Commercial Replacement and Attachment Window Solutions (CRAWS) Market Transformation Initiative

Appendix I: MTAB and Public Feedback

June 26, 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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1 Purpose

This document provides a comprehensive list of comments received from the Market Transformation Advisory Board (MTAB) on the draft Commercial Replacement and Attachment Window Solutions (CRAWS) 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 May 6, 2026, and the full draft of the MTI Plan and Appendices was provided to the MTAB and the public from May 22, 2026, to June 9, 2026. We received no comments from the public on the CRAWS 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

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1	1.1 Technology overview	9	Fred Gordon	First sentence, before tech review. Mentions carbon only, not energy efficiency. Is this deliberate?	Revised, thank you.
2	1.1 Technology overview	10	Jillian Rich	Might be helpful to define "clear glass". I interpret it as windows without a factory tint or after-market film applied like you often see in high-rises. Low-e coating is usually a clear-looking product as far as I know	A footnote has been added after the first mention of "clear" glass.
3	1.1 Technology overview	10	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Bundling window replacements with HVAC replacements is a critical sales point of the program. The report states that commercial replacement and attachment window solutions "...save about 9% annually in whole building energy costs..." Would reducing energy costs by 9% be enough to reduce the required size of a heat pump?	The 9% savings refers to bill savings, which are complex calculations involving various rate structures. In terms of reducing HVAC loads, multiple pilots within and beyond California have documented larger % energy savings resulting from installation of CRAWS (e.g., 20% electricity savings in the NEEA CSW project and 40% gas savings in CalMTA's Madison Elementary project). These savings are enough to support downsizing opportunities for HVAC systems.

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4	1.1 Technology overview	10	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	CRAWS (U ≤ 0.35) generally meets or improves on baseline Title 24 levels, but does not meet the most stringent prescriptive requirements in certain climate zones or scenarios in Title 24.	Title 24 does not cover window retrofits. CRAWS represents an added benefit that can be implemented to complement other energy efficiency requirements. CalMTA selected the U value and SHGC value for the CRAWS products to optimize energy savings across all California climate zones, based on extensive energy modeling. The CalMTA team is aware of commercially available products that meet or improve upon our baseline product specifications and can be specified on a case-by-case basis.
5	1.2 Market overview	10	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	The biggest barrier may be the fact that there is no reason (mandate) for most building owners to consider adding replacement or attachment window solutions.	CalMTA agrees that there is currently no mandate for window retrofits. However, there are compelling reasons for building owners to adopt CRAWS now: improved thermal comfort and noise abatement, aided by energy savings and downsized HVAC potential (at time of replacement) that offer capital and ongoing operation cost savings. If/when BPS is adopted in CA, that will provide another driver for adoption, if not a mandate.
6	1.3 Vision	12	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	This proposal relies heavily on three primary drivers: (1) Non-Energy Benefits (NEBs), (2) policy mechanisms—particularly Building Performance Standards (BPS), and (3) measure bundling strategies. The principal risk lies in the long-term persistence of the market following CalMTA's exit, as the pathway to sustained adoption without these supporting factors is not yet fully demonstrated.	The lastingness mechanism is expected to increase awareness of the combined energy and non-energy benefits. Currently, awareness is nearly non-existent. BPS is a potential catalyst/driver that will aid with moving building owners off the 'do-nothing' decision and can amplify the other lastingness mechanisms. Bundling strategies are a financial opportunity to optimize the ROI and reduce financial barriers. The MTI aims to demonstrate that the value stack created by these and additional factors will drive the market to

