



FACT SHEET

# Room Heat Pumps



*Heating and cooling represent the largest energy consumption end-uses for homes in California, with more than 3 million individual air conditioning units in use across the state and 50% of households using gas appliances for heating.<sup>1,2</sup> In coordination with California's decarbonization goals and targeted reduction in natural gas usage, room heat pumps offer a highly efficient and more affordable alternative than mini-split or centralized systems. Room heat pumps are self-contained products that provide efficient heating and cooling for small spaces, such as single rooms, modest apartments, or small homes. They offer both heating and cooling, use efficient heat pump technology, and can be installed without a certified technician.*

CalMTA is pursuing a market transformation initiative (MTI) that seeks to bring to market these efficient and affordable alternatives to AC window units in the summer and small-space electric resistance or gas heating in the winter. We seek to achieve a market where an improved version of this technology dominates product sales over separate, portable electric resistance heaters, window AC-only units, and possibility air purifiers.

## **The opportunity**

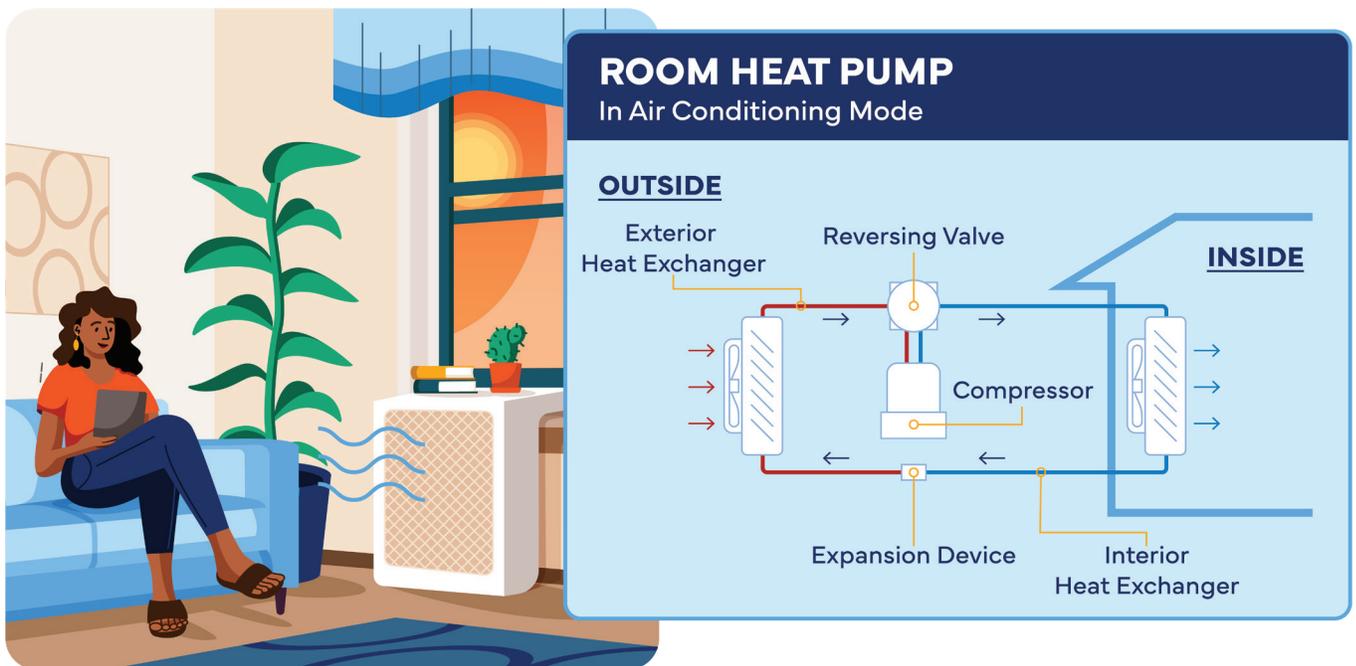
California's decarbonization goals seek to drastically decrease the state's natural gas emissions, which will require innovation in heating products. Yet as the climate continues to warm, more and more Californians are looking for affordable cooling options. Room heat pumps offer convenient and efficient, low global warming potential (GWP) options for both heating and cooling.

<sup>1</sup>Highlights for air conditioning in U.S. homes by state, 2020. Energy Information Agency. Released March 2023. <https://www.eia.gov/consumption/residential/data/2020/state/pdf/State%20Air%20Conditioning.pdf>.

