FACT SHEET

Commercial Rooftop Units



Nationwide, commercial rooftop units (CRTUs) provide HVAC systems to 50% of all commercial buildings' floorspace.[1] Our earliest research showed that more efficient RTUs can achieve 10-40% energy savings compared to standard RTUs.[2] 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 more efficient CRTUs across the state. We envision a future state in which remote monitoring and controls, including automated fault detection and diagnostics (AFDD), app-based startup commissioning, and remote access capabilities are integrated into CRTUs, 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 CRTUs 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 CRTUs into the market.[3]

An opportunity exists to increase CRTU 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 collaborations with market actors, current HVAC efficiency

Photo credit: Helios

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

[2]NEEA Q4 2022 Quarterly Report. https://neea.org/resources/neea-q4-2022-quarterly-report

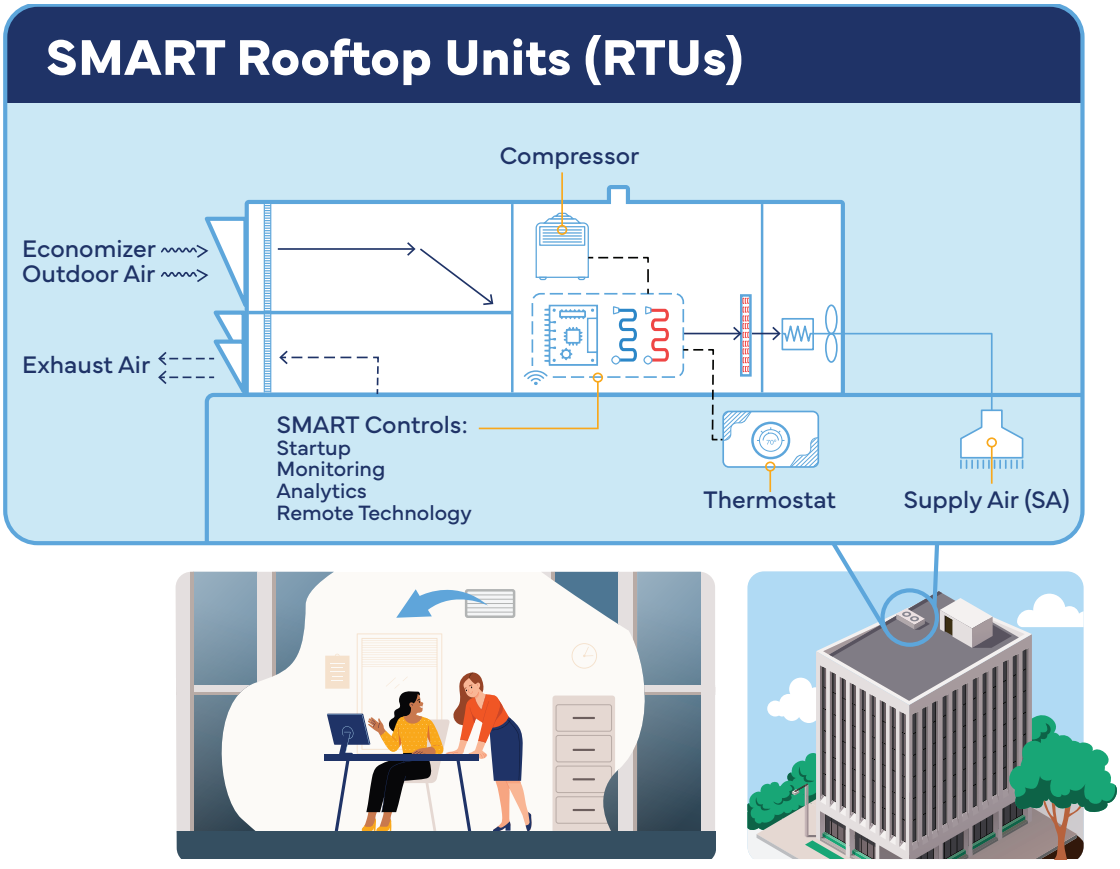
[3] Kurt, Dylan. Heat Pump RTUs Taking Center Stage in Expanding Market. ACHR News. https://www.achrnews.com/articles/154396-heat-pump-rtus-taking-center-stage-in-expanding-market

