
# CalNEXT Multifamily Split-System Heat Pump Water Heater Market Study

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# Why Focus on Split-System HPWHs in Multifamily now?

## Emerging Decarbonization Solution

Split-system HPWHs offer a critical alternative to installation of unitary models in challenging locations.

Image Source:
New Zealand Energy Efficiency & Conservation Authority

### Regulation Changes

Upcoming zero-NOx regulations (2027 Bay Area, 2030 statewide) will phase out gas water heaters.

### Market Needs

1.5 million CA multifamily units have small (under 50-gallon) in-unit water heaters, often in constrained spaces.

# Multifamily Split-System Heat Pump Water Heater Market Study

## • The Objectives

- Evaluate split-system HPWHs for **energy, cost, and hot water performance** in multifamily homes.
- Identify **adoption barriers** through secondary research and stakeholder engagement and provide actionable recommendations.

## • The Method

- **Analyzed market conditions and product readiness** via literature review and stakeholder interviews.
- **Modeled energy and cost impacts** using NREL ResStock and simulations across California climates.

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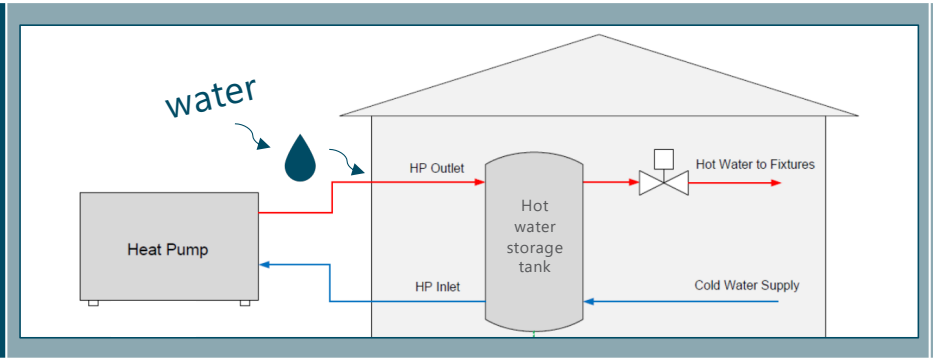
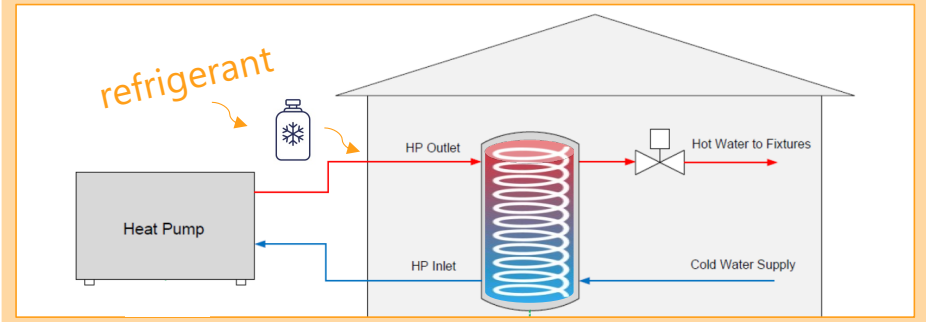
# Market Landscape of Split-Systems

**Monobloc (Split-System) HPWH**




Single outdoor unit with all heat pump refrigeration cycle components. Heated water is piped to the interior storage tank.

**Split (Split-System) HPWH**




Primary heat pump components in the outdoor unit and refrigerant lines transfer heat to the interior storage tank with a heat exchanger.

*Original Image Source: NREL 2022 Report: Split HPWHs as an Efficient Solution for Multifamily Buildings with In-Unit Water Heaters*

# Electric, Gas, and HPWHs: A Side-by-Side Comparison

| Water Heater Type | Tank Height (in) | Tank Diameter (in) | Refrigerant | UEF | First Hour Rating (gal/hr) | Price |
|---|---|---|---|---|---|---|
| Electric Lowboy | 34 | 26 | n/a | 0.89 | 50 | $539 |
| Natural Gas Short | 47 | 20 | n/a | 0.57 | 68 | $769 |
| Unitary HPWH | 66 | 20 | 134a | 3.6 | 55 | $2,098 |
| Split HPWH | 73 | 19 | 513A | 4.29 | 57 | $3,350 |
| Split 120V HPWH | 73 | 19 | 513A | 3.0 | 50 | $3,350 |
| Monobloc HPWH | 39 | 25 | CO2 | 3.66 | 69 | $5,856 |

**Emerging Trends:**

- Space constraints: manufacturers responding with solutions for MF, MMH, and ADUs.
- Transition to low-GWP refrigerants
- High efficiency and capacity recovery of split-systems
- Higher first costs for split-system HPWHs
- Plug-in 120V options

# Key Findings

## Emerging Products

Contractors have limited familiarity with the few split-system HPWHs currently eligible for incentives and commercially available.