<sup>2</sup>California State Energy Profile. US Energy Information Administration. May 16, 2024. <https://www.eia.gov/state/print.php?sid=CA>

One of the primary strengths of room heat pumps is their low installation cost. Unlike central HVAC systems or ductless mini-splits, which often require professional installation and can be significantly more expensive, window heat pumps can be installed by the consumer. This capability greatly reduces the overall cost, making them an attractive option for budget-conscious consumers. While the upfront cost of ductless mini-splits can be comparable, the necessity of professional installation often makes these systems two to three times more expensive than window heat pumps.

Window heat pumps are highly efficient when compared to other electric heating options such as space heaters, baseboards, and Cadet heaters. They utilize a refrigeration cycle to transfer heat, which is inherently more efficient than generating heat through resistance. This efficiency translates into lower operating costs and reduced energy consumption, making window heat pumps an environmentally friendly option. Finally, room heat pumps could further develop to include air filtration, which will enhance indoor air quality (IAQ).



## The technology

Room heat pumps are similar in shape and size to typical AC window units or portable products. They fall into roughly four groups: portable products that are ducted to a window, units that saddle over the windowsill of double-hung windows, and conventional window units held in place by brackets (in either standard or U-shaped configurations). This potential MTI targets inverter technology that allows for variable speed operations providing more efficient cooling in the summer and heating in the winter.

These products can be self-installed and plugged into a 120V outlet. They offer a cooling capacity of up to 18,000 BTUs and a similar heating capacity in most California climate zones, allowing them to heat or cool spaces up to 1,000ft<sup>1</sup>. They offer features CalMTA seeks to make more prevalent, such as the use of ultra-low GWP refrigerants and dual ducting.

By eliminating the need for expert installation or electrical panel upgrades, the technology can significantly improve comfort, remove reliance on inefficient AC units, and create space-heating flexibility for single- and multifamily homes. Additionally, as this product improves, room heat pumps could offer significant additional benefits. In addition to increased IAQ through filtration, they could also be grid-enabled to offer peak grid energy reductions or drive increased use of ultra-low GWP refrigerants.

## MT strategy

Room heat pumps face barriers related to consumer awareness, higher upfront costs compared to separate window AC and electric resistance space heater units, and product availability. However, this technology fills a gap for renters and owners in multifamily and smaller spaces, especially for residents of environmental and social justice (ESJ) communities. CalMTA is pursuing strategic market interventions to overcome barriers on several fronts.

### Identified market barriers

- Need for product improvements on cold climate capability, condensate management, noise abatement, and the use of ultra-low GWP refrigerants.
- Lack of product differentiation from non-heat pump options, including no ENERGY STAR® designation.
- Low consumer awareness of products and benefits.
- Higher costs than other options and limited availability in retail stores.
- Lack of inclusion in utility incentive programs

### Market interventions and leverage opportunities

- Leverage research and manufacturer engagement efforts by entities such as the California Codes and Standards Advocacy team and from other regional energy efficiency organizations.
- Coordinate and build upon product research work that the CalNEXT program has already completed.
- Forge partnerships with manufacturers to pursue technical improvements suitable for the California market.
- Pursue new Department of Energy test procedures with the California Codes and Standards Advocacy team, as well as new national specifications and ENERGY STAR® certification with the Consortium for Energy Efficiency.
- Partner with multiple existing California programs to align on efficient, high-quality standards for qualifying products and to ensure room heat pumps are included as a measure in relevant programs, especially for those targeting ESJ consumers.



## Applying an equity lens

This potential MTI could provide a significant opportunity to deliver benefits to ESJ communities, including enhanced household occupant comfort by combining cooling and heating options in a single product. Because they are more affordable than central or mini-split heat pumps and are moveable, they are primed for adoption by renters, who represent nearly half of all households in California.<sup>3</sup> They can also be easily purchased during climate events when supplemental heating or cooling is needed.

## Learn more

Read the [Room Heat Pumps MTI Plan](#)



### 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.



CalMTA is a program of the [California Public Utilities Commission](#) (CPUC) and is administered by [Resource Innovations](#)

Learn more: [calmta.org](https://calmta.org)  Follow us: [showcase/calmta](#)

<sup>3</sup>McGhee, Eric et al. California's Renters. Public Policy Institute of California. February 27, 2024.