



ACTIVITY REPORT

# 1st Quarter 2024



## SECTION 01

# Overview

### Key outcomes

*Since launching in late 2022, CalMTA has been working to develop a set of potential market transformation initiatives (MTIs) to help achieve California’s goals for cost-effective energy efficiency, decarbonization, workforce development, and equity. CalMTA is a program of the California Public Utilities Commission (CPUC) and is administered by Resource Innovations.*

In the 1st quarter of 2024, in collaboration with the Market Transformation Advisory Board (MTAB), the CalMTA team moved forward with the development of seven promising market transformation (MT) ideas that have high potential to create long-lasting change that delivers cost-effective energy efficiency and greenhouse gas (GHG) reductions. This report summarizes that work, with a focus on the development of these game-changing ideas.

#### Key 1st quarter accomplishments:

- Research under Phase II: Program Development began on the **first three ideas** deemed viable for the market transformation portfolio CalMTA is creating, including:
  - **Induction Cooktops & Ranges**
  - **Portable/Window Heat Pumps**
  - **Efficient Rooftop Units (ERTUs)**

<sup>1</sup>An Advancement Plan outlines the strategies, research, and activities that need to be conducted to determine the viability of a potential MTI. The activities indicated in the Advancement Plans are those that are needed to inform the development of the MTI Plans.



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### Key outcomes

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**The ENERGY STAR Retail Products Platform (ESRPP)** is a collaborative midstream initiative of ENERGY STAR®, energy efficiency program sponsors, retailers (e.g., The Home Depot, Lowe's, Best Buy, and independent stores through the Nationwide Marketing Group), and other key stakeholders.

- Advancement Plan development under Phase I: Concept Development for another **four high-potential ideas** was kicked off. Advancement Plans describe the research and investigation needed to form a full initiative.<sup>1</sup>
- These ideas include:
  - Residential Heat Pump Water Heating (HPWH)
  - Commercial Replacement and Attachment Window Solutions (CRAWS)
  - Efficient Streetlighting
  - Foodservice Water Heating Systems
- The CPUC Contract Manager approved two Strategy Pilot workplans and budgets following CalMTA's webinar that summarized comments from the MTAB and public. These are being implemented in collaboration with local partners and outreach to market actors will be conducted to inform development of a full initiative. These Strategy Pilots include:
  - **Geographic Targeting Using ESRPP for Portable/Window Heat Pump and Induction Cooking**<sup>2</sup>
  - **Portable/Window Heat Pump Self-Installation Practices**
- The final **MTI Evaluation Framework** was completed. The framework describes the policies, principles, and high-level approaches that CalMTA will use to assess market progress on its portfolio of MTIs.
- To further support MTI development, communications and outreach, and IT systems, four additional staff were hired in the 1st quarter.

**Key outcomes**

Developing a robust portfolio of MTIs will be an important consideration as CalMTA conducts Phase II: Program Development activities in 2024. In addition to selecting individual potential ideas, CalMTA is considering how the entire portfolio will perform compared to strategic goals. These particular ideas were chosen because they largely meet the Portfolio Priorities developed in collaboration with the MTAB.

Table 1 shows how market transformation ideas currently under consideration map to the Portfolio Priorities.

**Table 1: Portfolio priorities**

	Equity	WE&T*	Energy Savings	Grid Benefits	GHG Reductions
Induction Cooktops & Ranges	X		X		X
Portable/Window Heat Pumps	X		X		X
Efficient Rooftop Units	X	X	X	X	X
Residential Heat Pump Water Heating (HPWH)	X	X	X	X	X
Commercial Replacement and Attachment Window Solutions (CRAWS)	X	X	X	X	X
Efficient Streetlighting	X		X	X	X
Foodservice Water Heating Systems	X	X	X		X

\*Workforce Education & Training

**Published reports in 1st quarter**



See page 17 for links to all 1st quarter publications.



## SECTION 02

# MTI Development

### Ideas currently in Phase II

*Two of the ideas advanced to Phase II Program Development this quarter and are on track for completing MTI Plans\* at the close of the year for CPUC approval. Market characterization, technical assessment, and Strategy Pilots are underway.*

\* An MTI Plan describes the business case supporting the MTI and the market development and evaluation activities that will be implemented during Phase III: Market Deployment.

For those ideas identified as “front runners” following our Request for Ideas (RFI) and initial scoring process in 2023, CalMTA made strides in 1st quarter by advancing them from Phase I: Concept Development to Phase II: Program Development. Conclusion of Phase I: Concept Development is marked by the completion of an Advancement Plan describing the research and investigation that will be needed to form that idea into a full MTI Plan for implementation in Phase III: Market Deployment.

