



Draft MTAB Meeting Notes

November 20-21, 2024

Virtual Meeting

Day 1: Nov. 20

Welcome & Introductions

Stacey Hobart opened the meeting by inviting the Market Transformation Advisory Board (MTAB) and CalMTA team members to introduce themselves, followed by a review of the day's meeting agenda.

Stacey reviewed CalMTA's conflict of interest policies and asked MTAB members to disclose any conflicts. There were no disclosures. She then asked for any comments or feedback regarding Oct. 25 MTAB draft meeting notes. There were none.

An MT Portfolio for California

Lynette Curthoys shared appreciation for the MTAB members whose guidance resulted in the development of CalMTA's first two draft Market Transformation Initiative (MTI) Plans. She then described several notable aspects of these MTIs, including support for statewide decarbonization goals, potential benefits for environmental and social justice (ESJ) communities, and substantial health and safety benefits.

She presented the high-level total system benefits (TSB) and cost-effectiveness metrics for the two MTIs and shared the market deployment timeline with key milestones for filing of an application to the California Public Utilities Commission (CPUC) and future third-party requests for proposals (RFPs). Lynette reviewed the next steps for MTAB members to comment on the MTI Plans. She noted that previous comments received from MTAB, including Advancement Plan comments and prior meeting notes will be included in the Application supporting materials. Comments received in today's meeting and via MTAB member written comments, will be included in a separate appendix (Appendix I) of the final MTI Plans.

Summary of Room Heat Pump MTI

Elaine Miller provided an overview of the Room Heat Pump MTI. MTAB comments included the following:

- Barriers related to the technology itself (e.g., any currently available products that do not perform at the optimal level or have all desired features) seem to be addressed through activities like the tech challenge, but CalMTA should also call out any activities related to installation barriers if the time and effort required to install room heat pumps proves significant.

- The need for rate structures that enable or encourage electrification seems applicable to multiple MTIs and is an issue with many drivers or requirements. Is this an MTI-specific intervention or a standalone MTI, and what role would CalMTA play in supporting rate design and optimization?
 - Elaine clarified that this intervention will be a component of multiple MTIs and is included in the Induction Cooking MTI Plan. CalMTA is still determining the support we could provide for this work and will clarify an appropriate role to play for this MTI - for instance, potentially collecting/sharing data and supporting product development with a focus on the multifamily sector.
- The MTI Plan rightly highlights bill impacts as a significant barrier, so capturing the need for improved electrification-friendly rate structures in the plan makes sense. The most natural role for CalMTA is providing data, information, and input on what forward-looking rate design could look like (e.g, what a customer needs to do to qualify for special electrification rates, whether enrollment in demand response programs is required, etc.) as well as helping advocates and policymakers think about this issue in terms of real-life technology and use-cases.
- Most IOUs have electrification rates of some sort, although the requirements may be easier for end-uses like EV charging but not others such as cooking or space cooling, although pre-cooling can help with this. However, it's also important to increase the efficiency of products to reduce electrical bills beyond any special rates, and CalMTA could support the advancement or sales of more efficient products.
 - Elaine noted that the Room Heat Pump MTI Plan talks about pushing for a more rigorous ENERGY STAR specification that should drive increased efficiency.
- CalMTA has identified a barrier around operating costs in an electrification scenario and needs to include something in the logic model that addresses that, so this intervention should remain regardless of CalMTA's role in driving new rate structures. In the Northwest, NEEA doesn't lobby for special rates but provides supportive data and real-world examples of policy impacts, a role CalMTA could play in California.
- Recognizing that rate structure is likely not the only intervention that will cross multiple MTIs, CalMTA should look at its organizational structure to determine how best to address these cross-cutting activities.
 - Jeff Mitchell replied that CalMTA has decided to represent cross-cutting interventions in each MTI Plan they apply to, but that CalMTA's influence in these areas will grow as the organization grows.
- Regarding cost parity between room heat pumps and less efficient products, as well as the higher operating cost associated with fuel switching, it's worth noting that the success of ductless heat pump initiative in the Northwest demonstrates that many customers will adopt a more expensive technology in exchange for better performance and valued benefits like increased comfort.

Room Heat Pumps: Total System Benefits & Cost-Effectiveness

Karen Horkitz introduced a discussion on the market forecasts and cost-effectiveness for the Room Heat Pump MTI. MTAB questions and feedback included:

- Are IOU-verified savings still subtracted when running the societal cost test (SCT)?
 - Karen confirmed that CalMTA did this consistently.
- A footnote in Appendix B of the MTI Plan indicated that impacts will be measured only once implemented but costs are measured earlier. Is that accurate?
 - Karen noted that this was correct and that it was important to capture the cost of the MTI spent leading up to its full market deployment.

Gouri Mishra of Cadmus presented estimated adoption (both baseline/naturally occurring adoption, or BMA, and adoption in the presence of the MTI, or TMA) in terms of number of households and number of units, as well as the inputs, assumptions, and methodology used to develop them. Questions and comments included:

- Looking at market assumptions about household heating and cooling types, how did CalMTA define rural vs. urban given that much of California is suburban?
 - Gouri noted that the definition taken directly from U.S. Census as used in the U.S. Energy Information Administration Residential Energy Consumption Survey (EIA-RECS). Suburban households are included in the urban segment.
- Why aren't climate zones a factor for market assumptions, since hotter climate zones may be more likely to adopt a room heat pump for its cooling capabilities?
 - Gouri clarified that climate zones were one of the variables initially considered for inclusion, but that it was ultimately discovered to have a relatively minor impact on likelihood of adoption. The final four variables were derived from 80 potential factors following analysis of how significant preferences were in those segments.
- Even if climate zones had a minimal impact on adoption, wouldn't they have significant impact on benefits?
 - Matt Wisnefske replied that this was included in the unit energy savings (UES) calculations.

