CalMTA

Nov. 12, 2025

Market Transformation Advisory Board (MTAB) Meeting

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

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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

MTAB Charter with Conflict of Interest

Transparency

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

CalMTA COI policies

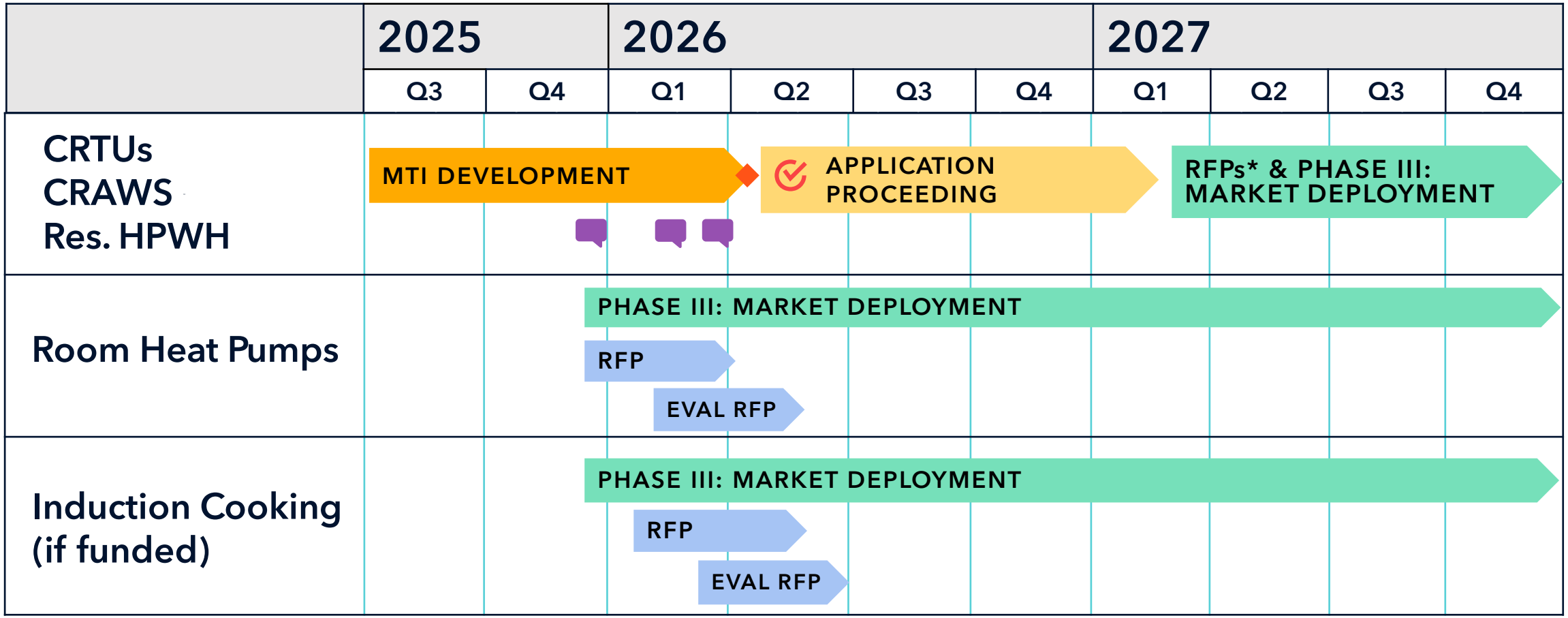
- The CalMTA program has robust COI policies to ensure decision-making is transparent, impartial, and unbiased.
- The Resource Innovations team that administers CalMTA has deep experience implementing market transformation and other energy efficiency programs in California and throughout North America.
- 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



Final MTI Plan(s) delivered Application MTAB and Public Review

*For approved initiatives

Idea to Initiative CRTUs schedule

Part 1 — **August 20**

- Logic Model
- Market Transformation Theory
- Market Characterization

Part 2 — **September 29**

- Market Progress Indicators & Milestones
- Product Assessment

Part 3 — **November 12**

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

Commercial RTUs: Where we are today

- 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

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5. CRTUs: Draft Market Transformation Initiative Overview

Nick Fiore | Program Manager

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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** non-residential buildings
- Can provide heating via **gas-powered furnace, electric resistance, or heat pump**.

The need for improved RTUs

- Field performance of RTUs is often worse than rated performance due both to **installation errors** and **faults that develop over time**[1].
- 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 2045[2].

[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.)

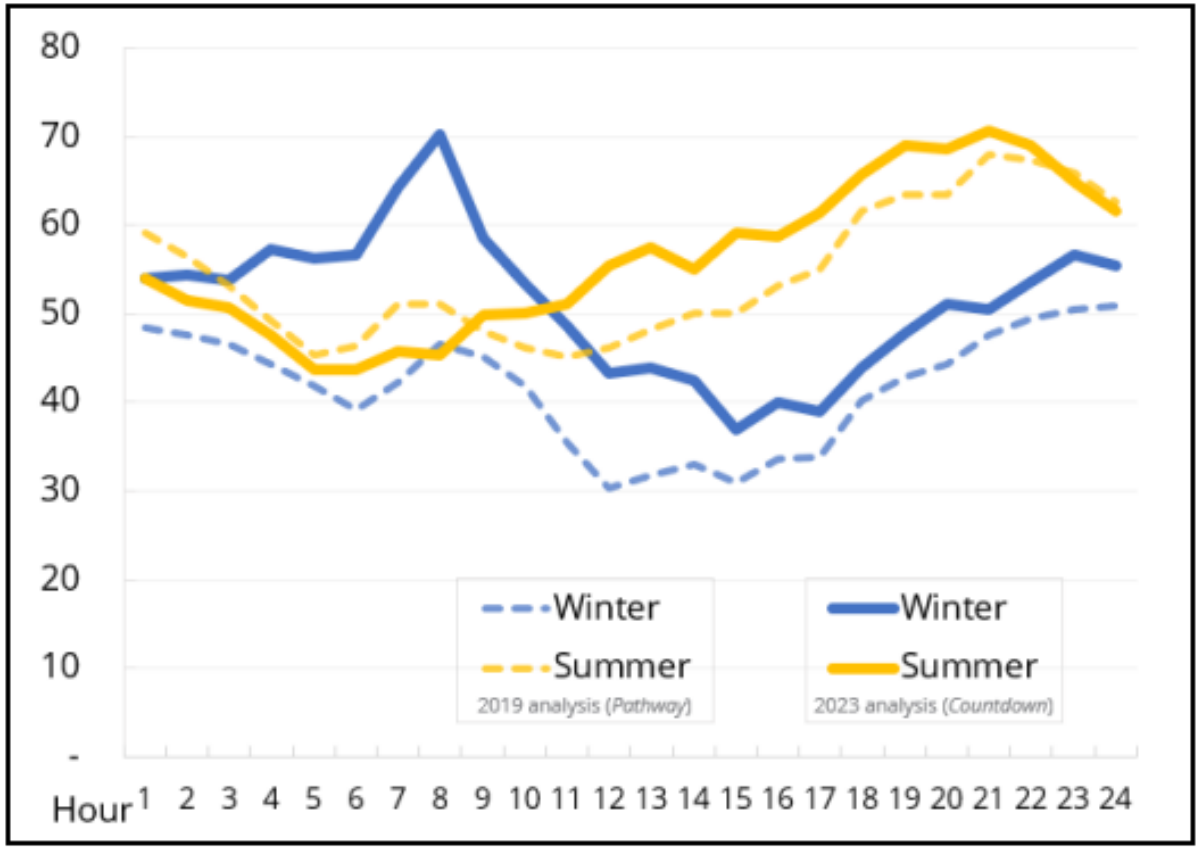
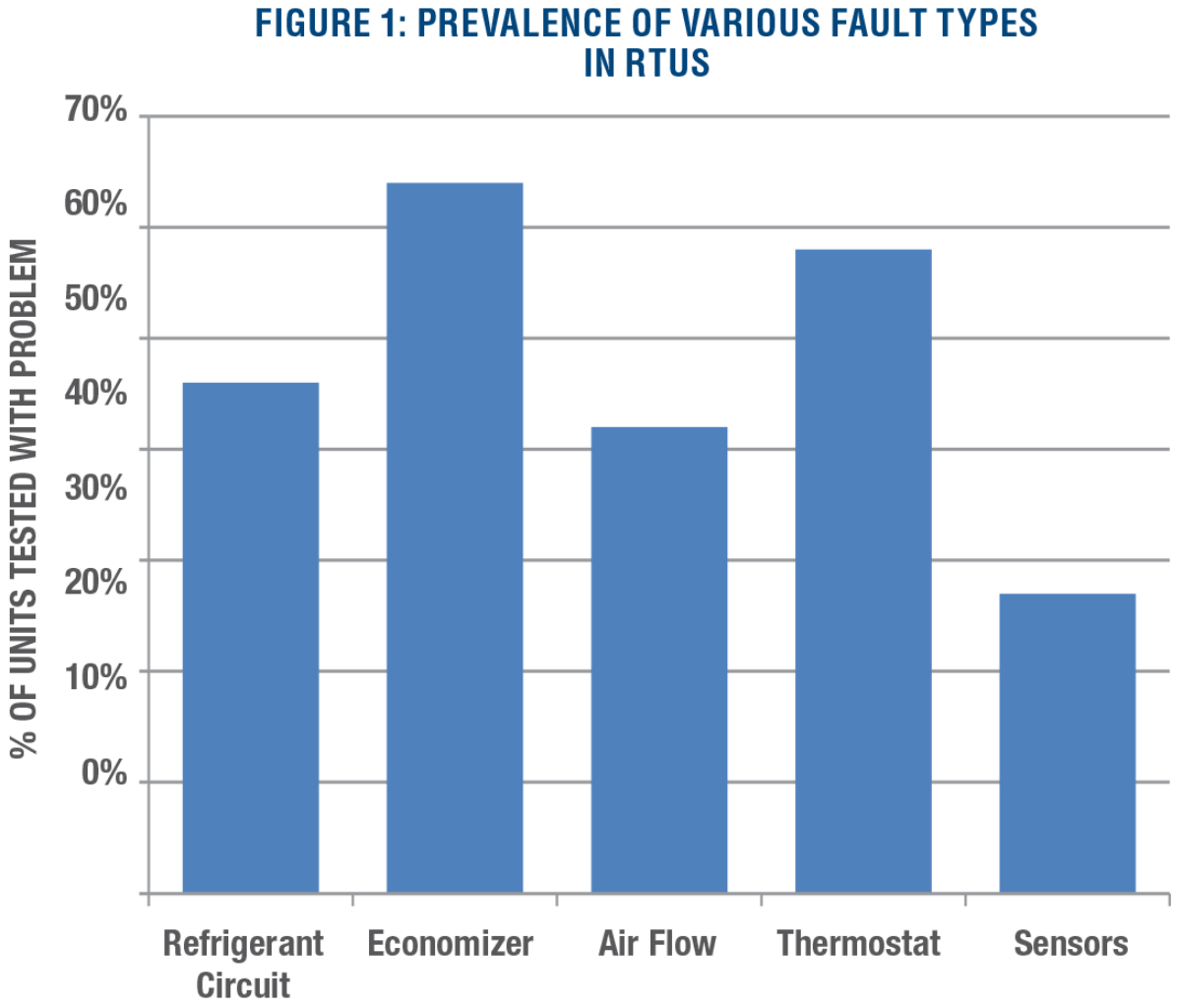


Figure 2: 2045 California Independent System Operator peak load forecast (GW). *Source*: Edison International Countdown to 2045

The need for improved RTUs (cont.)



Source: Automated Fault Detection & Diagnostics for Rooftop Packaged Air Conditioners, 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)

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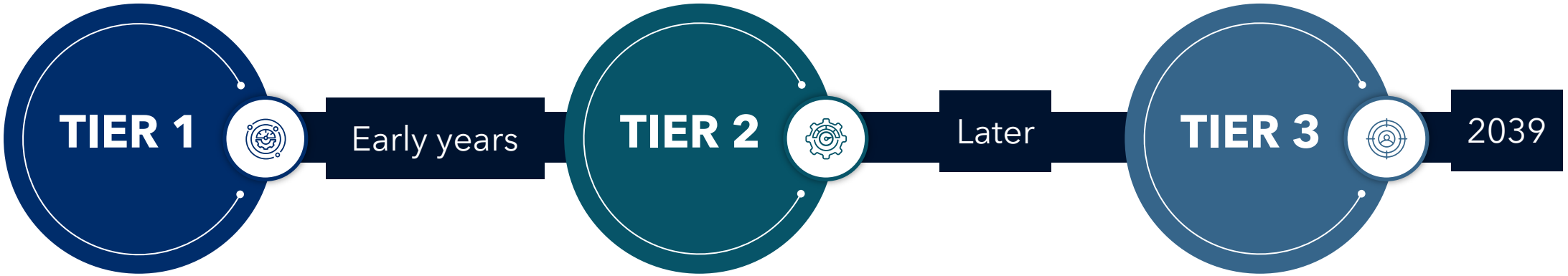
Application-based startup and commissioning	Reduces installation errors
Automated fault detection and diagnostics (beyond Title 24)	Optimizes performance over lifetime
Remote connection	Allows off-site troubleshooting and scheduling
Demand response	Allows for load flexibility

