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Southern California Edison
Energy Efficiency Business Plan
Commercial, Industrial, & Agricultural Sectors
DRAFT October 28, 2016

NOTE TO CAEECC STAKEHOLDERS:

SCE's future approach to the Commercial, Industrial, and Agricultural sectors falls under a broader a non-residential approach to delivering EE services in the future (and aligns with many past evaluations that looks at these three sectors together). To support this approach, SCE's draft chapters for these three sectors is presented as a combined file aimed at minimizing repetition while still preserving the integrity of the sector approach to Business Plan template.

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I. Nonresidential Sector Overview

There are three Nonresidential sectors: Commercial, Industrial, and Agricultural. Though the Business Plan Guidance calls for separate chapters for each sector, SCE determined that several aspects of the Nonresidential sectors are common. To minimize redundancy and enable more efficient review of the Nonresidential sectors, SCE has combined the three sectors into one chapter. This enables those areas that are common across the sectors to be presented once.

This section presents SCE's high-level vision for the Nonresidential sectors and discusses Drivers and Barriers that are common across the three sectors. *Section V*, below, presents additional Business Plan elements that are common across the three sectors.

A. Nonresidential Sector Vision

SCE's vision for its nonresidential sectors—Commercial, Industrial, and Agricultural—is to support its EE portfolio with the following key overarching strategies:

- **Tailoring services based on customer size and behavior:** SCE will reconfigure its EE services because large (>250 kW) customers behave differently than small (<50 kW) or mid-size (50-250 kW) customers. SCE has traditionally done a better job of reaching large customers through its direct-to-customer programs, which SCE aims to enhance while introducing project implementation processes to improve gross realization and net realization rates.
- **Improving or maintaining cost-effectiveness:** SCE will focus on cost-efficient delivery channels for small and mid-size nonresidential customers that have limited EE resources and knowledge. Proposed strategies and activities for these customers will rely on midstream distributor-focused service delivery for lighting, HVAC, and potentially control system offerings to seek above-code energy savings.
- **Piloting innovations:** SCE expects to conduct several pilots with partners to test different delivery requirements, technology options, performance-based program design, and other elements. SCE expects future pilot activity to advance key strategic functions such as a segmented approach to delivering services, the capture of previously stranded potential opportunities, and the targeted deployment of EE resources.
- **Educating customers and partners:** As evaluation studies have pointed out, the role of training and education will be important for informing small or mid-size customers with energy-management-resource constraints about changes to offerings and delivery channels. SCE plans to increase collaboration with professional partners participating in WE&T programs to develop training content for industry needs and grow market exposure to key best practices.

Historically, SCE has offered nonresidential programs designed for all customer types regardless of energy usage. In pursuing the key overarching strategies above, SCE expects to shift away from a “one size fits all” approach for the nonresidential

sector to a more segmented set of offerings that aligns EE service opportunities with customer energy usage patterns.

B. Nonresidential Sector Common Drivers

While each of the Nonresidential sectors has factors specific to the sector that drive the EE landscape, certain drivers are common across the three non-residential sectors. Primary among these is regulatory and legislative policy. (Need to add others).

1. Regulatory Policy Goals & Objectives

Several bills that were recently enacted into law will affect SCE's nonresidential sectors. For example:

- AB 802 (2015) requires the IOUs to provide aggregated energy usage data to qualified buildings, while opening opportunities to incent to-code EE activities based on normalized metered energy consumption as a measure of savings.
- AB 758 is the Comprehensive Energy Efficiency Program for Existing Buildings. This bill establishes requirements for program administrators to offer a full range of energy, efficiency, and complementary services.
- The Sustainable Groundwater Management Act of 2014 requires the formation of local groundwater sustainability agencies (GSAs) that must assess conditions in their local water basins and adopt locally-based management plans. The act provides substantial time—20 years—for GSAs to implement plans and achieve long-term groundwater sustainability.

SCE's Portfolio Sector chapter provides more information on relevant legislative bills and their broader impacts. SCE will work with stakeholders and regulatory agencies to implement new activities resulting from new bills. This includes offering energy assessment, building benchmarking, energy rating, cost-effective EE improvements, and financing options to support affected activities in the Commercial, Industrial, and Agricultural sectors.

C. Nonresidential Sector Common Barriers

The Nonresidential sectors face many barriers to further adoption of EE, ranging from lack of EE awareness to performance uncertainties to capital budget limitations. Descriptions of Commercial, Industrial and Agricultural sectors market barriers and market barriers definitions are available in the table below. Definitions of the EE-related market barriers are in *Appendix A*.

Table 1. Market Barriers

Market Barrier	Description
Information or search costs	<ul style="list-style-type: none"> • Customers have varying levels of knowledge and experience of EE best practices, programs, and solutions^{1 2} • Access to customer's energy data and how to translate that information into actionable energy efficiency decisions is complicated for small/mid-size customers³
Performance uncertainties	<ul style="list-style-type: none"> • Performance issues — resulting from improper equipment installation, maintenance, or poor owner & operator education — create customer dissatisfaction with EE measures^{4 5} • Strategic Energy Management faces the challenge of demonstrating "clear-cut" savings attribution⁶
Hassle or transaction costs	<ul style="list-style-type: none"> • EE is not a top priority for them relative to making profits and increasing and maintaining production levels or meeting sector-specific compliance issues^{7 8}
Access to financing	<ul style="list-style-type: none"> • Small and mid-size customers lack the capital and/or qualified resources (facility and/or energy managers) to participate⁹
Organization practices or custom	<ul style="list-style-type: none"> • Decision-makers are hard to identify; multiple decision-makers in the industrial world make it difficult to kick-start energy efficiency projects¹⁰ • Customers have varying project development timeframes that may extend multiple years¹¹
Misplaced or split incentives	<ul style="list-style-type: none"> • Tenant and landlord split incentive (lessee mindset): Tenant and landlord both have little incentive to make energy efficiency improvements at their facilities¹²

¹ PY2013-14 Third Party Commercial Program Value and Effectiveness Study Report, Opinion Dynamics Corp., 2016.

² California Nonresidential Program Assessments Study: IOU Core Calculated Program Group Report, Itron, December 2012

³ PY2013-14 Third Party Commercial Program Value and Effectiveness Study Report, Opinion Dynamics Corp., 2016.

⁴ Ibid.

⁵ Impact Evaluation of 2013-14 Commercial Quality Maintenance Program (HVAC3), DNV-GL, 2016.

⁶ Impact Evaluability Assessment of California's Continuous Energy Improvement Pilot Program, The Cadmus Group, Inc., 2013.

⁷ PY2013-14 Third Party Commercial Program Value and Effectiveness Study Report, Opinion Dynamics Corp., 2016.

⁸ California Nonresidential Program Assessments Study: IOU Core Calculated Program Group Report, Itron, December 2012

⁹ PY2013-14 Third Party Commercial Program Value and Effectiveness Study Report, Opinion Dynamics Corp., 2016.

¹⁰ Ibid.

¹¹ California Nonresidential Program Assessments Study: IOU Core Calculated Program Group Report, Itron, December 2012

¹² PY2013-14 Third Party Commercial Program Value and Effectiveness Study Report, Opinion Dynamics Corp., 2016.

Market Barrier	Description
<p>Product or service unavailability</p>	<ul style="list-style-type: none"> • Whole system opportunities are missed by individual equipment vendors, many of which provide only specific equipment types or building systems¹³ • It can be difficult to deliver scalable energy efficiency projects to industrial customers because they have unique processes and operations requirements.¹⁴ • Dispositions and Industry Standard Practices (ISPs) may be artificially limiting measure availability to select customer sizes^{15 16}

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¹³ California Nonresidential Program Assessments Study: IOU Core Calculated Program Group Report, Itron, December 2012.

¹⁴ Ibid.

¹⁵ Measure, Application, Segment, Industry (MASI): *New Opportunities in the Food Processing Industry*, Navigant, March 2015.

¹⁶ Measure, Application, Segment, Industry (MASI): *New Opportunities for Oil and Gas Extraction and Produced Water Management and Recycling*, Navigant, April 2015.