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					sustained adoption. If the strategic interventions fail to drive the desired outcomes, as defined by the evaluation plan, the MTI will either adapt in consideration of observed outcomes or may sunset if no viable path forward can be identified (as is always the case with MTIs).
7	1.4 Strategic interventions for Phase III	12	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Consider the potential of leveraging the TECH Clean California incentive program.	Thank you. TECH Clean California is a residential and multifamily program driving adoption of heat pumps for space and water heating. CRAWS is a commercial market MTI. If TECH Clean California expands into commercial markets, then we would look to work together given envelope/HVAC interactions.
8	1.4 Strategic interventions for Phase III	12	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Market transformation expects "self-sustaining" markets, not ones that remain dependent on incentives. It seems that the intervention proposed is mainly focused on "incentives," not on how "self-sustaining" the market would be after the interventions.	There are seven strategic interventions described in the MTI Plan. Incentives play a role but are not the primary intervention. Self-sustained market activity is expected to be driven primarily by a diverse value stack including substantially increased awareness of energy and non-energy benefits, the corresponding value proposition, and business case.
9	1.5 Recommendations	13	Jillian Rich	Total nit, but the finance person in me always wants right-aligned financials for comparability.	Revised, thank you.
10	2.1 Theory of market transformation	14	Fred Gordon	The lost opportunity market due to HVAC systems being oversized seems valid but overstated. Prior installations have often been on "problem buildings" where there were thermal comfort, HVAC balancing, or other related problems. If the is high heat loss through the shell and a less than perfect air distribution system these problems may persist with the new HVAC system and a low efficiency shell.	Agreed that the problem may persist, but may be mitigated enough by the new/larger HVAC system that the net effect is the same: far less motivation to upgrade the envelope. In other words, if it's difficult to drive envelope upgrades with an aging HVAC system, it will be even more difficult/less likely to do so once a better (and oversized) HVAC is installed.

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11	2.1 Theory of market transformation	15	Jillian Rich	See comment in section 1.1. exec summary on "clear". My original assumption was wrong above - clarify in both sections?	Thank you. A footnote has been added after the first mention of "clear" glass in Section 1.
12	2.1 Theory of market transformation	16	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	The identified target market for VIG seems small and unpredictable. Consider pushing this product for new construction.	VIG for single-pane replacement and CSW are not seen as interchangeable products. Each has its own market segment where it is expected to be an optimal solution relative to the other. VIG for single-pane replacement is expected to be the preferred product for larger scale building renewal projects where the scope of retrofit activity and strategic goals of building renewal will favor a non-attachment solution. We agree that this is, currently, a small and emerging market – but not insignificant. We are currently not modeling VIG adoption, but Section 2.1.2 of the MTI plan goes into additional detail about the rationale for retaining VIG in the MTI at this time.
13	2.1 Theory of market transformation	17	Fred Gordon	Third point. I don't think CalMTA has been able to assess the importance or lack thereof of quantifying the value of NEBs. Hard numbers are always nice, but owners often make decisions about factors that influence occupancy rate, rent, productivity, or property value without hard numbers today. I am not convinced either way with the idea that owners need hard data to act. Owners always talk about ROI, but don't always want numbers for "soft" values and may not believe them.	There are multiple audiences that NEBs will impact. While it's true that building owners may take action based solely on the qualitative impact of the NEB, quantifying them to build a stronger business case would likely add value and increase confidence in making the investment. The quantification of NEBs is expected to be more important/valuable to financiers for a more robust business case/ROI analysis. Lastly, policy makers are already working to quantify NEBs (see CPUC and CEC projects in this area) to support policy making and better inform cost-effectiveness calculations. Other organizations are also actively working to quantify NEBs. Assuming success by others, the CalMTA team can utilize those data for our efforts.

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14	2.1 Theory of market transformation	17	Jillian Rich	First bullet, last sub-bullet - perhaps consider adding that there appears to be a lack of knowledge of cost especially as it relates to the tradeoff costs between CRAWs and HVAC over-sizing (both upfront and operational costs over time)	Revised, thank you.
15	2.1 Theory of market transformation	19	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Additional data potentially available from the California GTI Energy research grant could improve this section.	Agreed, thank you. CalMTA does participate on the TAC for the GTI project and will incorporate learnings as the pilot gets underway.
16	2.1 Theory of market transformation	21	Fred Gordon	Need to define "ESCOs" as used here. Were respondents primarily firms that bundle performance guarantees or pay for performance with financing and installation? Or did respondents include audit/install contractors who do not directly provide financing and guarantees. The extensive reliance on the term "ESCO" and scant mention of audit/install contractors makes me wonder if it's both.	The term "ESCO," as used throughout the MTI Plan (including this appendix), refers to firms that provide financing, which aligns with the industry and DOE definition: *"ESCOs are distinguished from other firms that offer energy-efficiency improvements in that they use the performance-based contracting methodology. When an ESCO implements a project, the company's compensation is directly linked to the actual energy cost savings."* Firms that were interviewed by CalMTA as part of the market characterization fit this definition.
17	2.1 Theory of market transformation	21	Fred Gordon	Instead of saying that ESJ markets will be brought along, is it accurate to say that they will be used as leading demonstration markets for this initiative, in part because they have significant opportunities and specialized programs that may provide leverage?	Both are true: The MTI aims to ensure ESJ communities are not left behind (due to financial burdens) AND also aims to utilize ESJ sites as early demonstration projects, given greater need/benefit and ESJ-specific programs, points of leverage, etc. The first bullet under section 2.1.8 was modified accordingly.