CRTU product tiers

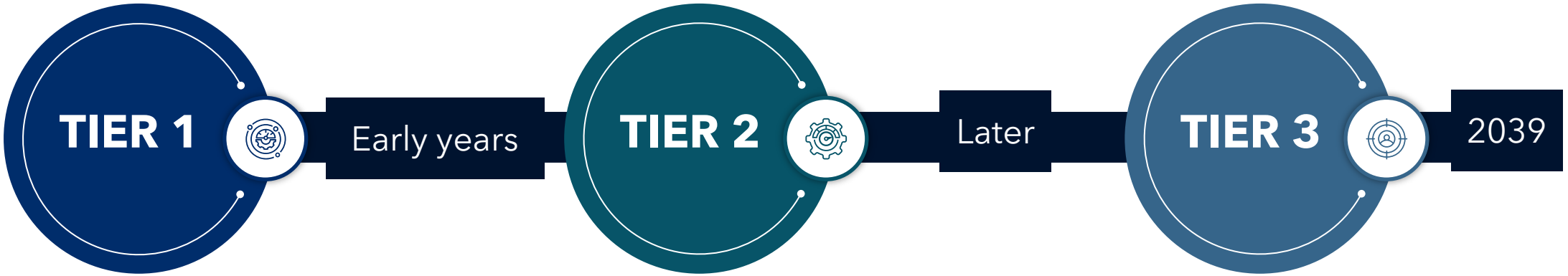


Code-minimum HP RTU equipped with CCC

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

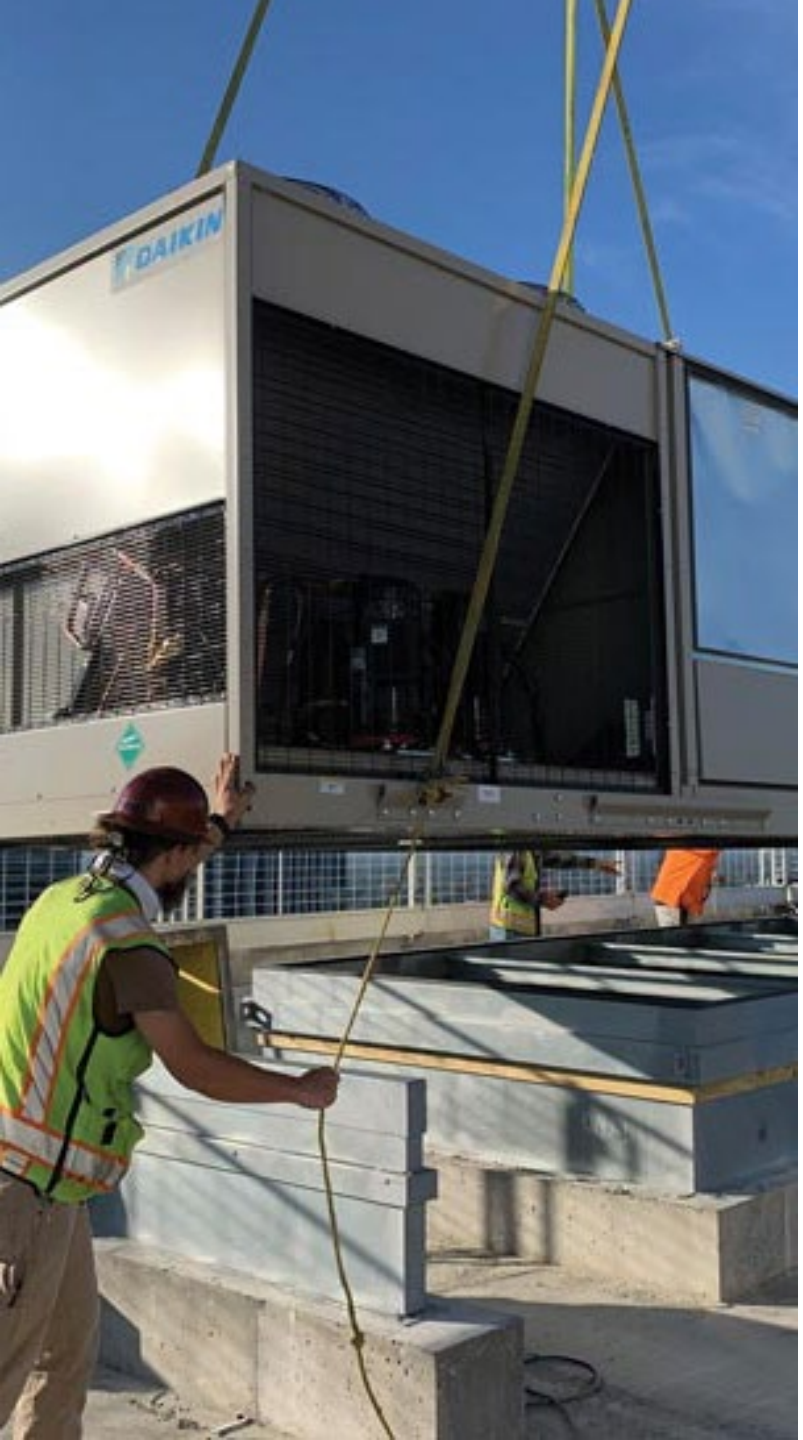
CRTU product benefits



- 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**

Benefits Key

- Energy
- Grid

Snapshot of Logic Model

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Barriers/ Opportunities

- High costs (equipment & installation)
- Limited supply chain and customer experience with technology package benefits
- Product availability and readiness
- Divergent product development asks to manufacturers
- Split incentives

- DOE Commercial HVAC Accelerator
- State and federal codes/standards/ test procedures
- Advanced Heat Pump Coalition
- CA adoption of heat pump RTUs
- Corporate & municipal sustainability goals
- 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
- 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

Distributor & supply chain engagement to increase availability and awareness

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

Key

- Market
- Financial
- Technology

Interventions with a focus on equity considerations

Theory of market change

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

Theory of market change (cont.)

IF	THEN
If California programs can align around a common RTU product roadmap…	**this will** reduce market confusion and accelerate the adoption of advanced RTU technology
If major manufacturers receive consistent market signals and coordinated requests from California and national partners…	**then** they will more quickly develop CRTU products
If major manufacturers see consistent product tiers from California and national partners…	**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%

Theory of market change (cont.)

IF	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
1. Opportunities today to hear Part 3 on market forecasts, cost-effectiveness, 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.

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6. CRTUs: Market Adoption Forecast

Jason Christensen | Cadmus

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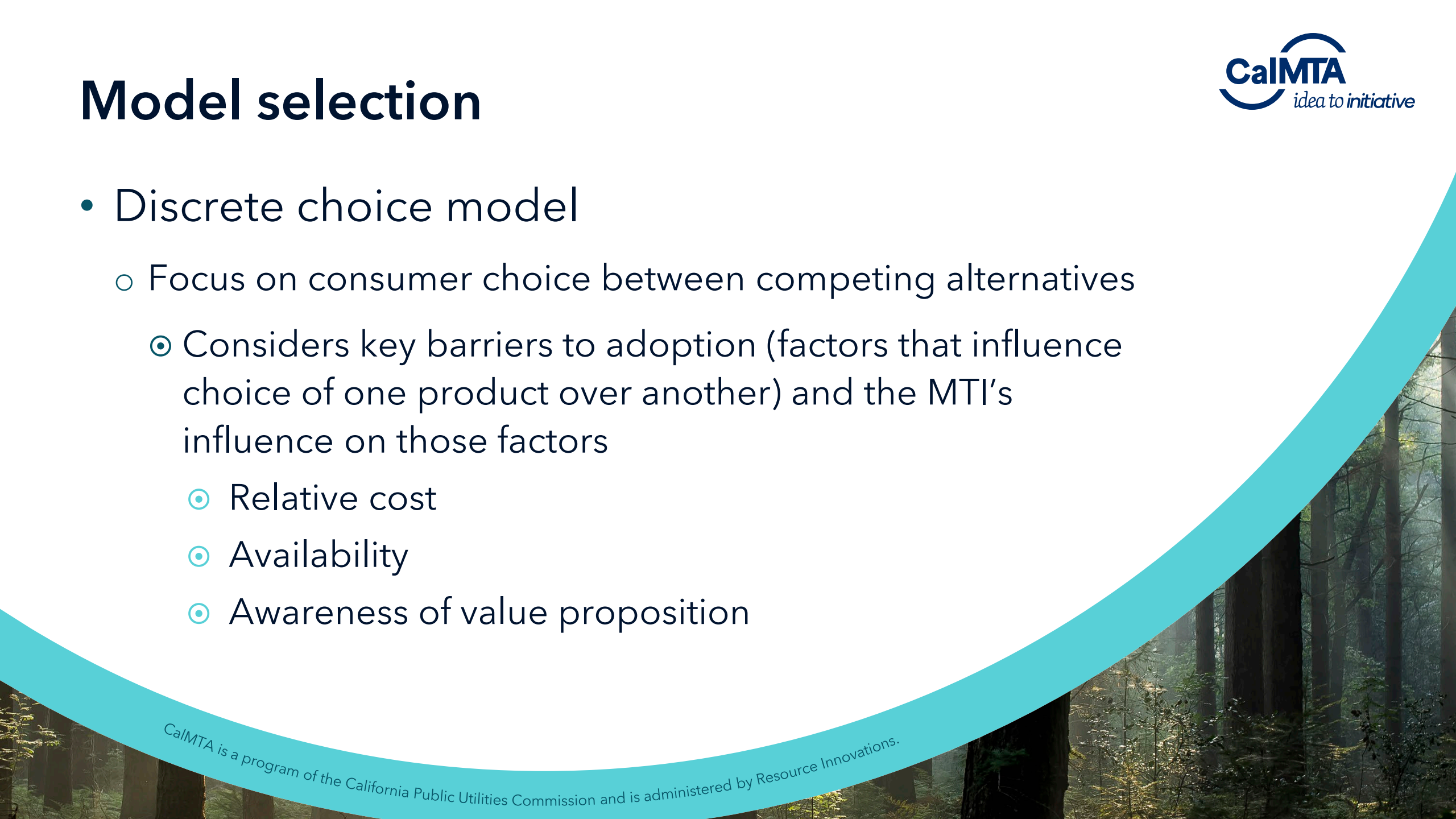
What we'll cover

- 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
  - 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



Adoption model approach

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

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.

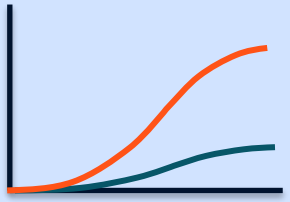
N: Total number of HVAC system types in that model stage.

Market adoption forecasting model

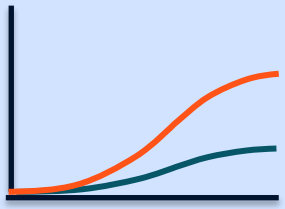
Inputs

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

Product availability



Awareness of Value Proposition (AVP)



Outputs

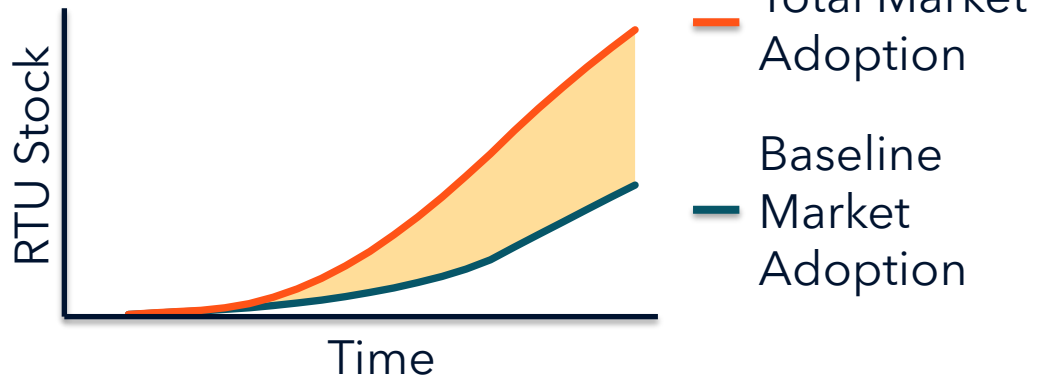
Market shares (unconstrained)

Market shares (constrained)

Purchases

Installed RTU stock

Failures



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Model Assumptions

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CRTU installation conditions

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

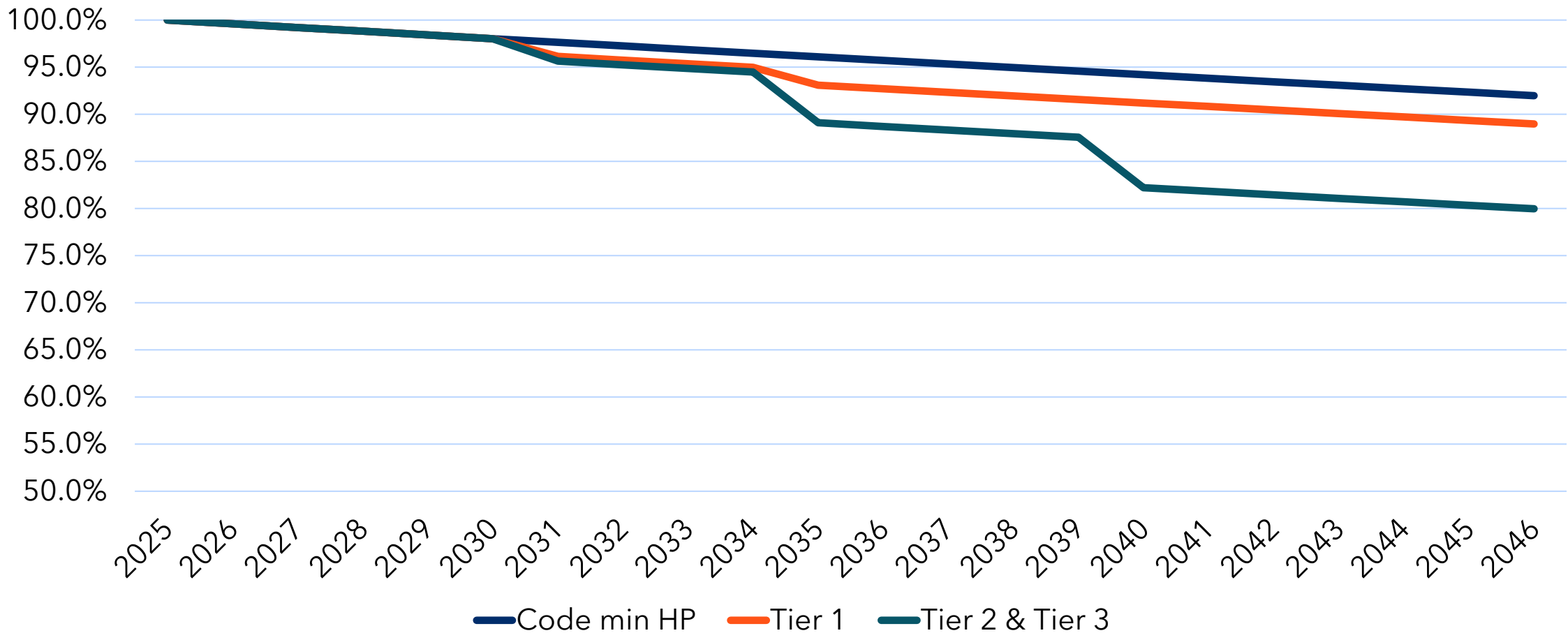
Key model assumptions

- Four market segments with different economic decisions
  - 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