Read on to learn more about the activities undertaken in the development of each idea.

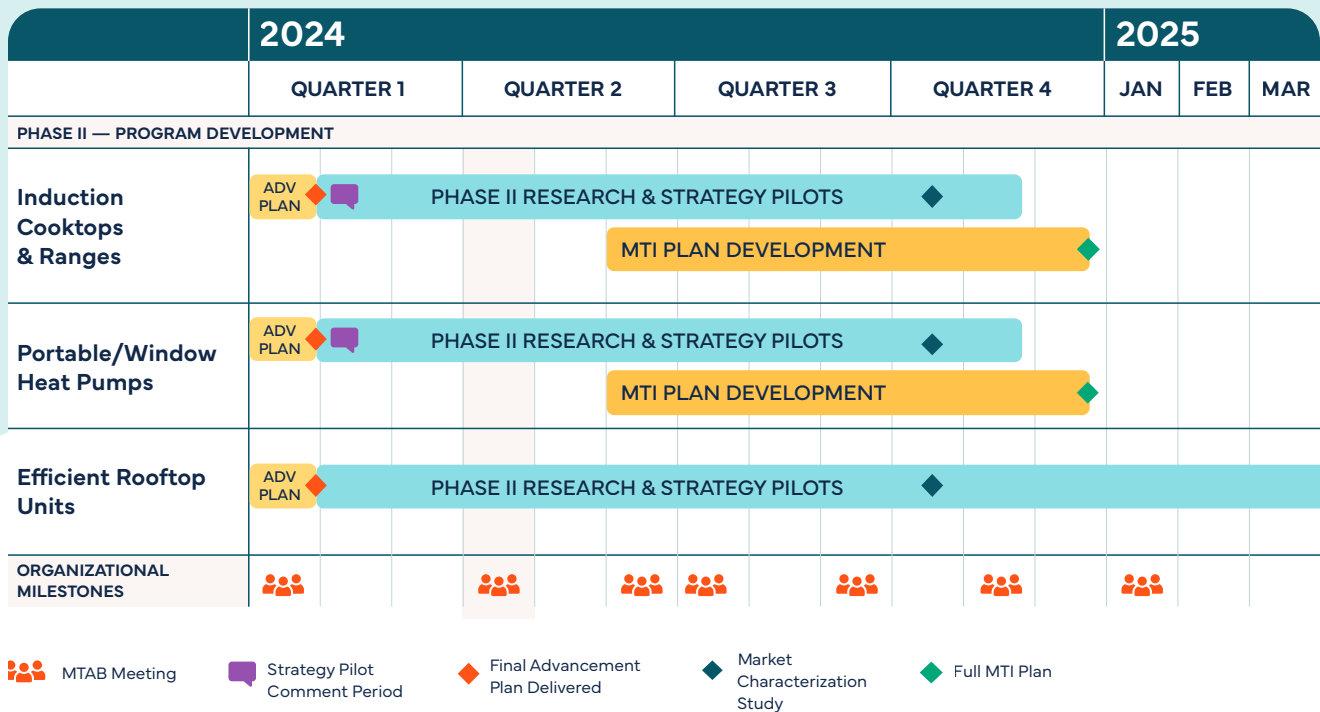
Figure 1: MTI development process

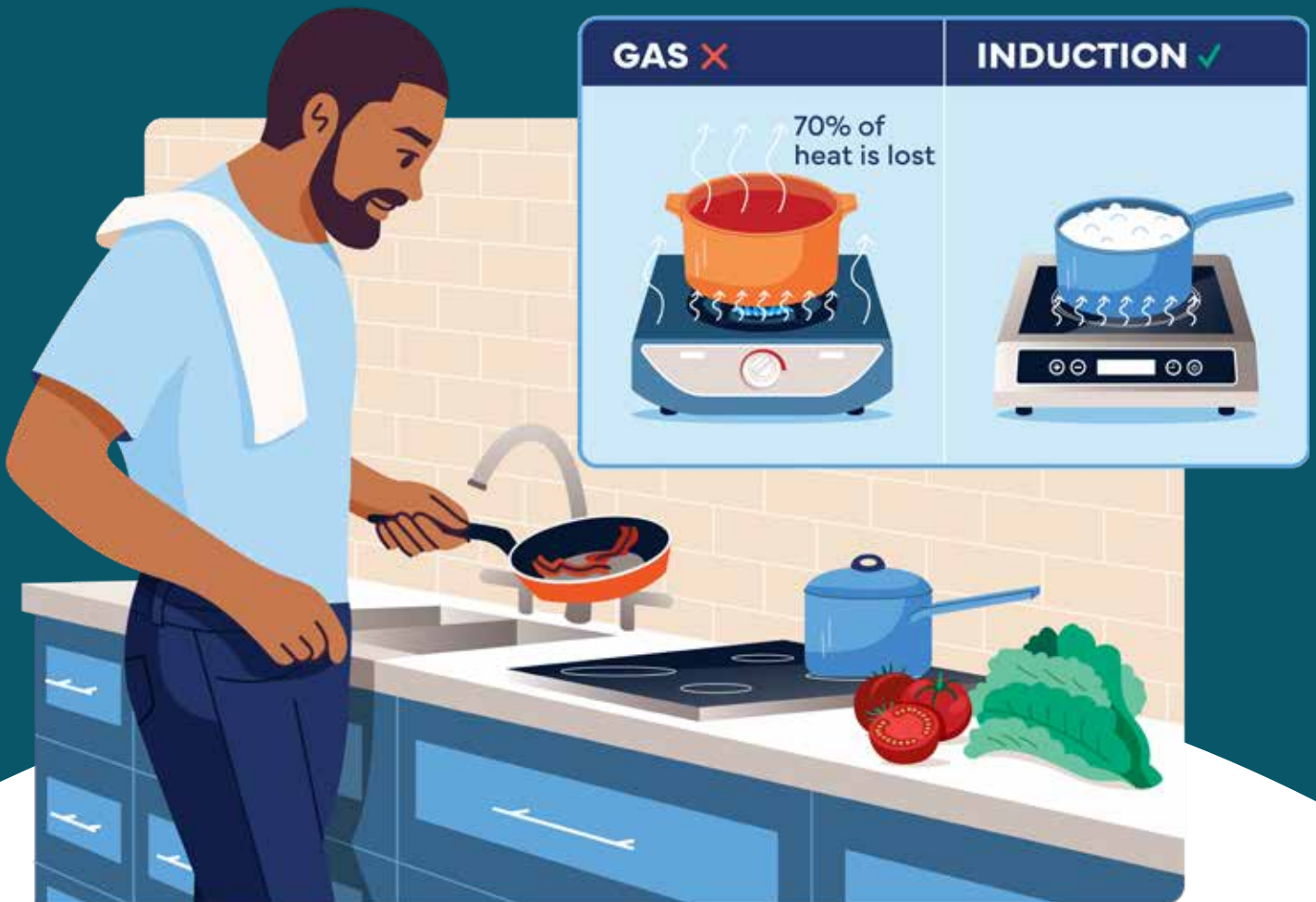


**Ideas currently in Phase II**

These **three ideas** — Induction Cooktops & Ranges, Portable/Window Heat Pumps, and ERTUs — now have final Advancement Plans, for which CalMTA has addressed all public comments. We also finalized the budgets and workplans for two Strategy Pilot projects: **Geographic Targeting Using ESRPP for Portable/Window Heat Pump and Induction Cooking**, and **Portable/Window Heat Pump Self-Installation Practices**. Market and technology research and strategy-testing activities identified in our Advancement Plans for these first three MT ideas are described in the sections below.

**Figure 2: Timeline of activities for Phase II ideas**





## Induction cooktops & ranges

*Induction cooktops and ranges use electromagnetic induction to heat cookware directly. They save energy through instant, direct, and efficient heat transfer, and provide precise temperature control without emitting gases that degrade indoor air quality.*

Key activities related to implementation of the Induction Cooktops & Ranges Advancement Plan include the following:

### **1 Initiating the market characterization study**

CalMTA completed a review of existing literature and a secondary data analysis of the housing market and cooktop/range characteristics. We also initiated interviews which included speaking with 18 California program stakeholders and subject matter experts, interviewing 15 multifamily building owners, and conducting outreach to manufacturers.



## 2 Creating induction cooktops & ranges product list

A significant number of commercially available induction cooktops and ranges were identified. However, CalMTA found no commercially available 120V induction ranges (with oven) but identified many 120V induction cooktops (burners only with no oven).

## 3 Building an annual bill impact estimator

CalMTA built a tool for accepting 8,760 load shapes and changes in energy consumption and applying user-selected electric rates to determine annual bill impacts. This tool was built to better understand energy consumption of portable/window heat pump products, induction cooktops and ranges, and efficient rooftop models.