Matt Wisnefske of Cadmus then introduced a presentation of cost-effectiveness and results for the Room Heat Pump MTI, including TSB and various cost-effectiveness tests. He presented technology definition inputs and program regulatory inputs. Questions and comments included:

- How did CalMTA deal with the baseline assuming that two pieces of equipment are retired at the same time, which people rarely do?
 - Matt acknowledged that by necessity, CalMTA made generic assumptions about how people behave, and this was one of them.
- Are discount rates real or nominal, as they seem high in real terms?
 - Matt confirmed that they are real.

- Is it assumed that at the end of the estimated useful life (EUL) that equipment is replaced at cost?
 - Matt explained that in cases where a particular piece of equipment works for nine years, the market adoption forecast assumes that the replacement unit would remain at the improved level of efficiency moving forward rather than returning to the more inefficient level of the previous unit. A second cost is not assigned in this scenario. If the unit is considered an MTI-moved unit then it is included in the calculation; if it is not considered an MTI-moved unit, it isn't represented. So, as the baseline and adoption curves move, the difference in the cost is included over time.
- The MTI is not responsible for units in the baseline adoption curve, but by reducing the cost of the technology through market transformation, everyone on the baseline would pay less so there are additional savings.
 - Matt agreed that while these are not included, it is an example of the entire state benefiting from the MTI indirectly.
- The ramp-up of TRC and parallel ramp-down of cost is typical and indicative of why California is pursuing MT: it is a long-term investment with the potential to deliver significant savings.
- From a cost-effectiveness standpoint, if you put a room heat pump in a home that previously only had heating, energy use will go up. How is that taken into account?
 - Matt replied that CalMTA modeled multiple scenarios, including this one in which there is a net-negative over time. It is included in the analysis but represents a fairly small percentage of California homes.
- When looking at cooling load, did CalMTA consider climate change and the likely increase in the number of cooling days over time?
 - Rick Dunn noted that CalMTA used rear-looking data to determine the number of heating and cooling degree days and due to climate change, the cooling degree days calculated were likely an underestimate.
- CalMTA was established to take a different approach than conventional utility resource acquisition programs, which are service-territory specific. Showing all statewide impacts outside the funding IOU territories helps demonstrate that MTIs will benefit the entire statewide market.
- The CPUC discussed the unique value a statewide independent administrator could bring vs. having an IOU administrator and the Decision says that CalMTA would be able to conduct "truly statewide activities...outside of IOUs." It is important to present the net incremental impacts statewide.
- A "robustness" or resilience investment test could be valuable, as certain variables driving the market are outside of CalMTA control or are uncertain - for instance, if manufacturers are unable to develop a form factor for horizontal slider or casement windows or if these products are unable to be integrated with central systems. CalMTA should model these and perform a sensitivity test to know how significant they are, clarifying which of the identified risks are identified are outside of CalMTA's control.

MTI Evaluation Plan

Karen presented highlights from the Evaluation Plan (Appendix F) for this MTI, including an overview of the evaluation approach and objectives for third-party evaluation. There was no MTAB feedback.

Room Heat Pumps: Budget, Risks & Discussion

Jeff Mitchell provided a summary of the MTI Phase III budget across a 20-year period, broken down by activity (program implementation, market research, mid/upstream and downstream incentives, and program evaluation). MTAB feedback included the following:

- Looking at what NEEA would typically spend on an initiative of this scale and factoring in the relative size of the California market compared to the Northwest, the budget seems very appropriate and potentially on the low side.

Elaine Miller shared the risks and management/mitigation strategies identified in Appendix G of the MTI Plan. She asked MTAB members to discuss the MTI Plan with a focus on bright spots and possible challenges, questions of clarity for CalMTA, questions for other MTAB members, and other feedback. MTAB comments and questions included:

- While California likely has mitigation strategies in place, CalMTA should describe these in addressing the potential risk of ENERGY STAR or Inflation Reduction Act (IRA) funding being eliminated by the next presidential administration.
- As a bright spot, there are many national actors, including in the Northwest, that are very engaged with manufacturers, share the need for a milder-climate product, and are interested in partnering. This satisfies language in the Decision that refers to market activation outside of California. The more other regions are involved, the greater leverage CalMTA will have with manufacturers.
- The MTI represents “the right amount of audaciousness” by taking enough risk but with a strong rationale and a high likelihood of success.
- The MTI makes sense and has the right level of ambition. It will be exciting to have more detail on activities during the first five years after the plan is approved.
- It’s important for CalMTA to differentiate an MT approach from that used in resource acquisition programs, and this plan does that. It includes multiple interventions that would not otherwise happen, and they come together with significant cost-effectiveness potential. Additionally, room heat pumps are a product that people understand and as California gets hotter, more people will want an efficient cooling option.
- Of all the ideas, this MTI fits expectations the most. It is encouraging to see manufacturer response and activities in other areas of the country. There are also strong equity benefits.
- Is the MTI dependent on federal funding?
 - Elaine noted that it was nice to leverage but not essential, and the MTI could work without it. Karen added that the ENERGY STAR labeling intervention relates to product differentiation and labeling, and there are many other

pathways to get there and achieve those strategic aims. Jeff Mitchell also pointed out that the MTI doesn't expect or depend on the U.S. Department of Energy to lock in a behavior.

