



Connect to Wi-Fi

- 1. Go to WeWorkWifi
- 2. Open a Chrome Browser
- 3. Click the connect button

Agenda for Nov. 12



Time	Agenda item	Presenter
10:00 AM	1. Welcome & Agenda	Stacey Hobart
10:05 AM	2. Safety Minute	Stacey Hobart
10:10 AM	3. Introductions & Ice Breaker	Stacey Hobart
10:30 AM	4. COI Declarations & Review Notes from Sept. 29 MTAB meeting	Stacey Hobart
10:35 AM	5. Commercial Rooftop Units (CRTUs): Draft Market Transformation Initiative Overview	Nick Fiore
11:10 AM	Break (10 min.)	
11:20 AM	6. CRTUs: Market Adoption Forecast	Karen Horkitz & Jason Christensen
12:30 PM	7. Public Comment	
12:35 PM	Lunch (45 min.)	

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

Agenda for Nov. 12 - continued



Time	Agenda item	Presenter
1:20 PM	8. CRTUs: Cost-Effectiveness Forecast	Matt Wisnefske
2:10 PM	9. CRTUs: Appendix F: Evaluation Plan	Cynthia Kan
2:55 PM	Break (15 min)	
3:10 PM	10. CRTUs: Appendix E: External Program Alignment & Coordination	Stacey Hobart
3:30 PM	11. Phase I Update	Jeff Mitchell
3:45 PM	12. Application Proceeding Update	Lynette Curthoys
4:05 PM	13. Request for Proposal Portal Overview	Stacey Hobart
4:20 PM	14. Public Comment	
4:30 PM	Adjourn	

their hand during the public comment period to be unmuted.

2. Safety Minute

- Two escape routes: turn right or left to exit this floor and the building.
 Emergency exit routes will be indicated by the exit signs
- Three fire extinguishers: kitchen and near each emergency exits on the right or left
- AED: near emergency exit on the left
- In case of an emergency, contact 911 once you are safe and out of danger

You are here





3. Introductions & Ice Breaker

Ask the magic 8 ball a question.

4. COI Declarations & Review MTAB Meeting Notes

Stacey Hobart | Principal, Stakeholder Engagement & Communications



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
 - All ideas under development are now in Phase II
- Those with competitive interest can recuse from discussion, but must leave MTAB if responding to RFP
- Agree not to influence remaining MTAB members
- Interpretation, if needed, done by CPUC staff

Transparency

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



CalMTA COI policies



- The CalMTA program has robust COI policies to ensure decision-making is transparent, impartial, and unbiased.
- The Resource Innovations team that administers CalMTA has deep experience implementing market transformation and other energy efficiency programs in California and throughout North America.
- Resource Innovations employees and subcontractors who function in decision-making roles for CalMTA are firewalled from any ongoing work with California utilities or other covered entities and sign COI certifications.
- CalMTA seeks CPUC approval when there is a need to draw on specialized expertise from subject matter experts who also support work with covered entities.



MTAB meeting notes



Draft MTAB meeting notes

Sept. 29, 2025

Timelines for MTIs being discussed



202			2026				2027	'		
	Q 3	Q4	Q1	Q2	Q 3	Q4	Q1	Q2	Q3	Q4
CRTUs CRAWS	MTIDEV	/ELOPMEN	NT		PPLICATIO ROCEEDIN			FPs* & PH	HASE III: DEPLOYM	ENT
Res. HPWH										
		F	PHASE III:	MARKET	DEPLOYM	ENT				
Room Heat Pumps		F	RFP							
			EVAL	RFP						
		F	PHASE III:	MARKET	DEPLOYM	ENT				
Induction Cooking (if funded)			RFP	VAL RFP						
			E	VAL REP						



Final MTI Plan(s) delivered



Application



MTAB and Public Review

*For approved initiatives

Idea to Initiative CRTUs schedule



Part 1

- Logic Model
- Market Transformation Theory
- Market Characterization

2

- Market Progress Indicators & Milestones
- Product Assessment

- Evaluation Plan
- Draft Market Transformation Initiative Plan & Appendices
- Total System Benefit & Cost Effectiveness

August 20

September 29

November 12











- Complete
- Current status

MTI Plan aspects discussed 8/20 & 9/29



A: Logic Model Packet

B: Market Forecasting & CE Modeling Approach

C: Product Assessment Report

D: Market Characterization Report

E: External Program Alignment & Coordination

F: Evaluation Plan

G: Risk Mitigation Plan

H: MTI Lifecycle Cost Estimate

I: MTAB Feedback

Market
Transformation
Initiative Plan

MTI Plan aspects to discuss today



A: Logic Model Packet

B: Market Forecasting & CE Modeling Approach

C: Product Assessment Report

D: Market Characterization Report

E: External Program Alignment & Coordination

F: Evaluation Plan

G: Risk Mitigation Plan

H: MTI Lifecycle Cost Estimate

I: MTAB Feedback

Market
Transformation
Initiative Plan



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

What is an RTU?





54% of commercial floorspace in California is conditioned by single-zone RTUs Rooftop Units (RTUs) package a variety of components into a single unit to serve a building's heating, cooling, and ventilation needs.

- Traditionally sit on the roof of small- to medium-sized nonresidential buildings
- Can provide heating via gaspowered furnace, electric resistance, or heat pump.





- Field performance of RTUs is often worse than rated performance due both to installation errors and faults that develop over time¹.
- As the number of HPs increase in RTUs and in other equipment, California's winter peak electricity demand is projected to become roughly equal to summer peak electricity demand by 2045².

¹ https://www.etcc-ca.com/reports/code-readiness-rtueconomizer-analysis-and-field-assessment
² https://www.aceee.org/sites/default/files/proceedings/ssb24/pdfs/Applicability%20of%20Cold%20Climate%20Heat%20Pumps%20in%20California.pdf



The need for improved RTUs (cont.)

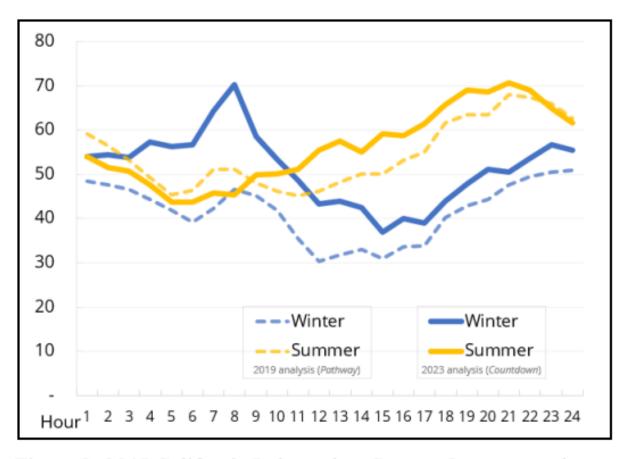
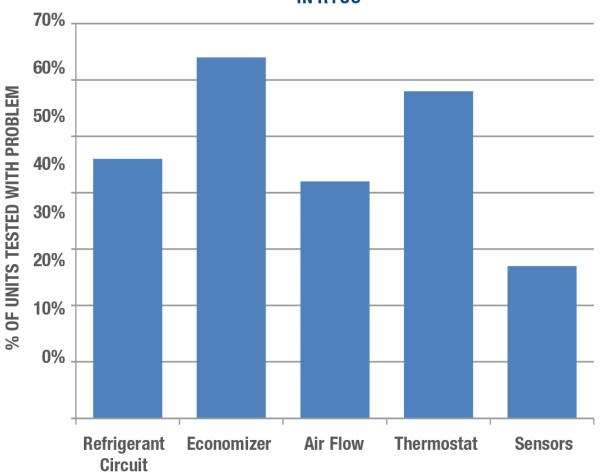


Figure 2: 2045 California Independent System Operator peak load forecast (GW). *Source*: Edison International Countdown to 2045



The need for improved RTUs (cont.)

FIGURE 1: PREVALENCE OF VARIOUS FAULT TYPES IN RTUS



Source: <u>Automated Fault</u>
<u>Detection & Diagnostics for</u>
<u>Rooftop Packaged Air</u>
<u>Conditioners</u>, PIER Buildings
Program, California Energy
Commission



What is a CRTU?



