



Market Transformation
Advisory Board (MTAB)
Meeting

1

Welcome & Agenda

Stacey Hobart, Principal, Stakeholder
Engagement & Communications



Agenda



Time	Agenda Item	Presenter
10:00 a.m.	1. Welcome & Agenda	Stacey Hobart
10:05 a.m.	2. Safety Minute & COI Declarations	Stacey Hobart
10:10 a.m.	3. Introductions & Ice Breaker	MTAB & CalMTA
10:25 a.m.	4. Review Draft MTAB Meeting Notes 6/14	Stacey Hobart
10:30 a.m.	5. RFI Initial Report & Advancement Plans Status	Jeff Mitchell
10:45 a.m.	6. Draft Advancement Plan: Foodservice Water Heating Systems	Sepideh Reznia
11:45 a.m.	<i>Break (10 min)</i>	
11:55 a.m.	7. Equity Update	Rachel Good
12:35 p.m.	8. Public comment	
12:45 p.m.	<i>Lunch (45 min)</i>	

Time	Agenda Item	Presenter
1:30 p.m.	9. 2nd Quarterly Progress Report <ul style="list-style-type: none"> • CalMTA Operations • Phase II MTI development update 	Stacey Hobart, Elaine Miller & Jeff Mitchell
2:50 p.m.	10. Draft 2025 Annual Budget Advice Letter (ABAL)	Lynette Curthoys
3:50 p.m.	<i>Break (10 min)</i>	
4:00 p.m.	11. MTI Evaluation in Practice	Karen Horkitz
4:40 p.m.	12. Public Comment	
4:50 p.m.	13. Next Meeting & Next Steps	Stacey Hobart
5:00 p.m.	Adjourn	

Attendees will be muted throughout the meeting and can raise their hand during the public comment period to be unmuted.

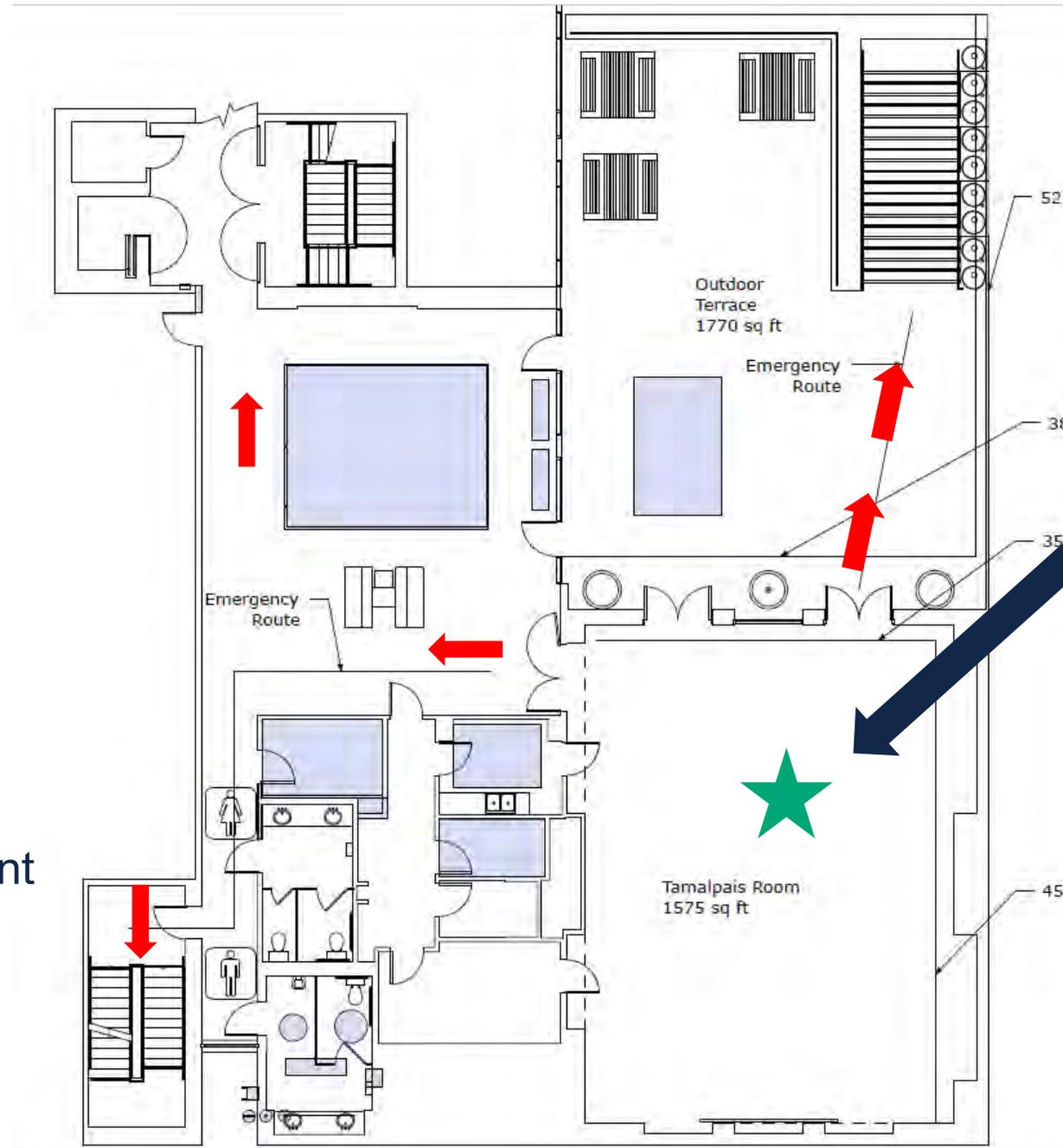
Safety min

Brower Center 2nd floor, Tamalpais Room

 = Exit route

 = turn left down the hall

 = AED and First Aid kit are downstairs. Go to front desk or contact 911 for emergencies



You are here

2 COI Declarations



MTAB Declaration of COI

MTAB eligibility

- Can't receive funding from CalMTA or be in pursuit of funding

Recusal requirements

- Can't bid on RFP/RFQ if giving input after Phase I
- Those with competitive interest can recuse from discussion, but must leave MTAB if responding to RFP
- Agree not to influence remaining MTAB
- Interpretation, if needed, done by CPUC staff

Transparency

- Public meetings & process where COI concerns can be raised by the public



CalMTA COI Policies



- CalMTA has robust COI policies to ensure decision-making is transparent, impartial, and unbiased
- RI team working on CalMTA has deep experience implementing MT and other efficiency programs
- RI employees and subcontractors, who are “decision makers,” are firewalled from any ongoing work with California utilities, covered entities
- Seek CPUC approval need specialized expertise from SMEs who also support work with covered entities

3

Introductions & Icebreaker



Ice Breaker

What sport most interests you at the upcoming Olympics in Paris?



4

Draft MTAB meeting notes – 6/14

CalMTA is a program of the California Public Utilities Commission and is administered by Resource Innovations





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RFI Initial Report & Advancement Plans Status

Jeff Mitchell, Principal, Market
Transformation

MTI Development - status of ideas



**PHASE I
Concept
Development**

STAGES 1 & 2
Identify & Score Ideas

Advancement Plan

**PHASE II
Program
Development**

STAGES 3 & 4
Strategy Development
& Testing

MTI Plan

**PHASE III
Market
Deployment**

STAGES 5 & 6
Market Deployment
& Long-Term Monitoring

Market Progress Reports

Commercial Replacement & Attachment Window Solutions

Residential Heat Pump Water Heating

Foodservice Water Heating Systems

Efficient Streetlighting

Portable/Window Heat Pumps

Induction Cooktops & Ranges

Efficient Rooftop Units (ERTUs)

MTI Plans in Application

RFI metrics

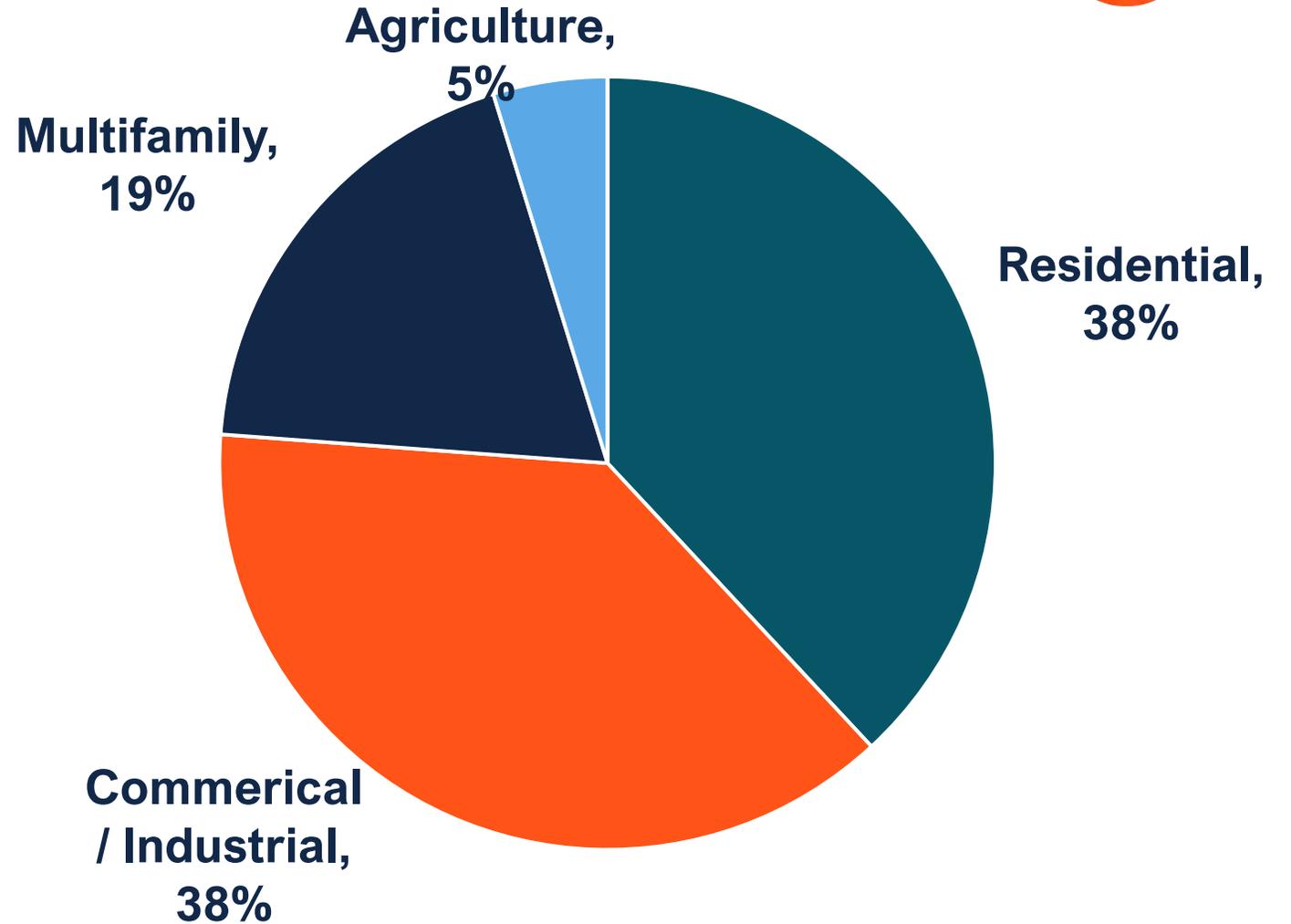


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MTI submissions

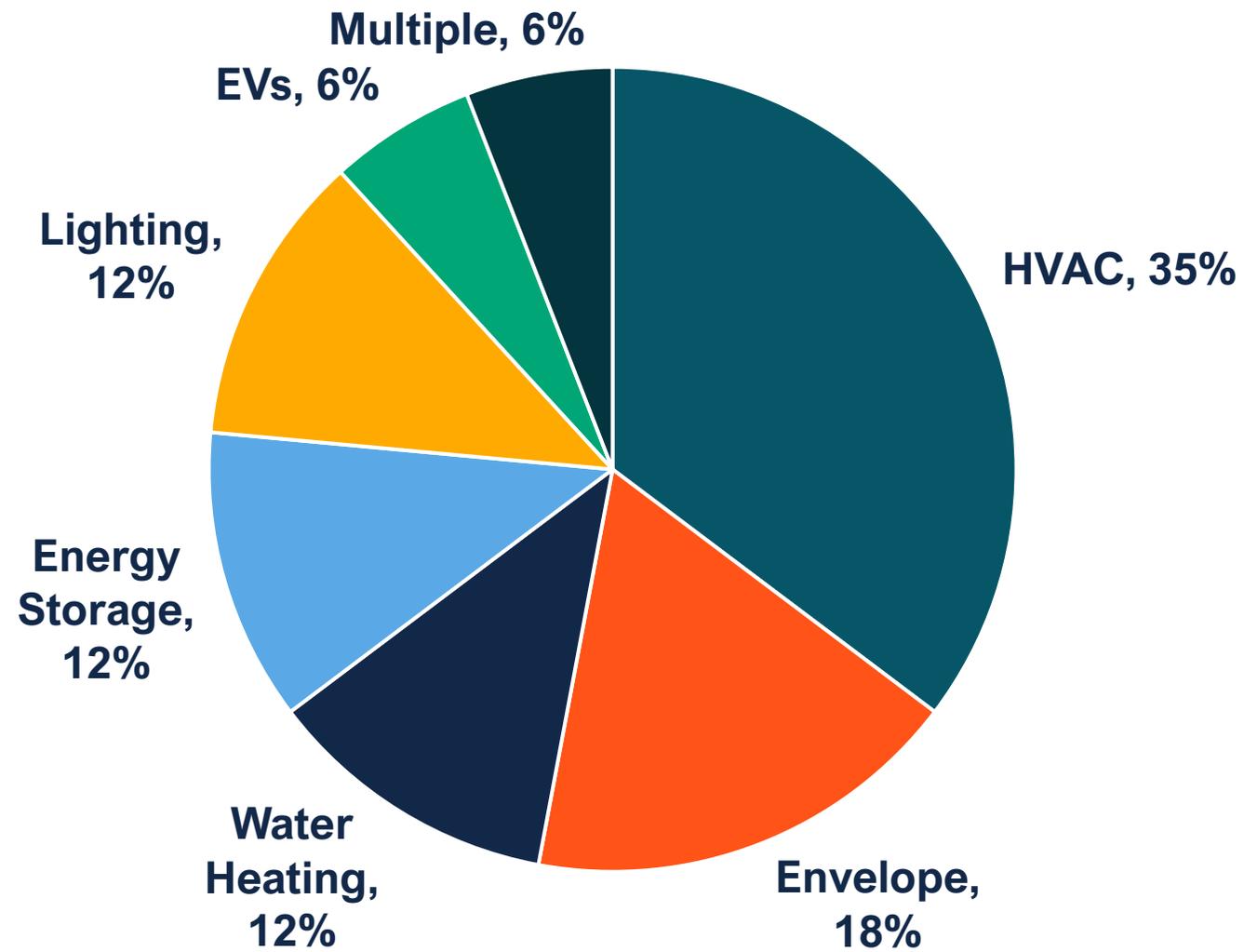
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Unique submitters