- The process of developing the MTI with the advisory board has met expectations, and there is recognition of the significant work that CalMTA has put into this.
- While there remain some concerns about high electrical rates and other factors that are outside of CalMTA's control but important, this MTI has a lot of clear value.
- Margie Gardner shared appreciation for MTAB's level of involvement in developing the first MTI Plans and hope that the MTI will move forward in the proceeding/application.
- The collaborative relationships, processes, and systems built so far with manufacturers, community-based organizations (CBOs), and other interested parties seem to be productive and will benefit future initiatives.
 - Rachel Good noted that while Appendix E wasn't presented to MTAB, this MTI has significant alignment between residential electrification efforts with an equity focus, which represent a large part of the IOUs' residential electrification programs.
- In addition to generally liking the MTI, it's possible that some customers may prefer this to a central heat pump system due to high electrical rates.
- It's exciting to see the MTI come to fruition. CalMTA needs to look at the ductless heat pump/mini-split market vs. the room heat pump market to see where the individual drivers exist from a market push-pull perspective and where room heat pumps may be a better fit.

Stage 2 Scoring & Prioritization of RFI Submissions

Rick Dunn introduced ideas under consideration for future development as "Batch 3," including an overview of the scoring process and RFI scoring criteria. Jennifer Barnes of 2050 Partners and Rick then presented a summary description, potential benefits, potential challenges and MT strategies, and preliminary TSB estimates for the four top-ranked ideas: Multifunction Heat Pumps, BPS Acceleration, VFD on all pumps & fans >10 HP, and Efficient Streetlighting (previously in Phase II development but paused by CalMTA).

Rick and Jennifer then introduced an interactive activity in which MTAB members could ask questions about each potential idea in this new batch and hold up a sign reflecting their level of interest: green (excited), yellow (neutral or unsure), or red (no way). The MTAB response and important comments and questions related to each idea are shared below.

Idea Name: Multifunction HP

MTAB Sentiment: Mostly neutral or unsure

Comments/Feedback:

- ETCC developed a hot and cold storage tank for a multifunction heat pump that enabled load-shifting in both directions - is that included?

- Jennifer replied that there are many different configurations that could be included and CalMTA has not determined what to focus on or include.
- Early versions of this technology were not particularly efficient when shifting between functions, and CalMTA should confirm this has been solved or can be.
- Strong positive support: it's worth keeping an open mind about the many different configurations. Air-to-water configurations offer the substantial benefit of using hot water as defrost or supplemental heat, therefore, from a grid perspective, consolidating to a single load and reducing use of strip heat.
- For some customers this might involve electrifying multiple parts of their homes, so CalMTA will need to explore how incentives would work or be applied.
- CalMTA should require these products to be connected so that end-users can shift loads around to the best rate period, especially if they are on an electrification rate schedule.
- If this product is deemed superior to high-efficiency heat pumps and heat pump water heaters, it may compete with these technologies and be more difficult to implement.
- There are multifunction gas heat pumps with a cooling side that are 50% more efficient than the gas water heater they replace. Would these be included?
 - Staff responded that CalMTA will work with the CPUC to assess inclusion of efficient gas technologies, looking at statewide policy.

Idea Name: BPS Acceleration

MTAB Sentiment: Mixed between excited and neutral or unsure, although slightly more neutral or unsure

Comments/Feedback:

- Another challenge that CalMTA will need to address is that no workforce is in place to support strategic energy plan development and subsequent implementation.
 - Rick agreed and laid out alternative solutions that have reduced capital investment over time.
- Most BPS will promote electrification so how can this be done in a way that minimizes the impact on the grid?
- For this to be successful, the MTI will need to reinvent how people operate buildings and position operations as a building profit center in the long-term play.
 - Rick acknowledged that the current standard is the consequence for noncompliance, but that better strategies to drive compliance are needed.

Idea Name: Efficient Streetlighting

MTAB Sentiment: Mostly "no way" with one neutral or unsure and one excited

Comments/Feedback:

- CalMTA should consider that while the technology is stable, previous work in this market has faced an unstable supply chain with significant wait time.
- Market barriers are entrenched with the jurisdictions that have to make these decisions and it's a hard market to penetrate. In an example from 10+ years ago, the LED market hadn't taken off, so savings were more substantial, and the value proposition was clearer.

Now that LEDs are the norm, savings are just claimed from the portion associated with controls.

- Jennifer noted that older LEDs can be updated to more efficient LEDs and not all streetlights have been converted, resulting in more significant savings.
- Also from this past example, experts looked at safety standards for roadway lighting. Illumination wasn't the appropriate metric for safety, and it was more about contrast and other factors, which proved challenging from the perspective of the municipalities' investment.
- How much would a city save by switching? What's the value proposition for cities to upgrade beyond efficient LEDs?
 - Jennifer replied that this depends on multiple factors, especially their existing technology. Jeff Mitchell added that it is also dependent on whether cities own their lights, as both energy and maintenance savings are much more significant in those cases.
- SCE owns more streetlights than anyone else in the state. There's uncertainty about how much more CalMTA can add from an energy efficiency perspective in this technology area.
- It seems like this is an exciting new area with opportunities for technology improvements at the control level, and the MTI could potentially make a big impact for a relatively low investment.
- CalMTA should explore city sports lighting, as cities seem motivated on that.

