



HEAT PUMP WATER HEATER BUYERS GUIDE



SILICON VALLEY
CLEAN ENERGY

The Future is Electric



Introducing
the “FutureFit” Home

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vs. Gas

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*Products shown are examples of available products and are not endorsements.

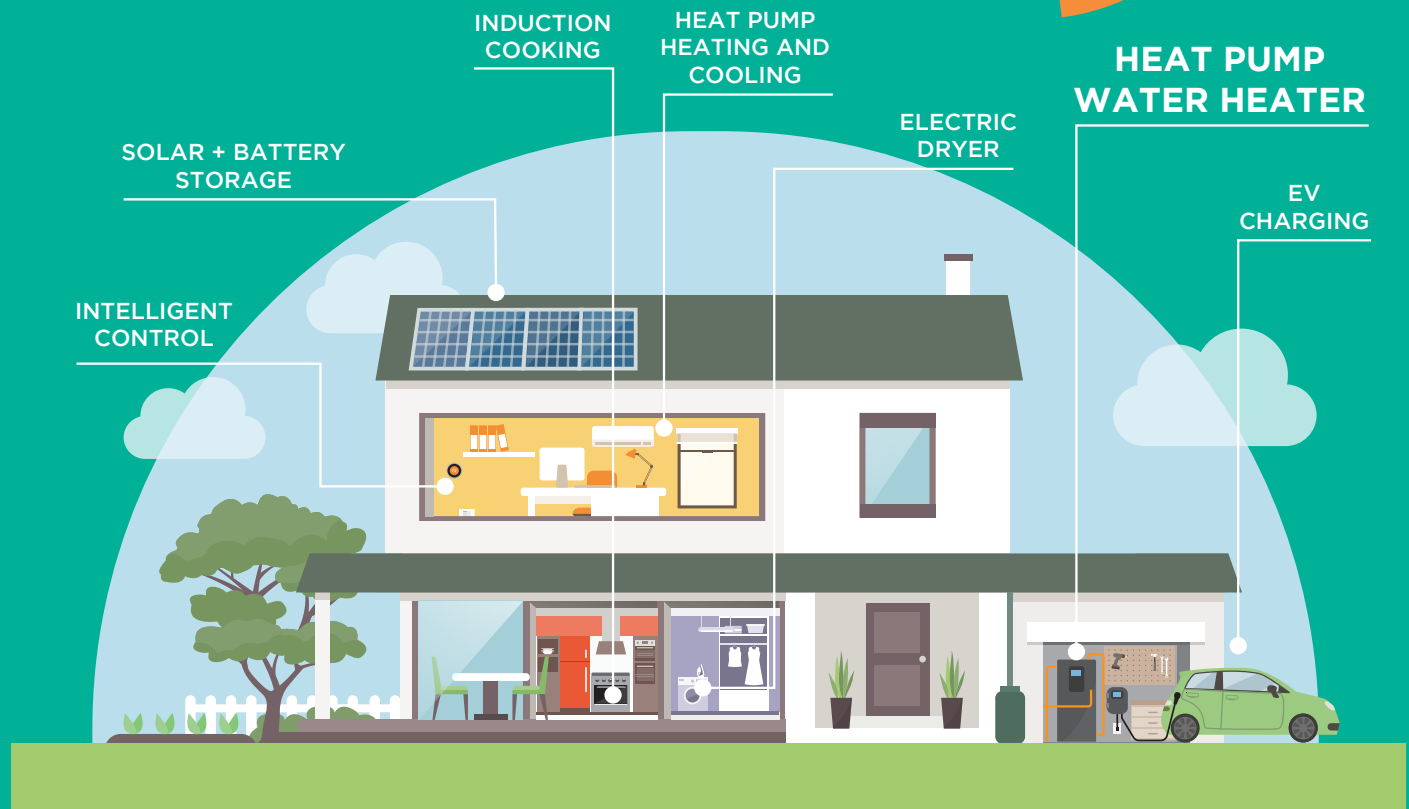
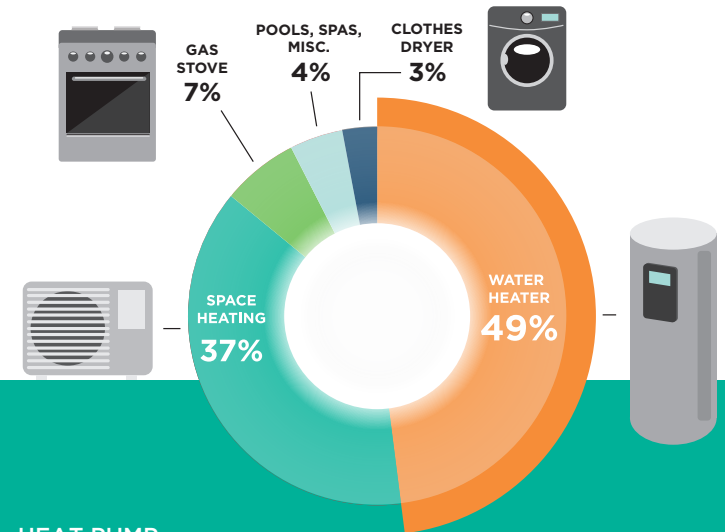
1. INTRODUCING THE “FUTUREFIT” HOME