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18	2.1 Theory of market transformation	22	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	The CEC should be included among key decision makers who need to be informed.	Agreed, thank you.
19	2.1 Theory of market transformation	22	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	This report assumes that short- and medium-term utility incentives are available to include envelope evaluations as part of any HVAC upgrade or replacement which is a good idea. It would be useful to evaluate how the MTI would be impacted if an incentive program was not available to support the MTI.	Section 8 risks & mitigation describes mitigation steps if incentives for either envelope assessments or envelope retrofits fail to materialize or contribute to increased adoption (noting that incentives are only one of many drivers of adoption).
20	2.2 Strategic interventions	25	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	We agree that all HVAC incentive programs should require an envelope audit and analysis of whether window replacement (and insulation and air sealing) can lower the initial HVAC cost. The cost savings from the lower initial HVAC cost could cover the cost of the audit and a portion of the window replacement cost.	Agreed, thank you.
21	2.2 Strategic interventions	25	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	California BPS could be a huge driver for addressing windows. The other interventions may prove to be less impactful.	Possibly. The robustness of the CRAWS MTI is due in part to its outcomes being driven by a constellation of interventions and opportunities, such that the MTI is not dependent upon any one activity, policy, or market driver.
22	2.2 Strategic interventions	26	Jillian Rich	Not sure where this goes (maybe SI 6? Or back when you mentioned the calculator you'd build?) but do installers need any	No new physical tools are needed. We do mention the need to quantify NEBs for those situations where a more quantified benefit is needed to

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				additional physical tools for selling CSWs? For instance, they all mostly have infrared cameras and tools to show the customer a visual of heat gain, but the main selling point are NEBs. Anything there?	develop a value proposition, build a business case, etc. Typical energy audits or envelope evaluations would be a common first step in selling CRAWS technologies.
23	2.2 Strategic interventions	28	Fred Gordon	Opportunities may include renovation of office space to improve attractiveness and/or change use to improve occupancy.	Agreed. This is related to Opportunity #1, though not exclusively. Since the opportunities listed in this section are directly from the logic model, and this level of granularity is not expressed in the logic model, the CalMTA team is leaving this section unchanged.
24	2.2 Strategic interventions	32	Fred Gordon	Part of establishing the value proposition should be understanding how the building owner/manager assesses certain types of benefit- with average dollar numbers, anecdotal dollar numbers other numerical criteria, or subjective evidence.	Agreed. This sentiment is reflected in section 2.1.2 Target market where we note that the value proposition will vary by building type and ownership models. Understanding what the building owner values will necessarily include understanding how they calculate/define benefit.
25	2.2 Strategic interventions	40	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Another intervention we suggest is focused outreach toward historic building owners and historic preservation professionals. This was discussed in MTAB meetings and it would be useful to have that approach documented.	Agreed. Historic buildings are listed as one of the MTI's target markets where strategic interventions will be focused. Also, revised Strategic Intervention #4 in the MTI Plan to specifically call out historic preservationists.
26	2.2 Strategic interventions	41	Fred Gordon	Should there be a section on trade ally development and diversification? The workforce section seems to dart back and forth between workforce and trade allies. They overlap but might be best separated so it's clear you're working on both.	Good point. The CalMTA team added language to Strategic Intervention #4 and section 2.4 Workforce development.
27	2.2 Strategic interventions	43	Jillian Rich	Also not sure where this goes, but I didn't see anything about tying into local ESPM benchmarking ordinances like SF's. I think	Good suggestion. Some local/regional benchmarking programs do require periodic audits. Currently, the statewide benchmarking