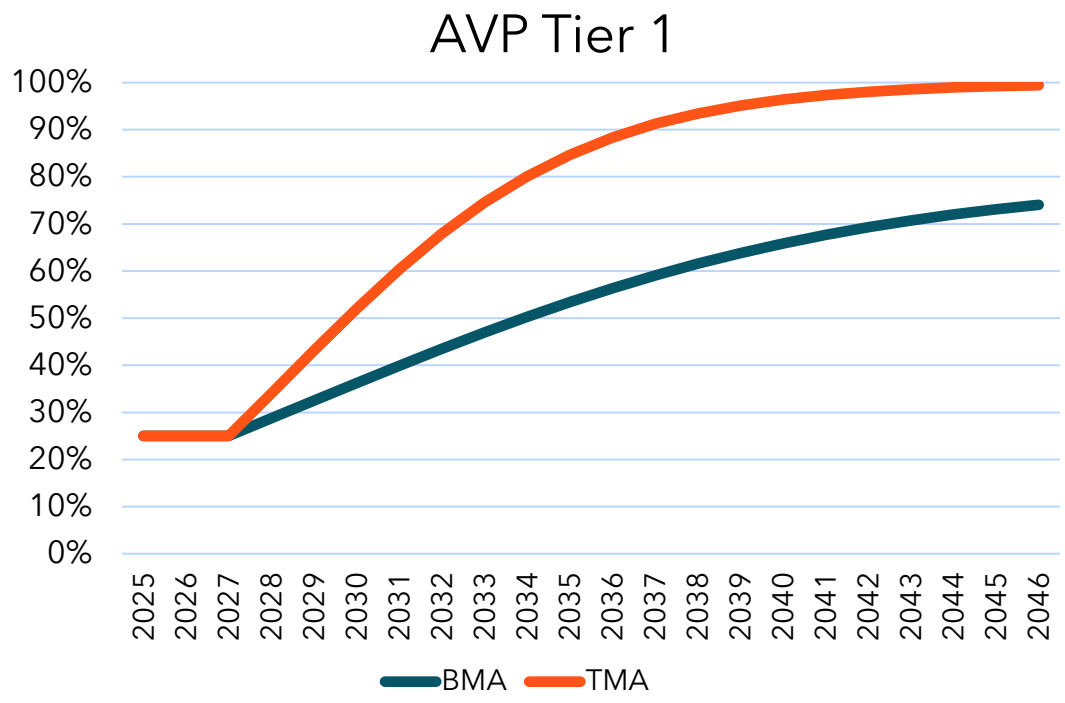
Key drivers of adoption

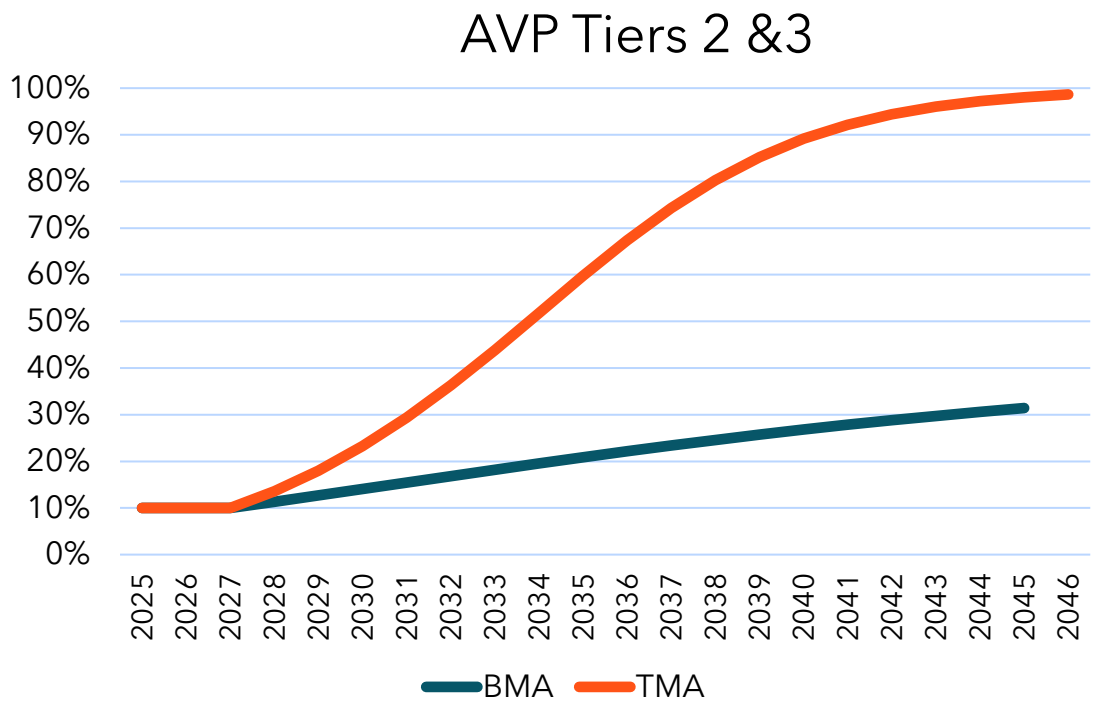
Reduction in Price Premium	• Installed price of HP RTUs with and without CCC are within 5% by 2035 • Price premium currently 60%; MTI interventions reduce premium to 30% by 2040
Increased Availability	• 60% of distributors stock CRTUs by 2032 • Three minimum-efficiency product lines include CCC as a standard feature by 2031.
Increased Awareness of Value Proposition	• 90% of contractors include CCC in 50% or more bids by 2032

Price projection curve

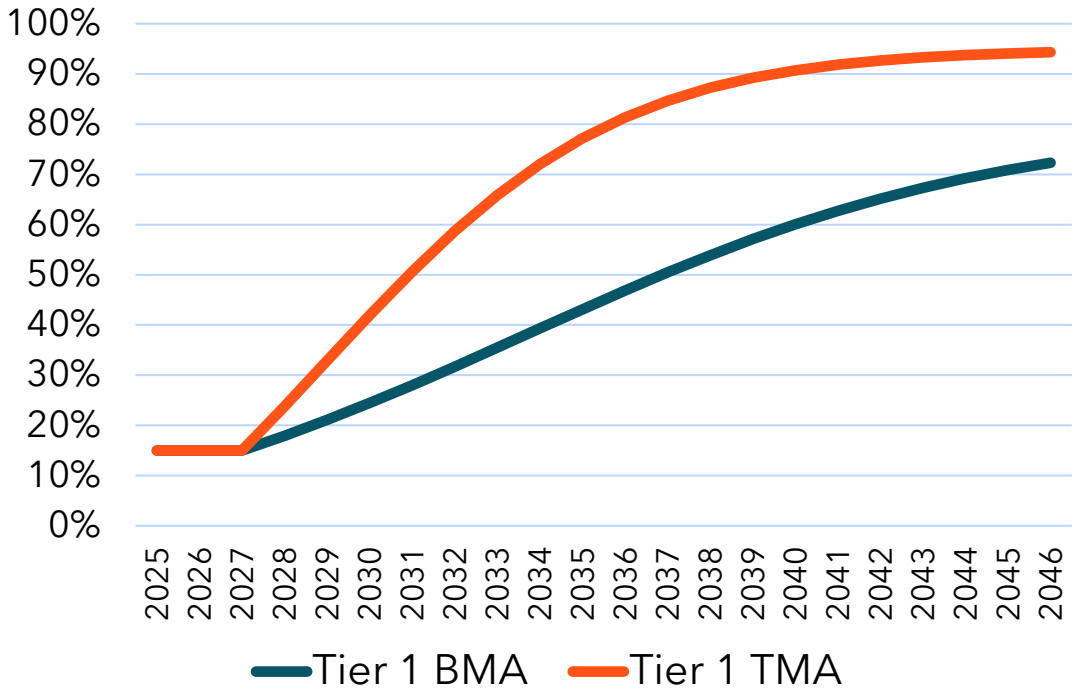


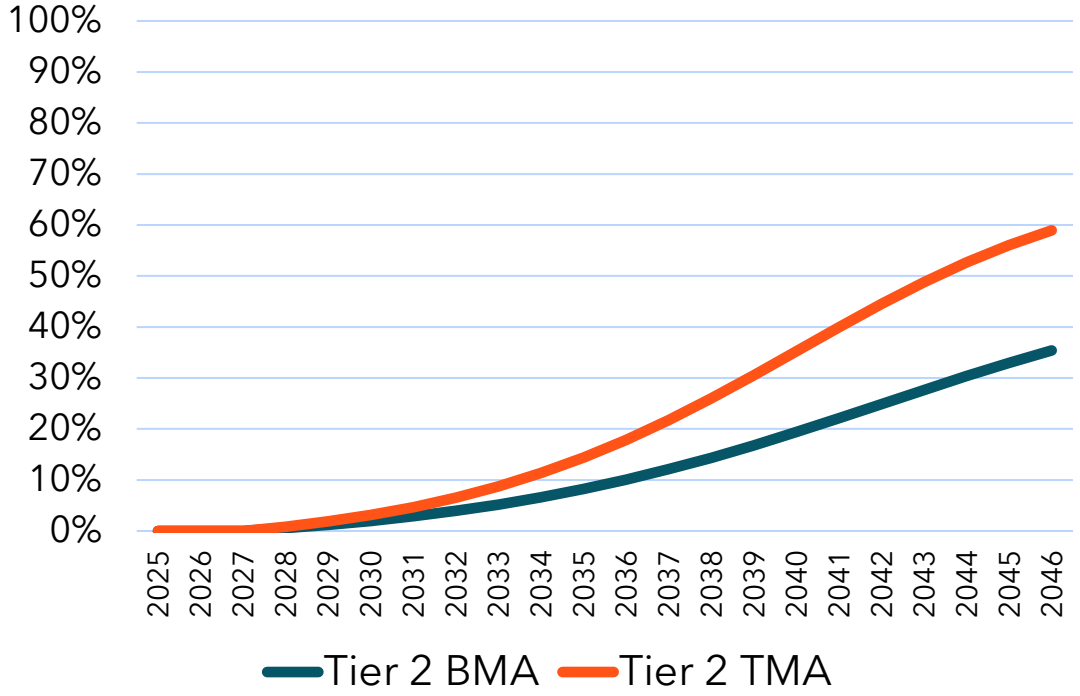
Awareness of Value Proposition (AVP)



