Residential Heat Pump Water Heating (HPWH) Market Transformation Initiative

Appendix I: MTAB and Public Feedback

June 24, 2026

This appendix contains written comments and responses from the Market Transformation Advisory Board (MTAB) and the public, as well as links to the notes from the MTAB meetings where this content was discussed. There were no comments from the public.

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Contents

1 Purpose

This document provides a comprehensive list of comments received from the Market Transformation Advisory Board (MTAB) on the draft Residential Heat Pump Water Heating (HPWH) Market Transformation Initiative (MTI) Plan. Content from the draft MTI Plan was shared with the MTAB via public meetings on November 13, 2025, and January 29, 2026. The MTI Plan was discussed with the MTAB via a public meeting on March 25, 2026, and the full draft of the MTI Plan and Appendices was provided to the MTAB and the public from April 22, 2026, to May 8, 2026. We received no comments from the public on the HPWH MTI Plan, which was posted to the CPUC Public Documents Area (PDA) website during those dates. Aside from minor grammatic corrections for added clarity, all feedback that appears in this document is presented verbatim as submitted, with no edits made by CalMTA.

2 MTAB feedback

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
1	1.1 Market overview	9	Mary Anderson on behalf of the California IOUs	To further strengthen the proposal, the Executive Summary section could more explicitly articulate the incremental value of the proposed MTI intervention strategies relative to the extensive set of existing HPWH programs and initiatives. Framing the MTI as an outcome-driven, time-limited effort with clearly testable objectives would improve alignment with CPUC expectations for market transformation investments.	We agree and have added some additional copy in order to reference the logic model and Appendix F (Evaluation Plan).
2	1.1 Market overview	9	Fred Gordon	Somewhere in exec sum should say that value is from units and savings beyond those forecast under state and federal standards. Otherwise, that question is left hanging until/if one reads further,	All incremental adoption, savings, and total system benefits (TSB) presented in this Plan are calculated relative to a baseline that includes expected market changes driven by the 2029 federal water heater efficiency standards and other regulatory drivers. As such, the impacts attributed to the MTI represent additional market transformation beyond what is expected to occur through these policies alone. We

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
					have added additional copy in section 1.5 of the MTI Plan Executive Summary.
3	1.1 Market overview	10	Fred Gordon	Is the $4000 more specific to the replacement/retrofit market, as compared to new construction. If so, suggest adding a couple of words to say so.	Thank you, updated to clarify in section 1.1.
4	1.1 Market overview	12	Fred Gordon	"Regional variations leave a disconnect from HPWHs and limit broad adoption". Disconnect from HPWHs to what?	Thank you, we updated to, "Regional variations leave a disconnect from seeing and experiencing HPWHs and limit broad adoption."
5	2.1 Transforming California's HPWH market	16	Mary Anderson on behalf of the California IOUs	The proposed market transformation theory outlines aggregation, alignment, and market infrastructure etc. as potential levers for a sustainable change (e.g., no further intervention needed). Consistent with theory based evaluation best practices, the Plan would benefit from greater clarity regarding which elements of the theory of change are being tested in the current California HPWH market context, the conditions under which these interventions are expected to produce incremental outcomes, and the evidence that would confirm or disconfirm their effectiveness over time.	Consistent with theory-based evaluation best practices, all elements of the program theory will be assessed. Appendix F describes the preliminary evaluation plan for the MTI, the details of which will be finalized when a third-party evaluator is selected.
6	1.2 Vision	17	Fred Gordon	Suggest you replace "unique" needs with "particular" needs. Many may also be true for some other states.	Thank you, we updated the language.
7	1.2 Vision	18	Fred Gordon	Would it be useful to say "without these coordinated efforts there is a greater chance that State and federal standards are not fully enforced or create significant backlash from customers and contractors who can't find a ready path to compliance.	Thank you, we updated the language.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
8	1.2 Vision	20	Fred Gordon	Term “segmentation tool" doesn't mean anything in particular and can raise a fear of gimmick-ism. Perhaps "segmentation scheme" sounds more transparent and less mysterious.	Thank you, we updated the language to “approach.”
9	2.2 Theory of market transformation	22	Mary Anderson on behalf of the California IOUs	The market barriers section notes that customers do not value technically complex features such as load shifting, DR, etc. It would be helpful to evaluate how much utilities value these features to address load shifting needs. Also, the report elsewhere mentions that these features are valuable, which seems to contradict this statement. Recommend clarifying if the need is to better communicate the value of load shifting/DR to consumers.	We agree that the current framing can read as contradictory. For clarity, we added language to section 2.2.4 Market barriers to further call out the split between the value of load shifting/DR benefits to the system versus the consumer value of features. We also added language to section 1.2 Vision to articulate MTI’s support of California’s grid reliability and climate goals. Finally, we confirmed that this value split is highlighted when load shifting/DR is discussed throughout the MTI Plan.
10	2.2 Theory of market transformation	26	Fred Gordon	It seems that load management capability is a big value driver for utilities, but a complexity, familiarity, and customer cost barrier for others. I'm wondering if the utilities are willing to frame this as an optional value add. Sales for demand capable units, if this capability is not required, may significantly lag total sales; but if demand control is required, overall sales and program success may lag. Another option is for utilities to fully cover the cost of demand control capabilities and provide a guarantee it will not interfere with use.	We agree that there is a fundamental tension between the system value of load management capabilities for utilities and the added cost, complexity, and limited perceived value for customers. The suggestion to explore alternative approaches, including utility-supported pathways such as covering incremental costs or ensuring customer protections around performance and usability is useful. These considerations align with ongoing questions around how best to scale adoption while enabling future grid capabilities. The CalMTA team will incorporate these considerations into the Product Roadmap and program alignment discussions.
11	2.2 Theory of market transformation	26	Fred Gordon	There is an assumption that better product understanding, more suitable designs, and volume will lead to lower HPWH prices. In other regions contractors have preferred	We agree there may be resistance to changing established business practices, and some contractors may prefer lower volume with higher margins over increased throughput. We also see

