



Induction Cooking

Market Transformation Initiative Plan

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



Induction Cooking

Market Transformation Initiative Plan

December 18, 2024

Prepared by:
Elaine Miller, Strategy Manager
Clarissa Kusel, Program Manager

Resource Innovations
719 Main Street, Suite A
Half Moon Bay, CA, 94019
(888) 217-0217
info@calmta.org

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

Purpose

This Market Transformation Initiative (MTI) Plan describes the business case for investment in the MTI including strategic interventions, intended market outcomes, and evaluation activities that will be implemented during Phase III: Market Deployment. This investment would result in long-term energy efficiency and other benefits for California. The MTI Plan was developed using the findings of Phase II assessment and research, which are detailed in the appendices of this document. Development of the MTI Plan followed the stage gate process described in the approved Market Transformation Framework in D.19-12-021. The research findings and plan elements have been shared with CalMTA's Market Transformation Advisory Board (MTAB) throughout development. The MTAB also had the opportunity to review and provide comments and feedback on the plan, which are included in Appendix I of this plan. All MTAB meetings are public and interested parties will have an opportunity to comment via a California Public Utilities Commission (CPUC) application proceeding.

MTI development documents by phase



Additional information on CalMTA and the MTI development process can be found at <https://calmta.org>.

The Advancement Plan for this MTI can be found at <https://calmta.org/resources-and-reports/>.



Contents

- 1 Executive summary 8
 - 1.2 Market overview..... 8
 - 1.3 Vision..... 9
 - 1.4 Key Phase II research findings..... 9
 - 1.5 Strategic interventions for Phase III 10
 - 1.6 Recommendations..... 11
- 2 Market Transformation theory & opportunity 12
 - 2.1 Theory of market transformation 12
 - 2.1.1 Brief product definition and benefits 12
 - 2.1.2 Target market..... 13
 - 2.1.3 Initiative vision..... 13
 - 2.1.4 Key market barriers 13
 - 2.1.5 Market opportunities and key leverage points 14
 - 2.1.6 Conditions that would trigger transitioning out of market 15
 - 2.1.7 Market end state..... 15
 - 2.1.8 Environmental & social justice approach..... 15
 - 2.1.9 Theory/Assumptions 16
 - 2.2 Strategic interventions 18
 - 2.3 Environmental & social justice communities 30
 - 2.4 Workforce development..... 31
 - 2.5 Total System Benefit & Cost-Effectiveness forecast..... 31
 - 2.5.1 Market adoption forecast 31
 - 2.6 Other benefits 34
- 3 Product definition & assessment 35
 - 3.1 Technical definitions and details..... 37
 - 3.2 Competitive analysis..... 38
 - 3.2.1 Key strengths..... 38
 - 3.2.2 Key weaknesses 38
 - 3.2.3 Key opportunities 38



Market Transformation Initiative Plan for Induction Cooking
*CalMTA is a program of the California Public Utilities Commission (CPUC)
 and is administered by Resource Innovations*

3.2.4	Key threats.....	38
3.3	Bill impacts	39
3.4	Product performance and/or behavior research summary	39
3.4.1	Technical differences that affect efficiency	39
3.4.2	Advanced cooktop efficiency features.....	40
3.4.3	Standby power consumption	40
3.4.4	IAQ and ventilation.....	40
3.4.5	Cooking performance.....	41
3.4.6	Improved safety/reduce risk of burns from induction cooktops.....	42
3.5	Potential product improvements	42
3.5.1	Improvements that address market or technical barriers to adoption.....	42
3.5.2	Improvements that increase consumer interest and/or satisfaction with electric cooking appliances.....	43
4	Market characterization	43
4.1	Current market state summary.....	43
4.1.1	Product availability	43
4.1.2	Technology outlook	44
4.1.3	Market size.....	44
4.2	Target market overview	45
4.3	Market actor and end-user insights	46
4.3.1	Awareness and value propositions.....	46
4.3.2	Consumer attitudes and preferences	47
4.3.3	Multifamily property managers	47
4.3.4	New construction sector.....	47
5	External program alignment & coordination	48
5.1	Collaboration at all phases of MTI development.....	48
5.2	Related programs for potential alignment	49
6	Data management.....	52
6.1	MTI program data and materials.....	53
6.1.1	Secondary data and information	53
6.1.2	Product category sales and shipment data	54



6.1.3	Data collection via primary research.....	54
6.1.4	Market Progress Indicators	54
7	Evaluation & market research.....	55
7.1	Evaluation approach overview	55
7.2	Market Progress Indicators.....	56
7.3	Ad hoc market research.....	57
8	Risks & mitigation	58
9	Cost estimates	61
10	Appendices	63



Market Transformation Initiative Plan for Induction Cooking
*CalMTA is a program of the California Public Utilities Commission (CPUC)
 and is administered by Resource Innovations*

List of Abbreviations

Abbreviation	Definition
ACEEE	American Council for an Energy-Efficient Economy
AHAM	Association of Home Appliance Manufacturers
BMA	Baseline Market Adoption
BUILD	Building Initiative for Low-Emissions Development
CalEHP	California Electric Homes Program
CalMTA	California Market Transformation Administrator
CARB	California Air Resources Board
CBO	Community-Based Organization
CE	Cost-Effectiveness
CEC	California Energy Commission
CPUC	California Public Utilities Commission
DOE	Department of Energy
DR	Demand Response
EPA	Environmental Protection Agency
EPIC	Electric Program Investment Charge
ESA	Energy Savings Assistance
ESJ	Environmental and Social Justice
ESRPP	ENERGY STAR Retail Products Platform
GHG	Greenhouse Gas
HVAC	Heating, Ventilation, and Air Conditioning
IAQ	Indoor Air Quality
IMC	Incremental Measure Cost
IOU	Investor-Owned Utility
IRA	Inflation Reduction Act
MF	Multifamily
MPI	Market Progress Indicator
MT	Market Transformation
MTAB	Market Transformation Advisory Board
MTI	Market Transformation Initiative
NOx	Nitrogen Oxides
NYCHA	New York City Housing Authority
NYSERDA	New York State Energy Research and Development Authority
PA	Program Administrator
PAC	Program Administrator Cost
PG&E	Pacific Gas and Electric
RFI	Request for Ideas
SCT	Societal Cost Test
SF	Single-Family
TOU	Time of Use
TSB	Total System Benefit
TMA	Total Market Adoption
TRC	Total Resource Cost



Market Transformation Initiative Plan for Induction Cooking
*CalMTA is a program of the California Public Utilities Commission (CPUC)
 and is administered by Resource Innovations*

1 Executive summary

CalMTA's Induction Cooking Market Transformation Initiative (MTI) seeks to accelerate market adoption of induction cooktops and ranges to provide a high-quality cooking experience with the added health and safety benefits afforded by induction technology. Cooking is one of the most visible and personal uses of energy in households and efficient induction cooking serves as a linchpin to bring about the full home electrification needed to meet California's decarbonization goals.

Induction cooktops use electromagnetic technology to heat cookware directly, delivering energy-efficient, precise, and faster cooking. Their surfaces also stay cooler to the touch and therefore are safer, especially for seniors or families with young children. While this MTI focuses on induction cooktops and ranges, it also incorporates ENERGY STAR 1.0 certified radiant cooking products. Many of the same benefits can be achieved with high-efficiency radiant cooking products (i.e., ENERGY STAR certified) and the ENERGY STAR label provides an important product differentiation mechanism. Nevertheless, induction cooking products achieve the temperature control associated with gas cooking and provide a safer working surface. These qualities, in addition to its superior energy efficiency, are the reasons for primarily focusing on induction products. Removing combustion sources for better indoor air quality (IAQ) will directly help Californians who live in smaller or multifamily (MF) homes. In addition to these non-energy benefits, the forecasted Total System Benefit of \$537 million demonstrates its clear value.

As California pivots to a more electrification-enabling rate structure, induction will provide a comparable alternative to gas cooking. Emerging battery-equipped 120V products promise opportunities for gas replacements that will plug into existing outlets, limiting the need for electrical panel upgrades, and deliver cooking performance on par with gas. Battery-equipped induction cooking will allow for charging during times when electricity rates are low and reduce demand at peak times as well as the ability to cook during power outages.

This MTI Plan is informed by CalMTA's extensive research on the product, market, active programs, and potential market interventions to ensure the adoption of induction cooktops and ranges.

1.2 Market overview

Currently, gas cooking products dominate the California residential market, with over 70% market penetration.¹ While induction cooking offers numerous advantages over both gas and existing electric coil or non-induction smooth top cooking products – such as improved IAQ, enhanced safety, superior cooking performance, and ease of cleaning – several barriers have prevented widespread adoption. The primary challenges include the following:

- Existing California homes built for gas cooking (120V) and no affordable 120V electric options that provide the same cooking capacity as 240V products

¹ U.S. Energy Information Administration. (2020). *Highlights for appliances in U.S. homes by state, 2020*. <https://www.eia.gov/consumption/residential/data/2020/state/pdf/State%20Appliances.pdf>.



- Higher product and installation costs
- Cultural and consumer attachment to gas cooking
- Concerns about durability given newer product and higher repair costs
- Low consumer awareness of induction and its benefits
- The need for new cookware for some buyers
- Potential energy bill increases under current gas and electric rate structures when customers change from gas to electric cooking

1.3 Vision

The vision for market transformation focuses on widespread adoption of induction cooking across California’s residential sector. Achieving this requires addressing the electrical infrastructure challenges posed by the dominant 120V circuitry found in most kitchens, increasing consumer awareness of induction benefits, and ensuring the availability of affordable induction products. The goal is for induction cooking to become the standard in California homes, with associated reductions in natural gas use, improved IAQ, enhanced energy efficiency, and improved cooking experience. The critical path includes engaging with manufacturers and retailers on suitable product for California’s infrastructure needs, building awareness of induction’s benefits, and engaging large influencers, aggregators, builders, and other California programs in the market to build market demand.²

1.4 Key Phase II research findings

While CalMTA envisions a changed market for induction cooking, Phase II research identified several important findings.

- Induction cooking technologies directly heats cookware and are 5-15% more efficient than traditional electric resistance cooking, making induction the preferred choice over electric resistance cooking.
- Induction stoves provide a high-performance cooking experience while significantly improving IAQ. They provide faster boil times, greater precision, do not emit indoor air pollutants, and are safer to operate. These features are especially desirable for families with young children and senior citizens. Over 80% of customers who stated that induction would be their preferred technology cited safety as a top reason.
- The primary barriers to adoption include lack of awareness of induction’s benefits and possible negative health impacts of gas cooking, the cost of transitioning from gas to

² For the purposes of this MTI, “programs” are defined as energy efficiency, decarbonization, weatherization, and climate resiliency programs, regardless of their funding source. Examples of such programs are listed in Appendix E. CalMTA will collaborate with such programs to aggregate demand and send a consistent signal to manufactures to develop California-appropriate room heat pumps.



electric supply, and the availability of products that meet California infrastructure needs. For most homes, accommodating affordable induction range models currently on the market would require an electrical upgrade from the standard 120V to 240V. In addition, this move to electric from gas will likely increase electric bills, making the switch more costly for some. Therefore, the most important product improvement for this MTI is development of more affordable 120V ranges with batteries to achieve both high cooking performance and offset energy use away from costly peak timeframes.

- The research also found that induction products were significantly underrepresented at brick-and-mortar retail locations when compared to online stores and retail sales associates often promoted gas.
- Despite these challenges, consumer sentiment toward induction cooking remains generally positive, though many are still unfamiliar with the technology's benefits. When speaking with builders and multifamily property managers, many were open to installing induction cooktops or ranges if consumers showed increased preference and repairs were readily available.

1.5 Strategic interventions for Phase III

Based on what CalMTA learned during Phase II research, several strategic interventions were identified as important to undertake to achieve lasting change in the market. To overcome market barriers and drive market adoption, the following interventions are proposed for Phase III:

- 1) Influence manufacturer development of affordable, 120V battery-equipped cooktops and ranges that fill the product availability gap for CA electrical infrastructure and multifamily market needs.
- 2) Support advancement of codes, policies, standards, and practices that increase consumer preference for electric cooking and reduce costs associated with installing electric cooking.
- 3) Support advancement of electrification-enabling rate structures and additional modifications that will work to mitigate the bill impacts of moving from gas to electric cooking.
- 4) Engage influential builders, remodelers, and property management firms through incentives or bulk purchase pricing coupled with marketing support.
- 5) Build consumer acceptance and awareness through marketing and education campaigns on the benefits of induction cooking in partnership with aligned organizations.
- 6) Support inclusion of affordable induction cooking products in California programs and the deployment of Inflation Reduction Act (IRA) funding.
- 7) Engage ENERGY STAR specification development to support continued product differentiation and increased energy efficiency stringency.
- 8) Deploy midstream stocking incentives that motivate retailers to target environmental and social justice (ESJ) communities with more affordable induction products.



Through these strategic interventions, California can accelerate the adoption of induction cooking, driving a significant shift toward all-electric homes, improving energy efficiency, and supporting the State’s decarbonization goals.

1.6 Recommendations

CalMTA will monitor these interventions over the 20-year lifetime of the MTI.³ Multiple short-, medium-, and long-term outcomes will be tracked with market progress indicators (MPIs) including the development of more 120V battery-equipped induction range products, and ENERGY STAR specification updates. Regular third-party evaluations of these MPIs will allow for real time evaluation of CalMTA’s interventions, monitoring of the market’s response, and identifying potential adaptations or shifts needed to the interventions.

CalMTA recognizes the other concurrent work being done in California by key stakeholders such as policymakers, statewide codes and standards advocacy, and efficiency and research programs. CalMTA intends to collaborate and build on this existing work to maximize the MTI’s market development phase.

Induction Cooking not only demonstrates a unique opportunity to tackle what might be the last end-use in residential buildings that consumers electrify, enabling disconnection from the gas grid, but also provides strong Total System Benefit (TSB) and cost-effectiveness (CE) for California in the long term. TSB forecasts, using assumptions learned from Phase II research, indicates a potential of \$537 million. This includes all savings from 2026-2045 and costs from 2024-2045. The contents of this MTI Plan summarize CalMTA’s lessons learned from Phase II activities as well as project the plan for market transformation over the next decade. Below is a table that includes a snapshot of the key cost and savings numbers derived from learnings in Phase II. Given the high potential value of this work, CalMTA recommends the Induction Cooking MTI advance to Phase III, pending approval from the CPUC.