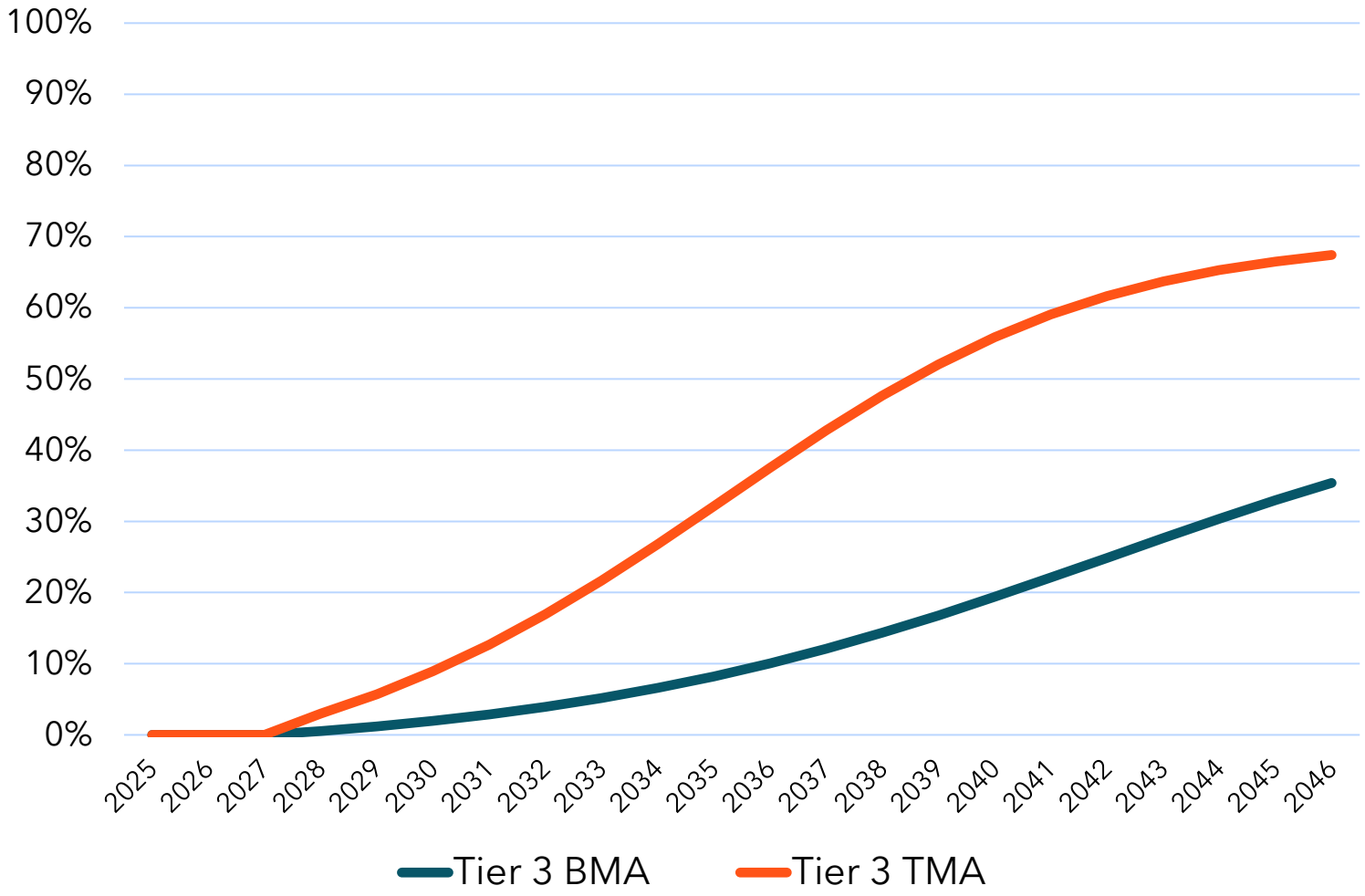


Availability: Tier 1 & 2





Availability: Tier 3



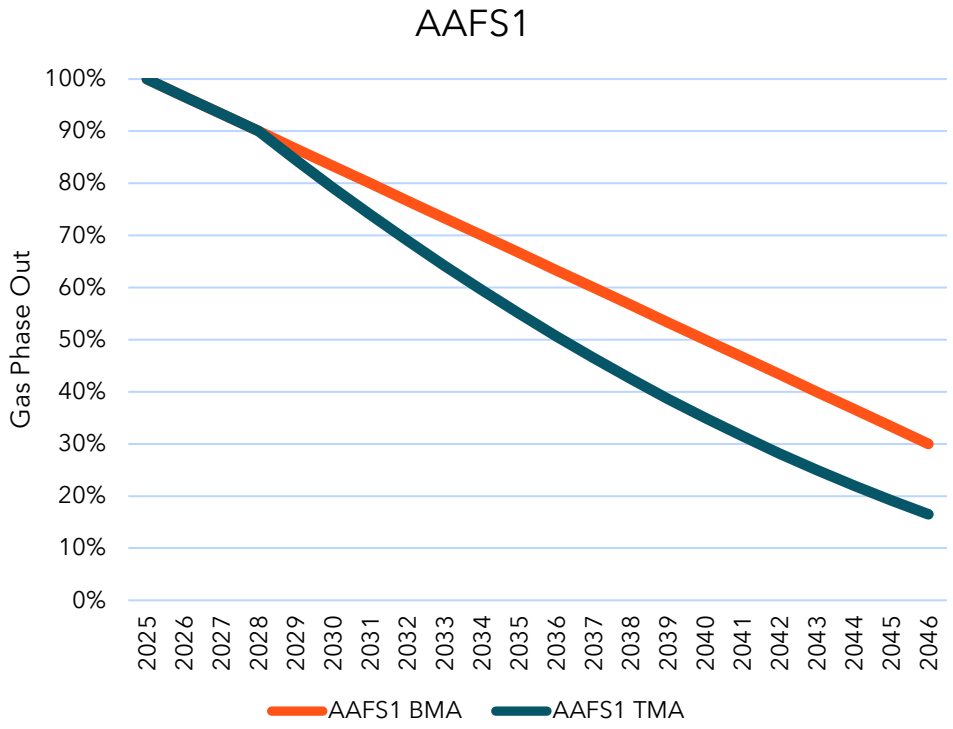
Three policy scenarios

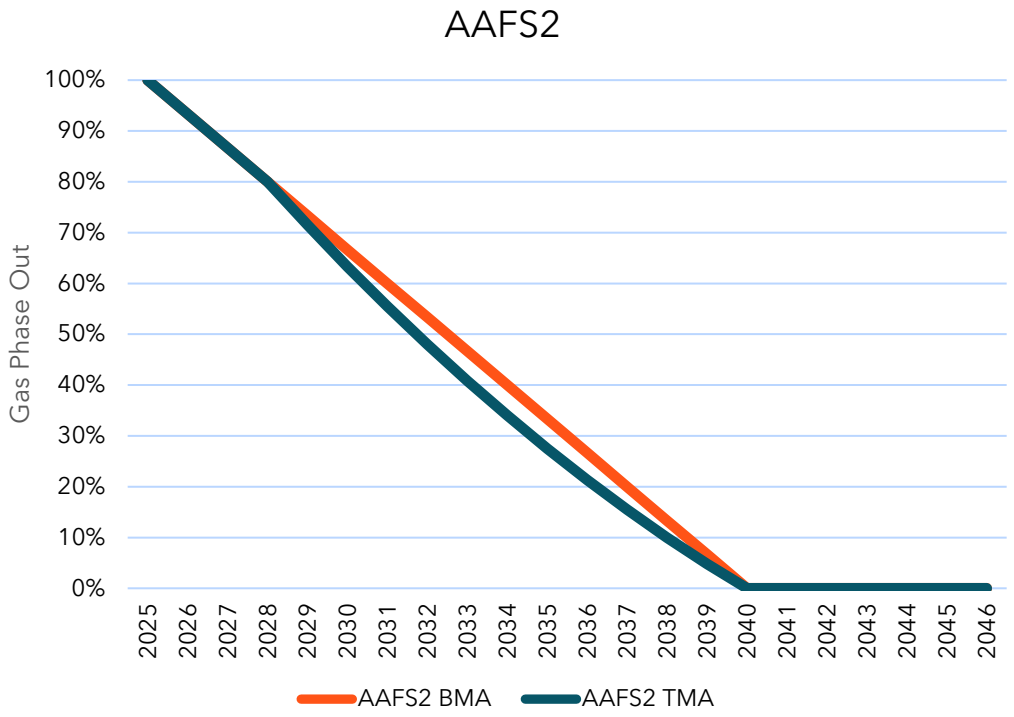
Additional Achievable Fuel Substitution (AAFS) scenarios developed as part of the 2025 draft Integrated Energy Policy Report (IEPR)[1] update

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

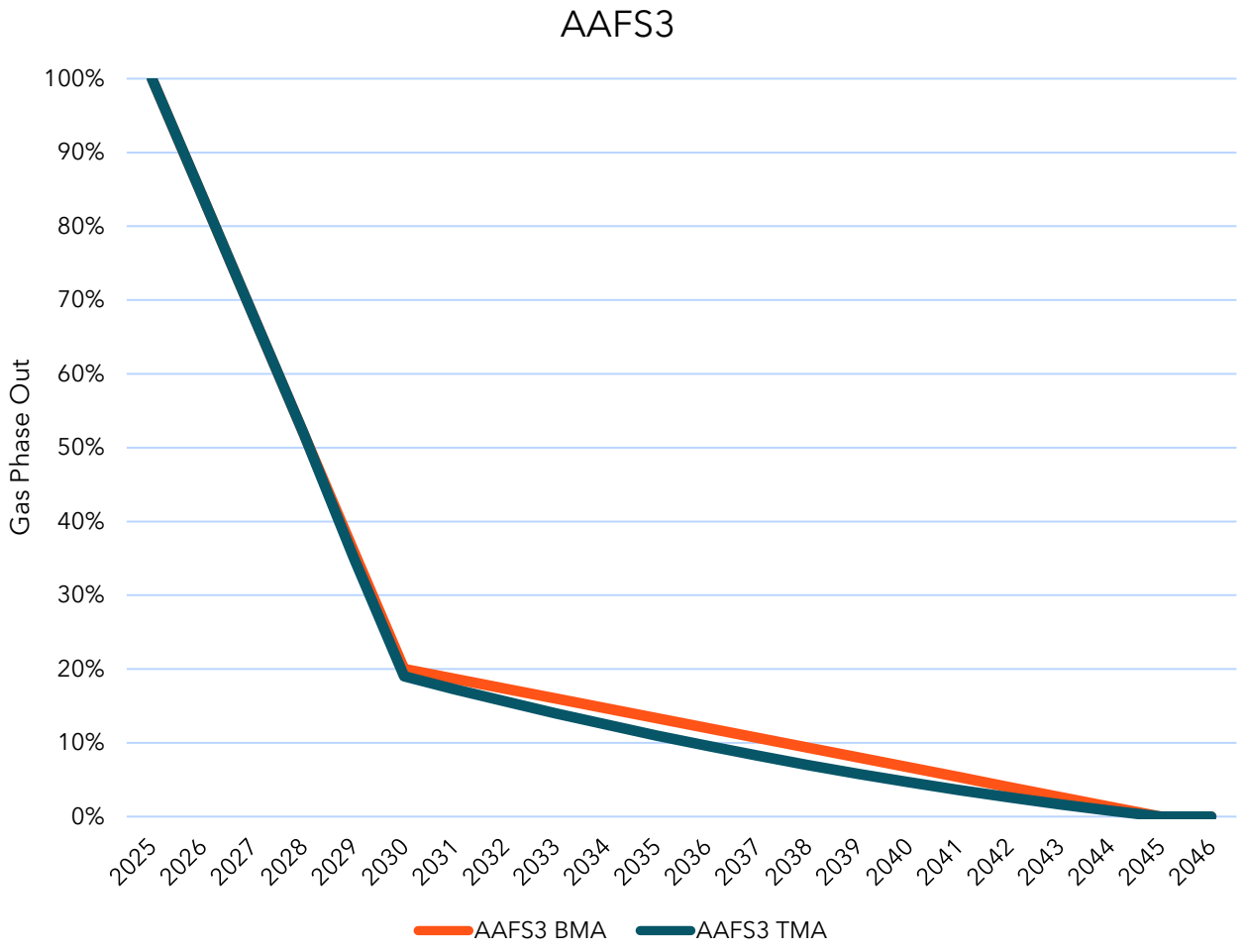
[1] https://www.energy.ca.gov/sites/default/files/2025-08/Additional_Achievable_Energy_Efficiency_%28AAEE%29_and_Additional_Achievable_Fuel_Substitution_%28AAFS%29_ada.pdf

Assumed Incremental FS





Assumed Incremental FS (cont.)



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Model Outputs

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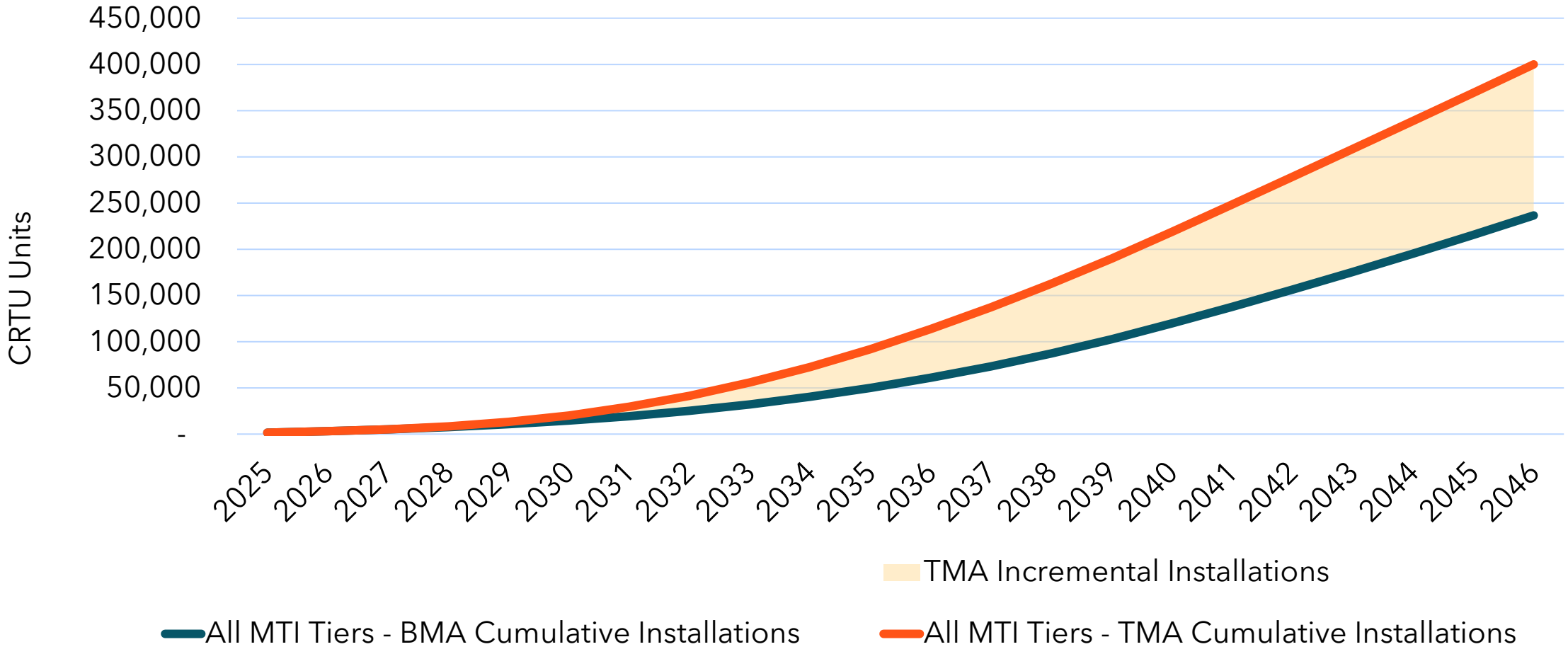
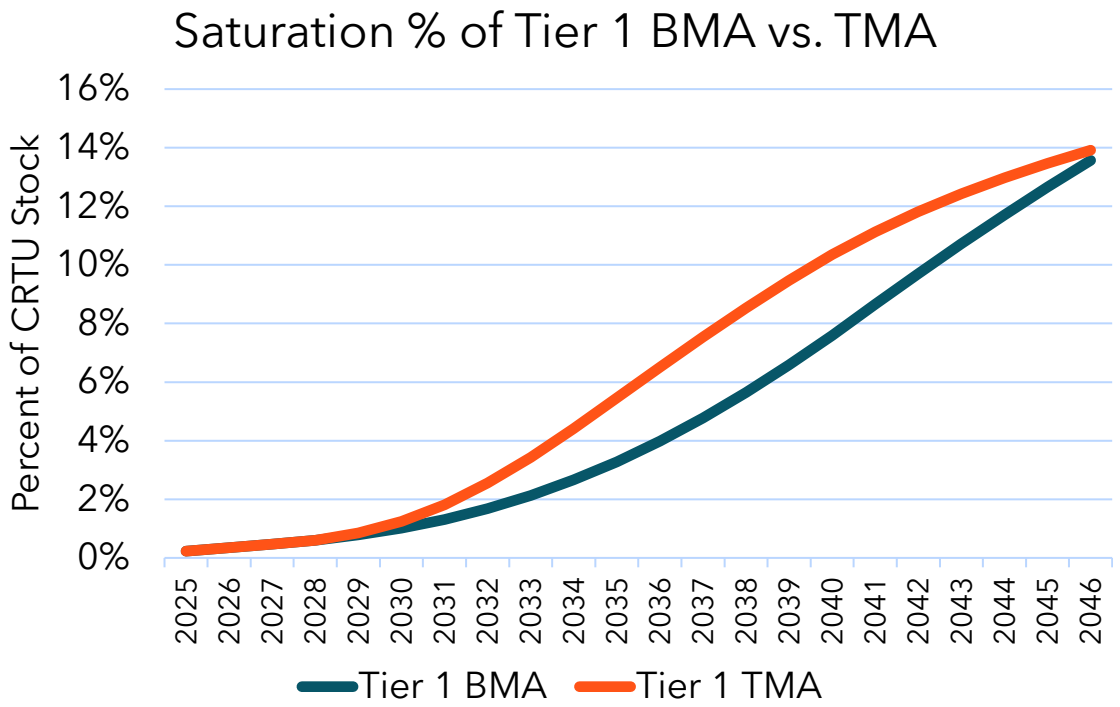
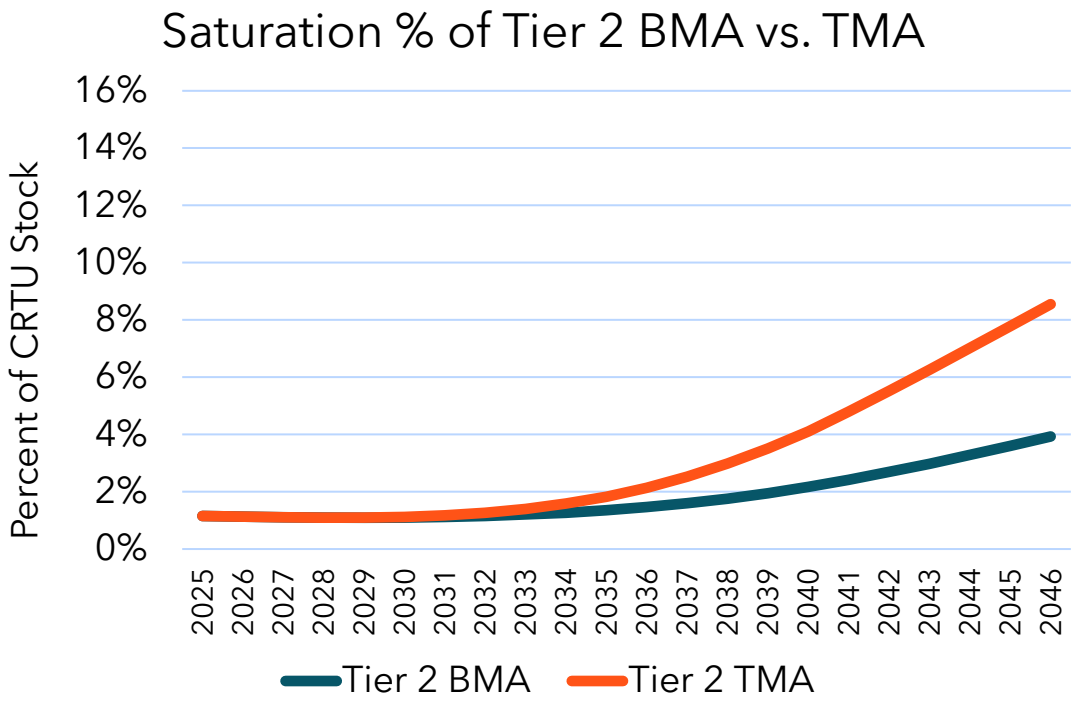
Estimated adoption base scenario AAFS 2