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				higher units to lower prices that might increase volume. If I can make the same profit on 100 water heaters or 150, wouldn't I prefer the 100? Many contractors fear changing their business model to scale up. There has to be another level to make the status quo less profitable or change less intimidating. It may be that the retail channel can provide a channel that manages contractor pricing a little more closely or provides more direct competition between installers.	the retail channel as a place to provide more direct competition between installers and have identified retail as a possible early submarket. This can be found in sections 2.1 and 2.3, where we identify retail as an early submarket and the importance in creating market competition.
12	2.3 Strategic interventions	28	Fred Gordon	This initiative seems to be pushing toward market clarity and product diversity at the same time. These may conflict. If "diversity" becomes 2-3 product types separately marketed with considerable care to tightly focused and mutually exclusive customer and contractor groups, the conflict is reduced. This is a tall order, esp. when coordinating with 30 programs. If there is a split system initiative focused through low-income program channels and a unitary system marketed through conventional program channels, this makes clarity easier, as the program and contractor channels are (in some places) mostly distinct. This may leave out some markets for the split system, in the name of avoiding market confusion. For the same reason CalMTA may want to assure that HPWHs are well established in a market before introducing low GWP or demand management as an option. Forcing them in for all participants just makes the	There is an inherent tension between pursuing greater product diversity and maintaining market clarity. The MTI is designed to manage this tension through a sequenced and segmented approach, rather than advancing all product attributes and capabilities simultaneously across the full market. As noted, introducing additional complexity too broadly or too early can increase costs and create barriers to adoption. This approach will require careful coordination and pacing, including the potential use of targeted research to generate insights and inform the introduction of new feature sets and product form factors.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				complexity and cost barriers higher. Pilots will be needed but could be narrowly geographically focused until the market is ready for the next complication. This would require some patience regarding the important climate and demand control goals.	
13	2.3 Strategic interventions	32	Fred Gordon	The low-income market may be able to take on demand control capability and low GWP refrigerants faster if there is no added cost to the customer. Decisions are made at a higher level between landlords and programs.	We agree and this will be considered as the CalMTA team refines our submarket strategies and product roadmap discussions, particularly in identifying segments where advanced capabilities can be deployed more readily without impacting customer adoption.
14	2.4 Environmental & social justice communities	36	Mary Anderson on behalf of the California IOUs	Please consider how product noise plays a role as a barrier to ESJ communities due to the water heater being in close proximity to sleeping areas in the home.	We agree this is a concern and have indicated noise as one of the barriers that ESJ households face in sections 2.2.8 and 2.4.
15	3.1 Technical definitions and details	43	Mary Anderson on behalf of the California IOUs	The technology discussion identified the first cost, installation challenges, and performance considerations for HPWHs market conditions. Several technologies referenced in the Plan, including plug-in (120V) and split-system configurations, are already commercially available or have been demonstrated in prior efforts (e.g., CEC, CA IOUs, SMUD, and various stakeholders' involvements over several years), now including variable speed HPWHs. As such, the market opportunity appears to center less on technological feasibility and more on reducing deployment friction, first and installation costs, and uncertainty of sustainable market transformation. Clarifying this distinction	It is true that residential HPWH technology options referenced are commercially available or have been demonstrated as viable. As such, this MTI focuses on accelerating the deployment of these technologies, not strengthening proof of feasibility. We added language to the MTI Plan to clarify this distinction in section 3.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				would further align the technology discussion with the proposed market-level interventions.	
16	3.2 Competitive analysis	45	Mary Anderson on behalf of the California IOUs	Section 3.2.2 on "primary weaknesses" is excellently worded. Please consider including "lowboy" as an example adjacent to the reference to "installation in tight enclosures" because the industry does not currently have any integrated system product offerings for such space constrained scenarios.	We agree and would add that split-system HPWH models can also mitigate form factor concerns. The "taller and heavier unit dimensions" weakness noted in the MTI Plan highlights the opportunity for improvement in model design. Section 4.1.2 of the MTI Plan also notes stakeholder interest in models with smaller form factors, including "lowboys," and cites example models recently introduced by manufacturers.
17	3.2 Competitive analysis	46	Mary Anderson on behalf of the California IOUs	Could you please clarify how updates to JA13, which specifies the HPWH demand flexibility compliance credit criteria, addresses the market barriers listed in preceding paragraph such as inferior hot water recovery performance, electrical requirements/panel capacity, and space requirements/ventilation needs? As of 04/10/2026, CEC's list of HPWHs certified to JA13 includes 533 records and has widely been supported by industry. Manufacturers have made the necessary investments to comply with the JA13 qualification requirements for a HPWH demand management system to meet the requirements for HPWH demand flexibility compliance credit available in the performance standards specified in Title 24, Part 6. Also please note that JA13 cannot be updated until 2031 as it is part of the residential code.	The intent of listing "updates to California's Title 24 JA 13" was not to suggest that updates to JA 13 would directly resolve barriers such as hot water recovery performance, electrical requirements/panel capacity, or space and ventilation constraints. Rather, JA 13 was referenced as an example of an existing framework that can help support long-term market scaling of HPWH load flexibility as the market matures. Additionally, we acknowledge that JA 13 cannot be updated until 2031 as a result of California Assembly Bill 130, which implemented a 6-year pause on changes to state building standards affecting residential construction. The CalMTA team updated the MTI Plan and Appendix C (Product Assessment Report) to note that updates to JA 13 are not expected to be feasible until after 2031.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
18	3.3 Energy policy landscape	47	Mary Anderson on behalf of the California IOUs	The 2025 edition of Title 24, Part 6, also prescribes installation criteria for HPWHs. It may be helpful to summarize the criteria in this section. See our responses in cell G142 for details.[1] (Section 1 specifies "HPWH installation goals." This topic should consider the following HPWH installation criteria in California: 1. Mandatory provisions currently exist in California's Building Energy Efficiency Standards, Title 24, Part 6, in section 110.3(c)7, and they prescribe backup heat, ventilation, and installation criteria for HPWHs with ducts. 2. For HPWH installation without ducts, the installation space must have a volume not less than the greater of 100 cubic feet per kBtu per hour of compressor capacity, or the minimum volume provided by the manufacturer for this method. The installation space must also be vented to a communicating space via permanent openings that must meet a minimum volume, and permanent openings must consist of fixed flat slat louvers or grilles with specific total minimum net free area and specific locations from the top and bottom of the enclosure locations. 2. For HPWH installation with ducts, the installation criteria specifically require the minimum volumes for the space adjoining the HPWH and the space in which the	CalMTA agrees that it is important to consider CA Title 24, Part 6 requirements applicable to all HPWH installations and has added a summary to the pertinent sections of the MTI Plan and Appendix C that discuss Title 24, Part 6.