³ The term "lifetime" refers to Phase III: Market Deployment only and has a defined "lifetime" of 20 years. While the lifetime of an MTI covers its implementation period, cost-effectiveness analyses include costs and savings from both Phase II and Phase III.



Table 1. Overview of the Induction Cooking MTI

Market	Residential single-family and multifamily target market, consumer products		
Total Phase III investment needed to achieve TSB forecast (2026-2045):	\$33,477,000		
Phase III investment over initial CalMTA funding cycle (2026-2030):	\$28,880,000		
Phase II investment (2024-2025):	\$3,950,000		
Total investment including Phase II and Phase III investment (2024-2045):	\$37,427,000		
TSB (2026-2045)	TSB - Energy	TSB - Grid	TSB - GHG
	\$36M	(\$125M)	\$626M
TSB - Total	\$537M		
Cost-Effectiveness (2024-2045)	TRC	PAC	SCT Base/High
	1.12	14.36	3.04/3.04

2 Market Transformation theory & opportunity

2.1 Theory of market transformation

2.1.1 Brief product definition and benefits

Induction cooktops and ranges use electromagnetic induction in the cooktop portions of the appliance to heat cookware directly. Induction cooking saves energy through instant, direct, and efficient heat transfer, and provides precise temperature control. This MTI will primarily focus on induction cooking products that are permanently installed in homes, but the product definition also includes radiant electric technology that meets the current version of the ENERGY STAR 1.0 specification as these efficient radiant products offer similar benefits as induction and are currently covered by ENERGY STAR’s market differentiation mechanism.^{4,5}

Although cooktops and ranges are not high energy use appliances on their own, induction cooking can serve as a highly visible linchpin technology to increase consumer acceptance with whole-home electrification. If consumers do not embrace electric cooking while other home appliances like water heaters and heating, ventilation, and air-conditioning (HVAC) electrify, then utilities run the risk of maintaining gas infrastructure to homes for one, last remaining appliance.

⁴ Radiant cooktops heat up the surface first, which then heats the cookware. Induction cooktops generate heat directly in the cookware using a magnetic field, offering faster, more efficient, and more precise cooking.

⁵ [ENERGY STAR Residential Electric Cooking Products V1.0 Final Specification](#).



2.1.2 Target market

This MTI primarily targets consumer cooking in existing and new construction in single-family (SF) and multifamily (MF) homes. It targets the entire residential cooking market but has a particular focus on the availability of affordable induction products that are well-suited to serving ESJ communities and products that fit with California’s current electrical infrastructure of primarily 120V outlets in kitchens.⁶

2.1.3 Initiative vision

Induction cooking offers consumers an improved cooking experience with clear benefits for the environment and consumer health and safety.⁷ Cooking also represents the highest profile end-use in an all-electric home and serves as a linchpin technology to full electrification of the home. Induction products are currently available but consumer awareness, market share, and availability of affordable products that would serve California’s infrastructure needs remain low. Overcoming consumers’ reluctance and addressing the availability of affordable products need to be addressed at scale now in order for Californians to embrace induction, which is a critical step to decarbonizing housing stock. If this MTI’s strategic interventions can overcome product availability challenges and persuade consumers of the superior cooking experience that induction provides, we can facilitate a faster and easier transition to an all-electric home.

2.1.4 Key market barriers

Induction cooking faces the following key barriers that this MTI needs to overcome before broad market adoption can take place. These are called out in Appendix A: Logic Model and also mapped to the planned interventions that seek to overcome these barriers in the strategic interventions listed below.

- Existing California homes have primarily been built for gas cooking (120V) resulting in higher installation costs (cost of rewiring and electrical upgrades) for 240V products. In addition, there is currently no affordable 120V electric options that provide the same cooking output as 240V products.
- Induction’s higher product costs compared to incumbent gas products.
- Concerns about durability given induction is a newer product.
- Cultural and consumer attachment to gas cooking.
- Low consumer awareness of induction and its benefits.

⁶ ESJ communities are identified by the CPUC as those where residents are: predominantly communities of color or low-income; underrepresented in the policy setting or decision-making process; subject to a disproportionate impact from one or more environmental hazards; and likely to experience disparate implementation of environmental regulations and socio-economic investments in their communities. These communities may also include: disadvantaged communities, all Tribal lands, low-income households, and low-income census tracts. <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/news-and-outreach/documents/news-office/key-issues/esj/esj-action-plan-v2jw.pdf>.

⁷ [Gas Stoves: Health and Air Quality Impacts and Solutions - RMI](#).



- Need some may have for new cookware when converting to induction.
- Bill impacts of moving from gas to electric cooking, especially for ESJ communities.

2.1.5 Market opportunities and key leverage points

This MTI will exploit both market opportunities and preexisting points of leverage. Market opportunities are the market activities and forces that serve as opportunities for this technology to reach greater adoption. These are called out in Appendix A: Logic Model and are also mapped to the planned interventions that seek to exploit these opportunities in the strategic interventions below.

- The IRA includes funding for induction cooking products. This IRA funding utilizes the ENERGY STAR certification to designate qualified products. In response, the U.S. Environmental Protection Agency (EPA) developed its first consumer ENERGY STAR specification for efficient electric cooking products in October 2023.
- Cooking appliances, including electric and gas cooktops, have not historically been regulated by federal appliance standards. This lack of regulation left a gap in energy standards for cooking appliances until the Department of Energy (DOE) issued and updated efficiency requirements that will go into effect in 2028. This provides greater focus on the impacts and efficiency opportunities with cooking products and opens the door, over time, to ratcheting down the standard to an efficiency level that could only be met by induction cooking products.
- New market entrants (Copper and Impulse) and national partners generating manufacturer momentum on 120V battery-equipped induction cooking products offering additional energy and grid benefits.
- California’s electrification momentum and growing awareness of IAQ benefits of electric cooking driving additional policies.

Key leverage points are points of aggregation that enable the MTI to reach a broader set of market actors at a reduced level of investment. CalMTA has identified several key leverage points and product benefits that this MTI will utilize to accelerate market adoption. These include:

- Induction cooking’s extensive benefits over incumbent technologies: improved safety, superior cooking experience, improved IAQ, and ease of cleaning.
- Existing efficiency and climate resilience programs that are providing consumer incentives and education on induction and overall electrification measures.
- The existing ENERGY STAR Retail Products Platform (ESRPP) program and data collection efforts with national retailers.⁸

⁸ The ENERGY STAR Retail Products Platform (ESRPP) is an existing, national collaborative midstream initiative of ENERGY STAR, energy efficiency program sponsors, retailers (i.e., The Home Depot, Lowe’s, Best Buy, and independent stores through the Nationwide Marketing Group), and other key stakeholders. Depending on the

2.1.6 Conditions that would trigger transitioning out of market

Once this MTI achieves the market conditions detailed below, the market will have sufficient momentum to allow CalMTA to begin to transition out of the market while continuing to monitor adoption progress. This is the point in time when funding levels reduce substantially while benefits continue to grow. For details on tracked MPIs and milestones, see Appendix F.

- There is wide product availability of induction products that serve the whole market, including affordable, ENERGY STAR certified products that serve MF housing, and battery-equipped products that utilize 120V electrical infrastructure and remove the need for electrical upgrades.
- Widespread builder acceptance resulting in the majority of both SF and MF new construction, including induction or ENERGY STAR certified cooking.
- Overall sales market share of induction cooking reaches the majority of all cooktops and ranges sold in California.
- California Air Resources Board (CARB) and air quality districts set zero emissions appliance standards beyond space and water heating to include the sale of new cooking products. These regulations focus on phasing out traditional gas-burning appliances to reduce both greenhouse gases (GHG) and nitrogen oxides (NOx), the latter of which contributes significantly to smog and IAQ issues.

2.1.7 Market end state

CalMTA envisions a market end state where the following scenarios exist:

- Majority of California consumers are aware of the benefits of induction cooking including improved safety, improved cooking experience, improved IAQ, and ease of cleaning.
- As California moves towards further decarbonization, affordable ENERGY STAR certified induction options are the first choice for cooking in most SF and MF homes.
- Consumers utilize induction 120V battery-equipped range products as a tool for increased energy benefits, lower electricity bills and resilience, such as charging off-peak hours and being able to cook during power outages.

2.1.8 Environmental & social justice approach

This MTI will focus on the cooking needs of ESJ communities and ensure that they are not left behind in the move towards full electrification. Several interventions will work to overcome specific barriers faced by MF and small residential housing, which predominantly serve ESJ communities. They are as follows:

product category, it is estimated that ESRPP retailers are responsible for the majority of incentivized product sales nationally, including plug-in heating and cooling products.



- Health benefits: The negative health impacts of gas cooking disproportionately impact ESJ communities because of smaller square footage and lack of ventilation in apartments and smaller homes, which result in increased concentrations of gas pollutants. By focusing on the benefits of induction cooking, these products will work to improve IAQ of these homes.
- Product availability through manufacturer engagement: The focus will be on influencing manufacturers to develop 120V battery-equipped products that will lower the cost of transition to electric cooking and will proportionally benefit ESJ communities and the programs that serve them. Over time, CalMTA will work to drive down the costs of these products.
- Product costs and availability through retail engagement: The MTI will incentivize retailers to stock and market more affordable induction products, including training retail staff to promote them to customers.

2.1.9 Theory/Assumptions

The following conditionals explain the theory of market change for this MTI and the key assumptions the theory is based on.

- **If** major manufacturers see large demand signals from building owners and programs, **then** they will be motivated to develop induction products that can be installed in 120V electrical circuits.
 - Assumes it is technically feasible to build a 120V induction product without compromising consumer cooking experience.
 - Assumes programs are in place in the early years for ESJ and MF households to help bring the price down of induction products overall and newer battery-equipped induction products once they come to market.
 - Assumes battery prices will continue to decline and concerns about battery fire hazards are allayed.
- **If** builders and remodelers understand the benefits of induction and hear from consumers that they want induction cooking to be part of remodeling projects and new construction, **then** builders will demand affordable and durable induction products from manufacturers.
 - Assumes broad deployment of marketing “influencer” campaign targeting both consumers and builders to increase awareness of induction benefits.
 - Assumes short-term builder incentives or bulk purchase agreements to bring down initial costs of induction technology with influential builders.
- **If** consumers understand the superior cooking experience and health impacts of induction technology compared to cooking with gas, **then** they will demand induction cooking products.
 - Assumes broad deployment of marketing “influencer” campaign to build demand and continued market support from other California electrification efforts (i.e., Electrify Now Campaign).
 - Assumes increase in awareness on IAQ and safety benefits of induction cooking.




- Assumes induction product price declines as economies of scale drive down cost of production and more affordable products come to market.
- **If** consumers have financial tools to mitigate electric bill impacts from transitioning from gas to electric cooking, **then** they will demand induction cooking products.
 - Assumes California rate structures evolve to help consumers move towards full electrification.
- **If** California codes continue to push for residential electrification and consumers/builders value induction cooking, **then** the majority of new construction will utilize induction cooking products.
 - Assumes California codes will continue to make it more expensive for builders to include gas in new homes.
- **If** retailers are rewarded with midstream incentives for stocking and selling more affordable induction products to consumers, **then** induction market share will grow in the retail channel.
 - Assumes differentiated midstream incentives for affordable induction products motivate retailers to push lower priced products, especially at stores serving identified ESJ zip codes.
 - Assumes consumer awareness of induction's benefits grows, driving consumers to demand more products.
- **If** both product availability and market share of induction grows to be the majority of cooking products sold in the California market, **then** it will be easier for regulatory agencies to push for a transition away from the sale of gas cooking appliances.
 - Assumes gas cooking is no longer associated with the culture wars and air quality regulatory agencies have the ability and political will to regulate the sales of consumer products.



2.2 Strategic interventions

Below are the strategic interventions that this MTI will deploy to overcome barriers in the induction cooking market. The list includes a general description of the intervention, market barriers the intervention will work to address, market opportunities it will exploit, and key outcomes. Many of the interventions will work to support multiple outcomes as detailed in the graphic Logic Model contained in Appendix A. Please also see the “Evaluability Map” Attachment to Appendix F for details on the outcomes, their associated MPLs and expected Milestones.

<p>Strategic intervention 1</p> 	<p>Influence manufacturer development of affordable, 120V battery-equipped ranges that fill the product availability gap for CA electrical infrastructure and multifamily market needs</p> <p>This intervention will include on-going engagement with manufacturers coupled with a release of a “product challenge” built upon the experiences of the Tech Challenges driven in 2023 by New York State Energy Research and Development Authority (NYSERDA) and the New York City Housing Authority (NYCHA). It will look different than the NYC challenge because California has a more decentralized public housing ownership structure making the ability to aggregate a large demand signal for manufacturers different than the NY scenario, but the overall approach will be similar. If manufacturers see a large enough demand signal on a 120V induction product from MF building owners and local programs, then they will bring these products to market.</p> <p>As of 2024, there are two local California manufacturers who are developing the market for and beginning to sell this 120V battery-equipped product, but at a very high price point. They see the importance of this product as California begins to electrify housing stock. This market state is analogous to products like electric vehicles: manufacturers start with the high-end market before they invest in the development of mass-market products. The goal of CalMTA’s induction product challenge will be to accelerate this process by offering manufacturers a potentially large purchase of over 20,000 units if they can develop an affordable 120V induction product for MF housing. If manufacturers can meet the staged milestones of the product challenge, they will be rewarded with a guaranteed large order for a 120V induction product.</p> <p>Another component of the product challenge might include an expansion of the Intellectual Property (IP) licensing agreement to quickly scale production of the 120V battery-equipped product. This might stimulate further interest from other major manufacturers.</p>
--	---

⁹ Icon represents interventions with a focus on equity considerations.