II. Commercial Sector

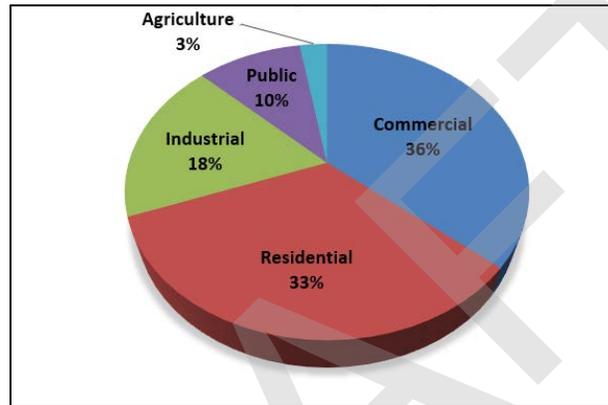
A. Commercial Sector Executive Summary

TBD

B. Commercial Sector Profile

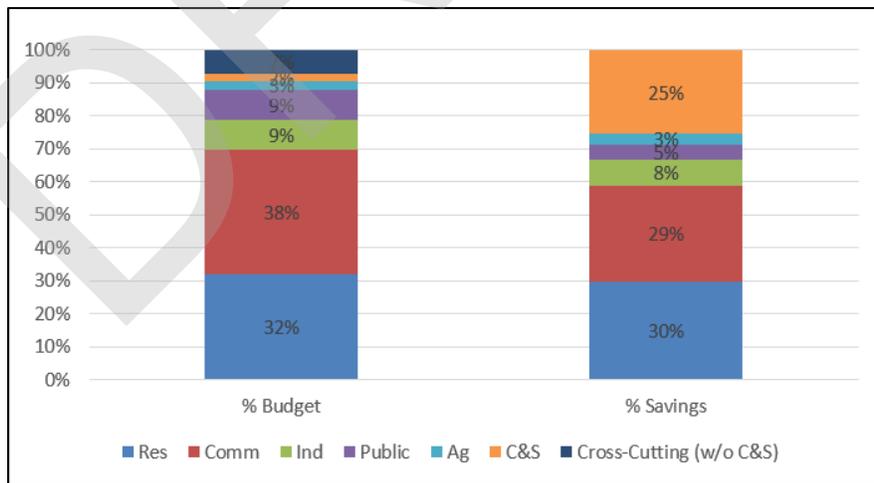
In 2015, 29,000 of the 81,000 GWh electric consumption within SCE's service territory came from the Commercial sector. This represents 36% of the total, making Commercial the largest energy-using sector (see Figure 1 below).¹⁷

Figure 1. SCE Electricity Use by Sector



In 2015, the Commercial sector is 38% of the EE portfolio budget, and 29% of GWh savings. See Figure 2: EE Sector Budget and Savings (2015), below.

Figure 2. EE Sector Budget and Savings (2015)¹⁸



¹⁷ SCE Customer Service System database, Year-To-Date as of March 2016.

¹⁸ SCE Reported Program Savings Data (2015).

1. Commercial Sector Characteristics

a. Customer Landscape

SCE's 520,000 Commercial service accounts¹⁹ offer differing energy savings opportunities. SCE's Commercial sector consists of the following customer segments, ranked by electricity usage:²⁰

- Retail;
- Office;
- Restaurants;
- Grocery stores;
- Warehouses;
- Refrigerated warehouses;
- Technology industries;
- Lodging (Hotel/Motel); and
- Miscellaneous (Assembly, etc.).

See *Appendix C* for key customer segment trends and electricity usage facts that support the focus of the main sector strategies.

b. Electricity Consumption

i. Electricity Consumption by Customer Size

In evaluating electricity consumption, SCE has focused on examining data based on customer size.²¹ Large customers make up 1% of all Commercial Service Accounts (SAs) but 46% of annual Commercial kWh energy usage. This indicates a high savings opportunity per customer. From 2013-2015, SCE installed EE measures in 40% of all large Commercial SAs. This demonstrates SCE's success in reaching out to large customers to achieve EE adoption.

Mid-size customers make up 6% of Commercial SAs, but 27% of annual Commercial kWh energy usage. This sub-segment has moderate energy savings opportunity per customer. From 2013-2015, SCE installed EE measures in 24% of all mid-size Commercial SAs.

Small customers make up 92% of Commercial SAs, but only 27% of annual Commercial kWh energy usage. This indicates a low savings opportunity per customer (indicative of high cost to reach each customer with a comparatively low savings opportunity). From 2013-2015, SCE installed EE measures installed in 9% of all small Commercial SAs.

¹⁹ The Commercial sector does not count institutions such as schools and public hospitals, per sector-specific statewide categorizations agreed upon by PAs.

²⁰ See *Section II.B.1.b.ii, Electricity Consumption*, for ranking details.

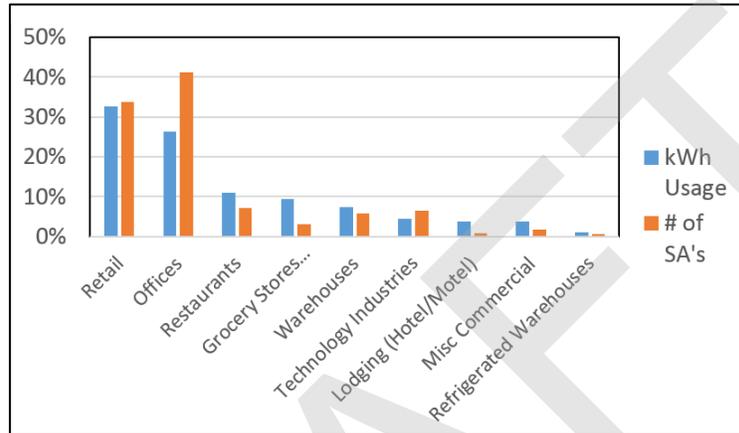
²¹ Large customers are ≥ 250 kW, Mid-size customers are 50-250 kW, and Small customers are < 50 kW.

See *Appendix D* for considerations and challenges in evolving the customer size metric from peak demand to customer energy intensity.

ii. Electricity Consumption by Customer Segment

Figure 3 shows the electricity usage by customer segment within the Commercial sector. Nearly 80% of all Commercial usage is in Retail, Offices, Restaurants, and Groceries/Food Stores.

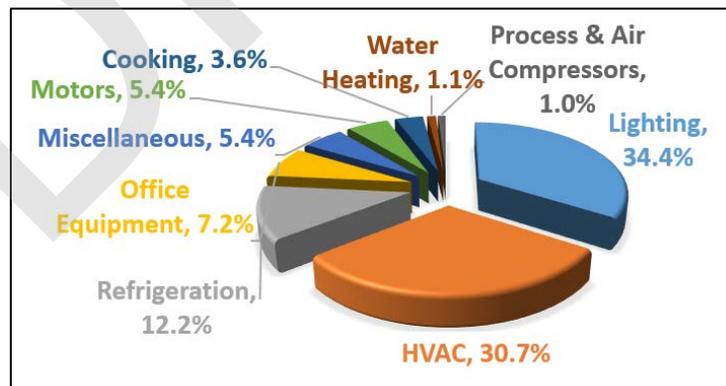
Figure 3. Commercial Sector Electricity Usage by Segment²²



iii. Electricity Consumption by End Use

Figure 4, following, shows the electricity usage in the Commercial sector by end use. The sector uses the most electricity for Lighting and HVAC (66% of all usage), with Refrigeration and Office Equipment making up another 20%.

Figure 4. Commercial Sector Electricity Usage by End Use²³



²² SCE Customer Service System database (Year-to-Date as of March 2016). Commercial sector does not include institutions such as private schools, which are included in the Public sector.

²³ California Commercial End Use Survey, 2006.

c. Commercial Sector Potential and Goals

The Commercial sector has primarily Lighting, Whole Building, and HVAC Achievable Potential²⁴ through 2026. See Figures 5-6, below, for the Commercial sector's Achievable Potential by GWh and MW, broken out by end use.