## 4 Assessing 120V product performance limitations

This assessment generated several results, including a chart of maximum theoretical limits for each combination of induction features based upon different cooktop sizes. CalMTA identified challenges with 15A circuit versus 20A 120V circuit maximum power. We noted that certain 120V induction cooktops use power invariance technology. Power invariance technology allows the cooktop to dynamically split power between heating elements to maximize the cooktop's output without overloading the circuit. As a result, we are exploring research to determine how much adaptation is required to cook using a power-limited 120V induction range product (with and/or without power invariance technology).

## 5 Assessing the NYCHA Induction Stove Challenge

The Induction Stove Challenge is a joint effort between the New York City Housing Authority (NYCHA), New York Power Authority (NYPA), and New York State Energy Research and Development Authority (NYSERDA) to motivate manufacturers to create a new induction stove product that can operate with lower electricity requirements (120V instead of 240V) that would be suitable for public housing in New York City. This will be a two-year effort to build prototypes and install them for a pilot project in NYCHA apartments, with the hope that it will lead to large-scale deployment. CalMTA is interested in this project since the type of product they are seeking to create may have application for California multifamily buildings with limited electrical capacity. The project provides 22 specifications that offer a baseline for refining CalMTA's product definition. Prominent among them are:

- Requires maximum power of 1,800W (15A @ 120V)
- Cannot exceed 16A draw while in use
- Must heat 5 pounds of water in seven minutes or less





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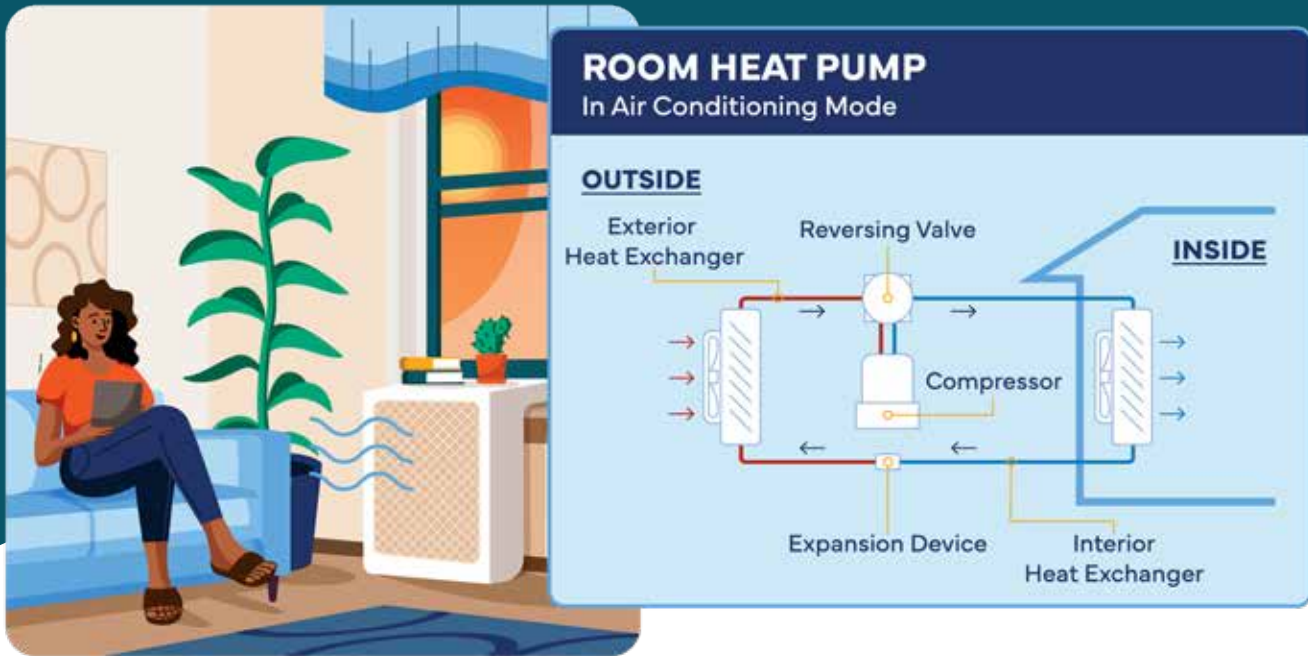
## Induction cooktops & ranges

- Oven or broiler, which has the larger current draw, must be capable of operating at full power simultaneously with the larger burner at full power for at least 10 minutes

Notably, the NYCHA Induction Stove Challenge also contains specifications for a battery backup induction range product.