	<p>This intervention fills the gap for an induction product that primarily serves the needs of existing MF and affordable housing markets, and thus the needs of more ESJ communities. The 120V battery-equipped product provides a plug-n-play option for homes that have existing gas cooking products and does not require the costs associated with changes to a home’s electrical infrastructure. The battery-equipped product also provides these consumers with a climate resilience measure that is cooler to operate, provides improved IAQ – especially in homes with less square footage, and the ability to continue to cook during a power outage. Overtime, a battery-equipped product will offer consumers the ability to participate in demand response (DR) programs and monetize off-peak charging, reducing the financial impact of moving to electric cooking.</p>
<p>Market barrier(s) addressed and opportunities to exploit</p>	<p>Barriers</p> <ul style="list-style-type: none"> Existing California homes built for gas cooking (120V) and no affordable 120V electric options that provide the same cooking capacity as 240V products. Higher product and installation costs. If the market had an affordable battery-equipped 120V product, installation costs for moving from gas to electric would decline. Bill impacts of moving from gas to electric cooking reduced via inclusion of a battery. Concerns about durability given newer product and higher repair costs can be addressed through manufacturer engagement. <p>Opportunities</p> <ul style="list-style-type: none"> New market entrants and national partners generating manufacturer momentum on 120V battery-equipped cooking products offering additional energy and grid benefits.
	<p>Outcomes</p>
<p>Short-term outcomes (1-2 yrs)</p>	<p>Manufacturers respond with plans for product roadmaps of 120V battery-equipped induction range products.</p>
<p>Medium-term outcomes (3-5 yrs)</p>	<p>Increased availability of 120V battery-equipped induction range products.</p>
<p>Long-term outcomes (6-10+ yrs)</p>	<p>Consumers utilize induction 120V battery-equipped ranges as tools for increased energy benefits such as the ability to cook during power outages and the ability to charge during off-peak hours.</p>


Market Transformation Initiative Plan for Induction Cooking

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

Strategic intervention 2	<p>Support advancement of codes, policies, standards, and practices that increase consumer preference for electric cooking and reduce costs associated with installing electric cooking</p> <p>A number of policies and code requirements serve to motivate builders and building owners to move toward electric cooking. These policies and code strategies are part of an overall electrification momentum, but also reflect the growing recognition that gas cooking can result in poor IAQ for occupants. For example, in Title 24, builders are required to install a 240V outlet within five feet of where the range or cooktop is installed regardless of whether they are installing gas cooking, which requires 120V. Builders are also subject to higher ventilation requirements if they want to install gas cooking. These drive the installation costs of installing gas cooking higher and help to make induction cooking more attractive.</p> <p>This intervention will work to support and arm policymakers with data, manufacturer support, public comment support, availability of affordable induction product, and overall growing consumer and builder awareness on the benefits of induction cooking. This should, over time, lessen consumer and supply chain resistance to policies making gas more difficult to install, which will lead to further adoption of induction cooking.</p> <p>In the long-term (8-10 years), this intervention could also make it easier for air quality districts, who have already adopted zero-NOx requirements for space- and water-heating, to also address the impacts of gas cooking. These agencies will need data, affordable product availability, and consumer acceptance of induction to support policies that address the impact of gas cooking products on GHG and NOx emissions.</p>
Market barrier(s) addressed and opportunities to exploit	<p>Barriers</p> <ul style="list-style-type: none"> Higher product and installation costs including the cost of any electrical wiring or upgrades. These policies and code changes should lessen consumer and the supply chain's attachment to gas and lead to further adoption of induction cooking. <p>Opportunities</p> <ul style="list-style-type: none"> California electrification momentum and growing awareness of IAQ benefits of electric cooking driving additional policies and greater adoption of efficient electric cooking products.
Outcomes	
Short-term outcomes (1-2 yrs)	NA
Medium-term outcomes (3-5 yrs)	NA

Market Transformation Initiative Plan for Induction Cooking


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

Long-term outcomes (6-10+ yrs)	CARB and air quality districts set zero emissions appliance standards that impact the sale of new cooking products.
Strategic intervention 3 	<p>Support advancement of electrification-enabling rate structures to mitigate the bill impacts of moving from gas to electric cooking</p> <p>Switching from gas to electric cooking will, in many cases, increase customer bills under current gas and electric rate structures, especially for ESJ communities. This is not a problem unique to electric cooking, but a problem for all electrification measures. The challenge with induction is that the efficiency gains of moving to induction are modest compared to the efficiency gains posed by heat pump water heaters or heat pump HVAC, and thus, do not enable the consumer to make up for the higher cost of electricity with efficiency. This is a barrier to encourage consumers to move from gas to electric cooking. The development and deployment of new rate structures that reward consumers for utilizing their electric products off peak and through DR programs, will work to mitigate this barrier. With battery-equipped induction products, consumers will be able to charge their cooking device off peak, which will improve the bill impact of changing to electric cooking.</p> <p>This intervention will work to gather consumer cooking usage data that will help policymakers better understand how a move to electric cooking can impact consumers under different rate structures. Additionally, when coupled with the future availability of battery-equipped induction ranges that charge during off-peak hours, this intervention will also support California policymakers to develop rate structures to mitigate increases in the transition to electrification. As the market for battery-equipped products grows and consumers become more comfortable and adept at utilizing rate structures that reward them with off-peak charging, then there will be multiple advantages for consumers to benefit from the electric rates.</p>
Market barrier(s) addressed and opportunities to exploit	<p>Barriers</p> <ul style="list-style-type: none"> • Bill impacts of moving from gas to electric cooking. <p>Opportunities</p> <ul style="list-style-type: none"> • California electrification momentum. • New market entrants and national partners generating manufacturer momentum on 120V battery-equipped range products offering additional energy and grid benefits.
	Outcomes
Short-term outcomes (1-2 yrs)	NA

Market Transformation Initiative Plan for Induction Cooking

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


Medium-term outcomes (3-5 yrs)	Prevalence of electrification-enabling rate structures grows across the state.
Long-term outcomes (6-10+ yrs)	Market share of efficient electric products reaches majority for all cooktops and ranges sold in California.

<p>Strategic intervention 4</p> 	<p>Engage influential builders, remodelers, and property management firms through incentives or bulk purchase pricing coupled with marketing support</p> <p>Builders, remodelers, and property management firms are important influencers on the products that are installed in new single- and MF homes. They are very price sensitive and wary of trying what they perceive to be new technologies. Builders of MF specifically are important aggregators of demand and a “beachhead” market likely to influence the larger replacement market over time. If this MTI can convince leading builders to include induction in some model homes and developments, then manufacturers will pay attention to meet the demand.</p> <p>This intervention will likely first deploy education events targeting builders to become more familiar with induction cooking. CalMTA will also engage key, influential builders (large builders of MF, production builders, and cutting-edge “green builders”) and their primary appliance suppliers on midstream incentives or bulk purchasing agreements that address the incremental cost difference between the induction models and what typically would have been offered to consumers (gas or basic electric radiant). It will initially focus on builders active in the SF and MF affordable housing market to target ESJ communities. Many builders offer “good, better, best” appliance packages and, along with midstream incentives to builders, could include both education materials and possibly a new set of cookware for the homeowner, if they chose the induction package.</p>
<p>Market barrier(s) addressed and opportunities to exploit</p>	<p>Barriers</p> <ul style="list-style-type: none"> • Cultural and consumer attachment to gas cooking. Builders are important influencers on new home buyers’ choice of cooking products. • Low consumer awareness of induction and its benefits. Builders are both consumers of cooking products themselves and important influencers who can help build consumer awareness. • Need for new cookware when converting to induction for some. <p>Opportunities</p> <ul style="list-style-type: none"> • California electrification momentum and growing awareness of IAQ benefits of electric cooking driving additional policies.

Market Transformation Initiative Plan for Induction Cooking

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

	Outcomes
Short-term outcomes (1-2 yrs)	Builders change design plans and installation of induction cooking grows in new construction.
Medium-term outcomes (3-5 yrs)	Builders in both SF and MF increasingly utilize induction products. Market share of induction and ENERGY STAR certified electric radiant cooking products increase relative to gas cooking products.
Long-term outcomes (6-10+ yrs)	Market share of sales of efficient electric cooking products reaches majority for all cooktops and ranges sold in California.

<p>Intervention strategy 5</p> 	<p>Build consumer acceptance and awareness through marketing and education campaigns on the benefits of induction cooking in partnership with aligned organizations</p> <p>Market research has shown that a majority of consumers are not familiar with induction cooking, do not understand the technology, and do not yet value its benefits. Cultural attachment to gas cooking persists and it continues to predominate in California. Consumers perceive it as offering a superior cooking experience, yet most are unaware of IAQ, and safety hazards associated with gas cooking. Published research on the impacts of cooking with gas, particularly with poor ventilation, concludes that there are significant health benefits by making the switch to electric cooking appliances. A 2023 study estimated 20% of current childhood asthma in California is attributable to gas cooking use.¹⁰ Another study by the Lawrence Berkeley National Lab found 60% of homes in California that cook at least once a week with a gas cooktop can reach pollutant levels that would be illegal if found outdoors.¹¹ Most consumers are unaware of IAQ issues and the safety hazards generated by gas cooking, which may play a pivotal role in their family's health, especially for households with asthma concerns.</p> <p>There are several programs and organizations that are deploying awareness tactics in pockets of the state to build the case with consumers on the benefits of induction cooking. Organizations like the Building Decarbonization Coalition have been hosting “Chefluencer” events where a local chef, often in the local language of the target audience, demonstrates the induction technology. Some local utilities, Regional Energy</p>
---	--

¹⁰ Gruenwald, T., Seals, B. A., Knibbs, L. D., and Hosgood, H. D. “Population attributable fraction of gas stoves and childhood asthma in the United States.” International journal of environmental research and public health 20, no. 1 (2023): 75.

¹¹ <https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1306673>.

Market Transformation Initiative Plan for Induction Cooking


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

	<p>Networks (RENs), and libraries offer “induction loaner programs” where consumers can directly experience a mobile induction product. Hands-on experience with mobile products presents an effective opportunity for growing awareness and comfort with induction that CalMTA can build on. There is more work to be done to expand these and other efforts to build consumer understanding of the overall health and cooking benefits that induction cooking products provide.</p> <p>The primary goal of this intervention will be to “change hearts and minds” for induction cooking through a leveraged and scaled marketing campaign. There is also the potential to tie this campaign to other interventions like the retailer midstream incentives, local utility consumer incentives, and IRA funding to further drive induction adoption. This intervention will include gathering and coalescing the current marketing and education messaging landscape for induction cooking, testing these messages, and then deploying the most effective ones to target builders and consumers. This work will require tailored messaging and delivery to various submarkets, based on building types and/or cultural communities. Messaging will likely include induction’s superior cooking experience, health benefits from improved IAQ, and safety benefits. Once key messages are developed, marketing can be deployed through a variety of partners like local programs that have induction loaner programs, co-marketing with willing manufacturers and retailers, scaled “Chefluencer” events targeting ESJ consumers, and programs targeting retail customers and builders. In addition, there will likely need to be a focused effort on owners of MF properties once the MTI has increased availability of 120V battery-equipped induction products.</p>
<p>Market barrier(s) addressed and opportunities to exploit</p>	<p>Barriers</p> <ul style="list-style-type: none"> • Cultural and consumer attachment to gas cooking. If consumers see and experience induction cooking, they will change their attachment to gas cooking. • Low consumer awareness of induction and its benefits. As awareness of induction cooking’s benefits grows, consumers will increasingly demand induction cooking products. • Need for new cookware when converting to induction for some. As consumers learn how induction works and which cookware products operate with induction, if needed, consumers can be directed to specific promotions that couple a purchase for induction with appropriate cookware. <p>Opportunities</p> <ul style="list-style-type: none"> • California electrification momentum and growing awareness of IAQ benefits of electric cooking driving additional policies. • New ENERGY STAR specification for cooking products and IRA funding.

Market Transformation Initiative Plan for Induction Cooking

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

	Outcomes
Short-term outcomes (1-2 yrs)	Awareness and preference for efficient electric cooking increases. Builders change design plans and installation of induction cooking grows in new construction.
Medium-term outcomes (3-5 yrs)	Market share of induction and ENERGY STAR certified electric radiant cooking products increases relative to gas cooking products.
Long-term outcomes (6-10+ yrs)	Market share of sales of efficient electric cooking products reaches majority for all cooktops and ranges sold in California.

<p>Strategic intervention 6</p> 	<p>Support inclusion of affordable induction cooking products in California programs and use of IRA funding</p> <p>Leveraging incentive programs will be important to gain market traction and help lower the consumer cost of induction cooking products in the initial stages of this MTI. This is especially true for reaching ESJ communities. Several local and statewide programs provide consumers with incentives to purchase an eligible induction stove. To help mitigate possible impacts to transitioning some consumers to full electrification, especially those of low income, this MTI will likely also need to work with electrification programs to help mitigate possible bill impacts as electric cooking is one component of the wider-reaching electric transition.¹² Please see the program alignment section below for a more complete list of possible programs with which this MTI will need to coordinate and possibility leverage available incentives.</p> <p>This intervention will initially take the form of coordination with key programs to identify leverage opportunities and ways to support downstream programs. For example, for new construction programs, CalMTA’s builder intervention (#4 above) could buy down the incremental cost of induction products for some leading builders participating in electrification new construction programs like the Building Initiative for Low-Emissions Development (BUILD) and the California Electric Homes Program (CalEHP). Intervention #1, which will work to</p>
--	--

¹² According to Assembly Bill 1550, low-income communities and households are defined as those who live in census tracts or households at or below 80% of the statewide median income or meeting the threshold designated as low-income by the California Department of Housing and Community Development's Revised 2021 State Income Limits. CalMTA uses the term "low-income" to describe individuals or households whose income status poses a barrier to adoption of the technology.


	aggregate demand for a 120V battery-equipped products, can support community-based organizations (CBOs) and programs serving ESJ communities and low-income households with an electrification measure that mitigates the need to upgrade electrical infrastructure. Overtime, this MTI will support these programs with greater product availability, manufacturer co-marketing, midstream supply-side support, and connection to IRA funding that can help to drive overall program participation.
Market barrier(s) addressed and opportunities to exploit	<p>Barriers</p> <ul style="list-style-type: none"> • Higher product and installation costs including the cost of any electrical wiring or upgrades. • Bill impacts of moving from gas to electric cooking, especially for ESJ communities. • Need for new cookware when converting to induction for some. <p>Opportunities</p> <ul style="list-style-type: none"> • New ENERGY STAR specification for cooking products and IRA funding. • CA electrification momentum and growing awareness of IAQ benefits of electric cooking driving additional polices.
	Outcomes
Short-term outcomes (1-2 yrs)	<p>Programs include induction cooking products as measure, especially in programs that target ESJ customers.</p> <p>Awareness and preference for efficient electric cooking increases.</p>
Medium-term outcomes (3-5 yrs)	Market share of induction and ENERGY STAR certified electric radiant cooking products increase relative to gas cooking products.
Long-term outcomes (6-10+ yrs)	Market share of efficient electric products reaches majority for all cooktops and ranges sold in California.