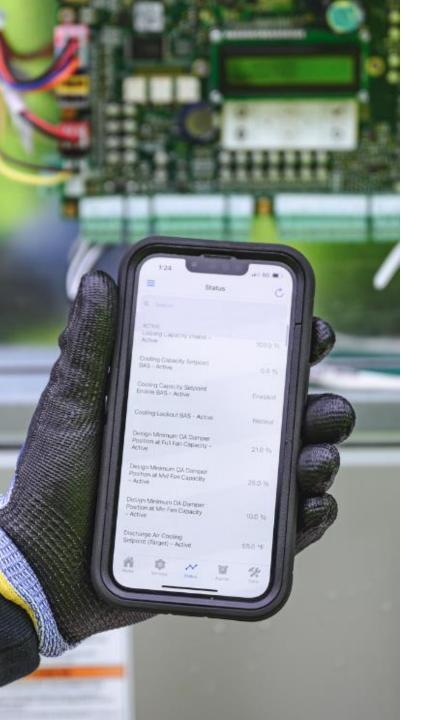
Single-zone heat pump RTU with 3-20 tons of cooling

Connected Commissioning and Controls (CCC)

- Application-based startup and commissioning
- Automated fault detection and diagnostics (beyond Title 24)
- Remote connection
- Demand response

Exceed federal minimum cooling efficiency by at least 20%

Variable speed heat pump



Connected commissioning and controls (CCC)



Application-based startup and commissioning

Reduces installation errors

Automated fault detection and diagnostics
(beyond Title 24)

Optimizes performance over lifetime

Remote connection

Allows off-site
troubleshooting and
scheduling

Demand response



Allows for load flexibility







Code-minimum HP RTU equipped with CCC

HP RTU with a cooling efficiency at least 20% above the federal minimum standard

Variable speed HP RTU with CCC and a cooling efficiency at least 20% above the federal minimum standard

CRTU product benefits

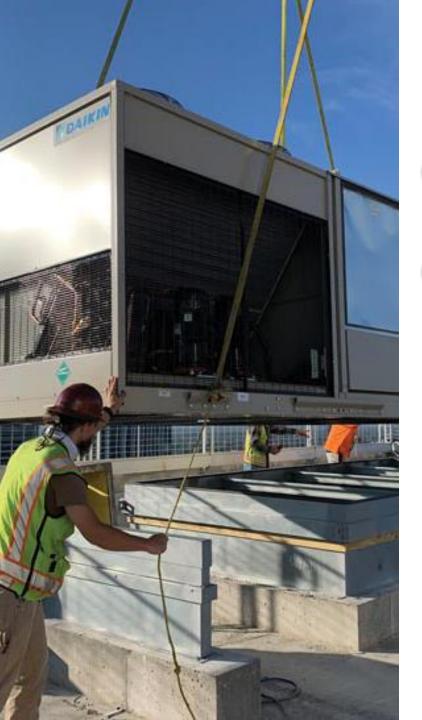




- App-based startup corrects common installation errors
- AFDD+ promotes long-term efficiency
- Remote connectivity improves proactive maintenance

- Lowers utility bills for end users
- Reduces energy use and peak demand for utilities

- Incorporates benefits of tiers 1 & 2
- Variable speed HPs reduce need and use of electric resistance heat
- CCC optimizes switchover temp for variable speed units



Vision for the future



- Variable speed heat pump RTUs and units with CCC see significant rise in market share
- Connected Controls & Commissioning (CCC) will reduce installation errors and optimize performance over lifetime
 - RTUs are capable of responding to demand response signals



Snapshot of Logic Model



Barriers/
Opportunities

High costs (equipment & installation)

chain and customer experience with technology package benefits

Product availability and readiness

Divergent product development asks to manufacturers

Split incentives

DOE Commercial HVAC Accelerator

CA adoption of heat pump RTUs

State and federal codes/standards/ test procedures

Corporate &

municipal

sustainability goals

Pump Coalition

Advanced Heat

CA Air Resources
Board
requirements

Strategic Interventions



Engage with manufacturers to develop pathways to affordable RTUs, support trade ally business case, and continue the advancement of HP RTUs

Distributor & supply chain engagement to build availability and comfort/ awareness

Coordination with energy efficiency programs (outside CA) to push manufacturers in product development

ဂိုဂိုဗိ

Contractor training and business owner marketing to increase awareness and comfort with CCC and variable speed RTUs California program coordination to create consistent incentive offerings

Coordinate with California regulatory programs to add CCC to Title 24.

Short-, mid-, and long-term outcomes

Impact

Replacement RTUs meet manufacturer installation best practice.

Previously undetected faults and inefficiencies are resolved, increasing operational efficiency and overall performance of RTUs.

Variable speed heat pump RTUs and units with CCC see significant rise in market share.

Replacement RTUs are capable of responding to DR signals.





Logic Model - interventions

Engage with manufacturers to develop pathways to affordable RTUs, support trade ally business case, and continue the advancement of HP **RTUs**



Contractor training and business owner marketing to increase awareness and comfort with CCC and variable speed RTUs

Coordination with energy efficiency programs (outside CA) to push manufacturers in product development

California voluntary program coordination to create consistent incentive offerings

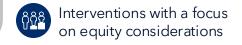
Coordinate with California regulatory programs to add CCC to Title 24



















IF

THEN

If manufacturers gain market share for developing products that incorporate CCC...

then stocking practices across the distribution network will shift, leading to increased market adoption of CCC

If manufacturers integrate CCC into RTU products intended for the unplanned replacement market...

then customers will begin to view these features as standard practice, leading to broader acceptance





IF

If California programs can align around a common RTU product roadmap...

If major manufacturers receive consistent market signals and coordinated requests from California and national partners...

If major manufacturers see consistent product tiers from California and national partners...

THEN

this will reduce market confusion and accelerate the adoption of advanced RTU technology

then they will more quickly develop CRTU products

then manufacturers will see value in producing these at scale and that will chip away at first-cost barriers for variable speed heat pump technology and IVEC +20%





THEN

If contractors recognize the value of equipment with CCC and adapt their business models to take advantage of them, particularly when available at comparable cost...

then contractors will become advocates and help promote CCC

If RTU products incorporate integrated sensors and CCC...

then a greater percentage of installations will be completed correctly, and system performance will be optimized – ultimately resulting in increased energy savings



Questions & Discussion

Next steps for MTAB members



- Much of the CRTU MTI Plan has been reviewed through the Idea to Initiative education campaign
- Opportunities today to hear Part 3 on market forecasts, costeffectiveness, and evaluation plan, ask questions, and discuss
- 2 MTAB members may provide written feedback via a form that will be consolidated and appended to the MTI Plan as Appendix I
- 3 Public comment will occur in parallel with MTAB review



Break (10 min.) We will be back soon.





6. CRTUs:
Market Adoption
Forecast

Jason Christensen | Cadmus

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







- Introduction: Forecasting model/approach
- Key model assumptions
- Model inputs
 - Incremental cost
 - Availability
 - Awareness of value proposition
 - Policy scenarios fuel substitution
- Market adoption forecast (model outputs)



Model selection



- Discrete choice model
 - o Focus on consumer choice between competing alternatives
 - Considers key barriers to adoption (factors that influence choice of one product over another) and the MTI's influence on those factors
 - Relative cost
 - Availability
 - Awareness of value proposition

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





$$S_i(t) = \frac{\alpha_i(t).e^{\gamma.(C_i(t))}}{\sum_{j=1}^N \alpha_j(t).e^{\gamma.(C_j(t))}}$$

Where:

 $S_i(t)$: Projected market share of HVAC system type i in year t

 $C_i(t)$: Cost to the commercial consumer for HVAC system type i if purchased in year t, including capital cost, expected operating costs, and monetary value of other factors

 $\alpha_i(t)$: Constraint for HVAC system type i in year t, availability constraint and awareness of value proposition (AVP) constraint

 γ : Logit exponent (or sensitivity parameter). These exponents determine the elasticity of substitution between different alternatives.

N: Total number of HVAC system types in that model stage.