Figure 5. Achievable Potential (Commercial Sector, GWh, 2016-2026)²⁵

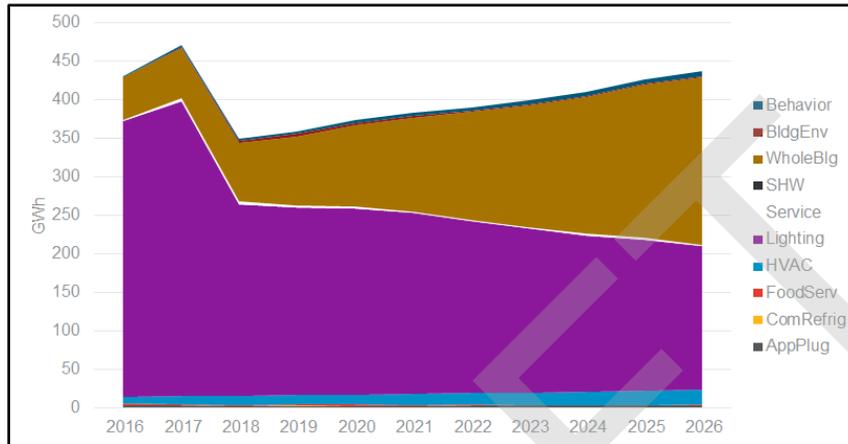
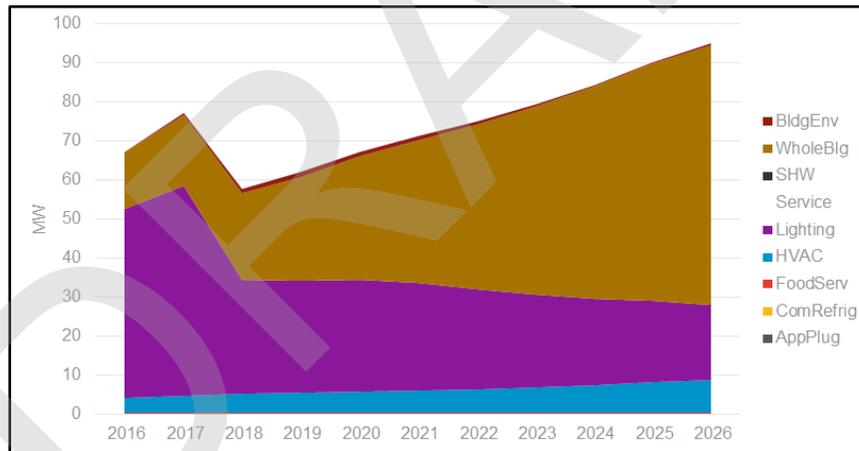


Figure 6. Achievable Potential (Commercial Sector, MW, 2016-2026)²⁶



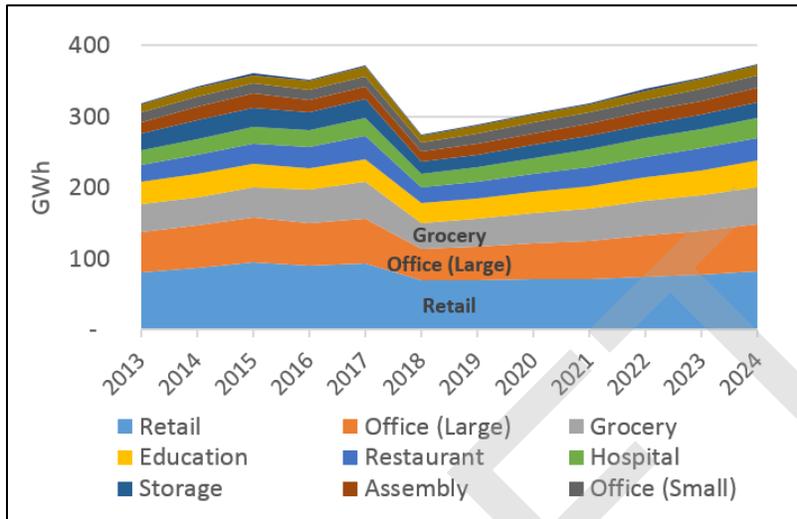
²⁴ Achievable Potential is defined as the cost-effective Technical Potential (by measure TRC) and then filtered to the energy efficiency savings that could be expected in response to specific levels of incentives and assumptions about policies, market influences, and barriers. Technical Potential is defined as the amount of energy savings that would be possible if the highest level of efficiency for all technically applicable opportunities to improve energy efficiency were taken. Technical potential represents the immediate replacement of applicable equipment-based technologies regardless of the remaining useful life of the existing measure.

²⁵ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. *Note:* The savings are pre-AB 802 savings. BldgEnv = Building Envelope, WholeBlg = Whole Building, SHW Service = Stored Hot Water Service, Food Serv = Food Service, ComRefrig = Commercial Refrigeration, and AppPlug = Appliances and Plug Loads.

²⁶ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. *Note:* The savings above are pre-AB 802 savings. BldgEnv = Building Envelope, WholeBlg = Whole Building, SHW Service = Stored Hot Water Service, Food Serv = Food Service, ComRefrig = Commercial Refrigeration, and AppPlug = Appliances and Plug Loads.

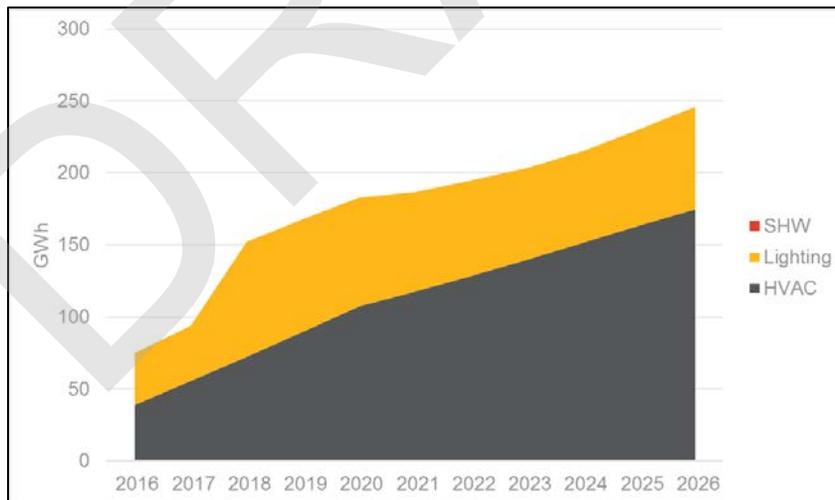
By Building Type, the top three are Retail, Offices (Large) and Groceries.²⁷

Figure 7. Commercial Sector Potential by Building Type



Figures 8 and 9 below show the incremental Stranded Potential (GWh and MW) unlocked due to AB 802 in the Commercial sector. This overall is +10-20% or 20-30% of the original Achievable Potential (by GWh and MW, respectively).²⁸

Figure 8. AB 802 Stranded Potential (Commercial Sector, GWh, 2016-2026)²⁹

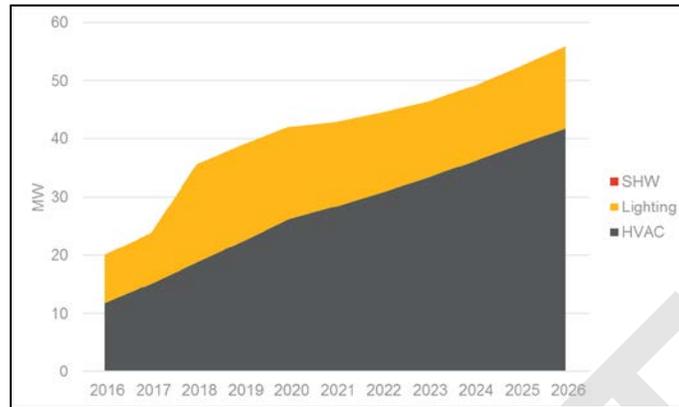


²⁷ "Energy Efficiency Potential and Goals Study for 2015 and Beyond," Navigant, Sept. 2015.

²⁸ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.

²⁹ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. SHW Service = Stored Hot Water Service.

Figure 9. AB 802 Stranded Potential (Commercial Sector, MW, 2016-2026)³⁰



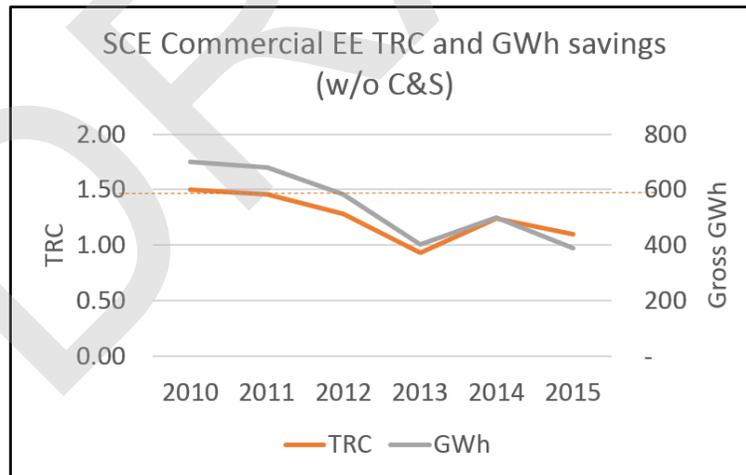
2. Commercial Sector Drivers

There are a number of drivers in the Commercial sector that shape the landscape of EE beyond the sector’s market characteristics and trends. These include utility EE program trends and results of EM&V studies.

a. EE Portfolio Trends and EM&V Evaluation Takeaways

The Commercial sector has seen a decreasing ability to maintain cost-effectiveness and support portfolio energy savings goals, as shown in Figure 10, below.