Strategic intervention 7	<p>Engage ENERGY STAR specification development to support continued product differentiation and increased energy efficiency stringency</p> <p>The EPA enacted their first ENERGY STAR certification on cooking products in September 2023 and this is tied to consumer eligibility for IRA incentives targeting induction cooking purchases. This certification enables consumers to differentiate efficiency for electric cooktops and ranges with a growing number of products</p>
---------------------------------	--

Market Transformation Initiative Plan for Induction Cooking

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

	<p>meeting the specification across all major manufacturers (47 induction and 41 radiant models as of December 2024).</p> <p>Typically, ENERGY STAR specifications are updated within 3-6 years and CalMTA, armed with data and consumer insights, will engage EPA throughout this process to drive efficiency even higher in the next version of the specification (2.0). It is likely, as induction products improve, consumers become more aware, and demand increases, future ENERGY STAR specifications will ratchet up providing additional energy efficiency benefits and result in the majority of the products that meet the specification be induction. Although likely to be modest, this increased efficiency, and subsequent reduced electric consumption will also work to mitigate electric bill impacts for consumers who are moving from gas cooking to electric. CalMTA will also work to have 120V battery-equipped products added to future specifications as these products have greater availability across the market.</p>
Market barrier(s) addressed and opportunities to exploit	<p>Barriers</p> <ul style="list-style-type: none"> • Low consumer awareness of induction and its benefits. <p>Opportunities</p> <ul style="list-style-type: none"> • New ENERGY STAR specification for cooking products and possible IRA incentives.
	Outcomes
Short-term outcomes (1-2 yrs)	Awareness and preference for efficient electric cooking increases.
Medium-term outcomes (3-5 yrs)	The EPA develops version 2.0 of the ENERGY STAR specification for cooking, which includes increased efficiency and provisions for 120V battery-equipped range product.
Long-term outcomes (6-10+ yrs)	Market share of efficient electric products reaches majority for all cooktops and ranges sold in California.

<p>Strategic intervention 8</p> 	<p>Deploy midstream stocking incentives that motivate retailers to target ESJ communities with more affordable induction products</p> <p>ESRPP is an existing, national collaborative midstream initiative of ENERGY STAR, energy efficiency program sponsors, retailers (i.e., The Home Depot, Lowe’s, Best Buy, and independent stores through the Nationwide Marketing Group), and other key stakeholders. Depending on the product category, it is estimated that ESRPP retailers are responsible for the majority of product sales nationally, including induction cooking products. Current participating ESRPP retail partners in California collectively comprise more than 500 storefronts – a</p>
--	--

Market Transformation Initiative Plan for Induction Cooking

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

	<p>significant distribution channel. There are others like Ikea and Costco which also sell induction products and CalMTA will explore possible partnerships and data gathering with these additional retailers as well.</p> <p>Through ESRPP, incentives on qualifying products are paid directly to retailers, which encourages them to purchase, stock, and promote higher efficiency products and influence consumer purchasing decisions through increased availability and visibility of energy-efficient retail products. In turn, the impact of ESRPP on retailer buying practices can motivate manufacturers to design efficiency improvements into consumer products, creating permanent change to the manufacturing processes across entire product categories. By analyzing full category sales data, ESRPP also helps identify promising energy efficiency opportunities, and with these insights, work to advance ENERGY STAR specifications and state/federal codes and standards. The ESRPP sales data also serves as a means to reliably evaluate program impacts.</p> <p>This intervention for induction will build upon ESRPP’s existing functionalities to gather statewide data and target products with lower price points in designated ESJ zip codes through tailored retailer incentives. Currently, most retailers position induction as a premium product beyond the reach of many ESJ communities. This intervention will influence retailer product selection, stocking, and sales practices towards more affordable induction product.</p> <p>This intervention also will work to amplify several of the other interventions and support program needs. It will provide market data for program tracking, consumer buying habits for further engagement with manufacturers on product enhancements, and arm CalMTA with data for future ENERGY STAR specifications that will drive those specifications higher over time. It will also serve as a channel for building awareness on the benefits of induction via in-store Chefluencer events, co-marketing opportunities with retailers, and coupling new cookware with the purchase of an induction cooking product. There will also be synergies of engagement with other CalMTA consumer product programs, such as room heat pumps, and with other programs like the Switch is On Campaign and consumer IRA incentives.</p>
<p>Market barrier(s) addressed and opportunities to exploit</p>	<p>Barriers</p> <ul style="list-style-type: none"> • Higher product and installation cost by deploying retailer incentives to stock more affordable induction products. • Low consumer awareness of induction and its benefits through retailer promotion and instore Chefluencer events. • Cultural and consumer attachment to gas cooking through retailer promotion and instore Chefluencer events.

Market Transformation Initiative Plan for Induction Cooking

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

	<ul style="list-style-type: none"> • Need for new cookware when converting to induction for some through joint promotions with cookware manufacturers. <p>Opportunities</p> <ul style="list-style-type: none"> • New ENERGY STAR specification for cooking products and IRA funding. • New market entrants and national partners generating manufacturer momentum on 120V battery-equipped range products offering additional energy and grid benefits.
	Outcomes
Short-term outcomes (1-2 yrs)	Retail partners stock and sell more affordable efficient electric products in ESJ communities.
Medium-term outcomes (3-5 yrs)	<p>Market share of induction and ENERGY STAR certified electric radiant cooking products increase relative to gas cooking products.</p> <p>The EPA develops version 2.0 of the ENERGY STAR specification for cooking, which includes increased efficiency and provisions for 120V battery-equipped range product.</p>
Long-term outcomes (6-10+ yrs)	Market share of efficient electric products reaches majority for all cooktops and ranges sold in CA.

Market Transformation Initiative Plan for Induction Cooking

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

2.3 Environmental & social justice communities

This MTIs will work to serve the needs of ESJ communities and ensure that they are not left behind in the move towards full electrification. Induction cooking is currently a premium product with an expensive consumer value proposition. Initial product costs, the need for appropriate cookware and, in many cases, a need to upgrade the home's electrical infrastructure keep induction cooking beyond the reach of most middle- and low-income consumers. This MTI will address both cost and product availability, which will serve all consumers, but especially ESJ communities. ESJ community targets are woven throughout all of the proposed interventions, but the following encapsulate those that will directly work to benefit ESJ communities:

- Strategic Intervention 1 focuses on encouraging manufacturers to develop 120V battery-equipped products that will lower the cost of transition to electric cooking. This product fills a product gap for MF housing, which predominantly serves tenants and ESJ communities. In the long-term, these products will provide ESJ communities additional energy benefits through off-peak charging and increased resilience as battery-equipped technology will enable cooking during power outages.
- Strategic Intervention 3 supports advancement of electrification-enabling rate structures to mitigate the bill impacts of moving from gas to electric cooking. This intervention will work to gather consumer cooking usage data that will help policymakers better understand how a move to electric cooking can impact consumers under different rate structures.
- Strategic Intervention 4 will engage influential builders, remodelers, and property management firms through incentives or bulk purchase pricing coupled with marketing support. Initially this intervention will focus on builders active in MF and SF affordable housing market to target ESJ communities.
- Strategic Intervention 5 will build consumer acceptance and awareness through marketing and education campaigns on the benefits of induction cooking in partnership with aligned organizations. The negative health impacts of gas cooking disproportionately impact ESJ communities because of the smaller square footage of apartments and smaller homes, which result in increased concentrations of gas pollutants. By focusing on the benefits of induction cooking, induction will work to improve the IAQ of ESJ communities.
- Strategic Intervention 6 focuses on supporting the inclusion of affordable induction cooking products in California programs, and the rollout of IRA funding. This intervention will initially take the form of coordination with key programs to identify leverage opportunities and ways to support downstream programs. Availability of affordable induction products will enable programs that serve ESJ communities more and better electric cooking options to help consumers fully electrify.
- Strategic Intervention 8 focuses on incenting retailers to stock and market more affordable induction products positioning induction from a premium product, out of reach for many in ESJ communities, to a more affordable product.



2.4 Workforce development

As this MTI pushes for increased adoption of all induction and ENERGY STAR certified electric resistance cooking, which is currently dominated by 240V products, there will be workforce needs in the near term to help convert homes to 240V to accommodate these products. But this MTI will also work to jumpstart the development of 120V battery-equipped products that will not require larger workforce development needs. Given this, the workforce development approach will be to collaborate and contract with CBOs that are working to help communities move toward electrification in general.

2.5 Total System Benefit & Cost-Effectiveness forecast

CalMTA estimated the TSB, and CE for the Induction Cooking MTI, including the Total Resource Cost (TRC), Program Administrator Cost (PAC), and two Societal Cost Test (SCT) results. Table 2 below shows MTI TSB with energy, grid, and GHG impacts. The initiative will deliver an estimated \$537 million in total system benefits over the period from 2024 to 2045. Most of these benefits come from greenhouse gas emission reductions associated with switching from gas to electric cooking appliances. These abated emissions are worth more than \$600 million when using TRC to calculate benefits, and substantially more when calculated using SCT, due to a much lower discount rate for that test. There are negative grid TSB benefits, largely due to the impact of fuel substituting as induction and efficient electric cooktops are projected to replace natural gas units. Overall, the initiative creates \$30 million in net energy benefits. The initiative is cost effective under the TRC and passes CE in the other test perspectives, including the SCT, because of its lower discount rate for GHG reductions (Table 3).

Table 2. Induction cooking TSB estimates

TSB (\$M)	Energy (\$M)	Grid (\$M)	GHG Non-Refrigerant (\$M)	GHG Refrigerant (\$M)
537	30	(125)	626	N/A

Table 3. MTI cost-effectiveness estimates – cooktops

TRC	PAC	Base SCT	High SCT
1.12	14.36	3.04	3.04

To develop the TSB and CE estimates, CalMTA developed a model to forecast incremental units of market adoption resulting from the MTI.

2.5.1 Market adoption forecast

This section summarizes CalMTA's forecast of the baseline market adoption (BMA) and total market adoption (TMA) of induction and ENERGY STAR certified cooking products. BMA represents the expected "naturally occurring" market adoption, considering current and anticipated market, regulatory, and technological trends. TMA includes the additional adoption resulting from strategic interventions detailed in this MTI plan.



To estimate BMA and TMA for existing households, CalMTA developed a stock turnover framework that models households' decisions to retire their existing products and replace them with new cooking products. The baseline projection incorporates historical trends in appliance retirement and replacement decisions, along with residential energy usage patterns. The model builds on methods used by the DOE's Office Energy Efficiency and Renewable Energy (2022) to assess the impacts of ENERGY STAR specifications for cooking appliances. Model assumptions were further informed by surveys of property managers and households, discussions with stakeholders such as manufacturers, and analyses by the California Energy Commission (CEC) and DOE's Energy Information Agency. The TMA analysis accounts for accelerated retirement of gas equipment and the transition toward efficient electric cooking appliances, and it is aligned with MTI planned interventions and milestones.

Figure 1 illustrates the estimated annual baseline and total market saturation levels for existing SF (left) and MF (right) households, while Figure 2 presents the adoption numbers in thousands of households.

Figure 1. Estimated proportion of households adopting induction and ENERGY STAR certified radiant cooking products

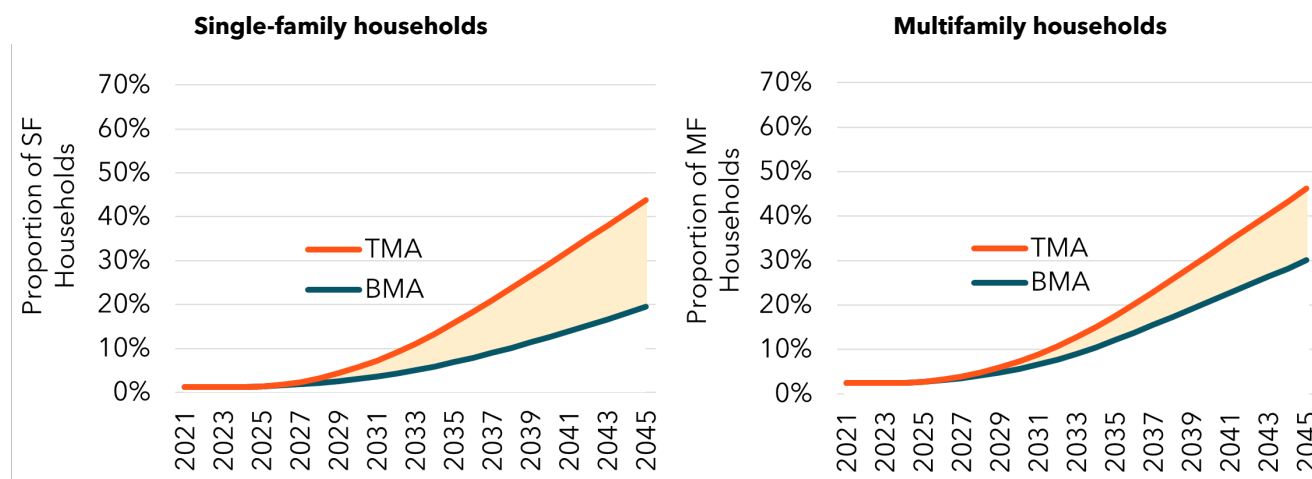
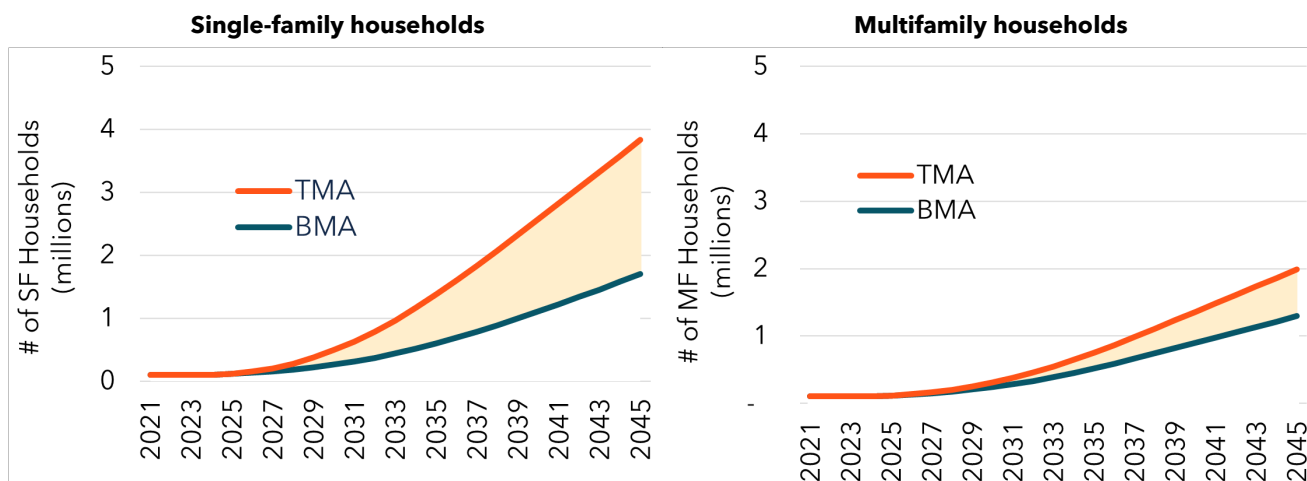


Figure 2. Estimated number of households adopting induction and ENERGY STAR certified radiant cooking products (in thousands)



In the next step of the adoption forecast process, CalMTA calculated the net incremental adoption, which is equal to TMA minus BMA, minus estimated adoption associated with Program Administrators' (PAs) verified savings (this included all PA programs statewide; for the investor-owned utilities (IOUs), this included programs reported in the California Energy Data and Reporting System or CEDARS).¹³ The net incremental adoption is summarized in the equation below.

$$\gamma^{N.Incremental} = \gamma^{TMA} - \gamma^{BMA} - \gamma^{RA}$$

Where Y represents cumulative adoption of induction and radiant cooking products over the forecast period of 2024 to 2045. The superscripts $N. incremental$, TMA , BMA , and PA represent net incremental adoption attributed to the MTI, Total Market Adoption, Baseline Market Adoption, and verified PA claimed savings respectively. Columns #2 to #5 of Table 4 below gives TMA, BMA, PA-verified units, and net incremental adoption in terms of units of ENERGY STAR certified radiant and induction products.