Market adoption forecasting model



Inputs

- Economic factors (Costs)
- Non-economic factors
- Logit exponent

Product availability Awareness of Value Proposition (AVP) Market shares (unconstrained)

Outputs

Market shares (constrained)

Purchases

RTU Stock

Installed RTU stock

Failures

Total Market Adoption

Baseline

Adoption

Time

Market







Sector	Decision type	Efficient equipment	Baseline equipment
	Normal replacement	Tier 1: Code minimum HP RTU + integrated monitoring with remote	Code minimum heat pump
		access and control, automated fault detection and diagnostic capabilities	Gas pack RTU
Commercial		Tier 2: Cooling efficiency exceeds	Code minimum heat pump
		federal minimum by 20%	Gas pack RTU
		Tier 3: Cooling efficiency exceeds federal minimum by 20% + variable speed	Code minimum heat pump
		compressor (inverter) + integrated remote monitoring, control, and diagnostics, AFDD	Gas pack RTU





Key model assumptions

- Four market segments with different economic decisions
 - o Planned vs. unplanned replacements
 - Availability and timing are important factors for unplanned, replace upon failure
 - Gas baseline vs. electric baseline
 - One-stage decision for electric
 - Two-stage decision for gas
 - First decision is fuel substitution
 - Second decision is heat pump RTU system type
- Three policy scenarios related to pace of gas phase-out





Reduction in Price Premium

- Installed price of HP RTUs with and without CCC are within 5% by 2035
- Price premium currently 60%; MTI interventions reduce premium to 30% by 2040

Increased Availability

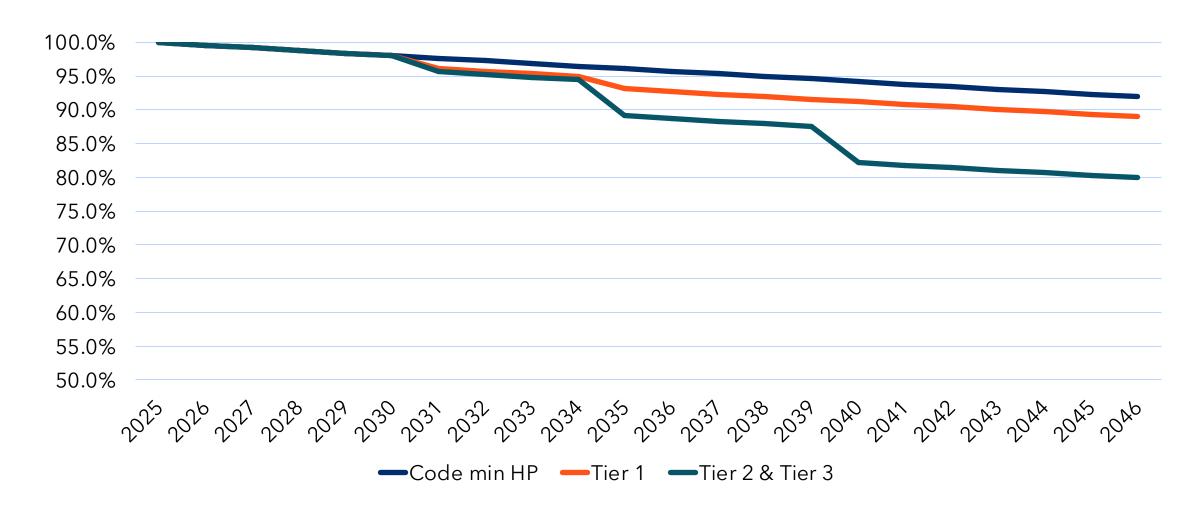
- 60% of distributors stock CRTUs by 2032
- Three minimum-efficiency product lines include CCC as a standard feature by 2031.

Increased
Awareness of
Value
Proposition

 90% of contractors include CCC in 50% or more bids by 2032

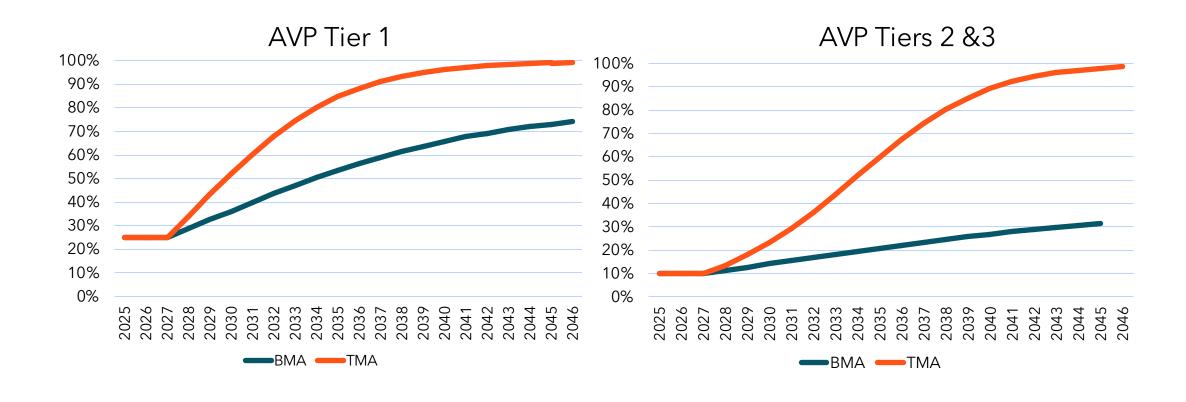








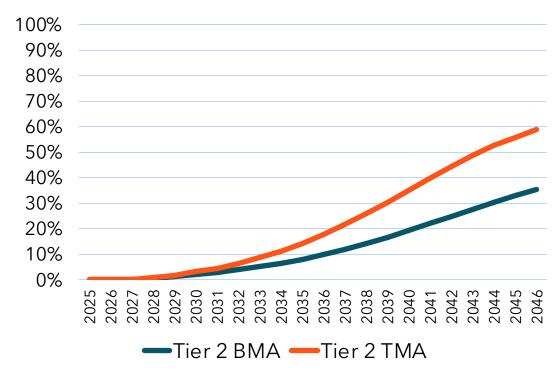






















Additional Achievable Fuel Substitution (AAFS) scenarios developed as part of the 2025 draft Integrated Energy Policy Report (IEPR)¹ update

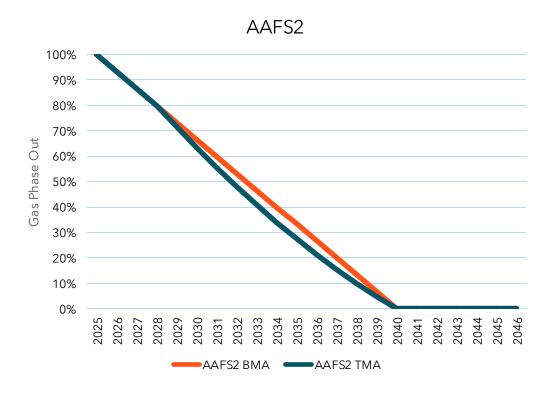
- 1. AAFS 1 gradual transition to 50% by 2040
- 2. AAFS 2 gradual transition to 100% by 2040
- 3. AAFS 3 80% transition by 2029,100% by 2045

¹https://www.energy.ca.gov/sites/default/files/2025-08/Additional_Achievable_Energy_Efficiency_%28AAEE%29_and_Additional_Achievable_ _Fuel_Substitution_%28AAFS%29_ada.pdf



