



CRAWS: MPIs & Milestones

Rick Dunn | Strategy Manager

Jun Suzuki | MRE Lead

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

DRAFT



Overview of six themes

Building Market Awareness & Understanding

Technical Standards & Third-Party Validation

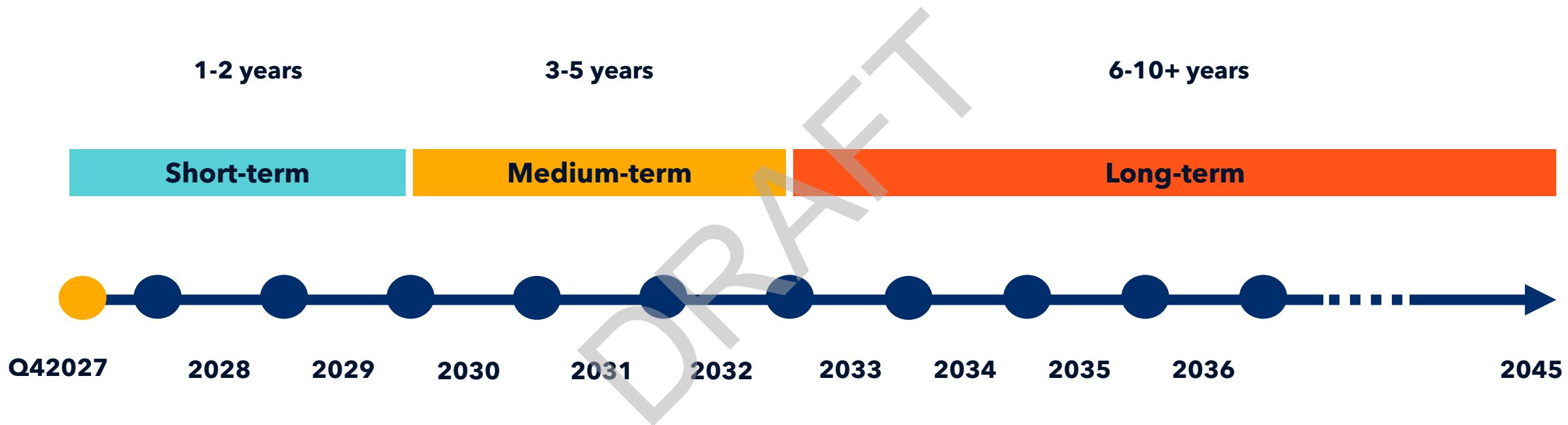
Building Installation & Supply Chain Capacity

Program Integration & Envelope-First Approach

Monetizing Non-Energy Benefits & Expanding Financing

Market Adoption & Transformation

Timeline



Theme 1: Building market awareness & understanding



LM Outcome	Time frame	MPI	Milestone
<p>Awareness of problem, solutions and business case grows among:</p> <ul style="list-style-type: none">• CRE owners/operators• BPS Hubs, accelerators• MUSH owners/operators• ESCOs• Architects, specifiers• Utility EE programs• CBOs• HVAC installers	Short-term	% of surveyed/interviewed market actors understand the energy and non-energy problems associated with SP/DPC windows as well as CRAWS solutions	60% of each market actor group demonstrate understanding AND view CRAWS as relevant to their building types/projects by 2029.

Theme 2: Technical standards & third-party validation

LM Outcome	Time frame	MPI	Milestone
VIG for SPR/DPC included in TRMs	Short-term	VIG measures included in TRMs	Field study data collected; draft measure developed for TRM consideration by 2029.
AERC funding stable; commercial workgroup initiates VIG rating work	Short-term	AERC initiates VIG rating work	Rating methodology work begins by 2028.
VIG rating method published Increase in number of manufacturers and products rated by AERC	Med-term	<ul style="list-style-type: none">• AERC developed and published a VIG rating method• Number of MNFs and products rated by AERC	<ul style="list-style-type: none">• VIG rating method published by 2030.• For CSW - 3 major manufacturers have rated products by 2030. For VIG - 2 major manufacturers have rated product by 2032.

Theme 2: Technical standards & third-party validation



LM Outcome	Time frame	MPI	Milestone
ENERGY STAR agrees to include CSWs	Long-term	<ul style="list-style-type: none">• ENERGY STAR includes CSW technology in ES list.• Number of CSW models that meet proposed ENERGY STAR criteria	

Theme 3: Building installation & supply chain capacity

LM Outcome	Time frame	MPI	Milestone
CSW manufacturers provide installer training and DIY installation resources	Short-term	<ul style="list-style-type: none">Number of installers who completed MNFs trainingNumber of MNFs providing DIY installation resources (videos, installation manuals, etc.)	At least 2 manufacturers have launched installer training programs and published minimum 2 DIY installation resources per product line by 2029.
Increase in number of suppliers and installers selling CRAWS product	Med-term	<p>Number of suppliers and installers (overall, and ESJ-owned) selling CRAWS products</p>	<ul style="list-style-type: none">CRAWS products available through at least 5 suppliers (ESJ and non-ESJ) by 2032.5 regional installation companies trained to install CRAWS products (ESJ and non-ESJ) by 2032.