Cumulative total MTI RTU installations



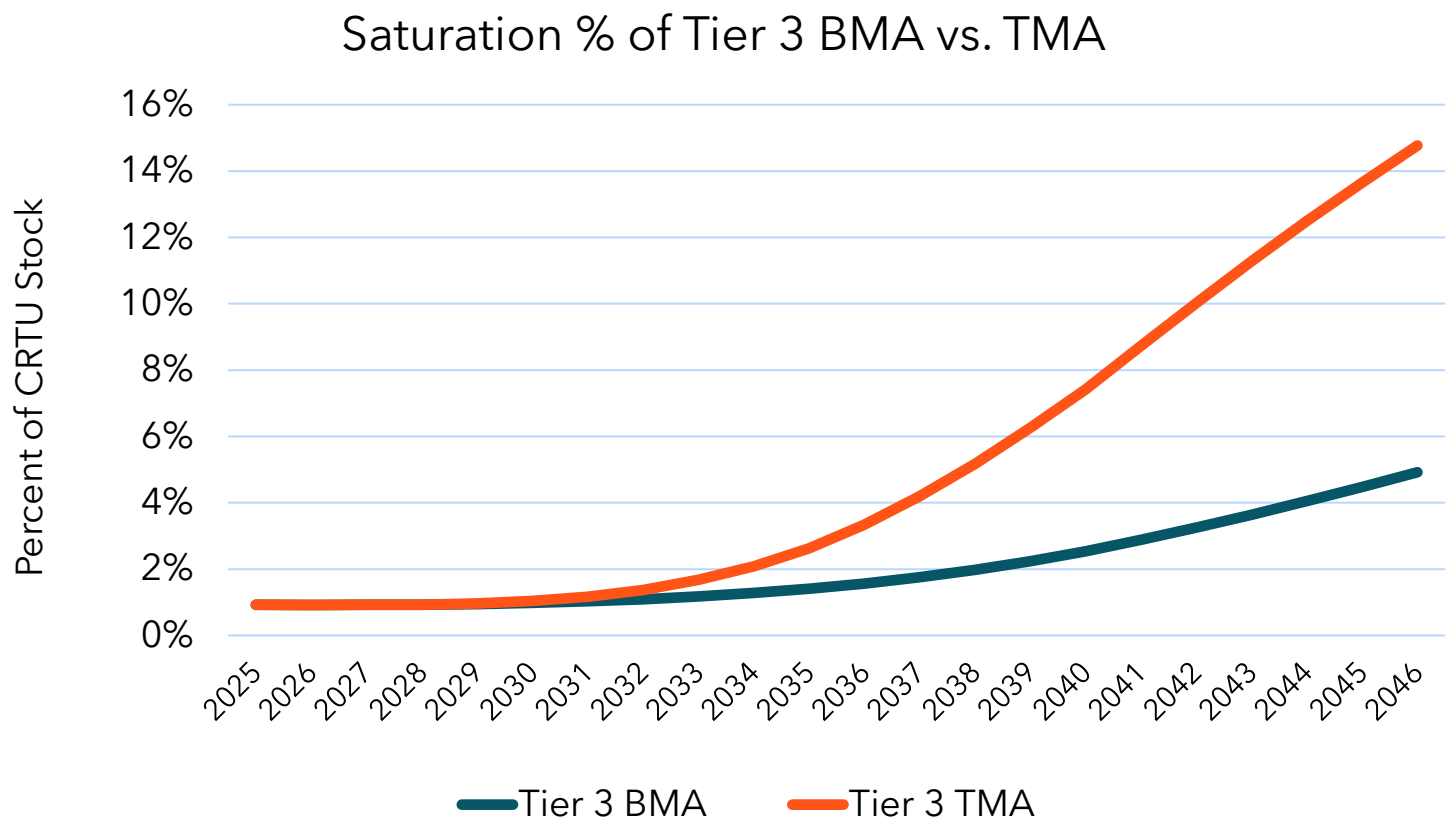
BMA vs. TMA Base AAFS 2



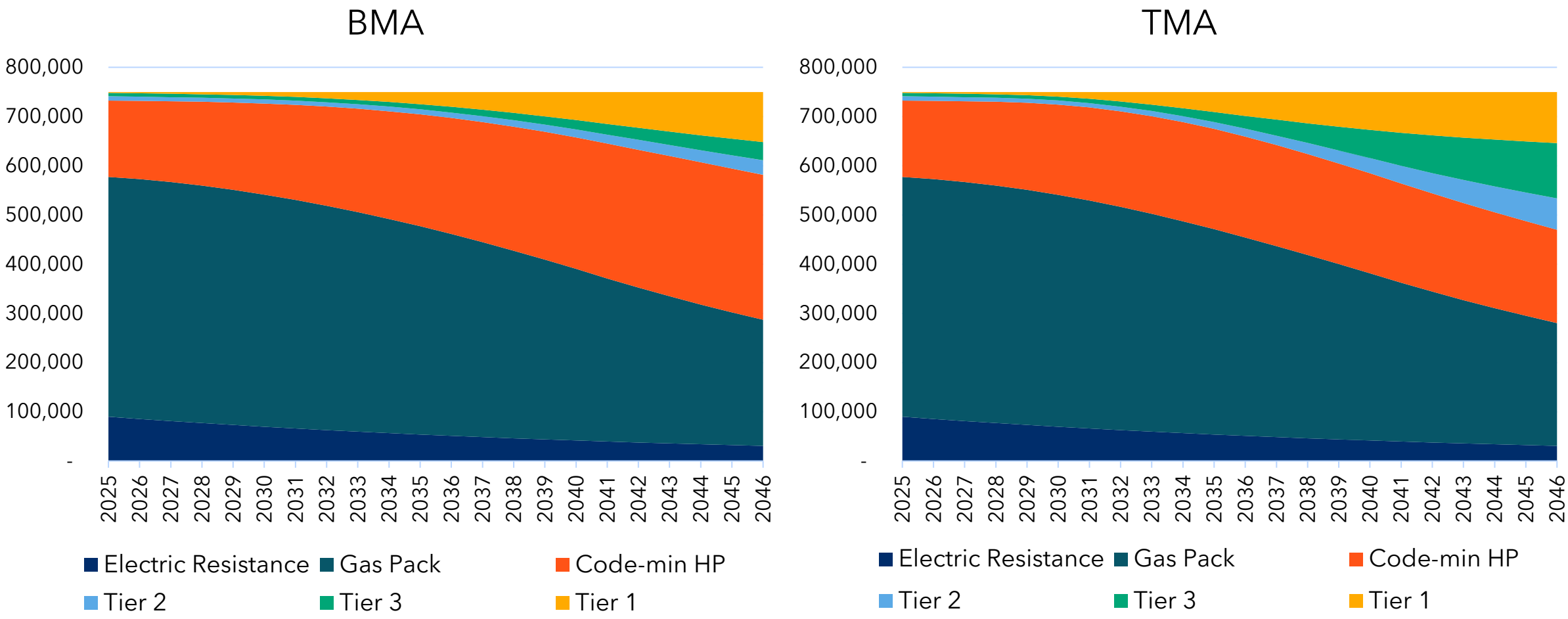


BMA vs. TMA Base AAFS 2

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

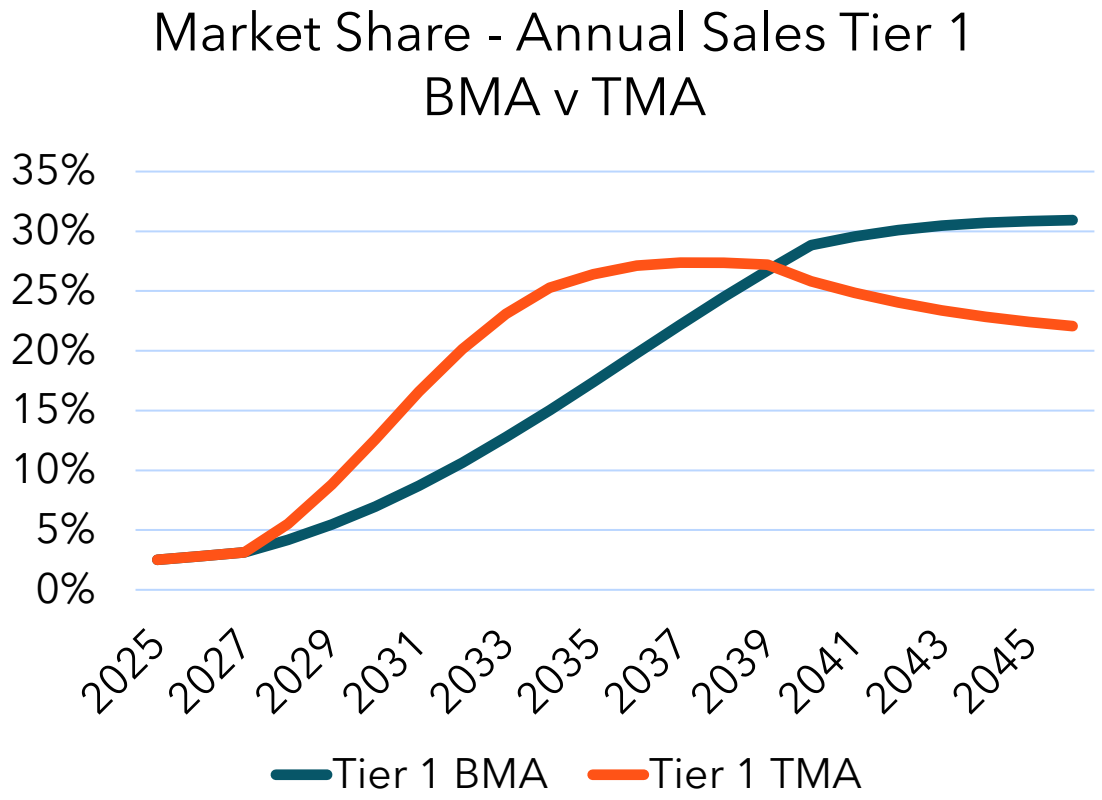


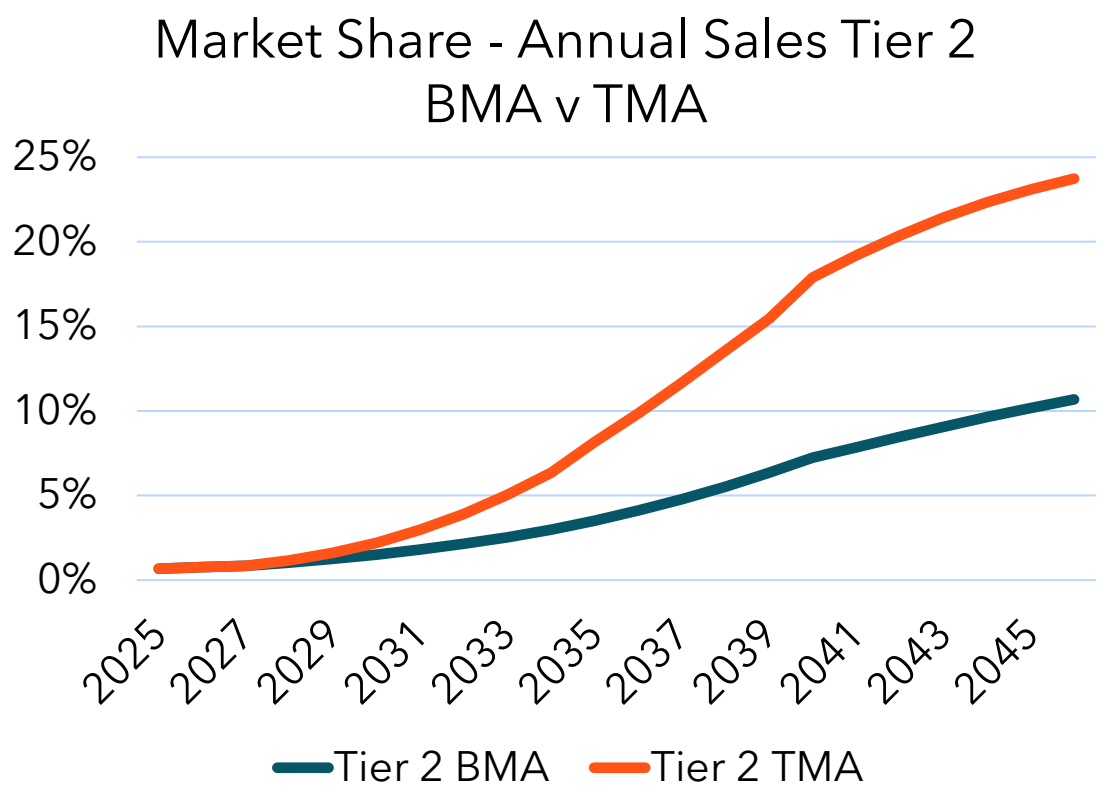
BMA vs. TMA Base AAFS 2



BMA vs. TMA Base AAFS 2

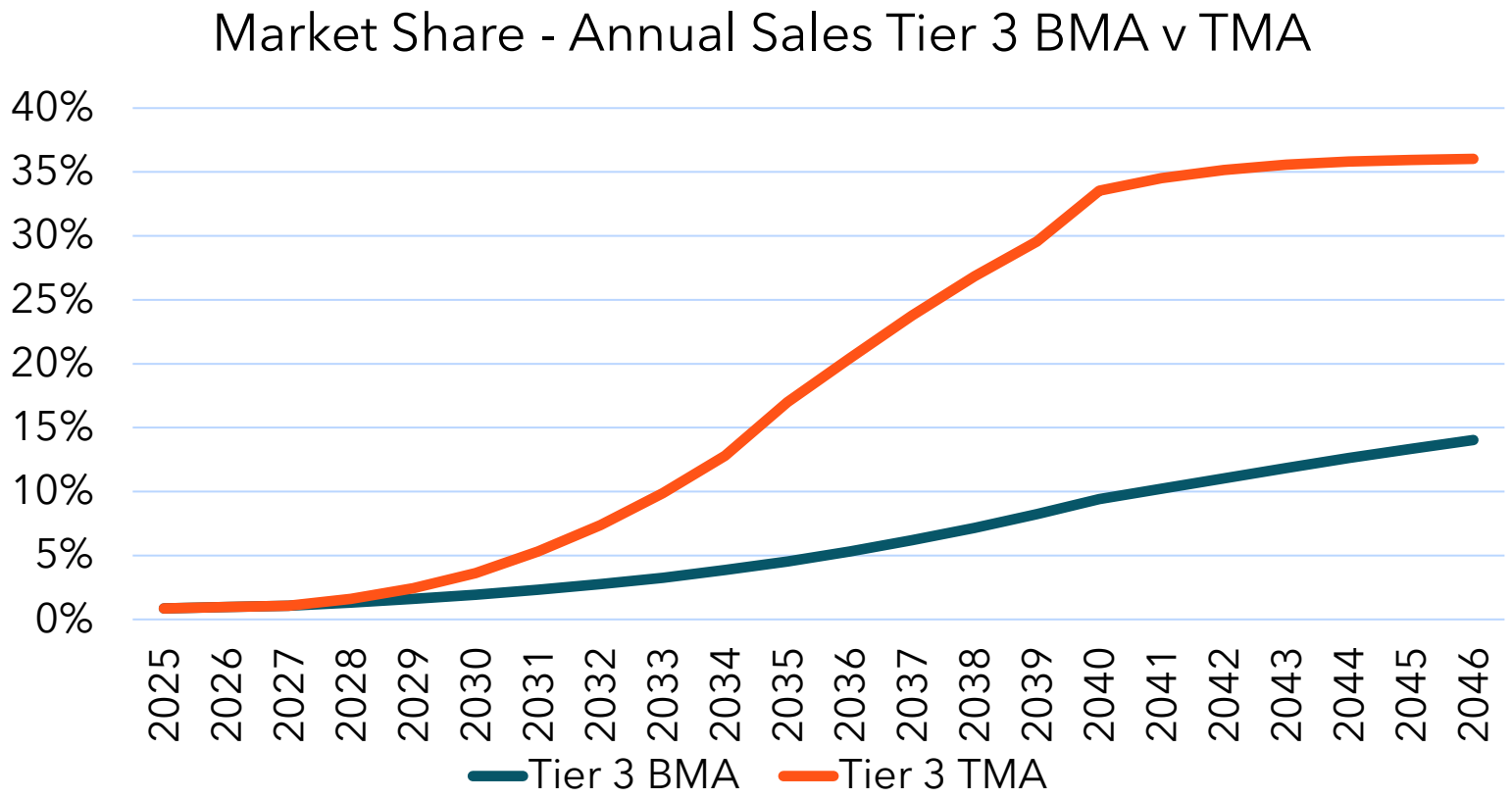
Tier 1: Code minimum HP RTU + CCC





BMA vs TMA Base AAFS 2

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



Net Incremental Adoption AAFS 2

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

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	BMA	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