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				they not only require the score but also a regular energy audit. Are CRAWs a standard option in an ASHRAE Level 1 or 2 audit?	program does not. The CalMTA Team added language to Strategic Intervention #4 and section 2.1.5 Market opportunities and key leverage points.
28	2.3 ESJ communities	45	Fred Gordon	Seems to start with strategic intervention 2. Is this misnumbering? The numbering also jumps from 4 to 6.	Section 2.3 ESJ communities only includes the strategic interventions with ESJ impacts, which are labelled with our ESJ icon that is defined in Strategic Intervention #2 (see footnote on page 28). Strategic Interventions #1 and #5 do not have a strong ESJ impact so they are omitted from section 2.3 (ESJ communities).
29	2.4 Workforce development	47	Fred Gordon	2.4.3 title. I suggest that whenever a title consists of two or more acronyms and no words, spell something out.	Revised, thank you.
30	2.5 Total system benefit & cost-effectiveness forecast	49	Fred Gordon	2.5.1. Thank you for explaining why you picked the particular curve. This is a small but valuable step in demystifying the B/C process. I rarely see this.	Thank you for your input.
31	2.5 Total system benefit & cost-effectiveness forecast	50	Fred Gordon	It would be useful to state what the end of forecast cumulative participation rate (%) is expected out of the MUSH and non-MUSH markets.	The CalMTA team added a statement that specifies the % of total incremental adoption forecasts to be non-MUSH (82%) with reference to Table 6 of Appendix B, which presents the window square footage detail.
32	2.6 Other benefits	52	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Another benefit of this technology is related to historic preservation. A construction team could upgrade the windows without changing the aesthetics of the building.	Agreed, thank you. Historic buildings are one of the target markets for this MTI and are specifically identified in section 2.1.2 Target market.
33	3.3 Product performance	60	Fred Gordon	Figure 4 needs a legend for building types.	Thank you for pointing out that the abbreviations are unclear to the reader. They are defined in a

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					table several pages earlier, so we've added a footnote to the title referring the reader to that table.
34	3.4 Product plan	62	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Consider also including professional conventions (architects, historic preservation, BOMA) and industry trade shows under 3.4.2.	Thank you for the suggestion. A sentence has been added in section 3.4.2 Stakeholder and industry collaboration stating that CalMTA will participate in professional conventions.
35	4.1 Current market state summary	63	Fred Gordon	Some of the emerging technologies have been emerging for 30 or 40 years without widespread commercial, success. E.G., aerogel and electrochromatic windows. They remain in the market in small niches. That might be worth mentioning. Not "early stage' but each limited by persistent barriers, technical, reputational, or cost.	Edited section 4.1.2 Technology outlook to reflect this distinction.
36	4.3 Market actor and end-user insights	66	Fred Gordon	NEBS seem to be called "secondary considerations" in general. But if a building is difficult to occupy due to comfort, noise, or air quality, does this generalization hold? You are reporting accurately on what was said, but does the evidence in the field line up? If respondents have not been through a specific decision process, they sometimes lack the experience to provide a reliable answer, so they retreat to generalities.	Edited this paragraph to clarify and improve accuracy.
37	4.3 Market actor and end-user insights	66	Jillian Rich	4.3.1 - I'd bring up historical building NEB to retain external façade. Also, I think a lot of our building's pre-date CA building code for safety glass / tempered glass. You mention safety benefits of preventing glass	Edited paragraphs in Section 4.3.1 Non-energy benefits to clarify and improve accuracy.

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				from breaking, which is especially important with older, non-tempered glass.	
38	5.2 Related programs and potential alignment approach	69	Jillian Rich	Table 8 - Per comment above, local benchmarking ordinance programs? What about green business programs? LEED? All make energy recs.	Table 8 is intended to be representative of key types of programs and examples of active programs that the CRAWS MTI will seek to coordinate with and complement, rather than a comprehensive list of all programs that meet that description. It is also focused on programs offered by the California Program Administrators (PAs), rather than industry entities or policymakers. The CalMTA team added language clarifying this point and acknowledging the value of coordination with other non-PA entities working in this market.
39	5.2 Related programs and potential alignment approach	70	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	TECH Clean California, while primarily focused on single family homes, also offers rebates for new heat pumps in multifamily buildings. If a multifamily building is considering an HVAC replacements, then it might be a good opportunity to also consider commercial replacement windows which would potentially reduce the size and cost of the HVAC equipment. Therefore, it would be appropriate to align and consider synergies with TECH Clean California.	TECH Clean California, by design, only incentivizes clean space and water heating technologies and is not structured to offer incentives on CRAWS and other commercial products. The representative multifamily programs identified in Table 1 of Appendix E are those that include, or are structured in a way that could include, CRAWS products in common areas, which have limited impact on building-level HVAC sizing.
40	7.2 Market progress indicators	75	Jillian Rich	I know I said this in the last meeting, but I don't think tracking climate/energy action plans are at all correlated to success of this MTI. CAPs are meant to be long-term policy documents so they rarely mention specific technologies. They instead focus on outreach/implementation channels. I did a quick check of a handful of recent CAPs just to make sure my understanding from when	Following the most recent MTAB meeting, we modified Table 8 of the MTI Plan to state, "Local reach codes and Climate Action Plans" to describe broader opportunities (see row titled, "Programs and services that address whole building energy performance improvements or strategic energy management.")

