



FACT SHEET

# Efficient Rooftop Units



*Nationwide, rooftop units (RTUs) make up approximately 37% of commercial buildings' heating, ventilation, and air conditioning (HVAC) systems, and 50% of all commercial buildings' floorspace.<sup>1</sup> According to the Northwest Energy Efficiency Alliance, commercialized efficient rooftop units (ERTUs) can achieve 10-40% energy savings compared to standard RTUs.<sup>2</sup> Nevertheless, product availability and adoption of these units remains low.*

CalMTA is investigating a potential market transformation initiative (MTI) to increase the heating and cooling efficiency in California's commercial buildings by accelerating market adoption of ERTUs across the state. We envision a future state in which controls and design improvements are integrated into ERTUs, the technology is widely adopted by small- and medium-sized existing commercial building owners and operators, and a skilled and diverse workforce exists to service and install the equipment.

## The opportunity

In California, both the new construction and replacement markets have long been dominated by mixed-fuel RTUs that combine a cooling-only compressor system with a gas furnace. More recently, existing and proposed policies and programs are beginning to drive heat pump RTUs into the market.<sup>3</sup>

*Photo credit: Helios*

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<sup>1</sup>CaraDonna, Chris et al. 2018 COMMERCIAL BUILDINGS ENERGY CONSUMPTION SURVEY (CBECS). Energy Information Agency. <https://www.eia.gov/consumption/commercial/>

<sup>2</sup>NEEA Q4 2022 Quarterly Report. <https://neea.org/resources/neea-q4-2022-quarterly-report>

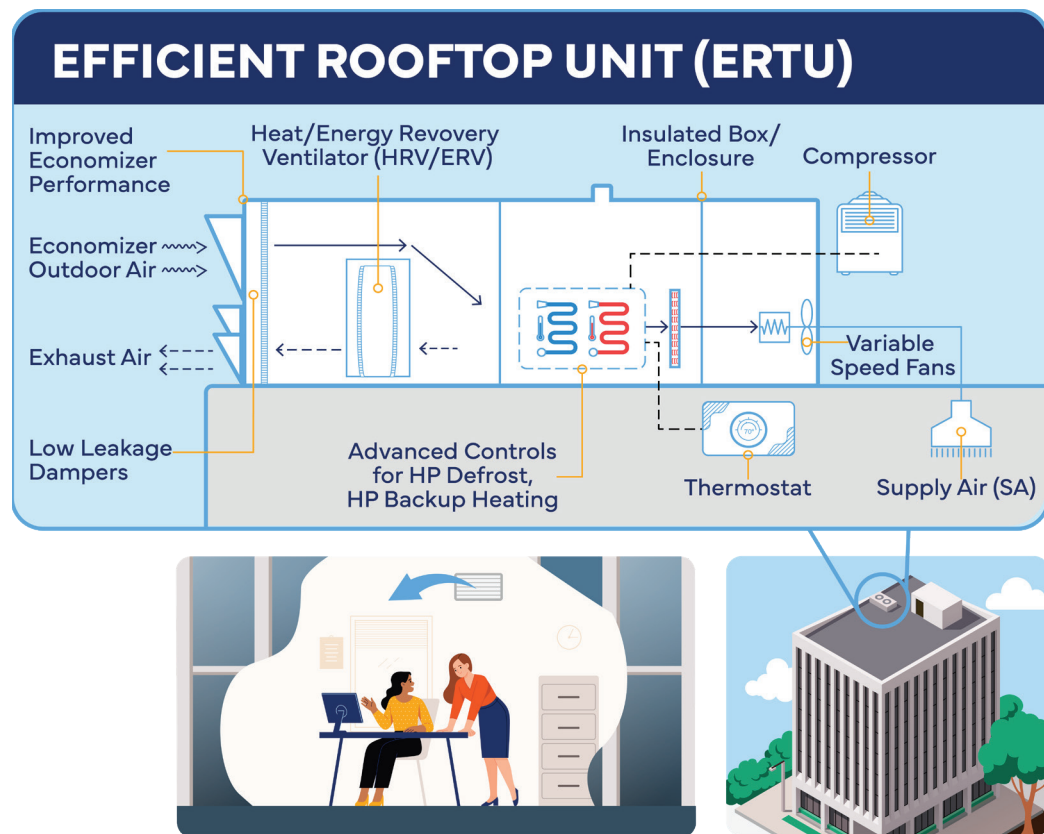
<sup>3</sup> Kurt, Dylan. Heat Pump RTUs Taking Center Stage in Expanding Market. ACHR News. <https://www.achrnews.com/articles/154396-heat-pump-rtus-taking-center-stage-in-expanding-market>