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8. CRTUs: DRAFT Cost-Effectiveness Forecast

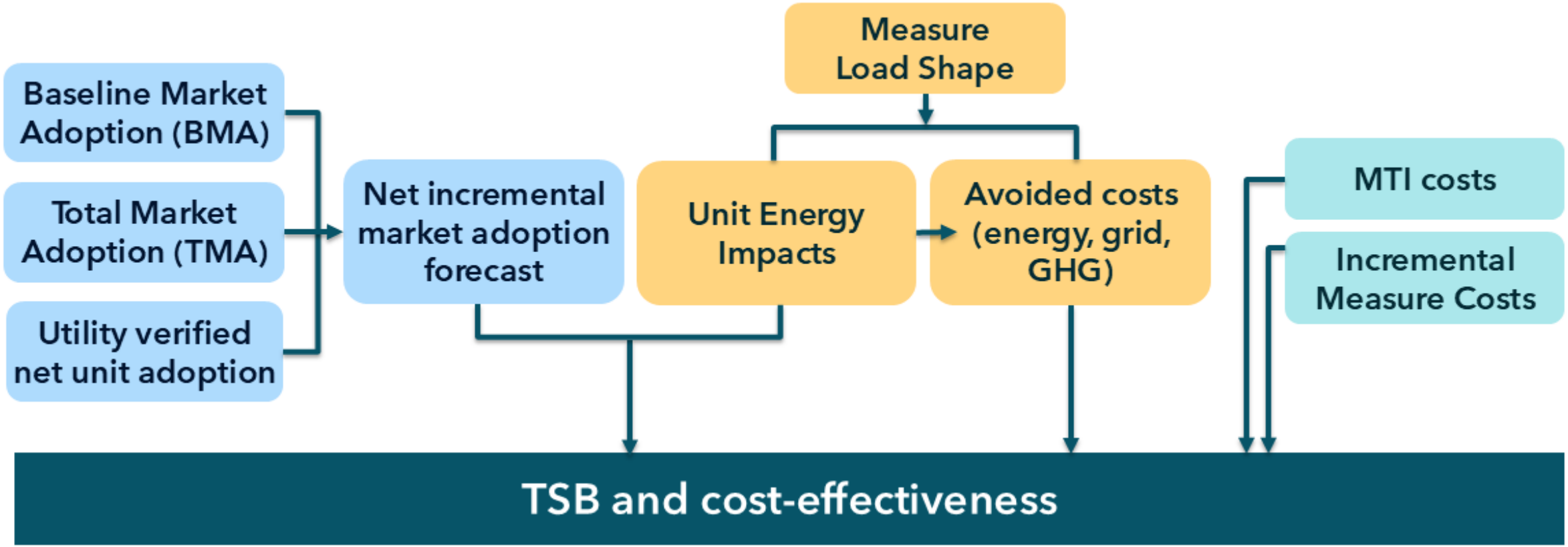
Matt Wisnefske | Contractor, Cadmus

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

What we'll cover

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

MTI incremental impact forecasting components



Cost-effectiveness inputs

- 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
Estimated incremental investment	$ 26.7M	$ 12.2M	$ 3.4M	$ 0.4M

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 secondary research and expert judgment	Based on • Extensive market and product research • Discrete Choice model incorporating economic drivers
TMA Forecast		
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

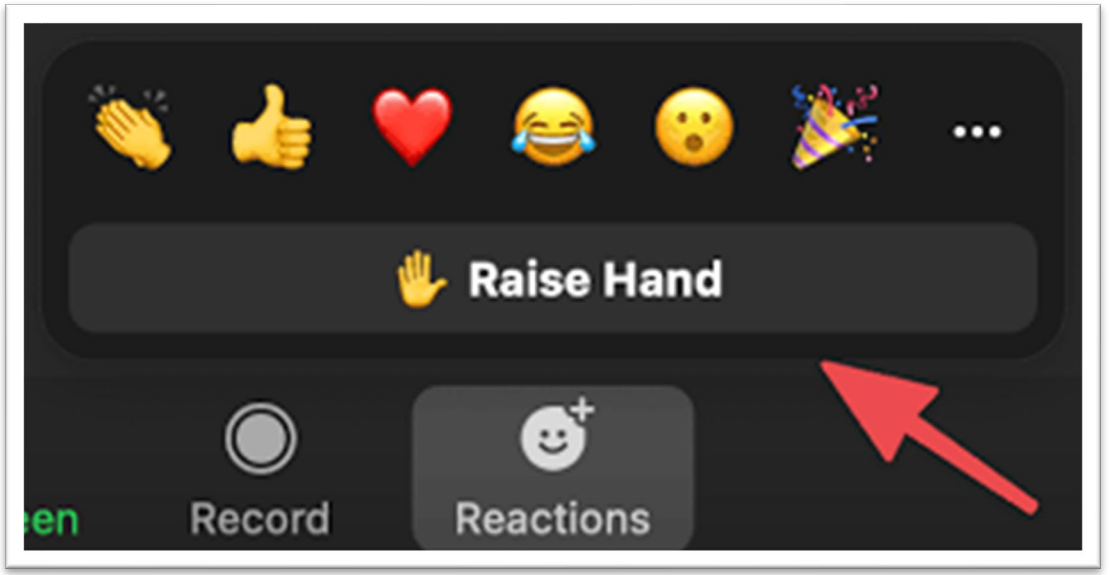
TSB components may not sum to totals due to rounding.

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

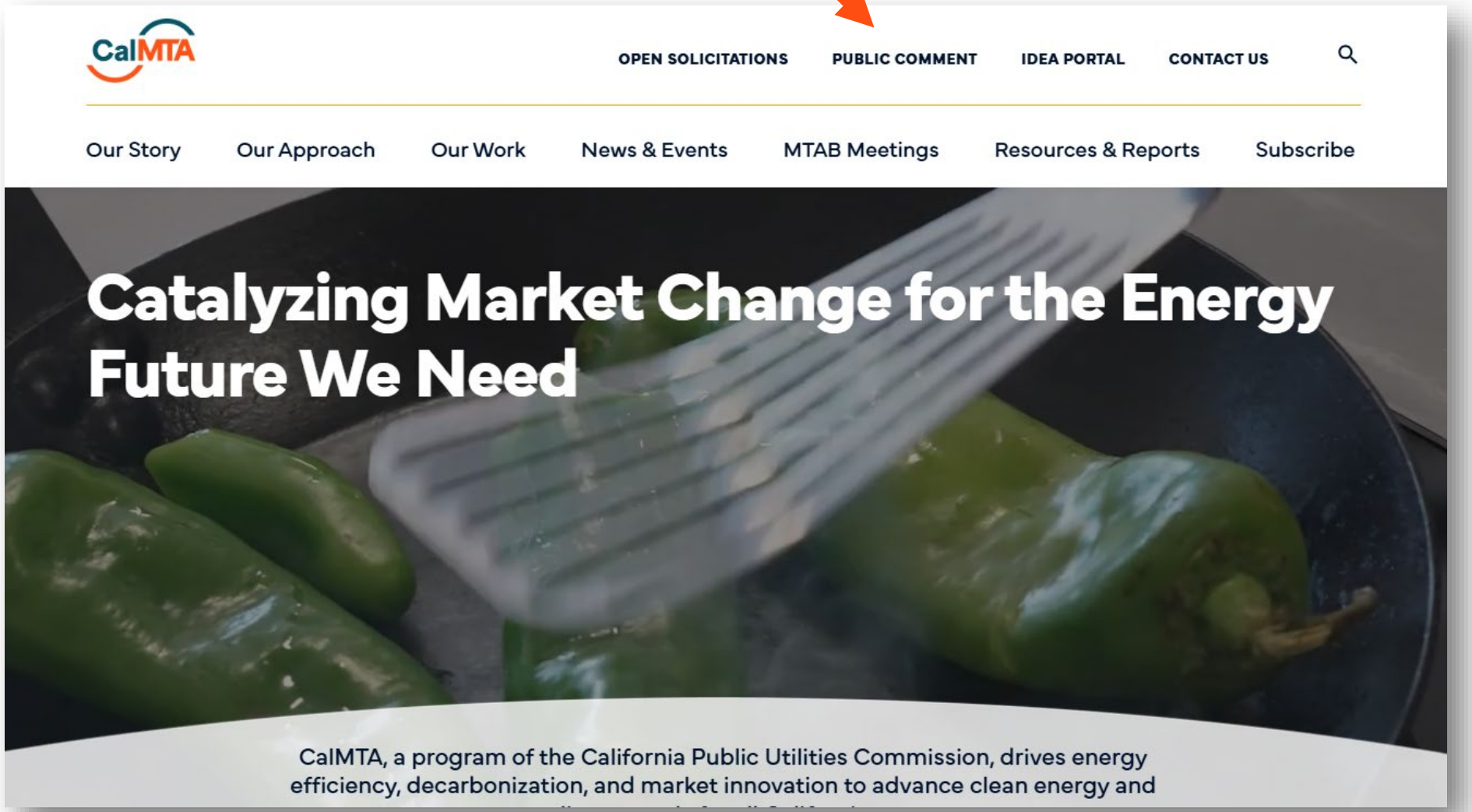
Questions & Discussion

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.

CalMTA
idea to initiative

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

Review PTLM
Develop MPIs/Milestones

Leadership, MTAB, CPUC review of MPI/Milestones

Draft eval. plan

CalMTA leadership and EAG review

Adjust milestones and refine plan

MTAB presentation

Address written feedback

Evaluation approach overview

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

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

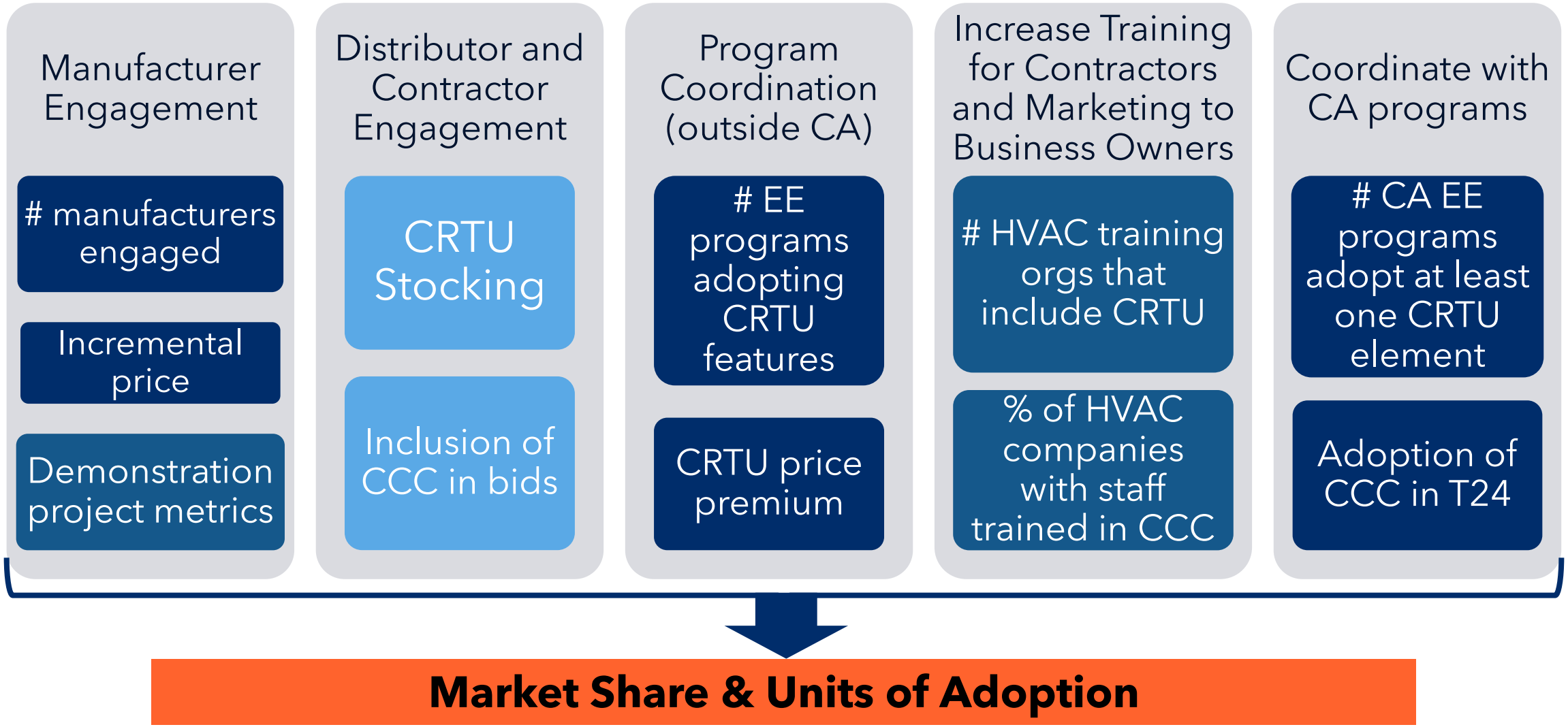
Use of widely accepted best practices to develop & refine baseline market adoption forecast