## **6** Preparing to launch the ESRPP Strategy Pilot

CalMTA is pursuing some limited studies to test MT idea-specific assumptions and strategies and gain greater insights into potential market barriers to adoption of a technology or practice. The ESRPP Strategy Pilot tests whether the ENERGY STAR Retail Products Platform (ESRPP) serves as a viable intervention strategy for targeting certain geographic areas including environmental and social justice (ESJ) communities for both portable/window heat pumps and induction cooking technologies. In preparation for this project, CalMTA identified “big box” retailers to participate in the project, and developed participation agreements with Best Buy, Lowe's, Home Depot, and Nationwide. CalMTA also initiated a data management contract with ICF. We defined the product list and the zip code list for regions that will be targeted.



## Portable/ window heat pumps

*Portable and window heat pumps are self-contained consumer products that can replace less efficient window air conditioners and also provide space heating in the winter months. These devices can be self-installed and plugged into standard 110-volt outlets.*

Key efforts related to implementation of the Portable/Window Heat Pumps Advancement Plan include the following:

### **1 Initiating the market characterization study**

CalMTA completed literature review and data analysis of the housing market and portable/window heat pump characteristics. We also initiated interviews which included speaking with 18 California program stakeholders and subject matter experts, interviewing 15 multifamily building owners, and conducting outreach to manufacturers.

### **2 Building an annual bill impact estimator**

CalMTA built a tool for accepting 8,760 load shapes and changes in energy consumption and applying user-selected IOU rate to determine annual bill impacts. This tool was built to better understand energy consumption of portable/window heat pump products, induction cooktops and ranges, and efficient rooftop models.



### 3 Verifying the list of qualifying products

Early on it was identified that many products claiming to be heat pumps were in fact only air conditioning units with electrical resistance heating (or in some cases no heating at all). CalMTA generated specifications to identify true heat pumps, and to determine any products that fall outside of the category. See Table 2 below for details.

Table 2. True heat pump specifications vs. products outside of category

True heat pump specifications	Products outside of category
Heating BTU capacity > 6400 Btu/h for 15 A (120V)	Any of the following nomenclature <ul style="list-style-type: none"><li>• air conditioner with backup heating</li><li>• packaged terminal air conditioner (PTAC)</li><li>• packaged terminal heat pump (PTHP)</li><li>• through the wall heat pump or air conditioner</li></ul>
Energy Guide label denoting a product in the category: air conditioning unit with reverse cycle	Any mention of resistance of heat
A heating minimum operating temperature -40–47° F	Voltages of 208, 220, or 240 V

### 4 Identifying parameters of product performance

Our analysis has confirmed that the following parameters are the main identifiers of product performance:

- Heating and cooling capacity (differentiating between ASHRAE and SACC)
- Minimum operating temperature (if noted)
- Combined Energy Efficiency Ratio (CEER)
- Max power (kW) or max amperage at 120V
- Operating noise level (dB)
- Refrigerant type (preference for R-32 over R-410A)
- Package type (window/waddle/U-shaped/portable)
- Hose configuration (for portables)

## 5 Assessing heating and cooling capacity

We are using building energy modeling to determine the real heating and cooling capacity as it relates to square footage of single- and multi-family homes in California and have taken the following steps:

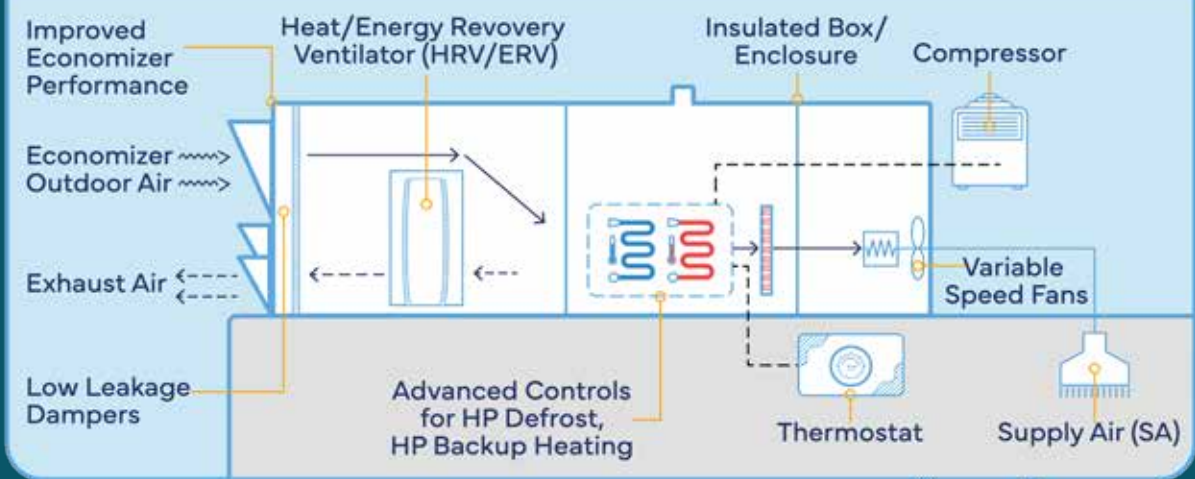
- Benchmarking in California Building Energy Code Compliance (CBECC), which determined that the simulation package was giving inconsistent results for window heat pumps and heating loads in multifamily buildings with shared walls
- Vetting and comparison of EnergyPlus and BeOpt to verify results and proper trends, which determined reliable modeling method to estimate of heating and cooling capacity of single and multifamily buildings
- Using building insulation/performance levels representative of residential stock in California to develop a prototype and change the square footage, climate zone, and number of shared walls to assess true heating and cooling capacity
- Additional preliminary work on the Portable/Window Heat Pumps idea  
1st quarter included specifying preliminary energy modeling criteria and completing technical modeling for heating and cooling units

