



Draft MTAB Meeting Notes

September 29, 2025

Virtual Meeting

Welcome, Agenda & Conflict of Interest Declarations

Stacey Hobart opened the meeting by introducing MTAB members and reviewing CalMTA's internal and MTAB conflict of interest policies.

She then asked MTAB members for any comments regarding draft notes from the previous meeting (8/20). There were none.

Commercial Rooftop Units (CRTUs): Product Assessment

Garth Torvestad presented the purpose of, methodology for, and key findings from the CRTU Product Assessment report, including the details of the product definition and results of preliminary modeling/savings analysis.

MTAB comments and questions included:

- Is it accurate that CalMTA's modeling approaches were similar to those used for comparable work in the Northwest?
 - Garth confirmed that the approach was similar, although not all prototypes used were identical.
- Was modeling conducted for individual features or combinations of them?
 - Garth explained that CalMTA did look at combinations of different measures but focused on isolating each feature under consideration to identify which had the greatest potential benefit and which should be screened out.
- The team clarified that the commercial definition did not include multifamily buildings.
- What assumptions were made in developing the gas fuel baseline?
 - Garth noted that the team assumed a code minimum heat pump product and then factored in the impact of each individual feature.
- Modeling may underestimate the savings potential of some features when compared to real world performance.
 - Garth clarified that this modeling work was conducted primarily to identify which measures should be screened out due to low cost-effectiveness, and that as CalMTA moved into analysis of total system benefit (TSB), the team took an increasingly conservative approach.
- Variable speed capability enables load flexibility at partial load reduction while still delivering HVAC capabilities.

- What degree of confidence does CalMTA have in the quality and accuracy of sensors currently being provided by manufacturers?
 - Garth said that initial research indicated that factory-installed sensors were performing well, but that this is an important question and one that will be continually monitored.
- What is the business model around continuous connectivity?
 - Rick Olson-Huddle noted that building the business case will be a key objective of CalMTA's future work, specifically the demonstration project we intend to conduct.
- Two identified products with CalMTA's desired features, CaptiveAire and Greenheck, are not yet rated as a RTU by AHRI. Does CalMTA believe that they will be?
 - Garth replied that conversations with these manufacturers indicate that their testing has been done at a certified lab and would only need to submit required documentation to be rated. Rick added that while very few RTU products on the market now have all desired features, nearly all have the features targeted in the MTI's first phase.
- What is the cost comparison between other models and CaptiveAire/Greenheck? Is there any sense of the market share for each product?
 - Stacey clarified that cost and other related issues would be addressed by Cadmus in their presentation at the Nov. MTAB meeting.
- Thinking about the number of mixed fuel RTUs that do have variable speed compressors, it might be worth doing a separate analysis of cooling-only gas products with variable speed compressors that could be converted to a heat pump RTU with a reversing valve. How many other variable capacity products could be in the market now with the addition of a reversing valve? A key element in thinking about the future of this initiative is how hard would it be to actually get the market to move in that direction?
 - Garth noted that some manufacturers use multiple compressors that are fixed capacity with one variable speed compressor to get more or less the same effect. Setting VSP as the future goal is a good approach now, and in the interim other technologies might offer alternate paths to variable capacity.
- There is no Title 20 angle for these products as they are covered by U.S. Department of Energy (DOE) standards and federal pre-emption applies. Because Title 24 could capture other components or features beyond federal minimum efficiency standards, it has more potential from a codes/standards perspective.
- CalMTA should explore the potential role for California Air Resources Board (CARB) in this market, possibly exploring requirements for RTUs to be heat pumps as a way to reduce carbon emissions.
- Are the results of bill impact analysis in PG&E territory driven primarily by the demand charge, difference in fuel cost between electric and gas, or cooler northern climate zones? Would a higher Coefficient of Performance (COP) for the heat pump offset that?

- Garth replied that the higher baseline use of gas, which is relatively inexpensive, and increased electric load in that case, is a primary driver. CalMTA was somewhat conservative in this modeling, and results indicate that even with added electric load, there are still savings.
- Since demand charges are one of the key drivers of cost for commercial customers in California, did CalMTA make an assumption about peak demand usage for these products?
 - Garth replied that modeling was done at the whole building scale (what a bill would have been in the whole building with baseline equipment vs. with the addition of the new technology) using a variety of different commercial rates. The modeling assumes a reduction in peak demand due primarily to cooling efficiency. The addition of the variable-speed heat pump doesn't yield any additional bill savings vs. that with just a Coefficient of Performance of 20 (a 20% improvement in cooling efficiency).
- Is the all-electric base case that was modeled a code minimum/federal minimum heat pump? Do the captured savings represent savings above that minimum?
 - Garth confirmed that was the case.
- Is the discharge temperature issue based on contractors setting equipment with a focus on avoiding callbacks and potentially going higher than most people need?
 - Garth noted that this issue may be unique to the specific site. Setting the fan to the high speed is common and so customers often do not get the full benefits of variable-speed fans. While that instance is likely very common, the discharge temperature issue may be less common. The question is really whether these features can be used to diagnose and resolve problems, and findings indicate that they can.
- It seems like multiple findings could be built into default factory settings for these systems. If fan energy use is a huge component of RTU energy consumption, any strategy to reduce fan usage would contribute to most of the energy savings.
- A future market discussion should explore the percentage of buildings with triple net leases, which would get into the split incentive issue.
- It will be useful to have a future discussion on how to factory set or automate these systems so that they are not using resistance heating unless actively adjusted by a user.
- What sources informed CalMTA's assumption about reduced sensor costs?
 - Rick Olson-Huddle said this was largely based on anecdotal evidence from market actors and that CalMTA will continue to seek additional data sources.

Public Comment

The following public comments were received.

- **Michael Deru, National Renewable Energy Laboratory (NREL):** I lead the DOE commercial HVAC technology challenge, so I'm very interested in this work that you're doing. One question I have is how will this be implemented? As I am working with all the different manufacturers and utilities across the country, and CEE, EPA, and ENERGY STAR, on the federal minimum standards, I'm always very aware of introducing new requirements that would cause confusion in the market. It doesn't help anybody and it makes it difficult for manufacturers to align with all the different requirements and regulations. It also makes a lot of confusion for building owners, especially those that have portfolios across the country and trying to manage different areas of the country. So how will this be implemented, and are you trying to align with these other requirements and not make special requirements here?
 - Garth replied that CalMTA was highly sensitive to not creating new hurdles but was also aware that while we've tried to align with existing requirements, current specifications are based on temperatures that don't make sense in California.
 - Rick added that CalMTA is very cognizant of the need for market alignment during implementation and has already been trying to work together with the market to influence specifications that include our desired features.
 - Michael added that his team was starting to address controls in this market and would reach out to discuss further.
 - CalMTA note: The MTI team and Michael met on Oct. 10.

Commercial Rooftop Units: Program Theory & Logic Model Review

Rick shared a snapshot of the MTI logic model as context for a deeper discussion on program theory and logic model.

MTAB feedback included:

- Split incentives are a barrier for one segment of the market but do not appear in the logic model. Is that because strategic interventions are focused on other segments?
 - Rick explained that that the split-incentive barrier was not a component of the logic model as it impacts only one segment of the market (leased spaces) and has limited impact on desired features beyond VSP. He added that CalMTA should quantify what portion of the market this issue impacts and that we may want to add it to the logic model based on this.
- In 2016, the DOE published a study that identified that leased commercial spaces account for approximately 50% of commercial building energy use.
https://www.energystar.gov/sites/default/files/asset/document/DOE%20-%20Energy%20Efficiency%20in%20Separate%20Tenant%20Spaces_0.pdf
- The portion of the market that is the "five-minute market" (emergency replacement scenarios) almost feels like a barrier in and of itself. Because these customers have less time to make thoughtful decisions, first cost becomes everything.