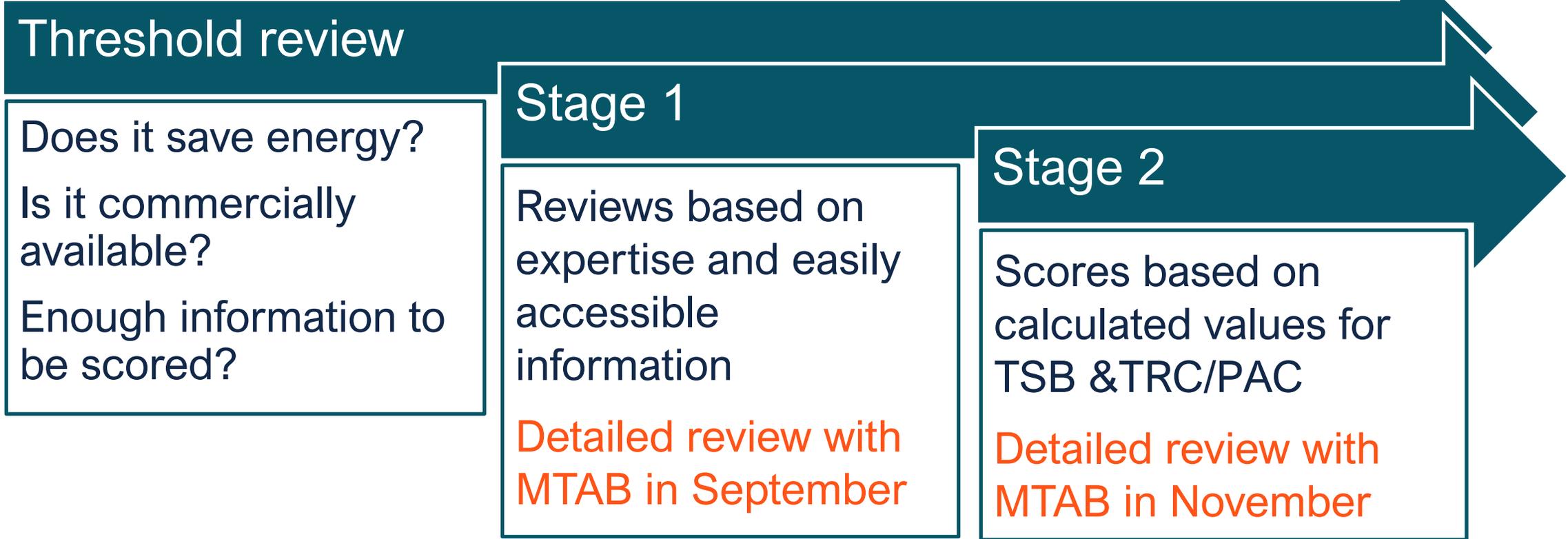




RFI submissions: end use



What's next?



Efficient Streetlighting





Product definition



This MTI focuses on energy-efficient LED streetlight technology with controls combined with design and asset management practices on local streets and roadways with streetlighting. Photometric design maximizes LED efficacy.



Key recurring questions



- Is an MTI needed or is this market transforming on its own?
- What action can CalMTA take to impact this market, specifically if tariff updates are required?
- What existing code or regulation can be used to lock in behavior?



Next steps



- Conduct some light research to answer key market questions
- Continue to refine strategy
- Revisit with MTAB as part of the Batch 3 MTI scoring process

6 Draft Advancement Plan: Foodservice Water Heating Systems

Sepideh Rezania, Partner, Unrooz Solutions





Preliminary MTI opportunity



California's foodservice industry relies heavily on gas for heating water, significantly contributing to the state's energy consumption.

There is an opportunity to support California's decarbonization goals by promoting efficient electric water heating systems through updating water heating sizing guidelines, engaging with manufacturers and restaurant chains, and aligning with evolving policies.



Current challenge



- Foodservice is a low-margin business with a high failure rate
- Little awareness of HPWH technologies in the foodservice market
- Quick replacement decision
- Health guidelines on water heater sizing do not allow for HPWH to be considered



Vision for the future: 2045



Efficient electric water heating systems capable of minimizing peak demand are the system of choice in both new construction and existing foodservice facilities.

Recent market events



- Bay Area Air Quality Management District established zero-NOx emission standards
 - Begins in 2027
- CARB is also exploring similar standards – currently in public engagement process



Product definition



Efficient and decarbonized foodservice water heating systems that include the following key components:

- **HPWHs:** Electric HPWHs designed for foodservice use, with features to minimize electrical demand during system peak hours
- **Combined heat pump systems:** Systems that provide simultaneous space cooling and water heating to improve overall efficiency



Product definition

- **Hot water distribution system:** Optimized pipe sizing and layout, integrating decentralized water heaters and reducing reliance on recirculation pumps
- **End-use equipment:** Equipment that reduces overall hot water demand, such as low-temperature or ventless dish machines



Target market

- Existing and new construction
 - Full-service, Quick-service, and Café
- Not including large cafeterias and institutions



Leverage points

- California Conference of Directors of Environmental Health
- National restaurant chains and key major manufacturers
- California Restaurant Associations
- Existing labs and programs such as Foodservice Technology Center and CalNext

Preliminary MT theory



IF

We work with industry leaders to adjust CCDEH sizing guidelines

We work with manufacturers/supply chain to make sure right products are available in CA

We engage with national chains/mfg suppliers to promote HPWHs

Promote the value to restaurant association and reduce financial barriers

We work with market partners to develop a trained and motivated pool of installers

THEN

HPWHs can be considered in system design

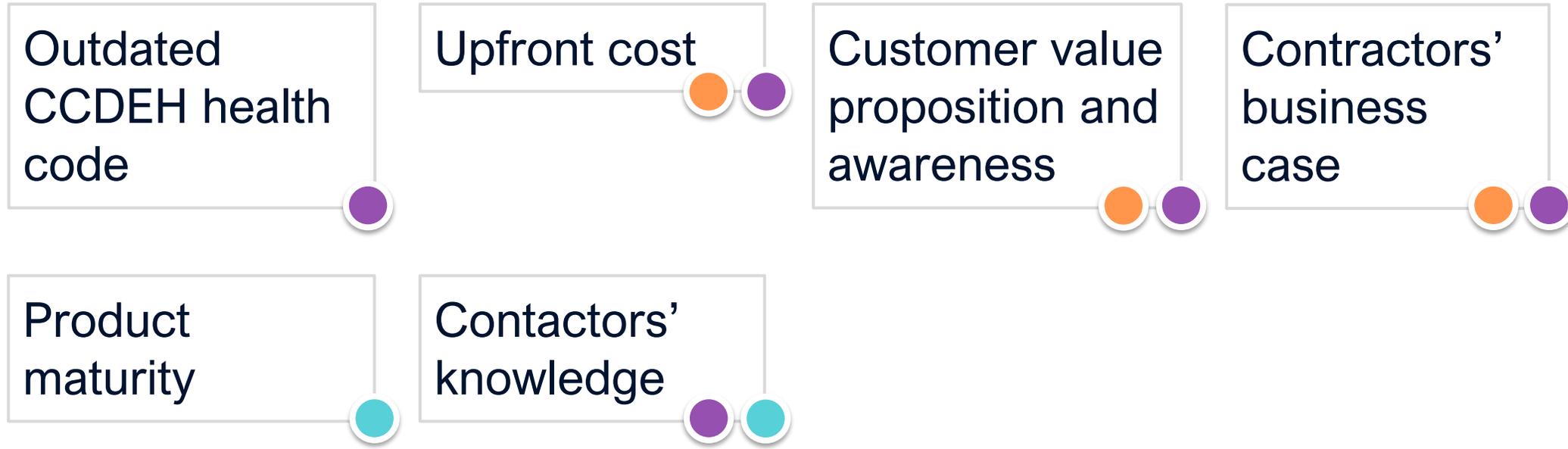
Owners/decision-makers can access HPWHs

We can shift chains purchasing practices

Independent restaurants will choose HPWH

They recommend HPWH to business owners

Conceptual Logic Model – Barriers



Key



Conceptual Logic Model – Opportunities



Key

-  Market
-  Financial
-  Technology

Conceptual Logic Model – Interventions



Support CCDEH guideline adjustments

Support Title 20/24 for HW efficiency and consumption

Align with CARB on equipment regulations

Engage manufacturers on affordable products for CA and make financing more accessible

Engage national chains and their manufacturer suppliers to change purchasing practices

Demonstrate benefits to customers and expand awareness on financial solutions

Key

Market

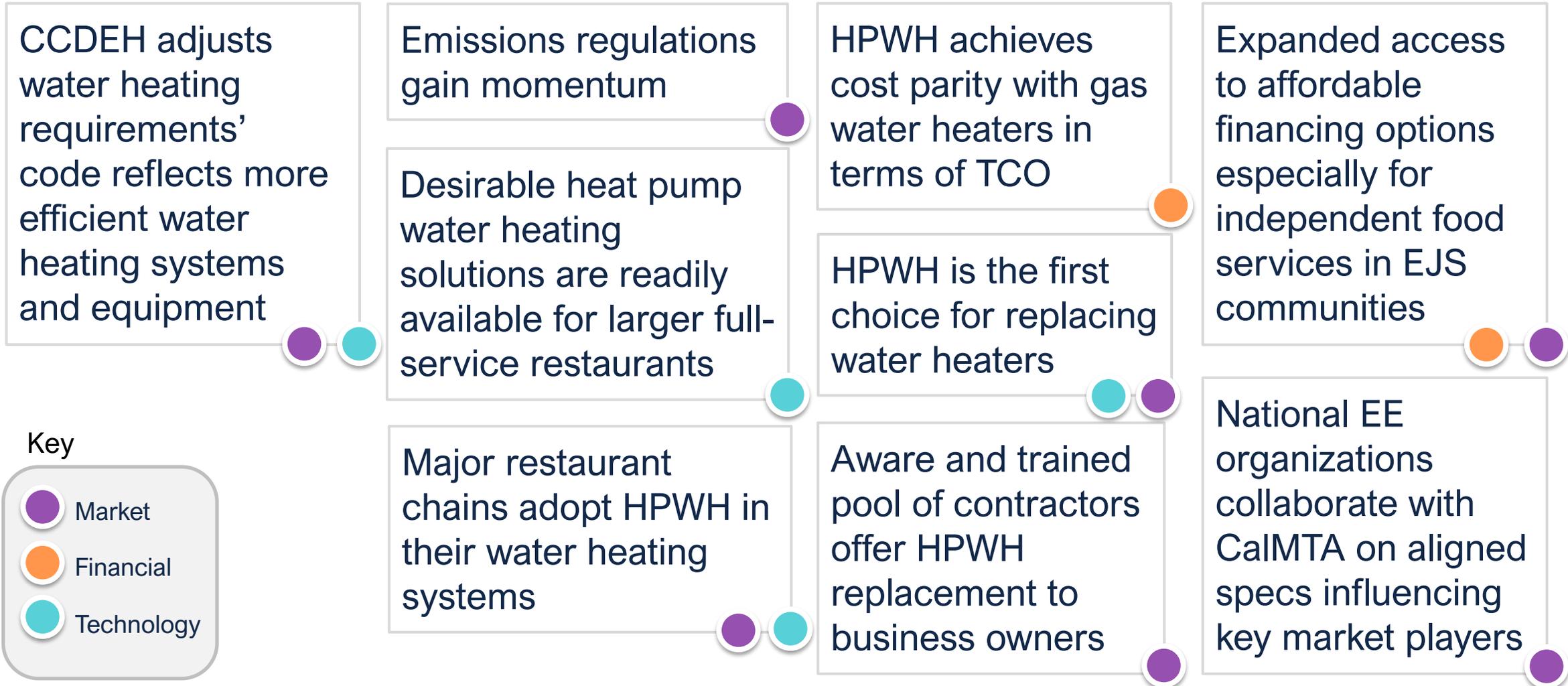
Financial

Technology

With market partners, develop a qualified and excited pool of contractors

Leverage and collaborate with existing programs on aligned strategies

Conceptual Logic Model – Outcomes



Key

- Market
- Financial
- Technology



ESJ Listening Session feedback



1. Concern with grid capacity and resiliency
2. Distrust of government/utilities
3. Very limited space
4. Concern with utility bill increases
5. Split incentive concerns related to upgrades



Diffusion and Lastingness Mechanisms



- Updated code and CCDEH sizing guidelines
- Awareness of HPWH systems and its benefits
- California decarbonization policies



Tech assessment priorities



1. Identify:

- optimal system configuration
- technical barriers
- hot water demand reduction strategies
- assess heat pump assist technology
- regulation and policy technical barriers and opportunities

2. Evaluate product performance and durability



Tech assessment priorities



3. Quantify energy benefits and identify non-energy benefits
4. Quantify lifecycle cost
5. Estimate peak load impact and identify management strategies

Market research priorities



1. Characterize baseline market conditions
2. Demand-side & supply-side market characterization
3. Policy and regulatory landscape
4. Develop market baseline forecast

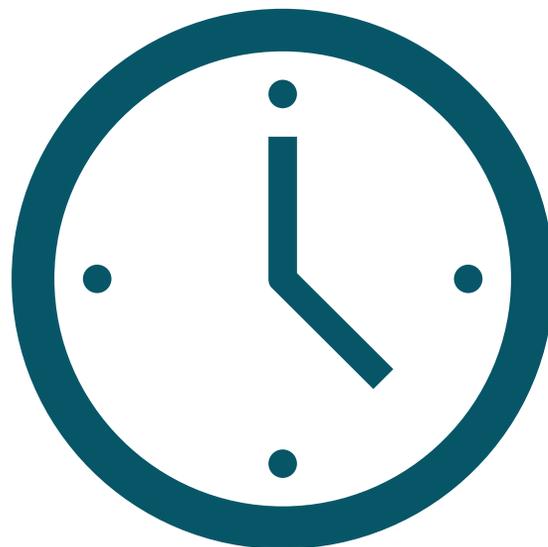
Proposed research cost estimates



Task	Estimated cost
Technology assessment	\$525,000
Market research	\$513,000
Total	\$1,038,000

Discussion

Break (10 min)
We will be back soon.