[1] CalMTA has duplicated the response here for reader understanding. Please see comment #42 for original response.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				HPWH is installed to be equal, duct connections and building penetrations to be sealed, exhaust air ducts and all ducts with cross pressure boundaries to be insulated with a minimum R-6 insulation, use of permanent openings like slat louvers or grilles when only HPWH inlet or outlet is ducted, consideration of minimum net free area depending on whether the inlet or exhaust is ducted, and airflows from termination points to be diverted away from each other when the inlet and outlet ducts terminate within the same pressure boundary.	
19	3.4 Product performance	49	Mary Anderson on behalf of the California IOUs	The second paragraph in section 3.4.2 references 120V HPWHs, but the installation cases covered in Table 7 on page 49 do not address those systems as a proposed technology. We appreciate the modeling insights offered on 120V HPWHs, and suggest the cases associated with those systems be specified in Table 7.	We reformatted Table 7 to make the assumptions of each case easier to read and make clear that Case 1 in Table 7 addresses 120V plug-in HPWH as a proposed technology to replace gas storage water heaters.
20	3.4 Product performance	56	Mary Anderson on behalf of the California IOUs	"Regarding the discussion on refrigerants in section 3.4.3, residential HPWHs are likely considered "high-probability systems" within the California Mechanical Code and Table 1104.1 limits refrigerant options to A1 or A2Ls. A change would need to be necessitated to the code to allow other refrigerants for high-probability systems. The allowable refrigerant quantities are specified in Table 1102.3. UL 60335-2-40, the product safety standard applicable to space-conditioning heat pumps, will also prevail for HPWHs and we are aware of one	We appreciate the additional information regarding refrigerant safety standards, mechanical code requirements, and EPA SNAP regulations. We recognize that the regulatory landscape governing refrigerant use in residential HPWHs continues to evolve and that there are currently uncertainties regarding allowable refrigerants, charge limits, product certification requirements, and federal refrigerant listings. We added the following clarification as a footnote to this section of the MTI Plan and to Table 6 of Appendix C:

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				HPWH on Intertek's product safety certification directory that provides an example of how one manufacturer is safety certifying its HPWHs per the UL standard. Lastly, the U.S. Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) final rules issued in previous years are yet to specify acceptable substitute refrigerants for HPWHs. EPA's 2021 final rule (86 FR 24,444) specifies that a manufacturer sought clarification as to which SNAP end-use HPWHs belong in and for clarification as to whether an end use category currently exists for these types of equipment. EPA's response stated that the classification of HPWHs is beyond the scope of this final rule, and EPA chose not to provide a further response. Nonetheless, EPA acknowledged being aware of this clarification request and invited the industry to further pursue this issue separately with EPA and the SNAP program. EPA subsequently issued another final rule in 2023 (82 FR 26,382) and stated that a manufacturer urged the use of refrigerants such as hydrocarbons, CO2, and ammonia in HPWHs. EPA acknowledged the increasing use of fluorinated and non-fluorinated alternatives to ozone depleting systems, but EPA chose not to finalize a listing incorporating hydrocarbons, CO2, and ammonia - EPA stated it intends to consider proposing additional listings,	The refrigerant sensitivity analysis included in section 3.4.3 is intended only as an illustrative assessment of how refrigerant choice could affect lifecycle avoided costs and does not represent a recommendation or expectation that specific refrigerants will be adopted by manufacturers or required by the program. Because refrigerant-related codes, standards, and regulatory requirements remain in flux, any future program requirements related to refrigerants would be driven by both market developments and the prevailing regulatory environment. We will continue to monitor updates to applicable codes, standards, and federal regulations as the market evolves.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				including listings for non-fluorinated alternatives, in future rulemakings."	
21	3.5 Product plan	57	Mary Anderson on behalf of the California IOUs	The last two bullets (circuit-sharing and repurposing photovoltaic meter collars) are interesting, and it would be helpful to expand on those.	More detail on meter collar adaptors and panel optimization is provided in section 5.1 of Appendix C. We added a footnote describing circuit sharing and meter collars in section 3.2.3.
22	3.5 Product plan	58	Mary Anderson on behalf of the California IOUs	The actions to facilitate harmonization of load flexibility protocols in 3.5.1 have been underway with the AHRI 1430 and CTA committees. The IOUs have done conformance lab testing, and the CA load shifting programs (WatterSaver and SmartShift) complete field testing to qualify products. PG&E is considering running a pilot called Residential Customer Energy Orchestration for various DERs (e.g., batteries, EV charge management systems, HVAC, WH). It would be helpful to coordinate with PG&E on these actions.	Coordination with California load-shifting programs is included in the approach described in Appendix E.
23	3.5 Product plan	58	Mary Anderson on behalf of the California IOUs	Consider updating language under Short-term actions to read "Standardize the CTA-20450B Level 2 communication protocol." Level 2 provides more detailed requirements so that OEMs have an understanding of what specs they should be hitting. CTA-2045-B does not provide sufficient detail. https://www.openadr.org/assets/OADR_CTA2045_Overview%20Webinar.pdf	Thanks for this resource. We have updated the relevant short-term action as follows: "Engage in CTA-2045 standard development. Work with manufacturers and trade associations to identify and resolve product-related conformance to load shift signals." With respect to JA 13, CalMTA notes that advanced load flexibility functionality is not a primary focus of the initial MTI rollout but would be considered as the MTI progresses.
24	3.5 Product plan	59	Mary Anderson on behalf of the California IOUs	Section 3.5.2 includes actions that are ongoing. We recommend coordinating with existing efforts and aim to increase data sharing. Also noting the AHRI res	A core part of the HPWH MTI Plan is to share data via CalMTA's Market Intelligence Data Hub. We welcome coordination and data sharing for ongoing and future efforts related to residential HPWHs.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				HPWH installation will be a Guideline, not a standard	We updated the MTI Plan language to clarify that AHRI's work on residential HPWH installation best practices is a guideline, not a standard.
25	4.1 Current market state summary	61	Mary Anderson on behalf of the California IOUs	The Plan could more explicitly distinguish between barriers that remain unresolved versus those already being addressed through existing CA IOU, CCA, REN, and statewide initiatives. A clearer linkage between identified barriers and gaps not currently served by existing efforts would strengthen the justification for MTI interventions.	CalMTA identified the key market barriers to HPWH adoption in the residential water heating market – despite the important efforts being made by existing initiatives throughout the state – in the MTI's logic model at the time the logic model was developed. Our MTI theory asserts that these barriers remain unresolved at a market level due to current efforts being implemented largely in a fragmented and inconsistent manner. That said, the CalMTA team recognizes that California's residential water heating landscape is rapidly changing. The team understands the importance of collaboration with other HPWH initiatives and will continue to be flexible about partnering to address persistent barriers as well as to avoid duplication of effort. The specific barriers listed in section 4.1 of the MTI Plan are technological, rather than market based. The team will be striving to address these challenges by monitoring technological updates and coordinating with manufacturers, other initiatives, and other market actors throughout the MTI's implementation.
