



Commercial Rooftop Units Market Transformation Initiative

Appendix G: Risk Management Plan

November 6, 2025

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Introduction

This document details the potential risks that could negatively impact the Commercial Rooftop Units (CRTU) Market Transformation Initiative (MTI) and CalMTA's plan to monitor and mitigate those risks. Additional information is included to establish the severity of the risk, likelihood of occurring, indicators that the risk is occurring, and assumptions around the possible mitigation approach. If the risk is designated with an "*", then the risk is listed in Section 8 of the MTI Plan as part of the summary of key risks that could impact this MTI.

The evaluation plan developed by CalMTA, found in Appendix F of this MTI plan, outlines the market progress indicators (MPIs) and details CalMTA's approach to assessing both MTI performance and market advancement. While these MPIs will primarily serve as lagging indicators, CalMTA will also monitor performance and track market progress continuously throughout the implementation phase. Regular meetings with our implementation contractor, manufacturers, and other market actors will facilitate real-time updates and offer valuable insights, enabling us to make necessary adjustments to implementation as circumstances evolve.

For "Probability of Occurring" in the third column, CalMTA is defining:

- **High:** Through our research and discussion with market actors, CalMTA deems this risk having a high probability of occurring. The program needs to monitor closely and identify a solid backup plan with resources that can be deployed to mitigate the risk if it comes to fruition.
- **Medium:** This risk has a medium probability of occurring given what we know about the market. The MTI needs to track and have a plan to mitigate.
- **Low:** The probability of this risk occurring is low based on what we know about the market to date. It could have some impact on the need for resources and timing, so the MTI needs to track it.

For "Severity" in the fourth column, CalMTA is defining:

- **High:** If this risk plays out and our mitigation approach is unfeasible, then the success of the MTI may be in jeopardy.
- **Medium:** This may have an impact on the timing or overall success of the MTI, but a solid mitigation approach exists and the MTI will be able to pivot with more time or resources.
- **Low:** This level of risk will likely require a program intervention adjustment, but it will not jeopardize the timing or resources needed.



Table 1. Risk assessment

#	Risk	Probability of occurring	Severity	How will we know the risk is occurring?	Tracking responsibility	Mitigation approach
1*	CalMTA's commercial rooftop unit (CRTU) demonstration project does not reach the expected number of installations or shows lack of customer and/or contractor acceptance of connected controls and commissioning (CCC).	Medium	High	Monthly progress reports from demonstration project implementation contractor	Program Manager, Strategy Manager	Identify barriers to participation in demonstration project and understand demonstration project participant experiences; work with market actors to set expectations on how the technology works and any long-term tracking that is desired.
2*	End users do not understand CCC and do not respond to faults. Some units with CCC will have service contractors monitor faults, and some will require end-user awareness and action to correct errors.	Medium	Medium	RTU buyer surveys (MPI #8)	Market Research & Evaluation Lead	Develop and share educational materials on what CCC is and is not, how CCC makes RTUs perform better and save more energy than a Title 24 minimum product. Distribute to RTU vendors and other organizations, such as Building Owners and Managers Association.
3*	Educational materials for CRTUs are not integrated into HVAC organizations' training curriculum.	Medium	Medium	Interviews with training organizations, HVAC contractor surveys (MPIs #17-18)	Market Research & Evaluation Lead	Conduct outreach to training organizations, respond appropriately to feedback.



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#	Risk	Probability of occurring	Severity	How will we know the risk is occurring?	Tracking responsibility	Mitigation approach
4	Distributors do not stock entry level RTUs with CCC.	Low	High	Distributor partner meetings	Program Manager, Strategy Manager	Provide evidence to distributors of market demand for CCC in the 2-minute market.
5	CCC is too expensive for base models. Current research indicates that CCC is relatively inexpensive, but manufacturers still may be reluctant to include CCC as a standard feature on base models.	Low	Medium	Manufacturer outreach, HVAC contractor surveys (MPI #10)	Program Manager, Strategy Manager, Market Research & Evaluation Lead	Collaborate with manufacturers to identify lower-cost versions of CCC. Potentially only track certain data points, simplify AFDD logic, etc.
6*	Variable speed (VS) RTUs do not deliver long-term energy savings. We have modeling and studies showing the savings potential, but we don't have extensive field studies to confirm savings. Early field studies, however, do show good savings. Residential studies show that proper setup of VS heat pumps is critical to meeting savings goals, so CCC should help ensure VS RTUs meet their savings goals.	Low	High	Tracking performance of units and CCC adoption during demonstration project and long-term	Strategy Manager, Program Manager	Increase training for contractors on use of CCC (to improve the critical stage of initial commissioning) and VS RTUs to improve equipment performance or work with manufacturers to improve efficiency of equipment.