The approach summarized above estimated BMA, TMA, and net incremental adoption at a statewide level. The last two columns of Table 4 show the adoption attributed to households outside the service territories of the IOUs and the adjusted adoption estimates included in the estimation of TSB and cost-effectiveness.¹⁴

¹³ <https://cedars.cpuc.ca.gov/>.

¹⁴ It is important to note that the state of California will realize electric system benefits from statewide incremental MTI cooking product market adoption - not only from adoption inside the IOU service territories. While the adjusted values may be the most appropriate values to use for the CPUC's cost-effectiveness tests, as a matter of



Table 4. Forecast of adoption of ENERGY STAR certified radiant and induction products (in thousands, 2024-2045)

	TMA (Y^{TMA})	BMA (Y^{BMA})	PA-verified units (Y^{PA})	Net Incremental ($Y^{N.Incremental}$)	Adoption attributed to non-IOU territory	Adoption for TSB and CE estimation
Single-family households	3,559	1,511	124	1,924	492	1,433
Multifamily households	1,610	958	35	617	158	460
New construction	459	338	-	121	31	90
Total	5,629	2,808	158	2,663	681	1,982

Note: PA verified units include adoption associated with PA programs statewide.

In addition to the net incremental adoption estimates attributed to households in the territories of the three IOUs, the TSB and CE calculations also considered initiative costs, incremental measure cost (IMC), avoided costs, load shapes, and unit energy impacts.

A detailed explanation of the methodology and approach, models, inputs, assumptions, and results are provided in Appendix B.

2.6 Other benefits

The following are additional, unique benefits (i.e., non-energy benefits) of induction cooking products.

- Superior cooking experience
- Safer cooking environment
- Improved IAQ and improved health benefits, especially for MF consumers
- Enables full electrification and prevents consumers holding on to last remaining gas appliance in the home
- 120V battery-equipped products provide resilience during power outages

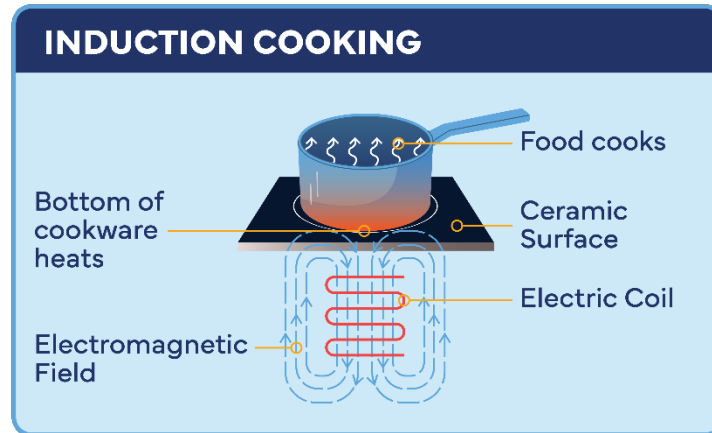
policy, they do not fully represent the statewide benefits that will result from investment in the Induction Cooking MTI. This approach discounts statewide benefits by nearly 26%.



3 Product definition & assessment

Modern, efficient electric cooking appliances offer improved IAQ, better cooking performance, energy savings, and emissions reductions compared to the natural gas and propane cooktops, ovens, and ranges found in most California homes. Electromagnetic induction is the principal technological advancement that provides targeted heating directly to cookware, enabling fast, efficient, and precise cooking.

Figure 3. Electromagnetic induction



This MTI will focus on electric cooktops and all-electric ranges using either induction or radiant electric technology. Cooktops and ranges that use radiant technology must be certified to the current version of the ENERGY STAR specification.

This definition includes freestanding electric ranges, which can be installed between cabinets, or stand alone as well as slide-in electric ranges, which can only be installed between cabinets. Freestanding ranges typically locate cooking controls in an elevated panel at the back of the appliance, whereas slide-in ranges typically put controls in the front.

Figure 4. Slide-in range (left) and freestanding range (right)



Photos credit: <https://www.whirlpool.com/blog/kitchen/slide-in-vs-freestanding-range.html>.

This definition also includes 240V standalone electric cooktops designed for permanent installation in a countertop.¹⁵

Figure 5. 240V 5-burner Miele radiant cooktop (left) and 240V 6-burner Viking induction cooktop (right)



Photos credit: <https://hintex.com/products/miele-km5627-electric-cooktop-240v> and <https://www.vikingrange.com/consumer/category/products/cooking/cooktops>.

Products built for 240V - and new battery-equipped 120V cooktops and ranges, as shown in Figure 6, are included in the product definition, but 240V cooktops and ranges with coil-style heating elements are excluded, as are standalone wall ovens.

¹⁵ Induction and radiant plug-in products that are designed for countertop use only are not part of the MTI product definition.

Figure 6. Impulse Labs cooktop (left) and Channing Street Copper Range (right), both battery-equipped



Photos credit: <https://shop.impulselabs.com/products/impulse-induction-cooktop-deposits> and <https://copperhome.com/products/charlie>.

3.1 Technical definitions and details

Cooking appliances have traditionally been grouped into cooktops, ovens, and ranges. Ovens are an enclosed compartment for cooking or heating food and can use either a gas flame or electric resistance heating. Cooktops consist of a horizontal surface with one or more surface units, commonly referred to as “burners.” Cooktop technologies are described by their respective modes of heat transfer: a gas flame, electric resistance coil, or electric inductive heating. Products that combine an oven and cooktop into a single appliance are referred to as “ranges.” The three types of cooktop heat modes are described below.

Electric resistance: Heat is generated by running an electric current through a metal wire with high electrical resistance and thermally conductive properties. The metal wire becomes hot and emits heat which is transferred to the cooking vessel primarily through conduction or radiation, depending on the type of resistance cooking product.

Electric induction: Heat is generated by allowing a high frequency alternating current to flow through a tightly wound coil of wire which generates a rapidly changing magnetic field at the surface of the cooktop. That heat is only transferred to a pot or pan containing ferrous material.

Natural gas: Heat is transferred to the cooking vessel via an open flame that is fueled by natural gas that is piped into the dwelling unit.

3.2 Competitive analysis

This section covers some of the key strengths, weaknesses, opportunities, and threats for induction cooking products. A full analysis of the competitive landscape can be found in Appendix C.

3.2.1 Key strengths

Compared to gas cooking, induction cooking results in improved IAQ and a meaningful reduction in the negative health impacts associated with combustion by-products, contaminants, and particulates, benefitting ESJ communities in particular. Induction cooking technology also provides a higher-performance cooking experience. Heat output is precise and immediate, reaches desired temperatures faster than electric resistance or gas appliances, and are more efficient because nearly all energy generated is transferred to the cooking vessel. Induction technology eliminates the need for an open flame or exposed heating elements, making it a safer option. The direct application of heat to the cookware provides safety benefits as well by keeping the cooking surface cool compared to gas and electric resistance cooktops. This cooler, smooth surface also facilitates a much easier cleaning process.

Battery-equipped induction appliances in particular present significant benefits in the ability to provide demand response capabilities, operate during power outages, and reduce the demand on the electrical grid through low-power charging during off-peak hours.

3.2.2 Key weaknesses

Most homes with existing gas cooking products require some degree of modification to the electrical system to accommodate 240V electric cooking appliances, which can be cost-prohibitive for many consumers and building owners. Induction cooking appliances are generally more expensive than incumbent products and they require compatible cookware. Another key weakness is the cultural preference for gas cooking, for things such as woks or open flame heating.

3.2.3 Key opportunities

Title 24 Electric Ready Requirements mandate that all new homes are constructed with 240V circuits in the kitchen, even if the builder installs a gas cooking appliance, which removes the electrical upgrade cost barrier in newly constructed homes. The many initiatives to ban gas appliances by municipalities and regional air quality districts also presents a significant opportunity for electrification of cooking. The new ENERGY STAR cooking product specification and IRA funding for products meeting these criteria will engage consumers looking for more affordable appliance upgrade opportunities. Lastly, messaging and awareness of the IAQ benefits of electric cooking are gaining the attention of consumers and may motivate a transition away from gas cooking.

3.2.4 Key threats

Moving to electric cooking from gas using the electricity and gas rates of today will lead to increased bills for some. Although less efficient, gas is cheaper than electricity. Time of Use (TOU)



rates amplify this by increasing the cost to cook dinner at the time most of California cooks dinner. Gas cooking does not currently suffer from this threat.

3.3 Bill impacts

The bill impacts of cooking electrification in California currently do not favor IOU ratepayers. Estimates show that substituting gas to electric cooking fuel results in higher bills for customers in Pacific Gas and Electric (PG&E), San Diego Gas and Electric, and Southern California Edison territories with an average increase of between \$145 to \$175 annually. Rates with a higher fixed rate and lower variable (\$/kWh) rate, like those available in Sacramento Municipal Utility District (SMUD) territory, improve the economics of fuel substitution efforts. We estimate that a SMUD customer using an electrification-friendly time of use (TOU) rate will save up to \$23 per year when switching from gas to induction cooking.¹⁶ These bill impact estimates are based only on cooking energy consumption and do not include the potential ventilation and cooling energy savings with induction appliances compared to incumbent gas products.

The 120V battery-equipped induction products allow customers to cook during peak rate hours but charge the appliance during hours in which their electric rates are lower. TOU customers leveraging off-peak charging with a battery would be able to save \$70 to \$95 per year compared to a typical 240V induction range without battery. This is still an increase of \$57 to \$81 compared to a gas range with IOU rates, so electrification still presents a challenge even with a TOU-optimized battery range.

3.4 Product performance and/or behavior research summary

The following sections summarize the key findings from research that informed the development of this MTI. Expanded summaries are provided in Appendix C.

3.4.1 Technical differences that affect efficiency

Frontier Energy conducted research in 2019 demonstrating the efficiency of all three cooking technologies across six different appliances.¹⁷ Induction cooking appliances were measured to be 85% efficient on average, compared to 77% for electric resistance products, and 32% for a gas-powered appliance. Notably, these efficiencies do not include the difference in ventilation energy required between each technology. These are likely conservative when viewing cooking appliances through a building systems lens.

A study published in the 2014 American Council for an Energy-Efficient Economy (ACEEE) Summer Study on Energy Efficiency in Buildings showed that conventional electric technology showed

¹⁶ In May 2024 the CPUC approved a proposal to increase the fixed monthly charge in all three electric IOUs to match SMUD's monthly charge of \$24.15. A detailed explanation of the bill impacts study can be found in Appendix C.

¹⁷ Frontier Energy, *Induction Range Final Report*, July 2019, accessed July 7, 2024, <https://www.caetrm.com/media/reference-documents/Induction-Range-Final-Report-July-2019.pdf>.



higher efficiency (83%) when tested with large cookware compared to small cookware (42%) while induction cooking maintained a relatively consistent efficiency regardless of cookware size.¹⁸ The ENERGY STAR test procedure does not currently account for cookware size in the values published, which creates a potentially hidden benefit for conventional resistance cooking.

3.4.2 Advanced cooktop efficiency features

Some modern induction cooktops feature advanced pan size detection capabilities, which enable them to adapt the size of the inductive field to match the diameter of the cookware. This is achieved using multiple “rings” of inductive coils, arranged concentrically around the cooking surface. As the cookware is placed on the cooktop, the system detects its diameter and adjusts the heating zones accordingly. If smaller cookware is used, only the inner coil activates, ensuring optimal heating performance while minimizing energy waste.

Pan presence detection is an important feature in modern induction cooktops; it detects the presence of compatible cookware with a flat bottom surface containing iron. If an incompatible pan is detected, the cooktop will prevent inefficient operation that would have occurred without this technology. Conversely, when a compatible pan is present and the heating zone is turned on, the cooktop will stay on and adjust its power output accordingly, which provides precise heating control and minimizes energy consumption.

3.4.3 Standby power consumption

Historically, gas cooktops with pilot lights resulted in standby losses due to continuous gas consumption to maintain the pilot flame. However, modern natural gas cooktops typically rely on electrical ignition and no longer incur standby losses. In contrast, resistance and induction cooking appliances experience standby losses due to the ongoing operation of their electronic circuits, particularly in models featuring clocks, Wi-Fi chips, or other more complex electronic components. However, ENERGY STAR certified cooking appliances for residential use exhibit cooktop standby losses that are remarkably low, accounting for less than ~3% of their total annual energy consumption, although a few outliers in the ENERGY STAR data set did have standby losses up to 30%.

3.4.4 IAQ and ventilation

IAQ can be compromised when using natural gas or propane-powered cooking appliances. These fuels emit chemicals like benzene, NO_x, and nitrogen dioxide when combusted, and can seep into living spaces even when the appliance is not in use. This slow leakage exposes occupants to harmful chemicals and poses a risk of explosion. Furthermore, when these fuels are burned, unventilated exhaust gases can fill a household with small airborne particulates, leading to dirt and grime buildup, respiratory issues, and ground-level ozone generation.