Theme 4: Program integration & “envelope-first” approach

LM Outcome	Time frame	MPI	Milestone
CA external programs include CRAWS technology in list of measures	Short-term	Number of external programs that include CRAWS measures	Three CA IOUs EE programs include CRAWS measures by 2029.
CA external programs increasingly offer incentives for CRAWS products.	Med-term	<ul style="list-style-type: none"> Number of CA external programs that include CRAWS measures Number of CA external programs that offer incentives for evaluating envelope as part of HVAC updates (in ESJ/DAC) 	Three CA IOUs EE programs launch incentives for envelope assessments conducted alongside HVAC replacements by 2032.
By 2045, 50% of HVAC replacements or upgrades include envelope evaluation	Long-term	% of HVAC upgrades that include envelope assessment	25% of surveyed HVAC projects included envelope assessment as part of sizing analysis by 2040.

Theme 5: Monetizing NEBs & expanding financing

LM Outcome	Time frame	MPI	Milestone
Market actor offerings reflect value of NEBs in determining incentives and financing terms	Short-term	<ul style="list-style-type: none"> • % of surveyed ESCOs that include NEBs in the value proposition • EQ: % of ESCOs that include NEBs in the value proposition to ESJ customers 	At least 30% of ESCOs include NEBs in customer value propositions and incorporate NEB values into project economics by 2029.
Market actors including funding/financing entities that monetize NEBs to provide mechanisms for ESJ financing	Med-term	EQ: Number of financing pathways that include NEBs (air quality, thermal comfort, noise, workforce, resilience) in loan calculation	NEB monetization framework developed and adopted by 5 financing entities that serve ESJ communities by 2032.
Increasing number of funding/financing pathways for CRAWS including ESJ solutions	Long-term	EQ: Number of financing pathways that allow CRAWS installation in ESJ communities	

Theme 6: Market adoption & transformation

LM Outcome	Time frame	MPI	Milestone
CRAWS increasingly recommended or evaluated by architects, design firms, ESCOs, CBOs, HVAC installers (i.e., specifier and influencer engagement increases)	Med-term	<ul style="list-style-type: none"> • % of market actors (specifier/influencers) recommending CRAWS solutions • EQ: % of market actors recommending CRAWS solutions in ESJ/DAC 	30% of market actors recommending CRAWS solutions in appropriate circumstances (when building is retrofitted, to be compliant with BPS, when addressing comfort/noise/EE problems) by 2032.
Majority of market with SP and DPC windows views CSW and VIG as standard product for improving overall building efficiency and a standard practice associated with HVAC sizing	Long-term	% of installers, architects/engineering firms/specifiers who routinely recommend CSW/VIG products during building envelope assessments or HVAC system sizing consultations	At least 60% of surveyed installers, architects/engineering firms/specifiers report routinely recommending CRAWS solutions by 2040.

Theme 6: Market adoption & transformation

LM Outcome	Time frame	MPI	Milestone
Municipalities include CRAWS as part of climate/energy action plans	Med-term	% of municipalities include CRAWS as a solution set for climate action	At least 30% of municipalities that have climate action plans or building decarb strategies include CRAWS measures by 2032.
	Long-term		At least 60% by 2040.

Theme 6: Market adoption & transformation

LM Outcome	Time frame	MPI	Milestone
Adoption of CRAWS technology grows in: - CRE market - MUSH market - ESCO project portfolios	Med-term	<ul style="list-style-type: none"> Sqft of CRAWS technology sold \$ of CRAWS technology incentive paid by EE programs 	TBD sqft of CSW sales by 2032
	Long-term	<ul style="list-style-type: none"> EQ: \$ of CRAWS technology incentive paid by EE programs in ESJ/DAC % of ESCO projects incorporating CRAWS 	<ul style="list-style-type: none"> TBD sqft of CSW sales; TBD sqft of VIG sales by 2040 25% of the existing commercial building sector sqft that currently has SP or DPC windows replaced by CRAWS by 2045

Theme 6: Market adoption & transformation

LM Outcome	Time frame	MPI	Milestone
CA BPS (or similar policy) includes CSW and VIG in prescriptive and performance-based pathways as means to meet CA state efficiency and decarbonization goals	Long-term	Actual regulatory language in BPS or Title 24 of prescriptive/performance-based inclusion	