## 6 Initiating the Self-Installation Strategy Pilot

CalMTA kicked off the Portable/Window Heat Pump Self-Installation Strategy Pilot, which will fully launch in 2nd quarter. We have executed contracts with local partners, including USGBC LA, Redwood Energy, and El Concilio Group. Strategy Pilot locations and sites have been identified, and we have engaged three manufacturers, Midea, Whynter, and Gradient, to participate.



## EFFICIENT ROOFTOP UNIT (ERTU)



### Efficient Rooftop Units

*Rooftop units (RTUs) are forced-air systems that package the evaporator, condenser coils, fans, and heating components into a single unit to serve a building's heating, cooling, and ventilation needs. Design improvements addressing supply efficiency, heat recovery, and an improved shell can deliver 10–40% energy savings beyond today's minimum efficiency rooftop units.*

Key activities related to implementation of the ERTU Advancement Plan include the following:

#### **1 Finalizing the Market Characterization Work Plan**

We incorporated workforce characterization into the Market Characterization Work Plan, and kicked off stakeholder mapping to understand key market patterns and establish our approach to outreach. We prepared an interview guide and began scheduling interviews with an initial round of stakeholders.

## 2 Conducting initial market research

CalMTA has begun researching into RTU and HVAC contractor industry data sources. We have also engaged with other MT organizations to build collaborative relationships and understand their current work on ERTUs.

## 3 Advancing the ERTU technical assessment

CalMTA summarized existing research (approximately 20 reports) and created a technology data set explaining main features and potential energy efficiency measures for RTUs. CalMTA provided the Codes & Standards Group with an update highlighting new packaged HVAC test standards.

## 4 Building an annual bill impact estimator

CalMTA built a tool for accepting 8,760 load shapes and changes in energy consumption and applying user-selected IOU rate to determine annual bill impacts. This tool was built to better understand energy consumption of portable/window heat pump products, induction cooktops and ranges, and efficient rooftop models.

## 5 Completing energy modeling

In addition, we completed over 500 energy models to identify RTU packages and efficiency measures. These include the following aspects:

- Three building types: retail, office, school
- Existing and new buildings (initial focus on existing)
- Three CA climate zones: two (Santa Rosa), 10 (Riverside), and 12 (Sacramento)
- All electric with heat pump and mixed fuel with gas furnace
- Three levels of ventilation heat recovery (0%, 60%, 80%)
- Three levels of fan speed and efficiency (two-speed, three-speed, continuously variable)
- Three levels of cooling efficiency (SEER2 13.4, 16, 20)
- Three levels of heating efficiency (HSPF2 6.7, 7.5, 8.5)
- Combination packages including efficient cooling and variable speed fans
- Low leakage dampers for economizers

CalMTA is currently developing additional efficiency measures for modeling.



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## Ideas currently in Phase I

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<sup>3</sup>The Single Pane Retrofit MT idea was subsequently renamed to Commercial Replacement and Attachment Windows Solutions (CRAWS). It includes both vacuum insulated glass and commercial secondary windows as solutions for single pane windows in commercial buildings.

*In collaboration with the MTAB, a second set of ideas have moved forward with further development of Advancement Plans to determine whether the MT idea is viable for a full initiative. The ideas presented below were scored highly in our process and will add to the forming portfolio alongside the ideas currently in Phase II.*

At a public meeting in January, an additional four MT ideas were discussed with the MTAB. After integrating their input, we launched Advancement Plan development for a **second batch of ideas** in the 1st quarter. These ideas are Residential HPWH, CRAWS, Efficient Streetlighting, and Foodservice Water Heating Systems.<sup>3</sup>

For each idea, a draft conceptual logic model was developed, which illustrates potential intervention strategies for removing barriers and leveraging opportunities in the market. We also began identifying and analyzing knowledge gaps to determine research objectives and assessing available technology to determine viability of proposed market interventions.