Idea Name: VFD on all pumps & fans >10 HP

MTAB Sentiment: Mostly excited, two neutral or unsure

Comments/Feedback:

- Are the people who sell motors the same people who sell VFDs?
 - Rick replied that it's a little of both, and that currently it may be that the people selling the motors are seeing the opportunity and bundling it, but that this is likely one of the challenges to address early on.
- NEEA is implementing programs in this relative area, looking at VFDs with very low HP. The market is complex and active. There are different kinds of manufacturers (e.g., motor manufacturers, drive manufacturers) all approaching different components. CalMTA should also look at a federal standard for pumps that recognizes a wide range of efficiency considerations, with fans on the way to a similar standard. All these activities could be applied to commercial buildings, industrial applications, possibly even irrigation-pumping systems - so refining the focus of the MTI will be helpful.
- How does Title 24 address this? How much of this is building-related under Title 24, even for replacements, because that seems like where the opportunity really is.
 - Jeff Harris clarified that Title 24 has standards that require VFDs in a certain size pump, not this smaller size, and this is also primarily in the retrofit market. NEEA's smart pumps program goes all the way down to 1 HP, which aren't covered by replacement requirements in building codes, although thousands of them are sold every year.

CalMTA should think about expanding this MTI to capture a broader range of horsepower.

Rick then introduced a breakout group activity for MTAB members to discuss factors that make a good MTI, followed by group discussions and presentations. MTAB feedback included:

Multifunction HPs

- The technology seems not ready for widespread adoption, particularly since they are less efficient than single-function heat pump systems or heat pump water heaters.
- Unlike separate space/water heating heat pump technologies, this could reduce the need for some of the grid buildout associated with electrification and could eliminate panel upgrade needs.
- The MTI could be very complex from a contractor standpoint, especially in water heater emergency replacement situations. Many different product configurations also create complicated retrofit technologies.
- From a statewide perspective, there could be issues competing with investments in promoting heat pump water heaters and heat pump HVAC systems that are already a priority.

BPS Acceleration

- The MT play is more about addressing barriers than technology. Trying to drive uptake of BPS has been happening for a while and seems challenging to address.
- The opportunity lies in creating a business case for building decision-makers to comply or go beyond compliance to pursue upgrades that are in their best interest, with BPS as a leverage point.
- 100% compliance should not be considered a realistic baseline assumption.

Streetlights

- This is a lower-cost MTI (positive) that creates opportunities to engage local governments.
- It may be hard to convince laggards who haven't already upgraded to LEDs and there might be additional issues with the utility-city ownership model.
- The MTI is complicated and difficult.

VFDs

- In general, the MTI seems focused on overcoming barriers rather than the technology, which already exists and seems accessible. It could be a short-term play.
- Adding an MTI focused on a commercial and industrial technology is viewed positively.
- The technology is ubiquitous, has impact, and fills CalMTA portfolio gaps by serving the C&I (and maybe agricultural) segments.

Public Comment

- Richard Fennelly: The cooling sector sells defective equipment that requires condenser coil cleaning, which almost never happens. Utilities need to incentivize preventative action.

The meeting was adjourned for the day.

Day 2: Nov. 21

Welcome & Introductions

Following an induction cooking demonstration at the Food Technology Center featuring a battery-enabled 120V range, Stacey Hobart opened the meeting by welcoming attendees and reviewing the Day 2 meeting agenda. She shared updates to the MTAB conflict of interest (COI) rules. She also reviewed several updates to the MTAB charter.

Summary of Induction Cooking MTI

Elaine Miller provided an overview of the Induction Cooking MTI. MTAB comments included the following:

- One outcome of advocating for an ENERGY STAR 2.0 specification for electric cooking could also be mitigating bill impacts through increased efficiency - potentially addressing bill impacts through a different path than rate design.
- ENERGY STAR efficient radiant products are included in the MTI but not addressed in most of the interventions. How does CalMTA envision radiant products fitting into the MTI activities and does its inclusion impact market acceptance if induction cooking is assumed to provide a superior end-user experience?
 - Elaine clarified that while the product definition includes ENERGY STAR-certified radiant products, almost all MTI interventions are focused exclusively on induction. No budget is allocated specifically to radiant products, but some interventions may increase adoption of efficient radiant products along with induction models.
 - Jeff Mitchell added that the MTI seeks to raise the efficiency of the product category, starting at the top (induction) but also wanting to raise the floor (efficient radiant). ENERGY STAR-certified radiant products are included in the product definition because some existing products are as efficient or more efficient than some induction products, but if the MTI achieves its desired market impact, radiant products will likely fall off.
- Radiant cooktops are about half the cost of comparable induction products and the radiant cooking experience has gotten better, so they could play a role in moving the market to efficient all-electric cooking, especially for consumers concerned about

affordability. This could also motivate induction manufacturers to lower the cost of their products to be competitive.

- As a counterpoint, switching from gas cooking to electric is already a jump for some consumers and past negative experiences may make consumers opposed to adopting electric radiant or deter them from adopting electric cooking products at all.
 - Looking toward ENERGY STAR 2.0, SCE helped develop the ENERGY STAR specification for commercial electric cooking products and learned there two ways to elevate induction in the specification: (1) raising overall efficiency standards and (2) including an idle rate, which effectively eliminates all other electric cooking options.