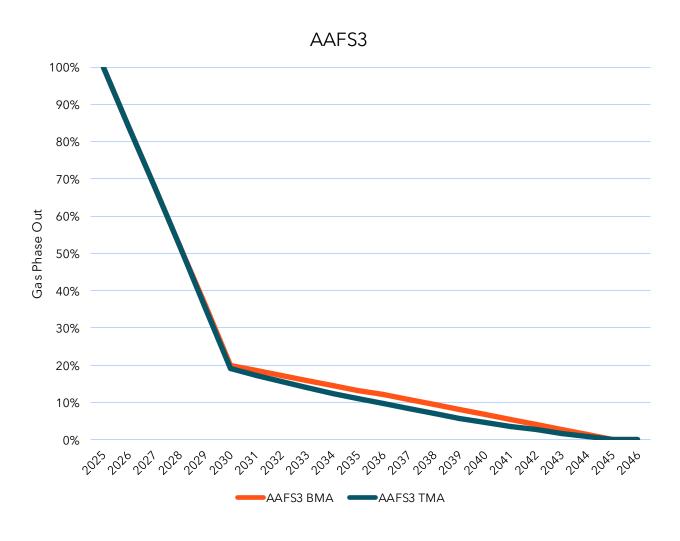










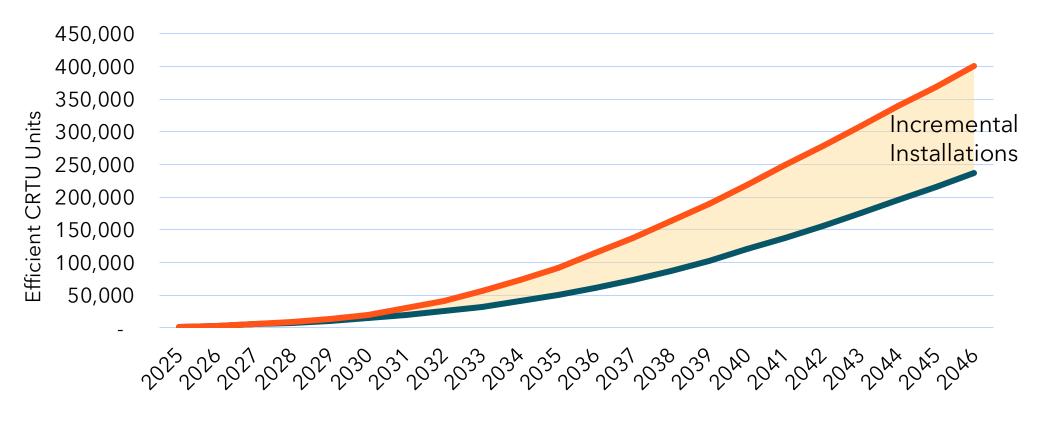




CalMTA idea to initiative

Estimated adoption base scenario AAFS 2

Cumulative total MTI Efficient CRTU installations

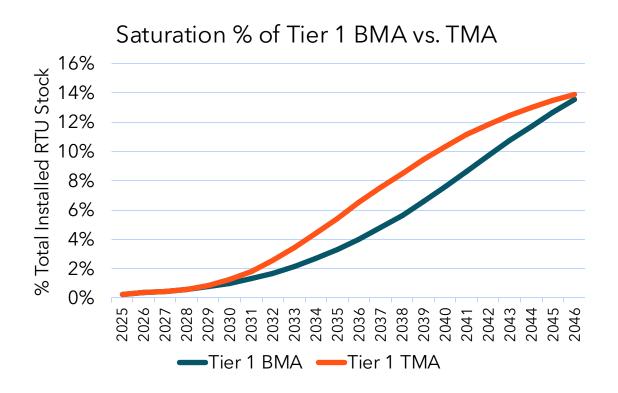


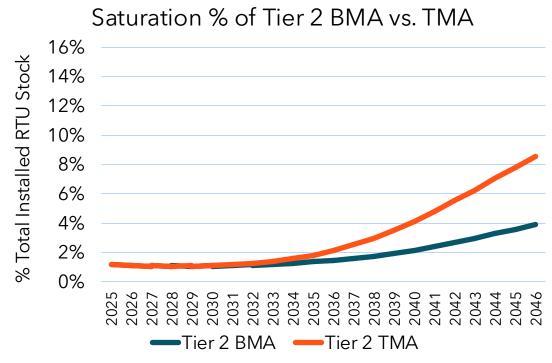
—All MTI Tiers - BMA Cumulative Installations

—All MTI Tiers - TMA Cumulative Installations





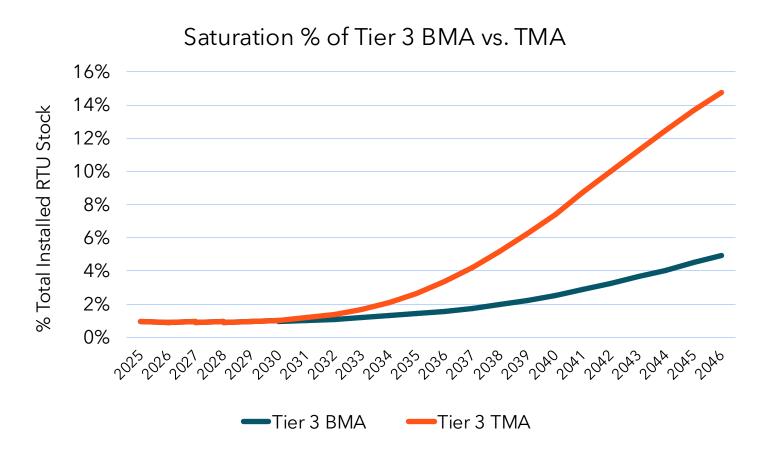






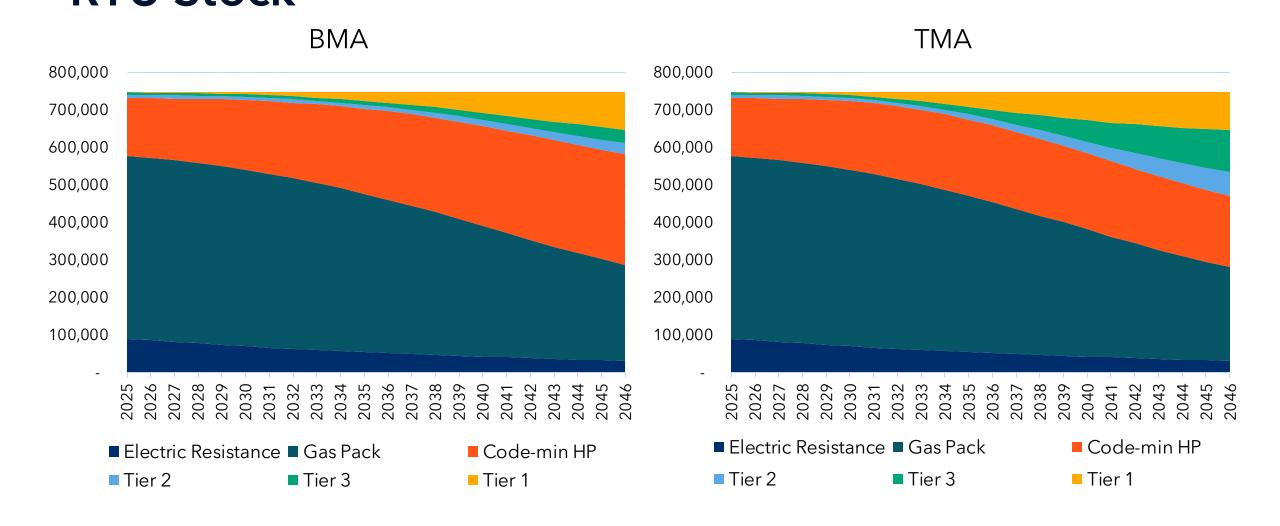


Saturation of Tier 3: Code minimum + 20% cooling efficiency + variable speed + CCC