An all-electric FutureFit home is more efficient, comfortable and safe. Appliances run exclusively on clean electricity from sources such as solar, wind and hydropower – rather than fossil fuels that harm indoor air quality and pollute the environment. At the core of a FutureFit home is an electric Heat Pump Water Heater.

Most existing homes in the San Francisco Bay Area have water heaters that run on natural gas. Gas water heaters are typically a home’s single biggest source of emissions that are damaging to air quality and the environment.

This guide offers important information on the benefits of installing an electric Heat Pump Water Heater, buying considerations, product details and installation.

HOME EMISSION SOURCES





2. BENEFITS

A Heat Pump Water Heater (HPWH) offers many benefits compared to gas water heaters:



Energy Savings

Heat Pump Water Heaters are more energy efficient because they use less energy to heat water compared to natural gas water heaters.

Heat Pump Water Heaters can also engage with money-saving options, like time-of-use electricity rates, and even money generating opportunities, like utility grid-interactive programs, neither of which are available to natural gas water heaters.



Usable Cold Air

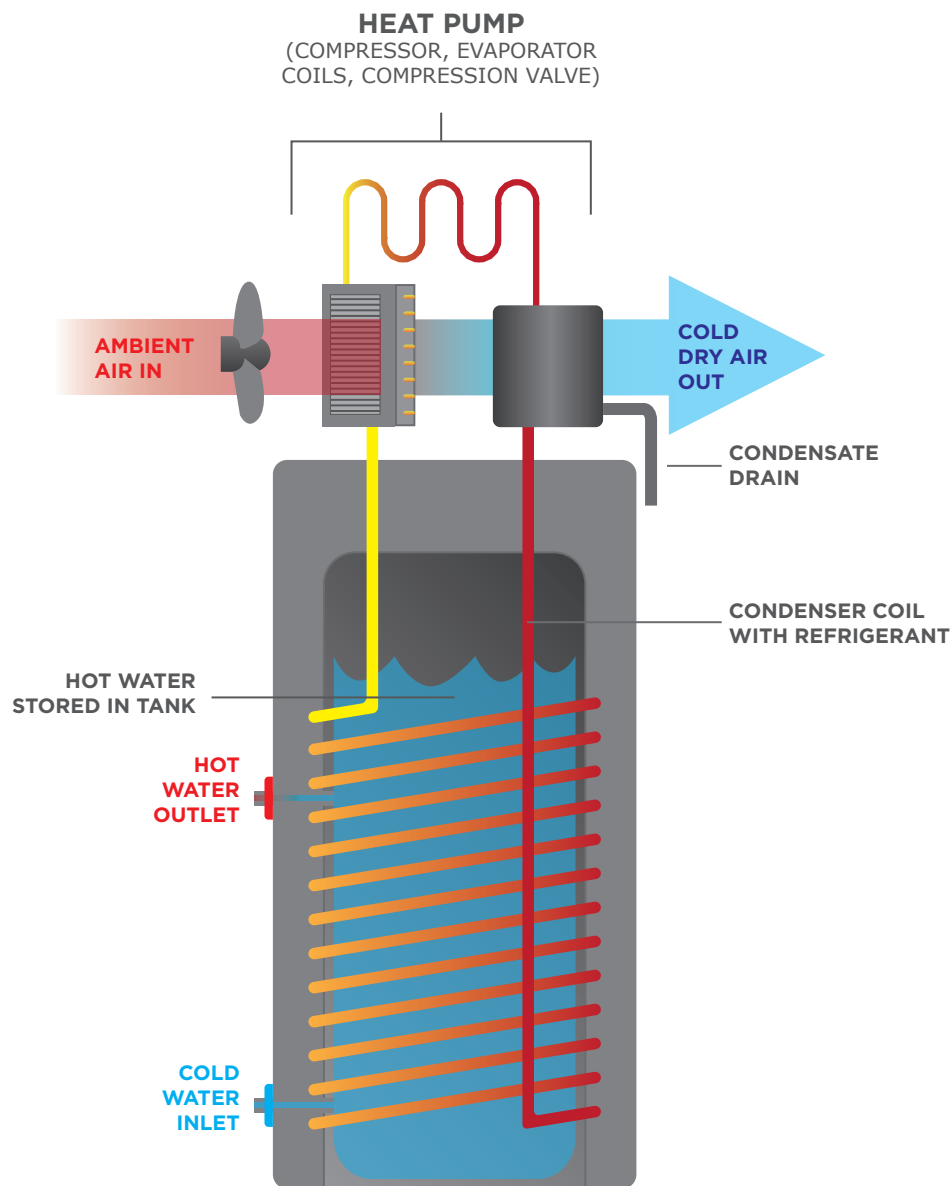
When a heat pump is operating, it expels cold air. This can often make the surrounding space more comfortable.