Induction Cooking: Total System Benefits & Cost-Effectiveness

Note: Throughout the discussion below, MTAB members raised questions that prompted the CalMTA team to revisit their models and analysis. The update to the material shared at this MTAB meeting is described in a supplemental memo added to the packet for this meeting located at: <https://calmta.org/market-transformation-advisory-board-mtab-meeting-11-20-21-24/>. In addition, sensitivity analysis was conducted to determine how key assumptions would affect the modeling for the Induction Cooking MTI and can be found in the Appendix B of this plan linked at: <https://calmta.org/resources-and-reports/induction-cooking-mti-plan/>.

Karen Horkitz shared an overview of the TSB and cost-effectiveness numbers for the Induction Cooking MTI. Gouri Mishra then presented estimated adoption (both baseline/naturally occurring adoption, or BMA, and adoption in the presence of the MTI, or TMA), including separate models for existing households and newly built housing units, as well as the inputs, assumptions, and methodology used to develop them. MTAB feedback included:

- It seems like the forecast shows radiant has a larger cumulative market share even in the presence of the MTI. Is that accurate and what is the reasoning?
 - Gouri explained that accelerated retirement of gas cooking products drives up an increased cumulative market share for all electric cooking products. Radiant will increase from a low percentage of the market share today to a very high one before induction starts to dominate the market. Looking at how many people purchase induction or radiant in a given year (vs. total market share), radiant is a much smaller percentage.
- In looking at the cumulative adoption forecast, CalMTA should also consider the diffusion of innovation curve: the “early majority” may be adopting induction, but “laggards” may be price-driven and opt for efficient radiant products first.
- As increased adoption of efficient electric cooking drives positive GHG impacts but negative grid impacts, it may be worth conducting a sensitivity analysis to model the TSB for scenarios with different ratios of radiant vs. induction products.
- How current is the data used to estimate the electrical loads for cooking products? It’s likely that consumer cooking behavior has changed since the increase in home

cooking during the height of the COVID pandemic and cooking behavior is likely to vary widely, so the operating cost for consumers who cook a lot will look very different than for those who cook very little.

- Jeff Mitchell noted that CalMTA used EPRI load shapes for this, which were published in 2019. Gouri added that EIA RECS is trying to ascertain changes in cooking behavior after the pandemic which will be reflected in the next iteration, scheduled for completion in the next year or two.
- The Northwest has a home energy use measurement data set that is actual load shapes and includes some cooking load shapes. This data is public at the hourly level.

Matt Wisnefske then introduced a presentation of cost-effectiveness and results for the Induction Cooking MTI, including TSB and various cost-effectiveness tests. He presented technology definition inputs and program regulatory. MTAB comments and questions included:

- In the scenario in which a gas burner range (counterfactual equipment) is replaced with an efficient induction or ENERGY STAR radiant range, does the first-year incremental measure cost include electric panel upgrades for service?
 - Matt replied that non-product assumptions were not modeled because the wide variance made this difficult to do accurately.
- Feedback emphasized the importance of modeling this, since electrical upgrade charges should be factored into incremental cost. This should also differentiate between a simple panel upgrade and upgrading to 240V.
- In California, electrification measures include estimates of infrastructure upgrades, although in some cases those costs are separated out.
 - Andre Salvidar of SCE (subject matter expert) shared that the 2019 version of the CPUC's fuel substitution technical guide says that the measured technology cost may exclude any additional upgrades required to increase the building's total electric or natural gas load. If those additional upgrades are included for the purpose of calculating the incremental measure cost, work papers should explain why. However, the necessity of such upgrades is specific to individual buildings and the cumulative load of installed technologies in the building and therefore in most cases should not be attributed entirely to a single measure.
- Do calculations assume the same cost for an induction and an ENERGY STAR radiant range? Will the inclusion of ENERGY STAR radiant products in the calculations skew some of the numbers if interventions are focused on induction products?
 - Matt clarified that there was a significant delta between products and CalMTA developed a reasonable median product price estimate after looking at a wide range of products sold by California retailers.
- There was discussion about whether the initiative is focused on induction cooking or efficient electric cooking including induction and ENERGY STAR radiant.