Figure 10. Commercial Sector Energy Savings and Cost-Effectiveness 2010-2015³¹

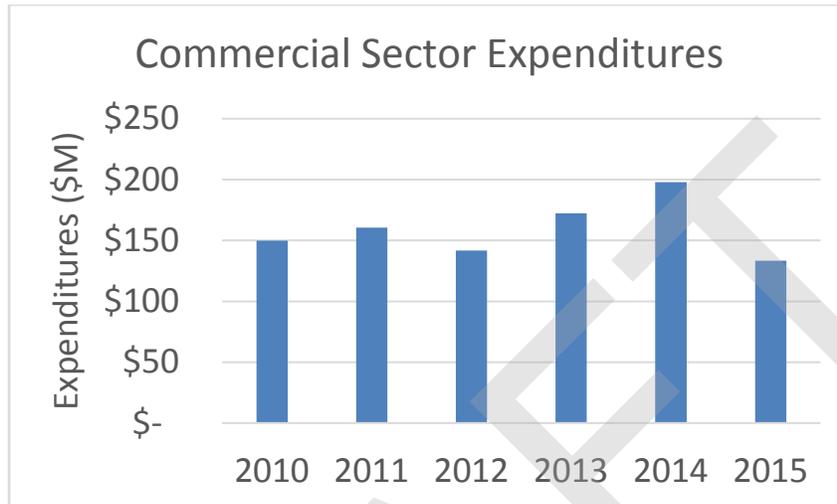


³⁰ Ibid.

³¹ From EEStats. Does not include commercial non-resource program costs embedded in cross-cutting programs (e.g., ET, WE&T, etc.) and C&S cost and benefits. Includes Public-related savings and TRC impacts as EEStats does not yet recognize the newly defined Public sector (e.g., private schools have moved from the Commercial sector to the Public sector).

At the same time, Commercial sector expenditures have remained somewhat consistent as shown in Figure 11, below. As it has become more expensive to achieve cost-effective energy savings, savings have dropped almost in half.

Figure 11. Commercial Sector Expenditures 2010-2015³²



Further informing these broader five-year trends are a number of evaluation takeaways. A review of relevant Commercial sector studies provides a number of key insights that inform SCE’s future approach to maintaining cost-effectiveness, lowering costs for delivering energy savings, and engaging customers in an effective manner. Key evaluation takeaways for SCE are as follows:

- Treating small, medium, and large commercial customers with greater variation will better meet market needs identified in multiple MASI studies and balance cost-effectiveness concerns, savings goals, and long-term GHG reduction. SCE intends to transition its entire nonresidential portfolio to size-specific service delivery, as described in the Sector Vision section.
- The Commercial sector programs, like all nonresidential programs, could improve their gross realization and net realization rates by investing more time and care to properly document existing baseline conditions, target early replacement measures, and document influence. Current program design and implementation is losing about 40% of energy savings through its NTG adjustment. SCE expects a combination of process improvements, along with the tailoring of customized services according to client footprint, to contribute to improved net and gross realization rates.

³² Ibid.

- The Commercial sector programs must continue to drive awareness and adoption of industry standards, including ASHRAE 180, among contractors and technicians. SCE addresses improving industry awareness and other related activities in the WE&T sector chapter.
- To improve service for small and medium size commercial customers, a set of midstream program offerings for lighting, HVAC, controls, and other offerings appears to be emerging as a sensible approach. For the majority of Commercial sector customers, these technologies cover the primary areas of potential savings opportunities for small and medium businesses.

Appendix B provides additional evaluation takeaways SCE plans to incorporate into its future nonresidential portfolio.

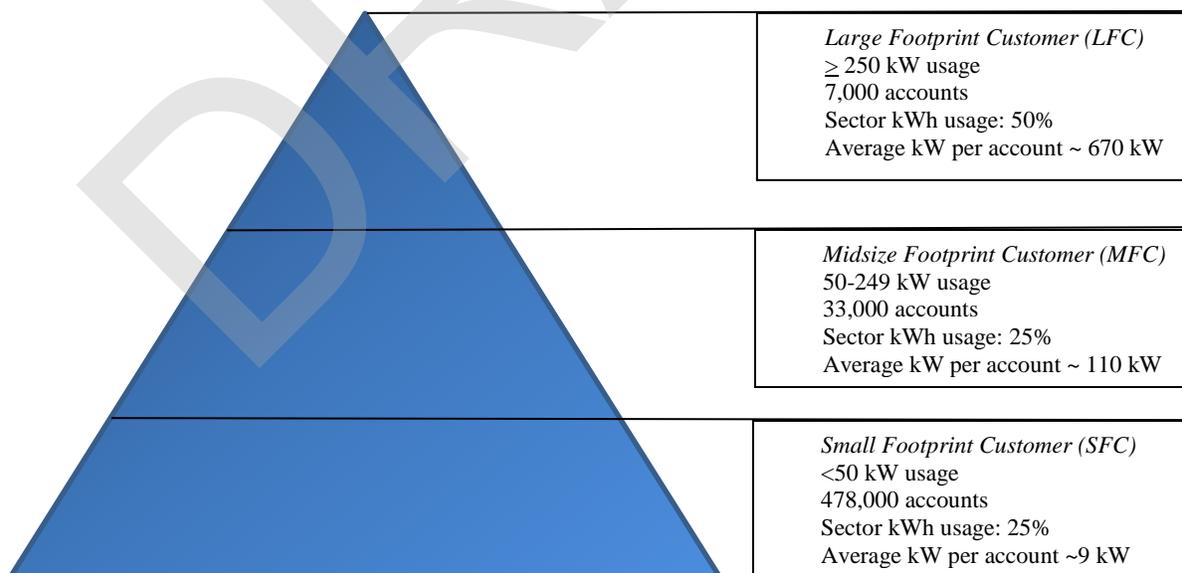
C. SCE's Approach to Achieving Commercial Sector Goals

This section of the chapter describes SCE's approach to achieving sector goals including the sector vision, budgets and metrics, coordination, and future needs.

1. Commercial Sector Vision

For SCE's Commercial sector, a customer segmentation approach as described in Figure 12, below, forms the basis for service delivery in the future. Customer energy usage drives SCE's segmentation approach, leading to characterization of large, mid-size, and small customers while recognizing that other factors may drive customer energy footprints and savings opportunities.

Figure 12. SCE Commercial Customer Segment Select Characteristics³³



³³ SCE Customer Service System database, Year-To-Date as of March 2016. Does not include the breakout of Public sector customers from this sector.

SCE plans to offer different delivery approaches to serve customers based on their level of savings opportunities. To maximize EE deployment in a cost-effective manner, SCE plans to provide its largest energy footprint customers with customized services while addressing the remainder of its EE opportunities through midstream channels.

Table 1 further describes how levels of service will match customer energy footprints to balance SCE’s desire to provide a diversity of EE opportunities with challenges to meet cost-effectiveness requirements. SCE plans to work with partners to enhance and implement strategies in support of this approach in which delivery channels differ by segment type.

Table 1. SCE Services by Customer Segment

Customer Segment	Expected Services
<p>Large Footprint Customers (LFC) <i>Accounts with 250 kW demand or greater</i></p>	<p>Direct to Customer Delivery Up to three tiers of customized service for direct delivery to customer:</p> <p><i>Basic Services:</i></p> <ul style="list-style-type: none"> • Customer-specific services, most likely requiring either on-site visit or billing data • Information-based indirect program activities. • Technical assistance to support benchmarking component of AB 802 and Energy Star Portfolio Manager • On-site audits supporting AB 753 • Services can help customers be more aware of energy usage and operations <p><i>Mid-level Services:</i></p> <ul style="list-style-type: none"> • Identifies and provides customer-specific services for OBF and OBR opportunities • Aims to encourage customers to utilize Finance-related opportunities to lessen the reliance on incentive based interventions • Companion to Basic Services as needed <p><i>Premium-Level Services:</i></p> <ul style="list-style-type: none"> • Invitation-only services for select customers holding promise to generate substantial kW/kWh energy savings • Strategic energy management services that engage organizations broadly • Technical support for sophisticated energy management or control services • Appropriate rebate forecasting for custom applications • Whole-building and/or whole-facility metered measurement and verification planning using established protocols (this support service might also yield new AB 802 implementation possibilities) • Companion to Basic and Mid-level services as needed

Customer Segment	Expected Services
<p>Midsize Footprint Customers (MFC)</p> <p><i>Accounts with 50-249 kW demand</i></p>	<p>Direct to Customer Delivery</p> <ul style="list-style-type: none"> MFCs with deeper energy savings opportunities addressed directly, as described above <p>Distributor Delivery</p> <ul style="list-style-type: none"> Majority of MFCs reached by distributor delivery channels for above-code energy savings Comprehensiveness less appropriate given energy awareness, competing priorities consideration, and potential Technology-based offerings such as distributor-focused midstream lighting, motors, and pumps for nonresidential applications, and upstream HVAC³⁴ address a majority of potential, with integration of Finance opportunities in need of further exploration To expand offerings, deemed measure development for MFCs’ needs remains critical to ensuring effective and efficient customer reach
<p>Small Footprint Customers (SFC)</p> <p><i>Accounts with less than 50 kW demand</i></p>	<p>Distributor Delivery</p> <ul style="list-style-type: none"> SFCs with limited energy savings opportunities addressed through distributor model, as described above

2. Commercial Sector Goals

Table 2 shows the EE goals for the Commercial sector while maintaining a portfolio TRC greater than 1.00.

