



FACT SHEET

Residential Heat Pump Water Heating



Residential heat pump water heaters (HPWHs) are two to three times more efficient than conventional gas and electric resistance water heating options.¹ While HPWHs have been available as energy-efficient alternatives that cut greenhouse gas (GHG) emissions – and improve local air quality – for the past 15 years, they represent less than 1% of the water heaters sold in California.² According to contractors and installers, however, small increases are starting to happen.

CalMTA is pursuing a potential market transformation initiative (MTI) that seeks to align the various statewide efforts currently underway to accelerate market adoption of HPWHs in the single- and small multifamily property sectors.

The opportunity

Residential HPWHs offer a substantial grid and energy efficiency benefit to California's housing stock and are a foundational technology for achieving the State's decarbonization goals. Several programs are now working to drive adoption of this efficient technology, including at California utilities, the California Energy Commission (CEC), Community Choice Aggregation (CCA), and Regional Energy Networks (RENs) that total more than 30 offerings. These programs, along with

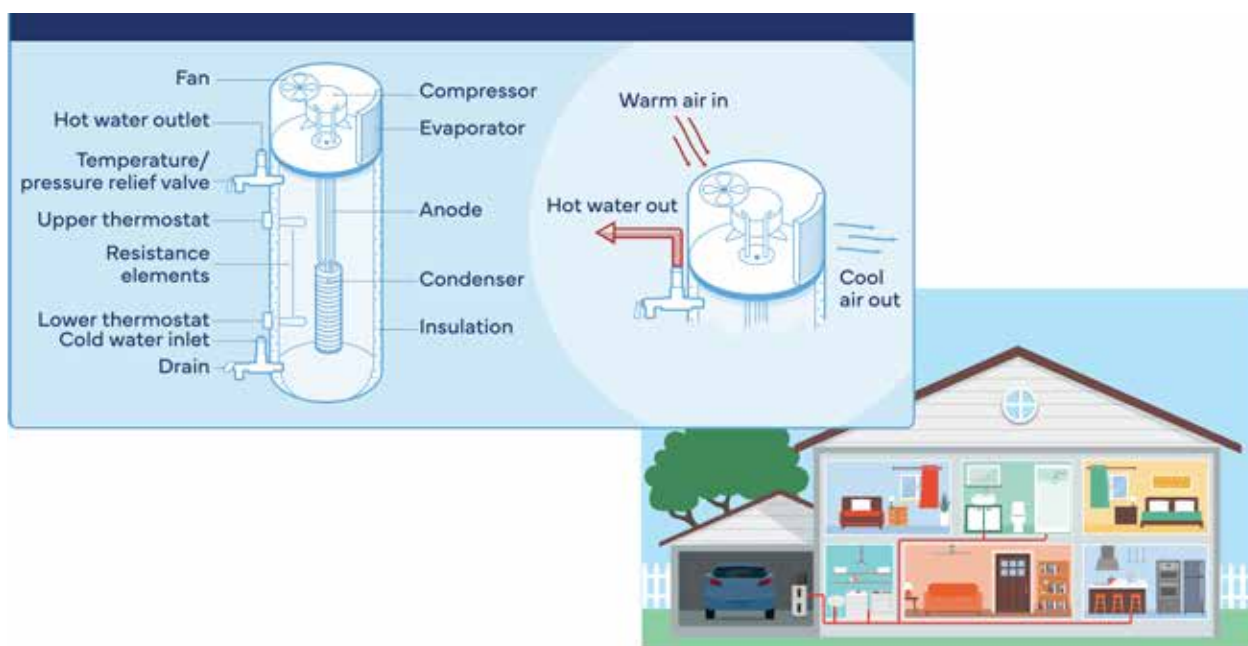
¹ Energy Saver: Heat Pump Water Heaters. Department of Energy. Undated. <https://www.energy.gov/energysaver/heat-pump-water-heaters>.