- How is CalMTA weighting replacement by induction vs. ENERGY STAR radiant products over time and do these scenarios use the same adoption curves Gouri presented? The same weightings that change over time would also affect the calculation of costs and benefits over time because there's a different incremental cost and different benefits calculation between the two technologies.
 - Matt replied that as with other MTIs, CalMTA assumed reductions in the relative incremental measure cost year-over-year using a learning-curve-based analysis. As induction products, especially those with a battery, become more common, economies of scale and additional market pressure will reduce the relative cost compared to the baseline. The numbers in the replacement scenario table are the first-year incremental measure costs, which are the highest they will be during the lifecycle of the MTI.
- Even though the MTI is focused on increasing induction adoption, it is developed as an initiative targeting increased adoption of efficient electric cooking, with induction as one primary way to reach high levels of efficient electric adoption because of its superior cooking experience. Induction is a pathway to getting more people to switch from gas cooking to electric, but the ultimate endpoint is efficient electric cooking.
- Given the substantial interest in building new accessory dwelling units (ADUs) in California, it may be easier to promote induction for these units as they would not face the challenge of infrastructure upgrades. Has CalMTA factored this in?
 - Matt noted that CalMTA has not isolated this segment specifically but that it could factor into adoption of smaller 24-inch models. Karen added that CalMTA will use data collection to true-up the forecast every year, so if we see that ADUs are a niche, specific strategies could be deployed to address that in the model. These units will also be captured in our market share calculations from an evaluation perspective.
- Would products with less than four hobs be included? The statewide fuel substitution workpaper currently requires four or five hobs.
 - Jeff Mitchell said that CalMTA is using the U.S. DOE definition right now but will look at the statewide workpaper to ensure alignment.
- CalMTA forecasted incremental price reductions over time, but for the battery-equipped models there's a very high cost associated with the battery itself. Has CalMTA used other forecasts for decrease in lithium-ion battery costs? If product cost is driven by batteries, the price of those is likely to go down quickly as EV adoption goes up.
 - Gouri stated that CalMTA did not look at the battery itself but referenced EV price trends, taking the revolutionary learning rate from the DOE study and applying it to the 120V model. Karen noted that CalMTA will look at this in finalizing the cost-effectiveness estimates.
- The MTI seems more frontloaded in cost than the Room Heat Pump MTI is, so showing the lower discount rate with the societal cost test would be helpful.

- Regarding discount rates, the number that is now in the Avoided Cost Calculator was adopted in 2024. The weighted average cost of capital for 2025 will be a bit lower, but not dramatically.
- With the assumption that induction cooking offers a superior cooking process, CalMTA should ensure that forecasts capture the consumers who may prefer it over gas, regardless of price parity.
 - Karen confirmed that those questions were included in CalMTA's baseline market characterization surveys and as a potential market progress indicator, and that the MTI will continue capturing preferences as part of market monitoring.
- How will CalMTA measure the MTI's ability to win hearts and minds and when it happens?
 - Karen replied that CalMTA can reference responses from the market characterization work about general perception, favorability, likelihood of purchase, etc. and compare with future stages. The third-party evaluator will also have good ideas for how to clearly identify this.
- Did CalMTA use the same baseline market characterization survey for the Room Heat Pumps and Induction Cooking MTIs?
 - Karen said that CalMTA used one survey to cover both products, with the same sample. Sampling needs to reflect the market, so for these two products it made sense to use the same one but for future MTIs it may be different.
- How is CalMTA tracking equity for this beyond inclusion in other California programs, specifically capturing hearts and minds in ESJ communities?
 - Karen replied that this information is in Appendix F of the MTI Plan and varies by metric. For instance, the consumer survey was broken out by low-income and non-low-income respondents and anything tracked by survey will follow this approach. For metrics related to inclusion of the measure in programs, CalMTA will track this at the statewide level so that will include equity programs. The metric tracking the share of products stocked in stores will specifically include those in identified ESJ communities and will include analysis of product price points.
- If CalMTA is really looking at all efficient electric cooking products, the MTI should include strategies to reduce gas replacement costs to get to parity.
- Consumers would have two choices: (1) between gas and induction and (2) between 120V and 240V models.
 - Jeff Mitchell noted the significant grid benefit of the 120V model, so CalMTA may shift strategy more toward that product if the price goes down quickly.

Public Comment

- Carol Yin: CalMTA uses the term “limited and low income” interchangeably in MTI Plans and it would be good to define these in terms of what programs they will be impacting and how savings will be claimed/attributed.
- Weldon Kennedy: Regarding the need for an analysis of the total cost of adopting induction products that includes panel and wiring upgrades, it would be good if CalMTA could publish this to show what parity really looks like as well as the cost per household or building.

Induction Cooking: Budget, Risks & Discussion

Jeff Mitchell provided a summary of the MTI Phase III budget across a 20-year period, broken down by activity (program implementation, market research, mid/upstream and downstream incentives, and program evaluation). MTAB questions included:

- Since no downstream incentives are included in this budget, how does CalMTA plan to engage or support programs serving ESJ community members?
 - Jeff Mitchell noted that the MTI strategy can shift over time, so there may be future downstream incentives offered if they are needed to reach these customers. Incentives paid to property owners/managers or builders may technically be downstream incentives but are categorized in the midstream budget. Elaine added that the tech challenge will help CalMTA understand manufacturers’ willingness to drive down prices to increase affordability to all customers.

Elaine shared the risks and management/mitigation strategies identified in Appendix G of the MTI Plan. MTAB feedback included:

- How significant is consumer understanding of the health impacts of gas cooking when looking at risks?
 - Elaine confirmed this is a significant risk but there is still much to learn about that specific barrier. Consumer surveys completed at Chefluencer events indicate that health impacts are one of the greatest motivations to switch.
- The health impacts may be more persuasive for residents in smaller multifamily buildings and ESJ community members.
- For high-pollution communities where poor air quality is driven by many external factors, it can be easy to deprioritize switching cooking methods. CalMTA should be sure to address this in the messaging or it will come off as tone deaf.
 - Elaine explained that having a local champion who can communicate in the regional language is important. CalMTA will also need to address consumer resistance regarding the focus on gas stoves in proportion to other issues in ESJ communities, potentially by bundling any promotion of induction cooking with information about weatherization or positioning basic energy efficiency as a first step. She confirmed that before deploying any MTI marketing, CalMTA

will research and test messaging to make sure it is culturally sensitive and responds to community priorities.