An opportunity exists to increase RTU product efficiency while creating a new network of skilled and trained technicians to install and maintain these products. CalMTA is currently assessing the viability of possible collaborations with market actors, current HVAC efficiency programs, the California Codes and Standards Advocacy team, and several market transformation efforts outside of the State to accelerate the acceptance of more efficient equipment, influence manufacturer product lifecycles, and support the continued advancement of codes and standards.

## The technology

RTUs are packaged HVAC systems that provide space conditioning to most small and mid-sized commercial buildings. Several measures are under research that could be implemented to increase the efficiency of these products:

- Insulated RTU box (to R-12)
- Low leakage dampers and improved economizer design
- Increased heat pump efficiency through sizing or variable speed capability
- Use of energy or heat recovery
- Controls improvements such as integrated sensors, web-connected thermostats, automated fault detection tools, and climate-optimized control strategies



The CalMTA team is conducting energy modeling and testing to understand the energy efficiency and decarbonization opportunities specific to California climate zones. This work will assess equipment performance, the benefits of recovery systems, component sizing, emission impacts, and lifecycle testing.

## MT Strategy

This potential MTI will target small-to-medium commercial buildings, both new and existing construction, which utilize single-zone RTUs that are largely 25 tons or less. In order to achieve lasting change in the market for rooftop units, CalMTA is developing market intervention strategies to overcome identified market barriers.

### Identified market barriers

- Lack of cost parity with other options
- Low product availability
- Minimal perceived benefit to manufacturers in advancing ERTUs
- Ineffective product differentiation
- Installation techniques that would require workforce training

### Market interventions and leverage opportunities

- Engage manufacturers to realize needed product development, availability of affordable products, and product specifications that support better equipment design and purchase decisions.
- Partner with distributors and manufacturer representatives to drive adoption and support education and acceptance among contractors.
- Initiate workforce development, marketing tactics, and incentives to motivate the supply chain to promote and sell more efficient RTUs with improved controls.
- Leverage other market transformation and research efforts, such as CalNEXT, in California and at the national level, to create cost-sharing opportunities, product specifications, and market outreach.
- Increase the use of more efficient heat pump RTUs in both new construction and alterations by providing data and analysis from MTI pilots and programs to the California Codes and Standards Advocacy team and subject matter experts.
- Capitalize on low global warming potential refrigerant requirements to accelerate replacement of RTUs with ERTUs instead of continuing to repair or recharge inefficient units.



## Applying an equity lens

In addition to these interventions, CalMTA will seek to create higher wage jobs for environmental and social justice (ESJ) communities through the workforce development efforts in this potential MTI. Key outcomes for equity and workforce development include:

- Leveraging incentives and other cost-reduction strategies to support installation of ERTU equipment for field testing (e.g., placing a target number of field test units in ESJ communities).
- Identifying and partnering with trusted allies in ESJ communities to establish a network of skilled installation technicians through workforce development, education, and training.

*Photo credit: Daikin Applied*



### About CalMTA

CalMTA works to deliver cost-effective energy efficiency and decarbonization benefits to Californians through a unique approach called market transformation. CalMTA-developed market transformation initiatives also aim to advance state goals on demand flexibility, workforce development, and equity.

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



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