7 Equity Update

Rachel Good, Stakeholder Engagement
Manager



CalMTA's Equity Lens



Align relevant MTIs with **existing income-qualified/equity program efforts** in California



Collaborate with community-based organizations to **engage ESJ communities through trusted channels**



Conduct **targeted outreach and listening sessions** to better understand unique barriers and inform MT intervention strategies



Include **equity in RFI scoring criteria**, identifying and prioritizing ideas that demonstrate benefits to ESJ communities

CalMTA's Equity Lens (cont'd)



Collaborate with ESJ community representatives to **identify and mitigate unintended impacts** of MTI implementation



Promote economic opportunities unlocked by MTIs to decrease the wealth gap and increase high-road career paths



Track and report on equity impacts to enable continuous improvement of ESJ community interventions



2023 Equity Foundation



- **Briefings with ESJ stakeholder organizations and collaboratives** to introduce CalMTA and promote RFI participation
- **Listening Sessions with ESJ community representatives** to understand past experiences with EE and opportunities to deliver better value
- **Research to identify existing CA programs and services** for ESJ communities and disadvantaged ratepayers

2024 Equity Work Areas



-  **1.0** Develop and document approach to ESJ integration in CalMTA MTI process
-  **2.0** Develop equity metrics at the CalMTA program- and initiative-level
-  **3.0** Conduct ESJ stakeholder engagement and relationship management
-  **4.0** Form ESJ community “Sounding Board” to engage on equity topics
-  **5.0** Support thought leadership and interregional coordination



1.0

Develop and document approach to ESJ integration in CalMTA MTI process: YTD highlights



- **Best practices guides** currently being finalized after team feedback
- **Interviews conducted** with ESJ-aligned organizations (e.g., AEA, Esperanza Community Housing, Rising Sun Center for Opportunity)
- **ESJ-focused strategy pilots** launched to test:
 - ESRPP as a viable intervention strategy for targeting ESJ communities
 - Value proposition of portable/window heat pump self-installation in affordable multifamily units and small single-family homes
- **Coordination meetings conducted with income-qualified EE programs** relevant to MTI focus area (e.g., BUILD and ESA Multifamily Whole Building)



2.0

Develop equity metrics at the CalMTA program- and initiative-level: YTD highlights



- **Equity performance indicators and measurement approaches** in development at the organization- and MTI-level
 - Preliminary equity metrics incorporated into Advancement Plans as appropriate
 - Metrics to be revised for MTI Plans based on final logic model
- Preliminary Batch 2 MTI **equity metrics shared with June listening session participants** for feedback



Conduct ESJ stakeholder engagement and relationship management: YTD highlights



- Direct outreach to **encourage equity stakeholder participation in MTAB meetings, public comment periods, and RFI**
- USGBC-CA, Redwood Energy, and El Concilio engaged as **community partners to recruit participants** for Portable/Window Heat Pump Self-Installation Practices strategy pilot
- Report summarizing **key findings and MT recommendations from Nov. 2023 listening sessions** published and shared
- Second round of **ESJ Community Listening Sessions** conducted for four Batch 2 MTIs in June



Form ESJ community “Sounding Board” to engage on equity topics: YTD highlights



- Draft member handbook and policies/procedures developed
- Recruitment and scoring process document; member application form created
- Equity sounding board timeline finalized:

**Policy documentation
finalized: July 2024**

**Kickoff meeting: Jan.
2025**



**Member recruitment
and selection: Aug.
30-Nov. 29**



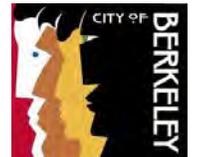
Support thought leadership and interregional coordination: YTD highlights



- **Equity-focused two-page CalMTA handout** developed and distributed at California Green Buildings Conference and California Climate & Energy Collaborative Forum
- **2024 ACEEE Summer Study on Energy Efficiency in Buildings**
 - Refereed paper to be published in the proceedings: *An Equity Lens for Market Transformation: Delivering ESJ Benefits at Scale through an Integrated Program Design Approach*
 - Oral presentation as part of Panel 7: Market Transformation Session 1: Infusing Equity in Transformational Program Design - **Tues. 8/6 8:30-10am**

June Listening Sessions: Overview

- **28 total participants** across four 90-min. sessions; participating organizations compensated
- Session prompts focused on **barriers to adoption, potential benefits and negative impacts, past experiences, and preliminary equity metrics**
 - **Strategy managers provided input** on prompts/learning objectives
- Key findings shared with MTI teams; summary memo in development





Sample findings: CRAWs



- **Soundproofing and improved air quality as non-energy benefits** have significant value
- Target **schools in rural areas and those with high asthma rates and lunch programs**
- Financing must address **the split between building owners and tenants** who run businesses
- Demonstrating **ROI/payback period** will be critical – potential need to couple with solar installation or whole-building upgrades for windows to be prioritized



Sample findings: Residential Heat Pump Water Heating



- **Income-qualification process/paperwork** is a barrier to equity-focused program participation
- **Consumer resentment** that utilities are forcing upgrades on them – need end-to-end support
- **Plumbing code assumptions** may not reflect larger households; **installation may require home modifications** like enlarged closets or ventilation
- Concerns about **intrusive city inspections**
- Even skilled contractors unprepared to address **apprehensive low-income customer barriers**



Sample findings: Foodservice Water Heating Systems



- **Distrust of the government/utilities** remains high among smaller and immigrant-owned businesses
- Slow industry recovery since 2020 – potential for a **separate electric rate for restaurants/restaurant operators** like EV rates?
- Need financing **options that benefit both building owners and tenants**
- Concerns about **reallocating already limited space**, reducing available area for essential operations
- **Peer success stories** have significant influence



Sample findings: Efficient Streetlighting



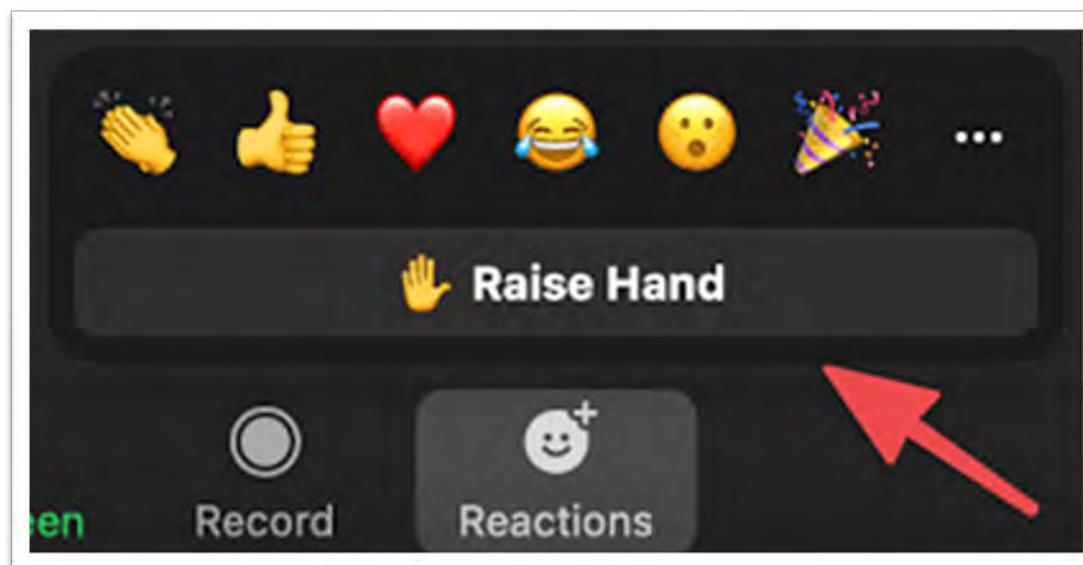
- Pairing streetlight upgrades with **EV charging stations, WiFi hotspots, etc.**, to increase community benefits
- Cameras on smart lights raise **concerns about over-policing/surveillance and privacy**
- **Need to address maintenance** – concerns about aging poles and wires
- Interest in a “smart lighting” program focused on **increased safety in rural and underserved communities**



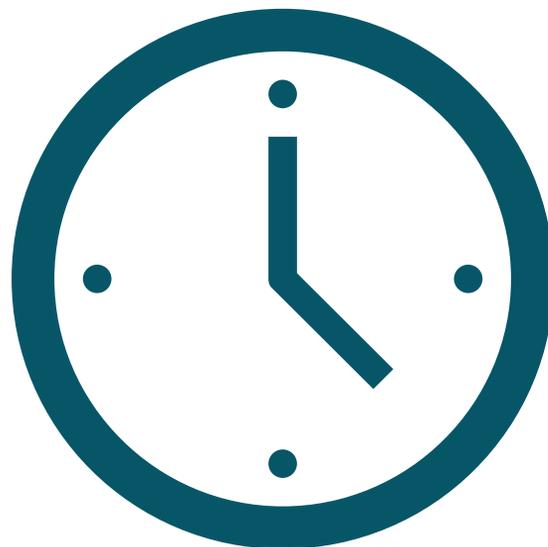
Discussion

8. Public Comment

Raise your hand using the “Reactions” feature and we will allow you to unmute yourself.



Lunch (45 min)
We will be back soon.



9

2nd Quarter Progress Report

Stacey Hobart, Principal, Stakeholder
Engagement & Communications

Elaine Miller, Senior Manager, MT Strategy

Jeff Mitchell, Principal, Market Transformation



Milestones achieved



○	◐	●
To be started	In process	Completed

MT idea development (2)	An equity lens (3)	Stakeholder engagement & communications (4)	Measuring success - evaluation (5)	Administration & operations (6)
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2nd quarter activity				
Hold a virtual MTAB meeting (April)		●		
Hold an in-person MTAB meeting (June)		●		
Release a draft 2025 ABAL for MTAB review		●		
Publish 2023 Annual Report		●		
Publish 2024 Operations Plan		●		
Release a Q1 2024 Update		●		

Milestones achieved



Draft CalMTA program-level Key Performance Indicators & Scorecard for discussion with MTAB		●		
Hold second ESJ Listening Sessions		●		
Release final Phase I Disposition Report		●		
Obtain MTAB feedback on sectors to target with 2024 RFI		●		
Launch and publicize second Request for Ideas (RFI)		●		
Release two draft Advancement Plans and solicit public comment for: <ul style="list-style-type: none"> Commercial Replacement and Attachment Window Solutions Residential Heat Pump Water Heating 		●		
Finalize MTI Plan template		●		

<https://calmta.org/resources-and-reports/2024-operations-plan/>

Other operational & admin activities

Hiring & staffing

- Hired, onboarded, and trained 3 new employees

Public commenting

- May funds transfer from Phase II Strategy Pilots in the 2024 ABAL to other Phase II market research and lab testing activities
- June Chefluencer Strategy Pilot comments on SOW and webinar

Application planning

- Ongoing tracking and research of proceedings, policy issues and developments to address in upcoming Application

MTIs in Phase II

- Induction Cooktops & Ranges
- Portable/Window Heat Pumps
- Efficient Rooftop Units

Completed 
Under development 



Phase II: Program development



-  Characterize market and define proposed technology or practice
-  Fill gaps in knowledge
-  Confirm market barriers and market leverage point(s)
-  Update market adoption models, savings estimates, and C/E estimates
-  Draft MTI Plan

MTI Plan: Induction Cooktops & Ranges

Elaine Miller, Senior Manager, Market
Transformation Strategy



Induction Cooktops & Ranges



Product definition/features

- **Current:** consumer-grade induction cooking products in both 240V and 120V
- **Future:** More 120V products with battery back-up and more affordable price points



Induction Cooktops & Ranges



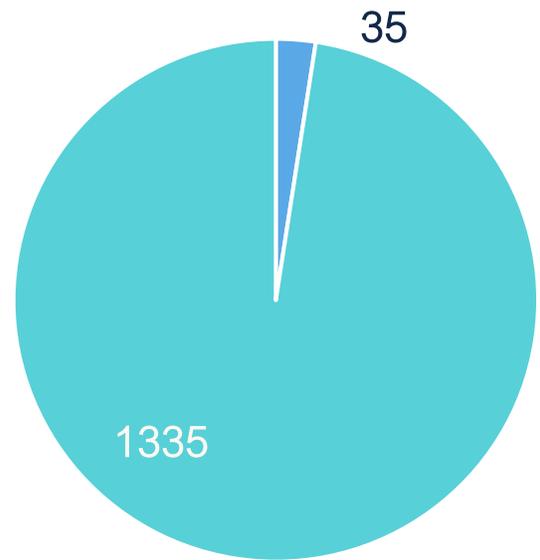
Target market: All residential new and existing (MF and SF) properties with a focus on ESJ customers

Possible leverage points: Retail channel, Title 24/building codes, California Air Resources Board, NYSERDA Tech Challenge, ENERGY STAR, IRA funding, production builders

Tech Assessment: Electrical panel infrastructure



HEA Study Participants With Less Than 1,800 Watts Available for a 15A @ 120V Induction Stove



- Participants with less than 1,800 Watts Available
- Participants with more than 1,800 Watts Available

Key findings:

- If we only focus on 240V, then 42% of California homes have electrical panel infrastructure constraints
- But if we had 120V product, 97% of homes have at least 1,800 Watts of capacity available for an additional full 15 Amp electrical load

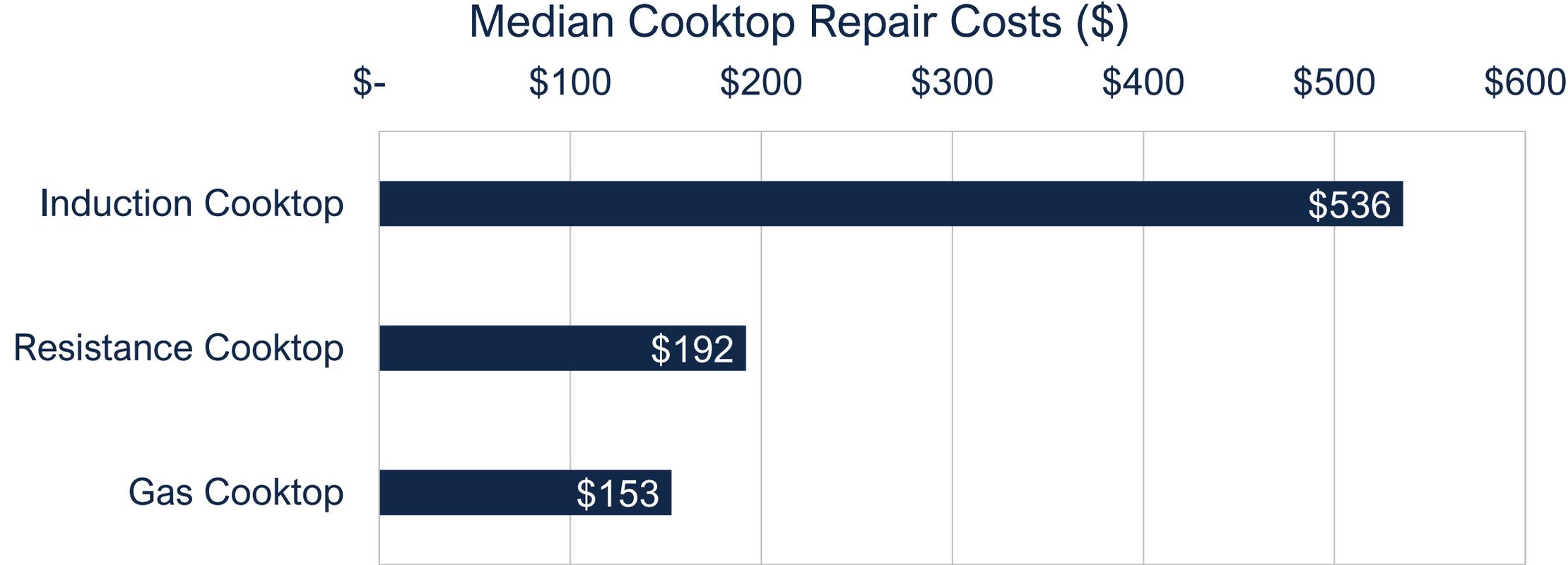


Tech assessment

- 240V circuit additions for switching to induction is a major barrier for existing multi-family due to limited panel capacity
- Possible 120V solutions:
 - 120V with battery storage – higher heating capacity and higher cost
 - 120V without battery – lower heating capacity and lower cost..
- More research is needed to determine the balance point of future 120V products on price and heating capacity for MF buildings and ESJ community