Table 2. Commercial Sector Savings Goals³⁵

Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Energy Savings (GWh)	TBD									
Demand Reduction (MW)	TBD									

³⁴ SCE acknowledges that D.16-08-019 differentiates between downstream, midstream, and upstream delivery channels that will result in name changes to select key offerings targeted to customers, contractors, and distributors in particular. Historical names (prior to publication of D.16-08-019) are utilized throughout SCE’s Business Plan when referring to pre-existing programs.

³⁵ CPUC Decision (D.) 16-08-019 states that "Future energy efficiency goals analysis should be done in coordination with the CEC, through the JASC and the DAWG, and should incorporate cumulative goals in addition to the annual goals in time for the beginning of 2018." For this reason, energy savings goals will be provided upon completion of the energy efficiency goals analysis.

a. Existing Programs and Services

To help overcome market barriers to optimized energy management, SCE offers a number of programs for Commercial sector customers. They span the following:

- Commercial core programs (Calculated, Deemed, and Midstream)
- Savings By Design program for nonresidential new construction
- Nonresidential HVAC program
- Continuous Energy Improvement program (benchmarking), and
- Nonresidential third party-implemented programs.

Based on qualifications, sector customers may also be eligible for additional programs and services such as OBF, OBR, DR, EV, time-of-use rates, and dynamic pricing.

SCE's nonresidential EE programs offer integrated energy management solutions through strategic energy planning support; technical support services, such as facility audits, and calculation and design assistance; and financial support through rebates, incentives, and financing options. Current sector offerings—several of which span across the Commercial, Industrial, and Agricultural sectors—are described in *Appendix E*. As previously mentioned, while these programs have experienced elements of success in engaging all customer types regardless of footprint, opportunities to improve products and services to fit more targeted needs still exist.

b. Strategic Initiatives

The Commercial, Industrial and Agricultural sectors share similar intervention strategies and tactics. The intervention strategies applicable to the Commercial sector are the following³⁶:

- Financing
- Customer Incentives
- Intelligent Outreach
- Midstream/Upstream Incentives
- Partnering
- Quality Assurance
- Single-Point of Contact
- Strategic Energy Management, and
- Sustainable Offerings.

Key new strategies and tactics proposed by SCE are identified in Table 3. *Appendix H* contains a complete list of potential strategies, including continuation of existing ones, SCE is proposing. Each strategy and tactic has additional identifying data, such as:

- Expected timeline (short-, mid- and/or long-term)

³⁶ Detailed descriptions of these intervention strategies are included in the Portfolio Summary chapter.

- Sector focus (Commercial, Industrial and/or Agricultural)
- Customer size focus (Small, Mid-size and/or Large)
- Indication of new, existing, or modified activity
- Legislative, policy, or proceeding alignment, and
- Sector strategies alignment.

Table 3. Key Commercial Sector Characteristics and Strategies

Key Sector Characteristics	Sector Strategies (by customer size, where applicable)
Interior lighting, HVAC, and refrigeration are historically the highest (dominant) end-uses in Commercial buildings, and continue to offer savings opportunities. ³⁷	<ul style="list-style-type: none"> • <i>SMB</i>: Continue midstream distributor program’s focus on HVAC and lighting, while expanding to refrigeration. • <i>Large</i>: Cover remaining end-uses (plus above end-uses) through deep customized offering and longer-term Strategic Energy Management offering.
Nearly 80% of all energy usage occurs in retail, offices, restaurants and groceries/food stores. ³⁸	<ul style="list-style-type: none"> • <i>SMB</i>: Expand direct install offering to cover national accounts customer segment. • <i>SMB</i>: Evolve midstream distributor program through a coupons pilot to complement direct install expansion. • <i>Large</i>: Focus on providing Strategic Energy Management savings to encompass behavior, retro-commissioning, and optimization measures that builds on existing sector-wide penetration from past.
The top 50 property management firms control nearly half of U.S. commercial office lease space, but they are neither the end-users of energy in office buildings (tenants are), nor the beneficiaries of capital improvements (owners are). ³⁹	<ul style="list-style-type: none"> • Enhance incentive delivery channels to allow building owners to directly apply for incentives.
For the Retail segment, most retailers want to be green, but being green must first be cost-justifiable. In the case of mid-size retailers, many lack resources to manage efficiency opportunities despite potential cost reductions ⁴⁰ .	<ul style="list-style-type: none"> • Partner with distributors and other key partners to engage with retail customers and influence their efficiency-related purchasing decisions.
The top 80% of office electricity usage is from lighting, HVAC, and office equipment. ⁴¹	<ul style="list-style-type: none"> • Offer a variety of downstream and midstream lighting and HVAC programs. • Expand current downstream office equipment measures with future midstream incentives.

³⁷ 2015 Navigant Potential & Goals Study

³⁸ SCE Customer Service System customer database, Year-To-Date as of March 2016.

³⁹ Office Sector Snapshot, Esource, 2011.

⁴⁰ Retail Sector Snapshot, Esource, 2012.

⁴¹ Office Sector Snapshot, Esource, 2011.

Key Sector Characteristics	Sector Strategies (by customer size, where applicable)
For 43% of restaurants, energy efficiency is an important consideration for their next equipment purchase. However, energy efficiency does not rank among the top five factors influencing food service operators' equipment purchases. ⁴²	<ul style="list-style-type: none"> Re-tool non-incentive services such as lab testing to validate their role in shaping efficient equipment choices that meet customer needs (and then demonstrate influence in order to claim energy savings on the customer's resulting actions).

As SCE engages with more third-party partners across its portfolio, SCE expects our strategies to evolve and grow.

3. Budget and Metrics

Table 4 shows SCE's planned budget for the Commercial sector over the next 10 years⁴³.

Table 4. Commercial Sector Budget 2018-2027

Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Commercial	TBD									

Table 5, following, provides the metrics for the Commercial sector based on customer size. Metrics will measure over time the effectiveness of programs to reach customers, engage them, and increase the depth of engagement.

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⁴² Restaurants Sector Snapshot, Esource, 2012.

⁴³ TBD until energy savings goals are updated (see Sector Goals section for pending CPUC direction).

Table 5. Commercial Sector Problem Statements, Market Barriers, Intervention Strategies, and Metrics

Commercial Sector Metric Table								
Problem Statement/Barrier	Desired Outcome	Strategies (Sample)	Metrics	Baseline	Metric Source	Short-Term Target	Mid-Term Target	Long-Term Target
						(1-3 years)	(4-7 years)	(8-10+ years)
Large commercial customers do not separate considerations of energy efficiency from considerations of overall optimization of business operations.	<ul style="list-style-type: none"> Increase participation rate from new large commercial customers Increase per project savings from large commercial customers 	<ul style="list-style-type: none"> SEM Customer Incentives Commercial Financing 	Number of new large commercial participants	2015 EE Program Tracking Data	Quarterly EE Reporting and EESStats Dashboard	TBD	TBD	TBD
			Claimable first year savings per project					
Medium commercial customers with high energy usage need technical assistance	<ul style="list-style-type: none"> Increase participation rate from new mid-size commercial customers Increase per project savings from mid-sized commercial customers 	<ul style="list-style-type: none"> Midstream EE Equipment Commercial Financing SEM Intelligent Outreach Direct Install 	Number of new mid-sized commercial participants					
			Claimable first year savings per project					
Small commercial customers do not place a high priority on reducing energy costs	<ul style="list-style-type: none"> Increase participation from new small commercial customers Increase per project savings from small commercial customers 	<ul style="list-style-type: none"> Midstream EE equipment SEM Intelligent Outreach Direct Install 	Number of new small commercial participants					
			Claimable first year savings per project					

4. Proposed Pilots

SCE anticipates conducting a number of pilots to support administration of sector strategies previously listed. Table 6 summarizes these efforts, which are discussed in further detail below. The proposals described below are expected to be in collaboration with stakeholders, and generate recommendations that kick-start a subsequent set of actions. SCE also anticipates modifications to current identified pilots based on future partnerships with third party collaborators.