26	4.2 Target market overview	64	Mary Anderson on behalf of the California IOUs	Table 10 - The permitting timeline can also play a role in influencing purchasing decisions. We recommend specifying permitting timeline in this table. For instance, TECH Clean California's Streamlining Permitting Pilot team partnered with the Bay Area Regional	Thank you. We have updated the text in Table 10 to include permitting as a factor.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				Energy Network (BayREN) on a pilot and found that while the statewide average time to issue a permit for a heat pump water heater is 5.9 days, permitting timelines and challenges vary widely by jurisdiction. The Data Analysis Report can be accessed here for review: https://techcleanca.com/about/news/pilot-addresses-barriers-to-heat-pump-water-heater-permits/	
27	4.3 Market actor and end-user insights	67	Mary Anderson on behalf of the California IOUs	4.3.5 notes that incentives are widespread but difficult to navigate. Programs have different applications, different data needs, incentive levels, timelines for submission QPLs, and installation requirements. For TECH there is a portal that others could run their program on (which was done with BayREN and CCCE), but most chose not to use it. For SGIP HPWH, the initial incentive levels were set in regulation and were too high. Combined with the SMUD incentives, this led to price inflation on projects where the stacked incentive covered more than the cost of install. TECH has a best practices report where which includes a high level overview of why to keep programs simple, available here: https://appliance-standards.org/sites/default/files/2026_ASAP_Model_Bill_Final.docx. It could be helpful to have recommendations for standard QPL, data collection fields, and installation requirements. The Muni's, CCAs, IOUs, and AQMD are all providing incentives, and each serves a different purpose with	One of the HPWH MTI Plan strategies is to align California's HPWH programs' QPLs, which we will assess with MPI 16. We also aim to align program messaging about HPWH benefits (MPI 17) and are seeking to create a Market Intelligence Data Hub for a more standardized data collection approach. The CalMTA team will have limited ability to influence some aspects of the administration of programs offered by other organizations (e.g., applications, incentive levels, data and reporting needs, timelines for submission) but through our segmentation activities we will strive for as much alignment as possible to create consistency for the market.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				different program needs, which makes alignment difficult.	
28	5.1 Collaborating with key external programs	68	Mary Anderson on behalf of the California IOUs	External alignment and coordination are core to the MTI's value proposition. Given the existing breadth of HPWH-related market intervention activities, the Plan would benefit from a clearer articulation of how CalMTA's role complements—rather than duplicates—established alignment structures, including IOU technical advisory groups, measure package coordination, and statewide incentive harmonization efforts. Clearly defined scope boundaries and formalized coordination interfaces would help reduce overlap, strengthen accountability, and enhance overall program effectiveness. For example, existing market actors are already actively involved in CEC, CARB, AQMD, CEE, AWHI, AHRI, ASHRAE, ENERGY STAR, DOE, NEEA, etc.	Additional language describing this approach has been added in the MTI Plan Executive Summary. While section 5 is intended to focus specifically on programs (the PA's energy efficiency and ESA portfolios as well other incentive-based and market-development-focused programs) and not policies/regulations or product assessment details, we have added clarifying language about our general approach to collaborating with all external entities working in the HPWH market. Section 7 of Appendix C (Energy and Policy Landscape) includes more detail. We also understand the importance of formalized coordination plans when this MTI moves into Phase III: Market Deployment. Section 2.3 of Appendix E describes CalMTA's proposed approach to defining and documenting cross-program coordination to avoid market confusion, ensure points of alignment are maintained and leveraged, and identify opportunities to adjust MTI strategies as the market evolves. Because the external program landscape is likely to include new or modified offerings by the time implementation of this MTI launches, we will prioritize detailed coordination planning as a high-priority first step in that phase.
29	5.2 Future coordination with external programs	72	Mary Anderson on behalf of the California IOUs	Reference to "right-sizing" should specify the consideration of approaches to minimize the use of supplemental electric resistance elements in HPWHs, so that consumers reap the benefits of the heat	The use of "right-sizing" in Table 11 does not necessarily refer to unit size or performance. We have clarified this as follows: Support manufacturer-level product development and enhancements based on research findings, with the goal of refining and aligning offerings to meet the specific needs of the