Pictured: Channing Street Copper Energy Storage Equipped (ESE) 120V range

Tech Assessment: Median cooktop repair costs



Tech Assessment: Codes & Standards



- Assembly Bill 2513 would require on or after January 1, 2025, that all gas stoves sold in the state have a label about air pollutants and their potential health hazards. It passed CA Assembly and is now waiting for its third hearing before the Senate Committee
- A federal standard, test procedure and ENERGY STAR (V 1.0) label has been adopted for cooking products that pushed primarily on induction
- Although the CEC has considered incorporating induction cooking into CBECC, it is currently no different from electric resistance in terms of compliance credit/tradeoffs

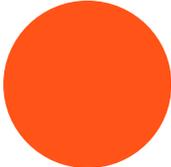
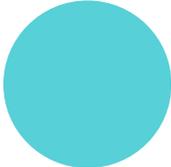
Tech Assessment: Codes & Standards



- Title 24 Electric-readiness requirement for all new construction requires any new buildings that installs a natural gas cooktop or range to install a 240V branch circuit within three feet of the cooktop
- Title 24 updated requirements for range hoods, which require higher CFM for homes and apartments with gas cooktops due to the increased indoor pollutants

Market characterization: secret shopping findings



-  Visits were at 8 Big Box and warehouse outlets split between Northern and Southern CA
-  270 total cooktop and range models on display, 24 of which were induction models (9%); gas options were approximately 70% of total inventory
-  Interactions with sales associates revealed many had a strong preference for gas fuel and lacked firm knowledge of induction technology, or potential rebate and incentive opportunities

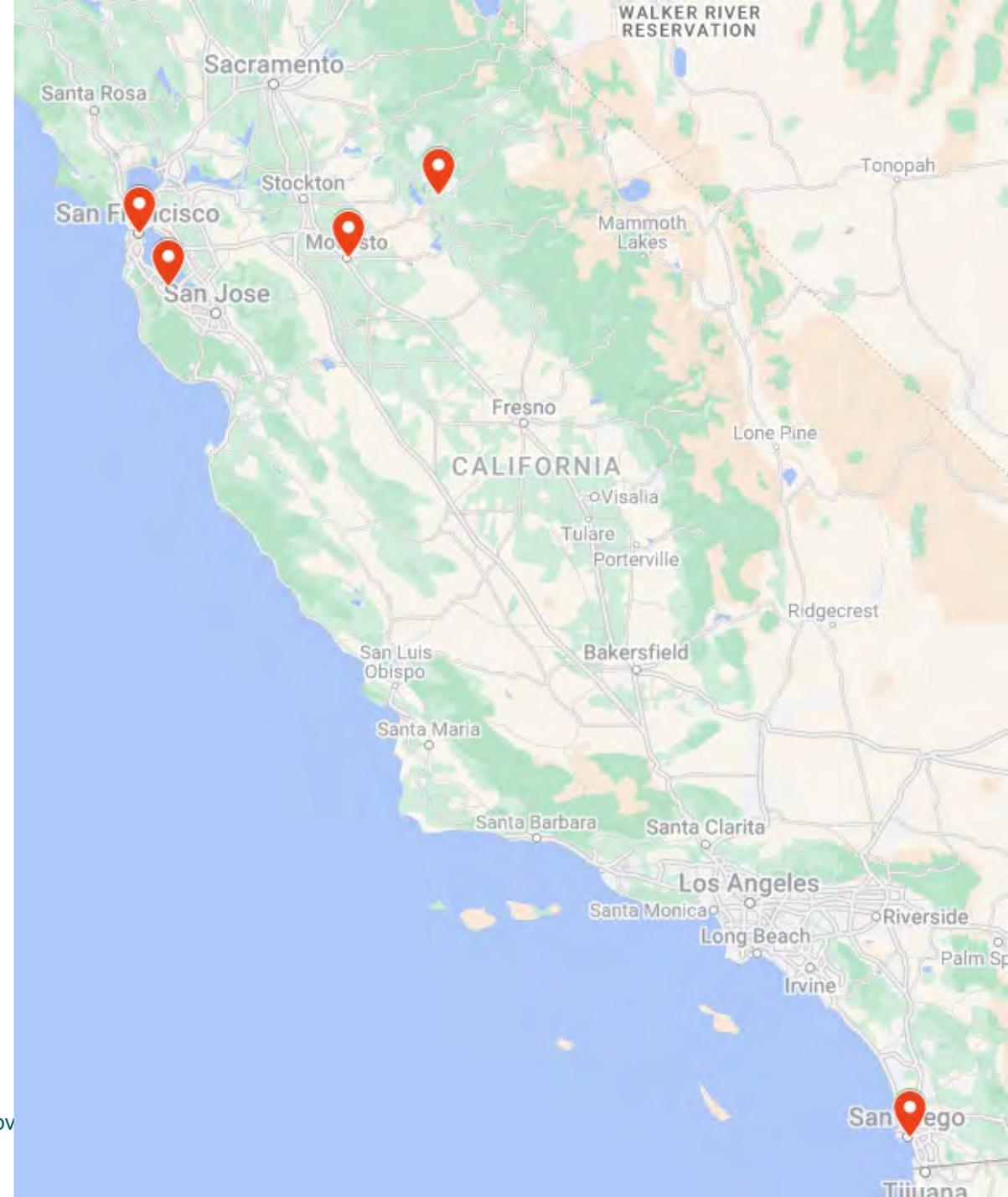
Market Characterization: Focus groups

Our CA-based facilitator, InterQ research, conducted 6 focus groups for induction cooktops

Groups were segmented by income and region

REGION SEGMENT	INCOME SEGMENT	NUMBER OF GROUPS
Coastal	Market Rate	1
Coastal	Low Income	2
Inland	Market Rate	2
Mountains	Low Income	1
Total		6

CalMTA is a program of the California Public Utilities Commission and is administered by Resource Innov



Market Characterization: Focus group findings



Barriers

Low overall awareness of induction

“I just wrote a question mark (when you asked us what it was). I don't know. It sounds a little too fancy for me. I have never heard of induction. What does that even mean?”

Market Characterization: Focus group findings



Barriers

Price: On average, FG participants would not pay more than \$1,125 for an induction range or cooktop; LI consumers assumed induction prices were more out of reach for them than market rate

“I would do the most energy-efficient and earth-friendly thing, but when it comes down to it, it's like how much is this going to affect my pocketbook?”

Focus Groups: Key findings



Barriers

Possibility of needing new cookware - particularly for LI groups

“How easy are induction pots and pans to find? I don't think I've ever been at a store ... and [the pan] said ‘good for induction.’”

“It sounds like a monopoly, so you have to buy their brand of cookware.”

“My wife likes to cook a lot and she would be like, *“not my pans... not the pans that I've spent two years finding.”* She would not like that at all.”

Focus Groups: Key findings

Barriers

Concern about losing cultural cooking habits used with open flame

“As a Latina lady, we sometimes cook the chiles on the open flame to burn them and then peel them to make some dishes. We also warm up handmade tortillas on the flames.”

“If I did not have an open flame my tortillas would not be as crunchy. I could probably broil them instead, but that's not my preference.”

“When you are using a wok, you need the flame because you're mixing the food so much. If you're lifting a wok to mix it off the induction, it's just going to turn off.”

Focus Groups: Key findings

Opportunities

Group participants valued enhanced safety of a cool cooktop, faster cooking, and reduced heat gain

“My mother suffered from severe sundowning. She would go and turn on the stove because it was time to fix dinner, but with nothing on the burners. This went on for a long time. Something like this would be great to have as far as a safety thing, as the population ages.”

“It's just one of those things (about living here). I would like to cook, but it is currently 95 degrees outside, so maybe don't cook.”

Focus Groups: Key findings

Opportunities

Awareness of negative IAQ and health impacts associated with gas cooking was very low, confirming this is a potential opportunity for awareness and education

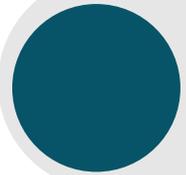
“Gas has been around so long. My mom always cooked with gas, and nobody had any problems. It's been around forever. I don't know why they're just now finding this out.”

“All our generations have been cooking this way for many years and nothing happened. Maybe some people got sick, but it hasn't been proven.”

In-progress market research



Quantitative consumer survey (English and Spanish)



Quantitative property manager survey



Manufacturer interviews



New home builder interviews

Strategy Pilots

- Continued collection of historical and present-day data for ESRPP
- Taking more time than anticipated and data is key input to other research
- Finalizing contract with BDC for implementation of Chefluencer events at select retailers
- Challenges with some retailers to get buyoff on instore events





External Coordination



- Ongoing meetings with IOU C&S and EE teams, including technology deep dive with C&S leads
- Introductory meetings with implementers of programs offering potential leverage and/or coordination
- Active monitoring of new or planned programs
 - CEC Equitable Building Decarbonization Program
 - SCE Wildfire & Natural Disaster Recovery Rebuild Program



Initial Program Coordination Meetings



- California Energy-Smart Homes Program (statewide residential new construction program)
- CEC California Electric Homes Program
- CEC Building Initiative for Low-Emissions Development (BUILD) Program
- SMUD induction rebates
- SCE ESA Building Electrification Program
- Golden State Rebates (statewide plug load & appliance program; combined with portable HPs)

Advancement Plan: Portable/Window Heat Pumps

Elaine Miller, Senior Manager, Market
Transformation Strategy





Portable/Window Heat Pumps



Product definition/features

- **Current:** Self-contained, self-installed, dual ducted efficient heating and cooling products for small spaces
- **Future:** More affordable, cold climate capacity, appropriate configuration for CA windows, air filtration, grid enabled, and use of lower GWP refrigerants

Portable/Window Heat Pumps



- **Target market:** Existing multifamily and smaller single-family homeowners and renters
- **Possible leverage points:** DOE test procedures, CalNEXT, CEE, ENERGY STAR, IRA funding, NYSERDA + NEEA, retail channel, multifamily and public health programs

Milestones Related to Each MT Idea

	2024								2025		
	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	JAN	FEB	MAR				
PHASE II – PROGRAM DEVELOPMENT											
Portable/ Window Heat Pumps	ADV PLAN	PHASE II RESEARCH & STRATEGY PILOTS									
				DRAFT MTI PLAN							✓
		RESEARCH ACTIVITIES			MARKET CHARACTERIZATION STUDY						
		TECHNOLOGY ASSESSMENT									
		STRATEGY PILOT: ESRPP									
		STRATEGY PILOT: SELF-INSTALLATION									
ORGANIZATIONAL MILESTONES											



Tech Assessment: Existing Products

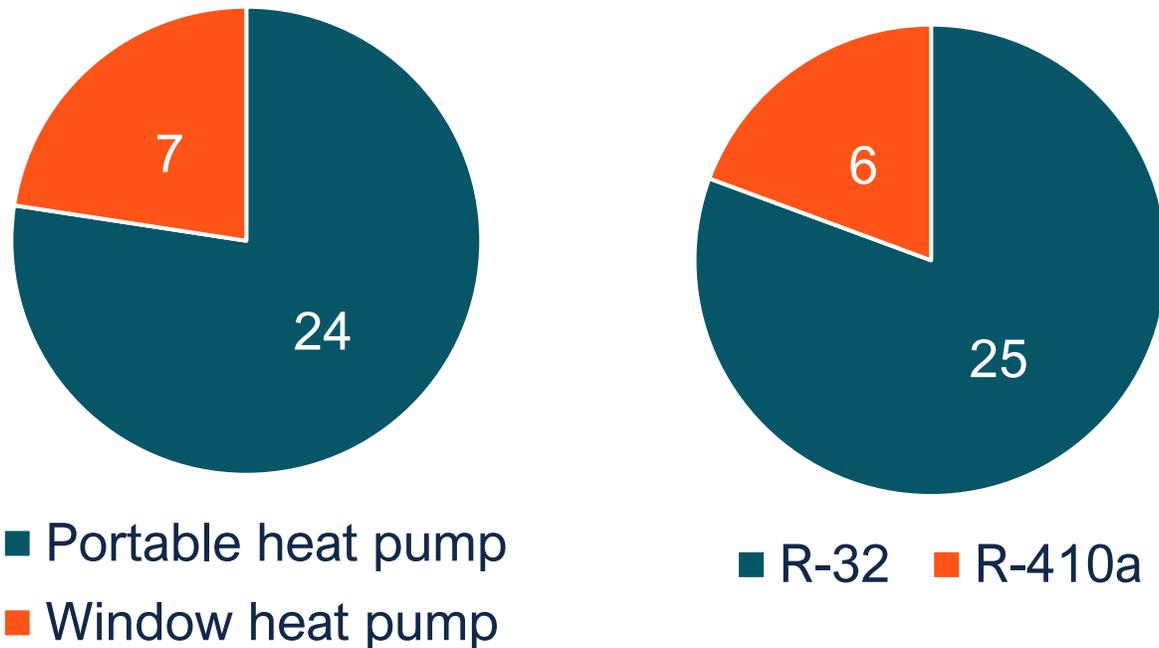


- Limited performance data available on existing products
- Cooling efficiency (CEER) reported by many but not all
- Cooling capacity (BTU) reported as a mix of ASHRAE and SACC values (which are different)
- No standard way to report heating capacity or low temperature heating performance
- No reports of heating efficiency (HEER) – may change soon with ENERGY STAR test

Tech Assessment: Existing products



Snapshot of heat pump type and refrigerant type for products available for purchase online



KEY TAKEAWAYS:

Lack of availability of Window HPs.