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7	Not enough manufacturers produce entry level products with CCC. At least three manufacturers currently offer CCC. If more don't start offering it as an option, overall market adoption could be low.	Low	Medium	Tracking CCC adoption with a Qualified Products List maintained by CalMTA or another energy efficiency organization, if applicable	Strategy Manager, Program Manager	Build demand on the contractor side through case studies and demonstration project.
8	Manufacturers provide CCC, but with non-intuitive user interfaces. Currently, at least two of the leading RTU manufacturers provide well-designed apps with startup, trending, and fault detection. If the majority of the market, however, provides CCC with a poor interface, market adoption could be impacted.	Low	Medium	RTU buyer surveys (MPI #8) and HVAC contractor surveys (MPI #10)	Market Research & Evaluation Lead, Strategy Manager, Program Manager	Engage with manufacturers to emphasize the benefits and contractor demand for an easy-to-use and intuitive user interface.
9*	Contractors do not fully embrace CCC. Contractors are the ones recommending equipment, and CCC is relatively new. Some contractors may be hesitant to push CCC RTUs if they don't have experience with them.	Low	High	HVAC contractor surveys (MPI #10)	Market Research & Evaluation Lead, Strategy Manager, Program Manager	When working on the demonstration project, identify tech-savvy contractors and consider providing financial incentives directly to contractors. Obtain feedback from contractors on any concerns with CCC.



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10	CA programs do not align on RTU roadmap. While CalMTA believes we have the most appropriate features for the CA climate, there are many players that need to agree.	High	Low	Meetings with CA program administrators	Program Manager	CalMTA can take a stronger lead in coordinating the HP roadmap and provide savings and cost effectiveness for each of the CRTU features.
11	Title 24 of the California Building Code doesn't adopt CCC. While CalMTA believes CCC is beneficial and cost-effective, there are many players that need to agree prior to adoption of energy efficiency standards.	Medium	Low	C&S dockets and document review	Program Manager, Strategy Manager	Diversify MT interventions. Continue to work with manufacturers and contractors to make sure CCC is adopted by the market, so reliance on code requirements is less important.
12	National partners don't align on the same features as CalMTA, which increases demand on manufacturers and lessens the potential for them to develop our features. While CalMTA believes we have the most appropriate features for the CA climate, organizations from other regions are placing a higher emphasis on heating performance and ERVs. Other organizations and manufacturers are already showing interest and developing cold-climate RTUs, which inherently meet CalMTA's VS criteria and	Low	Low	EE Program Working Group notes	Program Manager	Look for common features and ways to include as many features as realistic. For instance, cold-climate units are typically VS units. Insulation of the RTU benefits all climate zones and is low-cost (but requires changes in the manufacturing process, which takes time to implement). CCC benefits all climate zones and is low cost.



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	reduce the potential of using electric resistance heating.					
13 *	Contractors don't embrace VS CRTUs. As we're seeing in the residential sector, some contractors are fully embracing VS heat pumps, but others are not. Some consider VS too complicated, or not worth the extra cost. This would result in slower and/or limited adoption.	Medium	High	Early data from demonstration project. Longer term from HVAC contractor surveys and data from agreements with market actors (MPI #11)	Program Manager, Strategy Manager, Market Research & Evaluation Lead	Concentrate on education and training through all of the channels: manufacturers, distributors, and other avenues.



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14	VS RTUs are too expensive to manufacture for the replacement market (esp. 2-minute segment). While we see VS HPs becoming a significant portion of the residential sales, it's unclear if commercial buyers are more sensitive to first cost, especially considering they don't typically pay utility costs. This likely wouldn't eliminate all customers but may reduce the overall market share by limiting the adoption of VS RTUs to certain segments willing to pay for higher-end equipment. Distributors potentially wouldn't stock VS and/or high cooling efficiency RTUs.	Medium	Medium	Manufacturer engagement	Strategy Manager, Program Manager	Address barriers with manufacturers if/as they become known. Emphasize the non-energy benefits of VS equipment: better performance, better control of temperature, higher resiliency, demand response capabilities, and others as we learn more through the demonstration project. Incentivize distributor stocking practices or influence them through contractors and manufacturers. Develop and distribute total cost of ownership showing lifetime savings. Highlight benefits from 179D tax deductions.
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#	Risk	Probability of occurring	Severity	How will we know the risk is occurring?	Tracking responsibility	Mitigation approach
15	HP RTUs (even basic, code-minimum models) don't get adopted as quickly as expected. While our market research shows strong HP adoption, there are a variety of barriers: electrical panel upgrades, curb adapters, permits, and the cost of electricity compared to gas. This appears unlikely but could be a bigger risk in cooler climates.	Low	Medium	HVAC contractor surveys (MPI #10)	Market Research & Evaluation Lead	Develop interventions as barriers become evident in the demonstration project.



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16	New tenants lose WiFi connection and AFDD faults go unresolved. There are two paths for AFDD faults to be monitored: a signal to the thermostat (end user must notice and manage) and signal from RTU through WiFi or cellular (either the end user or contractor must notice and manage). For rented spaces, when a new tenant moves in, the WiFi signal would likely get changed, and for the portion of units that signal through WiFi, the signal might not get noticed.	Low	Low-Medium	During demonstration project, monitor the different connection methods. Later, use HVAC contractor surveys (MPI #10) and RTU buyer surveys (MPI #8)	Strategy Manager, Program Manager, Market Research & Evaluation Lead,	During the demonstration project, we will monitor the connection method to determine if this is an issue and then how to resolve it. Some potential solutions: • Providing third-party thermostats that are WiFi connected and easy to use. • Providing cellular connections on the RTU and QR-code instruction on how to connect at the thermostat. For VS units, ensure that thermostats can communicate with RTU controls.



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