### Some key activities in the 1st quarter include:

#### Residential Heat Pump Water Heating

- CalMTA completed the draft conceptual logic model for Residential Heat Pump Water Heating and shared early thinking with CalMTA strategic advisors and initiative teams
- We completed an external program review to identify programs or efforts aimed at heat pump water heaters in California and nationally.
- CalMTA conducted a roundtable discussion with industry experts at the Hot Water & Hot Air Forum to inform planning for this idea

#### CRAWS

- CalMTA developed the draft conceptual logic model for CRAWS and shared early thinking with CalMTA strategic advisors and initiative teams
- CalMTA engaged with the Lawrence Berkley National Lab for the latest research on vacuum insulating glass (VIG)
- We scoped energy/non-energy benefits modeling for commercial secondary windows (CSW), and established preliminary technical and energy modeling criteria for both VIG and CSW

Ideas currently in Phase I

**Efficient Streetlighting**

- CalMTA developed the draft conceptual logic model for Efficient Streetlighting and shared early thinking with CalMTA strategic advisors and initiative teams
- We launched an external program review
- We conducted an initial gap analysis and drafted questions to inform market characterization research and product assessment plans

**Foodservice Water Heating Systems**

- CalMTA developed the draft conceptual logic model for Foodservice Water Heating Systems and shared it with CalMTA strategic advisors and initiative teams
- We connected with key market actors working to test some of our assumptions and get perspective from the field
- We conducted initial gap analysis and drafted questions to inform market characterization research and product assessment plans

[Learn more about the ideas currently in Phase I: Concept Development.](#)

Figure 3. Timeline of activities for Phase I ideas



SECTION 03

# Stakeholder Engagement

## Collaboration & outreach

*We work with energy efficiency stakeholders, market actors, and others to deliver benefits for Californians. Through ongoing engagement and collaboration, we are maximizing input on our initiative development and ensuring that our efforts align with and support other programs.*

In support of our ongoing commitment to transparency and engagement at every step of the MTI development process, CalMTA conducted multichannel marketing, education, and outreach to connect with stakeholders throughout the 1st quarter.

Key highlights include:

**1 Producing and publishing extensive documentation of CalMTA efforts**

We finalized Advancement Plans for three ideas that moved to Phase II, the Stage 1 Disposition Report, plans for two Strategy Pilots, and the MTI Evaluation Framework.

**2 Conducting feedback with a public commenting process**

First quarter offered opportunities for public comment on the Advancement Plans and Strategy Pilots. In addition to promoting the opportunity through our public channels and during MTAB meetings, we conducted direct outreach to encourage stakeholders to engage with and





“ So how do we leverage [environmental and EE organizations], to utilize them as sounding boards, and advocates in the community... I would say, bring them along. ”

“ How can we reverse the trend that [uptake of new technologies] is only by those who can afford it? In my experience and from an academic perspective and empirical studies that I have been part of, everybody has a trigger point to change. Education is one of them. ”

**Collaboration & outreach**

comment on the documents on the CPUC’s PDA website. We resolved over 170 comments received on the Advancement Plans and also offered a webinar to review the comments received on the Strategy Pilots before finalizing.

**3 Reporting on listening sessions**

Following the listening sessions we conducted in 2023 with equity and workforce education and training (WE&T) representatives, CalMTA released a **summary report** that included recommendations on how to apply equity in MT idea development.

**4 Operationalizing our equity lens**

We charted our course for equity engagement and operationalizing our **equity lens** in 2024, including another set of listening sessions to be held in the 2nd quarter, establishing a sounding board of ESJ community experts to provide insights and feedback, incorporating ESJ community considerations at each phase of the MTI development process, and defining equity metrics for MTIs.



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### Collaborative to our core

CalMTA has many stakeholder groups that we work with to provide updates on our progress and ensure that market transformation efforts are well aligned with current energy efficiency and decarbonization program implementation happening across the state.