Table 6. Summary of Proposed Pilots

Identifier	Title	Support
a.	LED Back-Lit Menu Board Pilot (in progress)	California EE Strategic Plan, SB 350, AB 758
b.	SCE Advanced Lighting Control System (ALCS) Pilot (in progress)	California EE Strategic Plan, SB 350, AB 802
c.	Reverse Distributor Bidding Option Pilot	California EE Strategic Plan, SB 350, AB 802, AB 753, AB 793
d.	IDSMS Grid Reliability Rapid Response (GRRR) Pilot to Support Locational Needs <i>Joint funding with Industrial program</i>	Same as above
e.	Nonresidential ZNE IDSMS Retrofit Pilot <i>Joint funding with Industrial program</i>	Same as above
f.	Low Cost Customer Care Package & Customer Outreach Marketing Pilot	California EE Strategic Plan, SB 350, AB 802, AB 753
g.	Performance-Based Owner / Tenant	California EE Strategic Plan, SB 350, AB 802, AB 753
h.	Innovative Third Party Program Designs	Third Party Administration

i. LED Back-Lit Menu Board Pilot (in progress)

The LED Back-Lit Menu Board Project is an effort to explore the market potential of the sign industry. Based on prior studies, there is a large savings potential from signs because the base case is generally low efficiency fluorescent lamps and magnetic ballasts with peak usage pattern. The LED Back-Lit Menu Board Trial Program and Study has two main objectives:

- (1) To explore new program delivery models and market channels for utility incentives and education, and
- (2) To gather technical and market information to help inform a more accurate workpaper for LED menu board signs.

The LED Back-Lit Menu Board conducted outreach via a 3rd-party administrative support team that visited restaurants and other establishments

to promote the incentive program and gain participation from restaurant owners. The current goal is to complete 120 projects so the data can be used for workpaper development. Given the commercial strategies and goals, it is important to develop a work paper to establish energy saving value for this measure. This pilot may eventually be re-directed for midstream distributor delivery.

Milestones:

- This project is underway. SCE expect all projects will be completed in 2016. The workpaper analysis and submittal can be done in early 2017:
 - Per agreement with the DEER/Workpaper team, SCE needs to collect data from 120 pilot sites to collect the workpaper parameter data.
 - Once this data can be available, SCE's engineering team will prepare the workpaper submittal for approval.

ii. SCE Advanced Lighting Control System (ALCS) Pilot (in progress)

Since September 2014, SCE has been implementing an ALCS Pilot targeting nonresidential customers. The initial thought was to implement ALCS systems into 80 nonresidential installations. By 2015, the initial marketing and customer engagement efforts was yielding fruit. The pipeline for this pilot quickly grew from 16 participants at the end of 2015 to 40 potential participants by early 2016. This activity prompted SCE to review the pilot program's scale and budget, which triggered a series of pilot program re-sizing discussions with Energy Division of CPUC, including possible revisions for the pilot program's objective and intent.

By early 2016, SCE and Energy Division came to agreement to resize this pilot to 40 projects with a modified pilot focus on ALCS's deep energy savings potential. In March 2016, SCE provided Energy Division an ALCS Pilot Program update memo to summarize all the agreed to changes for the pilot program design and implementation.

The SCE ALCS Pilot is expected to be completed by the end of 2016. The pilot program results will be subject to program-funded early M&V evaluation using an independent third party consultant in early 2017. If successful, this pilot program can be redirected as an AB802 High Opportunity Project and Program Pilot to pursue to-code and above-code energy savings, targeting Large Footprint Customers (LFCs) as premium services. The properties with large energy savings potentials are commercial common areas, commercial-like spaces in industrial facilities, and warehouses.

Milestones:

SCE is planning to start the early M&V pilot assessment in late 2016 so it can be completed by early 2017. Once this assessment is completed, SCE will make a determination regarding if a HOPP implementation with additional performance based incentive to reward persistence can be cost-effective.

iii. Reverse Distributor Bidding Option Pilot

Once the midstream distributor programs are established, SCE can facilitate large customer purchases by allowing the eligible commercial/other customers to access these distributors to obtain price quotes or bids for projects. The pilot is still in concept and more development is needed. The benefit of this pilot is to reduce cost for customers, improve business volume for distribution, and enhance SCE's ability to support SB350 and AB758 implementation.

Milestones:

In 2017, SCE will aim to develop a more robust pilot concept once two of the distributor programs are available. This initial concept may take the form of a whitepaper to explore implementation details and to solicit feedback from possible participants. There are also a several regulatory and legal aspects of this pilot concept that require exploration. Once the whitepaper pilot concept is accepted, SCE will develop several customer test cases to collect data. If proven successful and cost-effective, SCE will propose additional pilot programs for consideration.

iv. IDSM Grid Reliability Rapid Response (GRRR) Pilot to Support Locational Needs

This is a nonresidential geographic locational needs pilot concept, but not restricted to any one customer sector. When SCE is experiencing a grid congestion situation (e.g., Aliso Canyon, SONGS-affected areas, other identified transmission and distribution congested locations, etc.), this pilot will supply a rapid response set of EE, DR, Solar, and IDSM solutions to help alleviate grid constraints. This is not a new concept since SCE faces these grid congestion challenges today. There are current grid reliability activities in both Aliso Canyon and SONGS-affected areas. However, this pilot is envisioned to have a pool of ready-made resources to address urgent electrical system needs, without needing time-intensive regulatory approval.

For this pilot to be productive, the pilot program must assess the effectiveness of the activities to date in the above locations. This pilot should go one step further by quantifying possible energy savings using approved methods, including possible Randomize Control Trial and Randomized Encouragement Designs.

The initial deliverable for this pilot concept is a pilot plan to address the content and logistics of implementation and funding. The next stage of the implementation is a small pilot design, perhaps with a RCT design or quasi-experimental design, to assess implementation hurdles. If proven successful and cost-effective, SCE will consider proposing and implementing an IDSM GRRR Pilot, using a single funding source.

Milestones:

This pilot may be applicable to both commercial and industrial sector customers. The SCE commercial program team will take the lead for this pilot. The industrial program team will provide funding to support joint participation.

- Develop a whitepaper concept for vetting and feedback in 2017. The whitepaper will address target locations beyond current needs, the methods to measure energy savings, a cost-effectiveness evaluation, and an approach for a single funding source.
- If successful, SCE will consider implementing an IDSM GRRR using a single funding source to meet geographic locational needs.
- The desired output is an assessment of the items described above and a set of recommendations for next steps.

v. Nonresidential ZNE IDSM Retrofit Pilot

This ZNE pilot is similar to the IDSM GRRR pilot concept, except it is not restricted to an area of locational needs. The goal of this pilot is to target specific commercial businesses to achieve ZNE retrofit goals. Similar to the IDSM GRRR, this pilot would like to combine all of the necessary EE, DR, Solar, and IDSM funding sources. This pilot concept should also take a phased approach. The initial deliverable for this pilot is a concept whitepaper. This whitepaper should leverage all completed work by the ZNE study team to date.

Milestones:

This pilot may be applicable to both commercial and industrial sector customers. The SCE commercial program team will take the lead for this pilot. The industrial program team will provide funding to support joint participation.

- Develop a whitepaper concept for vetting and feedback in 2017. The whitepaper will address target businesses, the methods to measure energy savings, a cost-effectiveness evaluation, and an approach for a single funding source.
- If successful, SCE will consider implementing this ZNE IDSM pilot using a single funding source to meet geographic locational needs.
- It is possible to link the ZNE IDSM and IDSM GRRR pilot concepts together with the goal of improving grid reliability and ZNE at the same time.
- The desired output is an assessment of the items described above and a set of recommendations for next steps.

vi. Low Cost Customer Care Package & Customer Outreach Marketing Pilot

This pilot is looking for a low-cost direct touch point for small and mid-size commercial customers. Since these customers are targeted for distributor program service delivery, SCE would like these customers to receive some basic level of services such as a "Customer Care Package" and customer outreach memo on an annual basis.