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				I used to write these plans ages ago was still valid, and it is. See Strategy 1 (page 69) of the San Carlos Climate Action Plan or measure GHG-04 from the Sacramento County CAP, among others. You'll see nothing about lighting or HVAC or water heaters, let alone windows. They might mention the building envelope but no specific measures.	CAPs are evolving and do identify priority areas such as weatherization and commercial HVAC that drive development of local reach codes. CRAWS could be highlighted as a weatherization solution for commercial buildings, consistent with our intervention language. We acknowledge that CAPs are one example of policy levers available to drive CRAWS adoption, but we will not rely exclusively on CAPs.
41	8 Risks & mitigation	78	Jillian Rich	Cost/financial risk: Is it worth pointing out that utility incentives might be a benefit and a challenge? A benefit because it'll help boost manufacturer and installer awareness and capability, but a challenge because incentives almost always artificially inflate the cost of a technology and sometimes the higher cost persists even when incentives end. Something perhaps to consider.	Downstream utility incentives would drive participant awareness and offset capital costs. While CalMTA generally recognizes that downstream incentives can inflate product costs, it is unclear to what extent that has been documented. The program team will track product costs through evaluation and other data management activities and will modify strategies as needed if we see upward price pressure as a result of our incentives.
42	8 Risks & mitigation	80	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	We suggest that this risk has a high probability of occurring: "CA external EE programs don't offer incentives for building envelope evaluation as part of HVAC upgrades."	Thank you. Others have commented that they believe incentives for envelope evaluations are a good idea and some have suggested that they would be the preferred focus of incentives, vs. for product directly, as they would drive similar behavior without the risk of driving up product costs. Given that, and that changing it to "high" wouldn't alter the described mitigations, the CalMTA Team believes that "medium" is appropriate for the risk level.
43	9 Cost estimates	82	Mary Anderson on	Market and outreach costs may be overstated. Once a statewide BPS is	BPS alone is not expected to drive awareness of window solutions – only increase the need to

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			behalf of the California Investor-owned utilities (IOUs)	implemented, there will be considerably more awareness of the impact of poor performing windows.	research pathways to satisfy compliance. Extensive market characterization has documented the nearly non-existent awareness of retrofit solutions and significant confusion, even when respondents indicate familiarity. As such, we expect awareness, education, and outreach activities to be critical to the success of the MTI.
44	9 Cost estimates	82	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Midstream/upstream incentive budget estimates seem low, and there is some concern that the market may not strongly participate at that incentive level.	The $750K for mid/upstream incentives are primarily for demonstration projects, aimed at ESCOs and HVAC designers to secure their involvement where they would otherwise not be motivated to engage. Additionally, there are some incentives set aside for manufacturers to submit secondary windows to AERC for rating. We feel these are adequate for the scope suggested but will monitor and adjust if needed.
45	Appendix A: Logic Model Packet	2	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Barriers / Opportunities include the lack of education around CSW, and benefits they provide.	Agreed. This is identified in barrier #1.
46	Appendix A: Logic Model Packet	2	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	"Awareness of problem, solutions and business case grows among:" The list leaves out general window installer contractors.	General window installers are not likely participants for CSW installation (and we are not currently modeling VIG adoption). CSW products compete with full window replacement, and the skill level to install CSW is much lower than for full window replacement. If conditions change as the MTI is deployed into the market, we will revise accordingly.
47	Appendix B: Market	18	Mary Anderson on	The baseline market adoption is also effected by the lack of CSW manufacturers.	Thank you for your comment.