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

Evaluation objectives

- 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

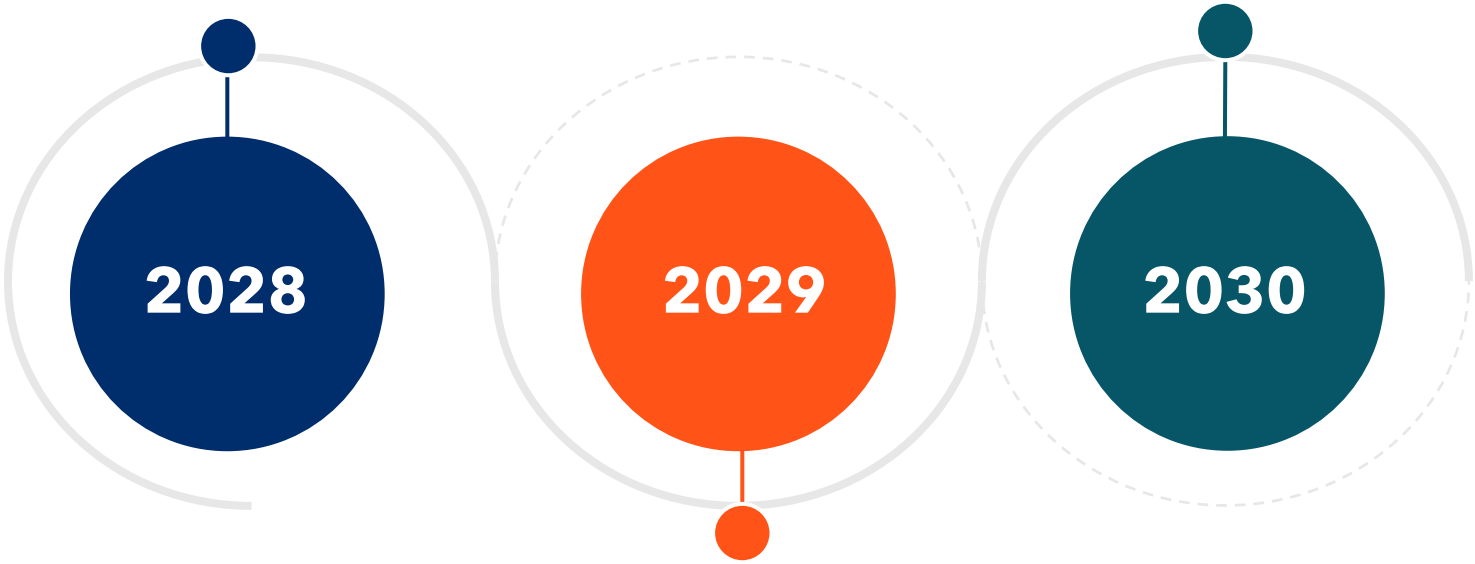
CRTU Market Progress Indicators



CRTU milestones

3+ manufacturers engage with demonstration project

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

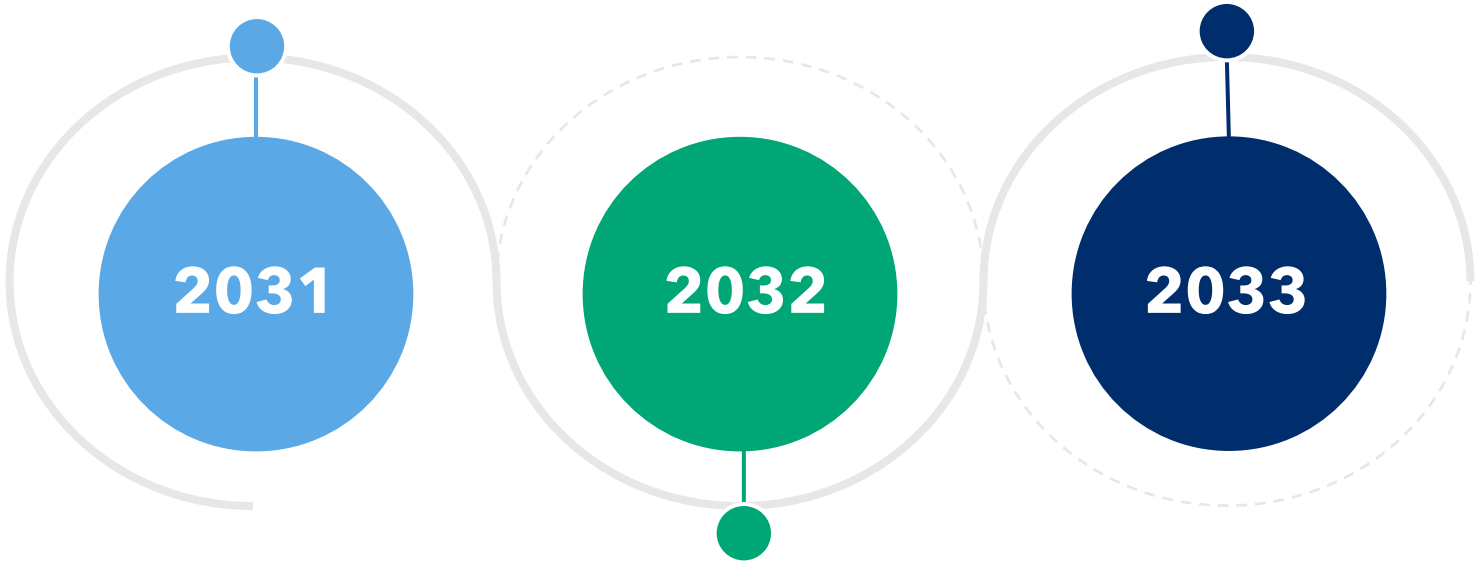


- 2 EE programs outside CA adopt CRTU definition
- 3 CA EE programs adopt at least one CRTU element
- 150 demonstration project CRTUs

CRTU milestones

- 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

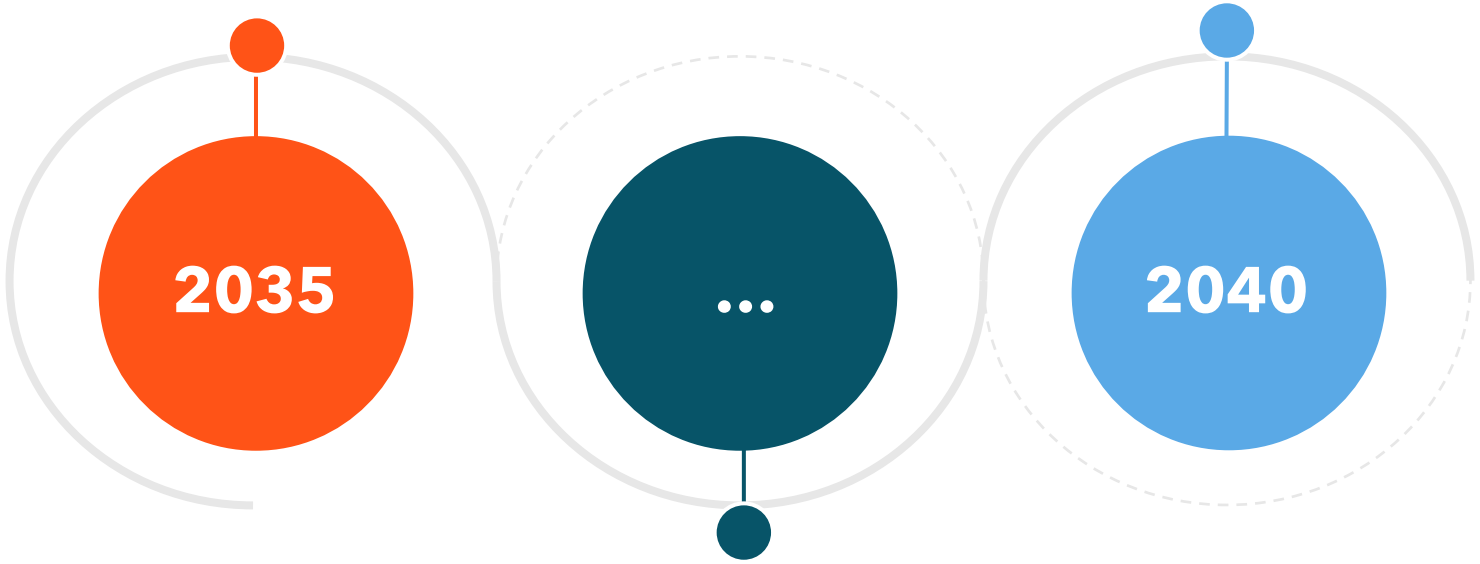
75% of contractors can support CCC installations and service



- 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%



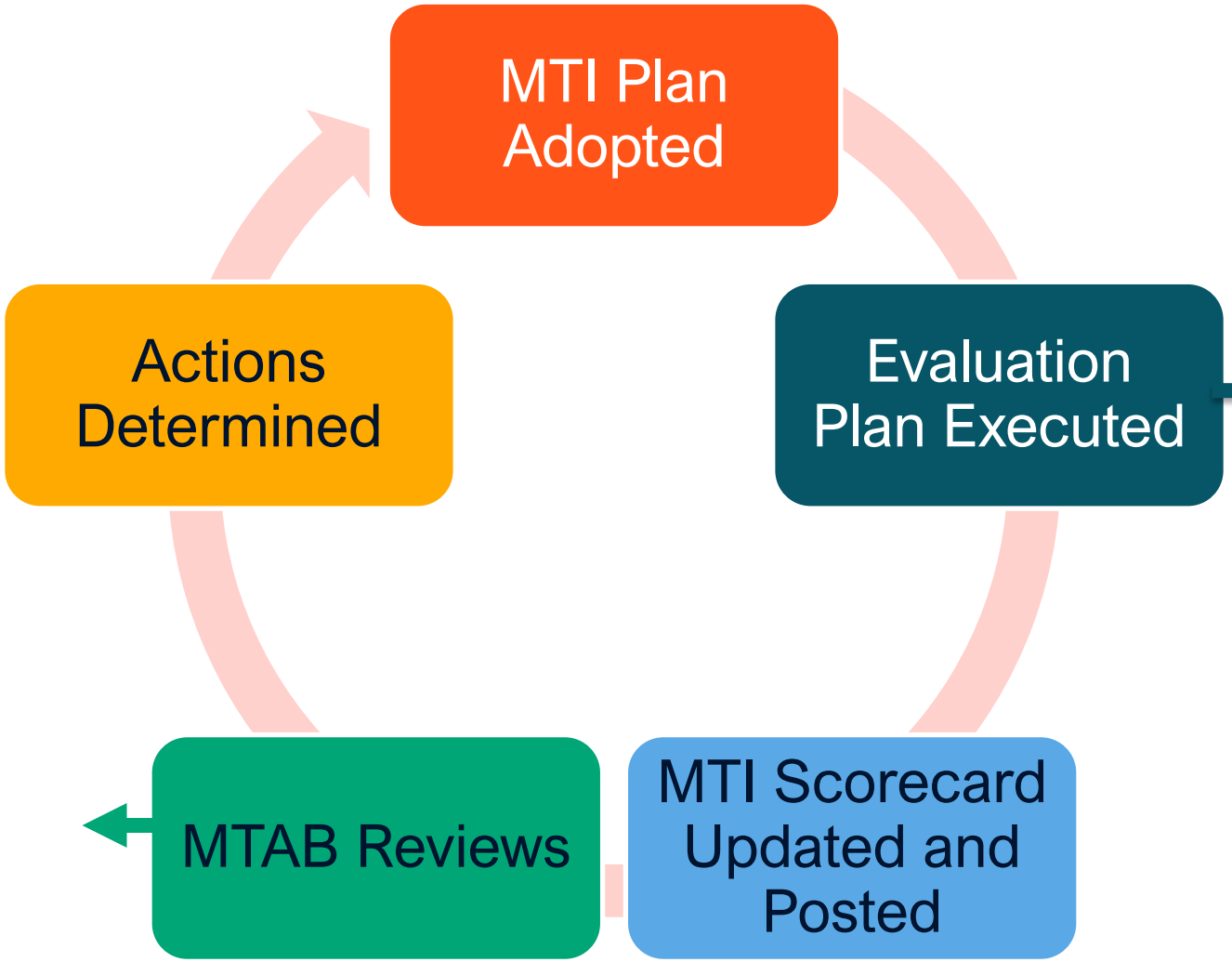
Primary data collection tasks

- 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

Other data sources

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

Monitoring, reporting, and review



MTI market progress and evaluated incremental impacts reported publicly

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

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

CalMTA
idea to initiative

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

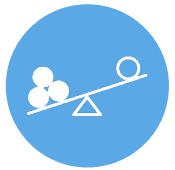
CalMTA external program alignment goals

CalMTA idea to initiative

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

11. Phase I Update

Jeff Mitchell | Principal of Market Transformation

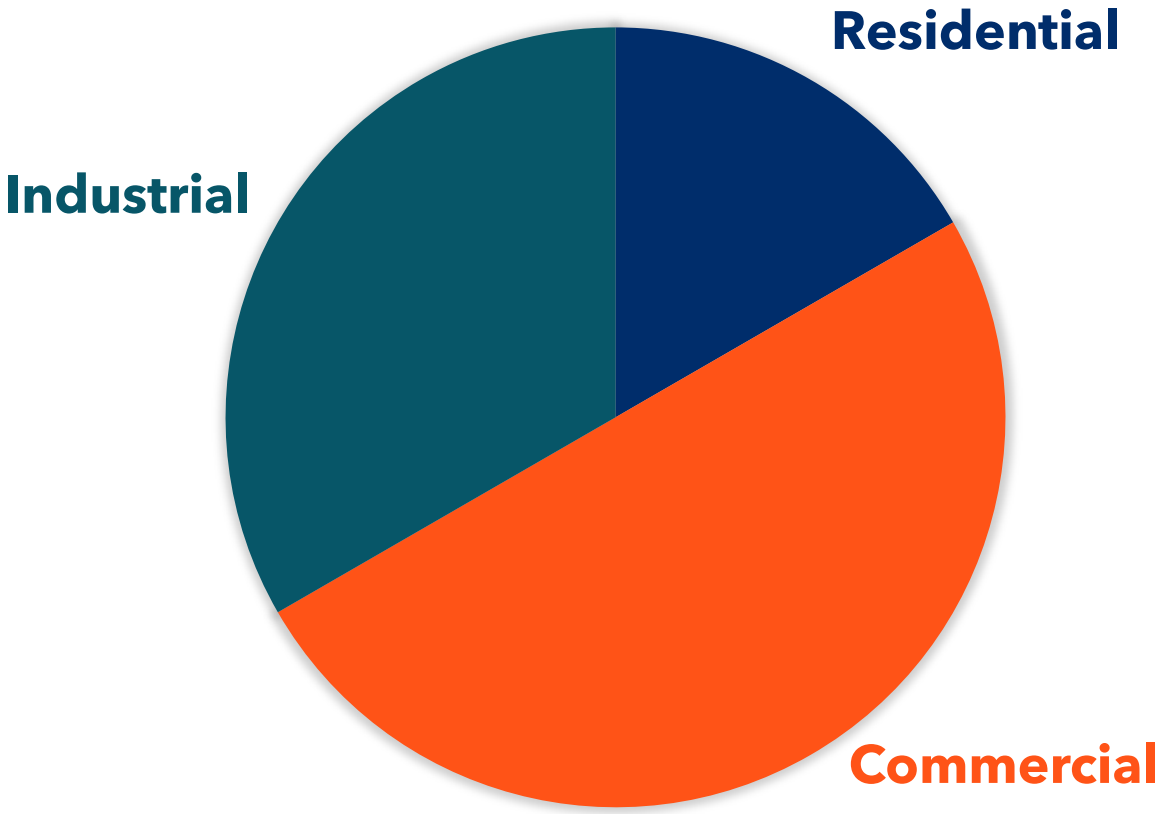
RFI Metrics 2025 YTD

6

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 Phase I Disposition Report (published June 2024) and the Disposition Report for the 2024 RFI (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

10 entries per page

Search:

Idea number	Idea Name	Description	Status	Technology	Industry	Fuel
0010	High Performance Windows	Windows that outperform code efficient windows by ~20% or more through the use of two+ panes of glass and/or the use of gases such as krypton or argon.	Archive/Stage 1 Submitted in 2023	Envelope	Residential	Electric
0011	Solar Windows	Enables windows to capture light and convert it into electricity similar to a solar panel but without blocking visible light.	Archive/Stage 1 Submitted in 2023	Envelope	Commercial	Electric
0020	LLLC	Lighting control systems that have sensors and controllers installed that are directly integrated or embedded into the light during the manufacturing process. By adding advanced controls into lighting systems, customers can have greater control over their lighting usage and increase occupant comfort, space utilization, and improve energy use.	Archive/Stage 2 -- Combined with IDEA-0120 Submitted in 2023	Lighting	Commercial	Electric
0021	Bi-Directional EV Charging Residential	Allows power to flow from the EV battery to the home or grid in response to a grid demand or price signal resulting in reduced peak demand.	Archive/Stage 2 Submitted in 2023	Electric Vehicles	Residential	Electric

Online RFI dashboard

- Developed a web-based 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.