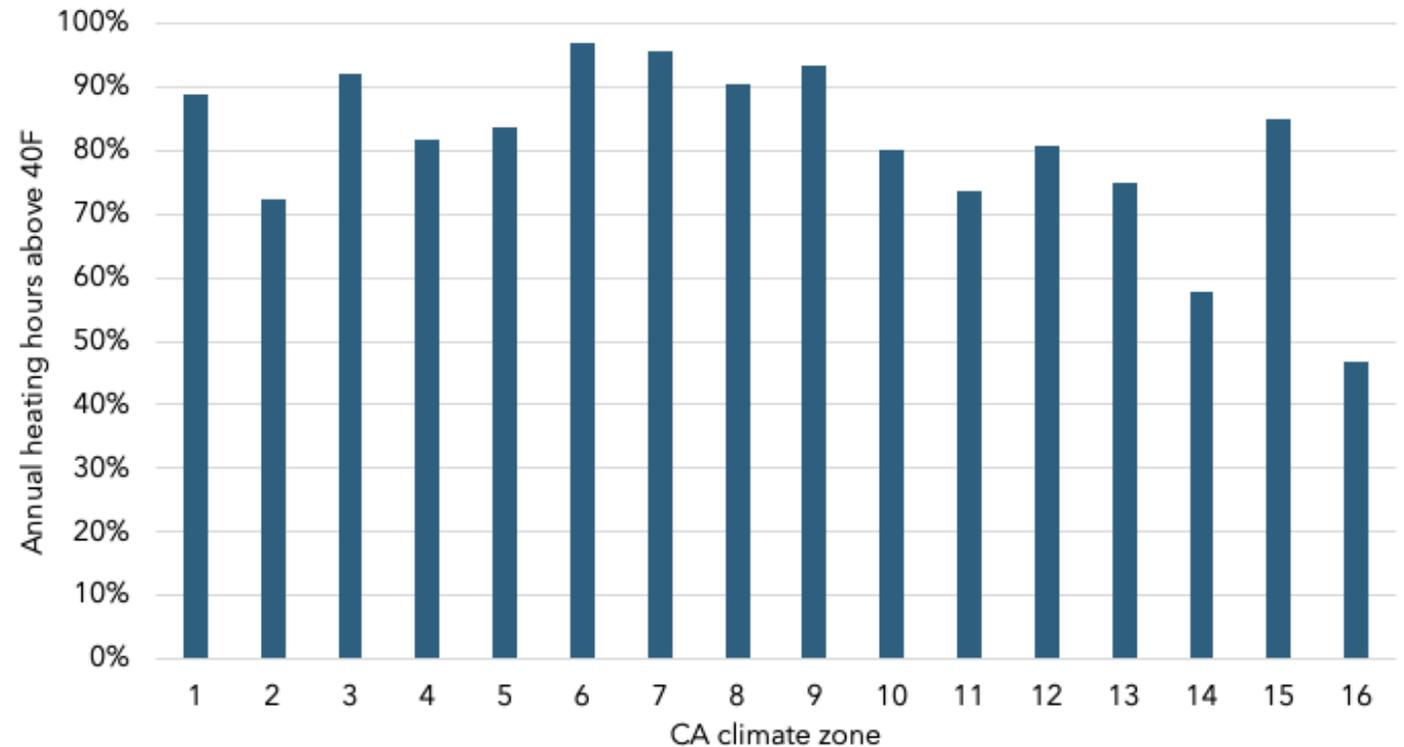
Good news on refrigerants.

Better performance spec reporting and more affordable window units are needed

Tech Assessment: Low temperature performance



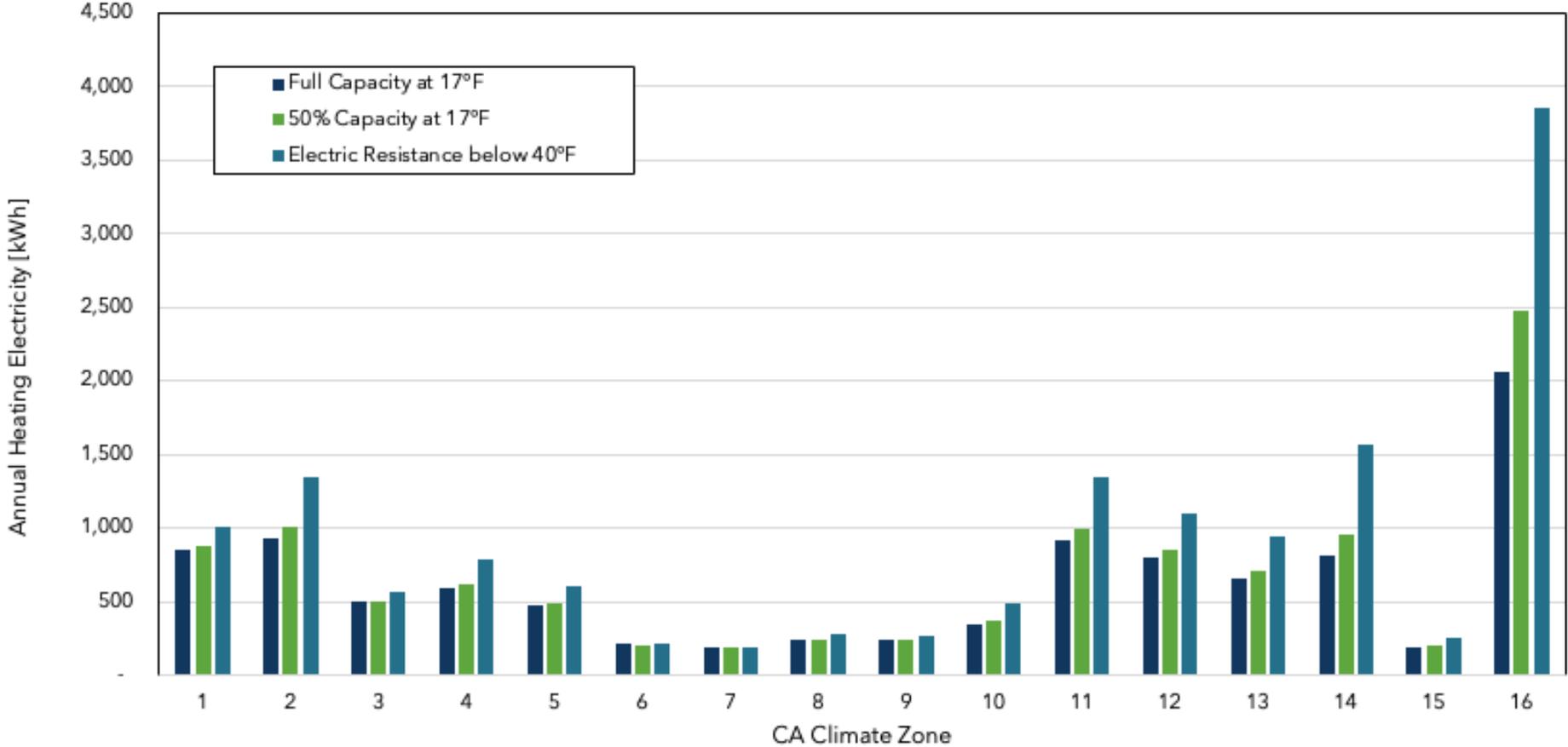
- The majority of portable and window HPs available today can only operate above 40F
- 14 of the 16 CA climate zones have greater than 70% of their heating occurring above 40F



Tech Assessment: Low temperature performance



Annual Heating Energy, Window HP, 950 ft² Apartment



KEY TAKEAWAY:

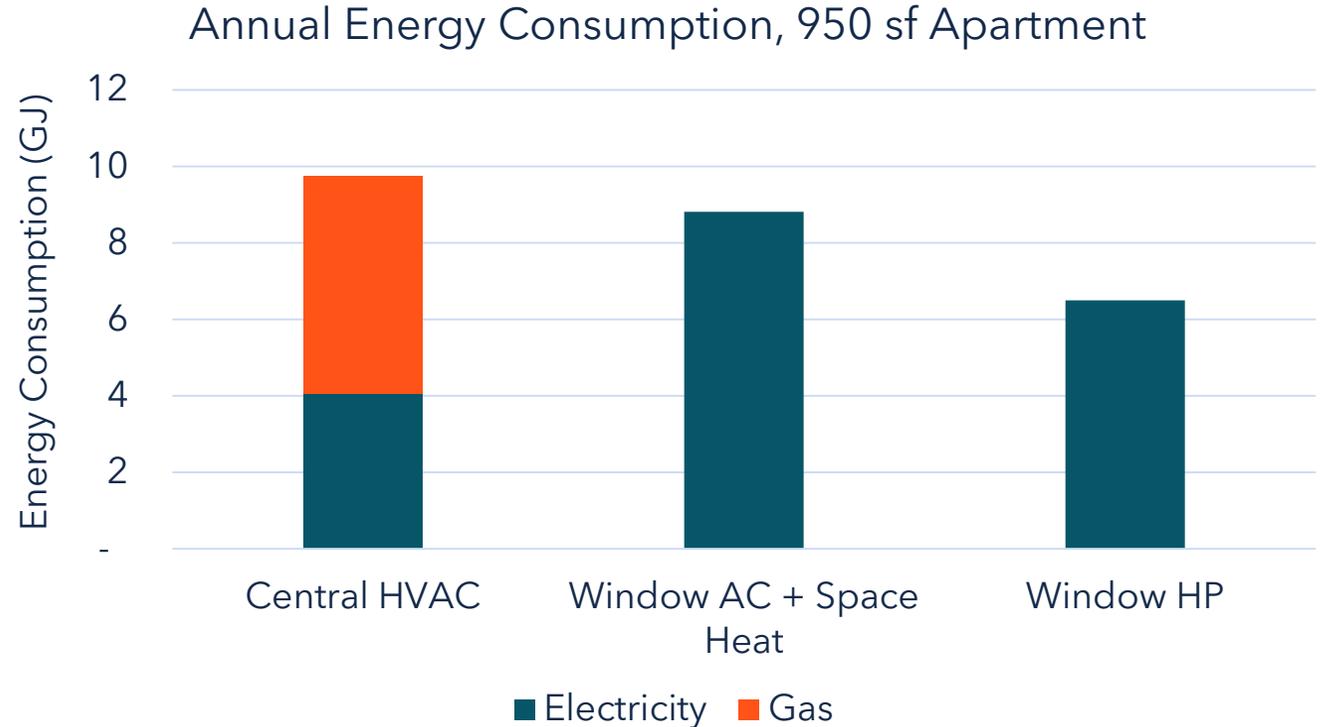
Significant potential benefit EVEN before low temp models are common but still want to drive for better temperature performance

Tech Assessment: Energy modeling update



KEY TAKEAWAY:

Window HPs offer energy savings opportunity, but we also need to consider bill impacts for full switching



**Average savings over 16 climate zones using DOE 90.1-2004 mid-rise apartment model building*

Tech Assessment: Codes & Standards



Draft final version of the ENERGY STAR Room HP test procedure released 4 types of products based upon their cold weather performance:

Better cold weather performance

E) Room heat pump: A room air conditioner as defined at 10 CFR 430.2 that utilizes reverse cycle refrigeration as its prime source for heating the indoor space.

1) Type 1 heat pump: A room heat pump that does not have active defrost or for which the specified compressor cut-in and cut-out temperatures are not both less than 40°F.

2) Type 2 heat pump: A room heat pump that has active defrost and for which the specified compressor cut-in and cut-out temperatures are both less than 40°F but not both less than 17°F.

3) Type 3 heat pump: A room heat pump that has active defrost and for which the specified compressor cut-in and cut-out temperatures are both less than 17°F but not both less than 5°F.

4) Type 4 heat pump: A room heat pump that has active defrost and for which the specified compressor cut-in and cut-out temperatures are both less 5°F.

Currently available products

Sweet spot for CA

NYCHA/NYSERDA cold climate models

KEY TAKEAWAY: ENERGY STAR test provides helpful product tiers for manufacturer engagement

PWHP Market Characterization: Secret shopping findings



- Visits were at 7 Big Box and warehouse outlets split between Northern and Southern CA
- 2 AC models were portable units that had dual heating/cooling: 1 Midea unit, 1 Toshiba unit – could not confirm HP operation
- No knowledge among sales associates of portable or window heat pump models



**Midea DUO 12,000 BTU SACC
Smart Inverter Portable Air
Conditioner with Heat**

Image credit: Midea

“Oh, it heats and cools? I've never seen that. That sounds interesting”

PWHP Market Characterization: Secret shopping findings



Company Name	Product Name
Gradient	Window Heat Pump
Whynter	Room Air Conditioner and Heater
Midea	Window Air Conditioner
Friedrich	Portable Air Conditioner with 9,500 Heating BTU
Danby	Portable AC

KEY TAKE AWAY: Labeling for portable heat pumps is confusing, and sometimes misleading

Market Characterization: Federal programs update

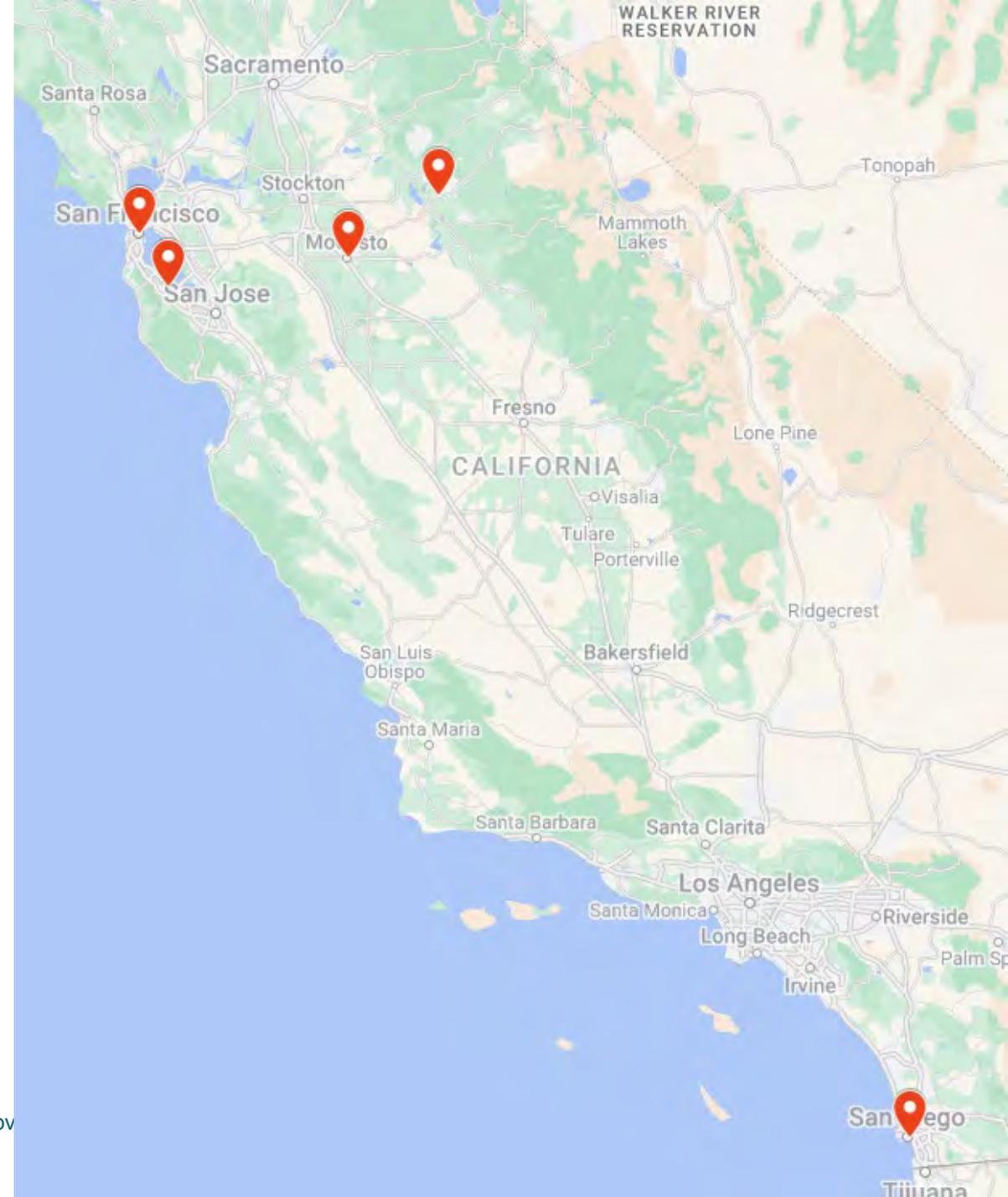


- New ENERGY STAR spec and new CEE tier for Room ACs that incorporates heating mode test
- ES spec and CEE tier will allow qualifying window-type HPs to be eligible for federal IRA tax credits and IRA rebates
- ENERGY STAR is expecting to release the draft specification in Fall of this year
- Will initially only apply to window-type heat pumps. Expect to incorporate “Portable” forms later

Market Characterization: Focus groups

- Our CA-based facilitator, InterQ research, conducted 8 focus groups for Portable/Window HPs
- Groups were segmented by income and region and also according to whether the participant already owned a portable or window unit

REGION SEGMENT	INCOME SEGMENT	NUMBER OF GROUPS
Coastal	Market Rate	2
Coastal	Low Income	1
Inland	Market Rate	2
Inland	Low Income	2
Mountains	Low Income	1
Total		8



Market Characterization: Focus group findings



Barriers

Low overall awareness of heat pumps; no awareness of portable or window HPs

“I was going to ask what a heat pump was too. Is it a plug-in thing or do you hook it up to your house somehow? Is it permanent or semi-permanent? Does it affix it to one area? (The description says it is) portable, so maybe it goes from room to room.”