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	Forecasting and Cost-Effectiveness Modeling Approach		behalf of the California Investor-owned utilities (IOUs)		
48	Appendix B: Market Forecasting and Cost-Effectiveness Modeling Approach	25	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Per square foot unit energy savings are not shown. This is a key input parameter that should be included.	We agree that this is a key input parameter. The energy savings are shown in section 8.1 of Appendix C; the CalMTA Team updated the document to include a reference to that information.
49	Appendix B: Market Forecasting and Cost-Effectiveness Modeling Approach	26	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	The MTI uses one per-unit savings value across all 16 climate zones. There is a measure package for commercial secondary windows that is almost approved by CPUC. Once approved, it would be beneficial for the MTI to adopt the per-unit savings from the measure package and utilize the 16 climate zones for CA.	The CalMTA Team included unique load shapes for all 16 climate zones; we did not use one savings value across all climate zones. We corrected a sentence in section 3.7 of Appendix B to clarify this. We also state in section 3.8 of Appendix B that we model a single installation case, which is true, but should not be confused with using a single savings value. The load shapes from each climate zone and building type were combined using weights from the TRM to create one final avoided cost value for each IOU as can be seen in the weighting Tables 35 and 36 in Attachment 2 of Appendix B.
50	Appendix B: Market Forecasting and Cost-Effectiveness Modeling Approach	32	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	A TRC of 1.31 seems very high compared to what we are seeing in the commercial measure package, which is approximately a 0.5 average TRC without admin. It would be helpful to understand the difference.	The TRC of 1.31 is higher than the average of all TRC values across all building types and climate zones. The primary reason for this is that we modeled adoption in part as a function of customer economics, so the resulting adoption is high in building types and climate zones with high savings and fast payback periods. This selection for cases where adoption "makes sense" leads to a higher TRC compared to the TRC for an average building:

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					the 0.5 average TRC includes many cases with low savings and long paybacks, whereas our result includes more of the higher savings cases and almost none of the low savings cases. This analysis also helps inform the MTI strategy by identifying target markets that are more likely to adopt the solution. If scaling results in cost declines, or NEBS support adoption in other markets, this analysis will be updated. The CRAWS MTI also recommends higher performance CSW with U-factor = 0.35 and SHGC = 0.25, which is comparable to the performance specifications used in our field study.
51	Appendix C: Product Assessment Report	15	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Are there modeling results for VIG?	A sentence has been added to section 4.2.4 of Appendix C explaining that because CSWs and VIG for SPR showed similar energy performance (within 1% on average), CalMTA used CSWs to represent all CRAWS technologies.
52	Appendix C: Product Assessment Report	16	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	It is unlikely that CSWs or VIGs could provide a one-measure solution toward BPS goals for any but the smallest percentage of buildings.	The NLR study was referenced as a demonstration that envelope measures such as windows can generally reduce HVAC costs in buildings. The CalMTA Team revised text in section 5.1.1 of Appendix C to remove specific dollar values, as they were not specific to CRAWS technologies or to commercial buildings.
53	Appendix C: Product Assessment Report	16	Mary Anderson on behalf of the California Investor-	It is unlikely that CSWs or VIGs could provide a one-measure solution toward BPS goals for any but the smallest percentage of buildings.	Agreed that the sentence as written could overstate the potential for CRAWS to enable compliance with BPS. The CalMTA revised text in section 5.1.2 of Appendix C to read, "Given the simplicity of installation and the substantial savings they provide,