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. Application Proceeding Update

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 Commission-approved 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 a news article sharing the support letter.

Central California Asthma Collaborative

BUILDING DECARBONIZATION COALITION

RISING SUN CENTER FOR OPPORTUNITY

REWIRING AMERICA

NRDC

SIERRA CLUB

> **. . . advance both equity and affordability *by helping make decarbonization accessible to low-income 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 ex parte letter in support of the PD on Oct. 24.
- The Commission held a rate-setting 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."

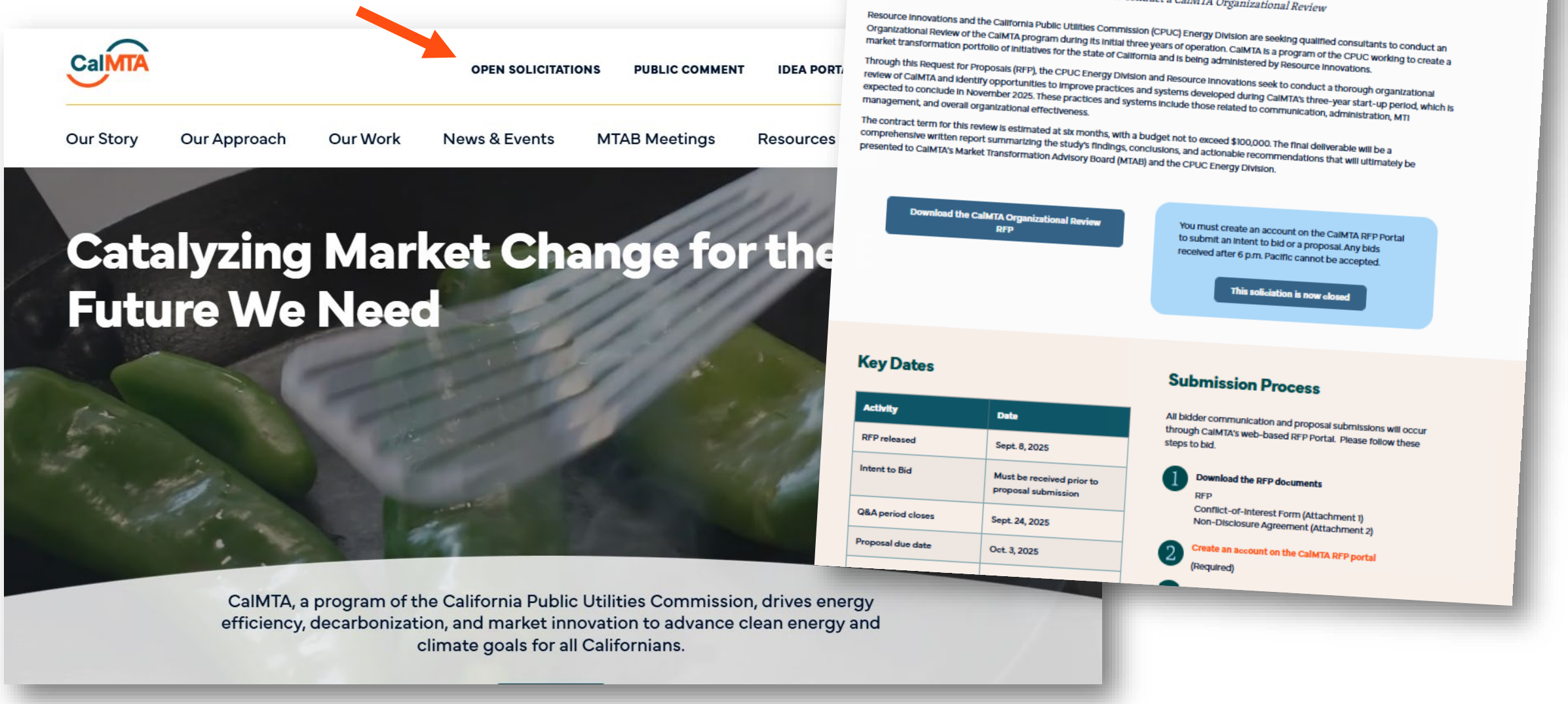
-Ex parte letter from Market Transformation Advisory Board members

Questions & Discussion

13. Request for Proposal Portal Overview

Stacey Hobart | Principal of Engagement & Communications

RFP Solicitation Portal



CalMTA Home Solicitations My Proposals

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

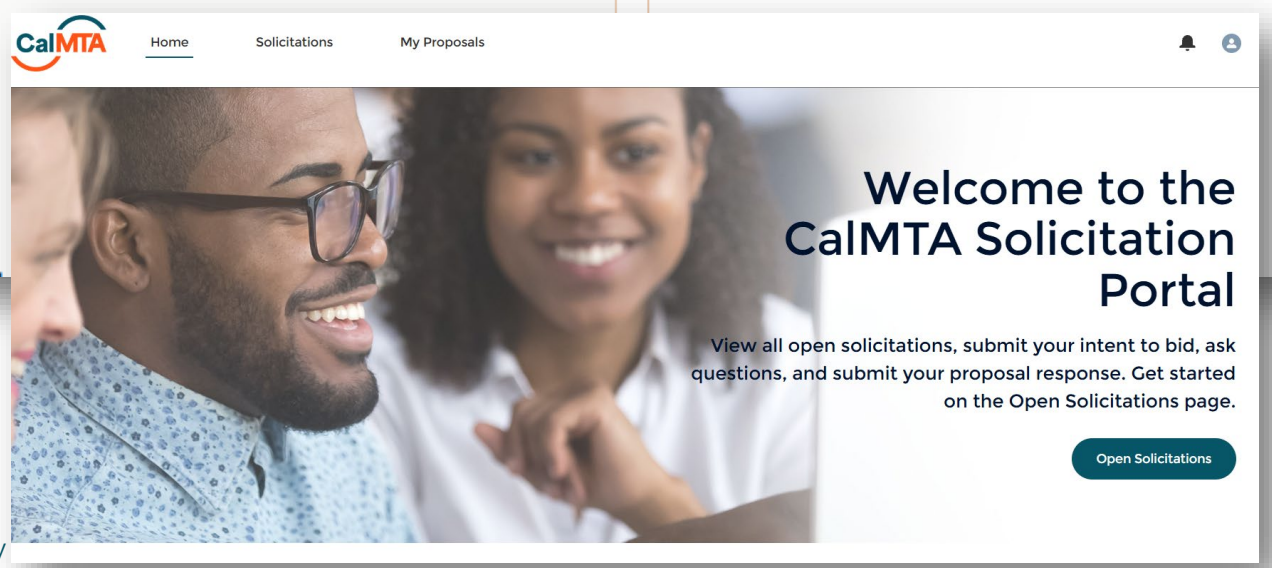
Submission Process:

1. Download the RFP documents [LINK]
2. Create an account on the CalMTA RFP portal (required)

Ask a Question

View Q & A

Create/Edit Bid



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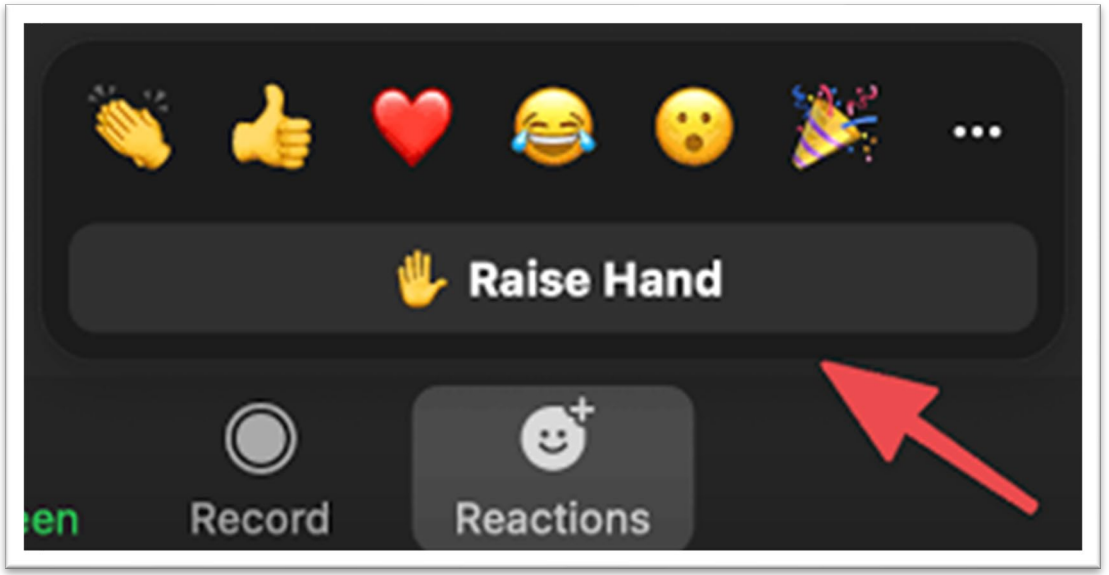
CalMTA Solicitations

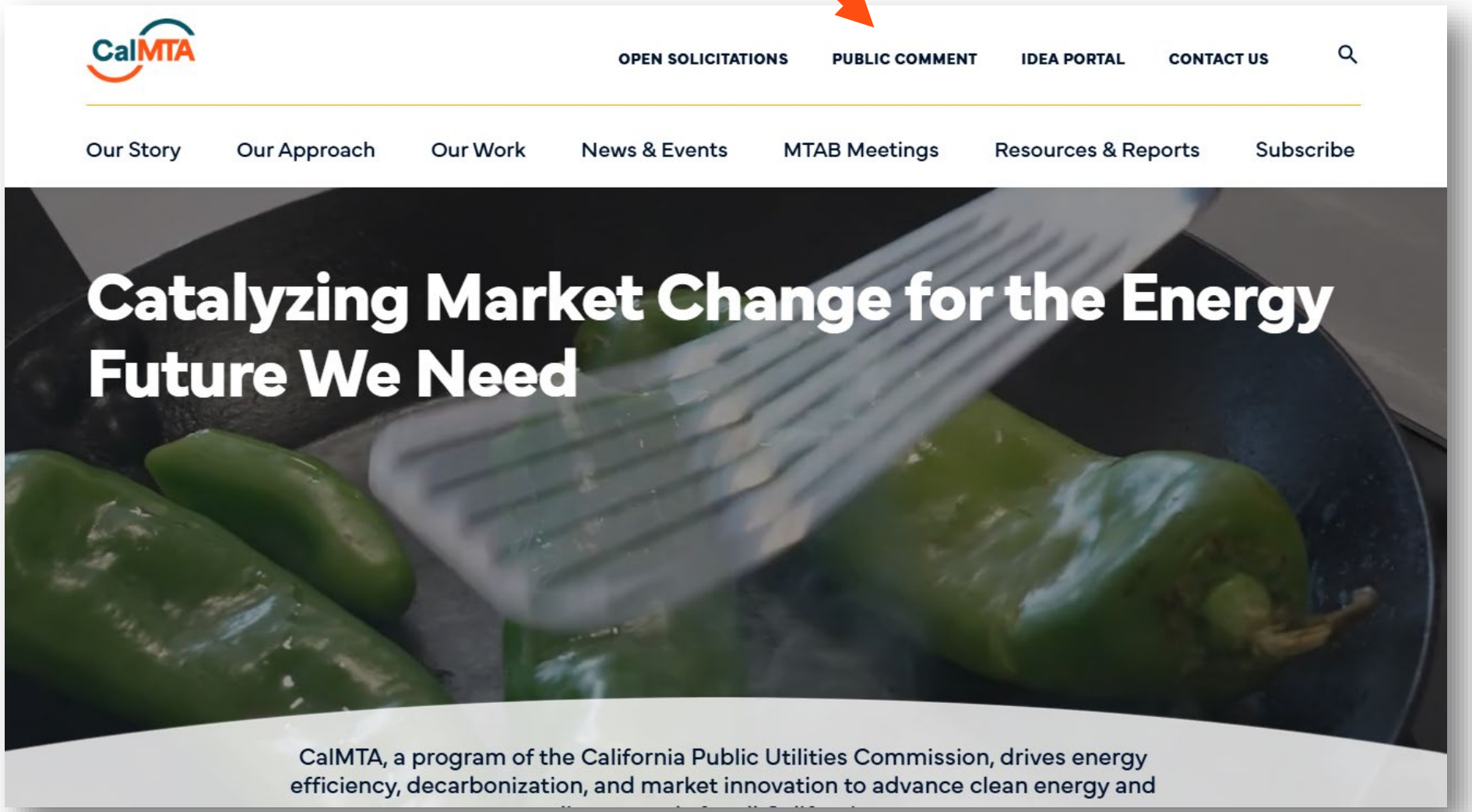
- Launched new portal in September, per Solicitation Protocols
- Issued first RFP to conduct an Organizational Review
  - Eight proposals received & contractor selection in process
  - Report is due in 2nd quarter 2026
- Preparation for implementation and evaluation RFPs
  - Anticipating 2-4 RFPs in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

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