BMA vs. TMA Base AAFS 2: Total Installed RTU Stock

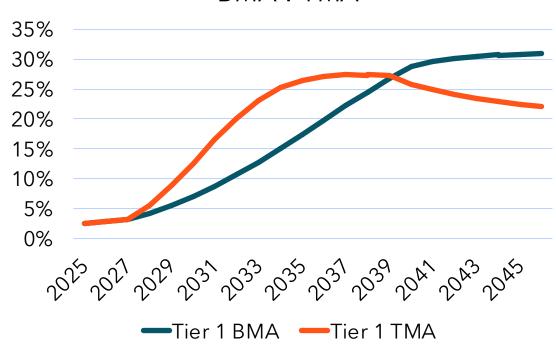




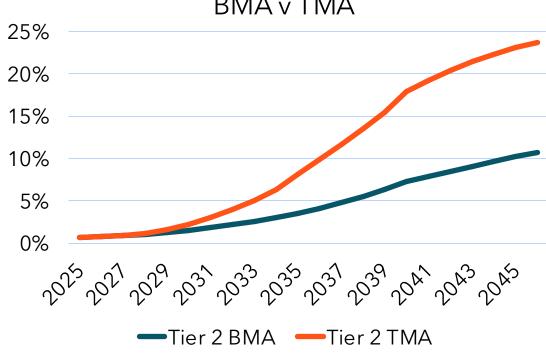




Market Share - Annual Sales Tier 1 BMA v TMA

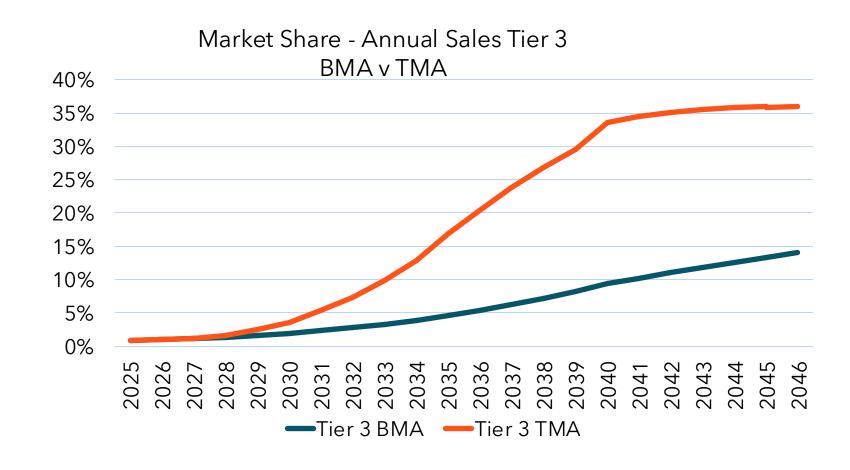


Market Share - Annual Sales Tier 2 BMA v TMA













 $Net\ Incremental\ Adoption = \ Y^{TMA} - Y^{BMA} - Y^{PA}$

Where Y represents cumulative adoption of CRTU Units over the forecast period of 2025 to 2046. TMA, BMA, and RA represent net incremental adoption attributed to the TMA, BMA, and PA-verified savings respectively

CRTU Tier	ВМА	TMA	RA	Incremental
Tier 1 - Code Min HP+CCC	147,782	158,056	0	10,274
Tier 2 - Code+20%	38,594	87,095	9,333	39,168
Tier 3 - Code+20%+VS+CCC	50,212	153,739	19,773	83,754
Total	236,588	398, 890	29,106	133,196



Questions & Discussion



8. CRTUs:
DRAFT CostEffectiveness Forecast

Matt Wisnefske | Contractor, Cadmus

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





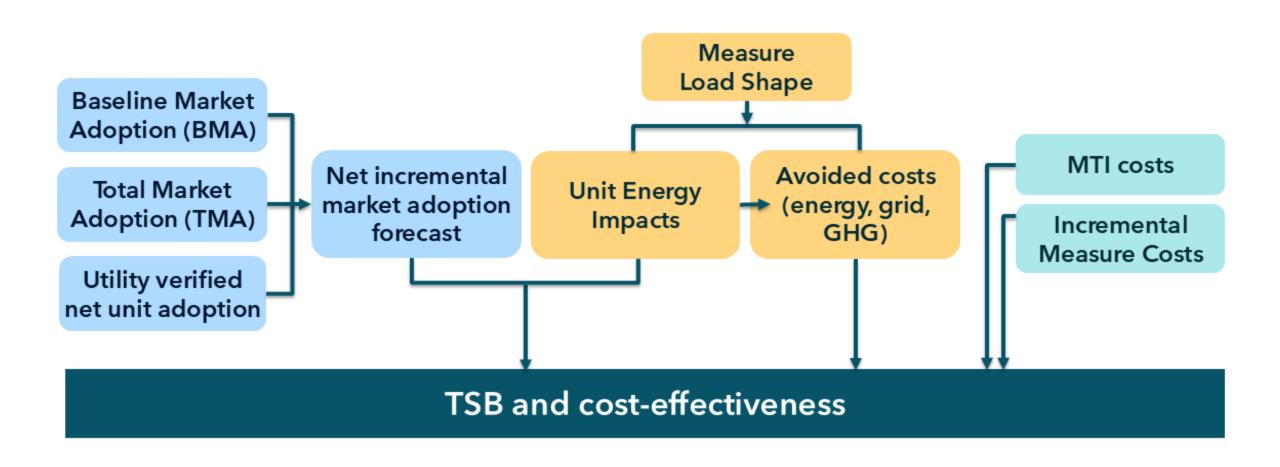


- Cost-effectiveness model/approach
- Inputs and assumptions
- TSB and cost-effectiveness (model outputs)
- Sensitivity analysis





MTI incremental impact forecasting components







- MTI lifetime = 20 years (2027-2046)
- EUL = 20 years (2025 DEER Database)
- UES (Unit Energy Savings)
 - Unique for each replacement case
 - No modeled refrigerant costs
- 2024 (V1b) Avoided Cost Calculator inputs with 8,760 hourly values for each year of MTI analysis period



Cost-effectiveness inputs (cont.)

- Modeled 8,760 probability load shapes for each baseline technology
- Avoided Lifetime costs for each measure including EUL
- Adoption for each major IOU (PG&E, SCE, SDG&E) and statewide
- Incremental Measure Costs for TRC:
 - Based on each pair of baseline/efficient condition delta (can be negative) including primary technology equipment, labor, permitting, and secondary equipment (electrical upgrade) costs
 - Incremental Measure Costs range from \$108.11 to \$1,500.60 per 1,000 sq. ft. depending on installation case.



CRTUs: Base scenario (AAFS 2) results - DRAFT

Test	TSB - Energy	TSB - Grid	TSB - GHG	TSB - Total
TRC	\$ 148M	\$ 147M	\$ 300M	\$ 595M
SCT (Base)	\$ 234M	\$ 232M	\$ 486M	\$ 951M
SCT (High)	\$ 234M	\$ 232M	\$ 559M	\$ 1,024M

TSB components may not sum to totals due to rounding.

TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio	
2.65	20.52	3.23	3.47	

CRTUs - TSB and cost-effectiveness test schedule results - DRAFT



Forecasting Metric	2031	2036	2041	2046
TSB	\$ 41M	\$ 218M	\$ 434M	\$ 595M
TRC ratio	1.51	2.48	2.62	2.65
PAC ratio	2.0	7.92	15.02	20.52
Cumulative initiative investment	\$ 26.7M	\$ 38.9M	\$ 42.3M	\$ 42.8M

Differences between Phase I and Phase II TSB estimates



	Phase I	Phase II - Base Case
TSB - DRAFT	\$1,705M	\$595M
Baseline Market Adoption Forecast	Based on available	 Based on Extensive market and product
TMA Forecast	secondary research and expert judgment	 research Discrete Choice model incorporating economic drivers
Non-Equipment Incremental Costs	Assumed to be zero	Includes Labor, Permitting, Infrastructure Upgrades
Gas Phaseout Assumption	Not specifically considered	IEPR AAFS Scenarios
Adoption	California statewide estimate	IOU service territory; subtracted estimated PA-verified impacts
Avoided Costs	2022	2024



CRTUs: Sensitivity analysis

- Sensitivity analysis parameters of interest:
 - Availability and AVP Constraints
 - First-year equipment cost (price premium)
 - Incremental additional fuel substitution



CRTUs: Sensitivity analysis (cont.)

Sensitivity Analysis	Adjusted Components
1	Assumes TMA increase in AVP and availability is 50% of the increase in base scenario
2	Assumes TMA reduction in price premium for Tier 1, 2, and 3 products is 50% of reduction in base scenario
3	Assumes no TMA incremental fuel substitution above AAFS phase out
4	Assumes all the above occur together

Sensitivity Analysis 1: AVP and availability constraints DRAFT



Assumes TMA increase in AVP and availability is 50% of the increase in base scenario

Scenario	TSB (\$M)	TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio
Primary	595	2.65	20.52	3.23	3.47
AVP/availability is constrained	403	2.70	13.89	3.35	3.59

Sensitivity Analysis 2: Price premium DRAFT



Assumes TMA reduction in price premium for Tier 1, 2, and 3 products is 50% of reduction in base scenario (60% down to 45% instead of 30%)

Scenario	TSB (\$M)	TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio
Primary	595	2.65	20.52	3.23	3.47
Price premium	581	2.26	20.03	2.73	2.94

Sensitivity Analysis 3: No incremental fuel substitution DRAFT



Assumes no TMA incremental fuel substitution above AAFS phase-out

Scenario	TSB (\$M)	TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio
Primary	595	2.65	20.52	3.23	3.47
No fuel substitution	521	2.35	17.98	2.75	3.02



Sensitivity Analysis 4: All combined - DRAFT

Assumes all three sets of inputs described in analyses 1-3 occur together (AVP and availability constraints, no additional fuel substitution, and price premium) under primary (AAFS2) fuel substitution parameters

Scenario	TSB (\$M)	TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio
Primary	595	2.65	20.52	3.23	3.47
All combined	308	2.00	10.62	2.30	2.53

CRTUs: Slow fuel substitution (AAFS1) scenario results DRAFT



Test	TSB - Energy	TSB - Grid	TSB - GHG	TSB - Total
TRC	\$ 143M	\$ 153M	\$ 497M	\$ 793M
SCT (Base)	\$ 228M	\$ 243M	\$ 1,055M	\$ 1,526M
SCT (High)	\$ 228M	\$ 243M	\$ 1,094M	\$ 1,565M

TSB components may not sum to totals due to rounding.

TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio
3.82	27.36	5.57	5.72

CRTUs: Fast fuel substitution (AAFS 3) scenario results DRAFT



Test	TSB - Energy	TSB - Grid	TSB - GHG	TSB - Total
TRC	\$ 153M	\$ 149M	\$ 292M	\$ 593M
SCT (Base)	\$ 241M	\$ 234M	\$ 457M	\$ 932M
SCT (High)	\$ 241M	\$ 234M	\$ 535M	\$ 1,009M

TSB components may not sum to totals due to rounding.

TRC Ratio	PAC Ratio	SCT (Base) Ratio	SCT (High) Ratio
2.55	20.47	3.07	3.32

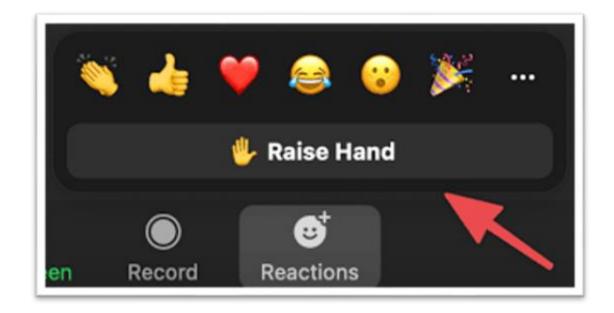


Questions & Discussion

7. Public Comment

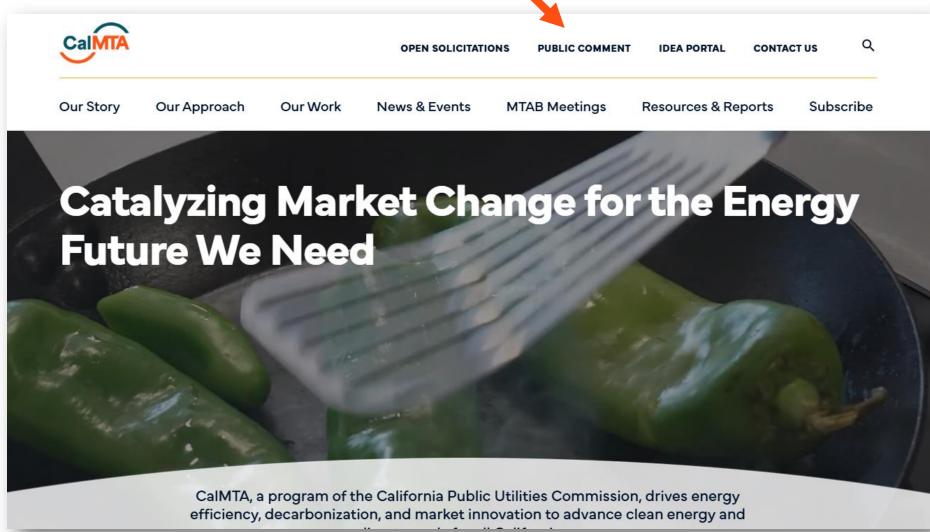


Raise your hand using the "Reactions" feature and we will allow you to unmute yourself.



Public Comment







Lunch (45 min.) We will be back soon.





9. CRTUs:
Appendix F: Evaluation
Plan

Cynthia Kan | Contractor, Cadmus

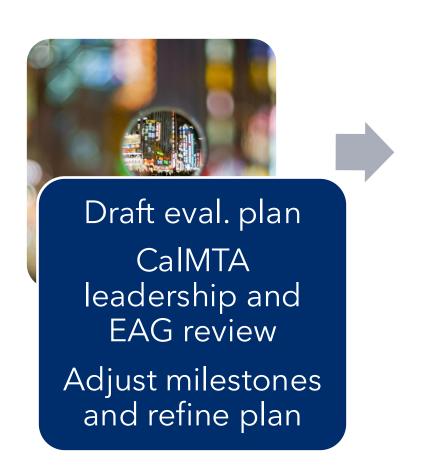
CalMTA is a program of the California Public Utilities Commission and is administered by Resource Innovations.

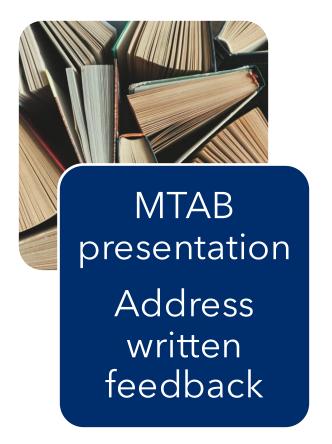


Evaluation Plan development















MTI progress and impact goals and metrics with data collection plan that substantiates MTI evaluability



Principles

Theory-based evaluation (TBE) relies on program theory, logic models, & market progress indicators to establish market influence, progress, & causal impact of MTI interventions



Data-driven, transparent analysis methods to estimate market diffusion, cost-effectiveness, & incremental impact



Use of widely accepted best practices to develop & refine baseline market adoption forecast



Agreed upon methodology to determine MTI incremental impact that supports California's policy goals, statewide collaboration, & decisions about future MT investments





- Monitor market dynamics and characteristics; assess market developments
- Review and assess the MTI logic model and program theory
- Measure market progress and equity, per the MPIs
- Assess MTI causality per the logic model
- Identify opportunities to adjust MTI strategy/tactics to improve effectiveness
- Review baseline & total market adoption forecasts, unit energy savings, incremental MTI impacts, TSB & cost-effectiveness model inputs & assumptions
- Assess ancillary benefits and costs

CRTU Market Progress Indicators



Manufacturer Engagement

manufacturers engaged

Incremental price

Demonstration project metrics

Distributor and Contractor Engagement

CRTU Stocking

Inclusion of CCC in bids

Program
Coordination
(outside CA)

EE
programs
adopting
CRTU
features

CRTU price premium

Increase Training for Contractors and Marketing to Business Owners

HVAC training orgs that include CRTU

% of HVAC companies with staff trained in CCC

Coordinate with CA programs

CA EE programs adopt at least one CRTU element

Adoption of CCC in T24



Market Share & Units of Adoption

CRTU milestones



3+ manufacturers engage with demonstration project 2+ manufacturers discuss product refinement with CalMTA post-demo.



- 2 EE programs outside CA adopt CRTU definition
- 3 CA EE programs adopt at least one CRTU element
- 150 demonstration project CRTUs

CRTU milestones

CalMTA idea to initiative

- No incremental equipment price for CCC feature
- Three code min. product lines include CCC by default
- Four HVAC training programs add CRTU content
- HVAC companies with CCC trained staff comparable in DAC/non-DAC areas

75% of contractors can support CCC installations and service

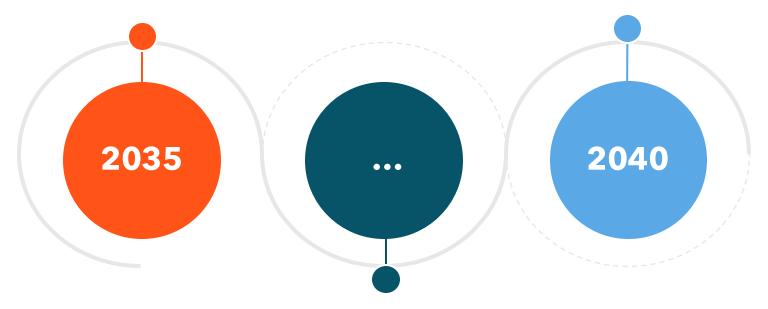


- 60% of distributors stock CRTUs
- 90% of contractors include CCC in 50% or more of bids

CRTU milestones



- Market share of HP RTUs with CCC is 50%
- 50% of contractors utilize customer CCC where available
- CCC adopted in Title 24
- Installed price with and w/o CCC is within 5%
- Market share of CRTUs with all features over 30%
- Price premium of CRTUs is no more than 30%