“It is a small heating unit for small spaces. I can’t differentiate how it would be different from a heater.”

Market Characterization: Focus group findings



Barriers

Aesthetics and concerns about fit

“I wouldn’t like to have another piece of furniture in the house. I would prefer it to be something that could be installed in the wall because sometimes kids run around, or they might pull on this tube thing.”

“I don't want this big thing in the middle of the room. It's not attractive.”

The portable model was not well received. Most participants liked the look of the window unit better.



Focus Groups: Key findings

Barrier AND Opportunity

Electric costs

- All segments, were very conscious of electric bills and this was ranked a **top consideration** in their decision when looking for a new heater or AC
- Bill concerns directly interact with climate considerations and existing system types
- PWHPs could offer different solutions (and savings) for different regions.

“I have central heating and air [conditioning], but I usually cannot afford to run it, so I utilize a fan.”

“Central heating and air... they cost way too much to use. It's just not feasible for my family.”

Focus Groups: Key findings

Opportunities

Awareness of electric usage/cost is an opportunity to leverage upcoming ENERGY STAR label for window units

“I go to see them physically in stores to see which one convinces me. I look at the energy consumption it will have and how many watts it will consume because we have to save a little. **They consume a lot of energy. You must look for something that helps you save a little money.**”

“I read reviews on Amazon, and I go to stores like Home Depot. I see the model, how big it is, if it fits in my room or not, and **how much the energy will cost.**”

Focus Groups: Key findings

Opportunities

Features customers value and would like to see in a PWHP

Durability and a warranty

Sleek, minimal design

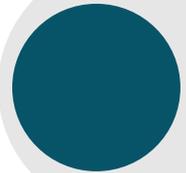
Room-to-room portability



Upcoming and in-progress market research



Quantitative consumer survey (English and Spanish)



Quantitative property manager survey



Manufacturer interviews

Status of Strategy Pilots – Portable/Window HP installation



- Procured approximately 130 heat pumps of various makes and models to be installed as part of DIY installation pilot
- Drafted survey questions for participants to complete after product is installed
- Completed on-site demonstration day activities with all three subcontractors
- DIY installations began in July 2024 and are expected to complete in August 2024

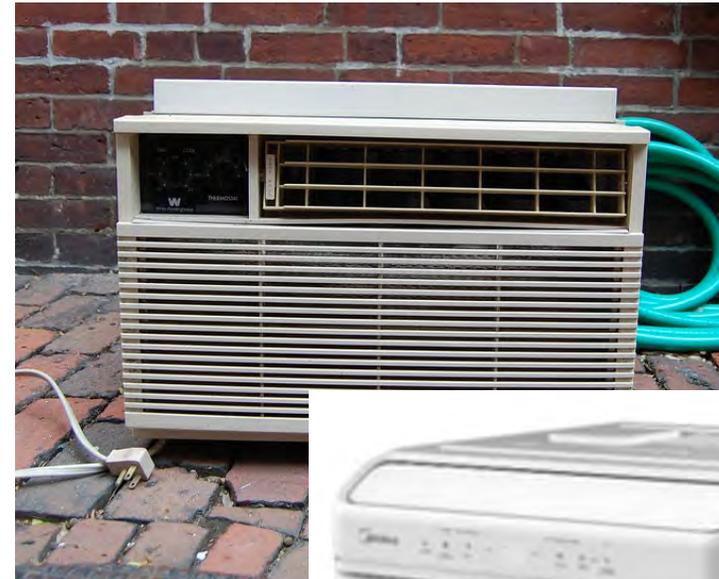


Demonstration day installation with El Concilio in San Mateo County

Status of Strategy Pilots – AC Turn In Event



- Working with C+C to organize and run the event
- Selecting location with big box retailer
- Assess consumer interest in exchanging AC units for more efficient options
- Projecting August timeline for event





What's coming next?



Market Characterization – Continued engagement with manufacturers and homebuilders as we work towards the first Market Characterization report draft

Product Assessment – Begin first drafts of product definition as well as continued work on cold climate performance assessment, product specification and lab testing

Pilots – Start receiving installation surveys to assess and analyze its success in addressing barriers. ESRPP Data coming (hopefully) in for analysis.



External Coordination



- Ongoing meetings with IOU C&S and EE teams, including technology deep dive with C&S leads
- Introductory meetings with implementers of programs offering potential leverage and/or coordination
- Active monitoring of new or planned programs



Initial Program Coordination Meetings



- ESA Multifamily Whole Building Program
- TECH Clean California
- Comfortably California (statewide HVAC program)
- Golden State Rebates (statewide plug load & appliance program; combined with induction cooktops/ranges)

Advancement Plan: Efficient Rooftop Units

Jeff Mitchell, Principal, Market
Transformation



Efficient Rooftop Units

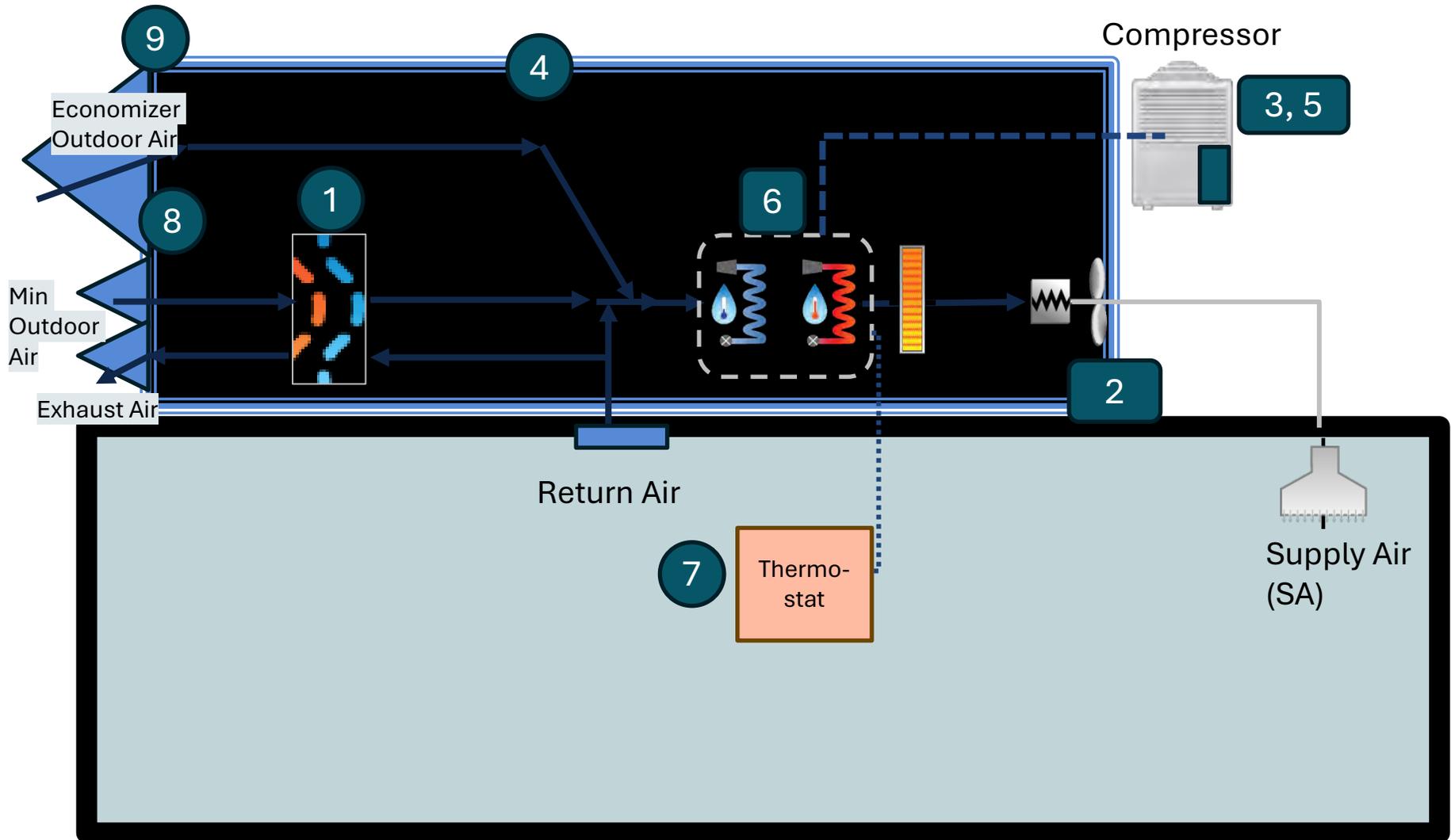
Product definition

Forced-air systems that package evaporator, condenser coils, fans, and heating components into a single unit to serve a building's heating, cooling, and ventilation needs



RTU System Efficiency Features

Measure #	Feature Description
1	Heat / Energy Recovery Ventilator (HRV / ERV)
2	Variable Speed Fans, Fan Efficiency
3	Compressor Efficiency, Variable Capacity Compressor
4	Insulated Box / Enclosure
5	Optimized Heat Pump (HP) Sizing
6	Advanced Controls for HP Defrost, HP Backup Heating
7	Connected/ Smart Thermostat
8	Low Leakage Dampers
9	Improved Economizer Performance



Milestones related to each MT idea

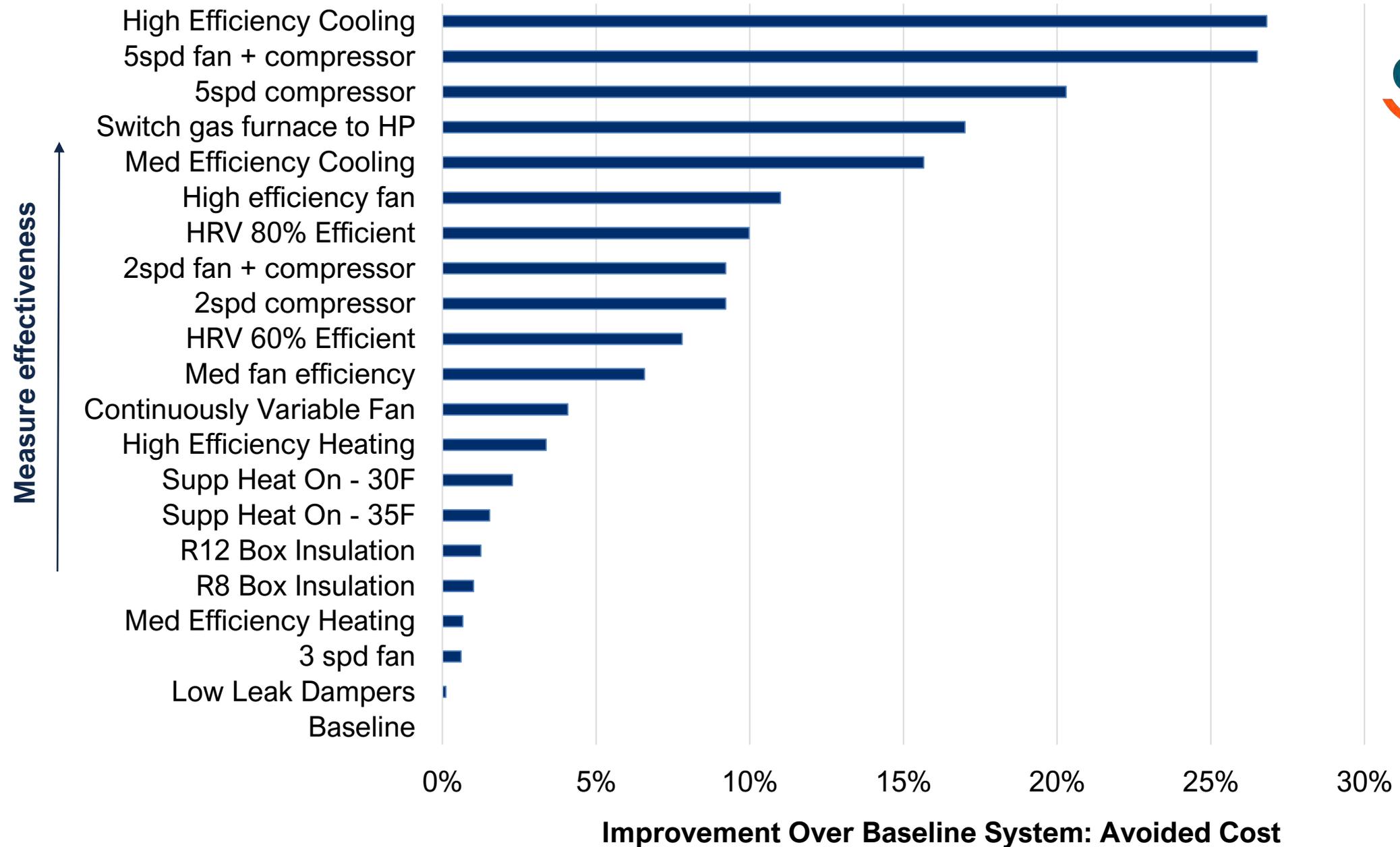
	2024				2025				
	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	
PHASE II – PROGRAM DEVELOPMENT									
ERTUs		 PHASE II RESEARCH & STRATEGY PILOTS							
		RESEARCH ACTIVITIES							
		TECHNOLOGY ASSESSMENT							
			FIELD STUDY ACTIVITIES						
ORG MILESTONES			 						



Technology Assessment update: Energy modeling



- Modeled packages of complementary features
- Used Avoided Cost Calculator (ACC) and hourly modeling outputs to estimate per-building avoided costs over the life of the measure/program
- Calculated estimated utility bill impacts for each feature and combination of features





Technology Assessment update: Stakeholder highlights



- Engaged NEEA, MN CEE and VEIC to discuss priorities for RTU performance, modeling efforts, advocacy, and collaboration with other efficiency organizations in other parts of the US
- Collaborated with CA IOU Codes and Standards leads to review modeling results, discuss draft product definition, and identify potential areas for coordination between CalMTA and IOU C&S programs



Market Characterization



- Completed stakeholder interviews of California programs and other MT organizations advocating for efficient RTUs
- Explored what other organizations were promoting as an “efficient” RTU to further inform our product definition
- Analyzed CEDARS, ComStock, and T24 databases to characterize current RTU adoption and stock

Market Characterization: Literature review



- Compiled literature review resources to characterize RTU market dynamics, lessons learned, and address other research objectives as noted in the ERTU advancement plan.
- Reviewed studies from SDG&E, CEE, MN CEE, NREL etc.
- This information will be used to identify the needed primary data collection research.