The concept of a "Customer Care Package" is not new. SCE's residential Home Energy Efficiency Survey (HEES) Program used such "Customer Care Packages" to encourage HEES mail-in participants to complete and return their in-home survey. The typical package may include slow-flow water faucets, window sealers, and other basic EE do-it-yourself items. For the Commercial Care Package, it may also include cost-effective LED bulbs, energy efficient power strip, and other sensible items. The current target is to put together several demonstration packages and customer messaging to evaluate their effectiveness. SCE is considering a target of \$350 per customer for this activity.

Milestones:

This is a 2017 project:

- Identify different customer care package configurations to evaluation cost and effectiveness,
- Make a recommendation on the feasibility of such market concepts, and
- If treated as an energy savings package, can this care package be cost-effective or at a minimum cost neutral.

vii. Performance-Based Tenant / Owner HVAC Pilot

Due to the nature of most commercial leases, tenants and owners have little incentive to make energy efficiency improvements at their facilities. This results in a large untapped opportunity in the commercial sector. The Tenant/Owner HVAC pilot is an effort to explore ways to increase participation in the Commercial HVAC program, ensuring that we talk to the right person – the energy decision-maker. One possible pilot concept is to encourage the property owners to make investments to replace the HVAC system, but rewarding tenants and the property owners with an equal sharing of a performance-based incentive for energy savings persistence. SCE is still considering the necessary details for this pilot concept.

SCE anticipates hosting regular trainings to educate the property management communities about the benefits of energy efficiency improvements. This will help address the tenant and property owner split incentive issue.

Milestones:

- SCE will use the balance of 2016 to develop a pilot program concept and implementation details as a third party initiative
- During 2017, SCE will use a RFP process to solicit and engage a third party implementer. The scope of the pilot will be limited to less than 50 customers due to customer availability and budget commitment
- SCE will use a meter/measure approach to document and report HVAC system energy savings for pilot results reporting. This pilot may propose a "performance-based incentive" payout to be shared between tenants and property owners.
- Once these pilot projects are completed, SCE will make a determination for the next steps. This will be communicated to ED/CPUC as appropriate.

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III. Industrial Sector

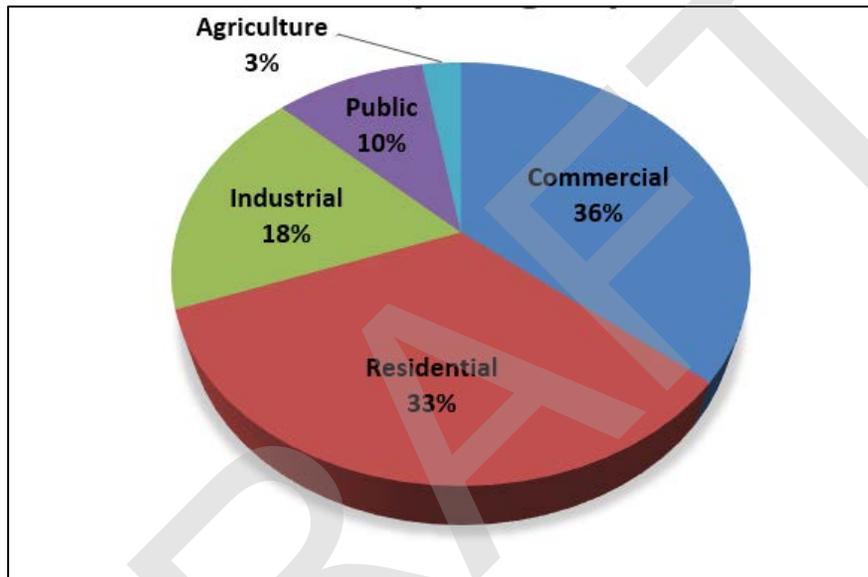
A. Industrial Sector Executive Summary

TBD

B. Industrial Sector Profile

In 2015, 15,000 of the 81,000 GWh electric consumption within SCE's service territory came from the Industrial sector. This represents 18% of the total.⁴⁴

Figure 13. SCE Electricity Use by Sector



SCE's 50,000 Industrial service accounts represent a sizeable portion of SCE's electric usage.⁴⁵

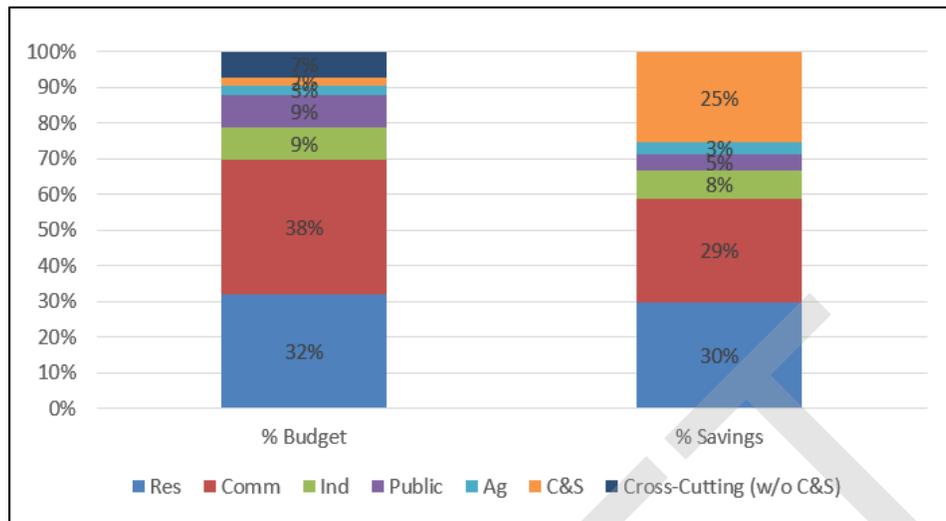
In 2015, the Industrial sector is 9% of the EE portfolio budget, and 8% of GWh savings.

See Figure 14, EE Sector Budget and Savings (2015), below.

⁴⁴ SCE Customer Service System database, Year-To-Date as of March 2016.

⁴⁵ The Industrial sector does not include non-Industrial-specific pumping such as water or wastewater facilities, please see the Public sector for a description of the business plan strategies for those customers.

Figure 14. EE Sector Budget and Savings (2015)⁴⁶



1. Industrial Sector Characteristics

a. Customer Landscape

SCE's Industrial sector consists of the following customer segments, ranked by electricity usage relative to the Industrial sector's electricity usage:^{47 48}

- Food & Kindred Products
- Transportation Equipment
- Stone, Clay, and Glass
- Chemical & Allied Products
- Rubber & Plastics
- Primary Metals
- Electronics
- Fabricated Metals
- Petroleum Refining
- Paper & Allied Products
- Industrial Machinery
- Instruments
- Printing & Publishing
- Textiles & Apparel , and
- Lumber & Furniture

See *Appendix F* for key customer segment trends and electricity usage facts that support the focus of the main sector strategies.

⁴⁶ SCE Reported Program Savings Data (2015).

⁴⁷ 2012 NAICS Definitions, United States Census Bureau, http://www.census.gov/eos/www/naics/2012NAICS/2012_Definition_File.pdf.

⁴⁸ See Section III.B.1.b.ii, *Electricity Consumption*, for ranking details.

b. Electricity Consumption

i. Electricity Consumption by Customer Size

SCE has analyzed electricity consumption by industrial customer size.⁴⁹ Large customers make up 5% of all Industrial Service Accounts (SAs), but 85% of annual Industrial kWh energy usage. This indicates a high savings opportunity per customer. From 2013-2015, SCE installed EE measures for 22% of large Industrial SAs.

Mid-size customers make up 12% of Industrial SAs, but 10% of annual Industrial kWh energy usage. This indicates a moderate energy savings opportunity per customer. From 2013-2015, SCE installed EE measures for 8% of mid-size Industrial Service Accounts.