Primary data collection tasks

- Demonstration project interviews & surveys
 - End-user, contractors, manufacturers
 - Long term M&V and end-user experience tracking
- RTU buyer survey
- HVAC contractor survey
- Distributor survey
- MTI staff/stakeholder/partner interviews
- Manufacturer interviews





- Negotiated data-sharing agreements with market actors
- C&S compliance database
- Demonstration project
- ComStock, HARDI, and AHRI



Monitoring, reporting, and review





Actions Determined

Evaluation
Plan Executed

MTI market
progress and
evaluated
incremental
impacts
reported publicly

At least annually; underperforming MTIs prioritized on agenda with recommendations from evaluators, staff

MTAB Reviews

MTI Scorecard
Updated and
Posted



Questions & Discussion

What's Next - CRTUs MTI



- Appendix I represents MTAB members' feedback
 - Final documents will be posted for MTAB review
 - MTAB will receive a form to submit comments that will be compiled and presented in Appendix I
 - Public comment will occur in parallel with MTAB review via the PDA site



10. CRTUs:

Appendix E: External

Program Alignment &

Coordination

Stacey Hobart | Principal of Engagement & Communications

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



Guidance from the Decision







The MTA, MTI proposer(s), and relevant PA(s), 3PI(s) and C&S implementation team(s) will work collaboratively together to find ways for the proposed MTI and affected RA/C&S programs to work synergistically, increasing value to customers and the energy system and promoting a robust and competitive market for efficiency.

D.19-12-021



CalMTA external program alignment goals



Maximize understanding of the MT idea development process among key groups and **share relevant aspects** of the ideas being developed



Seek to **create opportunities for collaboration** through briefings, discussion, and formal mechanisms to receive and resolve feedback



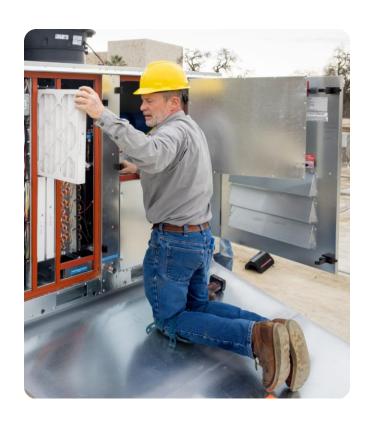
Collaboratively identify and work to **eliminate or minimize any conflicts** between the programs



Collaboratively identify and leverage opportunities that ensure resources are deployed efficiently across complementary programs

CRTUs MTI alignment goals





- Understand and encourage opportunities to solidify CRTU technology with desired features through C&S activities
- Collaborate on research, including pilots, to help all parities working in this market better understand product performance and necessary enhancements
- Support and encourage statewide or regional incentive programs whose inclusion of RTUs with desired features can reduce the upfront cost barrier



Questions & Discussion



RFI Metrics 2025 YTD

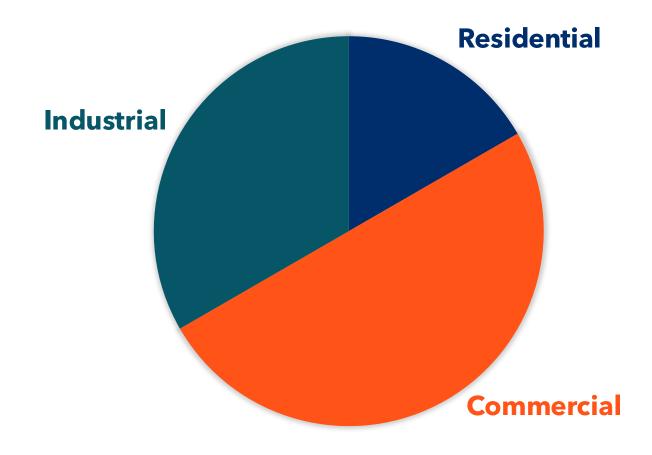




MTI submissions

6

Unique submitters



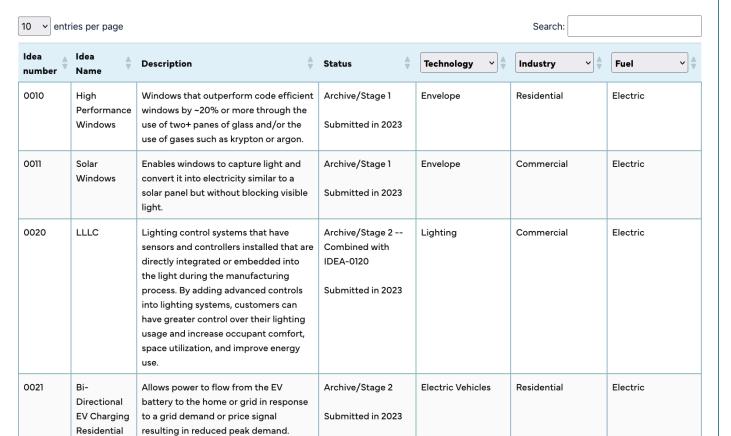
All Submitted Ideas Dashboard

The dashboard below contains all market transformation ideas that have been submitted to CalMTA via the 2023, 2024, and Open RFIs. Specific details about the results of the first two RFIs can be found in the <u>Phase I Disposition Report</u> (published June 2024) and the <u>Disposition Report for the 2024 RFI</u> (published May 2025).

How to use this dashboard:

- Use the arrow buttons in any of the columns to sort A-Z (up arrow) or Z-A (down arrow)
- Filter using the drop-down menus on the technology, industry or fuel columns
- Type keywords into the search bar at the top right of the dashboard
- Scroll to the bottom of this page for a key of status descriptions

All Submitted Ideas



Online RFI dashboard



- Developed a <u>web-based</u>
 dashboard listing all ideas
 that have been submitted
 to CalMTA
- Dashboard enables submitters to first check for existing ideas that are similar to their potential submission.

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

Technology scanning and screening



Industrial Heat Pumps

- Commercially available products in market for <100C applications and early commercial products <~140C products.
- Large California potential in food processing, dairy, and automotive industries
- ESJ benefits due to improved local air quality
- Water savings due to reduced need for cooling towers
- Spark gap will require COP>~3 to break even.

Technology scanning and screening



Low Carbon Calcine Clay Concrete (LC3)

- LC3 requires less limestone, lower heating temperatures, and doesn't require toxic filler materials
 - Heat requirements reduced from 1,500°C to 800°C
 - Diesel is the most common heating fuel
- California is the second-largest cement-producing state in the U.S.
- ESJ benefits due to local air quality improvements
- Intervention could include conversion to NG or other fuel sources to reduce GHG impacts.



Questions & Discussion

12. ApplicationProceedingUpdate

Lynette Curthoys | Vice President, Market Transformation



Options for approval of initiatives



Proposed decision (PD)

- Affirms market transformation approach to energy efficiency
- Finds proposed MTIs are forecasted to be cost-effective using Commissionapproved tests
- Approves Room Heat Pumps and Induction Cooking MTIs and their budgets

Alternate proposed decision (APD)

- Approves Room Heat Pumps MTI only; denies Induction Cooking MTI
- Approves a smaller portion of Administration, Operations, and Evaluation funding
- Reduces funding for Phase I and Phase II Concept Development.

ESJ and efficiency advocates sign letter to support CalMTA initiatives



CalMTA posted <u>a news article</u> sharing the support letter.













... advance both equity and affordability by helping make decarbonization accessible to lowincome and renter households and by reducing the need for grid upgrades to enable the high levels of electrification necessary to achieve the state's climate and air quality objectives.

A redlined PD Rev 1 published on Oct. 24



- Increases the budget cap for 2026-2031 from \$102.4M to \$114.6M
 - Restores Evaluation funding for RHP and Induction MTIs
 - Restores three years of Operations and Administration funding
- Allocates MTI benefits to the IOUs' goals
- Acknowledges the Commission has previously found indoor and outdoor air quality benefits from reducing reliance on natural gas
- Encourages mutual coordination but defers primacy issue to the EE proceeding
- Acknowledges prior Commission guidance on layering incentives from multiple programs
- Approves no-cost extension of the startup period to December 31, 2025.