- Messaging needs to be tailored to specific segments and audience priorities if the MTI is to be successful in changing hearts and minds.
- The Green & Healthy Homes Initiative partnered with local hospitals to access data on community factors like the rate of childhood asthma. Are there indicators CalMTA could look at to monitor health impacts?
 - Elaine replied that these indicators are not fully identified yet but are part of the MTI's planned trajectory.
- Regarding the need for rate optimization: Special rates already exist for income-qualified customers, but many are unaware of them and others may not be on the correct rate. The major IOUs have electrification-rate schedules that vary in structure and have very different requirements, but getting efficient electric cooking alone would not qualify a customer for any of the available options. No time-of-use (TOU) periods are convenient for cooking, and some have a higher fixed charge, so consumer uptake varies. It may not be financially advantageous for smaller users to be on these rates. At the end of the day California IOU electrical rates are very high and rate design alone will not solve this.
 - Jeff Mitchell clarified that the MTI Plans use "electrification rates" as a catch-all term designed to capture issues related to the high cost of electricity and bill impacts. CalMTA's ability to share real-world use cases and insight could be beneficial to better rate design. Sometimes policymakers who want to see electrification are disconnected from the people who face operating costs.
- While bill impacts are significant for electrification overall, they are less significant for cooking. The operating cost difference between a gas range and an electric range is nominal on a monthly basis and many consumers would be willing to look beyond that if they love their electric stove. The bill impact of switching to electrical cooking products is not necessarily the major challenge in this market.
- Before finalizing estimates of potential bill impacts and operating costs, it would be good to have greater insight into true usage patterns related to cooking, ensuring any estimates of cooking behavior used in CalMTA's modeling are accurate and current.

Stacey asked MTAB members to discuss the Induction Cooking MTI Plan with a focus on bright spots and possible challenges, questions of clarity for CalMTA, questions for other MTAB members, and other feedback. MTAB comments and questions included:

- CalMTA should be clearer about the goal for this MTI. Is it targeting (1) efficient electrification of cooking or (2) widespread adoption of induction as part of the overall market, with induction as a tool with which to electrify? The presentation sounds like the latter, but the documents are a little ambiguous and read more like the former. Appendix B is not ambiguous and seems very much focused on the former, which is the electrification of cooking.

- California transitioned to TSB in order to make fuel-switching work more feasible and palatable - it makes sense as a public benefit. The question is how much of the MTI goals are achieved through adoption of efficient radiant products. Modeling multiple scenarios and doing some sensitivity analysis may be beneficial.
- If the MTI pushes electric radiant products at all, is there the risk of backlash due to the inferior performance and low consumer satisfaction that could set electrification of cooking back overall?
- The Bay Area Air Quality Management District already requires electric replacement after furnace burnout, and similar requirements for cooking won't be far behind. If CalMTA is advocating for recommending or forcing an electric replacement in these scenarios, induction should be the only option.
- The 120V model with a battery is exciting, as the ability to cook with power out is huge. The 240V products are less exciting due to concerns about panel upgrades, expensive installation, and bill impacts.
- In touting the ability to cook during power outages, CalMTA should be careful about clarifying the negative health impacts of cooking without an exhaust fan or range hood, even with electric cooking products.
- The focus on 120V battery-equipped products seems like a good way to promote induction and an induction-only initiative seems like a good fit for MT. Is an MTI more broadly focused on efficient electric cooking better suited for the energy efficiency portfolio?

Stacey asked the MTAB members how much the lack of cost-effectiveness for the Induction Cooking MTI was an issue for them. The responses included:

- Regarding the preliminary total resource cost (TRC) of the MTI, the 0.9 TRC is a little bit disappointing, and the Decision should be reviewed to ensure a TRC of <1.0 is acceptable. Initially, really liked the addition of the battery-enabled products, but now looks more like pushing electrification. If it was focused fully on induction, there's an opportunity for market transformation. I need to read more but am more hesitant about this MTI at this time.
- The societal cost test (SCT) value is cost-effective, and the MTI addresses many societal costs and benefits beyond energy savings. While a TRC of 1.0 would be preferable, this kind of situation is why California has adopted other tests. Looking more closely at incremental measure costs or economies of scale associated with decrease in battery prices may result in a higher TRC. I just wish it was better.
- Guidance appears to be that all MTIs should strive to be cost-effective, but the only requirement is at the portfolio level. However, the Decision emphasizes the importance of individual cost-effectiveness for first MTIs and the CPUC is very interested in TRC vs. other cost-effectiveness tests.
- The Oregon Public Utilities Commission considers benefits you can't measure are just as important as the ones you can. CalMTA should apply its best judgement for benefits that could add value if the quantifiable metrics aren't quite sufficient and

make an argument for the significant, but difficult to quantify, health and safety benefits not captured in TRC.