Market Characterization: Workforce research



Identified organizations for possible interviews that could be potential partners or provide leverage opportunities:

- HVAC education and training in California (schools, manufacturers, distributors, unions, etc.)
- Organizations focusing on economic development, decarbonization, and job training

Developed interview questions and sample frame



CalNEXT Partnership: Field study



- Met to explore leveraging or expanding planned CalNEXT project to collect field data
- Conversations illuminated shared interests including:
 - Potential for remote monitoring systems to improve RTU performance
 - The importance/approaches reducing electrical demand to ease the transition to heat pump RTUs

What's coming next?



Modeling – Continued modeling efforts focused on desired RTU packages and tiers

Product Description updates – Based upon modeling results update initiative product description to best represent California climate needs and socialize update with partners

Market Characterization – Conduct decision maker and workforce interviews and draft summary memos

Field Study – Finalize research objectives, confirm field study partner(s), establish scope of work, and draft contract



A photograph of the Golden Gate Bridge in San Francisco, California, viewed from a high angle. The bridge's iconic orange-red towers and suspension cables are prominent against a clear blue sky. The bridge spans across a body of water, with a small boat visible in the distance. The foreground shows the rocky edge of the bridge's approach.

10 Final 2025 Annual Budget Advice Letter (ABAL)

Lynette Curthoys, VP, Market Transformation

2025 ABAL Update



- Received initial comments/questions in the June MTAB meeting
- Received comment letter from one MTAB member
- Comments have been addressed in
 - New Appendix A: Summary of 2024 Funding Allocation Changes
 - Redlined and clean version of the 2025 ABAL
 - Response to comments memo

Appendix A: Summary of 2024 Funding Allocation Changes



1) Phase II cost tracking:

- CPUC Contract Manager asked CalMTA to track and invoice Phase II program strategy development costs at the MTI level, rather than by the subtasks listed in the 2024 ABAL

2) Fund shifting:

- \$2.8 million shifted from Phase II to Phase I
- \$883,500 shifted from Program Strategy Testing/Pilots to other Phase II Program Strategy Development activities

3) Strategy pilot approvals:

- The CPUC Contract Manager approved workplans and budgets to allocate \$3,116,000 to specific strategy pilots

Appendix A Budget Details

- Table A1: Forecasted budget table from the 2024 ABAL
- Table A2: 2024 budget fund shifting summary
- Table A3: Budget allocation comparison table
 - 2024 ABAL estimates
 - 2024 reallocated estimates
 - 2025 ABAL estimates
- Table A4: Program strategy testing/pilots funding authorization summary

2025 ABAL: Key Redline Revisions



- Table 2. CalMTA Startup Budget Summary: updated 2024 forecast
- Added a description of fund shifting
 - \$19.6M budget is a firm cost cap
 - Estimates for cost categories and major activities are not cost caps
 - Fund shifting between and among cost categories is coordinated with CPUC Contract Manager
- Table 3. 2025 CalMTA Budget Forecast by Cost Category and Activity
 - Rounded numbers to the nearest 1,000
 - Added number of full-time equivalent staff “FTE”

2025 ABAL: Key Redline Revisions (cont.)



- Added “Budget Tracking and Reporting” section
 - CalMTA will report on the status of the budget in
 - Quarterly and annual reports
 - Quarterly MTAB meetings

2025 ABAL: Key Redline Revisions (cont.)



- Added “2024/2025 Budget Comparison” section
 - Administration: similar for 2024 and 2025
 - Operations: 24% of the total 2024 budget forecast / 23% in the 2024 budget forecast
 - Policy and stakeholder engagement and communications are budgeted to increase
 - Project management, MTAB operations, and data systems development and management are forecasted to decrease
 - Initiative/Concept Development:
 - 2025 estimate: 85% for Phase II and 15% Phase I
 - 2024 reallocated estimate: 72% for Phase II and 28% to Phase I

Specific cost category comments

- Administration
 - Goal is to keep administration spend low and focus more of our efforts on MTI development
 - Administration budget plans for activities that are difficult to forecast (e.g., financial/data requests + legal support for Application proceeding)
- Initiative/Concept Development
 - 2022-2023: Cost efficiencies in Administration and Operations allowed fund shifting of to Initiative/Concept Development to accelerate benefits to California

Level of detail provided in budget



MTAB Member comment summary:

- Provide line-item version of the 2025 Annual Budget as an Attachment to the 2025 Draft ABAL
 - Break down each Phase II MTI into the Market Research and Technological Assessment and itemize all associated tasks in their Advancement Plans
 - Break down major activities under “MTA Operations” and “Concept Development” to include costs associated with the key deliverables described in the 2025 Draft ABAL

Level of detail provided in budget

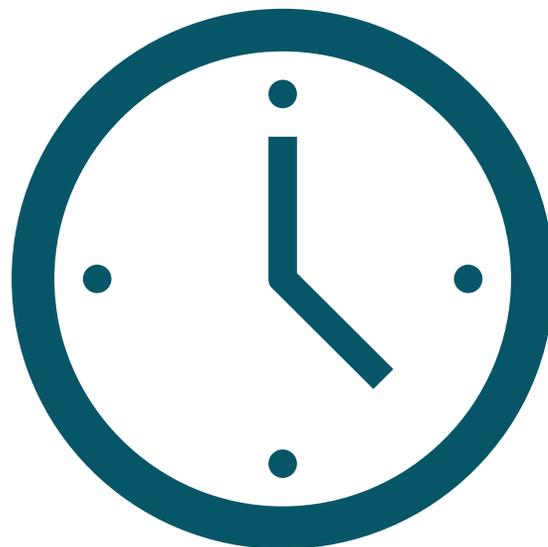
- Cost estimates are developed based on the anticipated level of effort to deliver the activities forecasted in the ABAL
- Advancement Plan research cost estimates span 2024-2025
- Balance sub-tasks accounting codes with goal of keeping administration costs low
- Propose to track Phase II costs for each MTI between
 - Research and Market Engagement
 - MTI Strategy and Plan Development

Overall budget & CalMTA performance



- Annual \$19.6M budget caps for startup phase are firm caps that CalMTA cannot exceed
- Fund shifting between individual line items allows the new MT program to evolve and be nimble, while staying under firm budget annual budget caps
- The CalMTA team has met every major milestone and key deliverable outlined in the contract and in our publicly available Operations Plans

Break (10 min)
We will be back soon.



11

MTI Evaluation in Practice

Karen Horkitz, Lead, Market Research & Evaluation





Agenda

- Evaluation activities by MTI lifecycle stage
- MTI Plan evaluation-related components
 - How components fit together
 - Evaluation plan outline
 - Evaluability Map example
- Evaluation process
- Discussion

Evaluation activities, by MTI phase

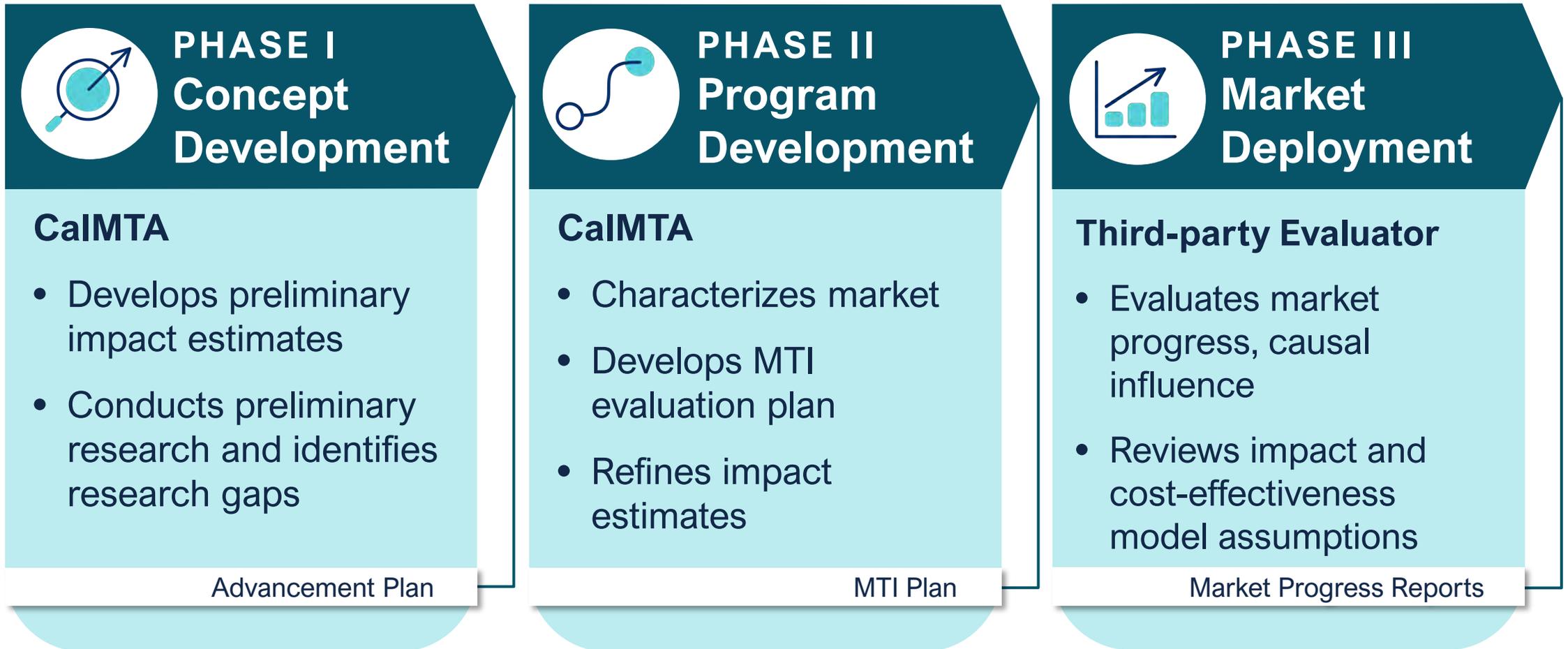
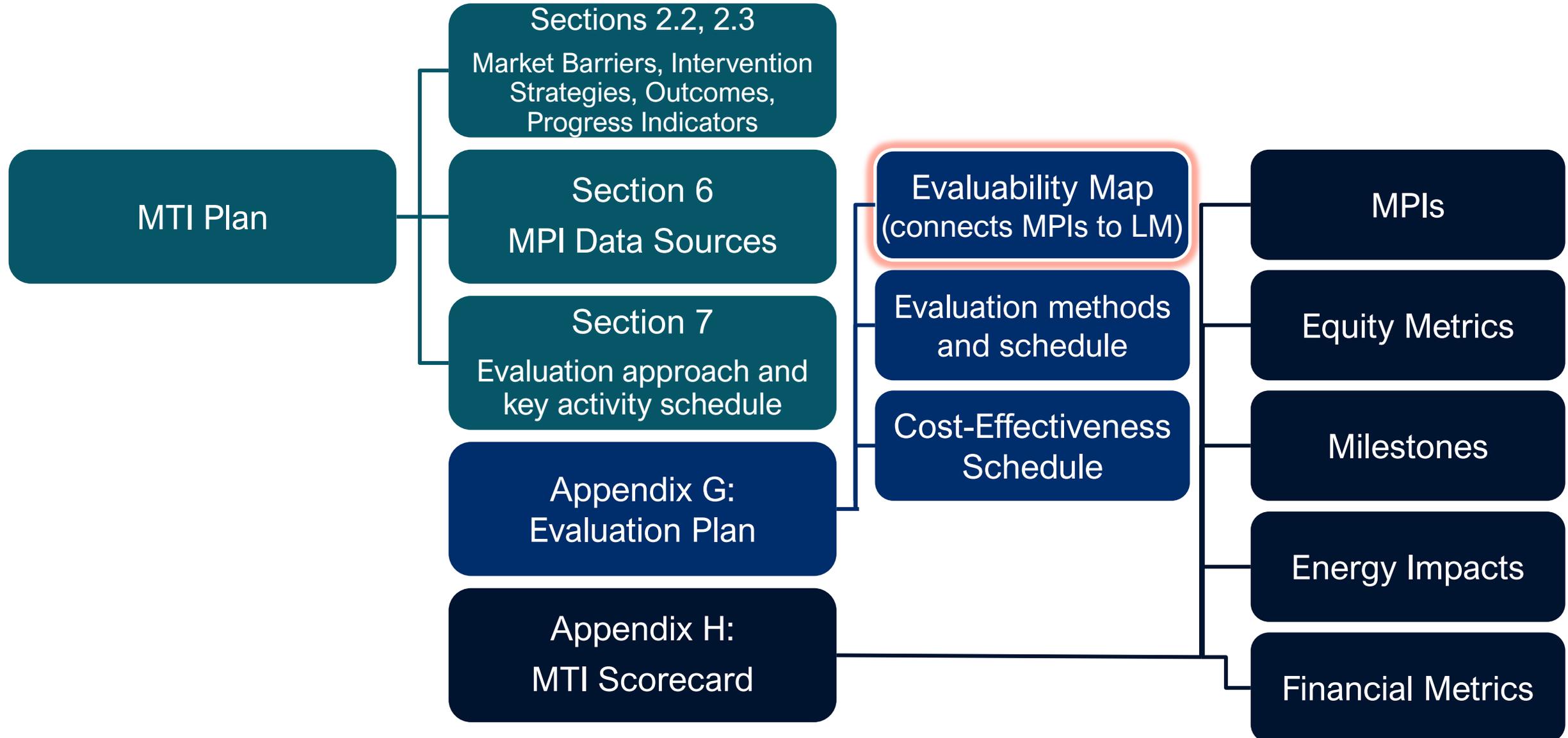
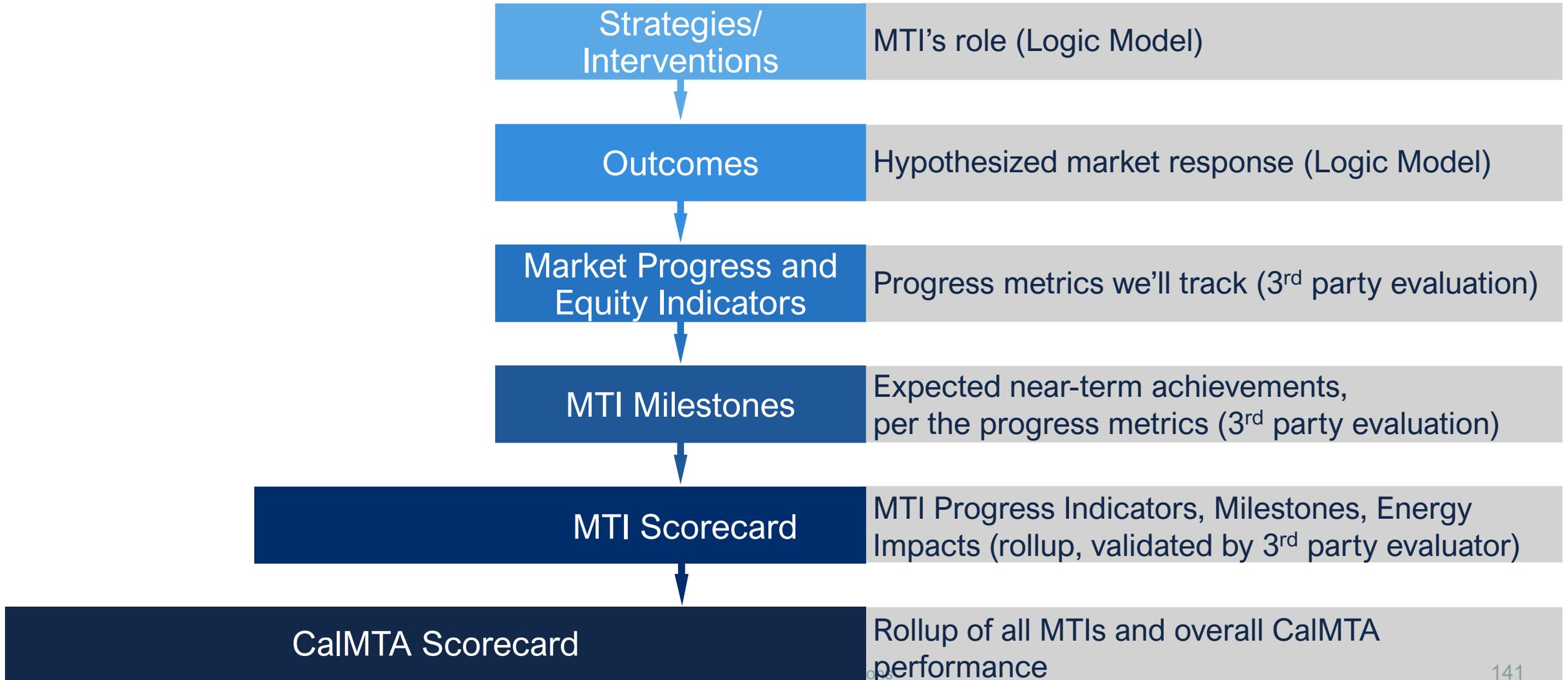