¹⁸ ACCEE, *Induction Cooking Technology Design and Assessment*, ACEEE, 2014, accessed July 7 2024, https://www.caetrm.com/media/reference-documents/Induction_Cooking_Tech_Design_and_Assessment_ACEEE_2014.pdf.



The negative IAQ impacts from both un-combusted gas and the combustion byproducts of gas ovens and cooktops tend to be more severe in MF buildings and small SF homes, as well as older residential buildings of both types. This is because the concentration of IAQ contaminants is inversely proportional to the volume of a space, and generally higher in MF buildings. Older buildings are less likely to have a functional mechanical ventilation of any type, including quiet, correctly sized range hoods ducted outdoors. Unfortunately, those same building attributes tend to reflect housing commonly found in ESJ communities. Additional details related to gas and propane IAQ can be found in Appendix C.

Induction cooktops create significantly less waste heat to surrounding spaces compared to gas. Induction cooktops require minimal ventilation and no supplementary fans to remove excess heat,¹⁹ which reduces the noise levels within the kitchen while also minimizing the infiltration of unconditioned outdoor air through unbalanced ventilation.

3.4.5 Cooking performance

The following sections describe research around factors that influence the cooking performance of induction cooking.

Thermal inertia and overshoot

Induction cooktops boil water more quickly than the tested gas or resistance cooktops, while experiencing minimal temperature overshoot. Typically, gas burners have less material in contact with the cookware, which reduces the surface area of contact for residual conduction of heat to occur. Resistance ceramic cooktops heat the cooktop surface, a significant thermal mass, which takes time to cool and continually conducts heat into cookware after power input is stopped. Induction cooktops do not heat points of contact with the cookware, only the cookware itself. This produces the smallest overshoot between all technologies. A smaller overshoot typically indicates a better, more responsive and precise cooking experience.

Power output

Electric resistance cooktops have a fixed peak power output based upon element size and wire gauge, which can result in less precision and repeatability at lower heat output. However, induction cooktops have more dynamic power control electronics that allow for high precision and repeatability at all levels of heat output. This also means that the maximum heat output for a given inductive coil with PowerBoost/RapidBoil/PowerBoil or equivalent functionality can “share” power between heating elements under certain conditions where there is available power to share and increase the power output of a single element.

¹⁹ This is reflected in recently updated Title 24 range hood requirements that mandate higher cubic feet per minute ratings for new homes and apartments with gas cooktops.

Boil times

Induction cooktops can divert unused power from adjacent coils to boost maximum output of a single coil, resulting in a significant increase in effective heat supplied to cookware. As a result, boil times are directly linked to effective heat output, and induction cooking emerges as the technology with the largest effective output and therefore the shortest boil times compared to gas and radiant resistance methods.

3.4.6 Improved safety/reduce risk of burns from induction cooktops

Induction cooktops significantly reduce the risk of burns associated with touching the cooking surface compared to conventional gas and, especially, electric resistance cooking. Unlike the conventional technologies, induction cooktops themselves do not reach dangerous high temperatures and create fire risks. This also means it is generally safer to touch an induction cooktop with bare hands, provided no ferrous materials are nearby or on your skin. Furthermore, exposure to the electromagnetic field of the cooktop poses no documented health risks to humans.

3.5 Potential product improvements

This section describes two broad categories of potential improvements to induction cooking products:

- Improvements that address market or technical barriers to adoption of electric appliances.
- Improvements that increase consumer interest and/or satisfaction with electric cooking appliances.

Any additional improvements that can increase the energy efficiency and/or demand flexibility of induction cooking products are described in Appendix C.

3.5.1 Improvements that address market or technical barriers to adoption

Most of the potential improvements within this category address the lack of 240V electrical infrastructure in California homes and buildings. Even in cases where it is possible to provide a 240V circuit for a new electric cooking appliance, improvements that allow induction products to use existing 120V circuits may provide the lowest overall cost to convert homes from gas to electric cooking. These include:

- 120V battery-equipped cooktops and ranges that can provide the same cooking experience as a 240V product, allow use of the product during power outages, and shift cooking electricity load away from daily grid peaks.
- Products that can be manually or automatically adjusted to match available amperage on a circuit, ensuring the best possible cooking experience (fastest heating times), without the risk of exceeding the capacity of a circuit (tripping a breaker).
- Potential strategies for developing lower cost 120V cooktops and ranges with reduced (but still acceptable) performance relative to 240V products include:
 - Leveraging two 120V receptacles, each on a different circuit.



- Operating the oven on a 120V AC and the cooktop on battery (DC) to reduce the coincident peak power demand on the circuit.
- Advanced strategies for balancing the allocation of power among heating zones, and/or between the oven and heating zones.
- Reducing oven volume, increasing insulation, or other strategies to reduce oven power demand.

3.5.2 Improvements that increase consumer interest and/or satisfaction with electric cooking appliances

Induction cooking products already offer significant advantages over both gas and electric resistance cooking appliances; however, induction products will need to appeal specifically to customers who are accustomed to cooking with gas and have negative perceptions about electric cooking. Potential improvements that can help overcome this include:

- Visual cues that help users transition from gas cooktops, such as LED lights that emulate the look and intensity of a gas flame.
- Incorporation of a universally compatible resistance heating area (alongside several induction zones) to ease customer concerns about compatible cookware and allow more flexibility with use of existing cookware.
- Controls and digital temperature displays that allow the user to set and hold specific temperatures for each heating zone.
- Improvements to induction cooking products to address perceived/actual reliability issues.
- Development of new products like induction woks and tortilla makers that serve specific culturally important food needs.

4 Market characterization

4.1 Current market state summary

4.1.1 Product availability

Induction cooking products are growing in popularity but still occupy the smallest selection of cooking appliances available to purchase online and in stores, compared to electric resistance and gas models.

Additionally, CalMTA's market research uncovered that induction products were underrepresented at brick-and-mortar retail locations when compared to online stores, and in-person, retail sales associates often promoted gas. Across the stores the CalMTA team visited, there were approximately 271 total models of cooktops and ranges on display, 24 of which were induction models (9%). This contrasted with available models of induction cooktops and ranges found online, which represented 24% of all the cooktops and ranges found during web-scraping



research. Interactions with sales associates in stores revealed many had a strong preference for gas fuel and lacked firm knowledge of induction technology, or potential rebates and incentives for induction, indicating an opportunity for more education and engagement with this sector.

4.1.2 Technology outlook

While the vast majority of induction cooktops and ranges available to buy today are 240V, there are currently two induction cooking products on the market that use 120V with battery-equipped technology, which allow for cooking electrification without the cost of electrical upgrades or optimizations and without compromising performance. These products, sold by new market entrants, are priced close to \$6,000 (before any available incentives are applied) and therefore unattractive to most California consumers. Based on findings from manufacturer interviews, mainstream kitchen manufacturers do not have plans to develop a 120V battery-equipped product to overcome electrification barriers, citing perceived technical issues, performance drawbacks, and the cost of research and development. The manufacturers of the 120V-battery solutions do not expect costs to decline substantially in the near term, particularly due to tariffs on battery imports.

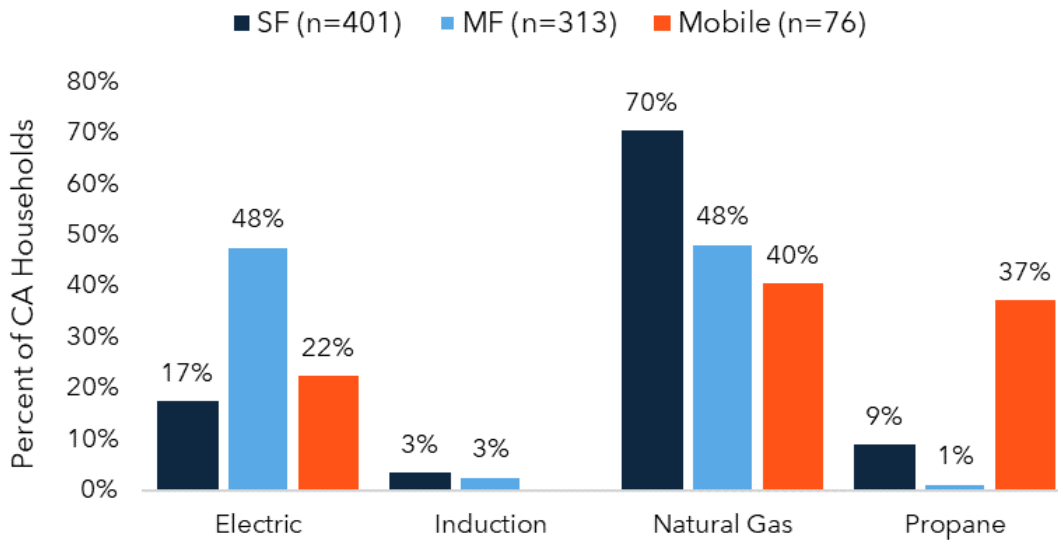
4.1.3 Market size

Studies show that a large proportion of existing households (over 32% of SF housing units and over 59% of MF units) have electric panels with intermediate capacity (100 amps) or less, posing an immediate obstacle to electrification that either requires panel optimization strategies (for many homes) or panel upgrades (for homes with small capacity panels). Typical panel upgrades range between \$2,500 and \$5,000 for SF homes (not including any utility-side service upgrades),²⁰ with much higher costs for MF buildings. The majority of SF and MF homes use gas cooking fuel, but MF properties have significantly more coil cooktops and ranges.

²⁰ Utility-side upgrades could include underground or overhead service connections and new transformers. These costs vary significantly by the service required, and a report by the Association for Energy Affordability and StopWaste found that utility service upgrades could range between \$300 and \$80,000.



Figure 7. Cooking fuel type among California residents by housing type



Source: Residential Survey QC4. “What type of fuel does your cooktop use?” (n=790). Some percentages may not total exactly 100% due to rounding. Differences in cooktop fuel type across SF and MF segments were statistically significant, $p < 0.05$.

4.2 Target market overview

Table 5 below summarizes the targeted residential market, as well as who makes, buys, uses, and sells induction products, and what influences purchasing decisions.

Table 5. Target market overview

Target market	Existing and newly constructed SF and MF households.
Who makes the product?	All major kitchen appliance manufacturers as well as several new start-up firms focused on technology innovations and battery-equipped products.
Who buys the product?	Homeowners, developers and builders, property managers or building owners, and PAs.
Who uses the product?	Residential consumers who use a cooktop or range.
How is product sold?	Online through e-commerce websites, in stores (big box as well as independent appliance retailers), and direct from manufacturer.
Who influences purchase decision?	Customers are influenced by a variety of concerns and market factors; market actors like builders and property managers are influenced by their perspective of consumer preferences for appliance types and fuel types.

4.3 Market actor and end-user insights

4.3.1 Awareness and value propositions

A large number of survey respondents had either never heard of induction products at all (24%) or had heard of them but didn't know very much about them (60%). Focus group participants were also largely unaware of how induction technology worked, and unaware of the fact that induction cooktop surfaces stay cool as a result of electromagnetic technology instead of radiant heat. When explained, group participants were often heavily drawn to this benefit. Many respondents felt this was particularly appealing for homes with small children or senior citizens.

The reaction to this information among consumers in the focus groups aligned with survey findings: "safety" was cited as a top reason for purchasing the cooktop among induction users surveyed (second only to cooking experience), along with respondents who didn't already have induction but said they would prefer it if they were going to purchase a new cooktop. Over 80% of the customers who stated that induction would be their preferred technology cited safety as a top reason. Property managers also cited safety as a valuable feature, rating the lowered risk of burns as the most important benefit. However, despite this being a strong value proposition for consumers and property managers, CalMTA's secret shopping research found that safety was not promoted as a feature of induction products. The findings instead found most brands touted efficiency, faster cooking time, and easy clean-up.

"All our generations have been cooking this way for many years and nothing happened. Maybe some people got sick, but it hasn't been proven." -Focus group participant with a gas cooktop

Focus groups revealed that there is a low awareness of the health risks and the corresponding benefits to IAQ that come from switching from gas to an efficient electric cooking appliance. Furthermore, the focus group research found a general skepticism about negative impacts on IAQ when participants were asked about this topic. Many participants felt that if there were such health risks, they certainly would have already known about them. Some questioned the credibility of the information.

Survey findings on this topic revealed that health concerns were not a top factor for induction cooktop users in the purchase of their induction cooktop, and when gas cooktop users were presented briefly with information about IAQ, this information did not meaningfully change their likelihood to purchase. These results showcase an opportunity for more information and education on the benefits of cooking electrification on IAQ and health, but careful attention should be paid to how these messages are presented and the credibility and authority of the sources of information about health impacts.



4.3.2 Consumer attitudes and preferences

The sentiment of Californians, who were aware of induction but did not currently own an induction cooking product, toward induction is positive, with 58% (n=585) of respondents reporting *somewhat* or *very positive* impressions of the technology and 25% of households reporting they would prefer induction over other fuels if they were to purchase a new cooktop. Gas cooking product users specifically stated a preference to switch to induction 19% of the time. Stakeholder interviews and literature review both supported the fact that providing direct experience to cooking with induction cooktops and ranges can mitigate concerns around adoption and support positive experiences with the technology. The majority of stakeholders and subject matter experts shared that customers overwhelmingly had a positive response to cooking on induction once they were able to test the technology and became comfortable. Multiple stakeholders cited the power of induction loaner programs and in-person demonstrations to shift customer perceptions of induction. When asked about their interest in this type of program in the CalMTA residential survey, 68% (n=415) of homeowners reported they would be interested in trying out an induction product via a loan program. This concept was particularly appealing to MF households.

4.3.3 Multifamily property managers

MF property managers saw benefit of installing induction cooking products and many were open to installing induction in their buildings in the future, with 42% reporting they would be “very likely” to install induction cooking products if undergoing a future renovation or needing to replace an appliance in their managed units. The key benefits of induction technology for property managers were safety and the ability to improve property value and rentability of their units. However, the research uncovered key barriers for property managers that included the perception that tenants prefer gas cooking appliances (50% of property managers surveyed stated this); concerns about durability and the possibility of repairs, and concern about potential electrical upgrades. In the in-depth interviews, respondents caveated their openness of installing induction with the fact that the cost of doing so would need to be supported by the ability to increase rents, with some mentioning they felt it would only be the right fit in higher-end properties. Property managers were cautious and conservative until knowing more about tenant preferences and what switching to induction cooking products could really mean for their bottom line.