Healthier and Safer

Replacing the combustion of natural gas with clean electricity for your water heater removes a major potential source of Carbon Monoxide (CO) and Nitrogen Dioxide (NO₂) from your home, according to the California Air Resources Board.

With SVCE providing carbon-free electricity for your home, switching to an electric Heat Pump Water Heater cuts nearly 50% of your house's overall greenhouse gas emissions that otherwise would have occurred with your natural gas water heater.



3. HOW IT WORKS

A Heat Pump Water Heater works similarly to a refrigerator, except in reverse. While a refrigerator removes heat from an enclosed box and expels that heat to the surrounding air, a HPWH takes the heat from surrounding air and transfers it to water in an enclosed tank.

Air is pulled inside the tank, then heat from the air is absorbed by an evaporative coil which transfers heat to the water. The cooled, dehumidified air is then pushed back out into the surrounding space. Cool water flows into the tank, is heated by the stored heat in the coil and is then sent to you through your home's pipes.

HPWHs typically allow for multiple modes of operation depending on the situation:

- **Efficiency/Economy** – Maximizes energy efficiency and savings by only using the heat pump to heat water.
- **Electric/Heater** – This high-demand setting is the least energy-efficient, using only the electric resistance element to heat water.
- **Auto/Hybrid** – The default setting is ideal for daily use, providing energy-efficient water heating using the heat pump, with sustained heat as needed from the electric element.
- **Vacation & Timer** (not available on all models) – Save energy when away from home by placing the unit in "sleep" mode until you return.

4. THINGS TO CONSIDER WHEN BUYING

SVCE recommends the higher efficiency and quieter models. Other considerations:

Efficiency

Look for a Uniform Energy Factor (UEF) of at least 3.0. This number represents how efficiently the unit operates. The higher the number, the less it will cost to heat water. A UEF of 3.5 or greater is quite common.

View the Northwest Energy Efficiency Alliance's qualified products list to find a product with a UEF of 3.0 or greater: [neea.org/img/documents/qualified-products-list.pdf](https://www.neea.org/img/documents/qualified-products-list.pdf).

A unit rated as Tier 3 indicates a higher level of efficiency and quieter operation than Tiers 1 or 2.

Tank Size

Select a tank of similar size (or larger) than your existing tank. Larger units are typically more efficient, store more hot water, and provide better money saving opportunities from utility demand response programs and time-of-use rates than their smaller counterparts.