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				pump operation to the maximum extent possible.	California market. While reducing energy use is a primary objective, minimizing electric resistance heating is not a specific focus of this MTI Plan.
30	6.1 MTI program data and materials	75	Mary Anderson on behalf of the California IOUs	The proposed data management approach has the potential to support informed decision making and evaluation; however, much relevant market data is already collected through existing programs and evaluations. The Plan would be strengthened by clarifying what new or uniquely integrated data the MTI will produce, how data governance will ensure transparency and consistency, and how data outputs will directly support theory based evaluation and adaptive program management rather than replicate existing datasets.	We intend to utilize existing data to supplement what the MTI will produce and agree that coordinating on data collection and governance is important to ensure transparency, consistency, and efficiency. The CalMTA team will ensure the details of the MTI's data management plan are included in the third-party implementer's implementation plan, which will be a contract deliverable.
31	7.1 Evaluation approach overview	78	Mary Anderson on behalf of the California IOUs	To further strengthen this section, the Plan could more explicitly describe how evaluation activities will assess whether observed market outcomes align with the theorized causal pathways articulated in the MTI's program theory. Establishing early, outcome oriented checkpoints consistent with theory based evaluation best practices would support timely learning and inform decisions to refine, scale, or sunset specific interventions.	We have added details on the use of theory-based evaluation findings – specifically, assessments of the MPIs and associated milestones – to inform timely decisions to refine, scale, or sunset the MTI's interventions. Details of the TBE plan are provided in Appendix F. Also note that section 2.2.6 of the MTI Plan describes the conditions that would trigger exiting the market.
32	8 Risks & mitigation	81	Mary Anderson on behalf of the California IOUs	The Plan identifies key implementation risks and external dependencies. However, given the active landscape of existing HPWH initiatives, there is a heightened risk of program overlap and duplicative efforts that warrants targeted attention. For	We agree that, given the highly active and multi-layered HPWH program landscape in California, the risk of overlap and duplication warrants clear and explicit mitigation and will expand upon current mitigation strategies in section 8 Risk & mitigation and Appendix G.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				example, many market actors, including CA IOUs' various programs, are actively involved with CEC, ENERGY STAR, CARB, AQMD, CEE, AHWI, AHRI, NEEA, etc. Enhancing mitigation strategies to include explicit non-duplication commitments, clearly defined coordination and escalation mechanisms, and performance-based adjustment or sunset criteria would better align the approach with CPUC market transformation principles.	
33	9 Cost estimates	85	Mary Anderson on behalf of the California IOUs	To align more closely with outcome-driven investment principles, the Plan could further clarify how early-phase expenditures support validation of key elements of the market transformation theory, with subsequent investments contingent on demonstrated progress consistent with evaluation findings.	We agree that early-phase investment is crucial to the Plan's success. Appendix H (Cost Estimates) Figure 1 depicts how MTI investment decreases each year while the market impact simultaneously increases. Appendix F (Evaluation Plan) also describes the various MPIs in the short-, medium-, and long-term MTI time horizons. While many of the medium- and long-term MPIs are contingent on initial success, the evaluation plan also highlights that if a strategy or tactic is not yielding the expected result, CalMTA and its implementation partner will adjust the MTI strategy accordingly. We also will ensure that we are tracking the ideas that are most effective and critical to transforming the market in California and sharing that information with key program partners. We have added that context to section 9.
34	Appendix A: Logic Model Packet	1	Mary Anderson on behalf of the California IOUs	Consistent with CPUC definitions of market transformation, the Plan would benefit from clearer articulation of exit conditions or transition criteria under which continued public intervention would no longer be appropriate, reinforcing the MTI's focus on durable, self-sustaining market change.	The logic model is intended to be a high-level visual of the MTI Plan. Exit or transition criteria can be found in section 2.2.6 Conditions that would trigger transitioning out of the market and section 2.2.7 Market end state.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
35	Appendix B: Market Forecasting and Cost-Effectiveness Modeling Approach	16	Mary Anderson on behalf of the California IOUs	It's possible that HPWHs with lower UEFs will be introduced to meet the 2029 standards (UEF just over 2), which may impact the HPWH efficiency distribution in Table 7.	CalMTA has discussed this possibility and plans to closely track sales data and market trends. The CalMTA team will true up forecasting model assumptions on an annual basis to reflect actual market data. This is reflected in the MTI Plan section 6.1.
36	Appendix C: Product Assessment Report	8	Mary Anderson on behalf of the California IOUs	Regarding finding 6: *Morning peak hot water demand and evening peak electricity demand makes sense, though "currently limiting savings opportunities" does not align with the later statement that there is an almost 20% increase in avoided costs. That seems reasonably significant for add on controls over the base efficiency savings of a HPWH. *$37 annual savings seems reasonable, though it will vary based on if this is per the CA avoided cost calculator or based on various actual customer rates. *The load shifting strategy will have a large impact on results. The modeling result that there is an increase in overall energy use is not representative. The CA programs currently do not show an increase in overall energy use because they generally limit post-shed recovery to using the heat pump only. If the unit setpoint is high (~>135 F), it's more likely that there will be an increase in overall energy use because the unit will have to heat a lot to catch up to that setpoint after a shed. If this is a modeled result, it should come with a caveat that it's only applicable to the modeling project	We understand that avoided cost impacts and customer bill impacts are distinct metrics and agree that modeled outcomes related to load shifting performance are sensitive to assumptions regarding control strategies, installation configurations, setpoints, and recovery operation. While advanced load flexibility is not a primary focus of the initial MTI Plan, CalMTA views these topics as important longer-term considerations as the residential HPWH market develops.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				based on the conditions and assumptions used and not representative more broadly. Here's a recent presentation from WatterSaver (from the March ETCC webinar) and they currently have an overall energy use savings based on the current shifting protocol. The shifting protocol is getting even more refined with specific optimized shifting schedules for customers based on their hot water usage pattern and price signal/rate: https://www.etcc-ca.com/sites/default/files/2026-03/webinar%20slides%20-%20Liu%20and%20Besson.pdf	
37	Appendix C: Product Assessment Report	24	Mary Anderson on behalf of the California IOUs	The fifth bullet references updating JA13; please note the residential elements of JA13 cannot be updated until 2031 due to the AB 130 moratorium on updates to residential elements of the Energy Code.	CalMTA acknowledges that JA 13 cannot be updated until 2031 and has added the following clarifying footnote to this bullet: Updates to Title 24 JA 13 are not expected to be feasible until 2031 because of California Assembly Bill 130. Signed in 2025, California Assembly Bill 130 implemented a temporary, 6-year pause on changes to state building standards affecting residential construction.
38	Appendix C: Product Assessment Report	59	Mary Anderson on behalf of the California IOUs	In 9.2.1 the AHRI Residential HPWH installation document will be a Guideline. It is not planned to be a standard at this point.	We updated Appendix C to clarify that AHRI's work on residential HPWH best practices for installation are meant as a guideline, not a standard.
39	Appendix C: Product Assessment Report	60	Mary Anderson on behalf of the California IOUs	This appendix is helpful and brings a lot of information into one easy-to-navigate document--thank you!	Thank you!