4.3.4 New construction sector

During in-depth interviews, manufacturers reported that builders represent a large portion of their appliance sales, but also that most of the cooking appliances purchased by builders are not induction. One respondent estimated that builder sales make up 25-30% of the industry - but noted that induction occupies a smaller percentage due to its higher price point. Another manufacturer echoed this, saying that induction sales to builders were “minimal,” and that builders were “a less progressive channel” and more focused on radiant or gas options. Other feedback noted that overall cost-sensitivity among builders seemed to be increasing. However, some production builders reported that even if they wanted to install induction, it can be difficult to get induction at the scale needed. One respondent stated, “We just couldn’t get enough of



what we needed to broadly offer it in some areas," making it challenging to offer induction cooking products as a standard feature in their homes. Builders and remodelers also reported cost as a barrier to installing induction cooking products, along with the perception that customers prefer gas.

5 External program alignment & coordination

Following guidance provided in the Market Transformation (MT) Framework attached to CPUC D.19-12-021, CalMTA intends for the Induction Cooking MTI to complement, leverage, and add value to existing programs serving the target market for the technology. Specifically, CalMTA's approach to engaging key parties working in this market seeks to facilitate mutually beneficial cross-program coordination - ranging from ongoing information-sharing to more formal co-creation or partnerships - with the outcomes of: 1) limiting customer and market confusion, 2) enhancing the ability of programs to achieve their goals, 3) overcoming barriers to a program serving a unique market segment, and 4) ensuring effective use of program and CalMTA resources by aligning activities.

As described below, CalMTA engaged PAs at key stages throughout the MTI development process to create a foundation for the future delivery of a plan for coordination in addition to engagement with other important entities whose work aligns with the target market of this MTI. Collaborating with PAs prior to finalization of the MTI Plan allowed CalMTA to share and receive feedback on the proposed approach to aligning MTI activities with the PAs' energy efficiency (resource acquisition, market support, equity) programs, codes and standards activities, and additional programs such as the Energy Savings Assistance (ESA) offerings. This also included the goal of this coordination and support the MTI could provide to benefit those programs.

Over the course of 2025, CalMTA will continue to work with PAs and other programs that include an induction cooking measure to develop and share mutually agreed upon guidance to potential bidders of a future Request for Proposals (RFP) regarding the needs for coordination on the MTI interventions. This collaboration will continue throughout the life of the MTI.

5.1 Collaboration at all phases of MTI development

Engagement with key parties in support of collaborative development of the Induction Cooking MTI occurs throughout CalMTA's three-phase development process (see the purpose section of this document for a graphic) with Phase II activities ongoing in 2025 and Phase III collaboration commencing after the MTI Plans are approved. Prior to finalization of the MTI Plan, CalMTA completed the first two bulleted activities described below and will complete the post-application activities in the coming months.

- **Request for Ideas (RFI) to Phase I MT Idea Selection** (Aug. 2023 - Feb. 2024): After identifying a preliminary set of local, state, and national programs for future coordination, CalMTA 1) conducted a series of introductory briefings to cultivate awareness of the



Market Transformation Initiative Plan for Induction Cooking
*CalMTA is a program of the California Public Utilities Commission (CPUC)
and is administered by Resource Innovations*

market transformation program and maximize participation in the inaugural RFI; 2) shared MTI development updates and solicited feedback at MTAB meetings and through the CPUC's Public Document Area website; and(3) held recurring meetings with the IOU energy efficiency portfolio directors, IOU Codes and Standards working group, and CalNEXT to maximize alignment and identify additional areas of coordination.

- **Phase II Advancement Plan Research to MTI Plan finalization** (Feb. - Dec. 2024): To gain deeper knowledge about other program efforts and their potential impact on the development of the MTI, CalMTA: 1) completed additional research to expand the list of overlapping programs and activities; 2) met directly with key parties to secure at least preliminary agreement on the potential extent of overlap and approach to program alignment; 3) conducted structured interviews with important stakeholders and subject matter experts to inform our market characterization report; and 4) held a series of listening sessions with ESJ community representatives to inform the equity approach outlined in this plan.

Ongoing updates were also shared by CalMTA at MTAB meetings scheduled during this phase of activity. In late 2024, CalMTA also recruited members for an Evaluation Advisory Group and Equity Sounding Board, whose insight will inform future activities related to the Induction Cooking MTI.

- **Post-application collaboration and Phase III** (Jan. - Oct. 2025): After submitting the CPUC application requesting approval for the Inducti MTI Plan and throughout Phase III implementation, CalMTA will continue to engage external programs and entities in this market, which are offering or planning to offer incentives or other aspects related to the MTI, to minimize conflicts and create opportunities for collaboration. Critically, CalMTA will conduct ongoing meetings with IOUs and third-party implementers of related programs to define activities that will avoid market confusion, ensure points of alignment are maintained and leveraged, and identify any need to adjust MTI strategies.

Explicit needs for coordination with existing resource acquisition programs and codes and standards activities will be addressed and prioritized in the RFP used to solicit an implementation contractor for this MTI, as well as the subsequent contract, implementation plan, and in the Market Progress Evaluation Reports used to measure progress toward MTI objectives. These activities, in tandem with work to align with the PAs on savings goals and attribution as defined in the MTI Evaluation Plan, will result in implementation work plans co-created with PAs and be shared with the CPUC for approval prior to MTI market deployment.

5.2 Related programs for potential alignment

As described in Appendix E, CalMTA identified more than 30 programs or organizations with potential relevance to the Induction Cooking MTI's target market.

Table 6 below, which is also included in Appendix E, summarizes the programs with aspects that relate to the Induction Cooking MTI.



Market Transformation Initiative Plan for Induction Cooking
*CalMTA is a program of the California Public Utilities Commission (CPUC)
and is administered by Resource Innovations*

Table 6. Induction cooking-related programs

Program/Organization name	Program description
Statewide Codes and Standards Advocacy Programs	The statewide Codes and Standards Advocacy programs seek to influence agencies that are involved in the development of appliance and building codes at the state and national level by: (1) Developing Codes and Standards Enhancement studies in support of Title 20 and 24 building code improvements and submitting comments on federal standards, (2) Supporting the implementation of recently adopted versions of the energy code, (3) Participation in public rulemaking proceedings for both state and federal standards and test procedures, and (4) Facilitating discussions with the CEC and across utilities regarding impacts of codes and standards on future gas and electric operations.
CalNEXT	The statewide electric emerging technologies program identifies, tests, and improves electric energy technologies and delivery methods. Project categories include research and development addressing appliances, HVAC, lighting, process loads, water heating, and whole buildings. Selected projects are tested and potentially incorporated into IOU programs.
Electric Program Investment Charge Program (EPIC)	The CEC’s EPIC program invests in scientific and technological research to accelerate the transformation of the electricity sector to meet the state’s energy and climate goals.
Building Initiative for Low-Emissions Development (BUILD)	The CEC’s BUILD program provides incentives and technical assistance to support the adoption of advanced building design and all-electric technologies, including ranges and cooktops, in new, low-income all-electric homes and MF buildings.
California Electric Homes Program (CalEHP)	Designed as a market-rate counterpart to BUILD, the program provides incentives for the construction of all-electric residential buildings and installation of energy storage systems to encourage deployment of near-zero-emission building technologies.
California Energy Smart Homes	The statewide residential new construction and alterations program provides incentives to adopt advanced energy measures and transition to all-electric construction, offering incentives for SF homes, duplexes, townhomes, MF low-rise buildings, alteration projects, and additional dwelling units.



Program/Organization name	Program description
Golden State Rebates	The statewide midstream plug load and appliance program provides instant rebates on efficient water heaters, smart thermostats, and other measures to residential customers at participating retail locations and could potentially expand to include induction cooktops or other products.
Main Energy Savings Assistance (ESA) Basic/Plus Program	Implemented in each IOU territory, this trade-ally-driven program offers no-cost energy-saving measures to income-qualified homeowners and renters.
ESA Building Electrification Program	This targeted offering helps eligible homeowners and renters electrify their homes by replacing natural gas and propane appliances with high-efficiency electric equipment at no cost.
ESA Whole Home Pilot	Targeting deeper energy savings than the standard ESA program, this pilot is implemented in each IOU territory and offers a holistic package of no-cost energy-efficiency and decarbonization measures.
Self-Generation Incentive Program (SGIP)	Relevant to our exploration of battery-equipped induction products, SGIP provides financial incentives for installing clean, efficient, on-site distributed generation, including small residential storage.
The Switch is On	The statewide education and awareness campaign provides information, resources, and tools to help homeowners and renters electrify their homes, as well as tools for contractors.
Air quality policymakers , specifically the California Air Resources Board (CARB), Bay Area Air Quality Management District (BAAQMD), and (SCAQMD)	At the state and local level, these entities develop emissions standards and ordinances for space and water heating measures in addition to other appliances like cooktops and ranges.
Local and regional incentive programs such as 3C-REN Home Energy Savings, BayREN's Bay Area Multifamily Building Enhancements Program, BayREN Efficiency and Sustainable Energy Home program, Marin Clean Energy's Marin Clean Energy's Multifamily Energy Savings and Low-Income Families and Tenants programs, SCP Appliance Rebates, Silicon Valley Clean Energy FutureFit Homes Rebates, and SMUD Appliance Rebates	While each program is structured differently, these offerings reduce the upfront cost of adoption through rebates on qualifying products, including electric cooking technologies.
Local induction cooktop loaner programs , including SCE's Induction Lending Program, the PG&E Induction Cooktop Loaner Program, the City of San Jose Induction Cooktop Checkout	While each program is structured differently, these offerings reduce the upfront cost of adoption through rebates on qualifying products.



Program/Organization name	Program description
Program, Sonoma Clean Power's Induction Cooktop Check Out, and the Electric Home Cooktop Program offered by U.S. Green Building Council - California in the San Diego area	
Local utility online marketplaces like the PG&E Energy Action Guide, Los Angeles Department of Water and Power's Efficient Product Marketplace, and the Southern California Edison Marketplace	These online marketplaces allow utility customers to shop for energy-efficiency products online and apply instant rebates to qualifying models. They also highlight energy-efficiency financing options, including solutions for income-qualified consumers.
ENERGY STAR	Administered by the EPA, ENERGY STAR is a voluntary labeling program for products that meet energy efficiency specifications set by the EPA. Initial engagement will support the ENERGY STAR Residential Cooking Products V1.0 specification; CalMTA plans to work with ENERGY STAR on V2.0 which will continue to improve efficiency of induction cooking.
Induction Stove Challenge	Led by the New York Power Authority, NYSEERDA, and NYCHA, this competitive innovation challenge calls on appliance manufacturers to design and produce product designs and prototypes for new induction stoves that can be installed in older buildings using standard 120-V/20-amp outlets.

This table does not include programs that have not yet launched or are still in early stages of development. However, CalMTA recognizes the importance of coordination with the CEC Equitable Building Decarbonization Direct Install Program, the CEC-administered and IRA-funded High-Efficiency Home Rebate Program and Home Efficiency Rebate Program, the Wildfire and Natural Disaster Recovery Rebuild Program and equity-focused residential electrification programs like PG&E's zonal equity electrification pilot. We will continue outreach leading up to Phase III delivery to identify points of alignment and potential coordination with these programs as they evolve.

More detailed information regarding our analysis of the existing program landscape and approach to engagement/coordination with these stakeholders can be found in Appendix E.

6 Data management

CalMTA will implement a comprehensive data collection and management strategy throughout the MTI's life that includes collection and ongoing management and analysis of these data:

- MTI program data and materials



- Secondary data and information on population characteristics, market trends, and other programs
- Product category sales and shipment data – either purchased or negotiated as part of the MTI
- Data collected via primary research
- MPIs

Data will be securely stored, allowing for both longitudinal tracking and efficient access to data for analysis activities. This data will support market progress evaluation and updates/true-up analyses to MTI incremental impacts and CE, as well as assessment of market trends and progress toward MTI goals.

6.1 MTI program data and materials

CalMTA will create a repository of program data and materials that includes a detailed record of stakeholder and market actor communications, program data including agreements and data provided by market partners, market adoption and CE models and forecasts with fully documented inputs, assumptions, and calculations, MTI MPIs, and market and product research data and reports.

CalMTA team members log communication with stakeholders, partners, and clients to enable a comprehensive tracking and reporting of activities, outreach, and events. This will act as a record of CalMTA’s interventions and their timing and be a resource for evaluators to monitor MPIs and investigate the causal relationship and impact of interventions.

The CalMTA website also includes a Resources and Reports section that catalogues program material and public communication from CalMTA.

CalMTA will conduct market and product research in support of specific MTIs, and regularly true up the cooking products market adoption forecast by incorporating actual sales or shipment data as it becomes available. These program data, market and technology data, summary findings and other work products resulting from research conducted by CalMTA and third-party evaluators will be securely stored as part of CalMTA’s ongoing data management activities.

6.1.1 Secondary data and information

CalMTA will collect data from secondary sources regarding population characteristics (such as California household demographic characteristics, home ownership, building types, and equipment saturation), market trends, and other programs. Secondary data and information sources may include:

- U.S. Census American Community Survey (Source US Census, Accessed Annually)



- Energy Information Administration’s Residential Energy Consumption Survey data
- California Residential Appliance Saturation Study
- PA Program and California Energy Data and Reporting System data
- Evaluation reports from related California programs

6.1.2 Product category sales and shipment data

Data on cooking product sales and shipments will be critically important for evaluating the MTI incremental impacts, yet such data can be difficult to obtain. Given how crucial it is, CalMTA will negotiate agreements with market partners that include sales or shipment data, whenever possible. CalMTA will supplement what can be obtained from market partners with other sources of sales and shipment data that can be purchased or acquired via primary research.

Appendix F provides a detailed description of the sales, programs, and shipping data the MTI will maintain, including:

- ESRPP retailer stocking and sales data (source: CalMTA ESRPP data)
- Circana data (source: Circana, purchased data)
- Other sources of shipment data, such as such as ENERGY STAR, Association of Home Appliance Manufacturers (AHAM)

6.1.3 Data collection via primary research

CalMTA will collect primary data through a variety of market research and evaluation activities that generate ongoing market insights to inform MTI strategy and tactics, and support market progress evaluation, including longitudinal tracking of MPIs, and assessment of progress toward milestones and outcomes. Appendix F: Evaluation Plan provides detailed descriptions of data collection activities, which include:

- Residential consumer surveys
- MF property manager interviews
- Property manager (SF and MF) survey
- Manufacturer interviews
- Homebuilder and remodeler interviews
- Stakeholder, SMEs, and MTI staff interviews
- Brick-and-mortar and online retailer data collection (including retail staff interviews)

6.1.4 Market Progress Indicators

MPIs correspond with the induction cooking MTI’s theory of market transformation, as represented in the Logic Model, and are critical to ongoing market and MTI performance



tracking. The data collection described above will enable CalMTA and evaluators to assess progress against these metrics.