## Overcoming Unitary HPWH Barriers

Split-system HPWHs enable outdoor heat pump placement, solving ventilation, noise, and space limitations of unitary HPWHs.

## Eliminating Interactive Effects

Interior installs of unitary HPWHs interact with HVAC. Split-systems eliminate interactive effects.

# RTF Analysis of Unitary and Split-System HPWHs

## Split-system HPWHs show higher energy savings than unitary models in conditioned spaces

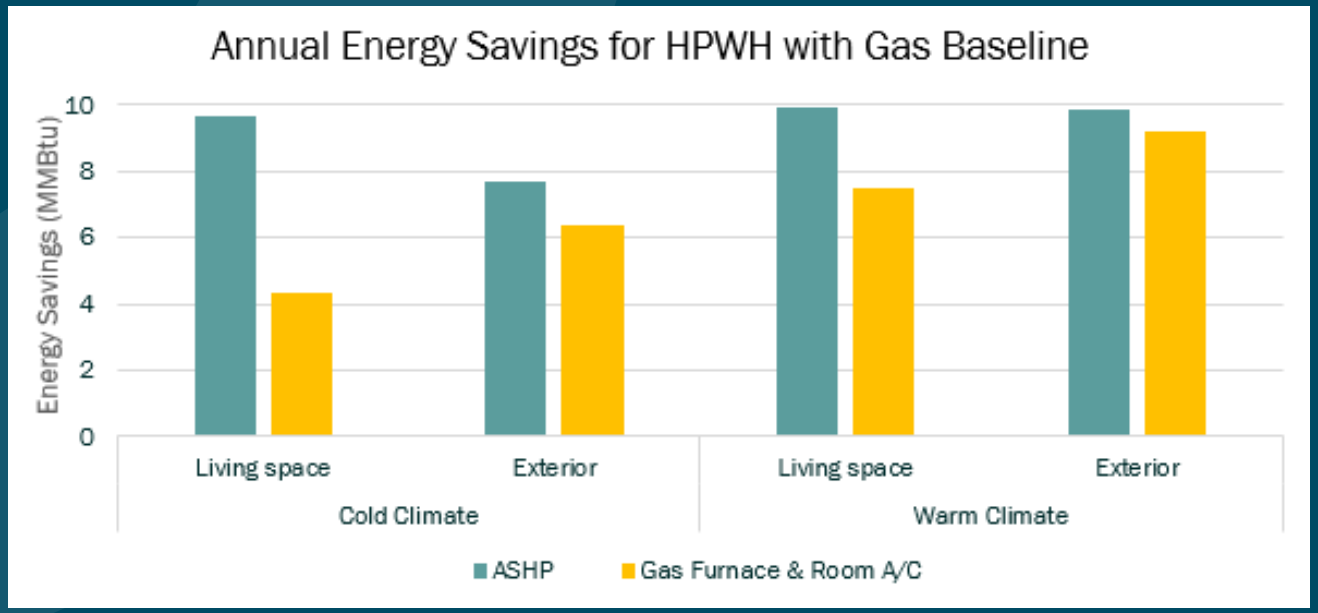
| HPWH configuration* | ΔkWh/yr*** | Δtherms/yr | ΔMMBTU/yr |
|---|---|---|---|
| Tier 3 Unitary HPWH (in living space) | 1631 | -32 | 2.36 |
| Tier 3 Unitary HPWH (garage installation) | 1494 | 0 | 5.10 |
| Tier 3** Monobloc system w/ out resistance heat | 1720 | 0 | 5.87 |

*Savings represent all tank sizes

**From NEAA Qualified Products Tier 3- rated models

***Includes interactive effects of heating and cooling loads with electric water heater, central AC, and gas furnace; and climate assumptions for Seattle, WA

# Optimizing HPWHs for Location and HVAC Types




Consistent modeled energy savings when replacing a gas water heater (many of the CA MF water heaters)

# Pathway Forward

- ✓ **Scaling the market** through early-market opportunities (e.g., Hot Water Innovation Prize)
- ✓ **Lab and field evaluations** to gather performance data and best practices
- ✓ **Cost compression** and simplified installations with plumber/HVAC/DIY friendly solutions
- ✓ **Update CA eTRM** to include split-system systems and location / HVAC interactive impacts
- ✓ **Address incentive gaps** and limitations in California efficiency programs

## Contact Info

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