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
40	Appendix E: External Program Alignment & Coordination	5	Mary Anderson on behalf of the California IOUs	Section 1 specifies "HPWH installation goals." This topic should consider the following HPWH installation criteria in California: 1. Mandatory provisions currently exist in California's Building Energy Efficiency Standards, Title 24, Part 6, in section 110.3(c)7, and they prescribe backup heat, ventilation, and installation criteria for HPWHs with ducts. 2. For HPWH installation without ducts, the installation space must have a volume not less than the greater of 100 cubic feet per kBtu per hour of compressor capacity, or the minimum volume provided by the manufacturer for this method. The installation space must also be vented to a communicating space via permanent openings that must meet a minimum volume, and permanent openings must consist of fixed flat slat louvers or grilles with specific total minimum net free area and specific locations from the top and bottom of the enclosure locations. 3. For HPWH installation with ducts, the installation criteria specifically require the minimum volumes for the space adjoining the HPWH and the space in which the HPWH is installed to be equal, duct connections and building penetrations to be sealed, exhaust air ducts and all ducts with cross pressure boundaries to be insulated with a minimum R-6 insulation, use of permanent openings like slat louvers or grilles when only HPWH inlet or outlet is	CalMTA recognizes the importance of these criteria applicable to all HPWH installations in California. CalMTA added a summary to the pertinent sections of the MTI Plan and Appendix C that discuss Title 24, Part 6.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				ducted, consideration of minimum net free area depending on whether the inlet or exhaust is ducted, and airflows from termination points to be diverted away from each other when the inlet and outlet ducts terminate within the same pressure boundary.	
41	Appendix E: External Program Alignment & Coordination	13	Mary Anderson on behalf of the California IOUs	Table 1, C&S programs and other regulatory efforts - Consider inclusion of the following: 1. Load shifting HPWH incentive programs like California's Self Generation Incentive Program (SGIP). 2. Joint Appendix 13 (JA13) within Title 24, Part 6. As of 04/10/2026, CEC's list of HPWHs certified to JA13 include 533 records. 3. PG&E's WatterSaver (https://www.watter-saver.com/how-it-works/) - although a TOU rate plan is no longer required to participate in WatterSaver, a customer with an existing TOU plan may see additional bill savings when WatterSaver shifts the customer's water heating to lower priced periods. 4. Statewide Measure SWWH025 with SCE as the PA lead - As a fuel substitution measure, the measure case is defined as a HPWH that replaces a base case natural gas water heater. Efficiency requirements are based upon the uniform energy factor (UEF) metric, as required by federal regulations. The minimum qualifying measure case efficiencies exceed the California Title 20 and Code of Federal	CalMTA has included this list of C&S programs in Table 1 of Appendix E, including Watter-Saver and SGIP. The regulatory efforts are included in the following sections: for JA 13, see section 7.2.2 of Appendix C; for Statewide Measures SWWH025 and SWWH014, see section 4.2.1 of Appendix C, section 3.2.3 of Appendix B, and Attachment 1 to Appendix B.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				Regulations standards (see Code Requirements section). In addition to traditional 240V heat pump water heater, this measure includes offerings for 120V heat pump water heater with or without electric resistance elements. The 120V offerings were adopted based on the CalNEXT report Plug-in 120V Heat Pump Water Heater Measure Package Updates to California eTRM (ET23SWE0074). 5. Statewide Measure SWWH014 with SCE as the PA lead - Measure case is same as SWWH025 but base case is an electric storage water heater with a storage volume of 30, 40, or 50 gallons.	
42	Appendix E: External Program Alignment & Coordination	13	Mary Anderson on behalf of the California IOUs	Consider referencing Energy Transition Coordinating Council research in the second column of Table 1 for the "Existing research and development projects/programs" MTI alignment goal topic.	Thank you for this suggestion. The text has been revised.
43	Appendix E: External Program Alignment & Coordination	14	Mary Anderson on behalf of the California IOUs	The second column associated with "Local energy efficiency programs that install HPWHs" should also reference programs associated with NCPA, PG&E and SoCalGas - all of them are summarized in the "Electric HPWH" tab of CEE's residential water heating program summary.	Table 1 of Appendix E is intended to be representative of key types of programs and examples of active programs that the Residential HPWH MTI will seek to coordinate with and complement, rather than a comprehensive list of all programs that meet that description. We have added language clarifying this point. Creating a current and comprehensive inventory of active programs will be a critical step before this MTI moves into Phase III: Market Deployment. Regarding the CEE program summary, because CalMTA is not a CEE member, we are unable to access this document and respond to the specific