- Rick said that CalMTA has discussed the difference between emergency replacements in the residential and commercial markets. The commercial market functions differently and may offer more points of influence.
- Are equity customers and considerations addressed in the logic model?
 - Rick confirmed that the first and fourth strategic intervention have specific equity components, which will be described in the MTI Plan narrative.
- Is the Disadvantaged Community (DAC) target related to where the building is located or who owns it?
 - Rick clarified that this would be determined by the location of the building.
- Has CalMTA spoken with original equipment manufacturers (OEMs) regarding upstream incentives? Some utility interviews with major manufacturers indicated that they would prefer incentives go to contractors because they have the most influence on customer decision-making.
 - Rick said that CalMTA has not had these conversations yet but has engaged manufacturers to discuss potential involvement in the demonstration projects.
- How will the demonstration project impact distributor and contractor awareness and familiarity?
 - Rick said that CalMTA will work with 3-4 manufacturers to identify and engage distributors and that they will in turn engage contractors with whom they have established relationships.
- Contractor training as well as product availability and readiness go a long way in addressing the emergency replacement barrier. Midstream incentive programs can be effective in supporting suppliers to have the target RTUs available.
- Influencing stocking practices to ensure product is available for the “five-minute” market will be critical. But this goes beyond the RTU box – it also requires in-stock curb adaptors, which many units will require. It would be interesting to explore strategies that would remove that barrier, potentially through distributor incentives.
 - Rick said that CalMTA hadn’t considered curb adaptor stocking practices as an extra barrier but will explore further.
- It seems like the increased weight of the RTU “box” with targeted features might trigger additional review of the building and inhibit adoption. Is this a barrier?
 - Rick stated that increased weight has not been an issue for the features CalMTA is targeting, particularly since gas pack RTUs are typically heavier. Energy 350 studied smaller units and didn’t see a significant change in weight.
- Work with IMT resulted in lease language for RTUs to address some of the split incentive barriers (<https://imt.org/resources/retail-rtu-green-lease-language/>).
- The MTI team should review a CEE meeting presentation on the difficulties of running a commercial midstream program (<https://cee1.my.salesforce.com/sfc/p/#1U0000011m3T/a/TR00000ADXd7/X0P6iR3yXXySBbOjzXZRnCljFBLqGWohmkymO46MNYo>).

Commercial Rooftop Units: Market Progress Indicators (MPIs) & Milestones

Cynthia Kan shared the Market Progress Indicators (MPIs) and milestones derived from the program theory and logic model, including the process by which they were developed and the metrics linked to each strategic intervention.

MTAB comments and questions included:

- If CalMTA is targeting 50% of demonstration projects in DACs, it is important to assess the potential risk associated with new technologies for entities that do not have the resources of large affluent corporations. What safety net exists for RTUs that don't work or fail?
 - Rick acknowledged the importance of being thoughtful about this but noted that currently targeted features do not pose a high risk.
- Activities centered on development of a value proposition should specify whether that value proposition is for contractors or manufacturers.
- For MPI #9, it seems like there are two audiences: contractors (the initial audience, a high-value opportunity) and owners/managers who would get engaged through long-term monitoring.
 - Cynthia clarified that this MPI focuses on individuals making buying decisions (often building owners/managers), with contractors and other audiences addressed through other metrics.
- Metrics should go beyond contractors having a business model in place to capture the number of contractors actually using that model to run their business profitably.
- Getting the first wave of installers on board to promote this technology will be challenging without financial incentives.
- The CalMTA team should have a more in-depth discussion with the Title 24 team to discuss some of the details involved in moving desired features into code.
- In thinking about reaching equity customers, CalMTA should also think about the long-term costs of maintaining this new equipment.
- Has CalMTA vetted any of these MPIs with contractors or distributors?
 - Karen Horkitz replied that CalMTA's planned embedded evaluation will help the team understand how the market is reacting and allow us to learn and refine our approach as we move forward. MPIs follow directly from the current MT theory, which will evolve over time. They are also informed by the market characterization study, which gathered input from contractors and distributors.
- Engagement with incentive providers/program administrators will be helpful once CalMTA is thinking about market deployment.
- Transparency into when evaluation activities and strategy pivots will happen if/when they're needed will help build trust in the process.
- Working with national accounts that have "design standards" for each of their stores/restaurants might be another good intervention. In many cases, the design

standards are quite old and in need of updating. There may also be a split incentive issue due to the corporate branch dictating design standards but making the local store/restaurant management pay the energy bills and perform the maintenance.