For example, CalMTA will track the market share of induction cooking products as a percent of full category sales in California via sales and shipment data from sources that include ESRPP Retailer Stocking and Sales Data, sales data purchased from Circana or others, ENERGY STAR, or AHAM, and manufacturer and distributor data, among others. Appendix F: Evaluation Plan provides a detailed description of data sources and the MPI assessment and other evaluation activities the MTI will conduct.

7 Evaluation & market research

Ongoing evaluation and market research are essential to the development and successful management of market transformation programs. CalMTA and the CPUC's Energy Division will oversee implementation of rigorous and strategically focused evaluation, measurement, and verification (EM&V) practices, which will enable CalMTA management and stakeholders to gauge the performance of CalMTA and MTIs, verify incremental impacts, and improve the design and success of future MTIs. Ongoing program evaluation that provides timely feedback to support program decision-making, which is also known as "real-time" or "embedded" evaluation will provide MTI program managers and implementers with continual feedback, allowing them to pivot strategies as needed to maximize the value delivered to California ratepayers.

Per the Decision and the MTI Evaluation Framework, CalMTA and an independent third-party evaluator each have important evaluation roles in MTI Evaluation. CalMTA will conduct ad hoc market research and developed forecasts of MTI incremental impact and CE, while an independent third-party evaluator is responsible for evaluating market progress and causal influence of the MTI, and for reviewing estimates of MTI incremental impacts and CE. CalMTA developed a preliminary plan for third-party evaluation of the Induction Cooking MTI with input from the Evaluation Advisory Group, a group of three independent evaluation experts, the CPUC project manager, and the CalMTA market research and evaluation lead (see Appendix F: Evaluation Plan for details).²¹ Final evaluation plans will be developed by an independent third-party evaluator to be selected via a competitive RFP process after the MTI advances to Phase III.

7.1 Evaluation approach overview

CalMTA and its third-party evaluator will employ a theory-based evaluation (TBE) approach to evaluating the cooking products MTI, which is widely accepted as a best practice for market transformation program evaluation.²² TBE uses the induction program theory as the point of

²¹ The purpose and roles of the Evaluation Advisory Group are detailed in CalMTA Market Transformation Initiative Evaluation Framework April 2024, <https://calmta.org/wp-content/uploads/sites/263/Market-Transformation-Evaluation-Framework-FINAL.pdf>.

²² For more about TBE and references, please see Appendix F: Evaluation Plan.



reference for market progress evaluation - assessing market progress against the theorized short-medium- and long-term outcomes and corresponding MPIs, and the extent to which the market interventions addressed the market barriers identified and caused the outcomes theorized in the Logic Model (shown in Appendix A).

The evaluation will address these high-level 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, using evidence-based assessments that use a “preponderance of evidence” approach and established market transformation evaluation best practices.
- Identify opportunities to adjust MTI strategy and tactics, to improve MTI effectiveness.
- Review CalMTA’s baseline and total market adoption forecasts, and TSB and CE model inputs and assumptions.
- Assess ancillary benefits and costs.

7.2 Market Progress Indicators

The cooking products evaluation plan identifies 23 MPIs that correspond with the MTI program theory. While the ultimate market progress indicator is market adoption of MTI cooking products (CalMTA will track this metric from the outset), this metric can be a misleading indicator of success during the first several years of MTI implementation because market share and adoption will accelerate only after the MTI addresses critical market barriers, such as reduction in incremental cost difference and supply chain delays affecting builders, improved awareness of the health and safety benefits of induction cooking, and increased availability of affordable 120V battery-equipped products. Therefore, to appropriately evaluate market progress and ensure accountability, the evaluator must assess short- and medium-term MPIs that align with the Logic Model, including these:

- Number of manufacturers engaging with CalMTA
- Number bulk purchase agreements in place
- Brands offering in-suite induction models in the majority of builder packages
- Availability of competitively priced 120V battery-equipped products
- Incremental cost of MTI products versus alternatives
- New ENERGY STAR specification 2.0 includes battery-equipped products and increased efficiency
- Share of MTI cooking products stocked in stores



- Consumer and property manager awareness of induction health and safety benefits
- Market share of MTI products in new construction and existing homes

Appendix F: Evaluation Plan provides a complete list of MPIs and how they will be assessed. It also describes data sources, and evaluation approaches that the third-party evaluator can use to assess market progress, MTI causality, equity, and CalMTA’s estimates of MTI incremental impacts and CE. The evaluator will conduct ongoing market monitoring via secondary data analysis and primary research to evaluate market progress and causality and, importantly, to provide ongoing market insights that provide real-time information to inform MTI strategy and improve performance.

CalMTA identified these primary and secondary data collection activities and associated analysis tasks that would allow the third-party evaluator to evaluate the induction MTI, which are described in Appendix F.

- Secondary data and literature review
- Residential consumer surveys
- Property manager surveys and interviews
- Retailer and manufacturer surveys and interviews
- Homebuilder/remodeler surveys and interviews
- PA, SME, CBO, and other stakeholder interviews
- Retailer data collection and in-store and online stocking studies
- Retailer interviews
- Sales and shipment data collection

CalMTA anticipates that the independent third-party evaluator will have suggestions for how to improve upon this plan.

7.3 Ad hoc market research

The planned evaluation activities include a breadth of planned market research activities that will provide ongoing market insights to support refinements to the MTI strategy and tactics. CalMTA expects there will also be a need for ad hoc research to help support timely implementation decisions and program effectiveness. For example, the induction initiative includes a strategic intervention to build market awareness of the health and safety benefits of induction cooking. The market research conducted for the Baseline Market Characterization study revealed that consumers are largely unaware of these health and safety benefits and concluded that focused research will be necessary to identify compelling messaging on this topic. CalMTA has included a modest budget for ad hoc research needs and will identify specific research studies over the initiative lifetime.



8 Risks & mitigation

This section details the potential risks that could negatively impact the Induction Cooking MTI and CalMTA's plan to monitor and mitigate the risks. The risks listed in the table below have been identified as key risks to track. Please see Appendix G for a full list of possible risks for this MTI. We are defining "high," "medium," and "low" for each risk as follows.

For "Probability of Occurring" in the second column, CalMTA is defining:

- **High:** Through our research and discussion with market actors, CalMTA deems this risk having a high probability of occurring. The program needs to monitor closely and identify a solid backup plan with resources that can be deployed to mitigate the risk if it comes to fruition.
- **Medium:** This risk has a medium probability of occurring given what we know about the market. The MTI needs to track and have a mitigation plan.
- **Low:** The probability of this risk occurring is low based on what know about the market to date. It could have some impact on the need for resources and timing, so the MTI needs to track.

For "Severity" in the third column, CalMTA is defining:

- **High:** If this risk plays out and our mitigation approach is unfeasible, then the success of the MTI may be in jeopardy.
- **Medium:** This may have an impact on the timing or overall success of the MTI, but the MTI will be able to pivot with more time or resources.
- **Low:** This level of risk will likely require a program intervention adjustment, but it will not jeopardize the timing or resources needed level.

Table 7. Risks and mitigation

Risk	Probability of occurring (H, M, L)	Severity (H, M, L)	Possible mitigation approaches
Large enough demand signal for manufacturers: MF building owners do not agree to purchase enough units of the product described in the Tech Challenge, resulting in a smaller than needed demand signal for manufacturers to invest in	M	H	<ul style="list-style-type: none"> • Work with MF building owner trusted partners to get additional signed agreements in place. • CalMTA could pay a portion of the product costs to reduce cost to building owners or CalMTA develops bulk purchase pricing with manufacturers to help reduce costs.



Risk	Probability of occurring (H, M, L)	Severity (H, M, L)	Possible mitigation approaches
the development of the product.			<ul style="list-style-type: none"> CalMTA couples promise to purchase with another program such as ESA to help offset costs.
<p>Multifamily building owners' willingness to overcome initial price/upfront costs associated with induction: Owners of MF may not be willing to pay the additional costs likely to be associated with purchasing and installing induction cooking products in their units.</p>	M	M	<ul style="list-style-type: none"> CalMTA subsidizes incremental costs for some buildings in MF building owner portfolio. Negotiate bulk purchase agreements with manufacturers to drive down unit costs. Demonstrate induction's substantial benefits in terms of resilience, load shifting, and operating costs for tenants.
<p>Manufacturer response to product that meets California needs: Manufacturers do not respond to Tech Challenge with product roadmaps that meet 120V electrical needs of California market and at a reasonable price point for low-income.</p>	M	H	<ul style="list-style-type: none"> Show market that it can be done through two manufacturers that we know have already done it. Facilitate and support the expansion of the IP for the battery-equipped product from one of the startup manufacturers to other manufacturers. Reward the two known manufacturers that currently have the product with the entire MF order to stimulate competition and other manufacturers to join. Build a larger demand signal with California programs and other partners targeting a broader set of MF building owners. Explore alternatives solutions that mitigate the need for electrical panel upgrades for consumers switching from gas to electric cooking.
<p>Consumer and builder perception about induction: Consumers and builders continue to perceive gas cooking as</p>	M	H	<ul style="list-style-type: none"> Deploy targeted information campaign on health benefits of induction cooking with trusted health advocates.



Risk	Probability of occurring (H, M, L)	Severity (H, M, L)	Possible mitigation approaches
superior and are not willing to make the switch to electric cooking.			<ul style="list-style-type: none"> • Deploy additional “Chefluencer” events to consumers and builders coupled with a more direct marketing campaign from CalMTA (not just through the hands of others). • Expand loaner programs to get induction into the hands of consumers. • Incentivize builders for including induction in model homes even if gas remains an option for buyers. • For builders/new construction, if the range is the lone gas appliance, emphasize the cost of running a gas connection for just one appliance.
<p>Consumer and builder perception about health impacts of gas cooking: Consumers and builders do not believe the messages that gas cooking negatively impacts the health of occupants.</p>	M	H	<ul style="list-style-type: none"> • Identify and work with additional third-party, credible partners (universities, public health advocacy partners, foundations) to develop trusted data and messages on impacts of gas cooking on occupant health. • Expand marketing tactics to focus on this message. • Deploy health advocates to deliver message on benefits of induction cooking on improved IAQ.
<p>Induction cooking and culture wars: The negative publicity and culture wars around regulating cooking products dampens policymakers’ motivation to regulate the sale of gas cooking products.</p>	M	M	<ul style="list-style-type: none"> • Support policy makers with data, builder and market partners support to counter negative publicity. • Continue to focus on benefits and price declines of induction as alternative to gas cooking. • Expand influencer campaign with celebrity chefs.
<p>Electrification rates in California: California utilities roll out electrification enabling</p>	L	M	<ul style="list-style-type: none"> • Across all CalMTA consumer product MTIs (HPWH, RHPs, and Induction Cooking) support policy makers and



Risk	Probability of occurring (H, M, L)	Severity (H, M, L)	Possible mitigation approaches
rate structures, especially for ESJ communities, slower than anticipated. Without these rates, consumers will not be able to tap into the energy benefits of moving to induction cooking and adoption will be slowed.			advocates in the movement towards electrification friendly rates through bill impact information, avoided costs, and other non-energy benefit for the consumer.
Consumer price: The price of induction cooking products does not decline enough to compete with gas cooking.	M	H	<ul style="list-style-type: none"> • Develop a new specification to manufacturers that targets basic models of induction cooking that does not include features that drive costs up. • Continue to push for induction inclusion in other types of programs to help bring down costs.

9 Cost estimates

Table 8 contains annual cost estimate by major program activity for the full 20-year program period, representing all Phase III costs required to achieve full market transformation and to validate all impacts. Additional detail, including estimated annual investment by year, can be found in Appendix H.



Table 8. Cost estimates

Activity	Total Phase III cost estimate
Program implementation including the following line items: <ul style="list-style-type: none"> • MTI oversight, strategy, and management • Marketing and awareness building • Policy development and support • Supply chain management 	\$20,098,000
Market Research including the following line items: <ul style="list-style-type: none"> • Market research • Data collection 	\$1,835,000
Mid/Upstream Incentives including incentives to retailers or builders that are “upstream in the market”	\$8,700,000
Downstream incentives include a CalMTA incentive that would be provided to consumers	\$0
Program evaluation	\$2,843,000
Total	\$33,477,000

*Cost estimates in Appendix B and used in all cost-effectiveness calculations include costs incurred during Phase II: Program Development. Total investments for Phase II and Phase III are estimated to total \$37,427,000.



Market Transformation Initiative Plan for Induction Cooking
*CalMTA is a program of the California Public Utilities Commission (CPUC)
 and is administered by Resource Innovations*

10 Appendices

Link to <https://calmta.org/resources-and-reports/induction-cooking-mti-plan/> to access the appendices below.

Appendix A: Logic Model Packet

This appendix includes the MTI's full Logic Model. The Logic Model is a systematic and visual way of presenting CalMTA's understanding of the interventions necessary to remove barriers, expected outcomes of those interventions, and a pathway to the desired end state.

Appendix B: Market Forecasting and Cost-Effectiveness Modeling Approach

This appendix details the inputs, sources and methods used to develop the market forecasting, TSB, and CE model for this MTI.

Appendix C: Product Assessment Report

This appendix presents the findings on the technology research conducted in Phase II and on behalf of the MTI.

Appendix D: Market Characterization Report

This appendix includes the baseline assumptions and a thorough assessment of the market state, supply chain, market actors, and other programs that support the MTI.

Appendix E: External Program Alignment & Coordination

This appendix describes how CalMTA will communicate and collaborate with key market actors and program stakeholders.

Appendix F: Evaluation Plan

This appendix describes the plan to track the progress and assess the impact of the MTI over time.

Appendix G: Risk Management Plan

This appendix documents the potential risks and obstacles to the MTI and CalMTA plans to mitigate the risks.

Appendix H: Budget

This appendix details the budget requirements for the MTI.

Appendix I: MTAB Feedback

This appendix contains feedback on the MTI Plan from the Market Transformation Advisory Board.