#### Ongoing stakeholder engagement efforts include:

- Opening all regular MTAB meetings to the public, allowing time on the agenda for public comment, and providing a process for submitting written comments regarding any agenda items
- Regular meetings with program administrators to share our plans, research outcomes, and confirm opportunities for leverage
- Collaboration with subject matter experts working on related programs as CalMTA develops full MTI Plans for implementation following CPUC approval
- Coordination with CalNEXT and similar programs to optimize synergies between emerging technology development and commercialization strategies that accelerate market adoption

#### This quarter, CalMTA staff presented at or hosted the following events:

- **1/10:** Consortium for Energy Efficiency (CEE) member meeting
- **2/15:** California Efficiency + Demand Management Council (CEDMC) Evaluation, Management & Verification Forum
- **3/14:** California Energy Efficiency Coordinating Committee (CAEECC)'s quarterly meeting
- **3/14:** Breakfast roundtable at the 2024 Hot Air & Hot Water Forum hosted by ACEEE (American Council for an Energy Efficient Economy)

## SECTION 04

# Operations

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### Optimizing process & practices

*Operations and administration of the CalMTA program is foundational to all we do. These aspects maintain the critical processes and practices that keep our team effectively meeting milestones.*

In the 1st quarter, CalMTA's operations performed a wide range of ongoing operational activities including project financial support, contract management and compliance monitoring, and IT system development and support.

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**We hired four new staff to support our expanding MTI development, communications and outreach, and IT systems, including:**



**Katie Teshima**  
Program Manager



**Nick Fiore**  
Program Manager



**Nicki Hashemi**  
Technology Analyst



**Scott Dill**  
Technical Writer/Editor





## Optimizing process & practices

### Additional key activities include:

- We continued to revise the draft Protocols for Conducting Competitive Solicitations that we submitted to CPUC staff at the end of 2022. This evolving document outlines the policies and procedures for selecting future implementation and evaluation contractors.
- CalMTA gathered the MTAB on **January 25** to review comments on the Stage 1 Disposition Report, hear an update on the final **MTI Evaluation framework**, and give input on the recommended second batch of ideas. All MTAB meeting details and materials can be found in our website's **News & Events** section.
- We solicited applications for three seats that were opening after one-year terms expire in April. In addition, we coordinated with the Regional Energy Networks to replace their outgoing member.

Through this process, in which applications were scored and approved by the CPUC, CalMTA reseated the three MTAB members' terms: Hayley Goodson (Ratepayer Advocacy/Protection), Peter Miller (Environmental Advocacy), and Fred Gordon (Evaluation Professional). Karina Camacho of I-REN was chosen by the Regional Energy Network to represent them in this new term. All four of these members will serve two years through April 2027.

### [Learn more about the MTAB](#)

## SECTION 05

# Looking Ahead

### Highlights of upcoming activities

*In the coming months, CalMTA will continue to report quarterly on our progress. We look forward to a highly productive 2nd quarter, including commencing two Strategy Pilots, presenting Advancement Plans for two ideas, holding another set of Listening Sessions, and releasing our 2024 Operations Plan.*

#### Highlights of activities planned for 2nd quarter 2024 include:

- Hold a virtual MTAB meeting in April and in-person session in June
- Release a 2024 Operations Plan and 2023 Annual Report
- Draft a 2025 Annual Budget Advice Letter for MTAB review
- Finalize a template for MTI Plan development
- Begin discussions about program-level KPIs with the MTAB at their April meeting
- Commence installations for Portable/Window Heat Pump Self-Installation Strategy Pilot with all three local partners and begin data collection
- Commence data collection under the ESRPP Strategy Pilot with contracted retailers
- Present the Advancement Plans for Residential HPWH and CRAWWS to the MTAB on June 14 and initiate a public comment process
- Release a final Phase 1 Disposition Report documenting the disposition of RFI ideas received
- Host Listening Sessions with ESJ community representatives on Phase I MT ideas
- Launch a second Request for Ideas for additional MT opportunities to consider advancing through the stage gate process



## About CalMTA

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

We work to deliver cost-effective energy efficiency and decarbonization benefits to Californians through a unique approach called market transformation. Market transformation is the strategic process of intervening in a market to create lasting change by removing market barriers or exploiting opportunities, accelerating the adoption of identified technologies or practices. CalMTA-developed market transformation initiatives also aim to advance state goals on demand flexibility, workforce development and equity.

Learn more at [www.calmta.org](http://www.calmta.org)

### Resources

[MTAB Meetings](#)

[Webinars](#)

[MTI Development Process](#)

[Phase II Ideas](#)

[Phase I Ideas](#)

### Contact Us

719 Main Street, Suite A  
Half Moon Bay, CA, 94019  
(888) 217-0217

[info@calmta.org](mailto:info@calmta.org)

[in showcase/calmta](#)



CalMTA is a program of the [California Public Utilities Commission](#) ([CPUC](#)) administered by [Resource Innovations](#)