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
					program suggestions. We also have reviewed the flagged CEE program summary and have confirmed that the relevant programs are included. We have elected not to include gas-focused programs, so the list does not include some programs noted in the CEE program summary.
44	Appendix F: Evaluation Plan	8	Mary Anderson on behalf of the California IOUs	Table 1 specifies a bullet to "Support split-system technology development and adoption." We recommend including a footnote that summarizes the value of this intervention for California's consumers.	Thank you, footnote added.
45	Appendix F: Evaluation Plan	8	Mary Anderson on behalf of the California IOUs	The "Leverage existing training efforts to help installers" Strategic Intervention in Table 1 should consider referencing the U.S. Department of Energy's Energy SkilledTM water heating programs as a footnote: https://bsesc.energy.gov/recognition/water-heating-programs In addition to manufacturer training resources, it also references California-centric resources offered by PG&E, TECH Clean California and ENERGY STAR Heat Pump Water Heater Manufacturers Action Council, and Sheet Metal Workers Local 104 Bay Area Industry Training Fund.	Thank you, footnote added.
46	Appendix F: Evaluation Plan	20	Mary Anderson on behalf of the California IOUs	The installer survey bullets in section 2.4.4 should also survey contractors about their current understanding of California's building efficiency standards set forth in Title 24, Part 6. The following fact sheet on the Energy Code Ace website is a good resource:	Thank you, revised.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				https://energycodeace.com/resources/?itemId=342396&showSingleDetails=1	
47	Appendix G: Risk Management Plan	3	Mary Anderson on behalf of the California IOUs	The installation criteria for HPWHs are relatively new in Title 24, Part 6, and were incorporated in the 2025 edition of the code. While the messaging in the federal standard is important and is identified as a mitigation approach, HPWH installation criteria set forth in Title 24, Part 6, should also be included as a bullet.	Thank you for this comment, we have added content to Appendix G.
48	Appendix G: Risk Management Plan	8	Mary Anderson on behalf of the California IOUs	We recommend revising the statement "California programs are not offering HWPH incentives." CEE's program summary list specifies that PG&E, SMUD, SoCalGas (statewide midstream commercial water heating program lead), SCE, and Southwest Gas-California have offered HPWH incentives, and three of those include a load flexibility component.	Thank you for this comment. We edited the language in the risk chart to better clarify. The intent of this risk is not to suggest that incentives are not currently available, but rather to identify a potential future risk scenario in which incentive funding is reduced or discontinued. The probability of this risk is low; however, given the importance of incentives in supporting adoption, the MTI includes mitigation strategies should this condition emerge.