- When it comes to metrics focused on DAC installation and workforce availability in DACs, CalMTA know yet whether commercial building HVAC installers tend to be very local or cover a large area?
 - Cynthia said that CalMTA's research indicates a high representation of businesses that originate from DACs who will be serving both DACs and non-DACs. MPIs therefore focus on the installation site location and not the installer's location.
- Many MPIs focus on connected controls and commissioning (CCCs) but CalMTA's product definition includes other features. If CCCs are very successful but other elements are not, how will this be addressed or how is it reflected in the plan?
 - Rick replied that the MPIs target different features beyond CCCs. CalMTA's adaptive management approach will ensure that the MTI adjusts and responds to market feedback as needed. The full MTI Plan will include a risk assessment plan that identifies potential risks and mitigation strategies.

Application Update

Lynette shared the details of the Proposed Decision and Alternate Proposed Decision released by the Commission in the proceeding that would approve CalMTA's first MTIs for market deployment. MTAB feedback included:

- How do the competing decisions get resolved at the Commission from a process perspective?
 - Christie Torok stated that all commissioners will vote on both the Proposed Decision and Alternate Proposed Decision at the next voting meeting with CalMTA's application on the agenda.
 - Hayley Goodson of TURN added that the two Decisions are completely equal documents and parties can comment on both. In some cases, reconciliation happens before the vote and the two documents are merged, but it is more typical to see red-lined versions of both documents reflecting public comments on the voting meeting agenda.

Public Comment

No public comments were received.

Next Meeting & Next Steps

Stacey reviewed the MTAB meetings scheduled for the remainder of 2025 and early 2026, which include both virtual and in-person meetings, as well as the key agenda items. Lynette added that the intent of the Idea to Initiative (I2I) series is to inform MTAB members and the public and ensure well-vetted MTI Plans, including the forthcoming CRTU MTI.

The meeting was adjourned.

Attendees

MTAB Members

1. Mary Anderson, PG&E
2. Haley Goodson, TURN
3. Fred Gordon, Context Consulting
4. Jeff Harris, Northwest Energy Efficiency Alliance
5. Peter Miller, Natural Resources Defense Council
6. Christie Torok, California Public Utilities Commission

Participating Staff & Consultants

1. Lynette Curthoys, CalMTA/Resource Innovations
2. Rachel Good, CalMTA/Resource Innovations
3. Stacey Hobart, CalMTA/Resource Innovations
4. Karen Horkitz, KSH Advising
5. Cynthia Kan, The Cadmus Group
6. Jeff Mitchell, CalMTA/Resource Innovations
7. Rick Olson-Huddle, CalMTA/Resource Innovations
8. Garth Torvestad, 2050 Partners

Guests

1. Durinda Abraham, Community Corporation of Santa Monica
2. Peter Biermayer, CPUC
3. Rob Bohn, PG&E
4. Paul Campbell, ICF
5. Tom Chase, VEIC
6. Anders Danryd, SoCalGas
7. Michael Deru, NREL
8. Lauren Eagan, Evergreen Energy Partners
9. Rocco Guaragno, Resource Innovations
10. Curtis Harrington, UC Davis - Western Cooling & Efficiency Center
11. Randall Higa, SCE
12. Scott Higa, SCE
13. Harshad Inamdar, Rheem
14. Karthig Kathirvel, Rheem
15. Floyd Keneipp, Tierra Resource Consultants
16. James Masters, Rheem
17. Savannah McLaughlin, CPUC
18. Carly Norris, Resource Innovations
19. Emily Pelstring, CPUC

20. Kevin Ray, Rheem
21. Michael Rochmes, U.S. Green Building Council - California
22. Sebastian Sarria, CPUC
23. Allison Skidd, Rheem
24. Conner Walworth, Rheem
25. Kate Zeng, SDG&E