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

CRTUs are single-zone, 3- and 20-ton packaged forced-air, heating, ventilation, and air-conditioning (HVAC) systems that are installed on the roof of small- to medium-sized non-residential buildings. Several measures are under research that could be implemented to increase the efficiency of these products:

- Increase installed efficiency through improved startup, commissioning, and compliance with Title 24 Acceptance Testing requirements
- Optimize long-term operational efficiency through automated fault detection
- Connect CRTUs to the cloud to provide alerts to owners and remote troubleshooting to HVAC technicians
- Add variable speed fans to reduce consumption
- Increase cooling efficiency beyond federal minimums



The CalMTA team has conducted energy modeling to understand the energy efficiency and decarbonization opportunities specific to California climate zones. This work assessed equipment performance, demand response, and emissions impacts.

MT Strategy

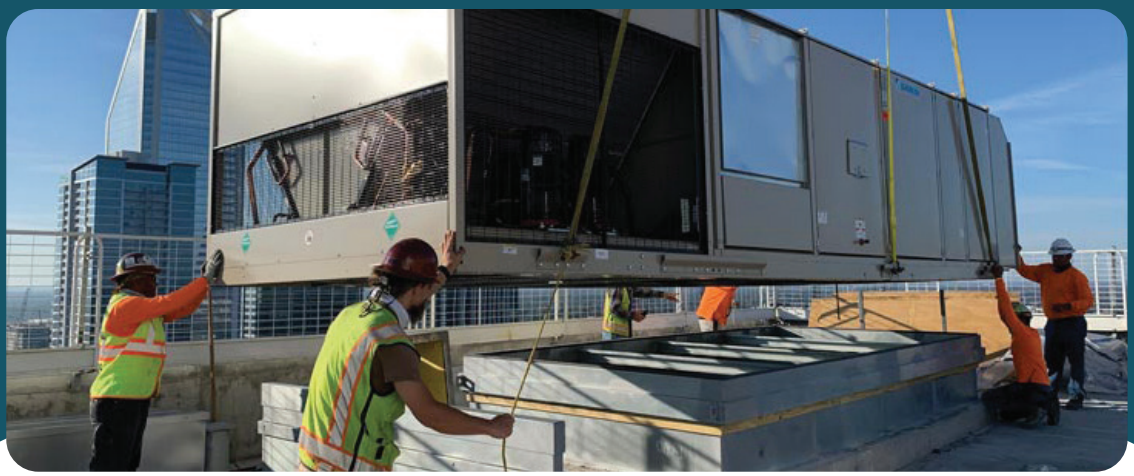
This MTI will target existing small-to-medium non-residential buildings that utilize 3- to 20-ton single zone CRTUs. In order to achieve lasting change in the market, CalMTA is developing market intervention strategies to overcome identified market barriers.

Identified market barriers

- Low product availability
- Minimal perceived benefit to manufacturers in advancing CRTUs
- Lack of cost parity with other options
- Ineffective product differentiation
- Limited supply chain and customer experience with technology benefits

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 CRTUs 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 CRTUs 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



Applying an equity lens

This MTI seeks to improve the accessibility of advanced CRTUs in environmental and social justice (ESJ) communities by promoting the development of inclusive training pathways for this technology. This will ensure the availability of a skilled workforce that can install these products without a cost premium. Demonstration projects planned for deployment in ESJ communities will validate CRTU savings and other benefits, strengthening a business case for adoption that reflects the needs of both contractors and building owners/operators facing equity-specific adoption barriers. The CRTU feature of connected commissioning and controls (CCC) aims to provide small-building owners and tenants with accessible, building-management-style functionality. This will enable small businesses to benefit from a level of visibility into RTU performance and energy savings that was previously available only in large buildings.

Learn more

Read the Commercial Rooftop Units MTI Plan.

CalMTA

About CalMTA

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

Learn more: calmta.org Follow us: calmta

resource innovations

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

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