PD Rev 2 - Nov 12 - key update from Rev 1



- Induction MTI is now conditional -
 - Must narrow to 120 V and return via Tier 2 AL by Apr 3, 2026;
 - Updated logic model, interventions, milestones, and a reduced budget
 - No Induction deployment spending until approval
- New expectations for future applications Include summary of non-ratepayer funding efforts (informational only, not a pre-condition) and sensitivity analyses when helpful.
- Non-profit transition AL: added additional content requirements.
- Commission gets a no-cost, perpetual license (including source code) to CalMTA's cost-effectiveness tool; PG&E must amend the contract within 60 days.

Application updates



- Five MTAB members signed an <u>ex parte letter</u> in support of the PD on Oct. 24.
- The Commission held a ratesetting deliberative meeting Oct.
 27 to discuss the application.
- A decision on the application was held to the Nov. 20 meeting.
- CalMTA supports the redlined PD.

"The two (proposed) iniatiatives, formed with expert review and technical and policy guidance support of the MTAB, would deliver market-level strategies to accelerate adoption of Induction Cooking and Room Heat Pump technologies, delivering over \$1 billion in value to Californians."

-Ex parte letter from Market Transformation Advisory Board members



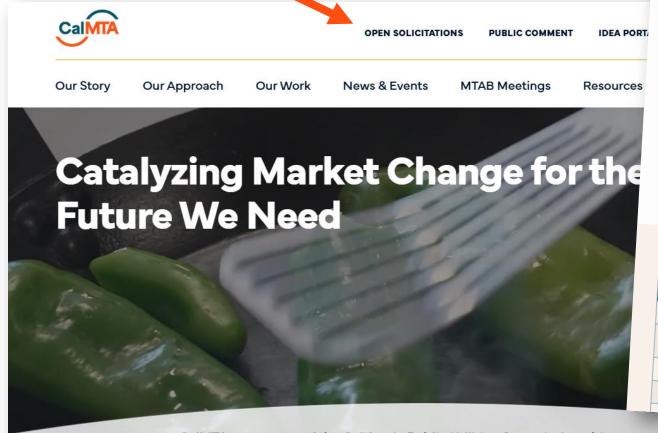
Questions & Discussion

13. Request for Proposal Portal Overview

Stacey Hobart | Principal of Engagement & Communications



RFP Solicitation Portal



REQUEST FOR PROPOSALS

CalMTA Organizational Review

CalMTA seeks a qualified management consultant to conduct a CalMTA Organizational Review

Resource innovations and the California Public Utilities Commission (CPUC) Energy Division are seeking qualified consultants to conduct an Organizational Review of the California program during its initial three years of operation. Califf is a program of the CPUC working to create a market transformation portfolio of initiatives for the state of California and is being administered by Resource Innovations.

Through this Request for Proposals (RFP), the CPUC Energy Division and Resource Innovations seek to conduct a thorough organizational review of CalMTA and identify opportunities to improve practices and systems developed during CalMTA's three-year start-up period, which is management, and overall organizational effectiveness.

The contract term for this review is estimated at six months, with a budget not to exceed \$100,000. The final deliverable will be a comprehensive written report summarizing the study's findings, conclusions, and actionable recommendations that will ultimately be presented to CaiMTA's Market Transformation Advisory Board (MTAB) and the CPUC Energy Division.

Download the CalMTA Organizational Review RFP

You must create an account on the CalMTA RFP Portal to submit an intent to bid or a proposal Any bids received after 6 p.m. Pacific cannot be accepted.

This soliciation is now closed

Key Dates

Activity	Date		
RFP released	Sept. 8, 2025		
Intent to Bid	Must be received prior to proposal submission		
Q&A period closes	Sept. 24, 2025		
Proposal due date	Oct. 3, 2025		

Submission Process

All bidder communication and proposal submissions will occur through CalMTA's web-based RFP Portal. Please follow these steps to bid.



Download the RFP documents

RFP

Conflict-of-Interest Form (Attachment 1) Non-Disclosure Agreement (Attachment 2)



Create an account on the CalMTA RFP portal (Required)



Induction Cooking MTI Request for Proposals

Open Date: 2025-01-15 Close Date: 2025-12-31

CalMTA seeks qualified contractors or teams of contractors to provide implementation services for the Induction Cooking Market Transformation Initiative (MTI), which seeks to accelerate market adoption of efficient induction cooktops and ranges to provide a high-quality cooking experience with the added health and safety benefits afforded by induction technology.

This MTI was approved by the California Public Utilities Commission (CPUC) on Oct. x. The initial contract term is three years, with an implementation budget not-to-exceed \$1.5M. CalMTA seeks to select one or more contractors to execute the following Implementation Areas:

abc

xyz

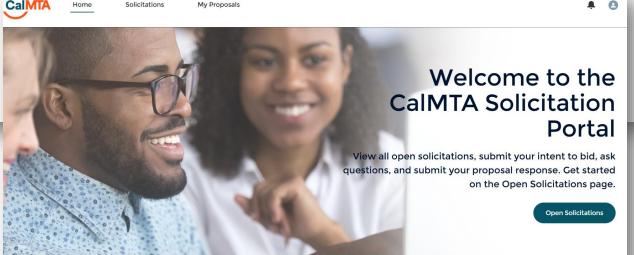
Submission Process:

- 1. Download the RFP documents [LINK]
- 2. Create an account on the CalMTA RFP portal (required)
- Demistration from an all attenued the annual historical binary and Oat 22 (anti-mally El

Ask a Question

View Q & A

Create/Edit Bid



CalMTA Solicitations

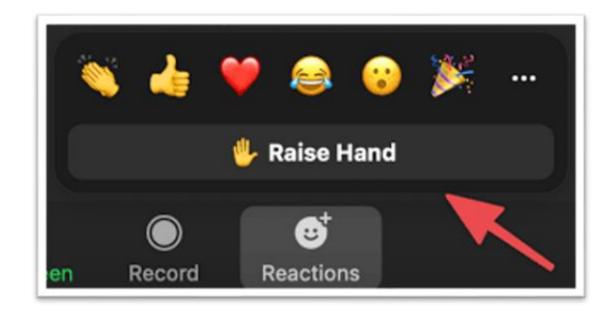


- Launched new portal in September, per Solicitation Protocols
- Issued first RFP to conduct an Organizational Review
 - Eight proposals received & contractor selection in process
 - Report is due in 2nd quarter 2026
- Preparation for implementation and evaluation RFPs
 - Anticipating 2-4 RFPs in 2025 and 2026
 - RHP MTI implementation 12/2025; evaluation 1/2026

14. Public Comment

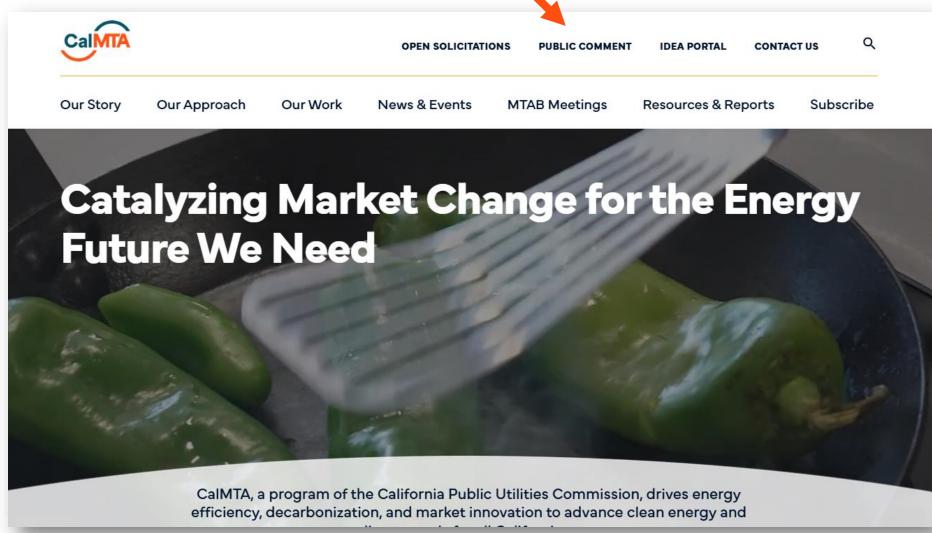


Raise your hand using the "Reactions" feature and we will allow you to unmute yourself.



Public Comment





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.

Sign up for updates at: calmta.org/subscribe/

Questions? Email info@calmta.org

Follow us on LinkedIn:

