

MARIN CLEAN ENERGY

ENERGY EFFICIENCY BUSINESS PLAN





MCE's Energy Efficiency Business Plan was created by MCE in partnership with Potrero Group.

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1. ACRONYMS

AMI — Advanced Metering Infrastructure

ANSI — American National Standards Institute

BayREN — Bay Area Regional Energy Network

BBEES — Big Bold Energy Efficiency Strategies

BPI — Building Performance Institute

CAS — Combustion Appliance Safety

CCA — Community Choice Aggregation

CEC — California Energy Commission

CAISO — California Integrated System Operator

CEUS — California Commercial End-Use Survey

CPUC — California Public Utilities Commission

CRM — Customer Relationship Management

CSI — California Solar Initiative

DG — Distributed Generation

DR — Demand Response

DSM — Demand Side Management

EE — Energy Efficiency

EM&V — Evaluation, Measurement and Verification

EMIS — Energy Management Information Systems

ESAP — Energy Savings Assistance Program

ESCO — Energy Services Company

EUC — Energy Update California

EVs — Electric Vehicles

GHG — Greenhouse Gas

HOA — Home Owners Association

HUD — The Department of Housing & Urban
Development

HUR — Home Utility Report

HVAC — Heating, Ventilation and Air Conditioning

IDSM — Integrated Demand Side Management

IOU — Investor Owned Utilities

IPCC — Intergovernmental Panel on Climate Change

ISO 50001 — International Organization for
Standardization's Energy Management Standard

kW — kilowatt

kWh — kilowatt-hour

LED — Light-Emitting Diode

LEED — Leadership in Energy & Environmental
Design

M&V — Measurement and Verification

MCE — Marin Clean Energy

MW — Megawatt

O&M — Operations and Maintenance

PA — Program Administrator

PACE — Property Assessed Clean Energy

PG&E — Pacific Gas & Electric Company

POU — Publicly Owned Utility

PY1 — Program Year 1

QA — Quality Assurance

QC — Quality Control

RASS — Residential Appliance Saturation Survey

RENs — Regional Energy Networks

S-CEI — Strategic and Continuous Energy
Improvement

SMB — Small to Mid-size Business

SPOC — Single Point of Contact

TCAC — Tax Credit Allocation Committee

TRC — Total Resource Cost

USDA — United States Department of Agriculture

WIB — Workforce Investment Board

ZNE — Zero Net Energy

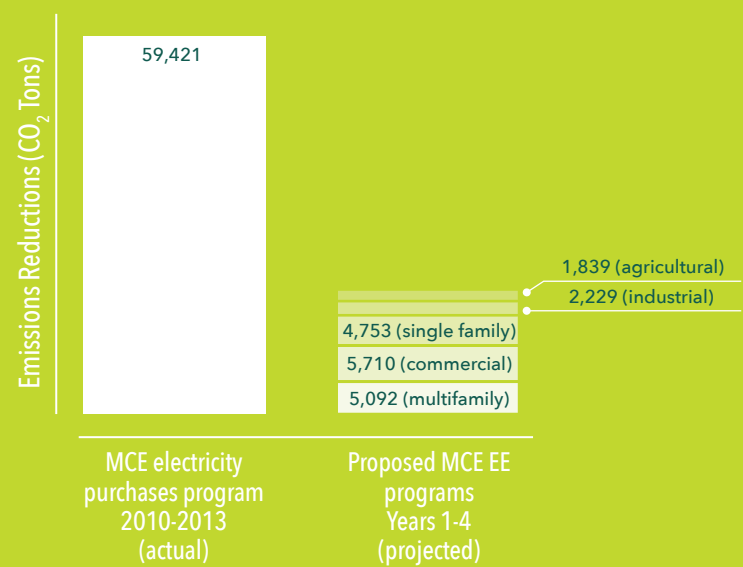
2. EXECUTIVE SUMMARY

California’s changing climate requires a response that focuses on deep, rapid, and widespread adoption of mitigation strategies. Energy efficiency should be a cornerstone of climate mitigation strategies because it relies on technology that is readily available and can offset the cost of more expensive improvements — such as transportation infrastructure upgrades. However, energy efficiency alone cannot achieve ambitious climate protection goals; resource conservation strategies of all types will be required to reduce carbon emissions across sectors. Likewise, the State needs to move beyond the actions of early adopters and introduce a paradigm in which all Californians achieve a low carbon lifestyle.

MCE is well situated to drive innovation and hard work in this area. MCE was first formed in 2008 to help Marin County achieve the dramatic carbon reductions targeted in its climate action plan. As a community choice aggregator, MCE is a local government agency with a voting board of elected officials. Since its inception, MCE has delivered on its mission of greenhouse gas mitigation. Between 2010 and 2013, MCE eliminated 59,421 metric tons of greenhouse gas emissions (Figure 1), helping Marin County meet its climate action plan targets 8 years early.

MCE first pursued energy efficiency funding in February of 2012, and received approval from

Figure 1. CO₂ Emission Reductions by MCE Program

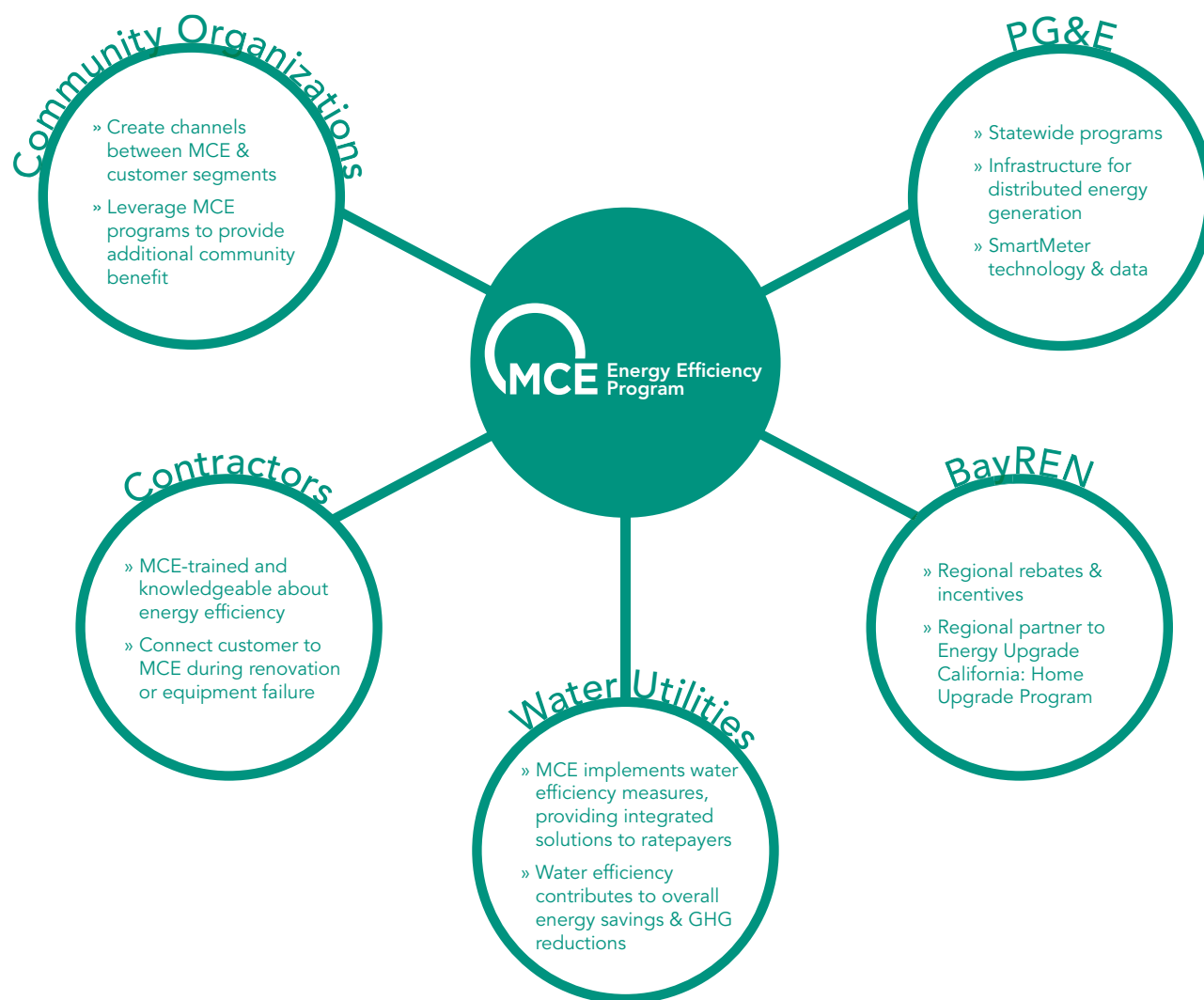


the CPUC to administer ratepayer funded energy efficiency programs in August of 2012. Since that time, MCE's energy efficiency programs have ramped up significantly with a 45% increase in claimed savings from 2013–2014.¹ MCE's programs provide energy efficiency services to hard to reach market sectors, such as small commercial and multifamily sectors, while also focusing on non-energy benefits such as job creation, health and safety, and good customer service.

¹ Gross electricity savings as reported to the CPUC in MCE's annual reports. Available at <http://eestats.cpuc.ca.gov/>

The MCE 2016 Energy Efficiency Business Plan (Business Plan) articulates MCE's ten-year vision to dramatically ramp up its role in providing energy efficiency programs. The Business Plan demonstrates how MCE will build upon its strategic advantage as a local government agency to leverage local connections and continue the upward growth of existing energy efficiency services (Figure 2). The Business Plan relies on a mix of energy usage data with building characteristics information to identify key priority areas for energy efficiency investment. The Business Plan details how MCE will look beyond energy efficiency, focusing on a suite of demand

Figure 2. MCE as a Critical Hub



management strategies that are more meaningful to customers and can achieve greater greenhouse gas mitigation than energy efficiency alone.

2.1 Key Innovations

The Business Plan contains five cornerstone elements. Together, these elements lay the foundation for a bold departure from the current status quo of well-intentioned but confusing, siloed offerings. Instead, MCE offers a customer-centric, cross-cutting, and streamlined approach. The five elements include:

- » **Integrated Program Delivery Model:** MCE will assist customers with an integrated and comprehensive approach to resource conservation – providing a one-stop-shop for everything from traditional building efficiency upgrades to solar hot water, water efficiency, battery storage, load shifting, and electric-vehicle charging. This model is seemingly simple, yet in reality requires innovative systems-thinking and a nimble approach. Promoting resource conservation through an integrated platform is a critical approach to achieving deep greenhouse gas reductions.
- » **Single Point of Contact (SPOC):** Highly-trained SPOCs will present a uniform and integrated presentation of opportunities across demand side management strategies. SPOCs will provide personalized attention, follow-through, and assistance identifying solutions that meet customers' needs, budget, and levels of readiness for change (thereby minimizing the barriers that often plague projects during the initial phases). Finally, SPOCs will play a critical role in promoting project phasing and presenting financing offerings.
- » **Sophisticated Customer Relationship Management (CRM) System:** MCE's advanced

CRM will enable SPOCs to promote an integrated program delivery model. In essence, the CRM will enable greater assessment to completion rates by assisting with an ongoing relationship between the property and the program. It will enable tailored solutions based on data for targeted customer segments.

- » **Customer Value Chain Optimization:** In an effort to achieve and sustain excellent customer service and satisfaction, MCE will roll out innovative ways to decrease customer barriers to participation. Elements include data-driven targeted outreach, customized assessments promoting integrated resource conservation, aggregated and tailored incentives (one-stop shop for local, regional, statewide and national rebates and incentives), workforce development, and advanced program performance monitoring techniques.
- » **Instantaneous Feedback Loop:** To ensure continuous program improvement and sustained excellence, MCE will leverage customer satisfaction surveys, smart meter data, and other qualitative and quantitative monitoring sources.

2.2 Innovations by Market Sector

MCE is focused on streamlined and easy to access programs that are tailored to the customer. Thus, programs are organized around sectors, (e.g. residential, commercial, and industrial), and each sector includes distinct strategies. Importantly, these strategies are not proposed as distinct programs but can be interwoven where appropriate.

- » **Single-Family Residential:** MCE will develop a website to provide more educational resources to customers, including bill analysis and connection to local programs. A suite of rebate options will be provided to meet customers where they are,

including one-off rebates as well as comprehensive rebates.

- » **Multifamily Residential:** MCE will continue its successful Multifamily Energy Efficiency Program, but will expand offerings to include single rebates to engage more customers. The program will continue to introduce new concepts, such as point-based incentives and project phasing, to gain participation from a variety of property types.
- » **Industrial:** MCE's strategy for serving industrial customers allows for one-off rebates as a 'hook' to get customers engaged in the program, and then builds on positive customer experiences to develop deeper relationships and ongoing energy improvement plans.
- » **Commercial:** The commercial program acknowledges the distinction between small businesses, which are best served by direct install delivery models, and medium to large businesses, which benefit from deeper assessments and commissioning. The program introduces a strategic energy conservation model which engages a company from operation and maintenance staff up to the C-level using dashboard technology to track and troubleshoot energy projects. This program will also leverage energy use disclosure laws (Assembly Bill (AB) 802 (2015)) to encourage action.

- » **Agriculture:** The agricultural sector in the MCE service area is characterized largely by dairies and vineyards, both of which are intimately connected to commercial and industrial operations. MCE envisions a 'farm to table' model of agricultural program delivery that integrates traditional agricultural offerings, such as lighting and motor upgrades, with a vertical analysis of companywide savings opportunities. The program will also seek opportunities to improve the condition and efficiency of farmworker housing through the multifamily program, where relevant.

2.3 Conclusion

By uniting these powerful elements in one integrated Business Plan, MCE aims to promote energy efficiency as a lifestyle. This bold vision is the only path forward to achieve the aggressive state goals and mandates put forth in the Clean Energy and Pollution Reduction Act (California Senate Bill (SB) 350 (2016)), the California Long Term Strategic Plan, the Global Warming Solutions Act (California AB 32 (2006) and SB 32 (2016)). MCE's 2016 and Beyond Business Plan delivers a roadmap to utilize the maximum resources available to combat the growing threat of climate change, transform the landscape of resource conservation efforts, and achieve California's ambitious goals. ■

3. INTRODUCTION

A Competitive Opportunity for Energy Efficiency

The effects of our warming climate are here. They are currently being experienced in California and across the globe in the form of drought, flooding, severe weather, and sea level rise. We are now at a critical juncture with regard to stemming further climate change and its negative impacts.

The Intergovernmental Panel on Climate Change (IPCC) has indicated that to avoid catastrophic warming, greenhouse gas (GHG) emissions have to be reduced by 80% from 1990 levels. California Governor Jerry Brown created an executive order (B-30-15) to reduce the state's GHG emissions to 40% below 1990 levels by 2030 which was codified in SB 32 (2016). Governor Brown also signed SB 350 (2015) into law, requiring a doubling of energy efficiency in buildings. This should help put the state on target to achieve GHG emissions 80% below 1990 levels by 2050, a necessary action if we are to live sustainably on the planet.

Energy efficiency is California's preferred energy resource. It is an important approach to reducing GHG emissions and a necessary strategy to employ

for meeting climate change targets. All reasonable scenarios of climate change mitigation rely heavily upon capturing the significant cost-effective potential in energy efficiency and strive toward zero net energy (ZNE) usage and a dramatic drop in GHG emissions.

Capturing the level of energy efficiency required under SB 350 will require that we move beyond a

"Reaching our climate change goals requires a bold new focus on energy efficiency and a notable reworking of the way energy efficiency programs are delivered in California."

"rebate per widget" mentality in energy efficiency program delivery. Reaching our climate change goals requires a bold new focus on energy efficiency and a notable reworking of the way energy efficiency programs are delivered in California. The old, top-down, investor-owned utilities (IOU) programs must be augmented or replaced by more nimble, responsive, localized approaches.

Effective reversal of climate change will also require significantly greater participation in demand-reduction programs by each market sector involved in energy efficiency programs. Program administrators need to move toward a future in which energy efficiency is the status quo and subsidies are no longer necessary to drive market participation in energy efficiency programs. In short, they must develop and articulate a vision for achieving

transformation in how California residents see and use energy on a daily basis.

Fortunately, there are more opportunities than ever for customers in every rate class to participate in energy reduction and efficiency. For example, powerful energy efficiency products and technologies now exist to give customers the ability to monitor and control their own energy use. Distributed generation from homes and businesses is helping to close supply gaps in renewables. Electric vehicles offer a no or low-carbon form of transportation that can also assist with renewable energy integration. Innovations such as these represent huge potential to drastically reduce energy demand and ratepayer utility costs as well as to increase the comfort, health, and sustainability of our communities and significantly stem the adverse effects of climbing GHG emissions.

These important emerging opportunities, however, can only be achieved through direct customer engagement and participation. Therefore, an organization's effectiveness with regard to energy efficiency is strongly dependent on an exceptional level of customer service. Those organizations that can react the fastest to ratepayer needs, be nimble in overcoming barriers, and work on the ground with place-based institutions to achieve deep market penetration are best poised to deliver energy efficiency programs with high participation and impact.

California's push toward ZNE and less carbon dependence is spurring massive change across the energy sector and leading to the development of energy producing organizations that are focused on this type of customer engagement and participation. New actors are entering the regulated markets of energy generation, distribution, and efficiency, bringing changes that challenge the notion that

these activities must be carried out exclusively by utility providers. Where IOUs once held a regional monopoly on energy generation, now renewable and distributed energy resources are changing the landscape. Changes are taking place on the procurement side, with local energy collectives and aggregators now purchasing energy from varied sources on behalf of their communities, breaking the regional monopsony of the few utilities that traditionally purchased and delivered power.

The changing landscape within the energy sector has given rise to the Community Choice Aggregation (CCA) energy supply model. This approach allows local governments to aggregate their buying power in order to secure alternative energy supply contracts on behalf of their constituents. CCAs are taking hold in a handful of states across the U.S. In fact, as of 2014, CCAs were serving nearly 5% of all Americans in over 1300 municipalities,² and this trend is rising.

Marin Clean Energy (MCE) was California's first operating CCA and is a mission-driven, not-for-profit electricity provider that is governed by local elected officials. Its mission and sole motivation is to address climate change by reducing energy-related GHG emissions through the use of renewable energy and energy efficiency. While the focus of this document is on energy efficiency, MCE's outlook is much larger than energy efficiency. Integrating energy and water efficiency, renewable energy, distributed generation, and energy delivery, MCE moves toward solutions that achieve maximum GHG reductions. MCE's goal is to drive market transformation by engaging more people than ever in energy reduction. Part of MCE's success derives from its community-based structure and strong local partnerships to achieve deep market penetration. With a focus on engaging customers in energy reduction initiatives, MCE aims to transform

2 <http://www.leanenergyus.org/cca-by-state/>

the energy market by decreasing the need for incentives and reducing reliance on subsidies.

MCE puts a high priority on delivering exceptional service and personalized value to its customers. MCE utilizes its local knowledge to effectively develop innovative programs that are well tailored to specific regions and result in high levels of customer participation (e.g., point-based incentives and project phasing in the multifamily sector).³ This approach has created points of entry for projects that were not well served under current statewide programs, while at the same time creating new models that can be implemented in other communities. MCE's customer-driven, tailored approach puts the organization in a strong position to achieve the levels of customer engagement and participation necessary for realizing the emerging energy efficiency opportunities that now exist.

MCE's uniquely customer-focused program ushers in a new approach to energy efficiency program planning that gives the organization a significant

advantage in achieving deep market penetration. MCE's Business Plan outlines the key aspects of this focus on customer experience and the emphasis on localized solutions, along with a long-term vision and strategies around market acceptance and penetration. The underlying foundation of MCE's program design is based on customers' needs; its strategic position as a leader in customer service forms the basis for its business approach to energy efficiency.

The pages that follow contain a further exploration of how MCE will leverage its strengths to expand the base of participating customers in its energy efficiency program. It is structured as a Business Plan, as we believe that MCE needs to make a business case for increased investment in energy conservation and GHG reduction. The organization will build on its success and reengage existing energy efficiency customers toward continuous improvement. MCE will closely track key performance indicators and adjust incentives to increase cost effectiveness over time. As a local organization invested in creating mutual benefit with regional partners, MCE will also provide workforce development and other opportunities that generate additional community benefits. ■

3 Frequently Asked Questions MCE Multifamily Energy Efficiency Program, MCE. (2016) p.4. Available at mcecleanenergy.org/multi-family-savings

4. BACKGROUND

MCE's mission statement is to address climate change by:

- » Reducing energy related greenhouse gas emissions
- » Securing energy supply, price stability, and energy efficiency
- » Providing local economic and workforce benefits

MCE promotes the development and use of a wide range of renewable energy sources and energy efficiency programs, including, but not limited to, solar and wind energy production. MCE provides these utilities at competitive rates for all customers.

MCE has proven its business model, saving customers millions of dollars while also reducing GHG emissions and promoting local renewable generation and energy efficiency. MCE is also rapidly expanding its territory. MCE launched in Marin County in 2010 with about 9,000 customers. Today, MCE provides service to 255,000 California customers in Marin County, Napa County and the cities of Benicia, El Cerrito, Lafayette, Richmond, San Pablo, and Walnut Creek. Future enrollment is expected to climb. Given the public's increasing interest in local control, utility bill savings, and GHG reduction, MCE expects interest from local jurisdictions to grow in the coming months and years.

MCE has been a Program Administrator (PA) of ratepayer funded energy efficiency programs under the auspices of the California Public Utilities Commission (CPUC) since 2012, alongside PG&E (an IOU) and the Bay Area Regional Energy Network (BayREN, a local government PA). As a relatively new energy efficiency PA, MCE is not bound to legacy programs or business-as-usual planning traps. MCE is committed to testing innovative solutions and enacting continuous, measured improvements as the organization's reach grows.

4.1 Changes to MCE's Energy Efficiency Directives

In the 2013–2014 Energy Efficiency Portfolio decision, the CPUC limited the roles of Regional Energy Networks (RENs) and CCAs to specific market segments. The CPUC asked that these organizations:

- » Target hard to reach market sectors (such as multifamily and small commercial customers)
- » Target gaps in current IOU statewide energy efficiency programs
- » Pursue innovative programs, technologies, and approaches



MCE AS AN ENERGY EFFICIENCY PROGRAM ADMINISTRATOR

California Public Utilities Code 381.1 authorizes Community Choice Aggregators (CCAs) to become independent administrators of energy efficiency funds and permits them to apply to administer cost-effective energy efficiency and conservation programs.

In 2012, shortly after enrolling all customers in Marin County, MCE brought an Energy Efficiency Program Plan to the California Public Utilities Commission (CPUC) for consideration.

In August of 2012, MCE was approved for \$328,949 of funding to administer energy efficiency programs in its service area, becoming the first local government Program Administrator and the first CCA Program Administrator (Resolution E-4518). This first funding approval was for the authority a CCA holds under subsection 381.1 (e-f) of the CPUC, meaning MCE was only collecting funds from its customers and could only offer programs to its customers. In November of 2012, MCE's application under subsections 381.1 (a-d) to the CPUC for \$4.1 million was approved. This allowed MCE to offer programs to any customer in its service area, regardless of customer status.

When MCE first brought an application to the CPUC, MCE was advised to "avoid duplication of existing IOU programs, focus on hard to reach market sectors, and provide innovative program concepts" (D. 12-11-015). Subsequently, D. 14-01-033 was put into place, establishing the first guidelines for CCA energy efficiency programs and directing MCE to achieve a total resource cost (TRC) test equivalent to the investor-owned utility program administrators following the third year of program administration, while lifting previous restrictions on the types of programs a CCA could apply to administer. Thus, MCE's Business Plan and expanded programs seek to align with the direction of the CPUC and apply for a balanced portfolio to better serve its customers.

The CPUC initially chose a regional approach to cost effectiveness, rolling the budgets and savings of the CCAs into a larger IOU service territory-wide equation. During the 2013–2014 program cycle, the CPUC developed first-time regulations on CCA-administered energy efficiency programs. Decision 14–01–033 released CCAs from the previous program limitations and required them to achieve the same cost effectiveness as IOUs following the third year of their programs. The total resource cost (TRC) test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the PA's costs, divided by the total benefits of the program, including energy cost savings.

The CPUC's new directive asks MCE to achieve a TRC of at least 1.25 and provides MCE with a good opportunity to revise its portfolio. Focusing on IOU program gaps in hard to reach markets while simultaneously striving to attain the 1.25 TRC required of IOUs proves to be challenging. MCE is shifting to a more balanced portfolio that will allow it to attain the 1.25 TRC benchmark. MCE will shift its focus from being a niche provider to positioning itself as the primary provider of energy efficiency to the ratepayers in its service area. It will offer broader programs and rebates, including those it avoided in the past because of program overlap with other providers.

“Because of its local connectivity, MCE can focus on the local needs and engagement of communities without the cumbersome responsibility of needing to manage a complicated and aging energy and distribution system.”

sustainable changes in the structure or functioning of a market achieved by reducing barriers to the adoption of energy efficiency measures to the point where further publicly-funded intervention is no longer appropriate in that specific market.”⁴ For such a vision to be a reality, ratepayer programs need to be designed in such a way as to slowly decrease the reliance on subsidy to influence energy efficient behavior. The Long Term Energy Efficiency Strategic Plan (Strategic Plan), adopted jointly by the CPUC and the California Energy Commission (CEC),⁵ was developed to help create a roadmap for

the utilities on how to achieve this goal. The 2007 CPUC Decision instituting the Strategic Plan explicitly states “a key element of the strategic plan would be that it articulates how energy efficiency programs are or will be designed with the goal of transitioning to either the marketplace without ratepayer subsidies, or codes and standards.”⁶ MCE has taken the opportunity presented by the development of a Business Plan to design a program that has declining ratepayer subsidies over time. MCE will utilize the strategic advantages offered by

its nimble, integrated, and non-siloed organization to institute a program designed to grow and adapt as the energy market matures into an increasingly decentralized and customer oriented market. MCE focuses on the concept of ‘customer transformation,’ or the idea that through a positive experience with energy efficiency, customers will be more likely to choose the energy efficient option in the future. MCE believes the customer transformation emphasis

4.2 A Long Term Vision for Energy Efficiency

The California Public Utilities Commission defined market transformation in 1998 as “long-lasting,

4 D. 98–04–063, Appendix A, CPUC.

5 Longterm Energy Efficiency Strategic Plan, CPUC. 2009. Available at www.cpuc.gov/WorkArea/DownloadAsset.aspx?id=5305

6 D. 07–10–032, CPUC.

has been missing from existing programs, which tend to emphasize policy and program design over customer experience. MCE will leverage distributed energy resources to provide enhanced value to both customers and the grid to spur the integration of renewable energy and other distributed energy resources.

By developing a roadmap for individual customer accounts, MCE aims to achieve great advancements in attaining zero-net energy for existing buildings over the coming decade — a goal firmly aligned with the Strategic Plan.

4.3 Program Coordination

MCE proposes a program coordination approach that accommodates the evolving energy efficiency landscape as statewide and third party programs take on new forms. To facilitate these changes and to enable the cost-effective execution of MCE's portfolio, MCE proposes to assume the role of the Single Point of Contact (SPOC) within its service area, acting as a downstream liaison. MCE further proposes to receive savings attribution for all program activities that occur within MCE's service area.

The role of downstream liaison will require other programs to coordinate with MCE prior to performing outreach to customers in MCE's service area. This coordination will enhance MCE's ability to serve as the SPOC for downstream energy efficiency programs. MCE is not proposing to provide all outreach activities for non-MCE programs. In its role as downstream liaison, MCE will help eliminate customer confusion about multiple program offerings and may preclude duplicative IOU and Third Party programs from customer acquisition activities in MCE's service area. MCE will coordinate with existing statewide and local government programs to avoid overlapping customer outreach activities.

MCE's portfolio acknowledges and accounts for the fact that its service area also overlaps geographically with the Bay Area Regional Energy Network (BayREN) and certain Local Government Partnerships (LGPs). MCE is actively coordinating with BayREN and relevant LGPs to avoid duplication and overlap of programs. Where overlap is unavoidable, however, MCE will coordinate marketing and outreach with these partners to minimize customer confusion and maximize program uptake. MCE will also coordinate with the statewide Marketing Education & Outreach (ME&O) administrator to ensure the role of downstream liaison is adequately considered. MCE requires attribution of savings for programs within MCE's service area to maintain a cost-effective portfolio. The Commission authorized all PAs to share the attribution for upstream and midstream activities under the statewide programs in D.16-08-019. MCE proposes to extend that rationale to include downstream program activities within MCE's service area.

MCE's limited geographic range substantially limits its ability to develop a balanced and cost-effective portfolio. MCE's service area is heavily comprised of residential and small- to mid-sized commercial customers. These customer segments are historically among the least cost-effective to serve, especially with comprehensive programs. Competing programs that can capture the more cost-effective savings opportunities compound this problem. MCE proposes to receive full savings attribution for the purpose of calculating cost-effectiveness. In exchange for receiving attribution, MCE will contribute a portion of its program budget to the program that accomplished the savings where appropriate.

Table 1 provides information about how the role of downstream liaison and savings attribution will be coordinated with multiple types of programs.

Table 1. Coordination in MCE's Role as Downstream Liaison and with Savings Attribution

Entity	Required to Coordinate with MCE Prior to Outreach	MCE has Authority to Preclude Duplicative Offerings	100% Savings Attribution for Activities within MCE Service Area	MCE to Reimburse from Program Budget for Attribution
Upstream & Midstream Statewide Programs	No	No	Yes	Yes
Downstream Statewide Programs	Yes	No	Yes	Yes
Third Party Programs	Yes	Yes	Yes	Yes
Other IOU Downstream Programs	Yes	Yes	Yes	Yes
REN Programs	Yes	No	Yes	Yes
LGP Programs	Yes	No	Yes	Yes

4.4 Opportunities in California's New Program Cycle

Beginning in 2015, the CPUC began moving from a 2–3 year approval cycle to a 10-year rolling cycle. 2015 is considered “Year 0” of the first 10-year rolling cycle. Portfolio budgets approved in 2013–2014 are approved through 2025, with additional considerations for new Proposition 39–related school funding starting in the 2015 portfolio year. During this transition, the CPUC is encouraging PAs to consider the implications of a 10-year cycle on their program planning and how the program administration process may be improved.

The switch to a 10-year rolling cycle presents yet another opportunity for MCE to look strategically at its efforts to date and to enact a bold vision for energy efficiency over the coming decade. The rolling cycle provides an opportunity to consider how cost effectiveness can be improved with a long-term vision. For example, programs designed to promote customer transformation over a 10-year period may begin with low participation and high incentives, with these two reversing as the program

matures. Programs that focus on low-hanging fruit to achieve cost effectiveness will not easily bring customers from modest energy savings toward Zero Net Energy (ZNE). MCE's approach is also anticipated to improve the Program Administrator Cost (PAC) test as customers grow more willing to take on costs to achieve energy efficiency.

One of MCE's most important differentiators is that it is an energy provider designed with today's needs in mind.

Fortunately, MCE is in a unique position. As a local government, MCE is very close to its customer base. MCE can focus on energy efficiency and customer responsiveness in the service of effective and significant GHG reduction. MCE can be nimble and take advantage of the best new opportunities provided by smart grid technology, distributed energy, and new technologies. Most importantly, because of its local connectivity, MCE can focus on the local needs and engagement of communities.

MCE's focus on reducing GHG emissions, combined with its flexibility in addressing customer needs,

sets its energy efficiency program apart from other ratepayer funded programs. MCE's commitment to helping customers embrace energy efficiency at all levels of engagement will drive meaningful market transformation: increased customer demand and decreased need for incentives and subsidies. As it

establishes its track record, MCE recognizes that this momentum provides an important opportunity to fully implement its vision and the business approach that will guide the next decade of its energy efficiency services. ■

Purpose of MCE's Business Plan for Energy Efficiency

- » Clearly articulate MCE's value proposition
- » Establish a portfolio oriented to the customers' needs
- » Seize the opportunity of a transition to a 10-year rolling cycle to assess energy efficiency strategy
- » Set a strategic vision for energy efficiency as MCE's territory and reach grow
- » Articulate strategic advantages and position MCE as the primary provider in its service area
- » Demonstrate MCE's local customer knowledge through its energy efficiency vision
- » Establish a commitment to innovation and continuous improvement

CALIFORNIA'S ENERGY EFFICIENCY GOALS

Californians' per capita electricity use has remained relatively flat over the last 20 years, while per capita use has risen 33% nationally. These savings have allowed California power facilities to expand capacity at two-thirds the rate of the rest of the nation. This is due in part to California's ambitious energy reduction goals.

Energy efficiency is California's preferred energy resource. Public Utilities Code Section 454.5 requires that IOUs "meet unmet resource needs with all available [energy efficiency] and demand reduction that is cost-effective, reliable, and feasible." It further requires the CPUC to establish targets for IOUs to achieve all cost-effective electric and gas energy efficiency goals. These targets are released by the CPUC with each program application cycle.

While these targets do not apply to CCAs, MCE has chosen to emphasize energy reduction as a core component of its Integrated Resource Plan. MCE is also committed to supporting California's many other energy and GHG reduction goals, including:

- » All new residential construction in California will be ZNE by 2020;*
- » All new commercial construction in California will be ZNE by 2030;*
- » The Heating Ventilation and Air Conditioning (HVAC) industry and market will be transformed to ensure that its energy performance is optimal for California's climate;* and
- » All eligible low-income customers will be given the opportunity to participate in low-income energy efficiency programs by 2020*
- » 32,000 GWh and 800 million therms by 2020**
- » Achieve 1990 GHG levels by 2020 and 40% below 1990 levels by 2030;***
- » Increase the energy efficiency improvements of buildings 50% by 2030 (SB 350 signed by Governor Jerry Brown October 7, 2015);*** and
- » Establish cleaner sources of heating fuels***

Sources:

*Big Bold Energy Efficiency Strategies (BBEES) from the California Energy Efficiency Strategic Plan, a collaborative statewide effort to identify market barriers and develop cross-industry solutions.

**California Air Resources Board's Scoping Plan for AB 32.

***GHG reduction targets set first by AB 32 (2006) and strengthened by Executive Order from Governor Jerry Brown and codified by SB 32 (2015).

5. MCE'S STRATEGIC ADVANTAGES

From an energy efficiency perspective, MCE is a leading provider due to its key differentiators:

- » GHG reduction is MCE's top priority
- » MCE is driven by constituents, not shareholders
- » MCE leadership is local and responsive to community needs
- » Local partnerships provide a foundation for deepening market penetration

Greenhouse Gas Reduction is MCE's Top Priority.

Reducing GHGs and mitigating the effects of climate change is MCE's central mission.

MCE's carbon-reduction goal is in strong alignment with SB 350, SB 32 and Governor Jerry Brown's executive order to establish GHG reductions 40% below 1990 levels by 2030, a necessary step to ultimately reaching 80% reductions by 2050. To support these goals, MCE evaluates and prioritizes activities across operations according to GHG reductions

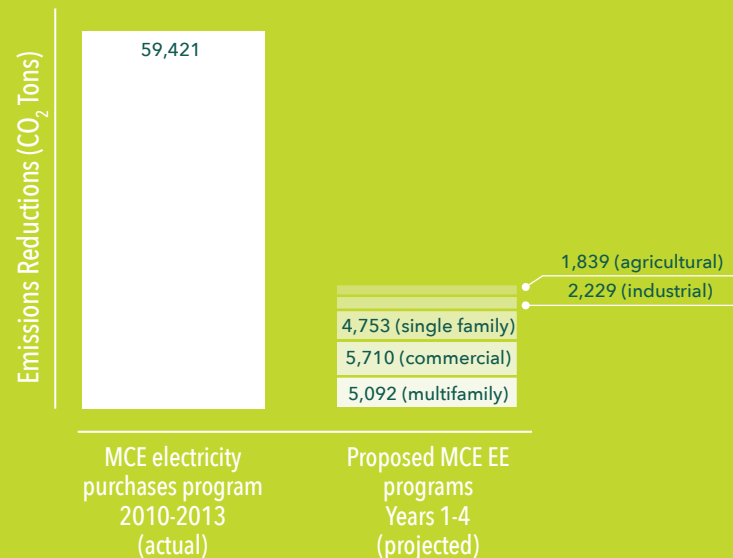
rather than energy savings per se. The energy world is rapidly changing; SmartMeter technology has enabled customers to be in control of how and when

"Because MCE serves communities not shareholders, ... MCE can optimize energy and efficiency without the pressure of making profits for [external] shareholders."

they use energy across their properties, integrating energy conservation, energy efficiency, distributed generation, and demand response strategies into simple, easy to understand dashboards. These new strategies are enabling customers to become a part of the renewable energy solution, turning homes and businesses into providers of grid services. The energy solutions of tomorrow will not be focused on a single end use or single conservation strategy. Achieving our carbon reduction goals as a state will require recognizing this changing landscape and utilizing these emerging integrated solutions as a key component of renewables integration and demand reduction.

MCE's multifamily program features a strong emphasis on high-efficiency natural gas measures, which can offer considerable GHG reductions. In addition, MCE proposes to integrate fuel-switching measures where possible. See Figure 3 for the estimated GHG impacts of MCE's energy efficiency programs relative to MCE's electricity purchases.

MCE's primary focus on GHG reductions enables its energy efficiency strategy to drive towards customer transformation in unique ways. Aligning incentives

Figure 3. CO₂ Emission Reductions by MCE Program

with indicators of increasing energy efficiency adoption will allow MCE to take a long-term approach to energy efficiency program planning. Reducing incentives based on customer participation will allow ratepayer dollars to go further and reduce direct costs to MCE's programs. MCE anticipates this approach will improve the PAC results over time and free up resources for more comprehensive projects. Programs like the California Solar Initiative have demonstrated the success of this approach, and similar logic could be applied to penetrate harder to reach markets or to bring customers in the later stages of energy efficiency to full ZNE. Continuing to reach beyond the low-hanging fruit and toward these deep, sometimes difficult to achieve energy savings is a key component of meeting California's carbon reduction goals.

MCE is Driven by Constituents, not Shareholders.

California is the nation's most populous state, and its ratepayers are geographically, demographically, and politically diverse. Engaging these diverse ratepayers in energy efficiency efforts will be critical in reaching California's ambitious energy reduction goals.

While certain statewide programs are beneficial to customers, the size of these programs can inhibit PAs from taking a more proactive approach in reaching customers. A strength of the CCA model is that its designed purpose is to meet the needs of local customers. Not only are MCE's local communities its customers, but deep market penetration is how MCE creates "shareholder return" in the form of greater GHG reductions and services for the community. As a result, MCE strives to understand customers' specific needs and motivators, which in turn drive the design of MCE's energy efficiency program. The program is designed for ease of use with greater accessibility to program staff that can navigate offerings and provide integrated, streamlined solutions. It includes activities that increase MCE's customer knowledge, such as use of sophisticated CRM software, customer satisfaction feedback, and collaboration with organizations deeply seated in the local community.

MCE's customer-centered approach directly addresses the following barriers and missed opportunities:

- » There are a myriad of resource conservation programs made available by a variety of administrators, and customers have a hard time navigating their options or accessing multiple offerings within the scope of one project.
- » Because program offerings can be inflexible, many customers with small- to medium-sized projects as well as projects that must happen in phases (as tenants move out, for example) often have a hard time taking advantage of incentives.
- » New technologies and incentives are frequently marketed broadly, rather than targeted to customers for whom the solution meets a clear need.
- » Opportunities to follow up with past energy efficiency customers are rarely utilized, often due to poor household/building data collection at the time of assessment.
- » Private interests often push IOUs to focus on opportunities that will offer the biggest shareholder incentives rather than toward integrated, customer-focused solutions that target overall GHG emissions.

MCE provides a competitive advantage over IOUs when it comes to addressing customer engagement and participation barriers. MCE's programs take a flexible approach to the uniquely local characteristics of commercial, residential, industrial, and agricultural customers in its service area. CRM systems track previous interactions with, and behaviors of, ratepayers. This allows MCE to anticipate customer needs and to target new technologies and incentives that best meet these needs. MCE is able to leverage and include statewide programs in its customized solutions for each customer, thereby increasing the overall value provided.

Because MCE's customers are also constituents, an important alignment takes place because the need to make profits for external shareholders is absent. MCE can make decisions that are in the best interests of those it serves. This means that MCE can optimize energy and efficiency without the pressure of making profits for shareholders.

MCE Leadership is Local and Responsive to Community Needs.

As a CCA, MCE is governed by local elected officials and supported by community leaders and local institutions. Inherent partnerships with city councils, planning and building departments, community organizations, local banks, contractors, local utilities, and technical assistants aggregate the opportunities available to MCE's ratepayers, while also fostering community connectedness and trust between parties. Ratepayer fees are invested in energy programs that directly benefit constituents without diverting funds to private investors. MCE's energy efficiency programs are discussed at publicly noticed board meetings. This offers transparency and allows for constituents to provide immediate feedback on program design and implementation.

MCE is governed by a board of directors comprised of elected officials from the communities it serves. Because these elected officials need to respond to their constituents, MCE also shares this responsibility for meeting the needs of the local community. This means that MCE can undertake local initiatives that are unlikely to be led by IOUs.

Further, many local governments are under self-imposed mandates via locally adopted Climate Action Plans to manage carbon emissions. Because of MCE's strong connectivity to local governments, MCE is uniquely positioned to partner with communities in order to help them address their most pressing needs.

Local Partnerships Aid Market Penetration.

MCE maximizes the strengths of a flexible, locally connected energy efficiency program by meeting ratepayers where they are. MCE collaborates with innovative partners to access community-based organizations, schools, local companies, religious institutions, and other organizations as drivers of energy efficient behaviors. Partnerships with place-based organizations that employ local residents as part of energy efficiency solutions engage customers not only as ratepayers, but also as contractors, employers, workers, and community leaders, resulting in behavior change across many important sectors. MCE's ability to deeply penetrate the local market helps to maximize program participation.

MCE's service area also includes a large percentage of low- to middle-income residents (Figure 4). MCE's local partnerships also help to serve hard to reach residents, including renters, low to moderate income households, and non-English speaking households, who often miss out on services due to language barriers. With workforce partners, MCE brings services directly to underserved households by using bilingual contractors and job trainees. Because program contractors are hired directly from the communities they serve, their language skills mirror the communities themselves and allow increased access to non-English speaking households. MCE connects with these segments by participating in over 100 public community events annually, including fairs, farmers, markets, workshops, and presentations to a wide range of audiences. This outreach empowers customers and local contractors to promote programs to their neighbors, friends, and family members to help spread information about energy efficiency through trusted channels. ■

"MCE's local partnerships also help to serve hard to reach residents, including renters, low to moderate income households, and non-English speaking households, who often miss out on services due to language barriers."

Figure 4. Income Levels by Service Area



*Includes City of Benicia

Source: 2000 Census

Note: Low income is defined using the criteria for the California Low Income Home Energy Assistance Program for the average household size by county. Middle income is defined as the range from the upper bracket of low income to 120% of State Median Income for the county average household size (<https://www.benefits.gov/benefits/benefit-details/1540>). High Income is any household that earns more than the upper bracket of middle income.

6. MARKET ANALYSIS

Like most businesses and organizations, MCE exists within three different market contexts: (1) the macro context, (2) the industry context, and (3) the local context (Figure 5). Understanding these contexts is important because they show why MCE is so well positioned to deliver energy efficiency programs to northern California customers.

Macro Context. The macro context includes those forces largely outside of a business' control that influence the conditions for the business to operate. The macro context for MCE is quite strong with the political, regulatory, and social/cultural environments favoring significant action on curbing GHG emissions. As a CCA, MCE is well poised to help dramatically cut GHG from energy usage. Because MCE was created for this purpose, it is much more effective than traditional utilities at providing low-carbon intensive energy at competitive rates. Further, its nimbleness allows MCE to quickly adopt and deploy new technologies and to work toward market transformation efforts. Finally, MCE has demonstrated its ability to provide local, high-paying "green" jobs such as solar installers and energy educators. These jobs are needed in many of the communities that MCE serves, and they help meet the goal of many communities to be seen as leaders on environmental issues.

Industry Context. MCE exists in a highly regulated industry, with a long-established regulated monopoly as its primary competitor. While large companies may be good at providing reliable service, they have not proven themselves to be agile in meeting local community needs. MCE can provide targeted, relevant service focused on meeting the specific needs of its customers. Further, its size allows MCE to more readily adapt to new energy saving technologies. By its very structure and scale, MCE can take calculated risks and be more innovative, and thus create customer transformation much faster than larger entities.

Local Context. The local context also strongly favors MCE, as many communities are frustrated with large utilities and seeking alternatives that offer greater local control. MCE can provide its growing and diverse member communities with relevant options that provide energy with a much lower carbon footprint and efficiency programs designed around reducing carbon emissions. Further, MCE creates an easy way for local elected officials to meet many of their climate goals. Finally, MCE's local and customized focus generates distinct solutions to meet the needs of individual customers.

Figure 5. Market Context for MCE

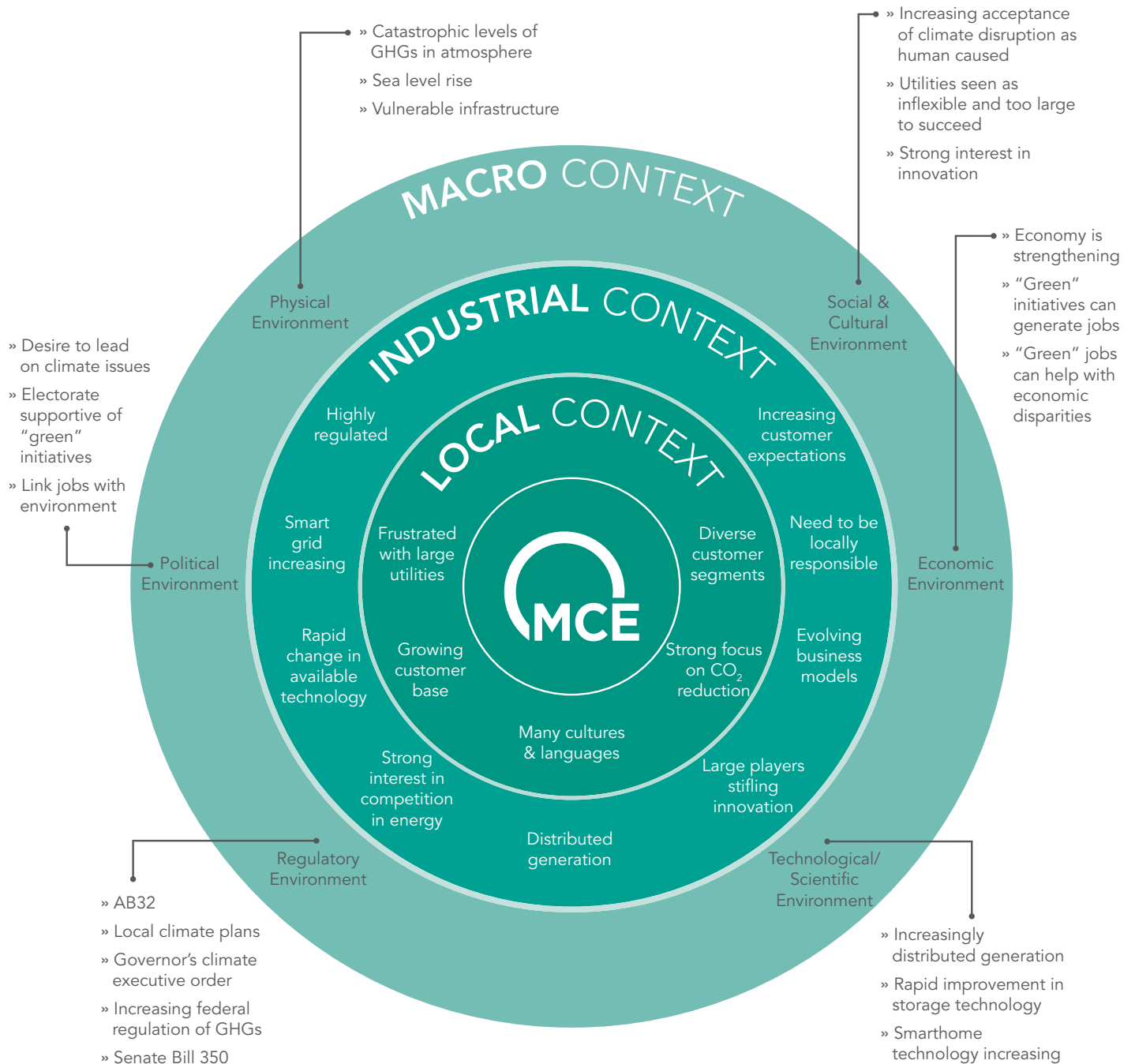
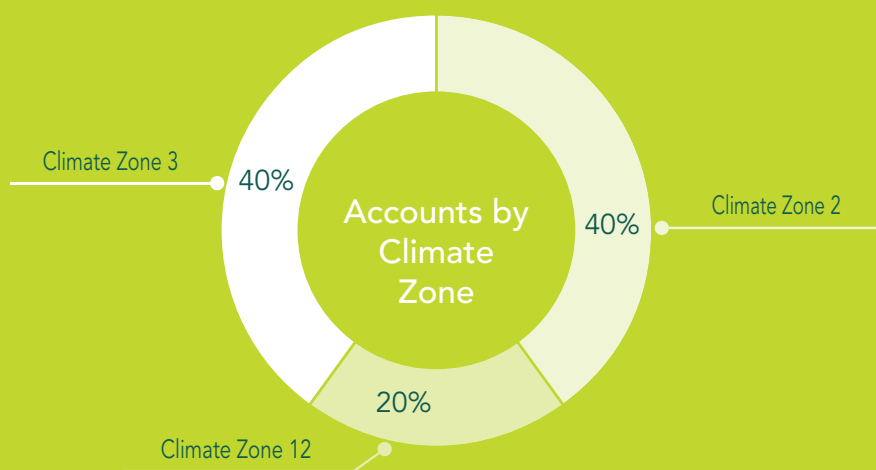


Figure 6. Accounts by Title 24 Climate Zone



6.1 Current Market Boundaries

MCE serves a much broader and more diverse service area today than it did in its founding years. MCE's service area has grown from the largely residential and small commercial customers in Marin to include some of the San Francisco Bay Area's agricultural, industrial, and large commercial ratepayers. MCE's expanded energy efficiency portfolio provides programs designed for all customers in its expanded service area. MCE's service area now spans four Title 24 Climate Zones (Figure 6).

6.2 Customer Segments

MCE serves customers in the following sectors:

- » Residential: Single Family
- » Residential: Multifamily

- » Industrial
- » Agricultural
- » Commercial

The residential segment characterizes the largest number of energy users in MCE's service area at 272,982 accounts, or nearly 90% of all ratepayers. However, MCE's high-consuming energy accounts in industrial, agricultural, and commercial make up 62% of its estimated electricity consumption and over 41% of estimated natural gas consumption, representing an equally important opportunity for efficiency.⁷

⁷ The numbers reported for natural gas consumption exclude agricultural customers due to privacy concerns.

Unincorporated Napa County

- » Climate Zone 2
- » Higher proportion of large, high-energy use single family homes
- » More pronounced air conditioning load
- » Hotels and vineyards comprise large commercial and industrial/agricultural accounts

Napa County

Cities of Benicia, Lafayette, Walnut Creek

- » Climate Zone 12
- » Higher proportion of large industrial accounts and high-energy use homes
- » Cooler winters and hotter summers than neighboring climate zones; more pronounced air conditioning load

Solano County

Benicia

Marin County

Contra Costa County

Richmond

San Pablo

El Cerrito

Lafayette

Walnut Creek

Cities in Marin County

- » Climate Zones 2 & 3b
- » Higher proportion of residential and small commercial accounts
- » High electric vehicle adoption
- » Agricultural uses include dairy and small organic farms

Cities of El Cerrito, Richmond, San Pablo

- » Climate Zone 3a
- » Higher proportion of large industrial accounts
- » El Cerrito has highest "Deep Green" (100% renewable energy) opt-in rates, indicating possible early adopters for new measures and technologies
- » High diversity of languages spoken in Richmond and San Pablo, including Mandarin and Spanish

6.3 Market Opportunities

Consideration of the following opportunities will help guide energy efficiency efforts. Indicators for potential savings include:

- » Buildings constructed prior to California's building energy code (Title 24)
- » HVAC systems installed prior to 2000 (expected lifespan: 15–20 years)
- » Considering water/energy nexus: residential and small-commercial water fixtures installed before 1992 (Energy Policy Act) and agricultural irrigation systems
- » Lighting upgrade potential, "leapfrogging" incandescent to LED where possible
- » Communities/segments with larger per-account usage compared to others in MCE's service area

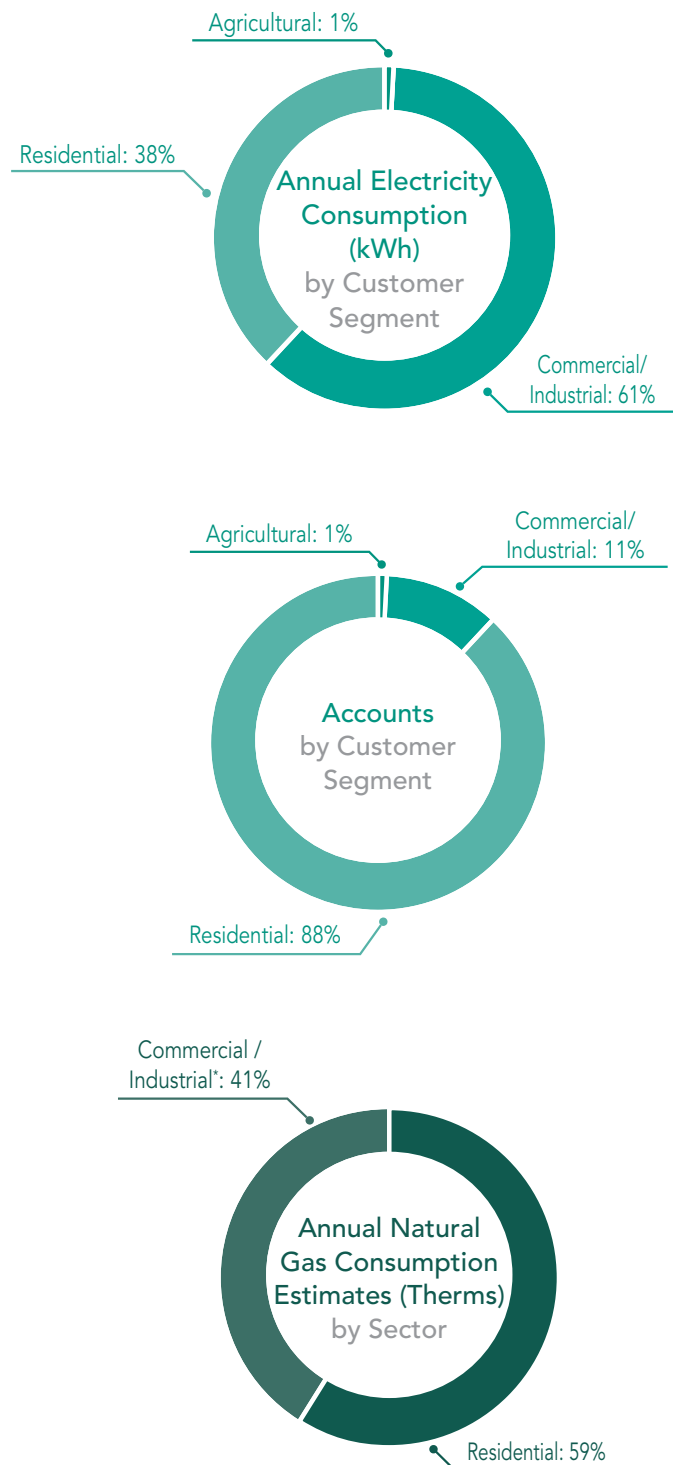
6.4 Building Stock and Energy Efficiency

MCE analyzed information from Housing Elements reports, US Census Bureau State & County QuickFacts, and county assessor data to gain insights into building characteristics.⁸ This information informs program design, marketing and outreach efforts.

Residential Building Stock Characteristics

Construction in the residential sector has followed relatively similar trends within MCE's service area (Figure 8), with the majority of the building stock constructed during 1950–2000, and close to 46% of the buildings between 1950–1975. The exception is

Figure 7. Customer Segmentation



⁸ The data presented in Figures 7, 8, 9, and 10 comes from county assessor data; Marin commercial data is from a February 2014 Navigant study "BayREN Commercial PACE Financing Market Research Survey."

*Due to possible privacy concerns and violations of the 15:15 rule, a number of Commercial/Industrial accounts are removed from this analysis.

Benicia, which saw its greatest growth in the 1975–1999 timeframe.

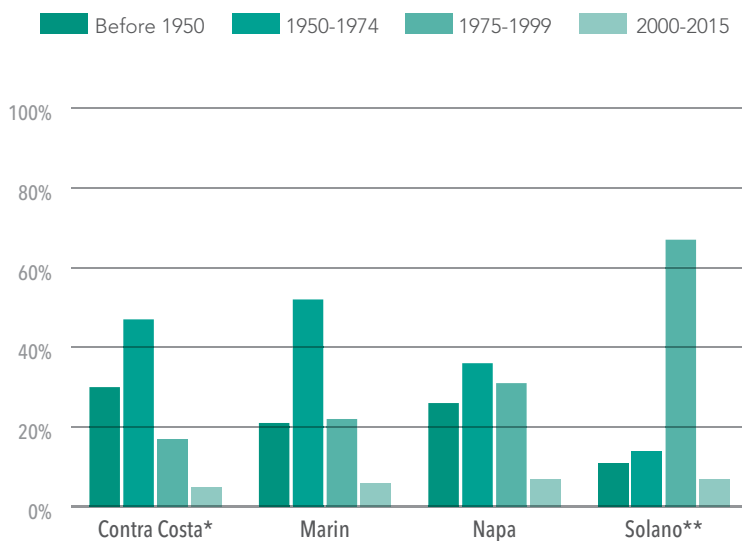
Commercial Building Stock Characteristics

Figure 9 illustrates the diversity of commercial building vintage within MCE’s service area, and can provide insights into trends affecting construction and growth at these locations. Marin County, for example, has seen declining growth since the mid 1970’s due to growth limits and planning regulations, while Benicia has seen considerable growth and expansion during that same time period. Building vintage

provides useful insights for energy efficiency program planning and marketing strategies.

The information presented in Figure 10 provides insights into the types of energy efficiency programs best suited to each of MCE’s service territories. For example, small commercial offerings will be better suited to Contra Costa and Marin County (with the greatest number of commercial buildings under 5,000 square feet); meanwhile, there may be opportunities for large commercial upgrades in Napa, Walnut Creek, Lafayette, and Benicia (which has the greatest share of commercial facilities over 100,000 square feet). ■

Figure 8. Residential Building Vintage by Service Area

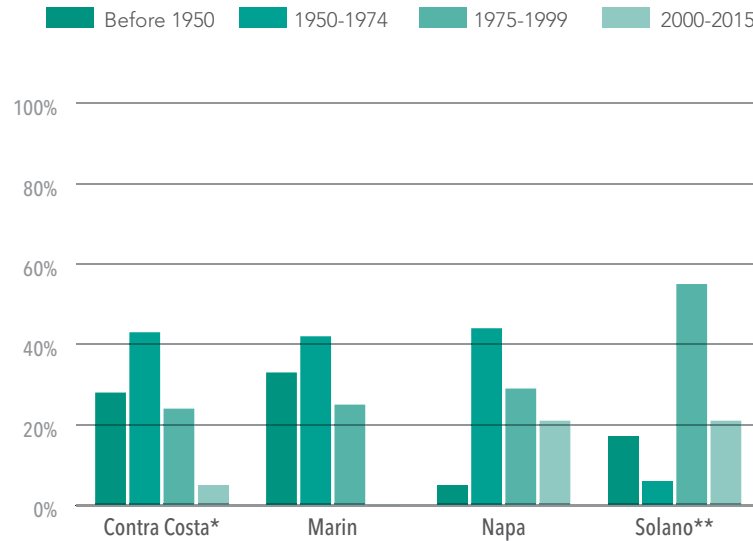


* Includes City of Richmond, El Cerrito, and San Pablo, Walnut Creek and Lafayette

** Includes City of Benicia

Source: County Assessor Data

Figure 9. Commercial Building Vintage by Service Area

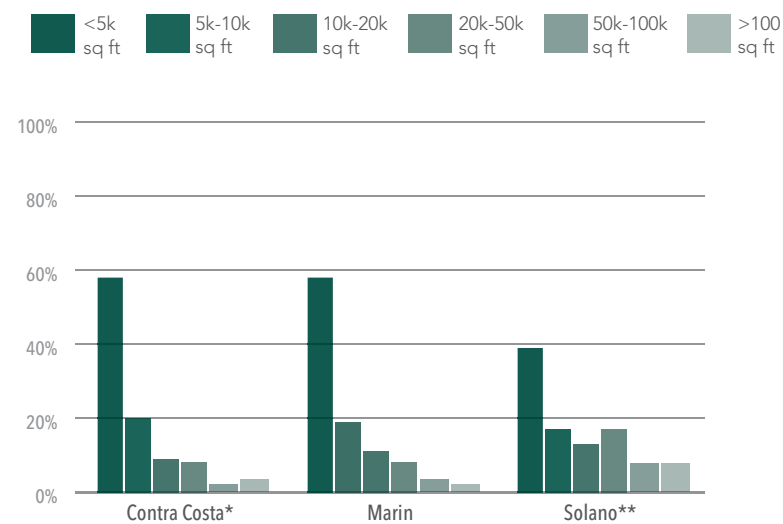


* Includes City of Richmond, El Cerrito, and San Pablo, Walnut Creek and Lafayette

** Includes City of Benicia

Source: County Assessor Data

Figure 10. Commercial Building Size by Service Area
(Sufficient data on parcel size unavailable in Napa County)



* Includes City of Richmond, El Cerrito, and San Pablo, Walnut Creek and Lafayette

** Includes City of Benicia

Source: County Assessor Data

CUSTOMER TRANSFORMATION & DECREASING INCENTIVES

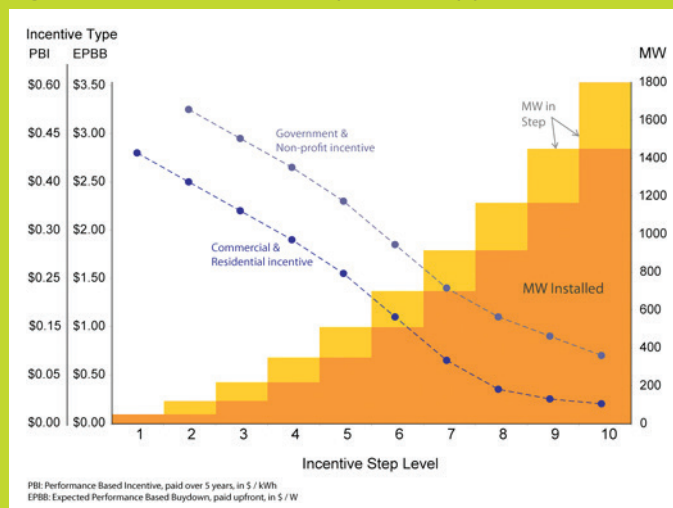
MCE has designed its 10-year energy efficiency program to move towards an energy efficiency market that is not reliant on subsidies using customer transformation logic. As customer demand increases for any given energy measure, and as energy efficiency becomes a way of life, MCE predicts that incentives will be less necessary to increase participation or adoption. Decreasing incentives help move the market to be more demand-driven and less subsidy-dependent. Thus, MCE has set program participation rates that will trigger step-wise incentive decreases at pace with market adoption (described in the Portfolio Budget and Savings section). At the same time, declining incentives will reduce the burden to ratepayers and improve MCE's PAC test results.

The California Solar Initiative (CSI) is an example of a statewide program designed with similar logic. As the solar market has grown, solar electric system costs have dropped and incentives offered through the program have declined according to participation targets. The CPUC divided the overall megawatt goal for the incentive program into ten programmatic incentive level steps. They also assigned a target amount of capacity in each step to receive an incentive based on dollars per-watt or cents per-kilowatt-hour. The megawatt (MW) targets in each incentive step level were assigned to particular customer classes (residential, commercial, and government/non-profit) and allocated across the three IOU service territories, in proportion with each group's contribution to overall state electricity sales.

Once all the MW targets in a particular incentive step level were reserved via CSI application — which could occur at different times for each customer class in each utility service area — the incentive level offered by the CSI Program automatically reduced to the next lower incentive step level. This created a demand-driven incentive program that adjusted solar incentive levels based on local solar market conditions.

The figure below shows how CSI incentives declined as the program progressed through the ten steps and more MWs were installed.⁹ The CSI incentive levels have declined by customer class and utility from January 2007 to the present.

Figure 11. CSI Incentive Step Down Approach.



⁹ <http://www.cpuc.ca.gov/puc/energy/solar/aboutsolar.htm>

7. BUSINESS MODEL

MCE is one of California's CCAs. Community choice aggregation allows communities, residents, businesses, and municipal facilities to pool their electricity demand in order to increase their purchasing power and scale. CCAs also have the authority to administer ratepayer funded energy efficiency programs on equal footing with the existing IOU PAs.¹⁰

With its vision to engage more customers in energy reduction, MCE leverages its local knowledge and customer proximity to penetrate its market. MCE's energy efficiency programs present integrated solutions—including opportunities for distributed generation, on-site energy storage, and water reduction measures—and track opportunities for further engagement with customers. Not only does an integrated approach provide streamlined rather than piecemeal pathways for customers, it also aligns all of MCE's key activities behind its mission of GHG reduction. MCE has carefully considered and invested in some of the partnerships required to provide customers with integrated solutions and has seen the benefits to its customers and programs. It has built upon customer knowledge to create channels that reach customers where they are and provide a suite of programming that is relevant to customer needs.

7.1 Value Proposition: Provide a One-Stop Shop for Energy Savings

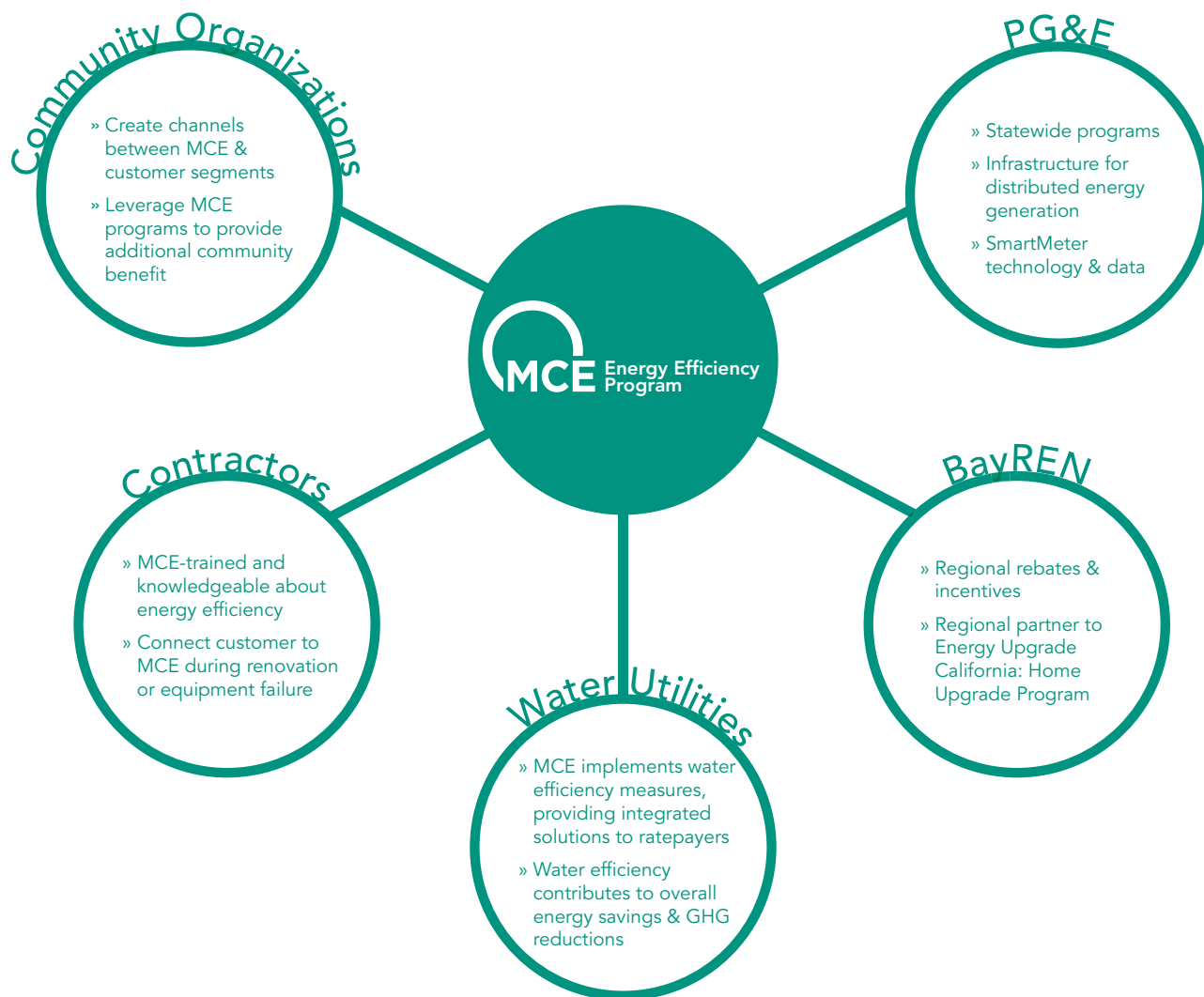
MCE helps customers plan energy reductions holistically by providing integrated, one-stop service. MCE presents customers with complete solutions that best suit their needs by acting as a hub that coordinates all relevant opportunities for energy savings (Figure 12). MCE takes the onus off of customers to navigate all applicable ratepayer programs, including demand response and distributed generation incentives; municipal, county, regional, and national programs; water utility incentives; trained contractors and technicians; and other local offerings. MCE recognizes its proximity to customers as its core strength, allowing MCE to provide tailored, relevant solutions in each of the key segments in its service area.

MCE supports its role as program hub with two customer relationship features: Single Point of Contact staff and sophisticated Customer Relationship Management software.

Single Point of Contact. MCE makes navigating energy savings opportunities simple by providing customers with a Single Point of Contact (SPOC). Across customer segments, the SPOC serves as a facilitator and participant advocate, helping to guide the property owner through the process from initial

¹⁰ California Public Utilities Code Section 381.1 (a–f); California Public Utilities Commission Decision 14–01–033.

Figure 12. MCE as a Critical Hub



contact to project completion. The SPOC develops an integrated assessment process, streamlining multiple program offerings into one customer report.

MCE will effectively remove barriers for residents that face implementation challenges with the aid of the SPOC. The SPOC helps customers take full advantage of MCE's energy efficiency program by providing the following:

- » **Uniform and Bundled Presentation of Opportunities.** Projects are more attractive to customers and easier to accomplish when all

savings opportunities are bundled together and follow a clear, uniform presentation. Moving incentives toward a point-based system for the multifamily sector has allowed customers to easily calculate the possible incentive from a bundled measure project and combine points to qualify for bigger incentives. This may be an important lesson learned for other programs. The SPOC also helps complete applications for multiple programs, eliminating extra work and information redundancies as well as streamlining the process for customers.

- » **Personalized Attention and Follow-Through.** A SPOC delivery model provides more personalized attention and more follow-through to reduce customer confusion and increase project completion rate.
- » **Project Phasing.** MCE remains in contact with participating properties over time and encourages property owners to implement projects in phases. This allows customers to take advantage of large project incentives without having to implement improvements all at once.
- » **Increased Financing Options.** MCE partners with local banks and leverages Property Assessed Clean Energy (PACE) and statewide financing options to serve building owners who have limited access to private or low-cost financing for retrofits.

Coordinating a full-service solution provides huge value to MCE's ratepayers and helps ensure that customers receive comprehensive energy efficiency solutions. At the conclusion of each energy efficiency project, the SPOC conducts a satisfaction survey and can choose from these projects to develop a case study that serves as a learning tool for MCE and a communications tool with potential customers.

Customer Relationship Management System.

Sophisticated Customer Relationship Management (CRM) allows for an ongoing relationship between the property and the program. MCE aims to provide solutions across customer segments that meet customers' needs, budgets, and levels of readiness for change. By providing resource conservation solutions for customers at any level of desired investment, MCE helps ensure a good customer experience. This increases the likelihood that customers who are not early adopters will consider efficient equipment at future key trigger points, such as at times of equipment failure or refinancing.

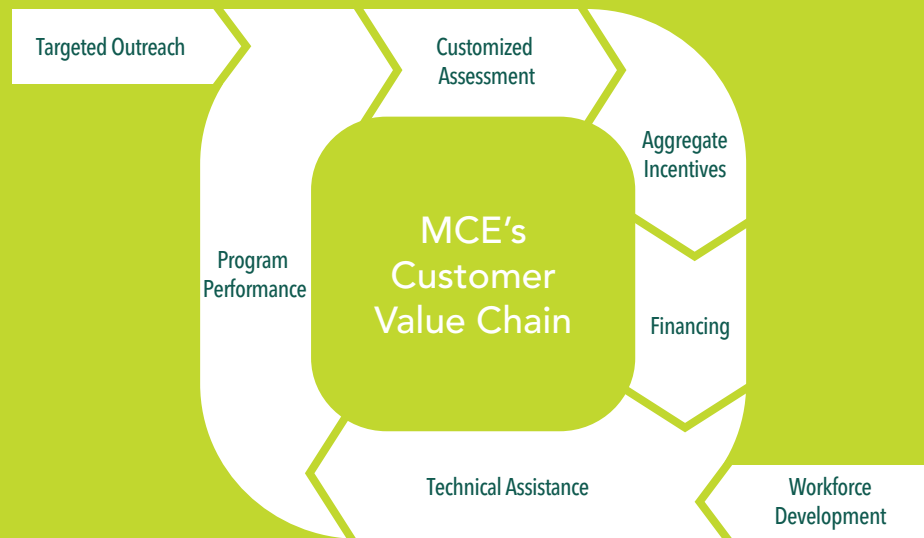
Evolving customer relationships supported by CRM will be key to moving MCE's customers toward ZNE. Sophisticated CRM software allows for an ongoing relationship between the customer and the program by providing a "menu of nudges" based on previous interactions and property knowledge to ultimately move the customer toward ZNE buildings.

Opportunities for future improvements are recorded every time a customer receives an integrated efficiency assessment. If, for example, a customer decides not to take action on a home improvement or replace an inefficient appliance, the energy professional will collect information to support follow-up when the appliance is closer to end-of-life or when a new incentive or technology arises. This allows MCE to rollout new opportunities and programs to "warm" targeted audiences, resulting in stronger customer relationships and increased energy efficiency adoption.

7.2 Customer Value Chain

Excellent customer service is one of the keys to MCE's energy efficiency program. MCE is piloting innovative ways to decrease customer barriers to participation, such as phasing projects with large scopes of work over longer timelines. While MCE is committed to addressing pressing customer needs within their current budget, recording whole building assessments captures opportunities to address further, deeper improvements in the future, especially as new technologies or incentives become available. A SPOC manages the process and provides clear pathways and integrated solutions for customers. The program leverages SmartMeter technology, customer satisfaction surveys, and program performance metrics, creating an instantaneous feedback loop for monitoring success and addressing program issues.

Figure 13. MCE's Customer Value Chain



MCE aims to provide multiple on-ramps for energy efficiency at each step of MCE's value chain for homeowners, multifamily building managers, as well as industrial, agricultural, and commercial business owners. MCE's energy efficiency activities are tailored for each customer segment, but a common underlying value chain describes MCE's key program strategy (Figure 13). MCE's energy efficiency program takes ratepayers from a customized assessment to an implemented solution that informs ongoing program improvement.

- » **Targeted Outreach:** Reach ratepayers through tested channels and in partnership with local organizations. A sophisticated CRM system identifies follow-up opportunities with customers.
- » **Customized Assessment:** Technical assistance providers offer building and property assessments and capture specific opportunities for future improvements in CRM.
- » **Aggregate Incentives:** Provide a one-stop shop for local, regional, statewide, and national rebates and incentives. A SPOC coordinates partner

programs to deliver a complete, tailored solution for the customer.

- » **Financing:** Remove barriers to investment in energy efficiency through low-cost financing.
- » **Technical Assistance:** Select the highest performing and most innovative technical assistance providers through solicitation procedures where appropriate.
- » **Workforce Development:** Partner with local workforce development organizations to provide articulated career pathways with on- and off-ramps based on the participant.
- » **Program Performance:** Evaluate each subprogram for actual energy savings, program performance metrics, market transformation indicators, and participant satisfaction surveys. Advanced Metering Infrastructure (AMI) data informs continuous program improvement. Rebate levels reduce over time, following market trends indicating that financial incentives are no longer needed as motivation to implement specific energy efficiency measures and upgrades. ■

Figure 14. MCE's Market Context





ENERGY EFFICIENCY GUIDING PRINCIPLE: INTEGRATE RESOURCE CONSERVATION SOLUTIONS

At every energy assessment opportunity, MCE presents efficiency solutions that integrate energy, water, and GHG reductions. This makes it easy for customers to adopt integrated resource conservation approaches rather than to have to cull together piecemeal solutions from different partners.

Across the organization, MCE takes a systems-thinking approach to reducing GHG emissions. Energy efficiency programs are considered alongside distributed generation and emerging technologies. Where it can, MCE leverages partnerships to address all operational aspects that affect energy consumption, including water and waste management. The program leverages Smart Meter technology, customer satisfaction surveys, and program performance metrics, creating an instantaneous feedback loop for monitoring success and addressing program issues. MCE partners with local water utility providers, leveraging water utility rebates for hot water and other water conservation energy measures.

MCE's CRM solution supports long-term engagement with its ratepayers. While MCE is committed to addressing pressing customer needs within customers' budgets, recording whole building assessments and audits in a CRM system captures opportunities to address further, deeper improvements in the future, especially as new technologies and incentives become available.

8. SINGLE FAMILY SECTOR

8.1 Introduction

MCE's single family program has a wide range of offerings: from one-off rebates for customers who have financial or structural barriers to incentives and technical assistance for customers who want to upgrade to Zero Net Energy.¹¹ The program also aims to help the highest energy users reduce their consumption with energy management tools. Online tools and real-time feedback on utility reports are emerging tactics that can help influence a household's interaction with energy use.

Motivators for energy efficiency and reductions can differ greatly from household to household. Likewise, each household's budget and readiness for change will also vary. Providing bundled solutions that offer meaningful support for any type of project a customer is considering will increase satisfaction and result in continued energy improvements over time.

Core Activities

- » Provide participants with a Single Family Single Point of Contact (SPOC) to serve as a facilitator and participant advocate, guiding customers through the process from initial contact to project completion.
- » Facilitate access to financing and rebates to help overcome upfront cost barriers.
- » Provide the highest consuming customers with information about how they use energy and advice for how to reduce consumption.

Key Innovations

- » Online portal provides a one-stop-shop to understand energy usage, identify upgrade opportunities, search available rebates and licensed contractors, and perform cost comparisons of energy efficiency appliances.
- » Access to one-off energy efficiency rebates for customers who have financial or structural barriers that prevent them from participating in the Energy Upgrade California: Home Upgrade Program.

¹¹ Zero Net Energy (ZNE) is defined as, "The societal value of energy consumed by the building over the course of a typical year is less than or equal to the societal value of the on-site renewable energy generated." (IEPR Workshop on the Definition of ZNE, July 2013).

- » Additional incentives and technical assistance to educate and enable Zero Net Energy (ZNE) customers to improve their home's efficiency beyond code.
- » Online social networking platforms stimulate behavior changes, utilizing tactics such as competitions and DIY tutorials on a YouTube channel.

Summary Tables

The proposed budget for the first four years of the single family program is as follows:

Table 2. Single Family Program Budget Summary

Budget Category	Year 1	Year 2
Administrative	\$187,526	\$271,789
Marketing	\$265,256	\$217,256
Direct Implementation	\$1,027,046	\$1,287,254
Incentives	\$463,464	\$975,920
Evaluation, Measurement, and Verification (EM&V)	\$75,175	\$108,880
TOTAL	\$2,018,466	\$2,861,099

The expected total resource cost and estimated savings are detailed below:

Table 3. Cost Effectiveness Summary

Sector Summary	Year 1	Year 2
Total Resource Cost (TRC)	1.13	
Budget	\$2,018,466	\$2,861,099
Estimated Net Savings	845,005 kWh 36,644 therms	1,635,911 kWh 101,384 therms

Figure 15. Integrated Program Structure — Single Family

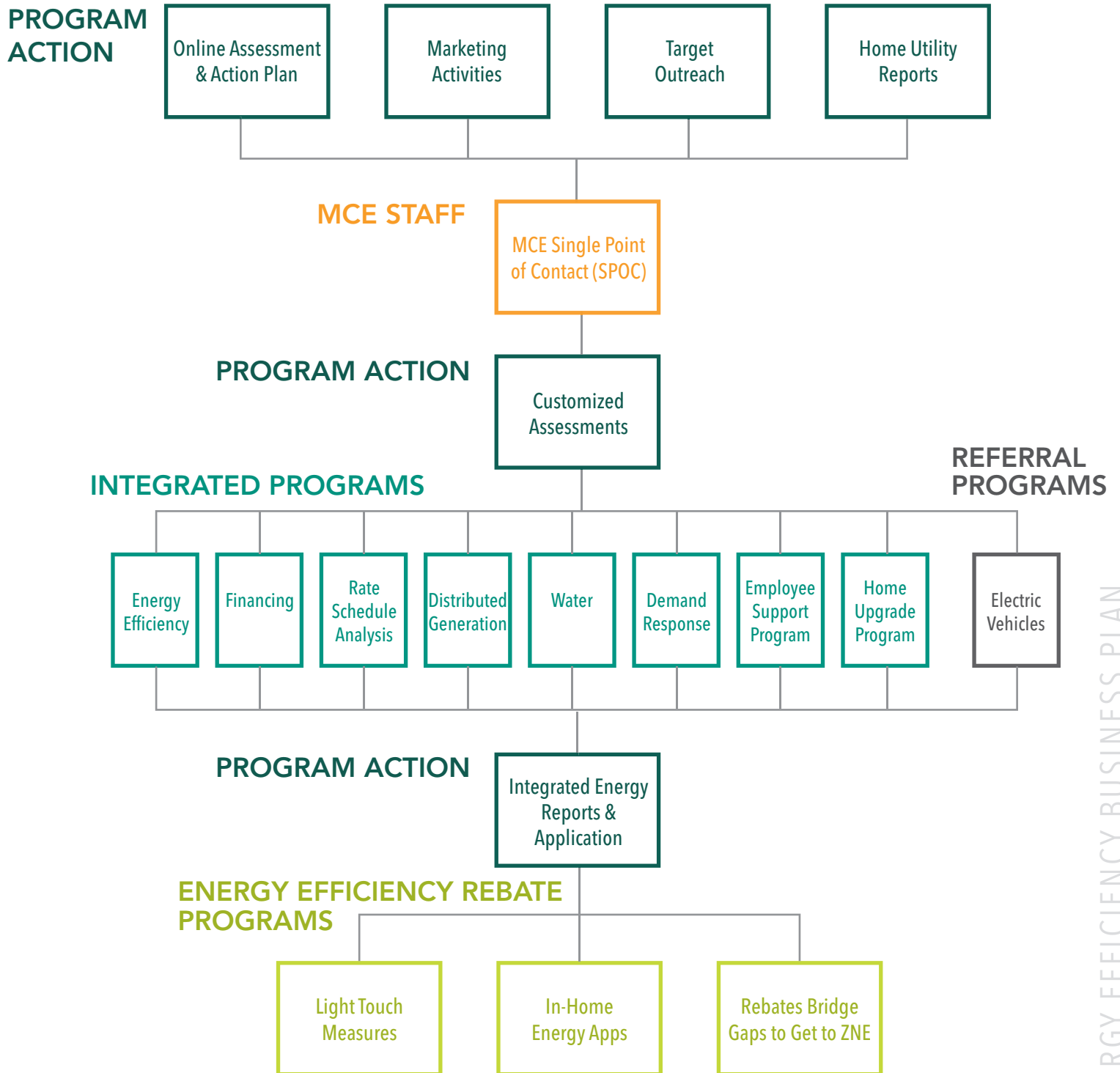
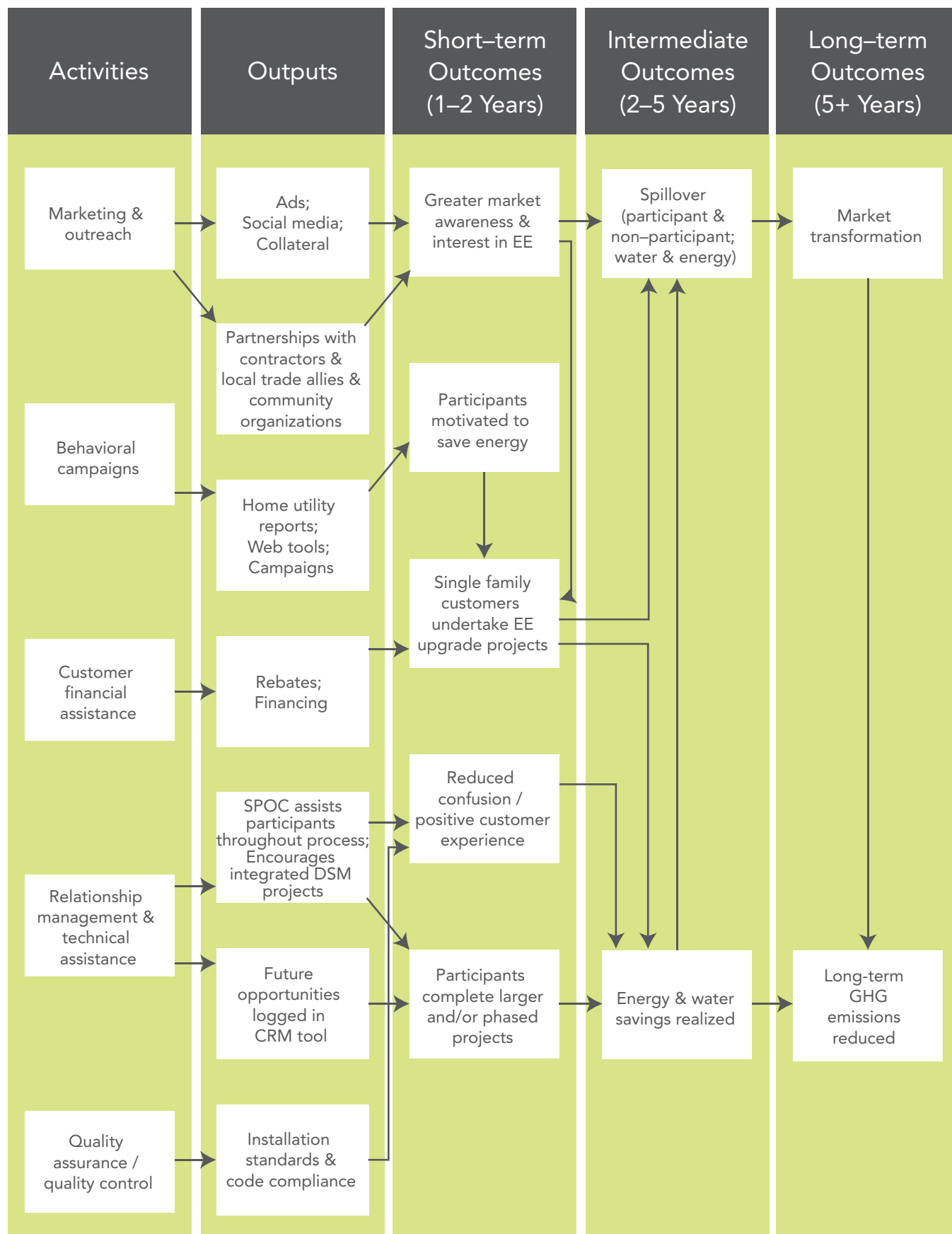


Figure 16. Single Family Program Logic Model



8.2 Gap Analysis and Market Characterization

MCE has analyzed energy consumption, building data, barriers, triggers, key market actors, and energy efficiency adoption to better understand the opportunities that exist within the single family sector.

The main gap in the residential sector is a single access point for customers to coordinate various residential sector program opportunities, actively track and manage EE opportunities in customers' homes, and serve as a guide to help navigate multiple program offerings. MCE's Single Point of Contact (SPOC) approach will bridge that gap by using sophisticated Customer Relationship Management (CRM) tools to track opportunities at the individual home level and guide homeowners through the various programs that are available to them. In doing so, MCE will serve as a trusted source of information and reduce barriers to customers participation in energy efficiency programs.

Additionally, there is a need in the residential sector for customers to better understand how they use energy in their home. Advanced metering technology provides highly detailed and real-time information about energy usage. Programs can couple this information with social science theories on behavior modification to try to influence customers' energy usage habits. MCE proposes a robust web tool that will integrate energy usage information with customer-provided data to develop recommendations. MCE will use their connection to local groups to extensively test this website and provide improvements on an ongoing basis based on customer feedback. This information will also feed into the CRM to help target messaging and advertisement about MCE programs. MCE will explore options for integrating the web tool into home displays, mobile phones, and home automation tools.

Energy Consumption

Single family homes represent the majority of MCE's customer accounts and about half of overall energy usage in MCE's service area. There is significant variety in the single family sector, and developing a program to serve this sector requires research into how energy is used in MCE's service area.

Across MCE's service area, there are substantial differences in electricity consumption per home per year. Marin and Napa Counties have per home electricity consumption that is somewhat higher than the statewide average while El Cerrito, Richmond, San Pablo and Benicia are higher than the statewide average but somewhat lower than the national average.

Statewide, lighting represents the largest share of residential electricity end-use, followed by refrigerators and freezers, then plug loads.¹² For residential natural gas end-use, space and water heating are the largest consumers, followed by cooking. Although they are still emerging on the market, electric vehicles have a significant effect on the electricity consumption of households where they are present.

Plug load is the most difficult end use to control, as there is significant variety among the types of devices that can be plugged into the wall. The United States Environmental Protection Agency labels certain efficient appliances with the Energy Star brand to help consumers navigate purchasing choices. There is large remaining potential in appliances like computers, air conditioners, clothing washers, refrigerators, and other appliances.¹³ The California

12 California Long Term Energy Efficiency Strategic Plan. California Public Utilities Commission. September 2008. Available at <http://www.cpuc.ca.gov/NR/rdonlyres/D4321448-208C-48F9-9F62-1BBB14A8D717/0/EEStrategicPlan.pdf>

13 Adoption of Energy Star Equipment Varies Among Appliances. Energy Information Administration. October 2012. Available at <http://www.eia.gov/todayinenergy/detail.php?id=8370>

Energy Commission (CEC) creates standards for appliance energy use,¹⁴ but can only target a finite number of technologies. Strategies focusing on controlling end uses, for example with automation or information, will be central to managing this fast growing source of consumption.

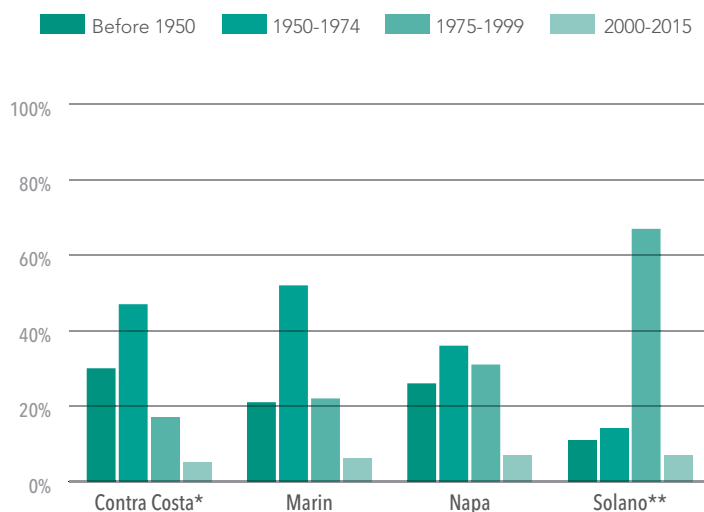
Building Data

The vast majority of the residential building stock in MCE's service area was built between 1950 and 2000, with approximately 50% of the buildings built between 1950 and 1975. The exception is in Benicia where the majority of residential buildings were built between 1975 and 1999 (Figure 17). Title 24 was established in 1978 by the CEC and set regulations regarding energy conservation standards for new residential and new non-residential buildings.¹⁵ The pre-1978 building stock was not built with these conservation standards. Older single family buildings present both for more impactful improvements, but also present a challenge with costs increased for bringing those buildings up to code.

More than half (65%) of homes in Richmond, El Cerrito, and San Pablo are between 800 and 1,600 square feet (Figure 18). Meanwhile, in Benicia, Marin, and Napa, over 50% of homes are greater than 1,600 square feet. This data is used to tailor strategies to target residential consumers across MCE's diverse service area.

Statewide, approximately 60% of households own their homes, with the remaining 40% renting. However, the percentages essentially reverse for low-income households, where

Figure 17. Residential Building Vintage in MCE Service Area

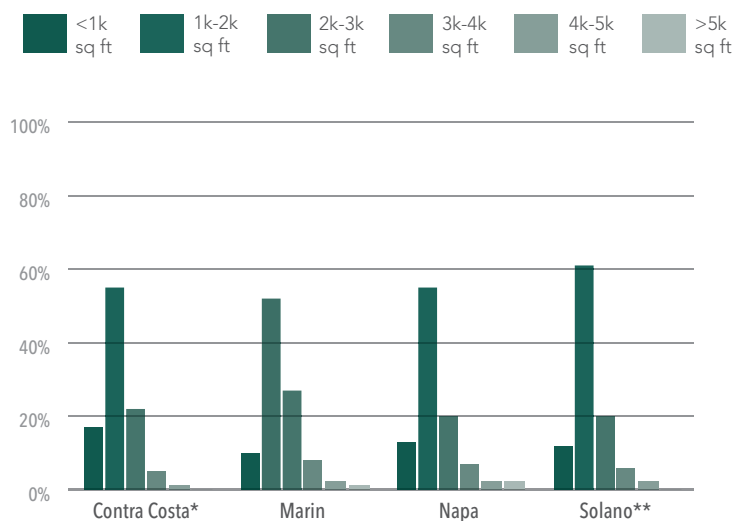


*Richmond, El Cerrito, San Pablo, Walnut Creek and Lafayette

**Benicia

Source: County Assessor Data

Figure 18. Residential Building Size by Service Area



*Richmond, El Cerrito, San Pablo, Walnut Creek and Lafayette

**Benicia

Source: County Assessor Data

14 California Code of Regulations, Title 20. Public Utilities and Energy. California Energy Commission. November 2016.

15 Regulations Establishing Energy Conservation Standards for New Residential and New Nonresidential Buildings. California Energy Commission. Conservation Division. July 26, 1978. Available at http://www.energy.ca.gov/title24/standards_archive/1978_standards/CEC-400-1978-001.PDF

approximately 40% own and 60% rent. MCE's single family program is structured to assist both owners and renters.

Problem Statements

There are several barriers that may prevent the single family customers from fully taking advantage of energy efficiency opportunities. These barriers include:

- » **Financial Constraints.** Customers may not have sufficient funds to cover the costs of upgrades, or may be uncertain as to the length of their tenure in a home. Customers may not be aware of financing options to overcome first cost barriers. Some customers may not qualify for traditional financing tools.
- » **Split Incentive Issues.** In renter-occupied homes, it can be challenging to encourage energy efficiency upgrades when the tenant pays for electricity, but does not own the home. Landlords are not incentivized to invest in efficiency upgrades because the financial benefits will go to the tenant. Tenants are not likely to invest in the property because they lose the value of the upgrades upon move out.
- » **Contractor Limitations.** There are a limited number of contractors with technical knowledge of integrated and comprehensive demand-side management.¹⁶ Additionally, there is the perception among some contractors that rebate programs are time and labor intensive.¹⁷ This poses a significant barrier, as contractors prefer to work outside of existing rebate programs.¹⁸

» **Baseline Challenge.** Since the Title 24 code baseline increased considerably, the opportunities to bring existing buildings above the baseline is expensive. AB 802 (2015) addressed the issue of code baseline but the transition to measuring below code savings will be a learning experience with specific problems to overcome.

» **Lack of Awareness.** Customers may not realize the potential benefits of energy efficiency upgrades in general and the benefits of MCE's program in particular, and may be concerned by the uncertainty in achievable savings. Customers may be overwhelmed by the large number of energy and water programs available.

MCE's single family program is designed to address these barriers by reaching customers at trigger points and offering tailored solutions.

Trigger Points

Trigger points are moments of opportunity when the likelihood of engaging customers in an energy efficiency program is highest. Trigger points for single family customers include:

» **Appliance and Equipment Failure.** Convincing customers to upgrade to more expensive but highly efficient equipment can be challenging to do until the equipment is at or near failure, especially for costly and long-lived equipment. Proactively educating contractors and customers about rebates and incentives can address this barrier. It is also important to make programs easy to access to ensure customers are informed and ready to replace equipment with more efficient alternatives. This also presents an opportunity to expand the energy efficiency savings beyond the replacement of equipment to a larger project.

» **Resident and Owner Turnover.** Periods of change, such as a turnover in renters, or sale of a home,

¹⁶ Energy Upgrade California Home Upgrade Program Process Evaluation 2014–2015. EMI Consulting. September 2016.

¹⁷ *ibid.*

¹⁸ *ibid.*

present an opportunity to perform home retrofits with minimal disruption.

Key Market Actors

There are many entities that influence the single family sector. It is important that MCE understand the role that each entity plays and how this role can affect efforts to promote energy efficiency:

- » **Local Governments.** Local governments set local building and zoning laws, issue permits, and provide information to local residents and property owners. Local governments have a pre-existing relationship with their constituents and are attuned to the community's opportunities, needs, and challenges. MCE is a local government agency and will partner with other local government personnel to conduct outreach to support implementation of its single family program.
- » **Property Owners, Renters, and Home Owners Associations.** Property owners are the primary decision makers and funders of expenditures on home improvements, such as energy efficiency improvements. MCE must engage them in order to accomplish projects and will benefit from building lasting relationships.
- » **Contractors, Builders, Designers, Architects, and Engineers.** Contractors, builders, designers, and architects are key influencers of home owners and make referrals to energy efficiency programs. These key actors often have significant influence over homeowners' decisions regarding the energy efficiency and capital improvements to properties. MCE will provide targeted training opportunities to these players to create a shift in the building industry to better incorporate energy efficient decision making. The design and construction workforce will also be integral to driving participants to the program.

» Retail Stores/Equipment Manufacturers.

Manufacturers and retail stores can use stocking and display practices to influence consumers' purchasing decisions. MCE will work with vendors to optimize these practices for greater adoption of energy efficient equipment.

MCE tracks key market actors in order to identify opportunities and challenges, and the impact of these entities on a customer's energy efficiency decision-making.

Adoption and Penetration

Before implementing single family program strategies, MCE evaluated current adoption and penetration of energy efficiency programs to identify opportunities and determine market gaps. Existing programs fall into four categories: (1) rebate and technical assistance programs; (2) direct install programs; (3) financing programs; and (4) behavioral programs.

- » **Rebate and Technical Assistance Programs.** One of the largest residential energy efficiency efforts in California is the Home Upgrade Program, which operates under the umbrella of the statewide Energy Upgrade California brand. Within Marin County (a subset of MCE's service area), over 230 homes participated in the Home Upgrade program (over 70 basic and over 160 advanced projects) between 2013 and 2015.¹⁹

PG&E reported the following 2013–2014 program savings: 149,983 MWh for Energy Advisor Program, 29,700 MWh for Energy Upgrade California, 7,233 MWh for new construction, and 7,233 MWh for California Advanced Homes program.²⁰ These numbers represent savings recently achieved, which reduce the available energy efficiency

¹⁹ Data from staff at County of Marin.

²⁰ Eestats.cpuc.ca.gov

opportunities in those homes. It's important to note that the data is across all of PG&E's service territory, so is more insightful on relative savings potential than remaining savings opportunities within MCE's service area.²¹

- » **Direct Install Programs.** PG&E currently offers direct install services for single family residences in MCE's service area. The direct install program, which provides youth training and light-touch measures, reached around 5,000 Marin homes between 2006 and 2014. The program can serve as an introduction to the benefits of energy efficiency and can be a gateway to deeper home energy upgrades.
- » **Financing Programs.** Financing can allow homeowners to mitigate the first cost barrier, or the need for significant amounts of capital availability at the beginning of a project, by spreading the cost over time. MCE will facilitate access to Property Assessed Clean Energy (PACE) financing programs and help to ensure PACE providers meet appropriate standards for conduct in its role as PACE administrator in Marin County. Additionally, MCE will help customers access the statewide financing offerings.

During the 2013–2015 program cycle, the CaliforniaFIRST PACE program was authorized in most of MCE's service area. Participation data for Marin shows that there have been 183 residential PACE applications received by the CaliforniaFIRST program, with 58 projects funded and/or under construction (as of Q2 2015).²² There are now five PACE providers authorized within Marin County,

where MCE serves as a lead generator, liaison and impartial advisor in the Open PACE marketplace.²³ MCE is also tracking and supporting the spread of PACE to other jurisdictions within its service area.

- » **Behavioral Programs.** Behavioral programs offer an untapped area of energy conservation activities. While the definition of a behavioral program has been limited in California to energy report style programs, there are many other activities that could be employed to influence energy consumption behavior. Emerging devices that communicate a home's energy usage to a web-based dashboard have increased the ability for homeowners to understand and control their energy usage. Pilot programs have been explored in this area with increasing frequency throughout the past few years in California.

In the past, MCE has offered a sophisticated web-based tool to inspire customers to take action to reduce energy use. Customers could search for contractors, rebates, and financing through MCE's MyEnergyTool.

MCE supplemented its web tool with a schools program in 2013 and 2014, designed to educate youth about energy conservation, using the web tool as supporting material. MCE, in partnership with Strategic Energy Innovations and Planet Ecosystems, Inc., was able to reach 2,025 students through this campaign.

MCE has also explored residential demand response (DR) programs, leveraging existing web technology to streamline access to DR programs. In 2016, MCE's web-based tool was offered on

21 Statewide Residential Programs 2013–2014. California Public Utilities Commission. Available at <http://www.cpuc.ca.gov/NR/rdon-lyres/3DE5A49C-9E9C-4945-AD78-161338282638/0/201314ResidentialFactSheet.pdf>

22 CaliforniaFIRST Activity Summary. July Q2 Report, Marin. Received via email from Jonathan Kevles at Renew Financial.

23 MCE worked with the County of Marin to implement an Open PACE marketplace in Marin. An Open PACE marketplace is a system in which any PACE provider who can agree to a minimum set of best practices is eligible to operate in Marin.

a statewide level by the Statewide Marketing, Education and Outreach program, so the MCE-specific tool was discontinued. In the future, MCE plans to offer a complimentary web-based tool that focuses on customer usage data and integrating DR, renewable energy, electric vehicle and storage offerings while also offering education on energy efficiency. MCE will continue to coordinate with the statewide program.

8.3 Intervention Strategies

MCE's single family program is designed to provide a positive customer experience and drive customer transformation. Program strategies are integrated and delivered in a seamless fashion by a SPOC, who will serve as a facilitator and customer advocate. Non-energy benefits are an important component of each of the strategies. For example, MCE recognizes the importance of benefits such as aesthetics, reduced energy costs, and greater comfort.

Emerging technology platforms provide customers with information and control related to their energy usage. For program administrators, these tools can also allow for a more powerful interaction with the customer. MCE will pair CRM software with home dashboard and data analytics platforms. This will help MCE provide targeted outreach according to demographics and energy savings opportunities and open the door to integration of demand side resources.

MCE proposes to offer the following four program strategies during the next program cycle: (1) rebate and technical assistance strategy; (2) direct install strategy; (3) financing strategy; and (4) behavioral strategy. To help ensure a successful outcome, MCE proposes a phased rollout, focusing first on building up existing programs and high-potential strategies.²⁴

Rebates and Technical Assistance

MCE plans to offer rebates and financial assistance to single family customers in its service area. The MCE single-family sector strategy offers solutions for the widest possible range of customers. For those customers ready to perform significant home upgrades, MCE proposes a comprehensive rebate and technical assistance program. This comprehensive program will include the option to pursue ZNE buildings, with ZNE design assistance and incentive kickers. For customers who are not yet prepared to do a comprehensive retrofit, MCE is offering a more streamlined single measure rebate program. MCE plans to support these programs with accessible and engaging outreach and educational tools available on the web and across the service area.

Single Measure Rebates

Not every residential customer is able or willing to consider a comprehensive upgrade to his or her property. However, providing meaningful rebate solutions for an individual project contributes to a positive customer experience. This offering may be valuable for tenants who do not have decision-making control over measures related to building envelope but still seek to save money on bills.

MCE will offer a suite of one-off rebates for measures including lighting, HVAC, insulation, and efficient appliances. There will be higher rebates for measures that offer benefits across multiple resources (e.g. water-energy measures). MCE's goal is to provide a positive experience to customers who have specific and discrete needs, and to use this entry point to establish an ongoing relationship with the customer. MCE anticipates that, as customers have good experiences with the MCE program, they have a higher likelihood to consider further upgrades down the road. For example, a customer who had a positive experience with an MCE energy

24 High-potential strategies include those for which there is more energy savings opportunity in the MCE service area. For example, there is less new construction overall in MCE's service area, and

hence retrofit programs will be emphasized before new construction.

audit and toilet replacement in the past may turn to MCE for assistance as their HVAC equipment nears replacement.

Comprehensive Retrofit Program

MCE proposes a comprehensive retrofit program that will offer customers a customized audit and rebate package. The focus of this offering is to encourage homeowners to undertake a cost-effective suite of energy efficiency measures. The program will take advantage of the natural trigger point that occurs when a homeowner is renovating their home to encourage energy efficiency through technical assistance, project management, and financial incentives such as rebates and financing.

Zero Net Energy

The California Public Utilities Commission (CPUC) and the CEC have reinforced a commitment to increased development of Zero Net Energy (ZNE) buildings in California. For the purposes of this program offering, a ZNE building is one that annually produces at least as much energy on site as it consumes. To achieve statewide carbon mitigation goals and the goals laid out in AB 758 (2009), ZNE buildings will be crucial. This will require deep retrofits for existing buildings and significant design and technical assistance for new construction.

MCE's approach to ZNE buildings will be two fold. Design assistance will be offered to local area architects and contractors to assist in integration of ZNE strategies at the onset of the project. MCE has the benefit of significant local interest and capacity in the ZNE building realm, and MCE will partner with local organizations to offer technical and design assistance for ZNE retrofits. MCE will also work with these organizations to develop a skilled workforce and advocate for codes and standards that facilitate the implementation of projects. The SPOC will also have a very strong role to play in ZNE projects, as these projects will require multiple demand-side

resources. The SPOC will facilitate applications to multiple funding streams to access renewable energy incentives, EV incentives, and to encourage ZNE projects to also incorporate water saving measures as well.

For ZNE retrofit projects, MCE will offer additional incentives to customers that want to achieve ZNE and are already undertaking home upgrade projects. Incentives will be provided on the basis of percent improvement over the modeled baseline of the home upgrade project. This will be an add-on to the existing comprehensive retrofit program.

ZNE for new construction will primarily involve front-end work with building professionals to ensure the ZNE strategies are integrated at the earliest possible stage of the project. As stated above, MCE will work with local organizations to offer technical and design assistance in accomplishing these projects. Contractors will be required to demonstrate compliance with codes and standards, and may be required to agree to minimum installation standards for specific technologies to ensure proper installation.

Door-to-Door Residential Direct Installation Program

MCE proposes to build on the successful door-to-door residential direct installation campaigns. MCE will emphasize youth vocational services and provide free installation and education for residential households, which will provide benefits to both the customer and the installers. This activity will be co-funded between marketing and outreach as well as direct implementation, and will be used as a lead generation strategy. The direct installation campaigns will introduce residential households to energy conservation and help establish a relationship with the program. MCE will follow up to encourage them to implement more energy savings measures over time.

Financing

MCE's SPOC will help customers navigate the landscape of financing offerings available and encourage them to participate to the extent that it facilitates energy efficiency upgrades.

PACE is a tool where property owners can voluntarily opt into a tax assessment, which is then tied to the property. The main advantage of PACE is the transferability with the property, helping to mitigate concerns over payback period and average tenancy in a residential building. PACE financing also enables investment in renewable energy and water savings improvements, and in some cases can be a source of financing for new construction projects.²⁵

MCE worked with the County of Marin to establish an Open PACE marketplace model.²⁶ MCE will seek to work with other parts of its service area to expand this approach to PACE. Additionally, SPOCs will refer customers directly to PACE providers.

Behavioral Strategy

Behavioral savings are an increasingly important component of energy efficiency programs. No-cost energy efficiency actions may serve as an introduction to energy savings concepts for customers who are not yet ready to invest money in performing energy upgrades. There are also certain energy end uses, such as plug loads that pose significant challenges to traditional rebate programs.²⁷ MCE seeks to expand its existing behavioral program offerings.

School Programs

Based on past experiences with the schools program, MCE has found that working with local schools is an important strategy for educating youth and parents alike about the value and benefits of energy and water conservation. MCE will continue to work with local schools to deliver curriculum based on energy savings. MCE will continue to provide in-class instruction, take home assignments, and presentations during school assemblies in order to raise energy awareness, encourage families to perform online energy assessments, and create energy actions plans. MCE will also seek to provide a platform for competitions between schools or classrooms around energy savings accomplishments.

Home Information and Automation Program

The information and automation strategy aims to empower customers with a deeper understanding of their energy consumption and habits, and provide tools that enable energy savings at a level of engagement that matches the customer's preferences.

The logic behind MCE's information strategy is that knowledge is power, and people are motivated by their peers.²⁸ The home automation element provides a promising way to integrate energy efficiency with other demand-side management resources, and possibly provides avenues for limiting plug load energy use. Providing insights into energy consumption and benchmarking peers against one-another (using web-based tools and home utility reports) is enough to motivate many consumers to take action.²⁹ By employing innovative social norming

25 Some PACE providers utilize SB 555 (2012) as the enabling legislation; this follows the Mello-Roos style assessment (rather than the Streets and Highways Code assessment enabled under AB 811 [2008]), which can be used for new construction.

26 An Open PACE marketplace is a system in which any PACE provider who can agree to a minimum set of best practices is eligible to operate in Marin.

27 Plug Load and Appliances Program Needs and Strategy, March 2013 (available at energydataweb.com).

28 Household Energy Use: Applying Behavioural Economics to Understand Consumer Decision-Making and Behaviour. Elisha R Frederiks, Karen Stenner, Elizabeth V Hobman. Renewable and Sustainable Energy Reviews, Volume 41. January 2015. Pp. 1385–1394. ISSN 1364–0321. Available at: <http://dx.doi.org/10.1016/j.rser.2014.09.026>

29 Household Energy Use: Applying Behavioural Economics to Understand Consumer Decision-Making and Behaviour. Elisha R

and marketing tactics that help people emotionally connect to energy savings and home performance, MCE anticipates effectively motivating customers with its energy efficiency message.

The strategy will offer multiple avenues for educating residential single family customers on how they use energy in their homes and ways they can save energy. The program will offer a web-based energy tool while looking for ways to expand into home automation tools and home dashboard technologies.

The web tool will use publicly available housing data, energy usage information, and any customer-provided data to develop a set of customized energy saving actions. The web tool will also guide users to resources (e.g., rebates, contractors, and financing) that can help them take the recommended actions. MCE will expand upon its current offerings to provide customers with a dashboard to track project progress and participation in other demand management programs (e.g., automated demand response using remotely controllable smart thermostats and load control devices).

MCE will explore options for integrating the web tool into home displays, mobile phones, and home automation tools.

Community Engagement and Gamification

MCE will work closely with community groups and local schools to recruit volunteers for geographically targeted campaigns encouraging households to implement energy saving actions and compete for rewards. This program will use the web tool and utility records to track the progress of groups. Participants will receive newsletters on their progress and competitive standing throughout the campaign.

MCE will also work with local groups taking action to address climate change as a means to keep members engaged throughout the competition. Participants will compete for free energy efficient equipment. Middle and high-school students from participating households will be eligible to participate in a photo and essay contest about their experiences with energy efficiency. The winning entries will be put on display in MCE's energy efficiency demonstration room, the Barbara George Learning Center, and the winning students will receive scholarships.

This platform may also enable group purchasing for the residential sector. Through these campaigns, participating households that would like to pool resources to make a bulk purchase of a certain measure, for example efficient water heaters, may be able to combine purchasing power and receive better costs. MCE will facilitate this aggregated purchasing on behalf of interested community groups.

Metrics Tables (Table 4)

Alongside the other program administrators, MCE developed metrics that connect market barriers to intervention strategies, and that provide near, mid, and long term targets that build towards a 10-year vision. The metrics are based on the framework presented to the Energy Division in August 2016, which emphasized:

- » Usefulness for program administrators to manage portfolio
- » Information on the progress towards achieving desired market effect(s) and strategy effectiveness
- » Reliance on data collected during program implementation and/or data reporting to the CPUC
- » Simple to understand and clear of any subjectivity
- » Emphasis on long-term outcomes

Table 4. Single Family Sector Market Barriers & Metrics

Problem Statement	Market Barriers	Desired Market Effects/ 10-year Vision	Intervention Strategies
Customers lack sufficient funds to cover the costs of upgrades. Customers are not aware of financing options or do not qualify for traditional financing tools	Financial barrier; lack of awareness	Increase in the number of homeowners who are aware of and make use of financing options to help them cover the cost of energy efficient home upgrades	1. Rebates ¹ 2. Education about financing offered by other entities (i.e. PACE)
In renter-occupied homes the homeowner pays for the upgrades but the renter sees the financial benefit on their utility bill resulting in fewer homeowners willing to make the investment in energy efficiency	Split incentive	Increase in the awareness of non-energy benefits of energy efficiency measures (i.e. comfort, light quality, etc.) and the value that has on the rental market	1. Door-to-door direct install provides energy efficiency measures free of cost 2. Behavioral campaigns encourage low-cost and no-cost solutions
There are a limited number of contractors with technical knowledge of integrated and comprehensive demand-side management or above code opportunities	Lack of contractors trained in IDSM and how to meet or exceed code	Increase in the number of contractors who understand the benefits of IDSM and can use that knowledge to sell projects	1. Contractor training
There is a perception among contractors that rebate programs are time and labor intensive	Confusion among contractors about program processes, high administrative burden of participating in programs	Increase participation and decrease customer/contractor confusion	1. SPOC guides customers through various program offerings and supports contractors in selling projects
Energy Efficiency improvements are not as visible as other clean energy strategies, such as rooftop solar panels, and therefore they are not valued as highly by homeowners or prospective home buyers	Low perceived value of energy efficiency measures	Energy efficiency improvements are valued in the real estate market	1. Home information and automation devices to make energy consumption more conspicuous 2. Community engagement and gamification to motivate customers to save energy
Customers are not aware of the potential benefits of energy efficiency upgrades or the availability of MCE's program	Lack of awareness	Increased awareness of MCE's program offerings and financial benefit of energy efficiency upgrades	1. Door-to-door campaigns and community outreach increase awareness of MCE programs 2. SPOC approach tracks opportunities for an individual customer over time
Customers are concerned about uncertainty in achievable savings	Uncertainty in savings	Increased certainty around achievable energy savings	1. Metered energy savings increase accuracy of projected energy savings and validate savings post-installation

Sector Metric	Baseline	Metric Source	Short Term Target (1–3 years)	Mid Term Target (4–7 years)	Long Term Target (8–10 years)
1. Number of completed projects 2. Number of referrals to PACE programs 3. Number of completed projects using PACE financing	1. Program Year 1 (PY1) 2. PY1 3. 2015 Baseline: 128 projects completed in MCE service area using PACE tax assessments	1. Program tracking data 2. Program tracking data 3. PACE providers	1. Increase 10% over PY1 baseline 2. Increase 10% over PY1 baseline 3. Increase 5% over 2015 baseline	1. Increase 20% over PY1 baseline 2. Increase 20% over PY1 baseline 3. Increase 10% over 2015 baseline	1. Increase 30% over PY1 baseline 2. Increase 30% over PY1 baseline 3. Increase 15% over 2015 baseline
1. Number of homes receiving direct install measures 2. Number of customers reached through behavioral campaigns	1. PY1 Participation 2. PY1 Participation	1. Program tracking data 2. Program tracking data	1. 0.1% of homes 2. 2% of residential customers	1. 0.5% of homes 2. 5% of residential customers	1. 1% of homes 2. 10% of residential customers
1. Number of contractors that participate in training	1. 2015 Baseline: 17 contractors attended training	1. Program tracking data	1. 10% increase over 2015 baseline	1. 10% increase over 2015 baseline	1. 10% increase over 2015 baseline
1. Number of repeat participants 2. Number of projects provided with technical assistance 3. Percentage of projects completed with more than one demand side strategy	1. PY1 Participation 2. PY1 Participation 3. PY1 Participation	1. Program tracking data 2. Program tracking data 3. Program tracking data	1. NA 2. 2% of homes 3. 50% of projects	1. 5% of participants 2. 10% of homes 3. 60% of projects	1. 10% of participants 2. 20% of homes 3. 80% of projects
1. Increase in value of energy efficiency retrofits in home sales 2. Participation in community outreach/competitions	1. PY1 Participation 2. PY1 Participation	1. Market study 2. Program tracking data	1. Increase 2% over PY1 baseline 2. 2% of residential customers	1. Increase 5% over PY1 baseline 2. 5% of residential customers	1. Increase 7% over PY1 baseline 2. 10% of residential customers
1. Participation in door to door campaigns and community outreach activities 2. Number of repeat referrals from SPOC	1. PY1 Participation 2. PY1 Participation	1. Program tracking data 2. Program tracking data	1. 2% of residential customers 2. NA	1. 5% of residential customers 2. 5% of participants	1. 10% of residential customers 2. 10% of participants
1. Increased alignment between projected energy saving and metered energy savings	1. PY1 Participation	1. Impact evaluation	1. Realization rate > 75%	1. Realization rate > 80%	1. Realization rate > 90%

8.4 Evaluation, Measurement & Verification

MCE will gather data on participation metrics, savings, and installed measure information as a standard business practice. Additionally, MCE will gather customer satisfaction and SPOC referral metrics, — either on project forms or via a customer survey submitted shortly after project completion. MCE takes an adaptive management approach to continuously evaluate program performance. MCE will use Advanced Metering Infrastructure (AMI) data, customer feedback, participation surveys, among other sources to measure the effectiveness of intervention strategies. This feedback loop enables MCE to make improvements throughout the program cycle. This data will be analyzed to ensure continuous improvement and that program strategies align with customer needs.

Anticipated Study Needs

To supplement any EM&V activities conducted by the CPUC, MCE will undertake an evaluation of its home automation intervention strategies to understand how customers are engaging with the technology, the persistence of the savings generated by the technology and the potential for expanding the application of home automation systems in the future.

In addition, MCE will conduct a cross-sector process evaluation of the SPOC offering to determine to what degree it helps alleviate customer confusion and encourages repeat participation.

8.5 Coordination

Key Partners

MCE will partner closely with other organizations promoting resource conservation, including water districts, climate coalitions, renewable and distributed

generation companies and installers, and electric vehicle companies. MCE will communicate regularly with these entities to ensure that they have access to the latest program information. MCE will facilitate program participants' applications for rebates with these partner agencies and to the extent possible integrate those applications with the MCE application to streamline the participation process.

MCE supports innovative community-based partnerships (such as neighborhood-based or peer-to-peer learning approaches), using the United States Department of Energy's "Tool Kit Framework: Small Town Energy Program".³⁰ This guide highlights models of successful community engagement and serves as a reference manual for running community-based energy programs.

MCE will adjust its partnership strategy throughout the program cycle based on key performance indicators, and customer needs and drivers. MCE constantly seeks new partnership opportunities to help achieve its end goal of deeper energy and greenhouse gas savings.

The partners that MCE will work with in the single family sector include:

» **Building Industry Partners.** MCE will work with builders and contractors to generate referrals. MCE will connect with building industry partners through local organizations and through direct outreach. MCE will partner with local building officials to identify the contractors pulling the most permits in the region, and will conduct targeted outreach to them.

30 Department of Energy. Tool Kit Framework: Small Town Energy Program. Available at <http://energy.gov/eere/better-buildings-neighborhood-program/tool-kit-framework-small-town-energy-program-step>. Accessed August 5, 2015.

- » **Local Governments.** Local governments set local building and zoning laws, issue permits, and provide information to local residents and property owners. Local governments have a pre-existing relationship with their constituents and are attuned to the community's opportunities, needs, and challenges. MCE will partner with local governments to conduct outreach to support implementation of its single family program.
- » **Property Owners and Renters/Home Owners Associations (HOA).** Property owners are the primary decision makers and funders of expenditures on home improvements, such as energy efficiency improvements. MCE must engage them in order to accomplish projects and will benefit from building lasting relationships.
- » **Contractors/Builders/Designers/Architects/Engineers.** Contractors, builders, designers, and architects are key influencers of home owners and make referrals to energy efficiency programs. These key players often hold significant delegated authority regarding the energy efficiency and

capital improvements to properties. MCE will provide targeted training opportunities to these players to create a shift in the building industry to better incorporate energy efficient decision making. They will also be integral to driving participants to the program.

- » **Retail Stores/Equipment Manufacturers.** Manufacturers and retail stores can use stocking and display practices to influence consumers' purchasing decisions. MCE will work with vendors to optimize these practices for greater adoption of energy efficient equipment.
- » **Schools/Community Groups.** Schools and community groups will be key partners in engaging residential customers, especially in regards to behavioral tactics and marketing and education efforts.

Table 5 maps strategies to key partners. It is not intended to be fully comprehensive, but rather, a visual representation. ■

Table 5. Single Family Key Partners

	Information & Automation	Community Engagement	Energy Upgrades	Zero Net Energy	Basic Rebates	Financing
Contractors (HVAC, lighting, etc.)			X	X	X	X
Community Groups	X		X		X	
City and County Organizations	X		X	X	X	X
Business Partners (implementers, software and web tool providers, etc.)	X		X	X	X	X
Schools		X				

9. MULTIFAMILY SECTOR

9.1 Introduction

Multifamily buildings are distinct enough from single family homes to warrant their own program approach. Multifamily programs are often characterized by split incentives because owners commonly bear the investment costs for energy consuming equipment or conservation upgrades while tenants reap the savings. Tenant turnover is also a factor; landlords may be reluctant to disrupt tenants for invasive upgrades, particularly in market rate buildings.

The multifamily program is an area where MCE's flexibility can greatly address participation barriers in tenant/owner situations. MCE takes a phased approach with multifamily upgrades, allowing owners to plan larger projects that take advantage of maximum incentive levels but are implemented over time, as tenants turn over. A combination of light touch, bundled, and customized measures help accommodate the specialized needs of each multifamily building upgrade opportunity.

Core Activities

- » Provide participants with a Multifamily Single Point of Contact (SPOC), who will provide personalized attention, follow-through, and assistance

identifying solutions that meet customers' needs, budget, and levels of readiness for change.

- » Develop an integrated assessment process streamlining multiple program offerings into one customer report.
- » Deploy sophisticated Customer Relationship Management software, allowing for an ongoing relationship between the property and the program.

Key Innovations

- » Integrates energy savings and on-site generation opportunities, allowing property owners to see the full benefit of upgrade projects, rather than isolating opportunities by savings type.
- » Project phasing allows building owners to capitalize on savings for large projects, while completing improvements over time, as tenants turn over.
- » A point-based incentive structure encourages and rewards a more comprehensive scope of work and helps the owner easily identify potential rebates based on planned improvements.

Summary Tables

The proposed budget for the first four years of the multifamily program is as follows.

Table 6. Multifamily Program Budget Summary

Budget Category	Year 1	Year 2
Administrative	\$146,917	\$288,745
Marketing	\$248,743	\$316,993
Direct Implementation	\$ 886,586	\$1,262,815
Incentives	\$286,024	\$1,066,357
Evaluation, Measurement, and Verification (EM&V)	\$58,862	\$115,593
TOTAL	\$1,627,131	\$3,050,503

The expected total resource cost and estimated savings are detailed below:

Table 7. Cost Effectiveness Summary

Sector Summary	Year 1	Year 2
Total Resource Cost (TRC)	1.33	
Budget	\$1,627,131	\$3,050,503
Estimated Net Savings	639,661 kWh 46,234 therms	1,859,560 kWh 154,203 kWh

Figure 19. Integrated Program Structure — Multifamily

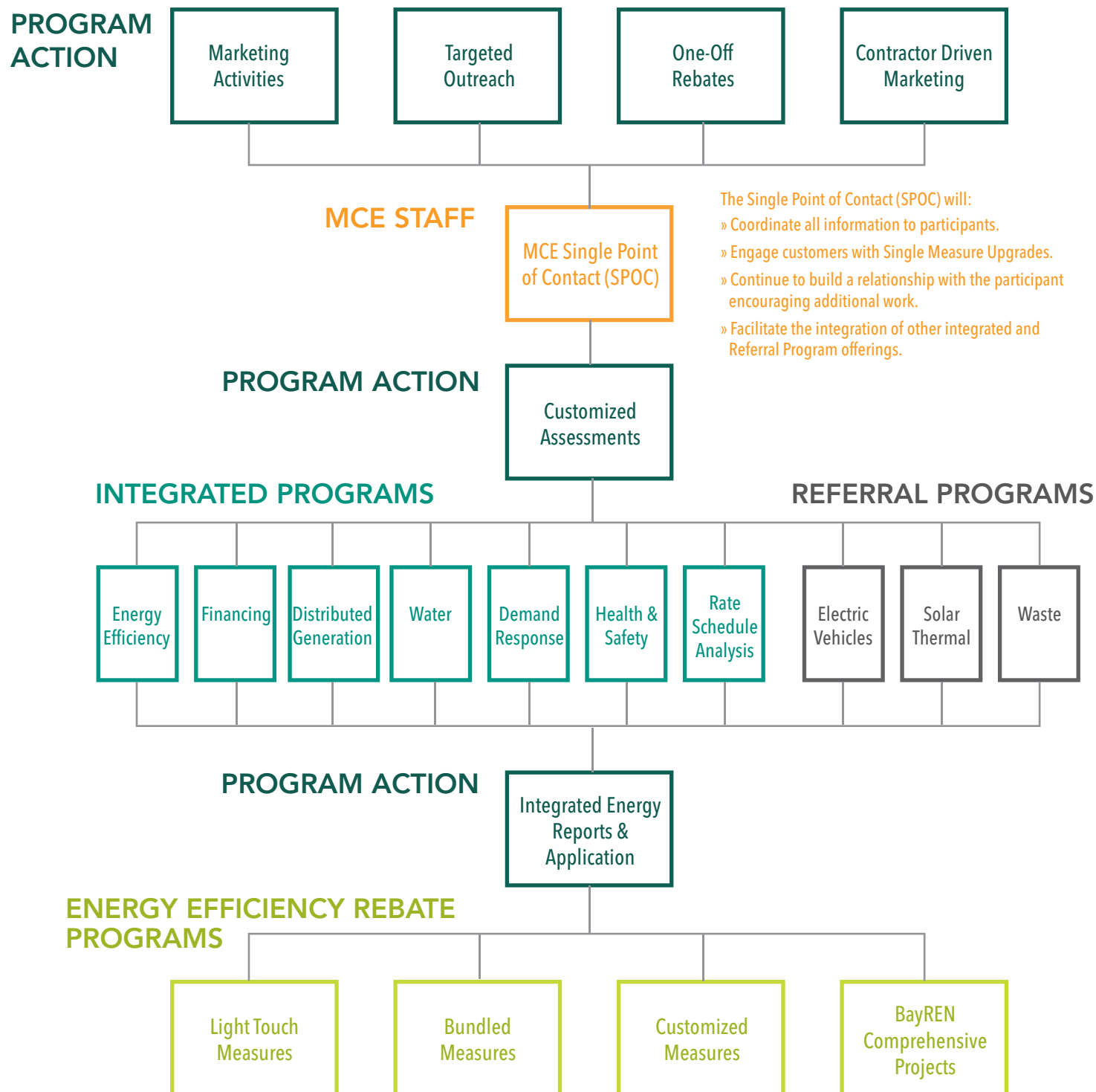
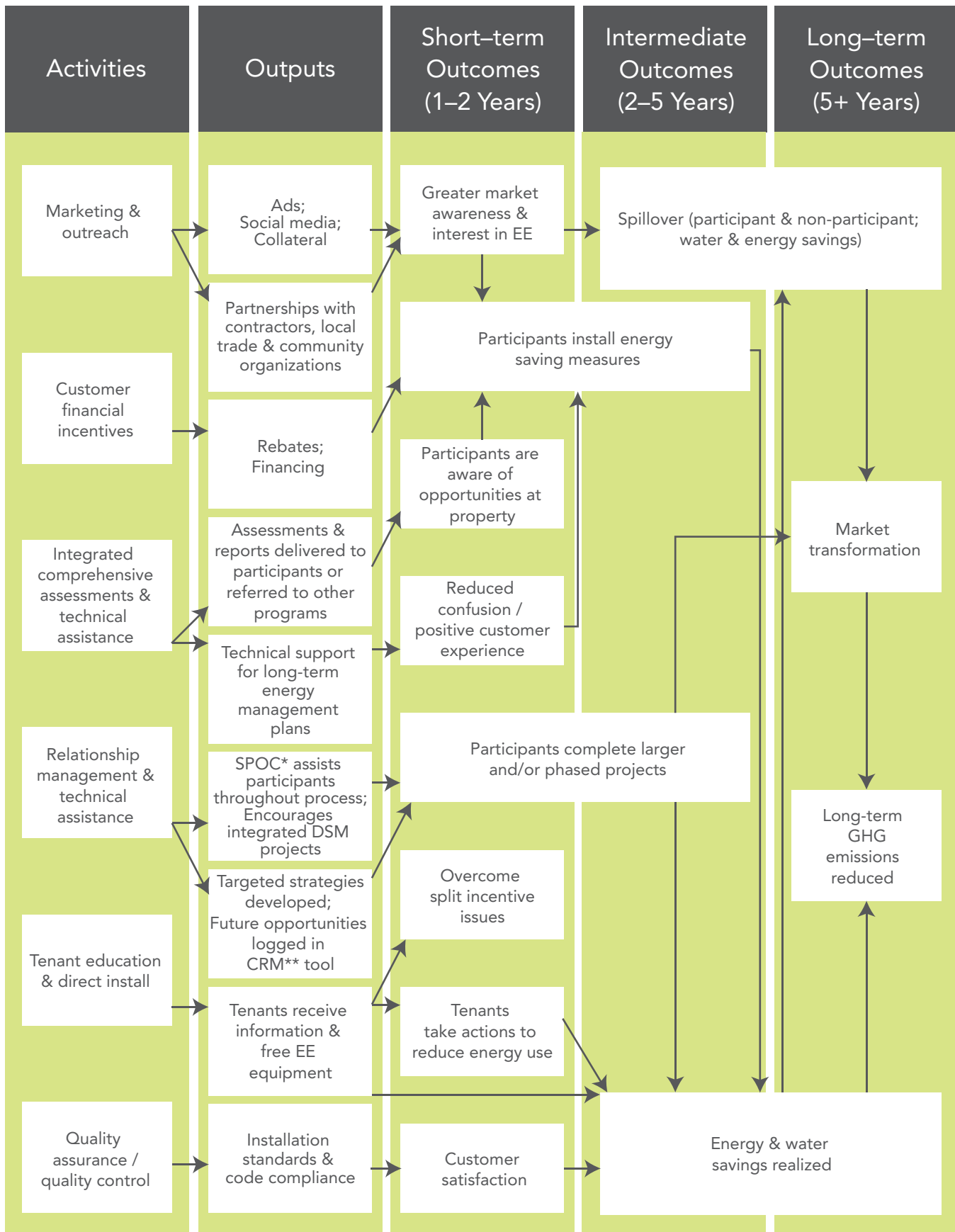


Figure 20. Multifamily Program Logic Model



* SPOC = Single Point of Contact

** CRM = customer relationship management

9.2 Gap Analysis and Market Characterization

MCE recognizes two major issues in the multifamily sector. First, that it is underserved in comparison to its potential,³¹ and second, that programs are not designed to meet the needs of the building owners.³² MCE has addressed both of these issues by designing a completely customizable program based on the needs, goals, and budget of the property or portfolio of properties.

MCE works with property owners and managers to understand their immediate needs and long-term goals, and then structures projects tailored to each customer. MCE also assists customers who are only prepared to initiate a small scope of work develop a long-term, phased scope of work. A Single Point of Contact (SPOC) serves as a facilitator and participant advocate, helping to guide property owners through the process from initial contact to project completion. The SPOC model also allows properties to address other conservation and resiliency opportunities using MCE's resources (technical expertise, rebates, financing, etc.) without having to over extend their own staff, who have many competing priorities.

MCE has removed many of the barriers to participation by providing property owners and managers with technical assistance, project management, incentives for in-unit upgrades, no-cost direct install service, identification of other resource conservation

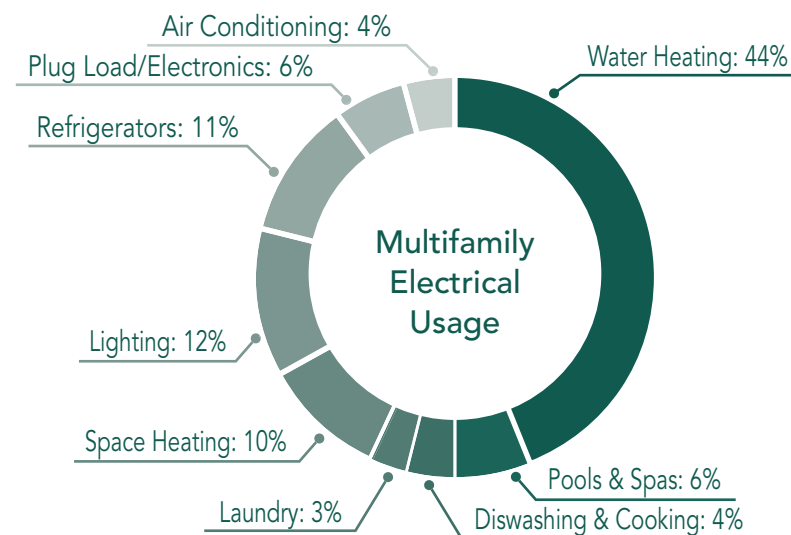
opportunities, and access to technical assistance and rebates to address those opportunities. MCE's multifamily program supports property owners in completing upgrades at unit turnover by providing sliding scale rebates. It also supports phasing projects to accommodate budgets, larger retrofits and long-term planning.

Energy Consumption

The multifamily sector accounts for 11% of building energy use in California and approximately 24% of all residential energy use.³³ Water heating accounts for the largest single end use of electricity in multifamily buildings at 44%, with lighting, space heating, and refrigeration making up another 33% of electrical use in the multifamily sector (Figure 21).

33 Multifamily energy use is representative of all buildings with 2+ units. California Energy Commission, Existing Buildings Energy Efficiency Action Plan (Sept. 2015), pg. 15. Available at http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-05/TN206015_20150904T153548_Existing_Buildings_Energy_Efficiency_Action_Plan.pdf

Figure 21. Electricity Use in Multifamily Building by End Use¹ (2009 RASS)



1 2009 California Residential Appliance Saturation Study. KEMA, Inc. for the California Energy Commission. October 2010. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>

31 Evaluation of the 2004–2005 Partnership for Energy Affordability in Multi-Family Housing Program. KEMA. (2006) p. 3–20. Available at http://www.calmac.org/publications/04-05_Eval_of_Partnership_for_Energy_Affordability_in_MF_Housing_%28ID_1211-04%29.pdf

32 Evaluation of the 2004–2005 Partnership for Energy Affordability in Multi-Family Housing Program. KEMA. (2006) p. 1–12. Available at http://www.calmac.org/publications/04-05_Eval_of_Partnership_for_Energy_Affordability_in_MF_Housing_%28ID_1211-04%29.pdf

Building Data

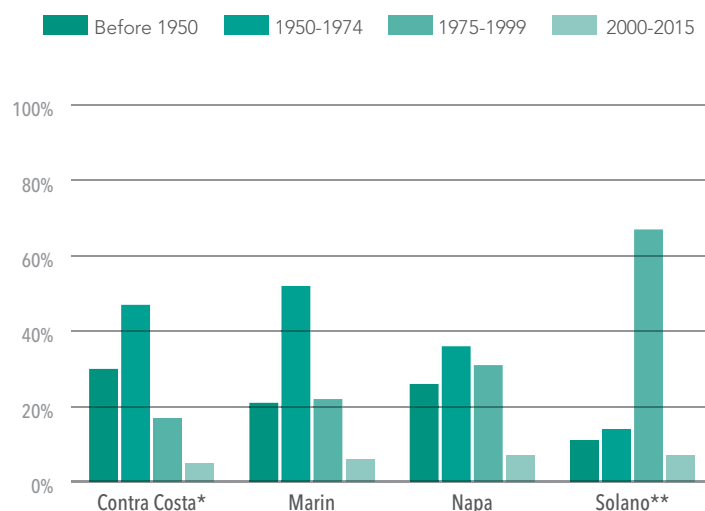
The majority of the residential building stock in MCE's service area was built between 1950 and 2000, with approximately 50% of the buildings being built between 1950 and 1975 (Figure 22). The exception is in Benicia where the majority of residential buildings were built between 1975 and 1999 (Figure 22). Title 24 was established in 1978 by the California Energy Commission (CEC) and set regulations regarding energy conservation standards for new residential and new non-residential buildings.³⁴ The pre-1978 building stock was not built with these set conservation standards. These older buildings present an opportunity for improvements but also a challenge as there will be costs associated with bringing those buildings up to code. The data provided above is not multifamily specific as the county assessor data does not provide that level of information.

MCE's service area is primarily residential, with 88% of its customers on a residential rate schedule. MCE does not have sufficient data to determine what proportion of customers live in multifamily properties.

Affordable Properties. MCE's multifamily program has been serving affordable and income-qualified properties since its inception in 2013. Affordable properties tend to require the most upgrades and lack sufficient resources. When these properties do have access to funds, it tends to be multiple funding streams each with its own constraints. Budgets are typically allocated at least a year in advance.

Public Housing. MCE's multifamily program also serves public housing. As with all multifamily

Figure 22. Residential Building Vintage by Service Area



*includes Cities of El Cerrito, Lafayette, Richmond, San Pablo, and Walnut Creek

**includes City of Benicia

Source: County Assessor Data

properties, public housing has unique characteristics (minimal funding, competing priorities, limited staffing resources and expertise) and requires extensive resources to complete comprehensive retrofits.

Market Rate Properties. MCE's multifamily program includes service to market rate properties (properties that are not deed restricted) as well. The challenges market rate properties experience are the split incentive issue and not wanting to disturb tenants for fear of turnover.

Homeowners Associations. MCE's multifamily program has served a number of homeowners association (HOA) properties. HOA properties have unique challenges, as they have a combination of multifamily and single family characteristics. A Board of Directors usually makes management decisions for common area measures. The HOA Board of Directors tends to get consensus from all owners prior to

34 California Energy commission. Conservation Division. Regulations Establishing Energy Conservation Standards for New Residential and New Nonresidential Buildings. July 26, 1978. Available at http://www.energy.ca.gov/title24/standards_archive/1978_standards/CEC-400-1978-001.PDF, accessed July 15, 2015.

making any decisions about upgrades. This can be a complicated and time intensive process. However, individual owners are often responsible for making upgrades within their units, which requires agreement from each individual property owner.

Problem Statements

There are several barriers that may prevent the multifamily sector from fully taking advantage of energy efficiency opportunities. These barriers include:

- » **Financial Constraints.** Energy-efficient upgrades can be quite costly. Multifamily property owners face difficulty in receiving loans for energy efficiency upgrades, as the risk-adverse underwriting market and lack of existing valuation for energy efficiency upgrades often results in high interest rates.³⁵
- » **Difficulty in Accessing Decision Makers.**³⁶ The majority of large market-rate properties are managed by property management companies. Within the structure of these companies, it can be difficult to communicate with property owners, who are often the primary decision makers on capital improvements spending.
- » **Split Incentive Issue.** The vast majority of multifamily property residents rent the unit they occupy.³⁷ When renters are responsible for paying utility bills, building owners are not incentivized to invest in upgrades from which they will not receive financial benefits.

» **Contractor Limitations.** Based on community feedback that MCE received at a contractor workshop, there is a perception among some contractors that rebate programs are time and labor intensive. Therefore, some contractors give customers an out-of-pocket discount to avoid referring projects to existing rebate programs.

» **Negative Customer Experience.** MCE attended a multifamily property safety meeting in Richmond where participants who participated in other low-income energy efficiency programs provided MCE with negative feedback regarding the quality of those programs, leading to reluctance to participate in MCE's Multifamily Energy Savings Program.

MCE's multifamily program is designed to address these barriers by reaching customers at trigger points and offering tailored solutions.

Trigger Points

Trigger points are moments of opportunity when the likelihood of engaging customers in an energy efficiency program is highest.

For example, there are particular times over the lifetime of a multifamily building when it is most cost effective to make energy efficiency upgrades. MCE will tailor its offerings to capitalize on opportunities such as:

- » Unit turnover
- » Major rehabilitation and renovations
- » Emergency equipment failure
- » And, affordable housing financing and budget cycles

35 Energy Efficiency Financing in California: Needs and Gaps. Harcourt, Brown and Carey, Inc. (2011) p. 24. Available at http://www.harcourtbrown.com/wp-content/uploads/CPUC_FinancingReport_HBC_Jul8v2.pdf

36 2010–2012 Multifamily Property Owner and Operator Study. Cadmus. (2013) p. 21. Available at http://www.calmac.org/publications/Multifamily_Property_Owners_and_Managers_GEN_POP_FINAL_130415.pdf

37 "Overlooked and Untapped: Unlocking the Energy-Efficiency Potential in Multifamily Housing." Benningfield Group. 2010.

Additionally, MCE will use upcoming or anticipated changes in codes, standards, and regulations as a trigger point to motivate multifamily customers to act on resource conservation.

MCE's objective is to utilize these trigger points to effectively engage customers in energy efficiency measures. To achieve this, MCE must identify and understand the entities that influence this sector.

Key Market Actors

There are many entities that influence the multifamily sector. It is important that MCE understands the role that each entity plays and how this can affect efforts to promote energy efficiency.

- » **Local Governments.** Local governments set local building and zoning laws, issue building permits, influence affordable housing policies, and provide information to local residents and property owners. Local governments have a pre-existing relationship with their constituents and are attuned to the community's opportunities, needs, and challenges.
- » **Property Owners and Developers, Home Owners Associations, and Property Management Companies.** Property owners are the primary decision makers and funders of capital improvements. Working with owners to implement upgrades over a portfolio of properties will support deeper upgrades through the development of long-term plans. Property managers, facility managers, and property management companies are the "boots on the ground" for replacement and maintenance of capital equipment. These key players are integral to the success of MCE's multifamily sector offerings. MCE will engage them in order to accomplish projects and will endeavor to build lasting relationships.
- » **Contractors, Builders, Designers, Architects, and Engineers.** Contractors, builders, designers,

architects, and engineers are important influencers of building owners and operators and are crucial to making referrals to energy efficiency programs. These key players often hold significant authority regarding the energy efficiency and capital improvements to properties. MCE will provide targeted workforce opportunities to these individuals to create a shift in the building industry to better incorporate energy efficient decision making.

MCE tracks key market actors in order to identify opportunities and challenges, and the impact of these entities on a customer's energy efficiency decision making.

Adoption and Penetration

Before developing multifamily program strategies, MCE evaluated current adoption and penetration of energy efficiency programs to identify opportunities and determine market gaps.

In the 2010–2012 program cycle, PG&E programs saved approximately 17 GWh and just under 2 MMTh in the multifamily sector.³⁸ The vast majority of the electricity savings came from indoor lighting, with much smaller savings coming from HVAC, appliances, and water heating. On the gas side, water heating generated the greatest savings, with HVAC and appliances contributing smaller savings figures.

According to MCE's internal tracking system, the multifamily program has provided technical assistance to more than 4,621 units and has completed upgrades in over 1,900 units over three years. The program has achieved the greatest savings from domestic hot water measures, pool pumps and lighting.

38 "California Energy Efficiency Statistics," accessed July 9, 2015, <http://eestats.cpuc.ca.gov/Views/EEDataPortal.aspx>

In addition to the energy efficiency programs administered under California Public Utilities Code Section 381.1, there are also energy efficiency programs available to the low income sector. The Energy Savings Assistance Program (ESAP) is administered in MCE's service area by PG&E. The ESAP provides free installation of energy saving equipment and performs energy upgrades at no cost to program participants. To qualify for these services, household incomes must be at or under 200% of the federal poverty level.

In program years 2007–2012, PG&E provided ESAP services to 81,555 participants, or 21% of the eligible population.³⁹ Information for program year 2010–2012 shows that of 58,877 multifamily households served through the ESAP, the most commonly installed measures were lighting (89% of households received lighting), domestic hot water (84%), and building envelope and air sealing (82%).⁴⁰ Other measure categories included appliance replacement: primarily refrigerators (14%), cooling equipment (14%), and heating equipment (1%).⁴¹

At the November 10, 2016 California Public Utilities Commission voting meeting, MCE's proposal for the Low Income Families and Tenants pilot (LIFT) was approved.⁴² MCE will run the LIFT pilot for two years with a budget of \$3.5 million. MCE will layer additional rebates onto multifamily projects at affordable properties that complete in-unit upgrades. Other objectives will include a heat pump pilot, resident education, referrals to the Low Income Weatherization Program (which provides rebates for solar systems), and to enroll properties in MCE's on-bill repayment financing program at a reduced interest rate.

9.3 Intervention Strategies

The multifamily program is an area where MCE's flexibility can greatly reduce participation barriers in tenant/owner situations. MCE takes a phased approach with multifamily upgrades, allowing owners to plan larger projects that take advantage of maximum incentive levels but are implemented over time, as tenants turn over. A combination of light-touch, bundled, and customized measures help accommodate the specialized needs of each multifamily building upgrade opportunity.

Based on the sector analysis, MCE will implement the following multifamily program offerings.

Combined Measure Incentives

The combined measure incentive program provides free technical assistance to property participants, including an initial on-site assessment, help in soliciting contractors, project management oversight, and post-project installation verification. Under this program, participants will need to complete at least two measures and incentives are offered on a per unit basis, with incentives increasing based on the depth of the project. If upgrades will be completed over a longer period of time, MCE will support project phasing; however, MCE will require monthly progress updates in order to continue to reserve rebates for a project with an extended completion schedule.

Single Measure Incentives

MCE will offer rebates on single measures to get properties engaged with its program. Examples of single measures would be small lighting projects, appliance replacements in 50% or less of units, window replacements, and pool pump replacements. These single measure rebates allow properties to complete smaller, cost-effective energy savings upgrades with little to no tenant disruption. This approach is intended to address an immediate need or a specific problem at the property. By meeting the

39 Energy Savings Assistance Program Multifamily Segment Study, Volume 1: Report. Cadmus, 2013. P.58.

40 Ibid, p.62.

41 Ibid.

42 D 16.11.002, CPUC.

immediate need and solving a specific problem, MCE hopes to provide a positive customer experience which will result in repeat participation and achieving deeper retrofits.

In-Unit Direct Install Service

MCE will offer a no-cost direct install service to multifamily properties in its service area. Representatives of MCE will install measures such as LEDs and high performance faucet aerators and showerheads in participating units. This service will be offered in two formats:

- » As a stand-alone offering for tenants who would like to upgrade their energy and water saving equipment.
- » As part of a larger combined measure project scope at the request of the property owner or manager.

The direct install service is also a component of MCE's workforce development program. MCE will partner with local workforce development organizations to provide outreach and equipment installation trainings to develop a pool of installers. In addition to installing equipment, direct install team members will educate tenants on energy and water conservation, the equipment being installed, and any larger upgrades being undertaken at the property.

Unit Turnover Program

MCE has found that property owners and managers are more willing to invest in energy efficient upgrades in tenant units when the unit is vacant. Thus, MCE has begun piloting a process to help property managers schedule in-unit upgrades at the time of unit turnover. Normally, a property would be required to do in-unit upgrades in at least 75% of units to be eligible for in-unit measure incentives under the combined measure rebate offering. However, MCE will work with property owners who commit to a

phased schedule to pay out incentives incrementally as units are upgraded.

Retrocommissioning and Maintenance Education Programs

In order to support ongoing energy savings beyond equipment replacement or retrofit, MCE will offer support for property managers to develop long-term energy management plans. These plans will achieve energy savings and help ensure persistence of previously realized savings. Strategies employed under this offering could include incentives for retrocommissioning and operations and maintenance training for building staff.

Zero Net Energy

The California Public Utilities Commission (CPUC) and the CEC have reinforced a commitment to increased development of Zero Net Energy (ZNE) buildings in California. For the purposes of this program offering, MCE defines a ZNE building as one that annually produces at least as much energy on site as it consumes. To achieve statewide carbon mitigation goals, ZNE buildings will be crucial, and deep retrofits for existing buildings will be necessary. Significant design and technical assistance will be required to help new construction reach ZNE goals. MCE will offer additional incentives and technical assistance to multifamily properties that are interested in reducing their energy consumption to the point that they could reasonably offset their full load with a combination of deep retrofits and on-site generation.

A significant part of this offering will be outreach and education about the value of ZNE to generate interest within the multifamily sector and to ensure that there is a robust trained network of professionals. MCE will work with ZNE and passive house advocates and local governments to advocate for codes and standards that will facilitate successful development of ZNE projects.

Tenant Education Strategies

MCE will develop an online platform that is specifically for tenants. The platform will provide how-to and do-it-yourself resources aimed specifically at renters, as well as resources to provide property managers or owners with information on MCE's rebate offerings to support property-wide upgrades.

MCE will explore opportunities to integrate the platform with home automation devices and programmable thermostats, enabling tenants to participate in emerging residential side demand response programs and take advantage of time-of-use rates. The SPOC will facilitate access to these programs where appropriate.

Data Access

MCE uses a portfolio manager dashboard to assist multifamily properties and portfolios of properties in accessing their energy and water data. The dashboard allows properties to better understand their usage and identify potential issues and opportunities. MCE is able to support properties in addressing these issues by connecting properties to necessary resources.

Financing

MCE will help customers navigate the landscape of available financing offerings and encourage them to participate to the extent that it facilitates energy efficiency upgrades. Financing structures can possibly stimulate investment where the split incentive would otherwise present a barrier. Specific financing strategies are described below.

» Green Property Loans

This on-bill repayment option provides eligible customers with a low interest loan they can repay on their monthly utility bill. The program is a public/private partnership between MCE and River City Bank. MCE has set aside ratepayer funds to

serve as a loan loss reserve, which will cover any losses the bank incurs on a portfolio of loans up to 20% of the value of the total portfolio. In exchange, the bank has agreed to a lower interest rate. The loan terms and conditions are detailed below.

Table 8. Terms of MCE's Green Property Loan

Interest Rate	5% APR
Loan Terms	5–10 years
Security	UCC–1 Fixture Filing
Eligible Projects	Multifamily properties participating in an MCE rebate program

» Property Assessed Clean Energy

Property Assessed Clean Energy (PACE) is a tool where property owners can voluntarily opt into a tax assessment, which is then tied to the property. Advantages of PACE include transferability with the property, helping to mitigate concerns over the payback period and average tenancy in a building, and the fact that it is paid on property taxes. PACE financing also enables investment in renewable energy and water savings improvements, and in some cases can be a source of financing for new construction projects.⁴³

Currently MCE and the County of Marin have established an Open Market PACE model, where any provider who can agree to a minimum set of best practices is eligible to operate in Marin. MCE will seek to work with other parts of its service area to expand this approach to PACE. SPOCs will refer customers to PACE providers if the customer is interested in this option.

⁴³ Some PACE providers utilize SB 555 (2012) as the enabling legislation; this follows the Mello–Roos style assessment (rather than the Streets and Highways Code assessment enabled under AB 811 [2008]), which can be used for new construction.

» **Bay Area Multifamily Capital Advance Program**

The Bay Area Multifamily Capital Advance Program (BAMCAP) is offered by BayREN and provides loan capital at 0% interest to a lender of choice, which means participants only pay interest on the loan capital supplied by the lender. For example, if the lender approves their portion of the energy efficiency loan at 7% interest rate, BAMCAP provides half of the capital at 0%, the combined interest rate on the loan would be 3.5%. The program's share of the financing is limited to no more than 50% of the cost of the approved scope of work minus any program incentives.

In addition, the share of the financing is up to \$5,000 per unit or \$500,000 per project, whichever is less.

Metrics Tables (Table 9)

Alongside the other program administrators, MCE developed metrics that connect market barriers to intervention strategies, and that provide near, mid, and long term targets that build towards a 10-year vision. The metrics are based on the framework presented to the Energy Division in August 2016, which emphasized:

- » Usefulness for program administrators to manage portfolio
- » Information on the progress towards achieving desired market effect(s) and strategy effectiveness
- » Reliance on data collected during program implementation and/or data reporting to CPUC
- » Simple to understand and clear of any subjectivity
- » Emphasis on long-term outcomes

9.4 Evaluation, Measurement & Verification

MCE will track metrics for measurement and verification (M&V) but will need to conduct Evaluation, Measurement, and Verification (EM&V) to gain richer insights through process and impact evaluations including two specific study proposals discussed below.

Anticipated Study Needs

MCE will undertake a process evaluation at the end of year two of the unit turnover strategy. The evaluation will explore the extent to which the phased approach helps property owners commit to larger projects and the expected rate of tenant turnover in participating properties. Based on the findings, the evaluation will offer recommendations about program continuation and recommendations for improvement.

Additionally, MCE will conduct a cross-program process evaluation of the SPOC offering to determine to what degree it helps alleviate customer confusion and encourages repeat participation through project phasing.

9.5 Coordination

MCE is an independent Program Administrator operating within PG&E's service territory and overlapping Bay Area Regional Energy's service territory. Coordination among different programs will be important to minimize customer and contractor confusion while also achieving program objectives.

As part of the SPOC model, MCE will partner closely with other organizations promoting resource conservation, including water districts, climate coalitions, renewable and distributed generation companies and installers, and electric vehicle technology companies. MCE will communicate

Table 9. Multifamily Sector Market Barriers & Metrics

Problem Statement	Market Barriers	Desired Market Effects/10-year Vision	Intervention Strategies
Energy efficiency upgrades can be costly	Lack of capital and willingness to incur financing	Energy efficiency becomes the norm (7% increase over 2016 baseline)	1. Educate property owners on the value of energy efficiency upgrades ¹ 2. Work with properties to develop long-term scope of work that fits into capital improvement plans 3. Develop programs that address entire portfolios
Energy efficiency upgrades can be costly ²	Risk adverse underwriting and high-interest loans	Financing programs that meet the needs of property owners opposed to financial institutions (5% increase over 2016 baseline)	1. Work with partners to design financing programs that meet the needs of properties ³ 2. Partner with existing financing programs to educate properties on their options
Affordable properties and HOAs have multiple owners and complex operating structures requiring time—consuming coordination to get buy-in, consensus and sign-off for individual measures and large-scale projects	It is difficult to access decision makers	MCE is the first point of contact for property owners considering upgrades (7% increase over 2016 baseline)	1. Partner with trusted entities already working with properties ⁴ 2. Leverage existing relationships for introductions to other decision makers ⁵ 3. Targeted outreach to decision makers ⁶
Market rate property owners are more likely to complete common area measures than resident unit upgrades ⁷	Property owners are hesitant to disturb or displace residents and risk loss of income	Energy efficiency improvements are valued and desired by renters (7% increase over 2016 baseline)	1. Develop a long-term plan to upgrade units at turnover using a sliding scale incentive 2. Resident energy efficiency certificate program
Renters are typically responsible for paying their own utility bill, disincentivizing owners from paying for in-unit upgrades ⁸	Split-incentive issue	Energy efficiency improvements are valued and desired by renters (7% increase over 2016 baseline)	1. Stand alone direct install program 2. Resident energy efficiency certificate program 3. Cost-share direct install program for in-unit measures 4. Higher incentives for in-unit measures paid for by owners ⁹
Contractors perceive rebate programs to be time and labor intensive ¹⁰	High transaction cost of engaging with complex rebate programs	Contractors incorporate energy efficiency measures into all proposals and MCE is their first point of contact for rebate programs (7% increase over 2016 baseline)	1. Establish a contractor advisory committee to help design and champion program offerings ¹¹ 2. Develop feedback loops for contractor input on processes and systems 3. Work with manufacturers to train contractors on new technologies
Properties are reluctant to participate in current programs based on past experiences being negative ¹²	Property owners’/ managers’ perception of rebate programs	MCE is the first point of contact for property owners considering upgrades (7% increase over 2016 baseline)	1. Add more resources offerings to the SPOC program 2. SPOC will build and maintain long-term relationships with property owners and managers ¹³ 3. Provide opportunities for properties to experience MCE’s program without having to make a long-term commitment

Sector Metric	Baseline	Metric Source	Short Term Target (1–3 years)	Mid Term Target (4–7 years)	Long Term Target (8–10 years)
1. Number of properties completing assessments 2. Number of properties that complete multiple projects over multiple years 3. Dollar amount of rebates given at the portfolio level	2016 baseline	Program tracking data	Increase 2% over baseline	Increase 5% over baseline	Increase 7% over baseline
1. Number of loans disbursed 2. Increase in number of referrals to other financing programs	2016 baseline	Program tracking data	Increase 1% over baseline	Increase 3% over baseline	Increase 5% over baseline
1. Number of properties brought in by trusted partners 2. Number of projects from referrals 3. Number of meetings/presentations to decision makers	2016 baseline	Program tracking data	Increase 2% over baseline	Increase 5% over baseline	Increase 7% over baseline
1. Percentage of market rate property owners completing common and in-unit measures 2. Number residents receiving certifications	2016 baseline	Program tracking data	Increase 2% over baseline	Increase 5% over baseline	Increase 7% over baseline
1. Number of units served 2. Number of units receiving in-unit upgrades where resident pays utility bill 3. Number of units served 4. Number of units receiving upgrades (not including DI)	Determine baseline from PY1 data	Program tracking data	Increase 2% over baseline	Increase 5% over baseline	Increase 7% over baseline
1. Number of unique contractors on the advisory committee 2. Number of project referrals from contractors 3. Number of contractors participating in trainings	Determine baseline from PY1 data	Program tracking data	Increase 2% over baseline	Increase 5% over baseline	Increase 7% over baseline
1. Number of referrals to other resource/ rebate programs 2. Number of properties completing multiple projects 3. Number of properties phasing upgrades	2016 baseline	Program tracking data	Increase 2% over baseline	Increase 5% over baseline	Increase 7% over baseline

- 1 Center for Sustainable Energy. Energy Upgrade California: Marketing Plan 2013-2014 pg 49.
- 2 Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 12. Available at CEC.com/laladoc.
- 3 Casey J. Bell, Stephanie Sienkowski, and Sameer Kwatra, "Financing for Multi Tenant Building Efficiency: Why this Market is Underserved and What Can be done to Reach It," Washington, D.C.: ACEEE, 2013. Pg. iii.
- 4 Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 66. Available at CEC.com/laladoc.
- 5 Energy Upgrade CA Marketing Plan 2013-2014. Center for Sustainable Energy. (2013) p. 97. Available at www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6091
- 6 Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 58. Available at CEC.com/laladoc.
- 7 Financing for Multi Tenant Building Efficiency: Why this Market is Underserved and What Can be done to Reach It. Casey J. Bell, Stephanie Sienkowski, and Sameer Kwatra. (2013) Pg. iii.
- 8 Overlooked and Untapped: Unlocking the Energy Efficiency Potential in Multifamily Housing. Benningfield Group. (2010). Available at http://in-online.co/wp-content/uploads/2015/02/BenningfieldGroup_Brochure_9-FINAL.pdf
- 9 Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 17. Available at CEC.com/laladoc.
- 10 Feedback form a Contractor Workshop held in 2014 by MCE, Marin County Energy Watch and PG&E.
- 11 Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 63. Available at CEC.com/laladoc.
- 12 Feedback from Richmond property managers at a 2013 Richmond Safety Meeting.
- 13 Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 67. Available at CEC.com/laladoc.

regularly with these entities to ensure that they have the latest program information.

MCE will facilitate program participants' applications for rebates with these partner agencies and to the extent possible integrate those applications with the MCE application to streamline customer participation in multiple programs.

Key Partners

MCE will adjust its partnership strategy throughout the program cycle based on key performance indicators and customer needs and drivers. MCE constantly seeks new partnership opportunities to help achieve its end goal of deeper energy and greenhouse gas savings.

Some of the key partners include:

- » **Building Industry Partners.** MCE will work with builders and contractors to generate referrals. MCE will connect with building industry partners through local organizations and through direct outreach. MCE will partner with local building officials to identify the contractors pulling the most permits

in the region, and will conduct targeted outreach to them.

- » **Technical Assistance Providers, Raters, and Inspectors.** MCE will conduct outreach to educate technical assistance providers, raters, and inspectors for project referrals. MCE will work with professional organizations such as the Building Performance Institute to identify trained professionals in its service area, and will use this information to reach out to professionals and ensure they are aware of the MCE program offerings. MCE will also use these channels to communicate the availability of specific incentives including a referral bonus for completed projects.
- » **Energy Services Company/Tax Credit Allocation Committee/Housing & Urban Development.** MCE will work with Energy Services Companies, the Tax Credit Allocation Committee providers, and the Department of Housing and Urban Development to ensure affordable housing developers are aware of MCE's multifamily program offerings. MCE will leverage the LIFT pilot funding for eligible properties to provide additional incentives and energy savings for income qualified customers.

10. INDUSTRIAL SECTOR

10.1 Introduction

Dollar savings from energy efficiency are significant for some industrial customers. A key consideration for these customers is the need to ensure that reduced energy use does not affect the timing, quality, or workforce efficiency of creating their product. Industrial activities vary significantly by region within MCE's area, though most offer major opportunities for energy use reduction, water conservation, and distributed generation.

The high-intensity energy demand of food production qualifies many of MCE's agricultural customers that process on-site as "industrial" ratepayers. Thus, in some cases MCE's industrial program is designed to serve both manufacturing and refinery facilities as well as some large agricultural producers.

MCE's industrial program is designed to serve all types of industrial customers. The program acknowledges inherent differences in opportunities between the myriad types and sizes of facilities, and emphasizes integrating diverse program offerings under one umbrella. The program focuses on customer satisfaction and repeat engagement to drive towards greater GHG reduction, and ultimately driving toward customer transformation.

Core Activities

- » Provide participants with an Industrial Single Point of Contact (SPOC) to serve as a facilitator and customer advocate and to help guide business owners through the process from initial contact to project completion.
- » Offer financing and rebates to help overcome upfront cost barriers.
- » Offer technical assistance to help with measure selection, project planning, and project management.
- » Use billing data and building characteristics to identify the highest energy users for targeted outreach.
- » Utilize one-off or widget rebates as a marketing strategy to get customers in the door.

Key Innovations

- » Promote energy efficient industries by partnering with existing Green Certification Programs.
- » Leverage peer advisory groups to offer training within a particular industry and share best practices.

- » Offer pay-for-performance incentives.
- » Promote strategic and continuous energy improvement.

Summary Tables

The proposed budget for the first four years of the multifamily program is as follows.

Table 11. Industrial Program Budget Summary

Budget Category	Year 1	Year 2
Administrative	\$97,782	\$101,289
Marketing	\$110,902	\$110,902
Direct Implementation	\$497,945	\$497,945
Incentives	\$289,780	\$517,564
Evaluation, Measurement, and Verification (EM&V)	\$45,893	\$49,588
TOTAL	\$1,042,302	\$1,277,288

The expected total resource cost and estimated savings are detailed below:

Table 12. Cost Effectiveness Summary

Sector Summary	Year 1	Year 2
Total Resource Cost (TRC)	1.24	
Budget	\$1,042,302	\$1,277,288
Estimated Net Savings	352,310 kWh 76,256 therms	830,725 kWh 113,910 therms

Figure 23. Integrated Program Structure — Industrial

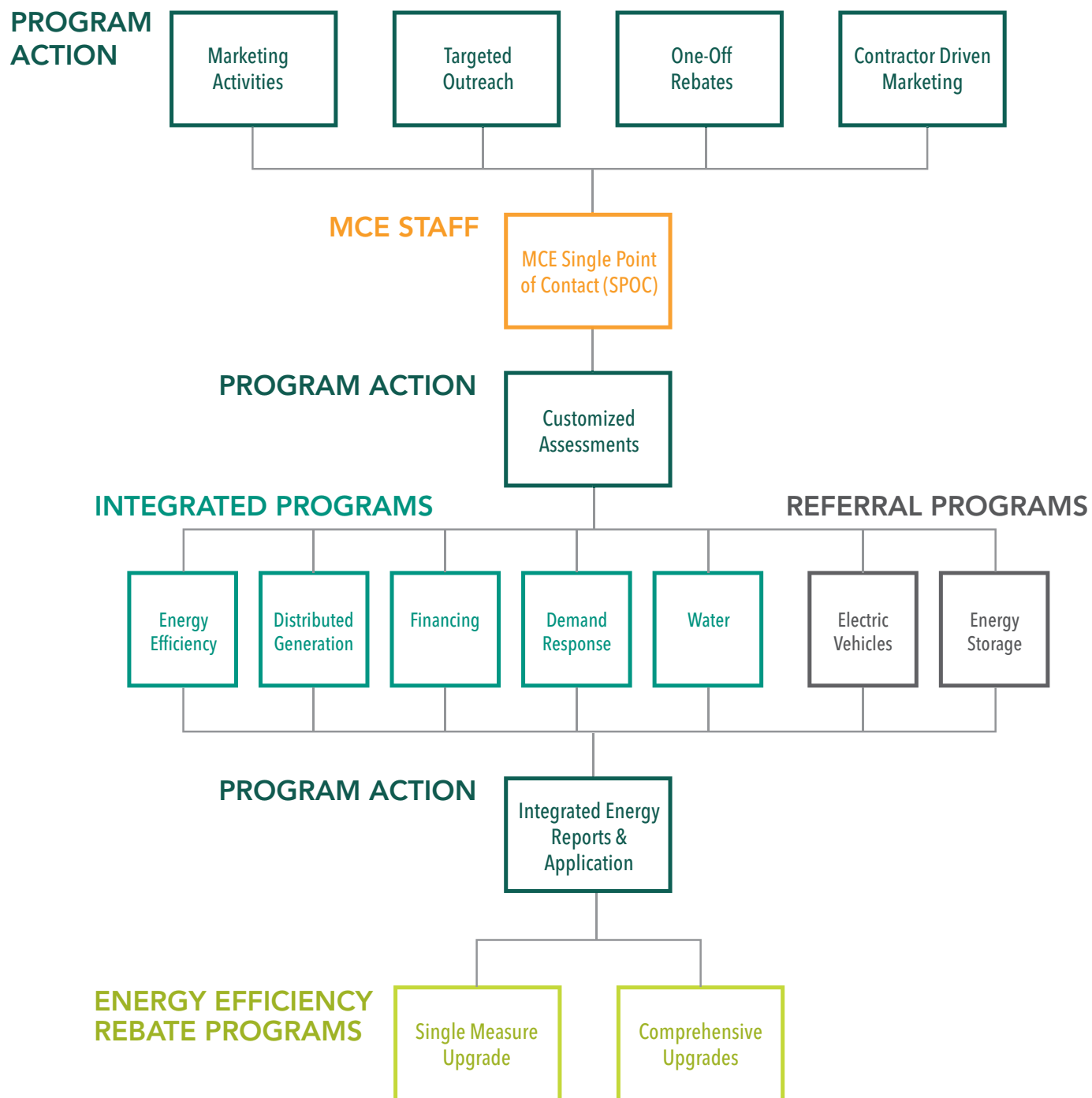
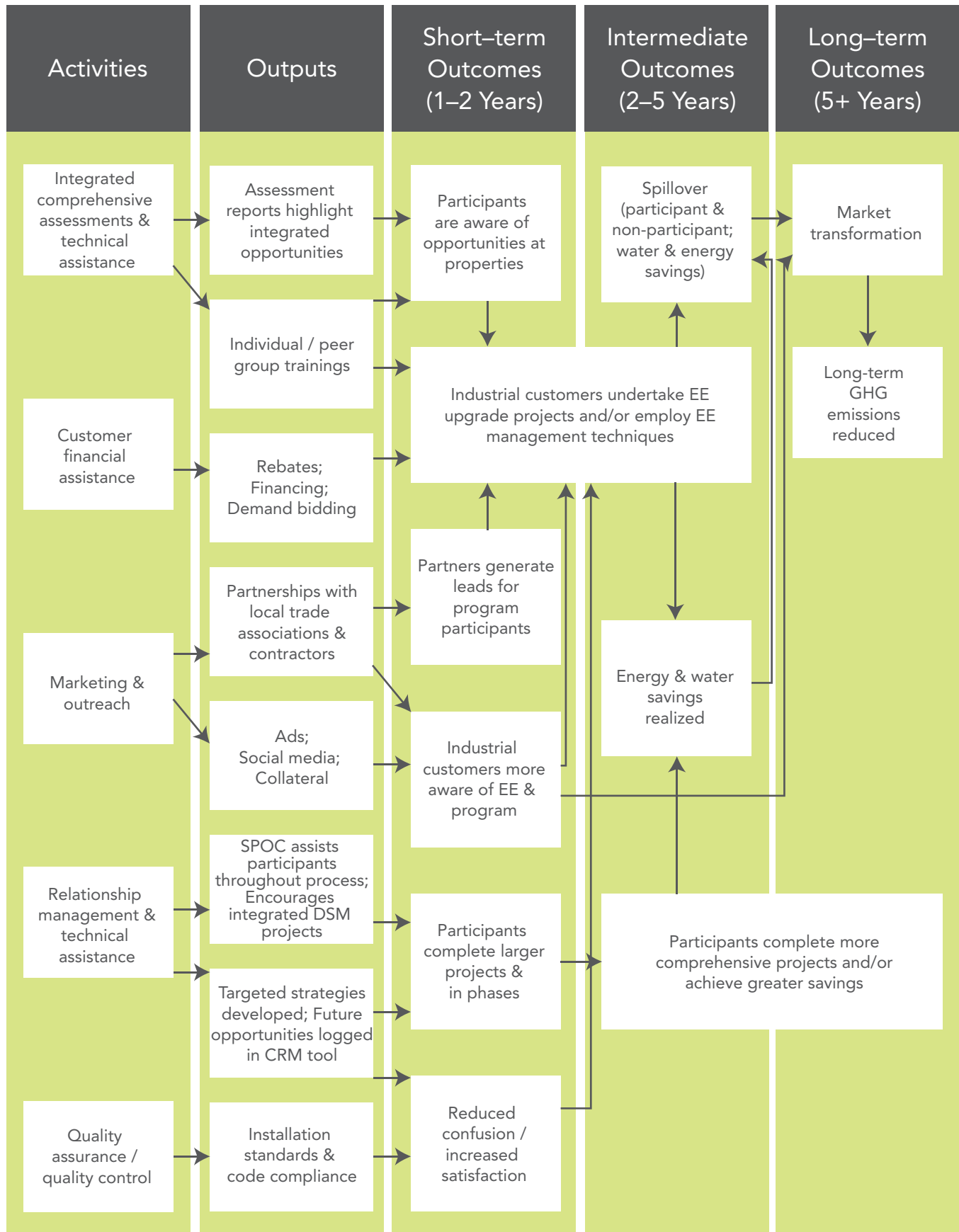


Figure 24. Industrial Program Logic Model



10.2 Gap Analysis and Market Characterization

MCE researched the industrial market size, basic demographics, and the landscape of existing programs. There are a handful of existing industrial programs in MCE's service area. For instance, ENERGY STAR offers the "Challenge for Industry"⁴⁴ program; PG&E offers programs such as Industrial Energy Advisor, calculated incentives, deemed incentives, and a continuous energy improvement program.

Given the uniqueness of each facility, the industrial sector requires highly tailored customer solutions. MCE's intervention strategies offer a unique one-stop shop that integrates programs such as demand response, distributed generation, energy efficiency, and water savings to maximize the value of the project for each customer.

MCE has analyzed energy consumption, barriers, triggers, key market actors, and energy efficiency adoption to better understand the opportunities that exist within the industrial sector. MCE's market characterization focuses primarily on a combination of energy consumption and publicly available data.

Energy Consumption

Within MCE's service area, industrial and commercial customers account for about 60% of electricity consumption and 41% of the gas usage.⁴⁵

Some examples of industrial customers in MCE service area include ports, refineries, glass factories, and wineries.

Problem Statements

There are several barriers that may prevent the industrial sector from fully taking advantage of energy efficiency opportunities. These barriers include:

- » **Financial Constraints.** While some larger companies may have the capital available to undertake projects, energy efficiency upgrades need to compete against other possible investments for funding and often have to pass initial screening to be considered, such as a short payback period (typically one to three years).⁴⁶
- » **Corporate Tax Structures.** Federal tax policy on issues such as depreciation and treatment of energy costs can complicate weighing the costs and benefits of upgrades.
- » **Budgetary Planning Cycles.** Energy efficiency programs should work around customers' budgetary planning cycles to ensure projects are proposed and considered at the appropriate time and that expensive upgrades can be incorporated into capital planning processes.
- » **Failure to Recognize Non-Energy Benefits.** Non-energy benefits such as reduced maintenance costs, grid reliability, and improved air quality are often not built into project proposals.
- » **Equipment Downtime.** The lost production time resulting from equipment being off-line for upgrades is costly to a manufacturer.
- » **Unique Processes Can be Difficult to Benchmark.** Each manufacturer may have unique and specific processes that make it difficult to find appropriate

44 ENERGY STAR Challenge for Industry. Available at https://www.energystar.gov/buildings/facility-owners-and-managers/industrial-plants/earn_recognition/energy_star_challenge_industry2

45 MCE internal data. Data for the Commercial and Industrial sectors have been combined to comply with CPUC privacy regulations.

46 Barriers to Industrial Energy Efficiency. U.S. Department of Energy. (2015). Available at https://www.energy.gov/sites/prod/files/2015/06/f23/EXEC-2014-005846_6%20Report_signed_0.pdf

comparisons to determine the relative efficiency of each site.

- » **Proprietary Information.** Manufacturers with unique processes may be unwilling to invite outside energy auditors to assess their facilities in the interest of protecting proprietary information.
- » **Lack of Awareness.** Smaller manufacturers may not have dedicated energy professionals on staff. With limited staff resources, the time needed to research energy efficient equipment and rebate programs may be a significant barrier.

MCE's industrial program is designed to address these barriers by reaching customers at trigger points and offering tailored solutions.

Trigger Points

Trigger points are moments of opportunity when the likelihood of engaging customers in an energy efficiency program is highest. Trigger points for industrial customers include:

- » **Equipment Failure.** Once equipment fails the ability to replace it quickly is critical. Establishing a relationship with customers prior to equipment failure is crucial to MCE's ability to influence the efficiency of the replacement equipment and to encourage a more comprehensive efficiency project.
- » **Coordination with other Resource Conservation Programs.** There is an opportunity to further reduce GHG emissions and stack value streams for the customer by coupling energy efficiency upgrades with other program opportunities, such as demand response and renewable energy generation.
- » **Capital Improvement Campaigns.** Larger industrial customers are likely to have a longer

term planning horizon for managing equipment turnover or making investments and improvements. This longer planning horizon can create an opportunity to incorporate energy efficiency into overall procurement.

- » **Change in Law or Regulation.** MCE will use upcoming or anticipated changes in codes, standards, and regulations as a trigger point to motivate industrial customers to act on resource conservation.

MCE's objective is to utilize these trigger points to effectively engage customers in MCE's energy efficiency offerings. To achieve this, MCE must identify and leverage the entities that influence this sector.

Key Market Actors

There are many entities that influence the industrial sector. It is important that MCE understand the role that each entity plays and how this can affect efforts to promote energy efficiency.

- » **Contractors.** Contractors are the primary point of contact with customers. They are involved in installation of projects and often have influence over the decision making process.
- » **Industry Groups.** Industry groups, such as West Contra Costa Council of Industries, Concrete Masonry Association of California and Nevada, and California Manufacturers and Technology Association, have broad networks of members that can be potential program participants. They also have knowledge of issues affecting the industrial sector and can be valuable advisors.
- » **Equipment Distributors and Manufacturers.** Equipment distributors and manufacturers have control over which products are available on the market.

- » **Regulatory bodies.** Regulatory bodies, such as the Occupational Safety and Health Administration, United States Food and Drug Administration, California Energy Commission, California Public Utilities Commission (CPUC), and others set the rules that govern the market which may affect product availability, product prices, and program design.
- » **Existing energy efficiency programs.** Existing energy efficiency programs have been working with the industrial sector to offer rebates, education, and advocacy around energy efficiency issues.

MCE tracks key market actors in order to identify opportunities and challenges, and the impact of these entities on a customer's energy efficiency decision-making.

Adoption and Penetration

Before implementing industrial program strategies, MCE evaluated current adoption and penetration of energy efficiency programs to identify opportunities and determine market gaps.

In the 2013 to 2015 program cycle, PG&E industrial programs saved nearly 82 GWH of energy, although MCE has not received figures on how much of that occurred in MCE service area.⁴⁷ The most commonly installed measures through PG&E's programs were process pumping, high bay fluorescents, motors, and air compressors. While this provides some insight into savings potential and measure opportunities, much more information is needed to understand the specific opportunities in MCE's service area.

10.3 Intervention Strategies

Based on the market characterization, gaps, barriers, and trigger points, MCE proposes to pursue the following intervention strategies:

Technical Assistance and Comprehensive Projects

MCE will offer technical assistance to customers to help them understand the full scope of available resource conservation options. Program offerings will focus on pumps, motors, lighting, refrigeration, water heating, and water conservation measures.

The technical advisor will create a comprehensive report outlining the rebates available to the customer at the time, including those offered through other program administrators, state, and federal programs, as well as take note of when existing equipment may be nearing the end of its expected useful life. This information will be entered into a Customer Relationship Management (CRM) system to allow the Single Point of Contact (SPOC) to follow up at the appropriate points in the future when the customer is likely to be making purchasing decisions. The SPOC will serve as a project facilitator and customer advocate to help guide business owners through the process from initial contact to project completion as well as helping to identify future participation opportunities.

After the assessment report is complete, the SPOC and technical advisor will work with the customer to develop a work plan for projects they intend to complete in the short-, mid-, and long-term. Project phasing will be encouraged to lessen barriers related to restricted capital and equipment replacement schedules.

On project completion, the SPOC will work with the customer to help them with local certification or recognition programs and help them market their investment in energy efficiency.

47 2013–2015 California Energy Efficiency Program Cycle Statistics. CPUC EE Stats. (2016). Available at <http://eestats.cpuc.ca.gov/Views/EEDataPortal.aspx>

Single Measure Rebates

MCE will offer single measure rebates for certain common measures as an introduction to the program. The program will work closely with its contractor network to allow them to be the primary driver of this offering and minimize any contractor participation barriers such as burdensome paperwork and long rebate turnaround time.

Single measure rebate recipients will be screened by the SPOC for opportunities for deeper upgrades and encouraged to receive a full assessment through the comprehensive program offering and to consider the pay-for-performance program. Measures will likely include, but are not limited to pumps, motors, lighting, refrigeration, water heating, distributed generation, and water conservation measures.

Benchmarking

MCE will investigate benchmarking platforms (such as Environmental Protection Agency's ENERGY STAR for Industry) and program design frameworks to assist customers in gathering data and taking appropriate action.

Data Analytics

MCE will leverage insights from data analytics platforms to better target stranded potential, and provide tailored solutions when approaching customers.

Pay-for-Performance

MCE will offer incentives to customers based on measured and verified savings. This "pay-for-performance" approach will leverage Advanced Metering Infrastructure (AMI) data and innovative meter-based measurement strategies to capture real, verified savings while minimizing administration expenses. This program may be delivered in conjunction with demand response programs. The load reductions could then be aggregated and bid into California Independent System Operator (CAISO) market.

Another model that pay-for-performance can support is the use of a transaction structure in which a third-party investor finances building efficiency upgrades. MCE would then buy the actual energy savings from the third-party investor. MCE would partner with industry leaders to pilot this innovative approach to using energy savings as a means of income.

The approach is intended to spur investment by building a market for efficiency bundled with demand response, solar, electric vehicles, and distributed generation. Smart Meter measured savings increases transparency and can spread program risk across contractors, customers, program administrator, and investor.

Strategic and Continuous Energy Improvement

Strategic and Continuous Energy Improvement (S-CEI) aims to promote energy efficiency as a lifestyle. The typical pillars of an S-CEI program include: obtaining management support for ongoing energy efficiency enhancements, conducting ongoing assessments, trainings and improvements, and periodically developing and reviewing strategic efficiency goals. An emerging best practice is to offer energy management certification to help ensure the long-term success of projects. The goal is to create lasting changes driven from management and facilities personnel alike.

S-CEI projects can be similar to retrocommissioning in that they typically target more behavioral and operational measures; however, they go beyond retrocommissioning by emphasizing leadership buy-in and ongoing updates to energy management plans.

Anticipated benefits to MCE include measurement of actual savings, plus a higher likelihood of deeper savings, greater persistence, and improved customer satisfaction.

The program design will leverage findings from several recent Evaluation, Measurement, and Verification (EM&V) studies. One report, the 2012 Industrial Market Characterization⁴⁸ study provides trends in consumption, impact of legislation, program design for national programs, and market characterization. It also emphasizes the importance of management support, discusses strategies for specific sectors, and suggests a focus on “incremental improvement to existing equipment and technologies” not just technological upgrades.⁴⁹ Second, the 2013 Custom Impact Evaluation⁵⁰ provides insights to all industrial strategies, but its focus on free ridership⁵¹ has particular implications for S–CEI. The study found moderately high free ridership due to corporate policy or regulatory compliance, non–energy benefits, or decisions to implement energy efficiency improvements prior to application. It also suggested a need for better ex–ante reporting of operating conditions. Finally, a variety of studies have shown strategic energy management (a type of program that currently exists in a number of states and is similar to S–CEI in its emphasis on assessments, obtaining buy–in, and training staff) can help industrial customers reduce energy and water use through operations and management practices. Some studies point to higher cost–effectiveness for small to midsized customers that were engaged via cohorts and/or trade associations – or single engagements with large

industrial customers.⁵² All of this feedback will be integrated into the S–CEI program design.

Peer Outreach and Training Cohorts

In addition to, or as a sub–component of S–CEI, MCE will convene cohorts of similar small industrial customers to discuss experiences with energy efficiency upgrades and equipment maintenance best practices. MCE will develop targeted outreach efforts, trainings, and technical assistance for this group. When possible, MCE will aim to coordinate with existing industry groups to bring cohorts together at existing events. The focus of these groups will be on sharing best practices around operations, maintenance, and behavioral energy efficiency. Additionally, MCE will work with each group to develop energy management metrics. Bringing similar businesses together will foster a network for sharing best practices and benchmarking. The cohorts could also provide a valuable feedback channel for MCE on its program offerings. This program may be best delivered on a regional basis, thus MCE will coordinate with neighboring counties to the extent that there is a benefit.

Financing

MCE will help customers navigate the landscape of financing offerings available and encourage them to participate to the extent that it facilitates energy efficiency upgrades. Specific financing strategies are described below.

» MCE Green Business Loans

This provides eligible industrial customers with a low interest loan they can repay on their monthly utility bills. The program is a public/private partnership between MCE and River City Bank.

48 Industrial Sectors Market Characterization. Kema. (2012). Available at http://calmac.org/publications/Final_Industrial_Sector_Market_Characterization_Chemicals_Report.pdf

49 Ibid. page 5.

50 Custom Impact Evaluation: Industrial, Agricultural, and Large Commercial. Itron. (2013). Available at http://www.calmac.org/publications/IALC_2013_Report_Final_071715.pdf

51 “free riders [free ridership]” are defined as “Program participants who would have installed the program measure or equipment in the absence of the program. California Energy Efficiency Policy Manual. (2013). Page 53. Available at http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPPolicyManualV-5forPDF.pdf

52 Process Evaluation of California’s Continuous Energy Improvement Pilot Program. Cadmus Group. (2012). Available at www.calmac.org/startDownload.asp?Name=CA_CEI_Process_Evaluation.pdf

MCE has set aside ratepayer funds to serve as a loan loss reserve, which will cover any losses the bank incurs on a portfolio of loans up to 20% of the value of the total portfolio. In exchange, the bank has agreed to a lower interest rate. As of December 2016, the interest rate is 5% for \$10,000 to \$265,000 projects, with 5- to 10-year payment terms (terms subject to change). Up to 30% of the loan value can be used for non-energy related projects.

» **Property Assessed Clean Energy**

Property Assessed Clean Energy (PACE) is a form of financing that enables property owners to pay for energy efficiency, renewable energy, and water conservation upgrades through a tax assessment on their property. Advantages of PACE include transferability with the property upon sale, long-term financing, and the ability to share the financing with tenants. Finally, it can be a source of financing for new construction projects.⁵³

MCE works with the County of Marin to implement an Open Market PACE model whereby any provider who agrees to a minimum set of best practices is eligible to operate in Marin. MCE will seek to work with other parts of its service area to expand this approach to PACE. Additionally, SPOCs will refer customers to PACE providers.

» **On-Bill Financing**

As of December 2016, the Investor Owned Utilities (IOUs) have a statewide program that uses ratepayer funds to offset the upfront cost of a project and the customer can pay back the improvements over time on the utility bill. This product, offered at 0% and available for loans between \$5,000 and \$100,000, requires

participants to limit the payback of projects financed through the loan to five years. The SPOC will ensure that customers who are a good fit for this program are made aware of the offering, and will facilitate participation to the extent possible.

Metrics Tables (Table 13)

Alongside the other program administrators, MCE developed metrics that connect market barriers to intervention strategies, and that provide near-, mid-, and long-term targets that build towards a 10-year vision. The metrics are based on the framework presented to the Energy Division in August 2016, which emphasized:

- » Usefulness for program administrators to manage portfolio
- » Information on the progress towards achieving desired market effect(s) and strategy effectiveness
- » Reliance on data collected during program implementation and/or data reporting to CPUC
- » Simple to understand and clear of any subjectivity
- » Emphasis on long-term outcomes

10.4 Evaluation, Measurement & Verification

MCE will track metrics for measurement and verification (M&V) but will need to conduct Evaluation, Measurement, and Verification (EM&V), in conjunction with the CPUC and its consultants, to gain richer insights through process and impact evaluations.

Anticipated Study Needs

To supplement the existing body of knowledge, and to better understand program success and market

⁵³ Some PACE providers utilize SB 555 (2012) as the enabling legislation; this follows the Mello-Roos style assessment which can be used for new construction rather than the Streets and Highways Code assessment enabled under AB 811 (2008).

Table 13. Industrial Sector Market Barriers & Metrics

Problem Statement	Market Barriers	Desired Market Effects/ 10-year Vision	Intervention Strategies
Energy efficiency upgrades need to compete against other possible investments for funding and often have to pass initial screening to be considered, such as a very short payback period (under three years)	Financial barrier; prioritization barrier	Modify industrial practices to have organizations naturally consider and adopt EE solutions	1. Intelligent outreach 2. Strategic and continuous energy improvement / SEM 3. Rebates and incentives 4. Direct install 5. Financing
Lost production time resulting from equipment being off-line for efficiency upgrades is costly to a manufacturer	Equipment downtime	Create simple, no hassle, low cost program transaction that encourages greater customer investment in EE	1. Intelligent outreach 2. Peer outreach and training cohorts
Manufacturers with unique processes may be unwilling to invite outside energy auditors to assess their facilities in the interest of protecting proprietary information	Proprietary information	Win customers' trust as a partner and advisor	1. Intelligent outreach 2. Strategic and continuous energy improvement / SEM
Smaller manufacturers may not have dedicated energy professionals on staff	Lack of time and awareness	Majority of industrial facilities have an energy manager	1. Incentives and trainings for dedicated and shared energy managers

needs over time, MCE proposes the following studies be conducted:

» **Potential Study:** The existing Navigant potential study provides little insight for MCE customers. It is not granular enough to provide insights into the potential in MCE’s service area. Further, the limited industrial segmentation in the study is unlikely to provide useful insights due to the uniqueness of industrial facilities — even when producing a similar product. The forthcoming potential study, spearheaded by the Energy Division, should include more detail on the industrial sector, including more measure-level categories (currently only machine drivers and process refrigeration are included).

» **Market Assessments:** Aimed at understanding key drivers and decision making processes for industrial customers, market assessments are to be conducted by the Energy Division or MCE.

» **Impact Evaluation:** Impact evaluations, which focus on key program metrics, are to be conducted by the Energy Division.

» **Process Evaluation:** Aimed at providing insights into customer drivers for participating, and areas for program design and process improvements, process evaluations are to be conducted by the Energy Division or MCE. For the strategic and continuous energy improvement strategy, MCE proposes an independent survey of participants to gather qualitative information on program design,

Sector Metric	Baseline	Metric Source	Short Term Target (1–3 years)	Mid Term Target (4–7 years)	Long Term Target (8–10 years)
1. Number of industrial customer participating in EE programs	2015 SEM participation levels in Oregon Energy Trust (OET) – % of industrial customer participation	OET Program Report	50% of OET 2015 participation level	75% of OET 2015 participation level	OET 2015 participation level
2. Amount of EE savings achieved from process-related projects	Program Year 1 (PY1)	MCE Program database	Increase in program savings by 10% over 2017 levels by Year 3	Increase in program savings by 15% over PY1 levels by Year 7	Increase in program savings by 20% over PY1 levels by Year 10
3. Number of industrial customer participating in EE programs	2015 SEM participation levels in Oregon Energy Trust	OET Program Report	50% of OET 2015 participation level	75% of OET 2015 participation level	OET 2015 participation level
4. Percentage of industrial customers with a dedicated or shared energy manager	PY1	MCE Program database	Increase by 10% over baseline	Increase by 15% over baseline	Increase by 20% over baseline

marketing and outreach, program implementation, participation experience, and market barriers.

In addition, MCE will conduct a cross-sector process evaluation of the SPOC offering to determine to what degree it helps alleviate customer confusion and encourages repeat participation through project phasing.

10.5 Coordination

MCE is an independent Program Administrator operating within PG&E’s service territory and overlapping the Bay Area Regional Energy Network’s service territory. Coordination among different programs will be important to minimize customer

and contractor confusion while also achieving program objectives.

Key Partners
MCE will partner closely with other organizations promoting resource conservation, including water districts, climate coalitions, renewable and distributed generation companies and installers, and electric vehicle companies. MCE will communicate regularly with these entities to ensure that they have the latest program information. MCE will facilitate program participants’ applications for rebates with these partner agencies and to the extent possible integrate those applications with the MCE application to streamline participation in multiple programs.

MCE will adjust its partnership strategy throughout the program cycle. MCE constantly seeks new partnership opportunities to help achieve its end goal of deeper energy and greenhouse gas savings.

Some of the key partners include:

- » **Implementation Partners.** Implementation partners will provide technical assistance, project management, training, quality assistance, and quality control.
- » **Other Program Administrators and Publicly-Owned Utilities.** Other program administrators and publicly-owned utilities are a great source of lessons learned and best practices. In addition, MCE will coordinate offerings with program administrators that share MCE's service area.
- » **Contractors.** Contractor will install measures and be the primary driver of new participants for the single measure rebates.
- » **Local Trade Associations.** Local trade associations will help with marketing and outreach, recruit participants, and provide feedback on program design.
- » **Equipment Distributors.** Equipment distributors will help with marketing and outreach.
- » **Lending Institutions.** Lending institutions will provide the secured financing for MCE's on-bill repayment offering.
- » **Local Government Sustainability Offices.** Local government sustainability offices or energy programs will identify key participants to facilitate their engagement with the program.
- » **Universities, Government and Other Research Institutions.** Universities, government and other research institutions such as the United States Department of Energy and Lawrence Berkeley National Laboratory test emerging technologies and program strategies, and can provide lead generation ideas.
- » **PACE Program Providers.** PACE program providers will be a potential source of financing for participants to cover upfront costs.

The table below maps strategies to key partners. It is not intended to be fully comprehensive, but rather, a visual representation. ■

Table 14. Industrial Key Partners

	Technical Assistance & Comprehensive Rebates	Single Measure Rebate	Pay-for-Performance	Peer Outreach	Financing	Marketing & Outreach
Implementation Partners	X	X	X	X	X	X
Contractors	X	X	X	X	X	X
Local Trade Associations				X		X
Lending Institutions					X	X
Local Governments				X	X	X

11. AGRICULTURAL SECTOR

11.1 Introduction

MCE's agricultural program focuses on dairies and vineyards, the region's largest agricultural users. This sector is characterized by a small number of overall accounts in MCE's member communities, a relatively low load, and a lack of time and resources to prioritize energy efficiency.

The program aims to overcome these barriers by integrating multiple resource conservation opportunities, such as water conservation and sustainable farming practices, with on-site generation and energy efficiency offerings to create integrated solutions that are attractive to local agricultural operations. Furthermore, the program will coordinate closely with applicable commercial and multifamily energy efficiency programs, to support aspects of the agricultural business that fall under those sectors, such as farm worker housing or agricultural product processing locations.

Core Activities

- » Provide participants with an Agricultural Single Point of Contact (SPOC) to serve as a facilitator and customer advocate, and to guide business owners through the process from initial contact to project completion.

- » Develop an integrated assessment process that streamlines multiple program offerings into one customer report.
- » Facilitate access to financing and rebates to help overcome up-front cost barriers.
- » Provide technical assistance to develop customized energy upgrade projects that meet the needs of the customer.

Key Innovations

- » Leverage existing certification programs to increase demand for green agricultural practices.
- » Design program and financing options around seasonal work cycles, which impact cash flow and equipment use.
- » Coordinate with MCE's multifamily program to provide farmworker housing energy efficiency assistance.

Summary Tables

The proposed budget for the first four years of the agricultural program is as follows:

Table 15. Agricultural Program Budget Summary

Budget Category	Year 1	Year 2
Administrative	\$74,062	\$106,062
Marketing	\$74,773	\$82,773
Direct Implementation	\$398,501	\$598,501
Incentives	\$215,709	\$407,865
Evaluation, Measurement, and Verification (EM&V)	\$31,506	\$50,088
TOTAL	\$794,553	\$1,245,290

The expected total resource cost and estimated savings are detailed below:

Table 16. Cost Effectiveness Summary

Sector Summary	Year 1	Year 2
Total Resource Cost (TRC)	1.27	
Budget	\$794,553	\$1,245,290
Estimated Net Savings	637,174 kWh 2,808 therms	1,369,357 kWh 4,097 therms

Figure 25. Integrated Program Structure — Agricultural

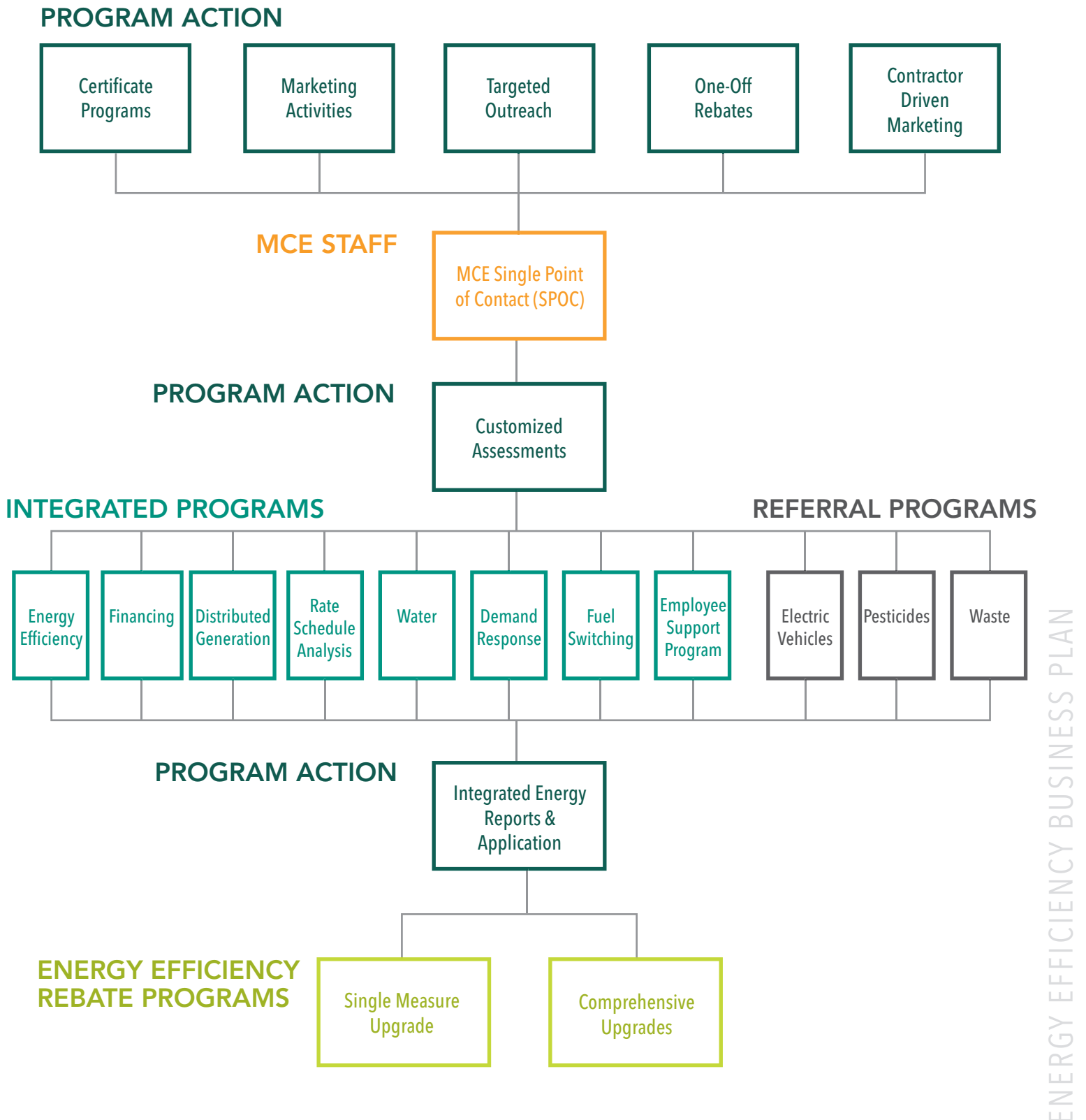
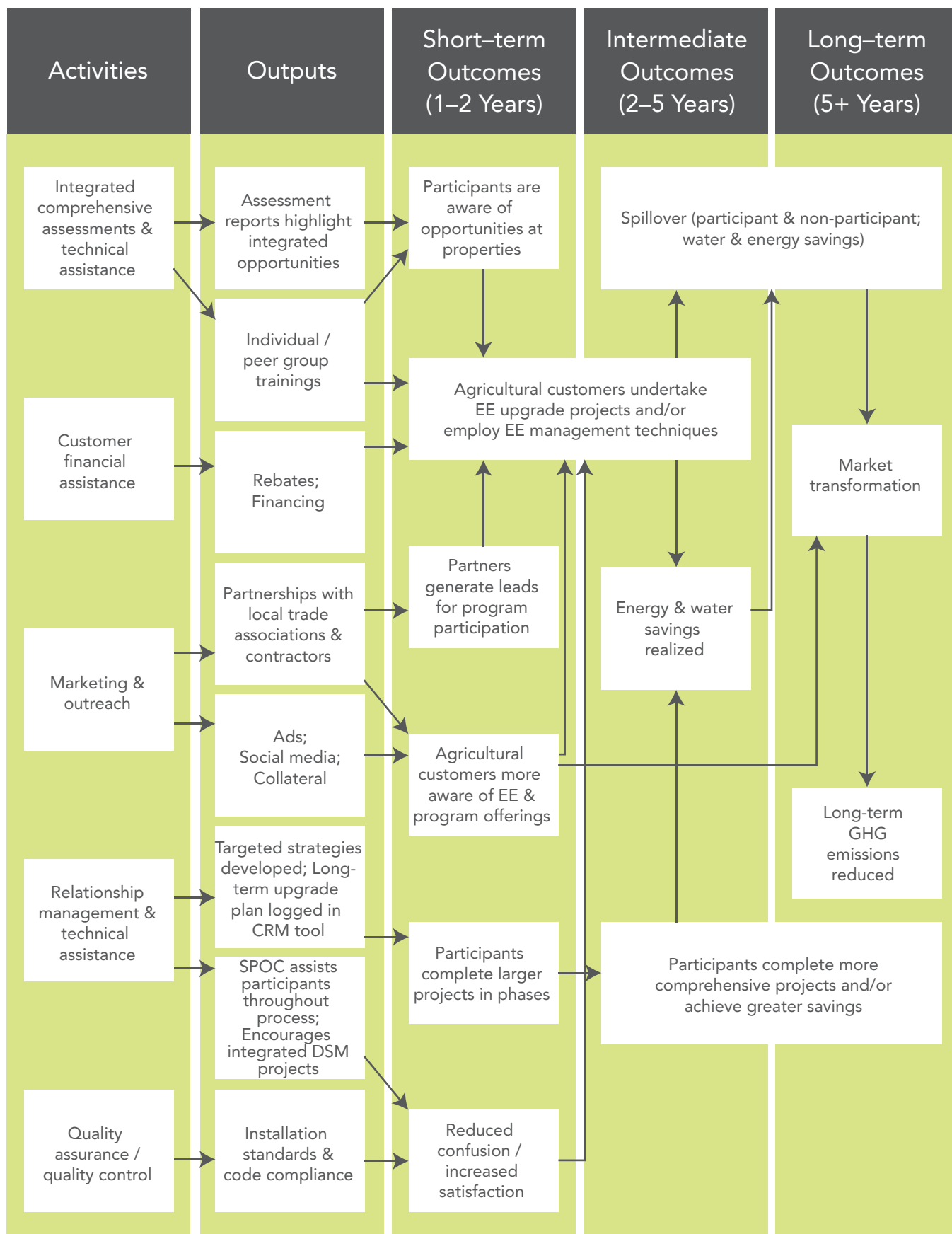


Figure 26. Agricultural Program Logic Model



11.2 Gap Analysis and Market Characterization

MCE researched the sector in detail, including adoption and penetration of key programs and measures, market size, and intervention strategies and tools. MCE also analyzed the landscape of existing programs and had extensive discussions with customers, contractors, implementers, and program administrators running similar programs in MCE's service area and in other areas. While there are many existing programs in MCE's service area, gaps remain in program offerings.

Agricultural energy efficiency projects often have long payback periods.⁵⁴ In order to encourage more projects, energy efficiency programs need to provide low cost capital to facilitate financing these projects. PG&E agricultural programs target large customers, leaving smaller customers without a program specifically tailored to their needs.⁵⁵

Most operations are in rural areas and therefore use propane instead of natural gas. Existing energy efficiency programs do not address propane use and require an onerous three-pronged test to incentivize fuel switching measures. However, fuel switching programs offer energy security and greenhouse gas benefits to these customers, and thus may present an opportunity for leveraged funding.

Many agricultural operations are installing on-site generation without first investigating energy efficiency opportunities. This is likely due to the highly visible nature of solar panels, which can help differentiate an operation as "green" and therefore more desirable to a certain group of customers. There is an opportunity to leverage the solar

transaction to promote a more integrated project that includes energy efficiency measures.

MCE will offer customers a SPOC to help navigate the landscape of demand side management opportunities. The SPOC serves as a facilitator and participant advocate, helping to guide the property owner through the process from initial contact to project completion. The SPOC would track and manage a comprehensive suite of opportunities to save energy and reduce greenhouse gas emissions, and ensure that agricultural customers are aware of all options at their sites.

To address the problem of energy efficiency being less visible to customers than renewable energy projects, working with local certification programs can generate additional value in energy efficiency projects by raising the visibility of energy efficiency improvements.

The seasonal nature of agricultural operations affects the cash flow of these businesses as well as the timing of when equipment is available to be upgraded. MCE can ramp up the activity of its agricultural offerings during the slow production seasons. In addition to energy efficiency opportunities, integrated on-site generation solutions capitalize on feed-in tariffs or net energy metering during the off-season and supplement customer energy needs during periods of high production.

Although agricultural electricity use makes up a relatively small percentage of MCE's load, agriculture is an important part of the character of MCE's service area, especially in Marin County and Unincorporated Napa County. In Marin, approximately 50% of the land is composed of farms and dairies.⁵⁶ There are

⁵⁴ MCE gathered this information through stakeholder outreach in 2016.

⁵⁵ MCE gathered this information through stakeholder outreach in 2016.

⁵⁶ Amazing but True Facts About Marin Agriculture. David Lewis, Paige Phinney and Elli Rilla, ed. University of California Cooperative Extension, Marin County. http://ucanr.edu/sites/Grown_in_Marin/files/213433.pdf

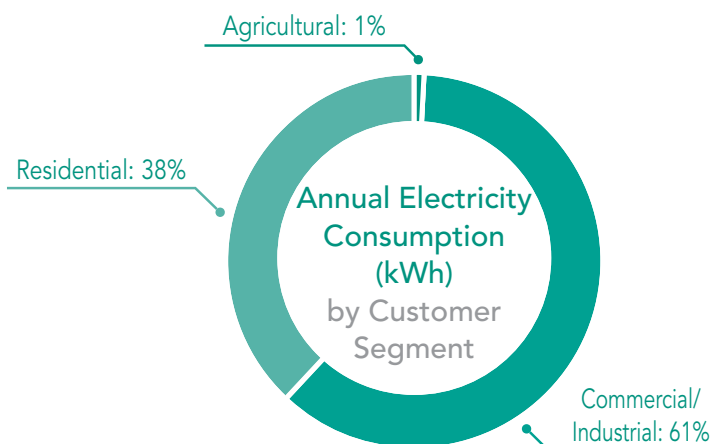
255 agricultural operations in Marin, 64 of which are considered large farms. There are 23 dairies and 159 livestock production operations producing beef cattle, dairy cows, and sheep.⁵⁷ Many of these dairies ship their milk to processors outside of MCE's service area but a few process their milk on site.⁵⁸ The dairy industry is a highly regulated market. The demand for dairy is rising but state regulations cap prices, which can create financial uncertainty for farmers in the face of fluctuating feed prices.⁵⁹

In Napa County, the dominant agricultural activity is grape production for wine, which accounts for approximately 99% of the agricultural revenues in the county.⁶⁰ Vineyards may be winery-owned or independently owned by those who sell their grapes to wineries. Most wineries list electricity among their top costs, along with labor.⁶¹ Both dairies and vineyards are industries that are divided into either large companies with global markets or small companies with local markets.⁶²

Energy Consumption

The agricultural sector accounts for approximately 1% of the electric load in MCE's service area (Figure 27). The sector's natural gas usage is also very small since most operations are in rural areas without access to utility natural gas service. While the primary uses

Figure 27. Electricity Use by Sector



of electricity vary depending on farm type, large end-uses typically include irrigation/water pumping, milking equipment, and refrigeration.⁶³

Problem Statements

There are several barriers that may prevent the agricultural sector from fully taking advantage of energy efficiency opportunities. These barriers include:

- » **Financial Constraints.** Dairies operate under constrained cash flow due to regulations that set milk prices. Many dairies in Marin are able to increase the price of their milk by producing organic milk, while a few others process milk into value added products on site, such as cheese, allowing them to set their own prices.⁶⁴ Other agricultural operations may face capital constraints due to fluctuating production, environmental factors such as drought, and market prices of products.

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

⁶⁰ 2014 Agricultural Crop Report. Napa County Department of Agriculture and Weights & Measures. May 2015. <http://www.county-ofnapa.org/agcom/>

⁶¹ Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Information gathered from conversations with dairy farm owners in Marin County.

- » **Seasonal Cycles.** Many agricultural operations often follow a seasonal calendar that determines high and low periods of activity and equipment use. The seasonal cycles also affect cash flow and financial planning. Energy efficiency projects need to incorporate these considerations in the planning process to ensure projects meet customer needs.⁶⁵ Technical assistance, long-term engagement with the customer, and financing may help bridge this barrier by facilitating a project timeline that minimizes disruption to the agricultural operations.
- » **Equipment Down Time.** Dairies generally operate on an intensive schedule with little to no down time for farm equipment. It can be burdensome and expensive for equipment to be off-line for even a short amount of time for upgrade and/or repairs.⁶⁶
- » **Lack of Awareness.** Compared to other regions of the state, agricultural operations in MCE's service area are smaller with fewer employees and fewer acres in production. These operations may not have staff with energy expertise and may not know where to seek out assistance, rebates, and financing for energy efficiency upgrades.⁶⁷

MCE's agricultural program is designed to address these barriers by reaching customers at trigger points and offering tailored solutions.

Trigger Points

Trigger points are moments of opportunity when the likelihood of engaging customers in an energy efficiency program is highest. Trigger points for agricultural customers include:

- » **Seasonal Triggers.** If an agricultural operation experiences seasonal periods of relatively lower activity, the best time to engage a customer for equipment upgrades is prior to the low point of activity such that upgrades can be performed during that time period. Conversely, the best time to target a customer for behavioral or operational efficiency offerings might be during periods of high use when there is the most opportunity to save.
- » **Equipment Failure.** Given capital constraints, agricultural operations are unlikely to invest in new energy efficient equipment.⁶⁸ However, once equipment fails, the ability to replace it quickly becomes paramount. Establishing a relationship with customers prior to equipment failure will be crucial to MCE's ability to influence the efficiency of the replacement equipment, and encourage customers to pursue more comprehensive efficiency projects. Alternatively, partnering with the contractors who most often provide equipment replacement will also ensure customers are presented with efficient alternatives at the right time.
- » **Coordination with Renewable Energy Installations.** The dairy and wine industries in particular have latched on to renewable energy as a way to distinguish their brand.⁶⁹ There is

65 Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

66 Information gathered from conversations with dairy farm owners in Marin County.

67 Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

68 Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

69 Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

an opportunity to further reduce greenhouse gas emission by coupling renewable energy installations with energy efficiency upgrades.

- » **Change in Law or Regulation.** MCE will use anticipated changes in codes, standards, and regulations as a trigger point to motivate agricultural customers to act on resource conservation. For example, if water restrictions are anticipated, MCE will reach out to the customer to provide assistance with conserving water and use the opportunity to also pitch energy efficiency.

MCE's objective is to utilize these trigger points to effectively engage customers in energy efficiency measures. To achieve this, MCE must identify and leverage the entities that influence this sector

Key Market Actors

There are many entities that influence the agricultural sector. It is important that MCE understand the role that each entity plays and how this can affect efforts to promote energy efficiency.

- » **Contractors.** Contractors are the primary point of contact with customers. They help select and install equipment for various customer projects.
- » **Equipment Distributors and Manufacturers.** Equipment distributors and manufacturers have control over which products are available on the market and have established relationships with agricultural customers.
- » **Industry Groups and Trade Associations.** Industry groups and trade associations, such as agricultural land trusts, councils of dairy producers, or organic trade organizations have broad networks of members who can be potential program participants. They also have knowledge of issues affecting the local agricultural industries and can be valuable advisors.

- » **Regulatory Bodies.** Regulatory bodies, such as Occupational Safety and Health Administration, United States Department of Agriculture, United States Food and Drug Administration, California Department of Food and Agriculture, California Energy Commission, and the California Public Utilities Commission, set the rules that govern the market and may affect product availability, product prices, and program design.

- » **Organic Certification Groups.** Organic certification groups can help with marketing and can motivate energy efficiency improvements.

- » **Academic Institutions.** Academic institutions, such as University of California Cooperative Extension, can provide research and case studies on resource conservation in agricultural operations and may also be a partner for marketing, outreach, and training.

MCE tracks key market actors in order to identify opportunities and challenges, and the impact of these entities on a customer's energy efficiency decision-making.

Adoption and Penetration

Before determining agricultural program strategies, MCE evaluated current adoption and penetration of energy efficiency programs to identify opportunities and determine market gaps.

According to the California Agriculture Market Characterization Study, vineyards and wineries have seized upon renewable energy — and to a lesser extent energy efficiency — as a means to distinguish their brand.⁷⁰ They are seen as energy efficiency leaders in the agricultural sector. MCE will develop

70 Market Characterization Report for the 2010–2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. Navigant Consulting. May 2013. Available at: http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

opportunities to further recognize energy efficiency leaders in its service area.

The energy efficiency upgrades that agricultural operations have already undertaken vary by farm type. Dairies are more likely to have upgraded their lighting equipment than their pumping or cooling equipment.⁷¹ Although pumping accounts for a much greater share of their electricity consumption, lighting equipment has a lower first cost, which makes it more feasible for the capital-constrained dairy farmer. Dairy farmers have indicated that they learn about the energy efficiency measures they install through equipment vendors, suggesting that these vendors will be an important partner in marketing MCE's program offerings.⁷²

Since 2006, over 150 wineries have installed energy efficiency measures through PG&E's wine industry program. Water is a primary concern for grape-growers and many are updating and mechanizing their irrigation systems.⁷³ This represents a major opportunity for MCE to influence equipment purchasing decisions. However, many agricultural customers also operate on well water, so communicating long-term sustainability of ground water supply for environmental and financial reasons will be an important message.

11.3 Intervention Strategies

Technical Assistance and Comprehensive or Phased Projects

MCE will offer technical assistance to customers to help them understand the full scope of available resource conservation options. Program offerings will focus on pumps, lighting, refrigeration, water heating,

distributed generation, and water conservation measures.

The technical advisor will create a comprehensive report outlining the rebates available to the customer at the time, including those offered through statewide programs, as well as take note of when existing equipment may be nearing the end of its expected useful life. This information will be entered into a Customer Relationship Management (CRM) system to allow the SPOC to follow up at the appropriate points in the future when the customer may be making purchasing decisions. The SPOC will serve as a project facilitator and customer advocate to help guide business owners through the process from initial contact to project completion as well as helping to identify future participation opportunities.

After the assessment report is complete the SPOC and technical advisor will work with the customer to develop a work plan for projects they intend to complete in the short, mid, and long term. The SPOC will track projects over time, allowing for energy efficiency upgrades to be scheduled around the seasonal calendar. Project phasing will be available to lessen barriers related to seasonal cash flow and periods of high equipment use.

Upon project completion the SPOC will work with the customer to help them participate in local certification or recognition programs and help them market their investment in energy efficiency.

Peer Outreach and Training Cohorts

MCE will convene cohorts of small farm owners to discuss experiences with energy efficiency upgrades and equipment maintenance best practices. MCE will develop targeted outreach efforts, trainings, and technical assistance for this group. When possible, MCE will aim to coordinate with industry groups to bring peer groups together at existing events. The focus of these groups will be on sharing

71 Ibid.

72 Ibid.

73 Ibid.

best practices around operations, maintenance, and behavioral energy efficiency. Additionally, MCE will work with each group to develop energy management metrics. Bringing similar operations together will foster a network for sharing best practices and benchmarking. The cohorts could also provide a valuable feedback channel for MCE on its agricultural program offerings.

Energy Efficiency Assistance for Farm Worker Housing

There are approximately 500 farm workers in Marin, many of whom are living in homes that do not meet minimum housing standards.⁷⁴ In Napa, the

74 Trevor Bach, "Farm Worker Housing: 200 Units Planned," Point Reyes Light, February 23, 2012. <http://www.ptreyeslight.com/article/farm-worker-housing-200-units-planned>

number is even greater. At the peak of the grape harvesting season there may be as many as 7,000 farmworkers in Napa.⁷⁵ Not all of these workers live in Napa permanently, but due to concerns about US immigration policy and a growing demand for year-round work, the trend is for an increasing number to remain in Napa year-round.⁷⁶

Year-round residents have greater housing requirements than seasonal workers — they tend to need family housing instead of just a bed.⁷⁷ A 2013

75 Bae Urban Economics, "Final Report: 2012 Napa County Farm-worker Housing Needs Assessment," Napa County Housing and Intergovernmental Affairs, March 29, 2013.

76 Ibid.

77 Bae Urban Economics, "Final Report: 2012 Napa County Farm-worker Housing Needs Assessment," Napa County Housing and Intergovernmental Affairs, March 29, 2013.

Table 17. Agriculture Sector Market Barriers & Metrics

Problem Statement	Market Barriers	Desired Market Effects/ 10-year Vision	Intervention Strategies
Dairies operate under constrained cash flow due to regulations that set milk prices. Other agricultural operations may face capital constraints due to fluctuating production, environmental factors such as drought, and market prices of products	Financial barrier	Increase in the number of customers who are aware of and make use of financing options and rebate programs to help them achieve energy savings	1. Incentives 2. Education about available financing options
Agricultural operations often follow a seasonal calendar that determines high and low periods of activity and equipment use. The seasonal cycles also affect cash flow and financial planning. Energy efficiency projects need to be arranged for at the appropriate point in the planning process, and conducted at key points during the year	Financial barrier, seasonal time constraints	Increase in the number of customers that have long term energy efficiency plans to upgrade specific equipment during times of low use	1. Technical assistance 2. Increased phasing of projects through SPOC approach
Compared to other regions of the state, agricultural operations in MCE service area are smaller with fewer employees and fewer acres in production. These operations may not have staff with energy expertise and may not know where to seek out assistance, rebates, and financing for energy efficiency upgrades	Lack of awareness of programs and energy efficiency equipment	Increased awareness of MCE's program offerings	1. Increase awareness of MCE's program and energy efficiency opportunities through peer to peer outreach, training cohorts and leveraging existing green certification programs

survey of Napa farm workers found that 34% live in apartments, 31% live in farm worker centers, 14% live in mobile homes, 12% live in single family homes and 9% live in bunk houses or dormitories. MCE will use relationships in the agriculture industry developed through this program to target farm worker housing for participation in MCE's multifamily program.

Financing

MCE will help customers navigate the landscape of financing offerings available and encourage them to participate to the extent that it facilitates energy efficiency upgrades. Financing will help reduce up-front costs and address challenges with seasonal cash flow. Financing is available either through the commercial On-Bill Repayment program offered by MCE, the Property Assessed Clean Energy (PACE) financing programs available in the MCE service

area, the California Energy Commission (CEC) low interest loan program, or agricultural specific lending programs such as those offered by the United States Department of Agriculture (USDA).

The SPOC will facilitate access to financing programs that are most suitable for the applicant. The SPOC will provide assistance in completing applications, supply information about the energy impacts of the proposed project where appropriate, and provide project management and oversight of the application to keep the process moving forward.

Metrics Tables (Table 17)

Alongside the other program administrators, MCE developed metrics that connect market barriers to intervention strategies and provide near-, mid-, and long-term targets that build towards a 10-year vision.

Market Effect Metrics	Baseline	Metric Source	Short Term Target (1–3 years)	Mid Term Target (4–7 years)	Long Term Target (8–10 years)
1. Number of completed projects through program	1. Program Year 1 (PY1) Participation	1. Program tracking data	1. Increase 5% over PY1 baseline	1. Increase 10% over PY1 baseline	1. Increase 15% over PY1 baseline
1. Number of customers who receive technical assistance 2. Number of customers with long term action plan under SPOC approach 3. Number of repeat referrals through SPOC	1. PY1 Participation 2. PY1 Participation 3. PY1 Participation	1. Program tracking data 2. Program tracking data 3. Program tracking data	1. 2% of ag customers 2. 50% of program participants 3. N/A	1. 5% of ag customers 2. 75% of program participants 3. 5% of participants	1. 10% of ag customers 2. 90% of program participants 3. 10% of participants
1. Number of completed projects through program 2. Number of customers attending training sessions	1. PY1 Participation 2. PY1 Participation	1. Program tracking data 2. Program tracking data	1. Increase 10% over PY1 baseline 2. 5 customers	1. Increase 15% over PY1 baseline 2. 20 customers	1. Increase 20% over PY1 baseline 2. 30 customers

The metrics are based on the framework presented to the Energy Division in August 2016, which emphasized:

- » Usefulness for program administrators to manage portfolio
- » Information on the progress towards achieving desired market effect(s) and strategy effectiveness
- » Reliance on data collected during program implementation and/or data reporting to the CPUC
- » Simple to understand and clear of any subjectivity
- » Emphasis on long-term outcomes

11.4 Evaluation, Measurement & Verification

MCE takes an adaptive management approach to continuously evaluate program performance. MCE will use Advanced Metering Infrastructure (AMI) data, customer feedback, participation surveys, among other sources to measure the effectiveness of intervention strategies. This feedback loop enables MCE to make improvements throughout the program cycle. For the agricultural sector, the following performance metrics will be tracked:

- » Number of completed projects through the program
- » Number of customers who receive technical assistance
- » Number of customers with long term action plans under the SPOC approach
- » Number of repeat referrals through SPOC

- » Number of customers attending peer-to-peer training sessions

Anticipated Study Needs

To supplement any EM&V activities conducted by the California Public Utilities Commission (CPUC), MCE will undertake a process evaluation at the end of year two of the peer training and outreach cohort offering. This evaluation will focus on the effectiveness of this strategy in influencing change in the operations and maintenance at agricultural operations and the effectiveness in encouraging members to undertake comprehensive upgrade projects. In addition, MCE will conduct a cross-sector process evaluation of the SPOC offering to determine to what degree it helps alleviate customer confusion and encourages repeat participation.

11.5 Coordination

Key Partners

MCE will partner closely with other organizations promoting water conservation, waste diversion, dairy digesters, solar power, and electric vehicles. MCE will communicate regularly with these entities to ensure that they have the latest program information. MCE will facilitate program participants' applications for rebates with these partner agencies and to the extent possible integrate those applications with the MCE application to streamline participation in multiple programs.

MCE will also seek to collaborate with neighboring regions that may be connected to farms in MCE service area through the supply chain. An example of this is milk processors in Sonoma that receive shipments from Marin dairies.

The SPOC will coordinate with social service organizations, income assistance programs, and the

MCE multifamily program to ensure that farmworkers living in eligible housing units are given support in upgrading their homes and bringing down their electricity costs. Some of the key partners include:

- » **Implementation Partners** will provide technical assistance, project management, training, quality assistance, and quality control.
- » **Contractors** will install measures and help recruit participants.
- » **Local Agricultural Associations** will help with marketing and outreach, recruit participants, and provide feedback on program design.
- » **Equipment Distributors** will help with marketing and outreach.
- » **Local Certification Bodies** (e.g. Napa Green and the Marin Green Business Program) will help raise visibility of energy efficiency improvements.
- » **Federal Agencies** provide complimentary programs and are a source for financing and grants, which can help cover upfront costs.
- » **MCE's Low Income Families and Tenants (LIFT) Program** will offer upgrade assistance for qualified farm worker housing.
- » **MCE's Existing On-Bill Repayment Programs and PACE Program Providers** will be sources of financing for participants to cover upfront costs.

Table 18 maps strategies to key partners. It is not intended to be fully comprehensive, but rather, a visual representation. ■

Table 18. Agricultural Key Partners

	Technical Assistance & Comprehensive Rebates	Peer Outreach	EE Assistance for Farmworker Housing	Financing	Marketing & Outreach
Implementation Partners	X	X	X	X	X
Contractors	X	X		X	X
Local Agricultural Associations					X
Equipment Distributors				X	X
Local Certification Bodies		X			X
USDA				X	

12. COMMERCIAL SECTOR

12.1 Introduction

MCE's commercial program is designed to serve all types of commercial customers. The program acknowledges inherent differences in opportunities between the myriad types and sizes of commercial properties, and emphasizes integrating diverse program offerings under one umbrella. The program focuses on customer satisfaction and repeat engagement to drive towards greater greenhouse gas reduction, and ultimately a transformed market.

Core Activities

- » Provide participants with a Commercial Single Point of Contact (SPOC) to serve as a facilitator and customer advocate and to help guide business owners through the process from initial contact to project completion.
- » Develop an integrated assessment process that streamlines multiple program offerings into one customer report.
- » Deploy user-friendly CRM software that supports ongoing relationships between the business and the program.
- » Target buildings by using data analytics in order to focus opportunities and improve MCE's sales approach.
- » Offer innovative behavioral approaches that leverage web-based tools and software programs. Depending on demand, offerings could also include competitions and campaigns, social media, green teams, and interactive dashboards.
- » Leverage existing and forthcoming benchmarking regulations for customers to compare their usage to their peers and best-in-class operations, and as a tool to incentivize upgrades and enhancements. Benchmarking can tie into other offerings and be used as motivation for anything from assessments to deep retrofits to behavioral campaigns to Fault Detection and Diagnostics.
- » Offer financing options through MCE on-bill repayment to help overcome one of the primary barriers for many small commercial customers: access to capital.
- » Provide assistance obtaining Bay Area Green Business certification.

Key Innovations

- » Deliver an integrated approach that provides a seamless customer experience.

Commitment to Public Sector

Public agencies play a leadership role in their community, and are expected to be a key player supporting the rollout of cornerstone energy efficiency regulations.⁷⁸ MCE has not proposed specific intervention strategies for the public sector because the sector is primarily served through Local Government Partnerships (LGPs) in MCE's service area. MCE will continue to expand public-private partnerships (e.g. PACE financing) and collaborate with LGPs to offer innovative approaches. MCE's SPOC will assist customers in accessing LGP programs that serve public agencies. Where opportunities for leveraging MCE's other offerings exist (e.g. commercial sector offerings), MCE will bundle these offering with LGP public sector offerings.

78 Assembly Bill 758 Existing Buildings Energy Efficiency Action Plan describes the public sector's role in creating a new statewide commercial benchmarking and disclosure program, encouraging local government innovation, and shaping better energy codes for existing buildings.

Summary Tables

The proposed budget for the first four years of the commercial program is as follows:

Table 19. Commercial Program Budget Summary

Budget Category	Year 1	Year 2
Administrative	\$192,496	\$227,696
Marketing	\$314,328	\$283,948
Direct Implementation	\$767,753	\$825,212
Incentives	\$599,621	\$851,637
Evaluation, Measurement, and Verification (EM&V)	\$84,604	\$84,604
TOTAL	\$1,958,803	\$2,273,098

The expected total resource cost and estimated savings are detailed below:

Table 20. Cost Effectiveness Summary

Sector Summary	Year 1	Year 2
Total Resource Cost (TRC)	1.17	
Budget	\$1,958,803	\$2,273,098
Estimated Net Savings	1,829,211 kWh 1,924 therms	3,671,630 kWh (1,983) therms

Figure 28. Integrated Program Structure — Commercial

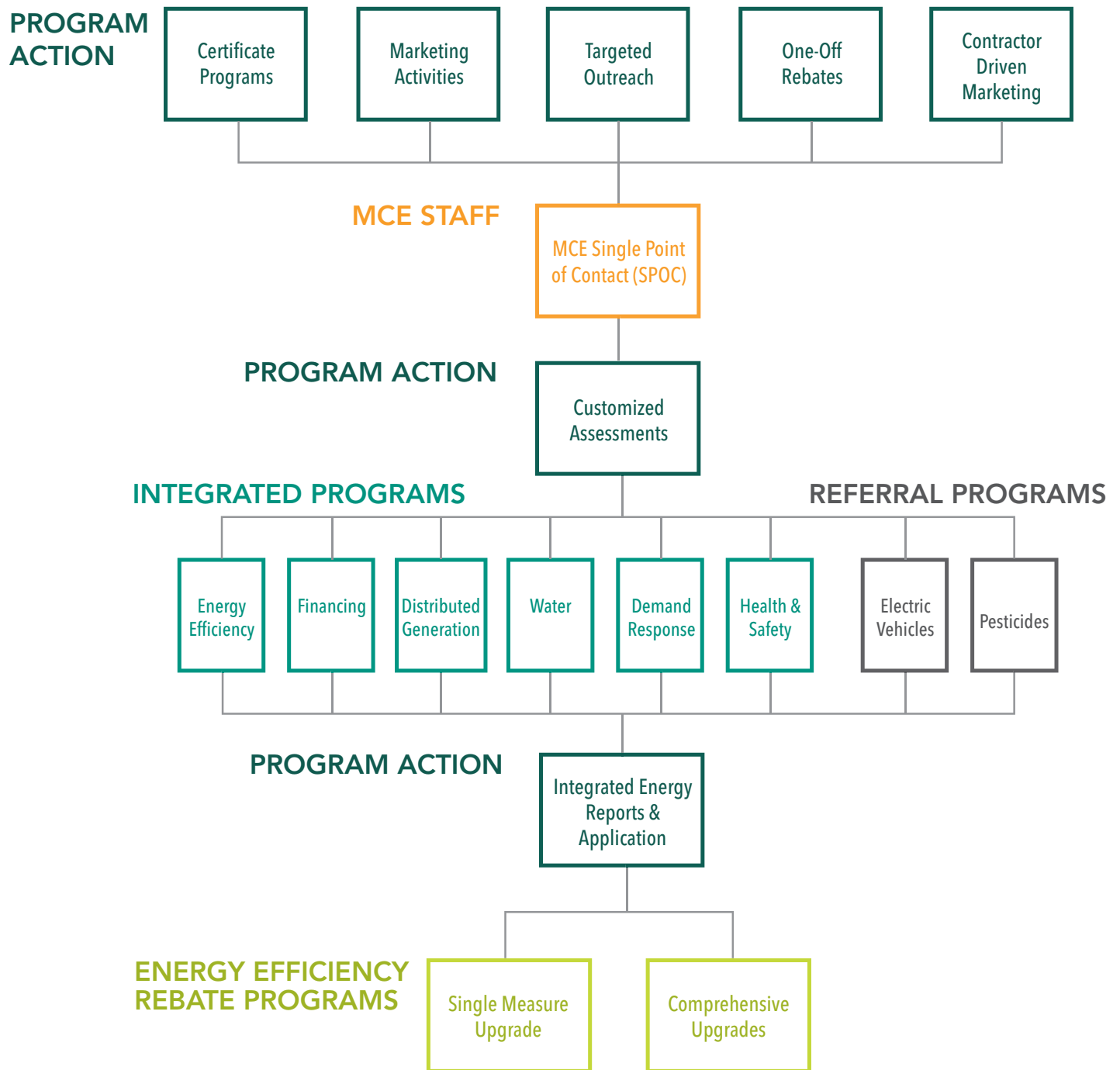
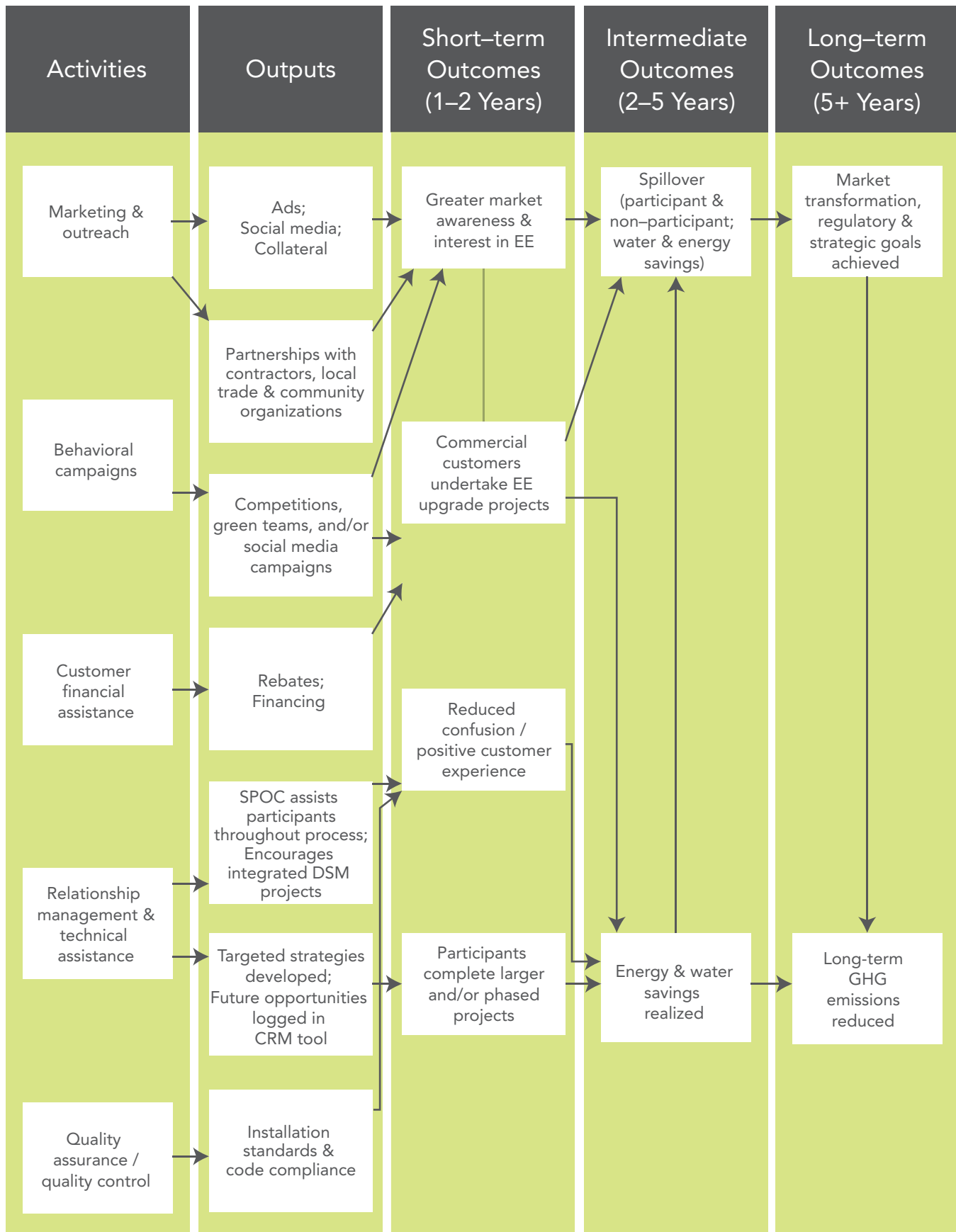


Figure 29. Commercial Program Logic Model



12.2 Gap Analysis and Market Characterization

MCE researched the sector in detail, including adoption and penetration of key programs and measures, market size, and intervention strategies and tools. MCE also analyzed the landscape of existing programs and had extensive discussions with customers, contractors, implementers, and program administrators running similar programs in MCE's service area and in other areas. While there are many existing programs in MCE's service area, gaps remain in program offerings.

Small commercial programs, including MCE's program, market themselves as "comprehensive" but have struggled to get traction for truly comprehensive measure mixes and deep retrofits. Likewise, small commercial programs in MCE's service area focus on boutique size, leaving a gap in the mid-sized facilities. These conclusions are drawn not only from extensive discussions and market research, but also represent a data-driven analysis conducted on the program, and for similar programs in the greater San Francisco Bay Area.

MCE's intervention strategies present solutions to these gaps. The SPOC model provides a framework that maximizes depth of retrofit to enable more comprehensive projects. Similarly, the default administrator status would provide MCE with the necessary autonomy to contract with implementers who can cost-effectively deliver more comprehensive savings and target specific verticals (e.g. restaurants) and market segments (e.g. mid-size businesses) that are currently underserved by the small to mid-size business direct install model.

The sections to follow present MCE's analysis of energy consumption, building data, barriers, triggers, key market actors, and energy efficiency adoption to

better understand the opportunities that exist within the commercial sector.

Energy Consumption

Commercial businesses account for about 10% of MCE's accounts, yet represent a much larger portion of its electrical consumption.⁷⁹ This demonstrates the importance of targeting the commercial sector to achieve energy and greenhouse gas emission reductions.

Since typical commercial energy consumption profiles vary considerably across California and within MCE's service area, MCE will work with partners that understand the diversity of its customer base to develop appropriately diverse strategies.

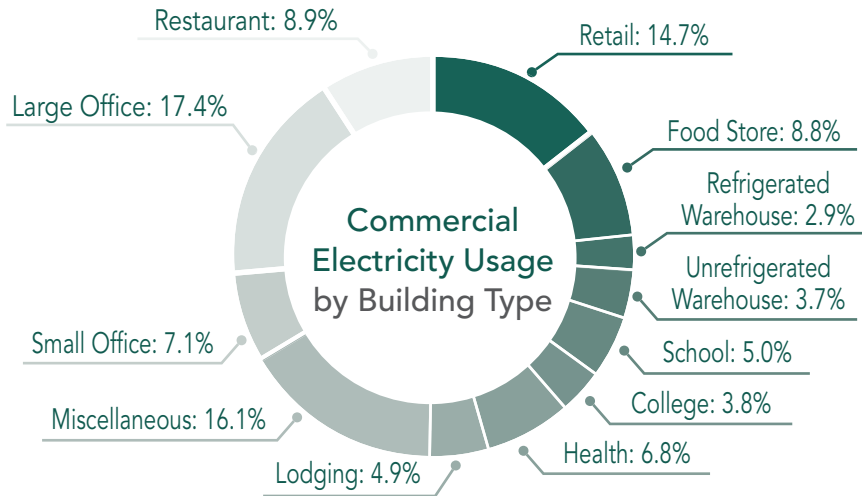
The following graphics depict statewide commercial electricity and gas usage by building type and end use. The data is from the 2006 California Commercial End-Use Survey (CEUS),⁸⁰ which is a comprehensive study of commercial energy use across thousands of commercial facilities in California.

On a statewide basis, electricity and gas use varies considerably across commercial customer segments (Figures 30 and 31). For example, on a comparative basis, the natural gas use of restaurants is a more significant cost driver than it is for large offices (Figure 31). Meanwhile, on an absolute basis, the large office segment represents the highest electricity use segment (Figure 30) while restaurants represent the highest gas use segment (Figure 31). This indicates a need for targeted, relevant customer offerings.

79 MCE internal data; data for the Commercial and Industrial sectors represents about 60% of MCE's electrical consumption; the sectors have been combined to comply with CPUC privacy regulations.

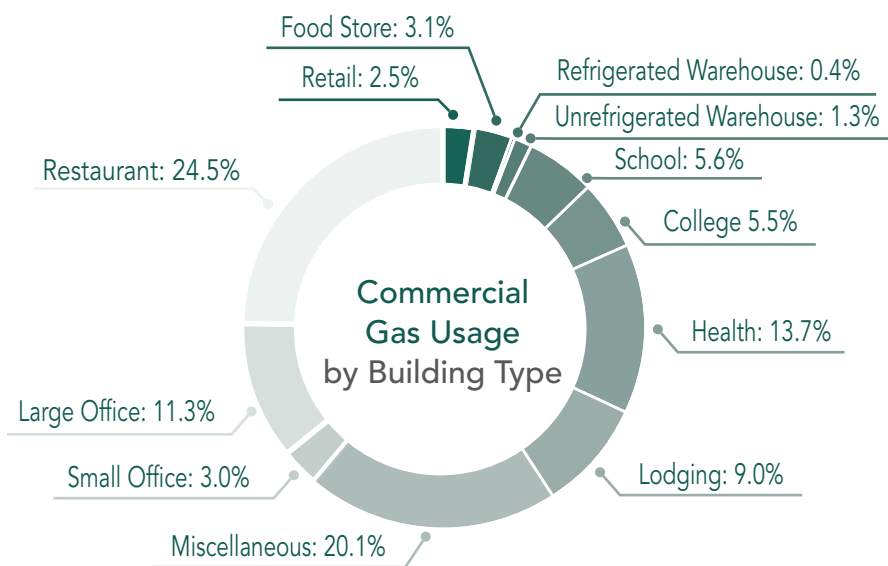
80 California Commercial End-Use Survey. California Energy Commission. (2006). Available at <http://www.energy.ca.gov/ceus/>

Figure 30. California Commercial Electricity Usage by Building Type



Source: CEUS 2006

Figure 31. California Commercial Natural Gas Usage by Building Type



Source: CEUS 2006

In the commercial sector, the primary electricity end uses are interior lighting, cooling, ventilation, and refrigeration (Figure 32). The top three gas end uses comprise over 90% of the sector's gas usage (Figure 33). These are space heating, water heating, and cooking. Analyzing end-use consumption provides insights into the top-consuming measures, which can serve as a useful tool for targeting energy efficiency opportunities.

Building Data

MCE's service area contains a diversity of commercial building vintages, which provide insights into trends affecting construction and growth (Figure 34). Benicia, for example, has seen considerable growth and expansion since the mid-1970s, while Marin County has seen declining growth during that same time period. Building vintage provides useful insights into energy efficiency program planning and marketing strategies, especially in the context of Title 24 and other code changes.

The size of commercial buildings varies considerably across MCE's service area (Figure 35). To effectively serve its diverse customer base, MCE tailors its energy efficiency strategies according to customer needs. For example, strategies focused

on serving the small commercial segment may be better suited to Richmond, El Cerrito, and San Pablo (with the greatest number of commercial buildings under 5,000 square feet); meanwhile, there may be more significant opportunities for large commercial upgrades in Napa, Walnut Creek, Lafayette, and Benicia (which have a greater share of commercial facilities over 100,000 square feet).

Problem Statements

There are several barriers that may prevent the commercial sector from fully taking advantage of energy efficiency opportunities. These barriers include:

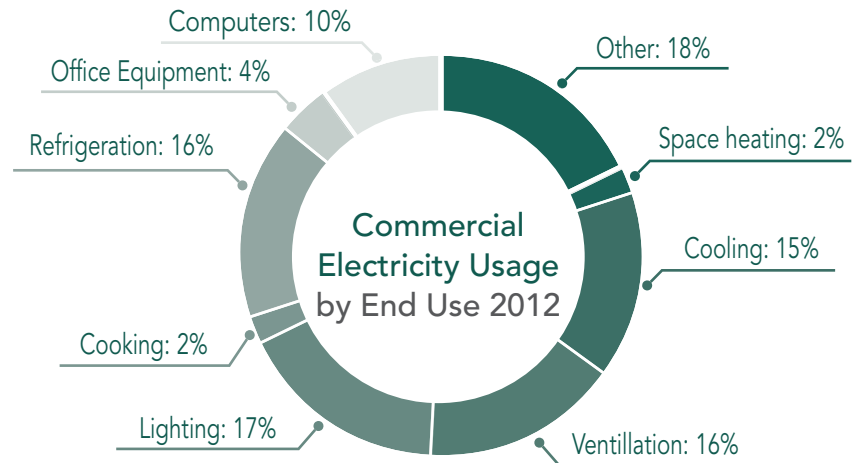
» Small to Mid-size Business

Barriers. This customer segment tends to be difficult to engage due to the high number of businesses, fragmentation of savings across many small accounts, and difficulty commanding the attention of busy owners and operators.

» Large Commercial Business

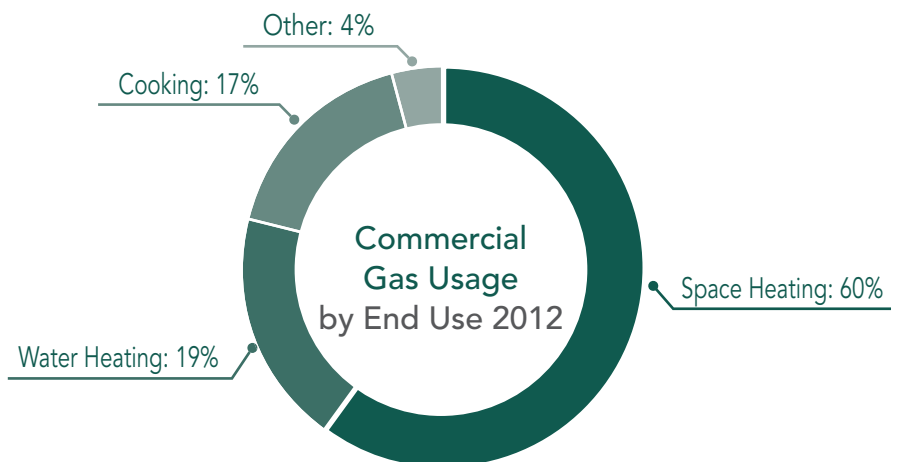
Barriers. Energy costs can represent a relatively small portion of the large commercial operating budget, which makes it a low priority for accessing organizational capital. Some businesses may be concerned about impacts of energy efficiency on products and productivity. Furthermore, it can be particularly challenging to reach decision makers in large commercial facilities due to the sheer size and number of employees.

Figure 32. California Commercial Electricity Usage by End Use



Source: Commercial Building Energy Consumption Survey (CBECS). United States Energy Information Administration. (2012). Available at <http://www.eia.gov/consumption/commercial/>.

Figure 33. California Commercial Natural Gas Usage by End Use



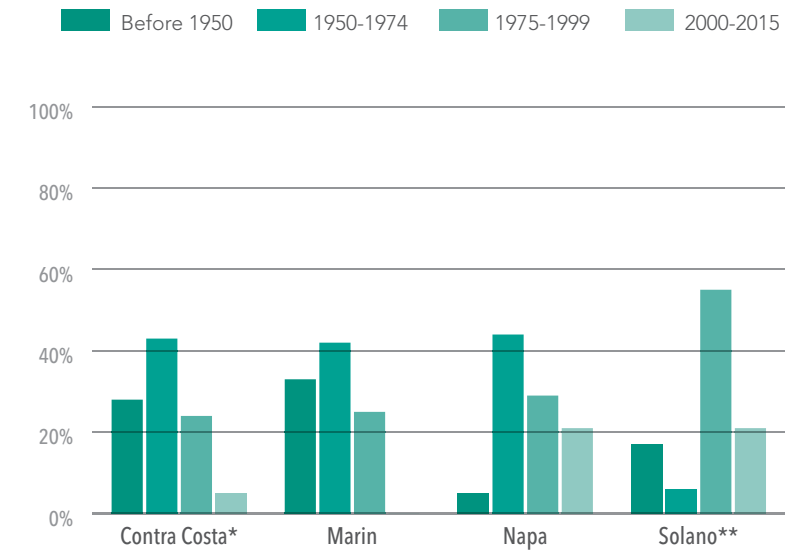
Source: Commercial Building Energy Consumption Survey (CBECS). United States Energy Information Administration. (2012). Available at <http://www.eia.gov/consumption/commercial/>.

» **Financial Constraints.** Payback requirements are 3.6 years on average — and considerably higher for many segments such as small businesses and renter-occupied spaces.⁸¹ This can be a challenge for two reasons. First, it can limit deeper retrofits that would pay back beyond that threshold. Second, commercial building tenants that move frequently are not incentivized to pay for efficiency upgrades where they may not reap the rewards during ownership. Some entities are constrained by barriers separating capital development and operating funds, and can be limited by lowest-bid regulations. Efficiency projects save on operating funds but often require capital fund expenditures. Accessing capital funds often requires approval from fiscal managers, who are tasked with balancing many competing priorities across business lines.

» **Split Incentive Issue.** It is a challenge to encourage energy efficiency upgrades in facilities where the tenant pays for electricity but does not own the equipment. This arrangement is very common in the commercial sector, and can make it challenging to get buy-in and financial backing for efficiency upgrades. Potential savings are fragmented across a high diversity in business type and large geographical area.

» **Contractor Limitations.** There are a limited number of contractors with technical knowledge of integrated and comprehensive demand-side management and a need for contractors that have the business, sales, and project management

Figure 34. Commercial Building Vintage by Service Area

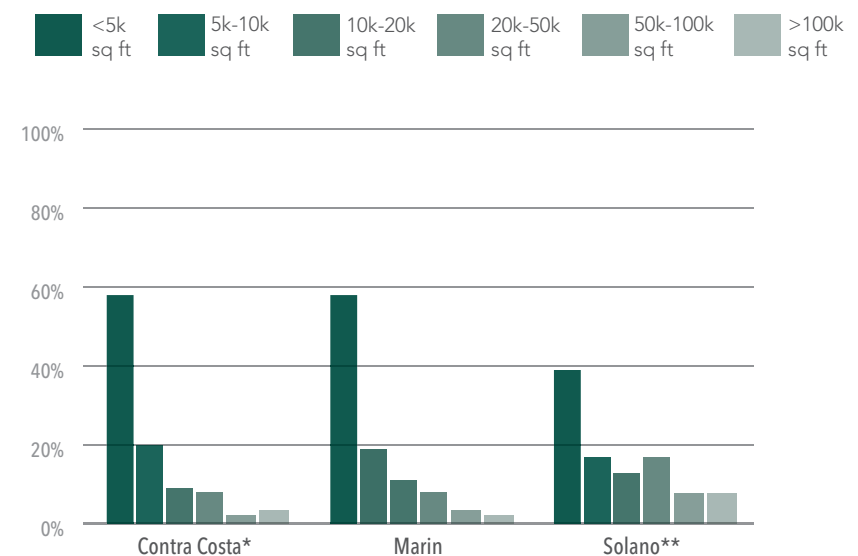


*includes Cities of El Cerrito, Lafayette, Richmond, San Pablo, and Walnut Creek

**includes City of Benicia

Source: City and County Tax Assessor Data

Figure 35. Commercial Building Size by Service Area
(Sufficient data on parcel size unavailable in Napa County)



*includes Cities of El Cerrito, Lafayette, Richmond, San Pablo, and Walnut Creek

**includes City of Benicia

Source: City and County Tax Assessor Data

81 Unlocking Energy Efficiency in the US Economy. McKinsey & Company. (2009). Page 58. Available at http://www.greenbuildinglawblog.com/uploads/file/mckinsey-US_energy_efficiency_full_report.pdf

skills needed to convert lead generation to complete projects.

- » **Visibility of Improvements.** Energy efficiency improvements are not as visible as other clean energy strategies, such as rooftop solar panels. As a result, efficiency improvements may not increase property values in the way that other clean energy strategies do.
- » **Lack of Awareness.** Commercial customers have a general lack of awareness of energy efficiency benefits and MCE programs. There is also uncertainty in achievable savings, time constraints, and a lack of dedicated energy managers in the commercial sector. Finally, there is a need for greater sub-metering to gain insight into energy consumption.

MCE's commercial program is designed to address these barriers by reaching customers at trigger points and offering tailored solutions.

Trigger Points

Trigger points are moments of opportunity when the likelihood of engaging customers in an energy efficiency program is highest. Trigger points for commercial customers include:

- » **Turnover and Upgrades.** Periods of change, such as office space turnover (signing or renewing a lease), turnover in retail or restaurant space, and major facility renovations or upgrades.
- » **Change in Law or Regulation.** MCE will use upcoming or anticipated changes in codes, standards, and regulations as a trigger point to motivate commercial customers to act on resource conservation. Where there is a change of law or a sunset to an existing law, there is also opportunity for a SPOC to engage. MCE closely tracks developments in the following laws, standards, and goals, among others:

- » **Laws:** California Green Building Initiative Executive Order (S-20-04), California Energy Benchmarking and Disclosure Law (AB 802, 2015),⁸² California Comprehensive Energy Efficiency Program for Existing Buildings (AB 758, 2009), and California Global Warming Solutions Act (AB 32, 2006 and SB 32, 2016).

- » **Regulations and Standards:** California's energy codes in retrofits (Title 20), California's energy codes in new construction (Title 24), International Organization for Standardization's Energy Management Standard (ISO 50001), American National Standards Institute (ANSI) certification; Leadership in Energy & Environmental Design (LEED); Green Building Initiative's Green Globes, and Department of Energy codes and standards (commercial HVAC equipment, lighting, appliances, etc.).

- » **Goals:** California Long Term Energy Efficiency Strategic Plan and the Governor's greenhouse gas emission reduction goals (Executive Order B-30-15).

- » **Projected or Actual Equipment Failure.** Given capital constraints, commercial operations are unlikely to replace equipment that is not at or near the point of failure. Furthermore, once equipment fails, the ability to replace it quickly is critical. Establishing a relationship with these customers prior to equipment failure will be crucial to MCE's ability to influence the efficiency of the replacement equipment and to encourage a more comprehensive efficiency project. Alternatively, partnering with the contractors who most often provide equipment replacement will also ensure customers are presented with efficient alternatives

82 MCE will also use benchmarking tools (such as Energy Star Portfolio Manager) to gather baseline building information and track efficiency updates.

at the right time and to connect customers with MCE's offerings to go beyond simply replacing the equipment.

- » **Seasonal Triggers.** If a business experiences seasonal periods of relatively low activity, the best time to engage a customer for equipment upgrades would be in advance of a low point of activity, to allow upgrades to be planned for that time period. Conversely, the best time to target a customer for behavioral or operational efficiency offerings might be during periods of high use when there is the most opportunity to save.
- » **Operating Budget Cycles.** Particularly for large commercial customers, an awareness of their budget planning cycle can be crucial to timing discussions about strategic and continuous energy management.

MCE's objective is to utilize these trigger points to effectively engage customers in MCE's energy efficiency offerings. To achieve this, MCE must identify and leverage the entities that influence this sector.

Key Market Actors

There are many entities that influence the commercial sector. It is important that MCE understand the role that each entity plays and how this can affect efforts to promote energy efficiency.

- » **Energy Consumers.** Energy consumers such as owners, renters, staff, and other occupants of a commercial facility are the ultimate end-use decision makers.
- » **Legislative and Regulatory Bodies.** Legislative and regulatory bodies such as Federal and State Legislatures, the California Energy Commission, and the California Public Utilities Commission are

responsible for tax laws, regulations, codes, and standards.

- » **City and County Organizations.** City and County organizations such as development agencies; Planning Commissions, and environmental task forces, committees, and commissions provide influence for programs related to building codes, financial incentives, and customer/constituent relationships.
- » **Community Organizations.** Community organizations such as Chambers of Commerce, RichmondBUILD, San Pablo Merchants Association, Marin Economic Commission, Marin Builders Association, Workforce Investment Boards, West County Council of Industries, and other trade associations and green certification programs provide customer/constituent relationships.
- » **Business Partners.** Business partners such as energy consultants, implementers, visionaries, and financial lending institutions provide marketing, outreach and implementation support services.
- » **Other Key Market Actors:** Construction industry; contractors; equipment manufacturers and suppliers; vendors/commercial supply store; research & development industry; and media.

MCE tracks key market actors in order to identify opportunities and challenges, and the impact of these entities on a customer's energy efficiency decision-making.

Adoption and Penetration

Before implementing commercial program strategies, MCE evaluated current adoption and penetration of energy efficiency programs to identify opportunities and determine market gaps.

Commercial participation rates vary significantly across program administrators and by sector and programmatic approach. According to the American Council for an Energy-Efficient Economy (ACEEE), key drivers in improving participation rates (and ultimately program success) include reducing complexity and increasing confidence. In particular, ACEEE's top ten recommendations include:⁸³

- » Performance Based Energy Efficiency
- » Integrated Services
- » Rich Territory Analytics
- » Persona Development
- » Direct Install Specific Technology
- » Consistent Customer Experience
- » Customer Relationship Manager Tool, Used at Scale
- » Flexible Financing Vehicles
- » Local Partner Ecosystem
- » Predictable Results

Likewise, market penetration rates for high-efficiency equipment varies significantly. For example, restaurants and medical clinics have a higher share of inefficient T12s than schools, while retail stores and warehouses have a higher proportion of high performance reduced wattage T5s and T8s.⁸⁴

83 From New York to the Southeast: EERS paves the way for the next generation of Small Business Direct Install Programs. American Council for an Energy Efficient Economy (ACEEE). Slide 4. Available at <http://aceee.org/files/pdf/conferences/eer/2013/5A-Castro.pdf>

84 California Commercial Saturation Study Final Report. Itron. (2014). Pg ES-8. Available at http://www.calmac.org/publications/California_Commercial_Saturation_Study_Report_Finalv2ES.pdf

MCE's baseline participation rates show that from 2013 to present, over 1,317 businesses have received no-cost audits through SmartLights, the joint MCE-PG&E direct install program, managed by Community Energy Services Corporation, and 401 projects have been completed, resulting in nearly 3,000,000 kWh in savings.

Existing commercial programs in MCE's service area have tended to focus on low-hanging fruit, which presents a challenge to achieving cost-effective savings when many of the lower cost measures have already been replaced, leaving higher cost measures that are less attractive to the customer if not bundled, or that are not cost-effective for the program administrator. However, significant opportunities remain for certain measures (e.g. LEDs and advanced rooftop HVAC controls for example) and in certain sectors (e.g. small to mid-size businesses).

To make significant inroads at penetrating the small to mid-size (SMB) market, energy efficiency programs must develop creative solutions to address structural market barriers like the owner-occupant split incentive. In the large commercial sector, relatively low-cost opportunities like retrocommissioning can be paired with more capital-intensive measures and deep retrofits.

Customer interest in measures like energy dashboards or subsidized electric vehicle infrastructure can be used as an entrance point to get a customer engaged and interested in comprehensive integrated demand side management upgrades. Likewise, upcoming regulations (such as building benchmarking under AB 802) can be a leverage point for large commercial customers. A tailored and integrated approach is crucial to making significant progress in increasing commercial efficiency penetration rates.

12.3 Intervention Strategies

Based on the market characterization, gaps, barriers, and trigger points, MCE proposes to offer the following overarching strategies:

- » Provide participants with a Commercial SPOC to serve as a facilitator and customer advocate and to help guide business owners through the process from initial contact to project completion.
- » Target buildings by using data analytics in order to narrow down opportunities and improve MCE's sales approach.
- » Provide low- or no-cost audits for small commercial properties with limited opportunities.
- » Provide extensive audits with customizable incentives for larger properties.
- » Develop an integrated assessment process that streamlines multiple program offerings into one customer report.
- » Deploy sophisticated customer relationship management (CRM) software that supports ongoing relationships between the business and the program.

The commercial program will offer low- or no-cost audits for small commercial properties, and will provide extensive audits with customizable incentives for larger properties. Upon completion of the audit, an integrated assessment process will streamline multiple program offerings into one customer report. MCE will leverage CRM tools as the foundation for an ongoing relationship between the business and the program.

The program will provide participants with a SPOC who will serve as a facilitator and customer advocate,

and help to guide the business owner through the process from initial contact to project completion. There are many benefits of a SPOC program. For example, projects may be more attractive to customers and easier to accomplish when all savings opportunities are bundled together and follow a clear, uniform presentation. In addition, the SPOC delivery model can provide more personalized attention and more follow-through to reduce customer confusion and increase the project completion rate. Project phasing is yet another benefit; MCE can remain in contact with participating properties over time and encourage property owners to implement projects in phases according to customer needs.

MCE will employ software and data analytics platforms to target buildings and tailor strategies according to demographics and energy savings opportunities.

EM&V studies heavily influence MCE's intervention strategies. Applicable studies are referenced within each strategy section, and a summary of key cross-cutting findings is below:

- » **Value of technical assistance:** demonstrated through 15 years of Savings by Design process evaluations, which show an increase in persistence of savings.⁸⁵
- » **Need for variety of intervention strategies and tactics to meet diverse customer needs:** Opinion Dynamics study points to the diversity of sectors, building types, occupancies, etc. in the commercial sector, and therefore the need for a tailored approach.⁸⁶

⁸⁵ Final Report 1999–2001 Building Efficiency Assessment (BEA) Study: An Evaluation of the Savings by Design Program. RLW Associates. (2001). Available at [http://www.calmac.org/startDownload.asp?Name=BEA+Final+Report+\(071603\)ES.pdf&Size=101KB](http://www.calmac.org/startDownload.asp?Name=BEA+Final+Report+(071603)ES.pdf&Size=101KB)

⁸⁶ PY 2013–2014 Third Party Commercial Program Value and

- » **Evolving Lighting Landscape:** the 2013–2014 Nonresidential Downstream Deemed Energy Savings Performance Incentive Lighting Impact Evaluation Final Report provided a series of key recommendations for how to properly claim early retirement, account for dual baselines, improve the net to gross ratio framework, and accurately apply installation rates in ex ante claims.⁸⁷

Comprehensiveness Analysis Report⁸⁸

- » An increase in technologies addressed (or measures offered) does not necessarily mean either an increase, or a decrease, in savings achieved.
- » Focusing on very small customers yields higher “depth of retrofit cost–effectiveness” (DORCE) than large customers.
- » Food service and water heating offer opportunities for higher DORCE scores, while plug loads are the least effective.
- » Colleges and other campus–style facilities, offices, groceries, and liquor stores generally have higher DORCE scores than restaurants and public assembly buildings.

These EM&V studies provide useful insights for the details behind intervention strategies.

Retrofit

This program offers technical assistance, incentives (including kickers for whole building projects and projects with multiple measures), and financing options to upgrade existing commercial facilities. In addition, customers who achieve zero net energy (ZNE)⁸⁹ will receive a bonus incentive. Savings can be estimated with either a performance–based or widget–based approach, depending on the type of project. Rebates will be offered for lighting, HVAC, refrigeration, insulation, building envelope, plug loads, and other measures as appropriate.

MCE will offer tailored approaches, recognizing that small businesses have different needs and barriers to entry than larger commercial facilities. For example, as a generalization, SMBs may face more stringent payback period thresholds—and therefore may be better candidates for financing to ensure deeper retrofits.

Data Analytics and Behavioral Approaches

Data and behavioral–based approaches offer a wealth of innovative tactics to inform, engage, and motivate customers to change their energy consumption habits. Displaying monthly usage over time and highlighting issues and opportunities for customers can encourage behavior changes in usage patterns.⁹⁰ Many of the same tools can also serve as powerful ways to target customers for participation. Data analytics and software systems are leveraged to enable continual measurable feedback for assessing opportunities, project tracking, lead generation, and Measurement & Verification (M&V).⁹¹

Effectiveness Study Report. Opinion Dynamics. (2016) Available at [http://www.energydataweb.com/cpucFiles/pdaDocs/1571/PY%202013–2014%20Third%20Party%20Commercial%20Program%20Value%20and%20Effectiveness%20Study%20\(volume%201%20of%20II\).pdf](http://www.energydataweb.com/cpucFiles/pdaDocs/1571/PY%202013–2014%20Third%20Party%20Commercial%20Program%20Value%20and%20Effectiveness%20Study%20(volume%201%20of%20II).pdf)

87 2014 Nonresidential Downstream Deemed ESPI Lighting Impact Evaluation Report. Itron. (2016). Available at <http://www.energydataweb.com/cpucFiles/pdaDocs/1446/Deemed%20Lighting%20Report%20and%20Appendices.pdf>

88 Comprehensiveness Analysis Report Phase I. Itron. (2016). Available at <http://www.energydataweb.com/cpucFiles/pdaDocs/1624/CA%20Comprehensiveness%20Analysis%20Draft%2>

89 Comprehensiveness Analysis Report Phase I. Itron. (2016). Available at <http://www.energydataweb.com/cpucFiles/pdaDocs/1624/CA%20Comprehensiveness%20Analysis%20Draft%2>

90 Home Energy Report impact evaluation findings vary from program to program. One report found 0.8% measurable kWh savings. Review and Validation of 2014 Southern California Edison Home Energy Reports Program Impacts (Final Report). DNVGL. (2014). Pg 3. Available at http://www.calmac.org/publications/DNV_GL_SCE_HERs_2014_FINAL_to_CalmacES.pdf

91 Measurement and verification differs from evaluation, measure-

Examples include everything from benchmarking platforms (like Energy Star Portfolio Manager), to load disaggregation software, to fault detection and diagnostics software. These tools could also enable dashboard control of plug load technology, and provide information to the customer to control existing plug load energy use.

Behavioral approaches can couple these tools with the principles of social norming. Possible strategies include comparative energy reports, competitions, green teams, interactive energy-use kiosks, social media, and games. Specific approaches will be tailored according to customer need and demand. Consistent with the other program strategies, data analytics and behavioral approaches will allow for integration with demand response, distributed generation, electric vehicles, and plug load control.

MCE will also leverage lessons learned from benchmarking process evaluations, which show that those who benchmarked buildings went on to take energy management actions in their buildings, such as reviewing building control strategies and setpoints, monitoring electricity, gas or steam use, and identifying areas for reducing energy use.⁹² These data analytics and behavioral approaches could be combined with retrofits to maximize savings and customer engagement.

ment, and verification (EM&V) in that it is information gathered real time and analyzed in house for the purposes of immediate program improvement. EM&V is traditionally conducted by an independent third party to provide an analysis of program improvement for regulatory processes.

⁹² Statewide Benchmarking Process Evaluation. NMR Group. (2012). Available at http://www.calmac.org/publications/Statewide_Benchmarking_Process_Evaluation_Report_CPU0055.pdf. Study findings indicate the potential for benchmarking and identifies barriers and opportunities that raise questions for California stakeholders on how to best leverage the legislative, ratepayer, market and other resources at hand going forward.

Green Business Certification

Green Business Certification provides proof of a company's commitment to conserving energy and water, minimizing waste, preventing pollution, and reducing its carbon footprint. This certification can be a powerful tool to encourage companies to conduct energy assessments and invest in the efficiency of their operations. MCE partners with local governments' sustainability departments to provide assistance in the certification process by helping customers navigate certification options and providing audit verification. MCE will facilitate marketing and outreach for green businesses to help publicize their commitment to sustainability, generate demand locally for green businesses, and drive participation in MCE's efficiency offerings. In addition, MCE will promote green building rating programs and educate customers on the value of building labels.

Pay-for-Performance

MCE will offer incentives to customers based on measured and verified savings. This "pay-for-performance" approach will leverage Advanced Metering Infrastructure (AMI) data and innovative meter-based measurement strategies to capture real, verified savings while minimizing administration expenses. This program may be delivered in conjunction with demand response programs. The load reductions could then be aggregated and bid into the California Independent System Operator (CAISO) market.

Another model that pay-for-performance can support is the use of a transaction structure in which a third-party investor finances building efficiency upgrades. MCE would then buy the actual energy savings from the third-party investor, while the building tenant or owner would reduce electricity consumption costs. MCE would partner with industry leaders to pilot this innovative approach to using energy efficiency in procurement.

The pay-for-performance approach aims to ultimately transform the market by spurring innovation and private sector investment in market-based approaches to energy efficiency, which may also be coupled with bundled approaches including demand response, solar, and electric vehicles. Ideally, the program will leverage real time accounting for savings using SmartMeter data. Finally, the program aims to share costs and risks with contractors and industry at large (not just the program). This strategy will be tailored and aligned with comparable program offerings in the industrial sector.

Strategic and Continuous Energy Improvement

Strategic and Continuous Energy Improvement (S-CEI) aims to promote energy efficiency as a common business practice. The typical pillars of an S-CEI program include: obtaining management support for ongoing energy efficiency enhancements, conducting ongoing assessments, trainings and improvements, and periodically developing and reviewing strategic efficiency goals. An emerging best practice is to offer energy management certification to help ensure the long-term success of projects. The goal is to create lasting changes driven by management and facilities personnel.

S-CEI projects can be a mix of retrocommissioning in that they typically target behavioral and operational measures; however, they go beyond retrocommissioning by emphasizing leadership buy-in and ongoing updates to energy management plans. Anticipated benefits of S-CEI include measurement of actual savings, plus a higher likelihood of deeper savings, greater persistence, and improved customer satisfaction. Rebates will be given for lighting, HVAC, refrigeration, insulation, building envelope, plug loads, and other measures as appropriate.

New Construction

MCE's commercial new construction offering targets new facilities or major renovations that require a

building permit and trigger code compliance. MCE offers education, performance-based incentives, and financing options to foster greater adoption of energy efficient and green building practices. Exceeding Title 24 requirements requires significant investment and technical knowledge. To help overcome this barrier, outreach will be conducted to architects and builders to encourage factoring energy-efficient technologies and strategies into cost estimates and design plans. Performance-based incentives will be offered to encourage investment in long-term energy savings. In addition, MCE will connect property developers with emerging financing programs that can help eligible customers to defray the higher upfront cost. Finally, customers who achieve ZNE will receive a bonus incentive.

MCE will offer tailored approaches, recognizing that small businesses have different needs and barriers to entry than large commercial facilities. Rebates will be offered for lighting, HVAC, refrigeration, building envelope, plug loads, and other measures as appropriate. MCE will evaluate offering tiered incentives for exceeding code.

Financing

MCE appreciates the value of financing in helping customers overcome barriers to efficiency. The 2012 "On-Bill Financing Process Evaluation and Market Assessment"⁹³ found that more than half of survey respondents said that financing was a bigger motivator than rebates.

MCE will help customers navigate the landscape of financing offerings available and encourage them to participate to the extent that it facilitates energy efficiency upgrades.

93 California 2010–2012 On-Bill Financing Process Evaluation and Market Assessment. Cadmus. (2012). Available at http://www.calmac.org/publications/On_Bill_Financing_Process_Evaluation_Report_2010-2012.pdf The study recommends ramping up training, which should highlight case studies of the benefits of bundling lighting retrofits with other equipment retrofits, and recommends expanding marketing efforts, emphasizing the benefits of removing the upfront cost barrier.

» **Green Business Loans**

This provides eligible customers with a low interest loan they can repay on their monthly utility bills. As of December 2016, the interest rate is 5% for \$10,000 to \$265,000 projects, with 5- to 10-year payment terms (subject to change). Up to 30% of the loan value can be used for non-energy related projects.

» **Leveraging Other Programs**

MCE also intends to promote a broad range of programs available in its service area including those described below.

» **Property Assessed Clean Energy**

Property Assessed Clean Energy (PACE) is a form of financing that enables property owners to pay for energy efficiency, renewable energy, and water conservation upgrades through a tax assessment on their property. Advantages of PACE include transferability with the property upon sale, long-term financing, and the ability to share the financing with tenants. Finally, it can be a source of financing for new construction projects.⁹⁴

MCE works with the County of Marin to implement an Open Market PACE model whereby any provider who agrees to a minimum set of best practices is eligible to operate in Marin. MCE will seek to work with other parts of its service area to expand this approach to PACE. MCE maintains a financing marketplace web portal where information about all available financing products is presented to the customer. Additionally, SPOCs will refer customers to PACE providers.

» **On-Bill Financing**

As of December 2016, the Investor Owned

Utilities (IOUs) have a statewide program that uses ratepayer funds to offset the upfront cost of a project and the customer can pay back the improvements over time on the utility bill. This product, offered at 0% and available for loans between \$5,000 and \$100,000, requires participants to limit the payback of projects financed through the loan to five years. However, this program may be a powerful motivator – particularly for small business customers who may have limited time tenancy in the property.

» **Statewide Financing Pilots**

The IOUs are rolling out a variety of financing tools (loans, leases, and energy service agreements) for energy efficiency improvements. MCE will monitor the development of these products and ensure that customers are made aware of them as a possible means to complete upgrade projects.

Metrics Tables (Table 21)

Alongside the other program administrators, MCE developed metrics that connect market barriers to intervention strategies, and that provide near, mid, and long term targets that build towards a 10-year vision. The metrics are based on the framework presented to the Energy Division in August 2016, which emphasized:

- » Usefulness for program administrators to manage portfolio
- » Information on the progress towards achieving desired market effect(s) and strategy effectiveness
- » Reliance on data collected during program implementation and/or data reporting to CPUC
- » Simple to understand and clear of any subjectivity
- » Emphasis on long-term outcomes

⁹⁴ Some PACE providers utilize SB 555 (2012) as the enabling legislation; this follows the Mello-Roos style assessment which can be used for new construction rather than the Streets and Highways Code assessment enabled under AB 811 (2008).

Table 21. Commercial Sector Market Barriers & Metrics

Problem Statement	Market Barriers	Desired Market Effects/ 10-year Vision	Intervention Strategies
Misalignment between typical payback requirements and commercial building turnover rates (disincentive to pay for upgrades that they may not benefit from)	Financial barrier	Improve the energy efficiency penetration in the untapped property management market	1. Leverage SPOC 2. Sophisticated CRM 3. Partnerships to engage and get buy-in from property managers
"Split incentive" issue in which the tenant pays for electricity, but does not own the equipment. This arrangement is very common in the commercial sector, and can make it challenging to get buy-in and financial backing for efficiency upgrades	Split incentive	Landlords offer upgrades as business-as-usual	1. Leverage SPOC 2. Sophisticated CRM 3. Partnerships to engage and get buy-in from property managers
Potential savings are fragmented across a high diversity in business type and large geographical area	Geographic diversity and area	Projects completed with relatively similar penetration across service area	1. Diversity of campaigns and outreach to reach broad territory
Limited number of contractors with technical knowledge of integrated and comprehensive demand-side management and a need for more contractors that also have the business, sales, and project management skills to convert lead generation to complete projects	Lack of contractor training; workforce limitations	Increase in contractor-driven projects	1. Expand contractor trainings and incentives
Uncertainty in achievable savings	Lack of data	Metered-based savings provides customers with greater certainty in savings	1. Metered-based savings pilots 2. Pay-for-performance strategies
Lack of dedicated energy managers in the commercial sector	Lack of time	Majority of commercial properties have an energy manager	1. Incentives and trainings for dedicated and shared energy managers
Need for greater sub-metering and metered energy savings approaches to gain insight into energy consumption patterns and savings over time	Lack of data	Greater reliance on metered savings	1. Promoting use of metered energy savings where applicable
Commercial customers' general lack of awareness of energy efficiency benefits and MCE programs	Lack of awareness	Majority of commercial customers recognize MCE's energy efficiency brand and benefits	1. Expand marketing efforts; leverage partnerships to broaden the message about EE benefits 2. Increase in standardization of savings
Energy efficiency improvements are not as visible as other clean energy strategies, such as rooftop solar panels. As a result, efficiency improvements may not increase property values in the way that other clean energy strategies do	Visibility of Improvements	Property owners and prospective tenants value EE improvements; greater reliance on benchmarking	1. Leverage partnerships and conduct strategic marketing efforts

Sector Metric	Baseline	Metric Source	Short Term Target (1–3 years)	Mid Term Target (4–7 years)	Long Term Target (8–10 years)
Percentage of commercial customers that participate in the program	Current percentage of commercial customers that participate in the program	MCE Program database	Increase to 2% of market	Increase to 4% of market	Increase to 6+% of market
Percentage of rental property owners and tenants that participate in programs	Current % of commercial customers that participate in the program	MCE Program database	Increase to 2% of market	Increase to 4% of market	Increase to 6+% of market
Increase in participation in historically under-participating regions	2015 baseline	MCE Program database	Increase to 2% of market	Increase to 4% of market	Increase to 6+% of market
Number of trainings; audit to completion conversion rate	2015 baseline	MCE Program database	Increase by 30% over baseline	Increase by 50% over baseline	Increase by 70% over baseline
Alignment between expected and achieved savings	2015 baseline	MCE Program database	Increase to 2% of market	Increase to 4% of market	Increase to 6+% of market
Percentage of all commercial customers with a dedicated or shared energy manager	Program Year 1 (PY1)	MCE Program database	Increase by 10% over baseline	Increase by 15% over baseline	Increase by 20% over baseline
Number of participants with savings tracked by metered based approaches	PY1	MCE Program database	Increase by 5% over baseline	Increase by 10% over baseline	Increase by 15% over baseline
Percentage of all commercial customers aware of MCE's EE programs	PY1	MCE Program database	Increase by 10% over baseline	Increase by 15% over baseline	Increase by 20% over baseline
EE value included in appraisal	PY1	Program administrator	Establish metric to quantify increased property value from EE (both savings and non-energy benefits)	Quantify data for newly established metric	Integrate metric into customer reports

12.4 Evaluation, Measurement & Verification

MCE will track metrics for measurement and verification (M&V) but will need to conduct Evaluation, Measurement, and Verification (EM&V), in conjunction with the CPUC and its consultants, to gain richer insights through process and impact evaluations.

Anticipated Study Needs

To supplement EM&V activities conducted by the CPUC, MCE proposes to undertake the following Impact and Process Evaluations.

- » **Impact Evaluation.** To evaluate the novel savings methodologies outlined in the data analytics and pay-for-performance strategies, MCE will conduct side-by-side project studies comparing savings estimated by the meter and software programs to savings estimates by traditional M&V approaches (e.g. pre- and post-inspections for lighting and HVAC measures).
- » **Process Evaluation.** For the strategic and continuous energy improvement strategy, MCE proposes an independent survey of participants to gather qualitative information on program design, marketing and outreach, program implementation, participation experience, and market barriers.

In addition, MCE will conduct a cross-sector process evaluation of the SPOC offering to determine to what degree it helps alleviate customer confusion and encourages repeat participation through project phasing.

12.5 Coordination

MCE is an independent Program Administrator operating within PG&E's service territory and overlapping Bay Area Regional Energy Network's service territory. Coordination among different programs will be important to minimize customer and contractor confusion while also achieving program objectives.

Key Partners

MCE will partner closely with other organizations promoting resource conservation, including water districts, climate coalitions, renewable and distributed generation companies and installers, and electric vehicle companies. MCE will communicate regularly with these entities to ensure that they have the latest program information. MCE will facilitate program participants' applications for rebates with these partner agencies and to the extent possible integrate those applications with the MCE application to streamline the participation process.

MCE will adjust its partnership strategy throughout the program cycle based on metrics (key performance indicators) and customer needs and drivers. MCE constantly seeks new partnership opportunities to help achieve its end goal of deeper energy and greenhouse gas savings. Some of the key partners include:

- » **Implementation Partners.** Implementation partners will provide technical assistance, project management, training, quality assistance, and quality control.
- » **Other Program Administrators and Publicly-Owned Utilities.** Other program administrators and publicly-owned utilities are a great source of lessons learned and best practices. In addition, MCE will coordinate offerings with program administrators that share MCE's service area.
- » **Contractors.** Contractors will install measures and be the primary driver of new participants for the single measure rebates.
- » **Local Trade Associations.** Local trade associations will help with marketing and outreach, recruit participants, and provide feedback on program design.
- » **Equipment Distributors.** Equipment distributors will help with marketing and outreach.

Table 22. Commercial Key Partners

	Retrofit	Green Business Certification	Green Business Loans	Pay-for-Performance	Data Analytics & Behavioral Approaches	S-CEI ¹	New Construction
Contractors (HVAC, lighting, etc.)	X		X		X	X	X
Community Groups and Chambers of Commerce	X	X	X		X	X	X
City and County Organizations	X	X	X				
Business Partners (implementers, software and web tool providers, etc.)	X	X	X	X	X	X	X
Trade Allies	X		X		X	X	X
Green Building Groups	X	X			X	X	
Property Management Companies	X		X				X
Commercial Real Estate Organizations	X		X	X		X	X
Financial Lending Institutions	X		X	X		X	X

¹ Strategic and Continuous Energy Improvement

- » **Lending Institutions.** Lending institutions will provide the secured financing for MCE's on-bill repayment offering.
- » **Local Government Sustainability Offices.** Local government sustainability offices or energy programs will identify key participants to facilitate their engagement with the program.
- » **Universities, Government and Other Research Institutions.** Universities, government and other research institutions such as the United States

Department of Energy and Lawrence Berkeley National Laboratory test emerging technologies and program strategies, and can provide lead generation ideas.

- » **PACE Program Providers.** PACE program providers will be a potential source of financing for participants to cover upfront costs.

Table 22 maps strategies to key partners. It is not intended to be fully comprehensive, but rather, a visual representation. ■

13. WORKFORCE DEVELOPMENT

13.1 Introduction

MCE has identified workforce development as a vital component of energy efficiency customer transformation. MCE is invested in developing relevant workforce opportunities in order to achieve its mission of addressing climate change while providing local economic and workforce benefits.

Through a growing network of trained local contractors, MCE can help achieve deeper market penetration with expertise in multiple demand-side management technologies and ensure each project has high program quality standards. MCE will support the success of its energy efficiency programs with complementary workforce development and training.

Skilled workers ensure that efficiency gains are met and that health and safety issues are addressed, even for those customers not participating in the program. Marketing, education, and outreach activities increase the demand for skilled labor in the region. Increase in skilled labor creates spillover benefits⁹⁵ for the whole community, not just program participants.

⁹⁵ Spillover benefits are obtained when the benefits received from the program, such as a highly trained workforce, are not limited to the participants in the program but are shared broadly across the community.

Core Activities

- » Work with local experts to align, leverage, and influence existing training programs and markets in the MCE service area.
- » Offer stackable credential programs that provide workers with a broad spectrum of transferable skills that qualify them for a variety of green jobs.
- » Provide on- and off-ramps for workers of varying levels of experience and ambition.

Summary Tables

MCE's workforce development activities are integral to each sector. The budget for workforce activities is embedded within the programmatic budgets for each of the sectors. Table 23 illustrates how MCE will support sector based workforce activities.

13.2 Gap Analysis and Market Characterization

MCE supports the success of its energy efficiency programs with complementary workforce development and training. MCE recognizes that contractors and workers must have the skills necessary to support program success and that a trained workforce is essential to achieving customer transformation. MCE's growing network of trained local contractors can also help achieve deeper market

Table 23. Workforce Budget Summary¹

Budget Category	Year 1	Year 2
Administrative	\$16,000	\$32,000
Marketing	\$9,600	\$32,000
Direct Implementation	\$128,000	\$243,200
Incentives	N/A	N/A
Evaluation, Measurement, and Verification (EM&V)	\$6,400	\$12,800
TOTAL	\$160,000	\$320,000

¹ Note the workforce budget is embedded in each sector budget and is included here for reference only.

penetration by identifying trigger events that could bring customers to the energy efficiency program.

MCE's goal is to create meaningful employment pathways for workers who are new or recently returning to the workforce, rather than creating one-off trainings that fail to guide participants toward future opportunities. MCE engages community partners to ensure the inclusion of workers from disadvantaged communities pursuing energy sector careers. Working closely with community partners helps MCE to build on existing success in the region, fill gaps in service, and provide meaningful local workforce opportunities in connection to MCE's own renewable energy projects. To date, MCE has contracted almost \$400,000 with RichmondBUILD, the Marin City Community Development Corporation, Rising Sun Energy Center, and others to train and provide local workers to implement energy upgrades for MCE's energy efficiency programs.

Workforce education and training creates an opportunity to break down barriers that disadvantaged communities face in the energy sector. Typically, disadvantaged workers are trained to do tasks that would be considered low-hanging fruit or entry level, which prevents them from career advancement.⁹⁶ MCE plans to address this issue

by working with community-based organizations, industry experts, workforce experts, and employers. Many community-based organizations and workforce development agencies provide clients with a case worker to assist them through the process of becoming gainfully employed as well as to support them and their employer to resolve challenges in the workplace. This type of on-the-job training leads to long-term employment.⁹⁷

The other major issue MCE has identified is that not enough industry professionals are aware of the benefits of energy efficiency upgrades. MCE's pathway program supports everyone from workforce entrants to professionals who have been in the industry for years. Supporting certifications⁹⁸ will create awareness around energy efficiency, ensure quality installations, and support the adoption of new technologies. However, it is important to note that certifications are a pathway to career advancement and not the end-goal of MCE's workforce program.⁹⁹

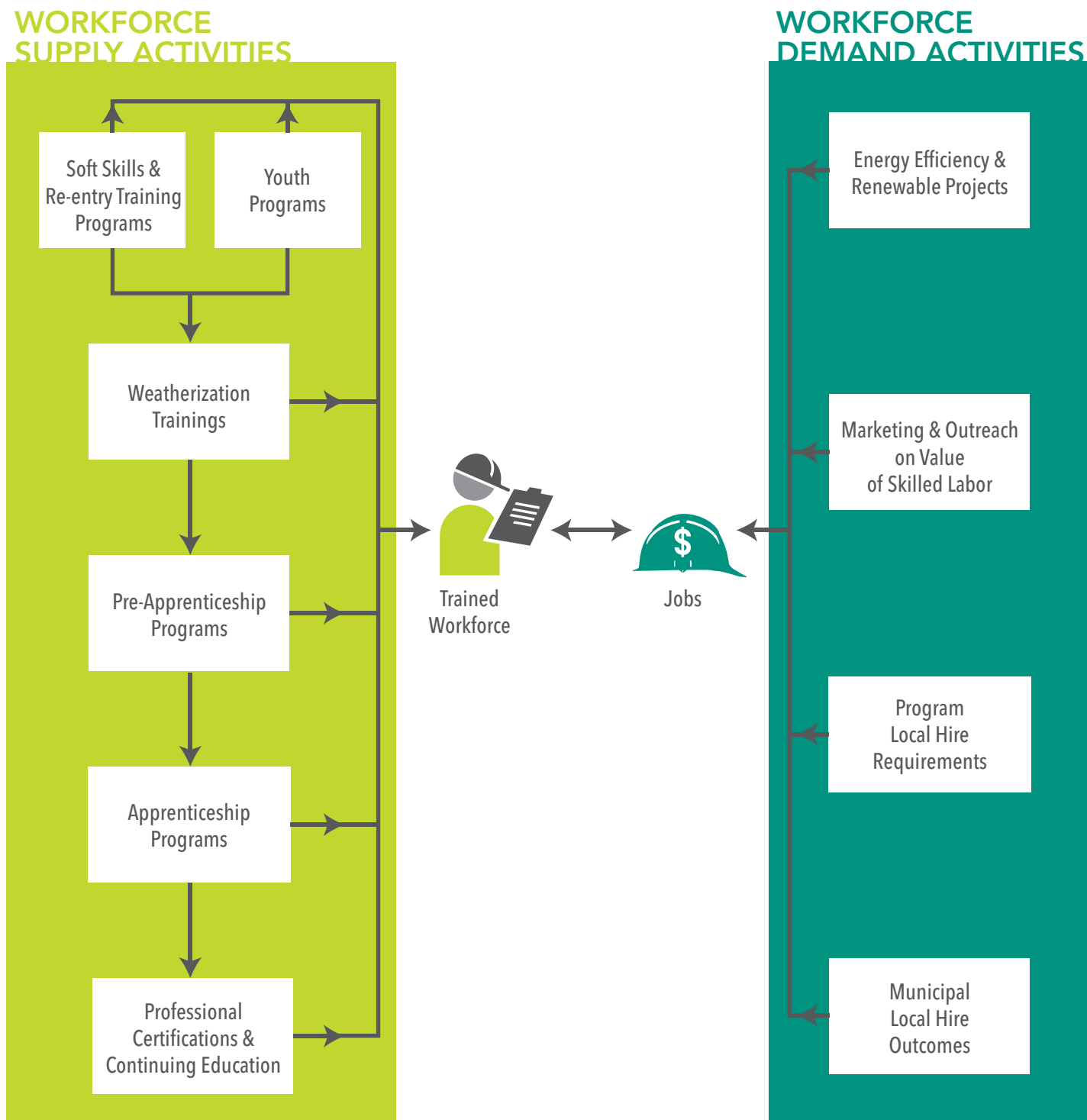
Opinion Dynamics and McLain ID Consulting. (2012) p. 59

⁹⁷ Training for the Future: Workforce Development for a 21st Century Utility Los Angeles's Utility PreOCraft Trainee Program. Ellen Avis and Carol Zabin. (2013) p. 11.

⁹⁸ Building Performance Institute, Green Point Raters, Pre-apprenticeship, and technology specific certifications.

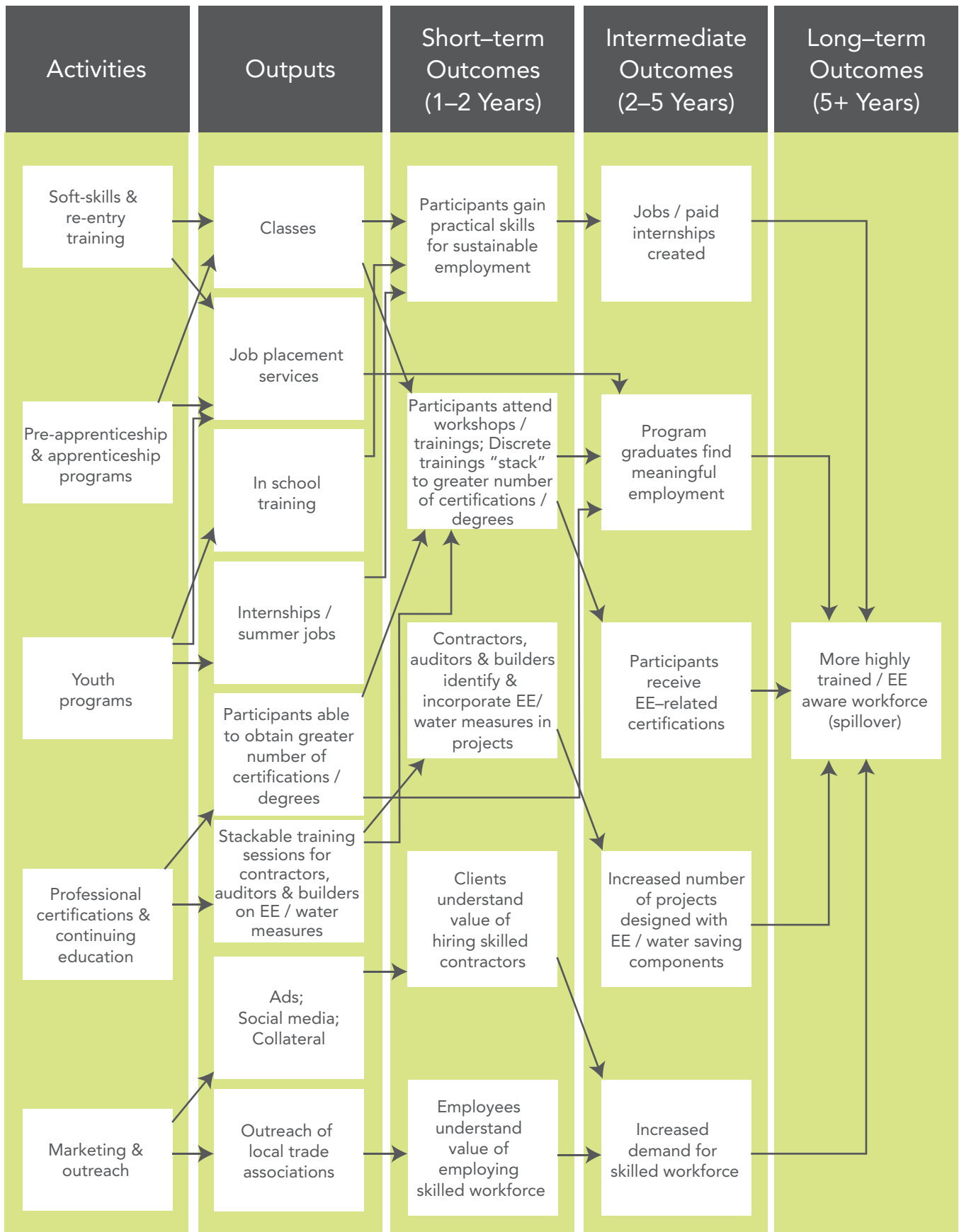
⁹⁹ Existing Buildings Energy Efficiency Action Plan. CEC. (2015) p. 66. Available at CEC.com/laladoc.

Figure 36. Workforce Program Diagram



MCE will work with industry experts to support trainings that create meaningful career pathways and activities that create a demand for a skilled workforce.

Figure 37. Workforce Program Logic Model



Workforce Data

MCE focuses on workforce development from a data-driven perspective. Understanding the existing level of engagement on energy efficiency and green building certifications, as well as the uptake in energy efficiency programs, will ensure trainings focus on areas where there is real opportunity. Tables 24–26 demonstrate that there are a significant number of certified green building professionals in MCE’s service area. The majority of contractors in the service area are general contractors, which indicates a strong opportunity for continuing education and professional development.

Problem Statements

There are several barriers that may prevent contractors from fully taking advantage of workforce development opportunities. These barriers include:

- » **Time Commitment.** Not all contractors have the time¹⁰⁰ or sufficient staff to participate in trainings while managing the daily needs of business. Contractors are hesitant to participate in trainings

100 2010–2012 WE&T Process Evaluation Volume I: Centergies. Opinion Dynamics and McLain ID Consulting. (2012) p. 16.

Table 24. Green Building Professionals Serving MCE’s Customers¹

Certification Type	# of Certifications
Certified Green Building Professionals	839
Certified Green Real Estate Professionals	362
Appraisers: Valuation of Sustainable Buildings (Residential)	26
Green Point Rater: New Homes	196
Green Point Advisor: New Homes	8
Green Point Rater: Existing Single Family	82
Green Point Advisor: Existing Single Family	25
Green Point Rater: Existing Multifamily	81

1 2009 California Residential Appliance Saturation Study. KEMA, Inc. for the California Energy Commission. October 2010. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>

Table 25. Building Performance Institute Certifications Awarded to Contractors in MCE’s Service Area¹

Certification Type	# of Certifications
Building Analyst	150
Envelope Professional	38
Heating Professional	6
AC & Heat Pump Professional	2
Multifamily	62
Infiltration & Duct Leakage	3
Energy Auditor	3

1 2009 California Residential Appliance Saturation Study. KEMA, Inc. for the California Energy Commission. October 2010. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>

Table 26. Membership of the Marin Builders Association by Contractor Type

Certification Type	Marin Contractors ¹	Contra Costa Contractors ²
Appliances	2	
Architects & Designers	12	
Construction Management, Estimating & Scheduling	4	
Drywall	3	
Electrical	19	17
Siding	3	
Fireplaces	2	10
General Contractors: Residential, Commercial, New & Remodels	143	72
Heating, Air Conditioning & Sheet Metal	12	62
Insulation	2	49
Lumber, Hardware, Tools	9	18
Plumbing	26	13
Propane	2	18
Roofing	13	22
Solar	5	
Windows & Doors	16	

1 Marin Builders Association Member Survey. Marin Builders Association. (2015).

2 Workforce Development Board of Contra Costa County. (2016).

that take time away from closing and completing projects.

» **Cost of Trainings.** Trainings, workshops, and certifications can be costly and cannot be invoiced to a specific project budget. This barrier particularly impacts contractors from disadvantaged communities.¹⁰¹

» **Contractor and Customer Perception of Energy Efficiency Costs and Benefits.** Contractors and their customers may have a misperception that

energy efficiency upgrades will increase the overall cost of a project¹⁰² as well as the payback period.

» **Background Check Policies.** Existing policies on background checks may bar non-violent criminals from participating in training programs or from being hired. Inclusion policies¹⁰³ that allow for an appeal process and time background checks as the last step in a hiring process may alleviate this and create opportunities for contractors.

101 Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities. Donald Vial Center on Employment in the Green Economy at the University of Berkeley. (2014) p. 98.

102 Energy Upgrade California – Home Upgrade Program Process Evaluation 2014–2015. EMI Consulting. (2016) p. 38.

103 Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities. Donald Vial Center on Employment in the Green Economy at the University of Berkeley. (2014) p. 111.

MCE's workforce development program is designed to address these barriers by providing a range of training opportunities that are accessible depending on a contractor's availability and can build towards more expert certifications over time.

Trigger Points

Trigger points are moments of opportunity when the likelihood of engaging contractors in workforce development strategies is highest. There are times during the negotiation of a contract or the development of a new project when it is most effective to include workforce development measures. When projects with new technologies arise, MCE can coordinate with contractors and the property to provide on-the-job training to local trainees. Additionally, there may be opportunities when a new federal or state workforce ordinance is passed.

MCE's objective is to utilize these trigger points to promote workforce development that is both socially and environmentally beneficial for the community.

Key Market Actors

There are many entities that influence workforce development. It is important that MCE understand the role that each entity plays and how they can affect energy efficiency workforce development:

- » **Workforce Development in Government.** Local governments, the California Energy Commission (CEC), and the Employment Development Department (tasked with workforce development) are key actors. Local hire ordinances and other local government procurement policies may also provide opportunities to support workforce development.
- » **Legislative and Regulatory Bodies.** Federal and State legislatures, the California Public Utilities Commission (CPUC), and the CEC all

support workforce development through tax laws, regulations, codes, and standards.

- » **Architects, Builders, Contractors, Designers and Engineers.** MCE will work with all levels of trades and professionals to understand their training needs and to distribute information about upcoming trainings. MCE will also work with these groups to identify key local industry leaders to deliver trainings.
- » **Local Building Supply and Hardware Stores.** MCE will partner with local building supply and hardware stores to conduct outreach and generate awareness around energy related training opportunities.
- » **Workforce Investment Board, Community College, and Online Training Providers.** Workforce Investment Boards (WIBs) and community colleges are currently major providers of training opportunities in MCE's service area. MCE will work with local WIBs and community colleges to deliver trainings.
- » **Local Business and Organized Labor.** Partnerships with local workforce development agencies will offer case management support to trainees to ensure successful transition to full-time work. MCE will work with organized labor unions as well as local businesses to ensure that job trainees are successful in the workforce and that job retention is an outcome of the program.

MCE tracks key market actors in order to identify opportunities and challenges, and the impact of these entities on a customer's energy efficiency decision making.

13.3 Intervention Strategies

MCE's overall workforce development strategy is geared towards creating meaningful career paths. MCE is working to establish relationships with labor organizations and local businesses to ensure there is a potential career pathway for training participants.

MCE will sponsor, support, and leverage workforce training for contractors, implementers, operations and maintenance staff, and workforce professionals working across sectors. There will be an emphasis on stackable training credentials so contractors with limited time can build towards a more comprehensive skillset. It is imperative that MCE employs and deploys a skilled workforce to implement and support energy efficiency projects completed through its programs.

Strengthen and Support Existing Programs

Many high quality training programs exist within MCE's service area to develop an energy efficiency workforce. MCE can accomplish more in partnership with existing programs than it can by working alone. MCE's objective under the workforce development program is to leverage and support programs that are already developing a robust energy efficiency workforce.

MCE will partner with local workforce experts to align programs throughout its service area ensuring consistent and high quality training. A wide range of trainings for workers will be offered throughout MCE's service area. MCE will influence training providers across MCE's service area by supporting cutting edge, high quality trainings, and creating career pathways to workforce entrants, re-entry workers and industry professionals.

Soft Skills and Re-entry Training Programs

MCE will partner with community-based organizations to provide soft skills training to

supplement participation in existing training programs for underemployed, unemployed, disadvantaged, veteran, reentry, and displaced workers. It will also support the development of on-the-job training programs in energy efficiency.

Stackable Certificate Programs

MCE will focus on providing access to existing stackable credential programs. Stackable credentials are training programs that offer outcomes which can collectively build towards more comprehensive certifications. Stackable credentials make the best use of available time for trainees. Stackable credentials are a component of a larger, more articulated career path. This is in contrast to one-off training opportunities focused solely on a near term and possibly time-limited job opportunity.

Youth Programs

MCE intends to partner with community colleges, primary schools, and technical schools to develop educational and vocational curricula. MCE will also support and sponsor the development of youth training in energy services.

Pre-Apprenticeship Programs

MCE will support the development and implementation of pre-apprenticeship programs. Pre-apprenticeship programs offer consistent and high-quality training and can be on-ramps into apprenticeship programs and eventually into union jobs. MCE will also emphasize soft skills programs to support pre-apprenticeship participants in completing the programs.

Apprenticeship Programs

MCE will support its training program participants to continue their pathway into apprenticeship positions. MCE may offer financial support in the form of scholarships for a limited number of its program participants emerging from the pre-apprenticeship.

Professional Certifications and Continuing Education

MCE will offer professional certification and continuing education opportunities on an ad hoc basis. These opportunities will focus on layering energy skills into existing careers. Examples of this include incorporating zero net energy (ZNE) into architecture and design practices and motivating real estate professionals to understand and communicate the significance of energy attributes on real property. As these opportunities are intended to supplement existing professions, they need to be highly flexible in timing and may be good candidates for online offerings.

Targeted Training Opportunities

MCE will first work to understand the needs of the buildings professionals before developing specific trainings. Using a data-driven, needs-based approach to developing training helps ensure that trainees will have employment opportunities and that training programs provide more meaningful outcomes.

Direct Install Training

Currently, as part of the Multifamily Energy Savings program, MCE trains community members on how to install equipment for efficient energy and water use (e.g. LEDs, showerheads, faucet aerators, and pipe wrapping), as well as program standards and safety protocols, data collection, and tenant outreach and education. MCE will continue its direct install trainings in the multifamily program to provide direct install team members with the skills necessary to implement this service.

Targeted Building Operator Course

MCE will offer customized building operations training to ensure multifamily properties maintain savings over the long-term. This training will be targeted at teaching both property managers and maintenance staff the practical hands-on and theoretical skills that are required to optimize the

performance of their properties. The course will aim to reduce the energy and water consumption at the property while simultaneously improving health, safety, and durability of the structure. This will be accomplished by developing a customized Energy and Green Building Operations and Maintenance Plan and training the building staff to implement it portfolio wide.

Fuel Switching

Fuel switching represents a major growth opportunity for construction trades in coming years with an increase of renewable content in California's electric grid and an emphasis on non-carbon heating sources. MCE will offer trainings to contractors on the best practices for safe and proper installation of new technologies. This ensures contractors understand proper installation procedures and also increases the exposure to and comfort of local contractors with these new technologies, increasing the likelihood that the contractor will recommend the technology to customers.

Zero Net Energy

MCE will work with local and national organizations to provide training to contractors, architects, and developers on the benefits of zero net energy (ZNE) design and construction. Trainings will emphasize integration of ZNE designs at the early stage of project design. MCE will offer training to assist local contractors in understanding implementation of new and emerging technologies to facilitate ZNE construction.

In order for ZNE to have mass adoption, MCE will need to support training at all levels of the workforce. Operations and maintenance staff will need to know how the new technologies work and how to operate, maintain, and fix the equipment.

Partnerships with Community-Based Organizations and Local Governments

MCE will partner with community-based organizations and local governments to provide educational opportunities, conduct outreach, and create awareness around workforce development and the value of a trained workforce. MCE will also work with community-based organizations to identify possible candidates for workforce training programs.

Metrics Tables (Table 27)

Alongside the other program administrators, MCE developed metrics that connect market barriers to intervention strategies, and that provide near, mid, and long term targets that build towards a 10-year vision. The metrics are based on the framework presented to the Energy Division in August 2016, which emphasized:

- » Usefulness for program administrators to manage portfolio
- » Information on the progress towards achieving desired market effect(s) and strategy effectiveness
- » Reliance on data collected during program implementation and/or data reporting to CPUC
- » Simple to understand and clear of any subjectivity
- » Emphasis on long-term outcomes

13.4 Evaluation, Measurement & Verification

MCE will track metrics for measurement and verification (M&V) but will need to conduct Evaluation, Measurement, and Verification (EM&V) to gain richer insights through process and impact evaluations including two specific study proposals discussed below.

Anticipated Study Needs

Certifications Relevance: Are building professionals putting the certification into action? MCE proposes a process evaluation on the ability of program participants to implement the skills obtained through sponsored education and training activities.

Job Creation and Retention: A key component of the workforce program logic is the ability to train workers who will be capable of remaining in jobs over time. MCE proposes an impact assessment to ascertain the ability of the program to place workers in jobs and the retention of those jobs over a year or longer. Components of this include job quality and workforce diversity.

13.5 Coordination

MCE will work as an advocate, convener, expert, and funder alongside workforce and industry experts to ensure the development of a skilled workforce.

Key Partners

Coordination of key stakeholders is imperative to the successful adoption of energy efficiency.

- » **Builders/Designers/Contractors/Architects/Engineers.** MCE will build and maintain relationships within the industry to support its workforce development program. This population is key in successful outreach, education, and development of training programs.
- » **Economic/Workforce Development Agencies.** MCE will work with local economic and workforce development agencies (Marin City Community Development Corporation, San Pablo Economic Development Corporation, RichmondBuild) to identify and enroll underemployed, unemployed, re-entry, and displaced workers within MCE's service area.

Table 27. Workforce Market Barriers & Metrics

Problem Statement	Market Barriers	Desired Market Effects/ 10-year Vision	Intervention Strategies
The energy efficiency workforce requires a wide variety of trainings for all skill levels	Lack of diverse trainings	Stackable certified programs that meet workforce entrants where they are at (Increase of 15% over baseline)	1. Work with partners and industry experts to design and implement trainings 2. Develop a plan for funding sector specific, stackable certifications (entry level to professional certifications) ¹
Trainings take contractors away from their core job responsibilities	Lack of time for trainings	To seamlessly integrate trainings into day-to-day operations (Increase of 15% over baseline)	1. Schedule trainings around peak work schedules ² 2. Incorporate on-the-job training ³ 3. Bring trainings to contractors ⁴
Trainings, workshops and certifications can be costly	Lack of funding for trainings	Provide trainings that are accessible to all (Increase of 15% over baseline)	1. Provide subsidized trainings 2. Offer scholarships to individuals 3. Partner with workforce development organizations to provide training for hard-to-reach and at-risk populations ⁵
Codes and standards change every few years and it can be difficult for contractors to stay up to date with the changes	Changing codes and standards	Contractors that understand and can easily implement new codes (Increase of 15% over baseline)	1. Work with local planning departments to develop a mobile app 2. Facilitate a conversation between planning departments and contractors to identify gaps, provide feedback loops, and develop channels for information dissemination 3. Work with inspectors to provide on-the-job training for new codes and standards
There are not enough comprehensive educational programs focused on energy efficiency	Discrete trainings do not contribute to a career pathway	Create meaningful career paths for participants (Increase of 15% over baseline)	1. Design an energy efficiency vocational program
Contractors don't know how to use, install or explain the value of new technology	Lack of training on new technologies	New technologies are valued and installed by the masses upon release (Increase of 15% over baseline)	1. Facilitate educational workshops with product manufacturers ⁶ 2. Provide on-the-job training for operations and maintenance staff

Sector Metric	Baseline	Metric Source	Short Term Target (1–3 years)	Mid Term Target (4–7 years)	Long Term Target (8–10 years)
1. Increase in stackable certifications 2. Increase in number of trainees completing the pathway	Determine baseline from Program Year 1 (PY1) data	Program tracking data	Increase 5% over baseline	Increase 10% over baseline	Increase 15% over baseline
1. Number of trainings scheduled around peak work 2. Increase in grants provided for on-the-job training 3. Number of trainings at individual businesses	Determine baseline from PY1 data	Program tracking data	Increase 5% over baseline	Increase 10% over baseline	Increase 15% over baseline
1. Increase in participants that wouldn't have been able to participate 2. a. Number of individual scholarships given b. Amount of individual scholarships given 3. a. Number of partner organizations b. Number of hard to reach participants trained	Determine baseline from PY1 data	Program tracking data	Increase 5% over baseline	Increase 10% over baseline	Increase 15% over baseline
1. Number of downloads 2. Number of MCE jurisdictions that participate in the standardized process for dissemination of and feedback loops for new codes and standards implementation 3. a. Number of on-the-job training sessions with inspectors b. Reduction in repeat inspector visits for code violations	Determine baseline from PY1 data	Program tracking data	Increase 5% over baseline	Increase 10% over baseline	Increase 15% over baseline
1. Number of graduates	Determine baseline from PY1 data	Program tracking data	Increase 5% over baseline	Increase 10% over baseline	Increase 15% over baseline
1. Number of product specific workshops 2. Number of product specific on-the-job training sessions for operations and maintenance staff	Determine baseline from PY1 data	Program tracking data	Increase 5% over baseline	Increase 10% over baseline	Increase 15% over baseline

1 Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities. Donald Vial Center on Employment in the Green Economy at the University of Berkeley. (2014) p. 132.

2 Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities. Donald Vial Center on Employment in the Green Economy at the University of Berkeley. (2014) p. 78.

3 2010-2012 WE&T Process Evaluation Volume I: Centergies. Opinion Dynamics and McLain ID Consulting. (2012) p. 40.

4 Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities. Donald Vial Center on Employment in the Green Economy at the University of Berkeley. (2014) p. 79.

5 2010-2012 WE&T Process Evaluation Volume I: Centergies. Opinion Dynamics and McLain ID Consulting. (2012) p. 118.

6 2010-2012 WE&T Process Evaluation Volume I: Centergies. Opinion Dynamics and McLain ID Consulting. (2012) p. 139.

» **Technical Assistance Providers/Raters/Inspectors.**

MCE will partner with technical assistance providers, GreenPoint Raters,¹⁰⁴ and local building inspectors to understand the challenges in the field, the training needs, and to conduct education, outreach, and trainings.

» **On-the-Job Training Organizations.** By partnering with organizations that provide on-the-job training (both host organizations and funding organizations like the Department of Rehabilitation and Public Safety), trainees will have the opportunity to gain practical, hands-on, and paid training. This provides financial support for trainees while helping them to gain valuable experience.

» **Department of Education/Community Colleges/Adult Education/K–12 Schools.** In order to provide proper training to and reach (future) workers of all ages MCE will seek partnerships with

local education departments, community colleges, vocational programs, adult education programs, and primary schools. These partnerships may include Marin County Department of Education, College of Marin, Laney College, Tamalpais Adult School, and local high schools.

» **Labor Unions.** MCE will work with local labor unions to ensure MCE is developing and/or supporting appropriate pre-apprenticeship and apprenticeship programs and to connect workers with meaningful career pathways.

» **Builders Associations/Industry Associations.** Partnering with local builders or other industry associations will provide access to the building industry workforce, a trusted resource to pass information on, and an inside perspective on the gaps in training and the general needs of the industry.

104 “GreenPoint Rated is the most trusted independent green home certification program in California, providing proof that a home is healthy, comfortable, durable, and resource efficient.” GreenPoint Rated Website. Build It Green. (2013-2016). Available at www.builditgreen.org/greenpoint-rated

The table below maps strategies to key partners. It is not intended to be fully comprehensive, but rather, a visual representation. ■

Table 28. Workforce Key Partners

	Support Existing Programs Developing an EE Workforce	Targeted Training Opportunities	Marketing & Outreach
Builders / Designers / Contractors	X	X	X
Economic / Workforce	X	X	
Development Agencies	X	X	X
Technical Assistance Providers	X	X	
On-the-Job Training Organizations	X		X
County Department of Education	X	X	
Labor Unions	X	X	X
Builders Associations / Industry Associations	X	X	X

14. PORTFOLIO BUDGET AND SAVINGS

14.1 Introduction

This section describes the methodology utilized by MCE to arrive at energy savings targets that are both realistic and achievable. Rather than relying on the E3 calculator¹⁰⁵ to create savings targets that are cost effective, MCE first modeled likely participation rates to identify achievable savings targets within its service area. MCE then developed a set of measures for inclusion into the portfolio based on the DEER database, the Commercial End-Use Survey (CEUS)¹⁰⁶ and Residential Appliance Saturation Survey (RASS)¹⁰⁷ data on appliances and energy use, the age and types of buildings in the service area, and past program data on the most common measures.

This section describes the methodology utilized by MCE to arrive at the proposed budget and energy

savings targets included in this Business Plan. This section also articulates the function of the declining incentives, and proposes thresholds for portfolio refresh.

14.2 Portfolio Savings and Cost Effectiveness

MCE's customer transformation vision involves a future in which public subsidies are no longer necessary to influence consumers' energy efficiency behaviors. The new, 10-year rolling cycle provides an opportunity to consider how programs should be designed with long-term vision. MCE's program is designed to promote customer transformation over a 10-year period. It will begin with low participation and high incentives, which will reverse as the program matures. Reducing incentives based on customer participation will allow ratepayers dollars to go further and reduce direct costs to MCE's programs. MCE anticipates this approach will improve the PAC results over time and free up resources for more comprehensive projects.

MCE developed cost effectiveness forecasts utilizing the cost effectiveness tool embedded in the California Energy Data and Reporting System (CEDARS) module. MCE input the measure list,

¹⁰⁵ The E3 calculator is a publicly available tool developed by consultants to the CPUC to evaluate the cost effectiveness of current and proposed programs. The tool can be downloaded at: https://ethree.com/public_projects/cpuc4.php

¹⁰⁶ CEUS is a comprehensive study of commercial sector energy use, primarily designed to support the state's energy demand forecasting activities. The data was published in 2006, and the study was funded by the California Energy Commission.

¹⁰⁷ RASS is a residential mail survey that requested information on appliances, equipment, and general consumption patterns from California households. The most recent round of data collection was completed in 2010. The survey was funded and administered by the California Energy Commission.

Figure 38. Declining Incentives by Measure Over Time

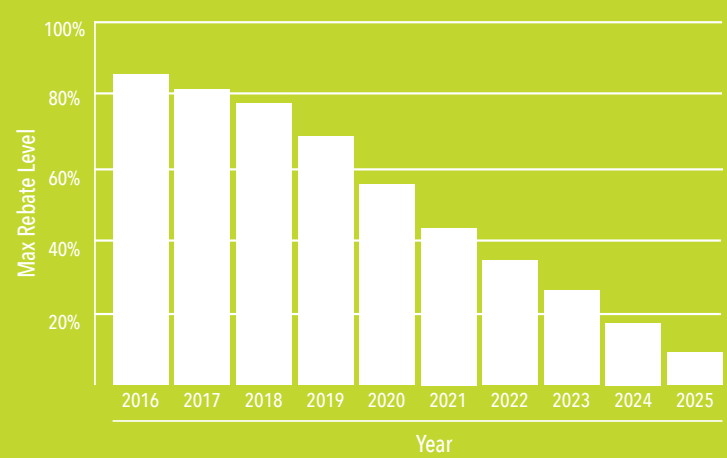
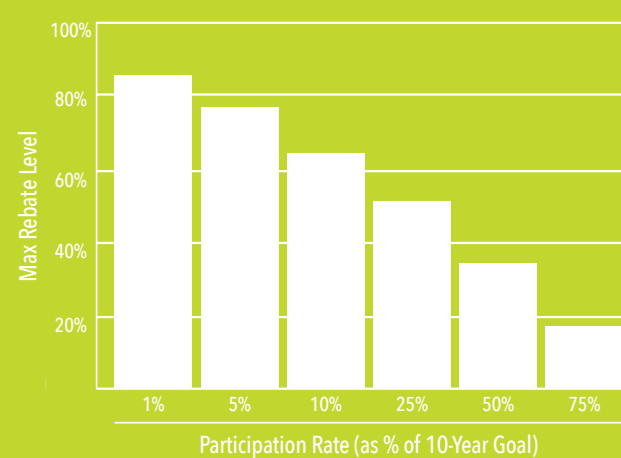


Figure 39. Declining Incentives Tied to Participation Rates



Note: These figures are intended to be illustrative visuals, and not precise or prescriptive.

as described below, and applied the formula of declining incentives over time.

Energy Efficiency Measures List. MCE developed a set of measures for inclusion into the energy savings portfolio based on the DEER database, the CEUS and RASS data on appliances and energy use, the age and types of buildings in the MCE service area, and past program data on the most common measures (particularly for custom measure estimates). MCE incorporated the guidance from Energy Division regarding existing conditions baselines into the cost effectiveness calculators submitted along with this Business Plan.

Declining Incentives Structure. MCE plans to reduce incentives over time, following market trends indicating that customers rely less on financial incentives as motivation increases to implement specific energy efficiency measures and upgrades. Program participation benchmarks will trigger reductions in rebates based on the participation

Table 29. Energy Efficiency Program Budget Summary Years 1-2

Program	Year 1	Year 2
Multifamily	\$1,627,131	\$3,050,503
Single Family	\$2,018,466	\$2,861,099
Commercial	\$1,958,803	\$2,273,098
Industrial	\$1,042,302	\$1,277,288
Agricultural	\$794,553	\$1,245,290
TOTAL	\$7,441,255	\$10,707,278

target. MCE estimates that these triggers will take place over the timeline described in Figure 38. The timeline is dependent on participation rates. Figure 39 shows how declining incentives are tied to participation rates (as a percent of the 10-year participation goal).

MCE expects an initial TRC close to 1.25 for the first year of implementation, with improving cost effectiveness over time as programs ramp up and

participation rates increase. Additionally, the attribution for statewide activities will have a positive effect on the portfolio-level TRC when they are incorporated into MCE's savings. Detailed budget and savings information can be found in Appendix A.

14.3 Energy Efficiency Program Budget

MCE proposes a budget for the first two years of program activities (Table 29) and an estimate of projected budget for program activities in years 3-10 (Appendix A). The actual budget for later program years may vary from the estimates due to changes in the market, adaptive management of the portfolio, or regulatory influence. For years 3-10 MCE will request actual budgets in the annual budget advice letter filings.

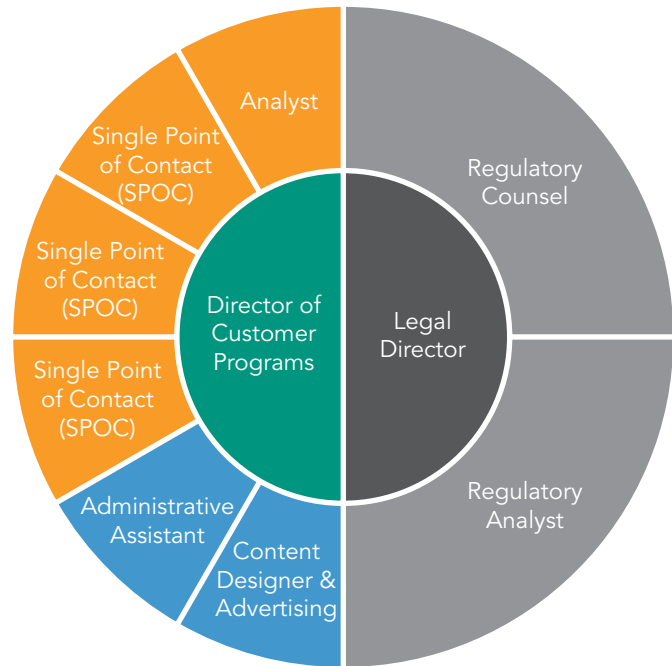
MCE estimates a ramp up period will be needed to transition to the full suite of programs, and such a ramp up is built into MCE's budget request. MCE also anticipates relying on external contractors to bolster limited internal program staff.

14.4 Management and Staffing Resources

MCE projects a need for increasing staff resources over time, though staffing is assumed to remain generally static after year three. Any further updates will be made with annual budget filings. Figure 40 presents an organizational chart for year 1; future years and a detailed description of existing and planned staff positions are elaborated in Appendix B. MCE will limit administrative expenditures to ten percent of the portfolio budget; full budget figures by category are shown in Appendix A.

MCE is a small local government agency and does not anticipate developing a large staff. While MCE has presented its proposal for internal staffing needs

Figure 40. Organizational Chart (Year 1)



to support successful Business Plan implementation, much of the work required to support this Plan will need to be accomplished through contracts with external consultants. MCE anticipates a combination of requesting bids for specific program functions, as well as entire program elements for design and deployment by third parties. This will include pilot program activity when appropriate as well as the primary components of MCE's portfolio.

As a local government, all solicitation processes will be conducted in a transparent and open manner. MCE will generally utilize competitive solicitations when the scope of work exceeds \$45,000 and will utilize a more robust, formal, and competitive solicitation process when the scope of work exceeds \$175,000. These values are provided for illustrative

purposes and revisions based on changes in applicable law will not trigger a Business Plan update.

MCE will coordinate the external and internal resources in part through leveraging a sophisticated CRM and has requested a budget to support this coordination activity.

14.5 Risk Mitigation

The energy savings and customer transformation strategy within the Business Plan are based on an assumption that participation levels will continue to increase even as incentives drop over time. This assumption is not without precedent; the California Solar Initiative demonstrated that increasing market participation can be sustained with declining incentives in part due to decreased material and labor expenses, and emerging technology programs have also demonstrated a similar trajectory. MCE asserts that a positive customer experience will similarly support robust customer participation. However, in order to maintain robust participation levels in later years of implementation, this assumption must hold.

Therefore, MCE proposes a “re-look,” or a reconsideration of budget and incentive levels in the event that assumptions underpinning the portfolio do not hold true. MCE will be responsible for monitoring overall cost effectiveness of the portfolio. Variation in measure-by-measure implementation will be managed through fund shifting or adjustment of incentives on individual measures, which will be reported on an annual basis. However, if drops in incentive levels are not met with a mostly consistent rate of participation, then MCE will be required to reconsider its customer transformation logic. To ensure sufficient time for MCE’s customer transformation proposal to be implemented, MCE proposes this re-look occur at year 4. MCE will continually discuss program progress with CPUC identified stakeholder groups (e.g. the California Energy Efficiency Coordinating Committee), MCE’s community and governing Board, and CPUC staff. MCE will gather input from all stakeholders to inform adaptive management and consider other circumstances that would require a “re-look.” ■

15. CONCLUSION

15.1 Moving from Niche to Primary Provider

Given the vast changes taking place in the energy delivery field, MCE is well poised to become the primary provider of energy efficiency in its service area. The energy provider of the future needs to be much more nimble and locally responsive than utilities of the past, and MCE is this energy provider. Because MCE was created within the last 10 years specifically in response to urgent climate needs, it is uniquely positioned to address significant customer and societal needs moving forward. Its position as a CCA allows MCE to manage its programs and approach from a local community need perspective. This perspective will ultimately provide the best results for communities and customers. From managing distributed energy resources to empowering the grid of the future, MCE has the local focus combined with operational agility to manage vastly and uniquely changing customer demands and needs. The focus of this document is on energy efficiency, but MCE's outlook includes much more than energy efficiency alone.

15.2 The Time is Now

We are living in an extraordinary time. While we currently face intimidating scenarios of climate

disruption due to an over-reliance on carbon-based fuels, we are also seeing incredible advances in technologies that offer the potential to reverse the massive build-up of carbon that is taking place in our atmosphere. But rising to the challenge of climate change will require a rethinking and reworking of how we deliver and manage energy systems as a whole.

As Albert Einstein famously quipped, "we cannot solve our problems with the same thinking we used when we created them." Nowhere is this truer than with our energy systems. Most of the energy in America is generated, delivered, and managed by regulated monopolies that are more than 100 years old. They have served us well for many years. The world now has unique challenges and extraordinary opportunities that did not exist before. MCE is built on a foundation that is focused on today's challenges, perspectives, and relevant issues. MCE was expressly created to solve the problem of GHG emissions and embraces the very best of energy efficiency research and practice. MCE can be nimble and focus on those areas of greatest need and opportunity to drive positive results for the environment and the community. ■

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APPENDIX A: PLACEMATS

Program Budget Years 1–2 (Combined)

Program #	Sector	Administrative Cost	Marketing & Outreach	Direct Implementation (Customer Services)	Direct Implementation (Incentives & Rebates)	Total Direct Implementation	Total Budget By Program
MCE01	Residential Single Family	\$459,315	\$482,511	\$2,314,300	\$1,439,385	\$3,753,684	\$4,695,510
MCE02	Residential Multifamily	\$435,662	\$565,736	\$2,149,401	\$1,352,381	\$3,501,782	\$4,503,179
MCE03	Commercial	\$420,193	\$598,277	\$1,592,965	\$1,451,258	\$3,044,223	\$4,062,693
MCE04	Industrial	\$199,071	\$221,804	\$995,890	\$807,344	\$1,803,234	\$2,224,109
MCE05	Agricultural	\$180,125	\$157,547	\$997,003	\$623,574	\$1,620,577	\$1,958,249
	Total						\$17,443,740
	EM&V						\$704,793

Note: Program Budgets are projected estimates only. Actual budgets for these years will be requested in the annual budget advice letter filings.

Program Budget Years 3–4 (Combined)

Program #	Sector	Administrative Cost	Marketing & Outreach	Direct Implementation (Customer Services)	Direct Implementation (Incentives & Rebates)	Total Direct Implementation	Total Budget By Program
MCE01	Residential Single Family	\$597,243	\$434,512	\$2,826,466	\$2,160,022	\$4,986,488	\$6,018,243
MCE02	Residential Multifamily	\$662,795	\$719,291	\$2,522,416	\$2,767,874	\$5,290,288	\$6,672,374
MCE03	Commercial	\$640,000	\$515,443	\$2,751,427	\$2,338,386	\$5,089,813	\$6,245,256
MCE04	Industrial	\$200,013	\$221,805	\$1,028,291	\$606,501	\$1,634,792	\$2,056,610
MCE05	Agricultural	\$212,125	\$165,547	\$1,197,003	\$647,331	\$1,844,334	\$2,222,006
	Total						\$23,214,490
	EM&V						\$967,270

Note: Program Budgets are projected estimates only. Actual budgets for these years will be requested in the annual budget advice letter filings.

Program Budget Years 5–7 (Combined)

Program #	Sector	Administrative Cost	Marketing & Outreach	Direct Implementation (Customer Services)	Direct Implementation (Incentives & Rebates)	Total Direct Implementation	Total Budget By Program
MCE01	Residential Single Family	\$950,699	\$691,661	\$4,499,206	\$1,736,405	\$6,235,611	\$7,877,971
MCE02	Residential Multifamily	\$1,055,046	\$1,144,978	\$4,015,214	\$2,216,384	\$6,231,598	\$8,431,622
MCE03	Commercial	\$1,018,760	\$ 820,490	\$ 4,379,758	\$ 2,075,434	\$ 6,455,194	\$ 8,294,443
MCE04	Industrial	\$ 318,382	\$ 353,070	\$ 1,636,848	\$ 733,336	\$ 2,370,184	\$3,041,637
MCE05	Agricultural	\$ 337,664	\$ 263,520	\$ 1,905,405	\$ 609,088	\$2,514,493	\$3,115,677
	Total						\$30,761,350
	EM&V						\$1,281,723

Note: Program Budgets are projected estimates only. Actual budgets for these years will be requested in the annual budget advice letter filings.

Program Budget Years 8–10 (Combined)

Program #	Sector	Administrative Cost	Marketing & Outreach	Direct Implementation (Customer Services)	Direct Implementation (Incentives & Rebates)	Total Direct Implementation	Total Budget By Program
MCE01	Residential Single Family	\$1,038,854	\$755,797	\$4,916,405	\$530,757	\$5,447,162	\$7,241,813
MCE02	Residential Multifamily	\$1,152,877	\$1,251,149	\$4,387,534	\$747,523	\$5,135,058	\$7,539,083
MCE03	Commercial	\$ 1,113,227	\$ 896,571	\$ 4,785,882	\$ 2,449,949	\$ 7,235,829	\$ 9,245,627
MCE04	Industrial	\$ 347,906	\$ 385,810	\$ 1,788,627	\$490,981	\$ 2,279,608	\$ 3,013,323
MCE05	Agricultural	\$368,974	\$ 287,955	\$ 2,082,088	\$ 613,626	\$ 2,695,712	\$ 3,352,642
	Total						\$30,392,488
	EM&V						\$1,266,354

Note: Program Budgets are projected estimates only. Actual budgets for these years will be requested in the annual budget advice letter filings.

Electric (kWh) Savings

Program #	Sector	Years 1–2		Years 3–4		Years 5–10	
		Gross kWh Savings	% of Total Portfolio Savings Goal	Gross kWh Savings	% of Total Portfolio Savings Goal	Gross kWh Savings	% of Total Portfolio Savings Goals
MCE01	Residential Single Family	3,802,162	20%	4,320,954	19%	12,620,832	16%
MCE02	Residential Multifamily	3,458,921	18%	3,301,830	15%	9,802,518	13%
MCE03	Commercial	7,259,309	38%	9,237,506	41%	32,758,342	42%
MCE04	Industrial	1,712,578	9%	3,568,890	16%	16,938,397	22%
MCE05	Agricultural	3,086,521	16%	2,120,622	9%	5,884,606	8%
Total		19,319,492	100%	22,549,802	100%	78,004,696	100%

Note: Program savings for years 3-10 are projected estimates only. Updated savings for these years will be provided in the annual budget advice letter filings.

Demand (kW) Savings

Program #	Sector	Years 1–2		Years 3–4		Years 5–10	
		Gross kW Savings	% of Total Portfolio Savings Estimate	Gross kW Savings	% of Total Portfolio Savings Goal	Gross kW Savings	% of Total Portfolio Savings Goals
MCE01	Residential Single Family	505	30%	544	43%	1,642	46%
MCE02	Residential Multifamily	103	6%	147	12%	346	10%
MCE03	Commercial	583	34%	323	26%	677	19%
MCE04	Industrial	125	7%	115	9%	538	15%
MCE05	Agricultural	393	23%	122	10%	394	11%
Total		1,710	100%	124,018	100%	3,595	100%

Note: Program savings for years 3-10 are projected estimates only. Updated savings for these years will be provided in the annual budget advice letter filings.

Gas (therm) Savings

Program #	Sector	Years 1–2		Years 3–4		Years 5–10	
		Gross Therm Savings	% of Total Portfolio Savings Goal	Gross Therm Savings	% of Total Portfolio Savings Goal	Gross Therm Savings	% of Total Portfolio Savings Goals
MCE01	Residential Single Family	182,344	22%	481,414	31%	1,316,875	26%
MCE02	Residential Multifamily	317,023	39%	693,910	44%	2,535,675	50%
MCE03	Commercial	11,041	1%	13,249	1%	47,696	1%
MCE04	Industrial	294,276	36%	353,131	22%	1,271,271	25%
MCE05	Agricultural	11,134	1%	13,360	1%	48,097	1%
Total		815,817	100%	1,555,065	100%	5,219,615	100%

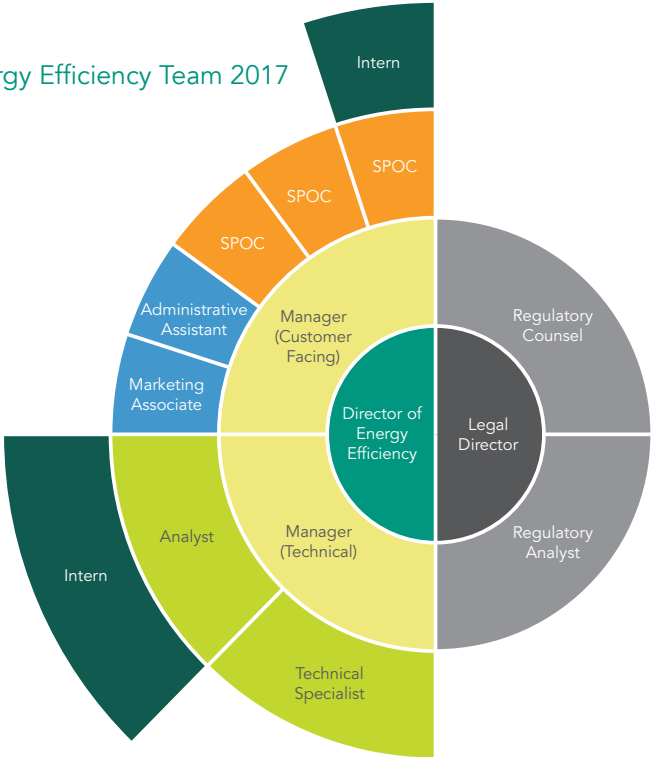
Note: Program savings for years 3-10 are projected estimates only. Updated savings for these years will be provided in the annual budget advice letter filings.

Cost Ratios Years 1–2

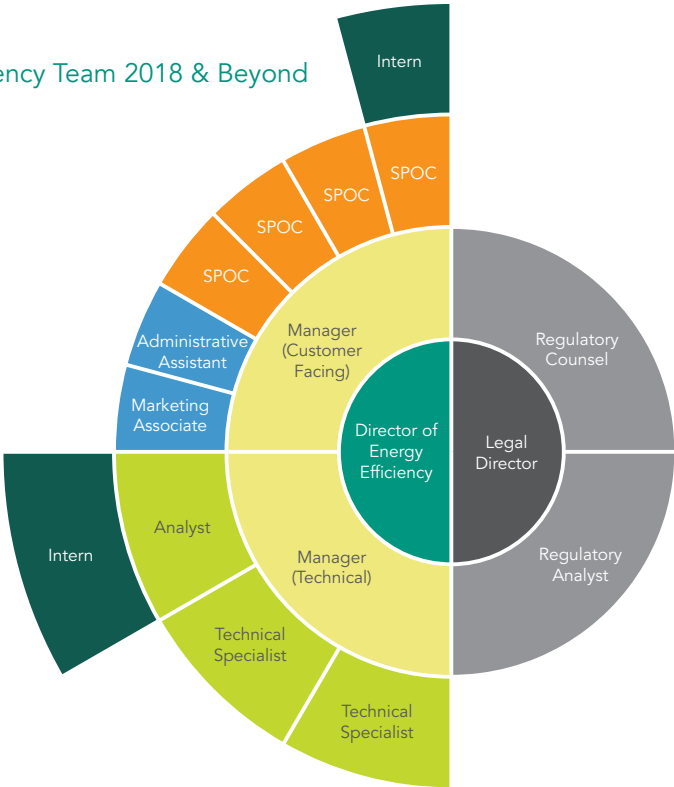
Program #	Sector	TRC Ratio	PAC Ratio
MCE01	Residential Single Family	1.13	1.11
MCE02	Residential Multifamily	1.33	1.33
MCE03	Commercial	1.17	1.27
MCE04	Industrial	1.24	1.31
MCE05	Agricultural	1.27	1.34
	Portfolio Level	1.22	1.25

APPENDIX B: MANAGEMENT & STAFFING RESOURCES 2017–18

MCE Energy Efficiency Team 2017



MCE Energy Efficiency Team 2018 & Beyond



Staff Positions and Descriptions

POSITION	JOB DESCRIPTION
Director of Energy Efficiency	Responsible for portfolio development and administration, regulatory filings and reporting, meeting and setting targets, and staff management.
Regulatory Counsel	Manages all energy efficiency related proceedings, drafts filings, represents MCE's policy interests.
Regulatory Analyst	Analyzes and prepares comments and filings for energy efficiency proceedings and represents MCE's policy interests.
Manager (Customer Facing)	Manages program implementation; responsible for community outreach, education, and engagement; manages SPOCs & support staff. (estimated future need)
Manager (Technical)	Manages the technical aspects of the program; responsible for development of measure lists, E3 calculator, savings and cost modeling, and data management. (estimated future need)
Single Point of Contact (SPOC)	Core of the program and first point of contact for participants, manages building/project data in CRM, identifies programs to meet participants needs, project management, follows up with additional program opportunities for future participation, maintains relationships to provide highest quality customer service, and collects data for reporting. (estimated future need)
Engineer	Responsible for measure list development, savings and cost modeling, data analysis, and E3 calculator management. (estimated future need)
Technical Specialist	Provides support for data tracking and reporting, measure list development, savings and cost modeling, and target and metrics development. (estimated future need)
Marketing Associate	Responsible for designing collateral, print and digital ad campaigns, and all other tasks related to marketing and outreach. (estimated future need)
Administrative Assistant	Provides administrative support; responsible for tracking program metrics, data entry for reporting, scheduling, event and outreach preparation.
Intern	Educational opportunity for high school and college students to learn more about the energy efficiency field; responsible for specific projects: researching funding or rebate opportunities, identifying innovative programs, support marketing; outreach, and administrative tasks. (estimated future need)

APPENDIX C: LETTERS OF SUPPORT



7/28/15

President Picker
Commissioner Florio
Commissioner Peterman
Commissioner Randolph
Commissioner Sandoval
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners,

Canal Alliance strongly supports Marin Clean Energy's (MCE's) application for its 2016 and Beyond Energy Efficiency Portfolio. MCE's Business Plan provides a bold vision for achieving ambitious energy savings targets. It provides detail on how MCE will leverage its key strengths – being nimble, flexible, and responsive to customer needs. In addition, the document lays out a plan for leveraging the ten-year program cycle to promote market transformation.

MCE's key innovations including the single-point-of-contact model, advanced customer relationship tool, integrated program delivery, and the use of advanced metering infrastructure data will help to provide higher quality energy efficiency services to our region. MCE's transition to a comprehensive and well-balanced portfolio presents an exciting opportunity to engage customers in novel ways.

We support MCE's proposal to deliver a portfolio of cutting edge programs designed to cost-effectively save customers energy and water, while reducing the state's greenhouse gas emissions.

MCE is the public power provider for the community that we serve. Canal Alliance strongly recommends you approve MCE's 2016 and Beyond Energy Efficiency Portfolio.

Sincerely,

Tom Wilson
Executive Director, Canal Alliance



President Picker
 Commissioner Florio
 Commissioner Peterman
 Commissioner Randolph
 Commissioner Sandoval
 California Public Utilities Commission
 505 Van Ness Avenue
 San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners,

Community Action Marin strongly supports Marin Clean Energy's (MCE's) application for its 2016 and Beyond Energy Efficiency Portfolio. MCE's Business Plan provides a bold vision for achieving ambitious energy savings targets. It provides detail on how MCE will leverage its key strengths – being nimble, flexible, and responsive to customer needs. In addition, the document lays out a plan for leveraging the ten-year program cycle to promote market transformation.

MCE's key innovations including the single-point-of-contact model, advanced customer relationship tool, integrated program delivery, and the use of advanced metering infrastructure data will help to provide higher quality energy efficiency services to our region. MCE's transition to a comprehensive and well-balanced portfolio presents an exciting opportunity to engage customers in novel ways.

We support MCE's proposal to deliver a portfolio of cutting edge programs designed to cost-effectively save customers energy and water, while reducing the state's greenhouse gas emissions.

MCE is the public power provider for the community that we serve. Community Action Marin strongly recommends you approve MCE's 2016 and Beyond Energy Efficiency Portfolio.

Sincerely,

 Laurel Hill
 Executive Director

29 Mary Street, San Rafael, CA 94901
 415.526.7500, fax 415.457.9677
www.camarin.org



July 29, 2015

Thomas Peters, Ph.D.
President & Chief Executive Officer

President Picker
Commissioner Florio
Commissioner Peterman
Commissioner Randolph
Commissioner Sandoval
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners:

The Marin Community Foundation strongly supports the applications from Marin Clean Energy (MCE) for its 2016 and Beyond Energy Efficiency Portfolio. I am writing to urge the Commission's approval.

MCE's Business Plan has a sharp vision for achieving ambitious energy saving targets. It provides detail on how MCE will leverage its key strengths. In addition, it lays out a plan for leveraging the ten-year program cycle to promote market transformation.

MCE's key innovations, including the single-point-of-contact model, advanced customer relationship tool, integrated program delivery, and the use of advanced metering infrastructure data will help to provide higher quality energy efficiency services to our region.

We support MCE's proposal to deliver a portfolio of cutting edge programs designed to save customers energy and water, while reducing the state's greenhouse gas emissions.

The Marin Community Foundation strongly recommends you approve MCE's 2016 and Beyond Energy Efficiency Portfolio.

Sincerely,

Thomas Peters, Ph.D.
President and CEO



166 Greenwood Avenue, San Rafael, CA 94901 (415) 488-3748
www.resilientneighborhoods.org

August 2, 2015

President Picker
 Commissioner Florio
 Commissioner Peterman
 Commissioner Randolph
 Commissioner Sandoval
 California Public Utilities Commission
 505 Van Ness Avenue
 San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners,

Resilient Neighborhoods is a community-based program that works with residents to reduce their CO₂ emissions. We strongly support Marin Clean Energy's (MCE's) application for its 2016 and Beyond Energy Efficiency Portfolio. MCE's Business Plan provides a solid vision for achieving ambitious energy savings targets. It provides details on how MCE will leverage its key strength of being responsive to customer needs. In addition, the document lays out a plan for leveraging the ten-year program cycle to promote market transformation.

MCE's key innovations including the single-point-of-contact model, advanced customer relationship tool, integrated program delivery, and the use of advanced metering infrastructure data will help to provide higher quality energy efficiency services to our region. MCE's transition to a comprehensive and well-balanced portfolio presents an opportunity to engage customers in novel ways.

We support MCE's proposal to deliver a portfolio of cutting edge programs designed to cost-effectively save customers energy and water, while reducing the state's greenhouse gas emissions.

MCE is the public power provider for the Marin County community that we serve. Resilient Neighborhoods strongly recommends you approve MCE's 2016 and Beyond Energy Efficiency Portfolio.

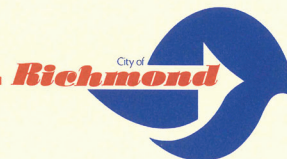
Sincerely,

Tamra Peters, Director
Resilientneighborhoods@gmail.com

Printed on Recycled Paper

RichmondWORKS/EASTBAY WORKS

Employment and Training Department



July 28, 2015

President Picker
Commissioner Florio
Commissioner Peterman
Commissioner Randolph
Commissioner Sandoval
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners,

RichmondBUILD strongly supports Marin Clean Energy's (MCE's) application for its 2016 and Beyond Energy Efficiency Portfolio. MCE's Business Plan provides a bold vision for achieving ambitious energy savings targets. It provides detail on how MCE will leverage its key strengths – being nimble, flexible, and responsive to customer needs. In addition, the document lays out a plan for leveraging the ten-year program cycle to promote market transformation.

MCE's key innovations including the single-point-of-contact model, advanced customer relationship tool, integrated program delivery, and the use of advanced metering infrastructure data will help to provide higher quality energy efficiency services to our region. MCE's transition to a comprehensive and well-balanced portfolio presents an exciting opportunity to engage customers in novel ways.

We support MCE's proposal to deliver a portfolio of cutting edge programs designed to cost-effectively save customers energy and water, while reducing the state's greenhouse gas emissions.

MCE is the public power provider for the community that we serve. RichmondBUILD strongly recommends you approve MCE's 2016 and Beyond Energy Efficiency Portfolio.

Sincerely,

Sal Vaca
Director

330 25th Street, Richmond, CA 94804-1727
Telephone: (510) 307-8034 Fax: (510) 307-8061 www.richmondworks.org

August 15, 2015

WattzOn
480 San Antonio Road, Suite 202
Mountain View, CA 94040

EcoFactor, Inc.
1450 Veterans Blvd, Suite 100
Redwood City, CA 94063

President Picker
Commissioner Florio
Commissioner Peterman
Commissioner Randolph
Commissioner Sandoval
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners,

WattzOn and EcoFactor appreciate the opportunity to comment on and contribute to Marin Clean Energy's energy efficiency (and demand response) program implementation plans. More specifically, we are generally supportive of MCE's initiatives, and would like to take this opportunity to open up the plan to data-driven applications that engage the consumer and deliver demand response and energy savings. We believe this expanded set of offerings would be consistent with MCE's mission and customer focus.

EcoFactor and WattzOn have partnered to create a solution that pairs automated energy savings, delivered via a connected thermostat, with behavioral, whole-home solutions gleaned from the unique combination of granular thermostat data and smart meter data. This data combination allows us to curate for the customer a truly personal and holistic experience, without any need to install hardware other than a connected thermostat. Customers gain the ability to control their energy from anywhere and at any time, while truly understanding what drives their energy spend, and receiving targeted, personalized prompts for habits, purchases, home upgrades and solar. Our solution increases the effectiveness of standard energy efficiency programs because it leverages the unique data and high engagement levels provided by mobile, smart thermostat controls.

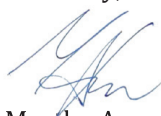
While we are proud of the results we have delivered individually (e.g., EcoFactor has delivered leading DR and EE results with Nevada Energy (3.1 kW of DR and ~ 7% whole-home energy savings) and WattzOn consistently delivers 10%+ savings via behavioral-based community programs), our combined solution is greater than the sum of its parts, in large part due to the integration of meter data and thermostat data. We thus suggest that our offering would be a great fit for MCE and its customers.

In addition, we were encouraged to read MCE's proposed residential TOU rates and relatively high true-up payments for solar. These incentives should drive desired market behavior, but it is important to provide the tools to consumers, so they can respond easily and intelligently to these

complex market forces. With automated platforms like ours, homeowners (aka “prosumers”) can manage solar production and home energy use in a coordinated fashion, truly optimizing energy usage for the grid and the customer.

Thank you for the opportunity to comment on MCE’s implementation plans. We believe MCE is well-positioned to continue to be a leader in energy efficiency, customer satisfaction, and demand response. We’re here to help.

Sincerely,



Martha Amram
Founder & CEO, WattzOn



Matthew Plante
CEO, EcoFactor



Protecting Marin Since 1934

August 6, 2015

President Picker
 Commissioner Florio
 Commissioner Peterman
 Commissioner Randolph
 Commissioner Sandoval
 California Public Utilities Commission
 505 Van Ness Avenue
 San Francisco, CA 94102

RE: Application for MCE's 2016 and Beyond Energy Efficiency Portfolio

Dear President and Commissioners,

The Marin Conservation League has been protecting and enhancing Marin County's natural environment for over eighty years. MCL supports Marin Clean Energy's (MCE's) commitment to reducing greenhouse gas emissions by achieving real energy efficiency as part of its mandate. We strongly support MCE's application for its 2016 and Beyond Energy Efficiency Portfolio.

MCE's transition to a comprehensive and well-balanced portfolio presents a great opportunity to engage customers in creative ways. MCE proposes to deliver cutting-edge programs designed to cost-effectively save energy and water. Its Business Plan provides detail on leveraging the ten-year program cycle to promote market transformation.

The Marin Conservation League strongly recommends you approve MCE's 2016 and Beyond Energy Efficiency Portfolio.

Sincerely,

Kate Powers, President

PHONE: 415.485.6257
 FAX: 415.485.6259

EMAIL: mcl@marinconservationleague.org
 WEB: marinconservationleague.org

ADDRESS: 175 N. Redwood Dr., Ste. 135
 San Rafael, CA 94903-1977



Marin Conservation League was founded in 1934 to preserve, protect and enhance the natural assets of Marin County.

APPENDIX D: KEY FINDINGS FROM WORKSHOPS & SURVEYS

Overview

- » Held six workshops between May – August 2014, with 88 attendees
- » Gathered results from leave-behind surveys, and internet-accessible survey
- » Goal was gathering input on community needs and how to align them to MCE's 2016 and beyond energy efficiency portfolio and strategy

Surveys: Key Findings

- » 64% interested in owning an electric car
- » 9% already own an electric car
- » Most building owners would like to do significant energy efficiency work and can spend over \$7,000 or are willing to finance
- » 83% said it was very important to them that buildings in their community use less energy through energy efficiency and renewables

Community Workshops: Key Findings

Community	Opportunities	Challenges
Expert Panel	Focus on peer educators and community based organizations; emphasize non-energy benefits, sell EE as a service, not a product	Lack of access to data; infrastructure constraints; rules tied to funding; split incentive need for skilled workforce
San Rafael	Saving money and comfort are high priorities for home upgrades	Many can afford high energy bills; EE lacks "street cred"
West Marin (agriculture)	Incentivize early replacement (dairies are cash constrained; tend to replace equipment at failure)	No natural gas; most water from wells or trucked in
Napa (agriculture)	Offer different approaches for small vs. large wineries	Little natural gas; most water from wells
Novato (single family)	Promote home aesthetics (comfort not a main driver; financing unlikely to be attractive)	High rate of renovations (great time to promote EE or ZNE)
Richmond	Workforce development	Language barrier; confusion on trusted messenger; split incentive (high proportion of renters)

APPENDIX E: PUBLIC COMMENTS

Overview

MCE solicited input from its key stakeholders and the community at large. Draft versions of the 2016 Business Plan and Program Implementation Plans were posted on MCE's website, and sent via email to key partners and those on the MCE listserv.

To ensure that the input from the seven (7) organizations is adequately addressed, MCE closely tracked all comments and compiled a formal response to each suggestion. The summary of comments and responses has been posted on MCE's Energy Efficiency webpage.

Summary of Public Comments

#	Organization	Submitter	Topic(s)
1	Benicia Community Sustainability Commission	Constance Beutel	Single Family PIP
2	MCE Board Member	Emmett O'Donnell	EE Strategy
3	Wattzon	Martha Amram	General Questions
4	Marin Conservation League	Kate Powers	All PIPs
5	Resilient Neighborhoods	Tamra Peters	Community Partnership Strategy
6	BayREN	Jennifer Berg	Single Family PIP
7	County of Marin	Dana Armanino	All PIPs
8	Sustainable Marin	Ed Mainland	All PIPs
9	Strategic Energy Innovations	Emily Quinton	Single Family PIP
10	Sustainable Napa County	Jeri Gill	All PIPs



MCE
1125 Tamalpais Avenue
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