² Daigle, Brian and David, Andrew. Residential Heat Pump (Hybrid) Water Heater Market, Production, and Trade. Executive Briefings on Trade. United States International Trade Commission. February 2022. https://www.usitc.gov/publications/332/executive_briefings/ebot_residential_heat_pump_hybrid_water_heaters.pdf.

initiatives from the California Air Resources Board (CARB) and state and federal standards, provide the right moment for CalMTA to harness market momentum and ensure that future policies will be successfully complied with.

The technology

Most residential HPWHs utilize air-source technology to transfer heat from the surrounding air to water using a vapor compression cycle. Since these HPWHs are all-electric and transfer instead of creating heat, they are more efficient and reduce emissions compared to gas water heating. This MTI is focused on unitary, grid-connected 120V and 240V electric, air-source products units less than or equal to 120 gallons with standardized connectivity and controls to support electric load shifting. This includes hybrid models that have a heat pump and electric resistance heating elements, which improve recovery times during high demand but draw significantly more power than the heat pump, and thus require accurate sizing.



MT strategy

Despite past investments to advance HPWH, market adoption has not seen growth. CalMTA has a unique opportunity to identify gaps preventing HPWH adoption and to develop a cohesive, collaborative MTI that builds on existing efforts and delivers strategic interventions to break down remaining barriers.

Identified market barriers

- High installation and equipment costs, due to lack of experience with products
- HPWHs may require electric panel upgrades, making emergency replacements difficult to install, which are roughly 50% of water heater replacements³
- Low consumer awareness and installers unconvinced of the business case for HPWHs
- Complex and crowded California landscape with differing programs to navigate

Market interventions and leverage opportunities

- **Current standards:** Product specifications such as those maintained by the Northwest Energy Efficiency Alliance (NEEA) and ENERGY STAR, which includes the Manufacturer's Action Council, can be leveraged to create awareness and innovation of the technology. Recently passed federal standard requiring HPWHs for the majority of electric applications can help to ready the supply chain and market for broader adoption in addition to CARB's zero-emission efforts and proposed sales prohibition on most residential combustion appliances.
- **Current incentives:** TECH Clean California and The Switch is On campaign are key points of leverage for contractor- and consumer-facing education and promotion of statewide incentives while the Energy Savings Assistance Program (ESA) and Low-Income Weatherization Program (LIWP) provide services to low-income households. The California Energy Commission's deployment of the HEEHRA, HOMES, and Equitable Building Decarbonization program include support for HPWHs and – pending possible changes at the federal level – will be considered as part of the initiative's overarching strategy. CalMTA will also look to braid together the work of California program administrators, CCAs, community-based organizations, and public utilities with a larger statewide effort.
- **Manufacturer and retail engagement:** New Building Institute's Advanced Water Heating Initiative (AWHI) is working to educate the supply chain while the ENERGY STAR Retail Products Platform (ESRPP) and Southern California Edison's online marketplace can help create awareness among retailers and connect consumers with qualified products.
- **Research:** CalNEXT expertise will be leveraged to compare and inform research projects exploring for duplication of efforts and looking for areas where our work can build off each other.

³Energy Star Water Heater Market Profile, Department 2009. https://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/water_heaters/Water_Heater_Market_Profile_Sept2009.pdf.



Applying an equity lens

As part of CalMTA's long-term strategy for HPWHs, leadership from environmental and social justice (ESJ) communities will be integral to addressing the specific barriers and needs of these communities. As a developed MTI, CalMTA and stakeholders would review and align on ESJ community approaches and identify roles and responsibilities collaboratively among the various efforts. Potential work includes identifying resources and collaboration opportunities, identifying available incentives and strategies to establish a low to no cost offering for HPWHs in ESJ communities while accounting for possible bill impacts, and leveraging opportunities to build a well-trained workforce that prioritizes creating greater diversity among trade allies, companies, and job placement.



About CalMTA

CalMTA is a program of the California Public Utilities Commission and is administered by Resource Innovations. We are creating a market transformation (MT) portfolio for California that will deliver cost-effective energy efficiency and decarbonization. Market transformation is the strategic process of intervening in a market to create lasting change by removing market barriers or exploiting opportunities, accelerating the adoption of identified technologies or practices.



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