First Hour Rating

First Hour Rating is the calculated amount of water your heater can deliver in an hour of usage. As hot water is used, cold water is added to the tank and heated. Therefore, this number can be larger than the tank capacity and is the best measure for how much consistent hot water your unit can supply in a given hour.

Refrigerant

Some units use naturally occurring CO2 refrigerants providing the lowest global warming potential. Others use synthetic refrigerants, such as R410A or R134A.

Overall Costs

For new construction, all-electric homes cost less to construct and a HPWH is a key component.

For existing homes, HPWHs can have a higher upfront cost as the home was likely constructed for natural gas lines, not 220V electrical lines to the water heater location.

In either case, a HPWH can end up being more cost-effective over the long term, especially when operating using lower cost, off-peak rates.

Electrical Panel

Check your main service panel to see if it can handle the added electric load of a HPWH, typically 30 Amps though some units only require 15 Amps. If you're thinking of cutting your carbon footprint even further with an electric vehicle, or switching other gas appliances to electric, you may want to prepare for the future and upgrade your panel now.

Noise

All HPWHs contain a compressor, similar to a refrigerator, and will emit noise when operating. The lower the decibel level, the quieter the operation. Look for units with a decibel level (dBA) of 55 or lower and/or locate the unit in the garage. 50 decibels is associated with sounds like quiet conversation, light traffic or a refrigerator.

Common Manufacturers

- A.O. Smith
- American
- Bradford White
- Kenmore
- Lochinvar
- Reliance
- Rheem
- Richmond
- Ruud
- Sanden
- State
- U.S. Craftmaster

The above manufacturers are featured on the Northwest Energy Efficiency Alliance qualified product list as of 4/15/2019.

Where to Buy



Local hardware or home improvement centers



Through your contractor



Online retailers

5. PRODUCTS & WHERE TO BUY



A photograph of two men shaking hands, overlaid with a teal color filter. The man on the left is wearing a light-colored shirt and a dark tie, while the man on the right is wearing a plaid shirt. The handshake is the central focus of the image.

6.

CONTRACTOR & INSTALLATION

Engaging with a contractor experienced with Heat Pump Water Heaters is recommended. A proper installation includes connecting the heat pump to your main electric service panel as well as capping the existing gas line that was serving your previous gas water heater.

Contractors are licensed and regulated through the Contractors State Licensing Board. Review the status of the contractor's license on the State Licensing Board's website. When selecting a contractor, we recommend receiving quotes from more than one contractor and speaking with one or more previous customers about their experiences with this contractor. When searching for a contractor you may utilize online resources, while some major home improvement stores have contractor referrals for products they sell.

HOW DO I KNOW IF A HEAT PUMP WATER HEATER IS A GOOD MATCH FOR ME?

- Your existing gas water heater is in the garage, or in a laundry room or similar indoor space.
- You have a spare 220V outlet near your existing gas water heater, such as an outlet for an electric clothes dryer.
- You have available circuit breaker capacity in your main electrical panel. For electrical panels below 200 Amps, this may be more difficult.
- You are comfortable with technologies that reduce your energy bill – solar, smart electric vehicle charging, time-of-use electricity rates, connected thermostats (like Ecobee, Honeywell or Nest).

If your home does not meet all these criteria, don't worry, heat pumps can still work for you.

7. BEST PRACTICES



- If you have solar, a HPWH can save you money by using your solar generation to heat water during peak solar times, then store it for later use.
- Use vacation mode when you plan to be away for a while. The HPWH will turn off while you are gone and reheat before you return so there is hot water when you arrive, without wasting energy.
- If on a time-of-use (TOU) rate, time your water heater to heat up during off-peak times so the HPWH uses the lowest-cost electricity available to heat your water.
- Include a thermostatic mixing valve to increase usable hot water. These valves allow storing water at a higher than normal temperature in the tank, then the valve automatically mixes your stored hotter water with cold water to deliver the desired temperature at the sink or shower.
- Look for units that include internet connectivity. This allows you greater control over the unit's operation and may unlock even more savings if your utility runs a specific program for grid-interactive "smart water heaters."

For more information and to learn more about Heat Pump Water Heaters please visit:

www.svcleanenergy.org/water-heating



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