City of Berkeley prior to installation and schedule an inspection prior to operating your HPWH.



Permit Submittal Guidance

In most cases, no zoning permit is needed. Plumbing, typically with electrical, permits are required.

1. Applicant must submit electronic plans to the [Permit Service Center](#) that include:
 - a. Partial floor or site plan of the heat pump water heater (HPWH) placement, as well as seismic bracing details
 - b. Manufacturer's specification sheet with installation instructions
 - c. Existing main panel rating with a dedicated circuit with capacity for the HPWH as confirmed by a licensed design professional. Include details if an electrical panel upgrade is required
 - d. An electrical disconnect (circuit breaker or a lockable switch) for the HPWH that is within sight of the appliance
 - e. If installed in an attic or other elevated floor space:
 - i. Provide verification that the existing framing members will support the proposed dead loads of the HPWH,
 - ii. Specify accessibility for service,
 - iii. Specify drainage system; and,
 - iv. Specify vacuum relief valves when the HPWH is installed above the hot water plumbing fixtures
 - f. Title 24, Part 6 of the California Energy Code may use either of the methods below:
 - i. Documentation demonstrating that the proposed HPHW meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher, or
 - ii. Performance Certificates of Compliance reporting modeling whole-home energy usage (more likely if the HPWH installation is part of a larger renovation project)