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			owned utilities (IOUs)		CSWs and VIG for SPR could offer an effective pathway for compliance with whole-building energy and emissions reduction targets set by BPS."
54	Appendix C: Product Assessment Report	22	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	"VIG glazing units meeting the CRAWS product definition exceed the prescriptive energy code requirement for glazing units." The CA energy code only provides performance requirements for whole fenestration units, including framing. Please provide substantiation for this assertion.	The paragraph in section 6.1 of Appendix C has been restructured to reference the Title 24 requirement that replacement glazing must be at least equivalent to the original in performance.
55	Appendix C: Product Assessment Report	24	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	Please include analysis regarding IECC-Commercial code.	IECC-Commercial was not originally included in the analysis, given that it is not used as the basis of building energy codes in California and, in contrast with ASHRAE 2025, its most recent version has not raised new industry standards for glazing performance. Text in section 6.4.1 of Appendix C has been revised to describe the national influence that both ASHRAE standards and ICC model codes have on accelerating the adoption of high-performance glazing technologies.
56	Appendix D: Market Characterization Report	8	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	It is helpful that ESCOs recognize the non-energy benefits, but their contracts are based off of performance. The table associated also should include ESCO testimonials. "Although familiarity with advanced window technologies remains low, market actors such as ESCOs recognize the potential non-energy benefits of CSW and VIG (see Table 2). "	Thank you for this observation. Appendix D (Market characterization report) is a final deliverable produced by Cadmus (2025) and is not subject to revision by the CalMTA MTI team. Your comment has been noted and will inform the team's ongoing work.
57	Appendix D: Market Characterization Report	12	Mary Anderson on behalf of the California	1.2.5 "While architects and glazers expressed some level of awareness of CSW products, they associated them almost exclusively with historical buildings." We	Thank you for your input.

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			Investor-owned utilities (IOUs)	agree with this because of all the other savings associated with the project. This would include demo, cranes, and preserving the frame and look of the building.	
58	Appendix D: Market Characterization Report	69	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	"Manufacturers demonstrated the highest level of familiarity with both CSW and VIG technologies" What type of manufacturers were interviewed? Shouldn't this be closer to 100%? 6 interviewed, and 4.XX knew of the technology. Was this because of the nomenclature? Or what was the gap for a manufacturer not familiar with the technology? Depending on the explanation, this issue should be addressed in the logic model.	The sample (n=6) included both CSW and VIG manufacturers, and the gap reflects each being very familiar with their own product but less so with the adjacent technology. The 4.2 for VIG is CSW manufacturers rating their VIG familiarity lower (and vice versa), not a manufacturer unfamiliar with their own product.
59	Appendix F: Evaluation Plan	9	Mary Anderson on behalf of the California Investor-owned utilities (IOUs)	One of the market progress indicators is getting a commercial secondary windows measure package developed in the eTRM. This is an activity separate from the MTI that Energy Solutions is in the process of completing, so it should not be considered a measure of success for the MTI.	We agree that the market progress indicator is not intended as a measure of success for the MTI and will not be attributed to the MTI; however, it does represent a critical enabling condition for utility program adoption of CRAWS, so it remains important to track, regardless of who drives it.
60	Appendix F: Evaluation Plan	10	Jillian Rich	Same comment above about CAPs	Thank you, please refer to our Climate Action Plans (CAPs) response in row #40.
61	Appendix F: Evaluation Plan	15	Jillian Rich	Page 15 2.3.2 - Missing HVAC installers on list of key market actor groups? They're in the PTLM list but not here.	We added HVAC installers to the list in section 2.3.2 of Appendix F (Evaluation Plan). The complete plan for interviews will be finalized as part of the final Evaluation Plan developed with input from the MTI third-party evaluator selected for this MTI.
62	Appendix F: Evaluation Plan	n/a	Jillian Rich	General question - Do the evaluation plans usually specify how you'll find your contact lists for interviews and surveys similar to the	These details will be specified as part of the final Evaluation Plan, developed with input from the MTI third-party evaluator that is selected for this MTI.

#	Section	Page #	Source	MTAB Feedback Provided	CalMTA Response
				section on how you'll obtain sales data? I wonder how you'll achieve a representative sample, especially for measuring awareness I think you need a fresh sample every year(?) We've found it extremely difficult in our recent process evaluations to pinpoint commercial customer decision makers and a representative mix of industry representatives.	
63	Appendix F: Evaluation Plan	n/a	Jillian Rich	Overall excellent job - I can tell RI and the evaluation subcommittee knows their stuff!	Thank you for your input!
64	Appendix G: Risk Management Plan	n/a	Jillian Rich	It may be helpful to document the risk of a severe economic disruption or public health event similar to COVID-19 that impacts the occupancy and ownership of commercial building spaces, even in the MUSH market. Such an event could delay progress by 3-5 years and would require downsizing the MTI market potential.	These types of 'black swan' events pose a risk to EE programs broadly and aren't necessarily an MTI-specific risk that the MTI team can mitigate.