Image credit: CalMTA

Evaluation-related MTI Plan components



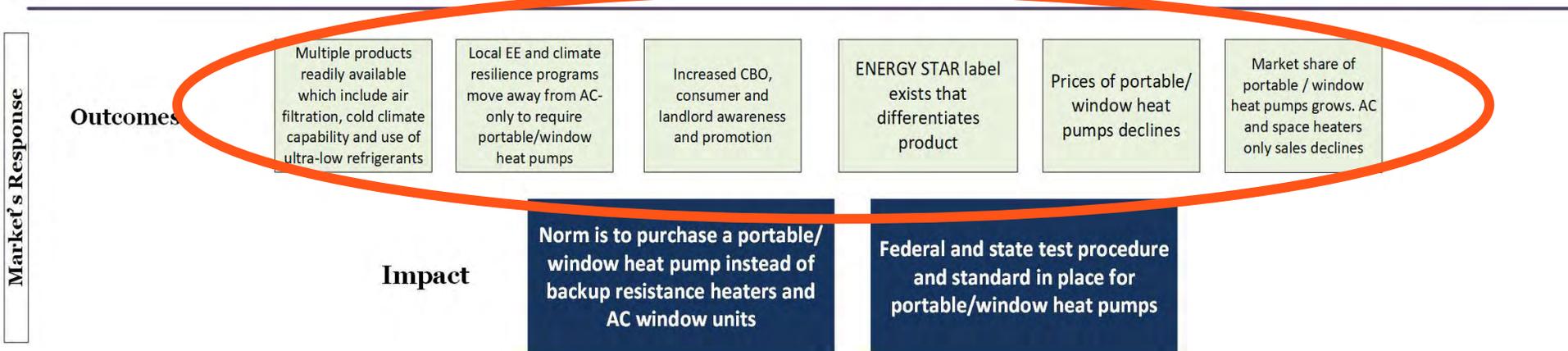
Performance management: how it all fits together



Evaluation Plan outline (Appendix G)



Section/Topic	Content Description
I. Introduction/ Overview	Overview of evaluation approach <ul style="list-style-type: none">• Draws from MTI Plan section 7• Adds timeline and roles for 3rd party evaluator
II. Evaluating Market Progress & Equity	Introduction to the evaluation map <ul style="list-style-type: none">• Connects MTI interventions to market progress indicators, milestones, and data sources
III. Evaluation Objectives and Activities	(a) Overview (b) Data collection and analysis activities (c) Methodology to estimate incremental impacts <ul style="list-style-type: none">• Total market adoption (total incremental units)• Net incremental impact analysis<ul style="list-style-type: none">• Baseline market adoption forecast & methodology• Utility verified units (to be subtracted)• Causality assessment (d) Market Adoption and Cost Effectiveness Model Review



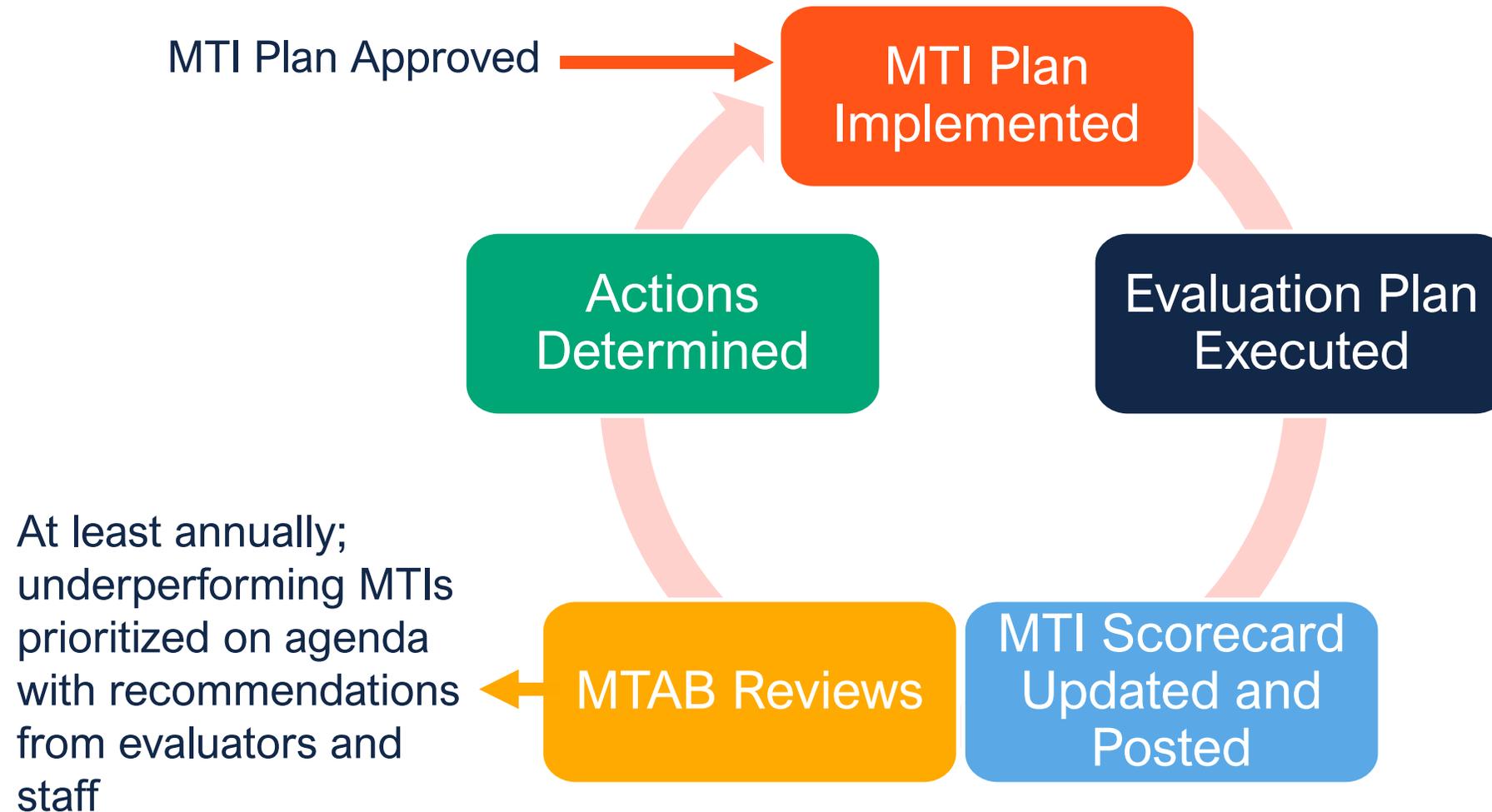
Evaluability Map (Section II of Evaluation Plan)

Illustrative Example: Portable/Window HPs



Outcomes	Timing	Progress Indicators	Milestone	Data Sources – MPI	Data Sources – Causality
Local programs incorporate PHPs to AC programs	1-3 years	1. # incentives for PHP 2. # programs offering cooling for extreme heat include PHPs	By end 2028: • 4 programs offer PHP incentives • 2 cooling programs offer	<ul style="list-style-type: none"> • Program materials • PA interviews 	<ul style="list-style-type: none"> • CalMTA Salesforce documentation • PA Interviews
Increased CBO awareness	1-3 years	3. # CBOs installing PHPs	By end of 2028: • 20% of CBOs install	CBO survey/interviews	<ul style="list-style-type: none"> • CalMTA Salesforce documentation • CBO interviews
Increased consumer and landlord, awareness	4-6 years	4. % consumers aware 5. % landlords aware	By end of 2030: • Consumer awareness +10% • Landlord awareness +10%	<ul style="list-style-type: none"> • Consumer survey • Landlord survey 	Consumer and landlord surveys
Market share of PHP grows; share of window AC/space heater share declines	4-6 years	6. % of PHPs of total portable heating and cooling unit sales	By end of 2030: • Market share doubles over baseline	<ul style="list-style-type: none"> • ESRPP Data • Other sales/ shipment data (AHAM, Circana) 	All sources
Energy Star label exists that differentiates product	4-6 years	7. ES Specification exists 8. # products on QPL	By end of 2030: • Specification scheduled	Energy Star website	<ul style="list-style-type: none"> • Salesforce • Energy Star interviews
Enhanced products exist (air filtration, CC, UL GWP)	7-10 years	9. # Products with targeted enhancements	By end of 2030: 3 manufacturers confirm development activity	Manufacturer interviews	<ul style="list-style-type: none"> • Salesforce • Manufacturer Interviews

Monitoring, Reporting, and Review Process



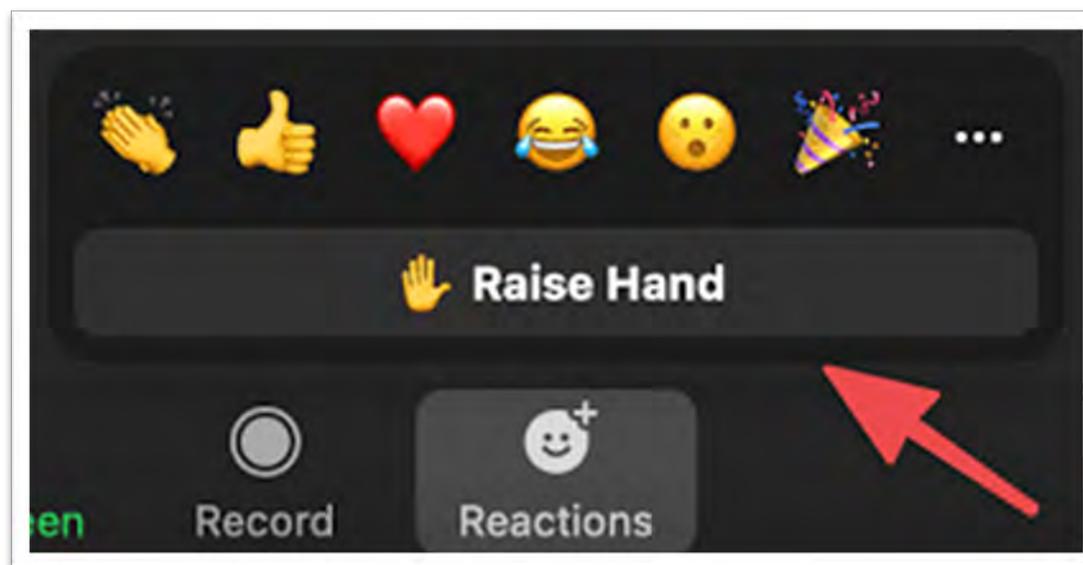
Discussion



- What additional observations do you have?
- What questions does this raise for you?
- What, if anything, makes you confident that we'll be able to adequately assess MTI performance?
- What gives you the greatest uncertainty with respect to accountability?
- What else should CalMTA be doing?

12. Public Comment

Raise your hand using the “Reactions” feature and we will allow you to unmute yourself.



13

Next Meeting & Next Steps

Stacey Hobart, Principal, Stakeholder
Engagement & Communications



MTAB review timeline



	Jul 12	Sep 19 & 23	Oct 25	Nov 20-21
MT Idea Advancement Plans				
Commercial Replacement & Attachment Window Solutions	Public comment ends: July 11	Final Adv. Plan w/ comment summary		
Residential Heat Pump Water Heating	Public comment ends: July 11	Final Adv. Plan w/ comment summary		
Food Service Water Heating Systems	Public comment ends: July 31	Final Adv. Plan w/ comment summary		
Efficient Streetlighting				Include in Stage 2 scoring with new batch of MTIs

MTAB review timeline



	Jul 12	Sep 19 & 23	Oct 25	Nov 20-21
MTI Plan Development				
Induction Cooktops & Ranges		Logic Models, & MT Theory	BMA/TMA & Cost Effectiveness	-Draft MTI Plans -Evaluation Plans
Portable/Window Heat Pumps				
Next Batch Ideas				
2024 Request for Ideas		Stage 1 scoring & prioritization		Stage 2 scoring & prioritization

MTAB review timeline



	Jul 12	Sep 19 & 23	Nov 20 & 21
Admin & Operations			
2025 ABAL	Updated draft & response to comments		
Application		Discuss application approaches	Overview of draft application to MTAB
Quarterly Updates	2nd Quarter Report w/financials		3rd Quarter Report w/financials



Transformative Energy Solutions for the public good

Market transformation is a proven approach that works to remove market barriers so that energy efficient, equitable, and climate-friendly approaches become the new standard practice for all Californians.

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