- Karen confirmed that the modeling team would refine the TRC estimate for the Induction Cooking MTI based on factors that include: (1) the addition of equipment installation/infrastructure costs; (2) factoring in the probable decline in the cost of batteries and assumption that the current 120V battery-equipped product may not be the best basis for cost modeling, as it may remain a niche custom-build product and not one that would be adopted at scale; and (3) factoring in data about statewide benefits outside of IOU service territories.
- The CPUC was very clear on not establishing a cost-effectiveness threshold for each MTI but rather wanting the portfolio to be managed with an eye toward cost-effectiveness. The CPUC uses SCT only as information and not as a basis for approving programs (which is TRC and PAC only). With the Room Heat Pump MTI's TRC factored in, CalMTA is in a good place at the portfolio level but should be thoughtful about how to present a MTI <1.0 - acknowledging it's not optimal and being clear on the many factors going into that. This is particularly important since California is used to resource acquisition programs where benefits are accrued fairly quickly, versus MT programs which yield significant benefits but not immediately.
- While there was previously a requirement that each IOU's energy efficiency portfolio be cost-effective, when this was segmented in 2021 to include market support and equity programs, only resource acquisition programs at the portfolio level were expected to be cost-effective and not all reach a TRC of 1.0.
- Induction cooking represents an on-peak-load measure that doesn't immediately pay the customer back but also yields significant other benefits, so the MTI needs a story with these various scenarios built out to show the foreseeable negative effects if the state doesn't try to address induction cooking right now. For limited-income customers, benefits messaging needs to overpower concerns about building an expensive stove that will drive usage up during peak times.
- If modeling assumptions are based on the premium model cost, CalMTA may not be capturing the real market and may want to make sure prevalence of mass market products, such as smaller models with smaller batteries, are factored in.

Application Overview

Lynette described the process for and contents of the CPUC application Pacific Gas & Electric will be filing on behalf of CalMTA, which will include the Room Heat Pump and Induction Cooking MTI Plans as well as an estimated five-year implementation budget and request for a process for future approval of new MTI Plans. MTAB feedback included:

- From the perspective of ensuring that program costs are being spent efficiently, TRC is a significant issue, but hearing about the MTI development process and all benefits of the technologies is also important. CalMTA should tell the story of how this work

benefits California. Statewide numbers are relevant in contextualizing, but CalMTA should keep in mind that IOU ratepayer dollars and benefits are always top of mind.

- Some reviewers value the opportunity to access and review Excel work papers, so CalMTA should have those ready with live cells supporting cost-effectiveness calculations.
- CalMTA may face expectations that these are the two MTIs that are the “best” of all possible ideas, so clarifying the frontrunner criteria and speaking to long-term portfolio plans will provide context and build confidence.
- CalMTA should clarify that these MTIs do not overlap with or duplicate existing program efforts but rather add value to the external program landscape.
- It is important to clearly state in the application why MT is different and provides added value, and that its activities cannot simply be rolled into other efforts.
- The narrative should tell the story that MT needs to extend itself more than resource acquisition programs and that these examples prove that principle. If all outcomes are accomplished after five years, not enough of a risk has been taken.
- Public comments on the application can be submitted directly to the docket and are included for consideration. Formal motions are submitted as evidentiary material and are weighted more heavily.

Public Comment (from the [online public comment form](#))

Jayson Martin: “Regarding the MTAB meeting, I am pleased to report that the recent session was quite productive, fostering insightful discussions and collaborative efforts among participants. The exchange of ideas was particularly enriching, and I believe it will significantly contribute to our ongoing electrification initiatives.”

Wrap-Up & 2025 Meeting Plans

Stacey shared a few closing items, including formation of the eight-member Equity Sounding Board and process for MTAB members to submit comments about the two MTI Plans prior to their finalization. She asked MTAB members to share their relative feelings about the deadline for comment form submittals and ask any questions about the process for resolution.

Stacey presented the initial plan for 2025 MTAB meeting dates and alignment with quarterly activity report updates.

The meeting was adjourned.

Attendees

MTAB Members

1. Karina Camacho, Inland Regional Energy Network
2. Cyane Dandridge, SEI
3. Hayley Goodson, The Utility Reform Network
4. Fred Gordon, Energy Trust of Oregon

5. Jeff Harris, Northwest Energy Efficiency Alliance
6. Randall Higa, Southern California Edison
7. Peter Miller, Natural Resources Defense Council
8. Christie Torok, California Public Utilities Commission (virtual)
9. Ky-An Tran, California Public Advocates

Participating Staff & Consultants

1. Taqua Ammar, CalMTA/Resource Innovations
2. Jennifer Barnes, 2050 Partners
3. Lynette Curthoys, CalMTA/Resource Innovations
4. Rick Dunn, CalMTA/Resource Innovations
5. Margie Gardiner, CalMTA/Resource Innovations (virtual)
6. Rachel Good, CalMTA/Resource Innovations
7. Karen Horkitz, consultant to CalMTA
8. Stacey Hobart, CalMTA/Resource Innovations
9. Elaine Miller, CalMTA/Resource Innovations
10. Gouri Mishra, Cadmus (virtual)
11. Jeff Mitchell, CalMTA/Resource Innovations
12. Nils Strindberg, CalMTA/Resource Innovations
13. Matt Wisnefske, Cadmus

Guests

1. Pradeep Bansal, Energy Solutions
2. Rob Bohn, PG&E
3. Courtney Dilly, SMUD
4. Richard Fennelly, CoilPod LLC
5. Natalie Flores-Rios, SCE
6. Mina Jimenez, Proteus, Inc.
7. Debra Little, AJO
8. Jayson Martin, R&B Wholesale Distributors
9. Savannah McLaughlin, CPUC
10. Emily Pelstring, CPUC
11. Andre Saldivar, SCE (subject matter expert on induction)
12. Steve Schiller, Schiller Consulting
13. Eduardo Uranga
14. Yanda Zhang, ZYD Energy