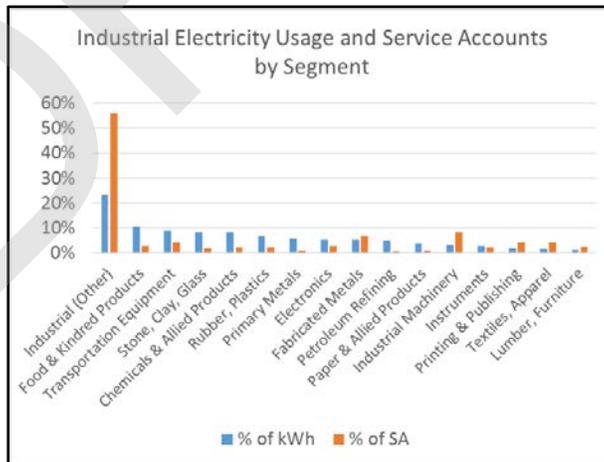
Small customers make up 83% of Industrial SAs, but only 5% of annual Industrial kWh energy usage. This indicates a low savings opportunity per customer (indicative of high cost to reach each customer with a comparatively low savings opportunity). From 2013-2015, SCE installed EE measures for 5% of small Industrial Service Accounts.

See *Appendix D* for considerations and challenges in evolving the customer size metric from peak demand to customer energy intensity.

ii. Electricity Consumption by Customer Segment

Customer electricity usage by segment shows that nearly 75% of Industrial electricity usage is in the following segments: Industrial (Other), Food & Kindred Products, Transportation Equipment, Metals & Minerals, Chemicals, Plastics, and Petroleum.

Figure 15. Industrial Sector Electricity Usage by Segment⁵⁰



⁴⁹ Large customers are ≥ 250 kW, mid-size customers are 50-250 kW, and small customers are < 50 kW.

⁵⁰ SCE Customer Service System database. SCE recognizes that Industrial (Other) is large and needs to be disaggregated, and is still working on resolving this data issue before Jan 15, 2017 Business Plan deadline.

c. Industrial Sector Potential and Goals

The Industrial sector has primarily Machine Drive, Lighting, and HVAC Achievable Potential⁵¹ through 2026.

See Figures 16 and 17, below, for the Industrial sector's Achievable Potential pre-AB 802 by GWh and MW broken out by End Use, respectively.

Figure 16. Achievable Potential (Industrial Sector, GWh, 2016-2026)⁵²

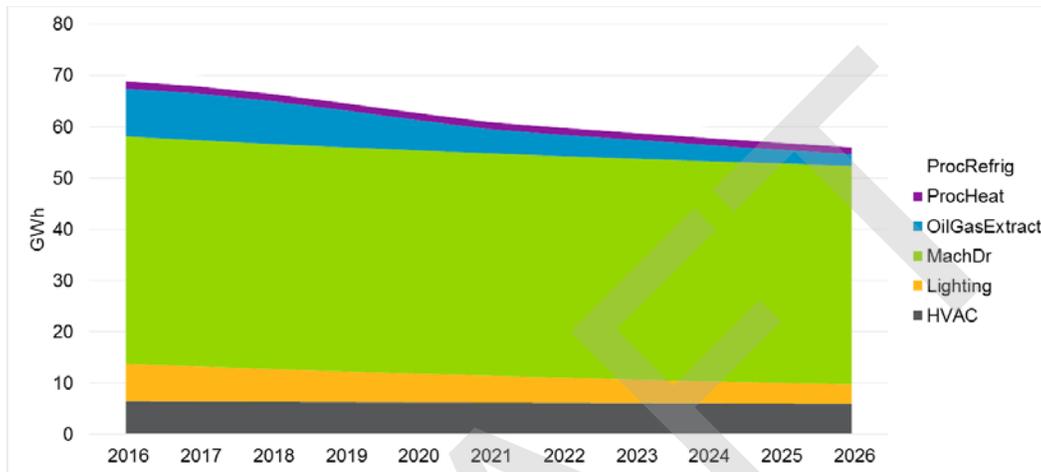
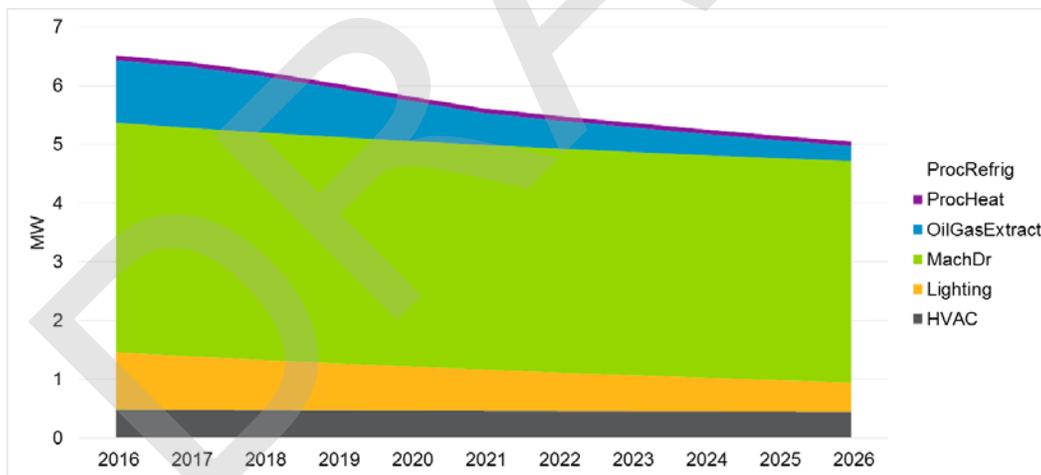


Figure 17. Achievable Potential (Industrial Sector, MW, 2016-2026)⁵³



⁵¹ Achievable Potential is defined as the cost-effective Technical Potential (by measure TRC) and then filtered to the energy efficiency savings that could be expected in response to specific levels of incentives and assumptions about policies, market influences, and barriers. Technical Potential is defined as the amount of energy savings that would be possible if the highest level of efficiency for all technically applicable opportunities to improve energy efficiency were taken. Technical potential represents the immediate replacement of applicable equipment-based technologies regardless of the remaining useful life of the existing measure.

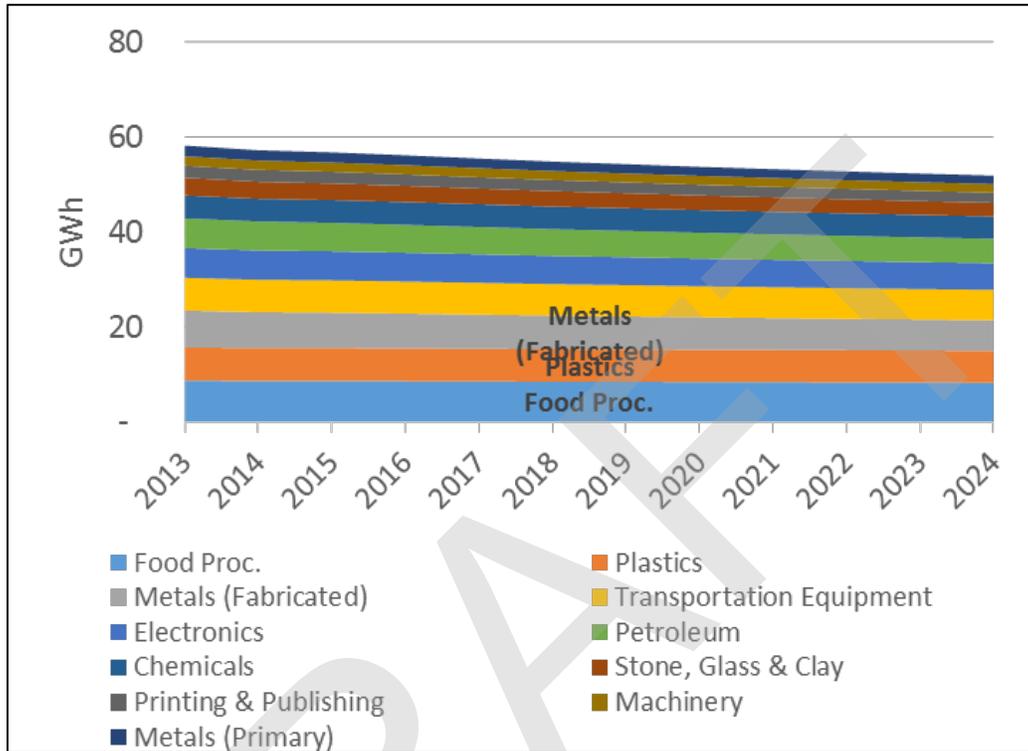
⁵² *AB 802 Technical Analysis – Potential Savings Analysis*, Navigant, March 2016. *Note*: The savings above are pre-AB 802 savings. ProcRefrig = Process Refrigeration, ProcHeat = Process Heat, OilGasExtract = Oil & Gas Extraction, MachDr = Machine Drive (e.g., motors, pumps, etc.).

⁵³ Ibid.

i. Potential Savings by Segment

The top three Industrial segments in terms of potential savings are Food Processing, Plastics, and Metals (Fabricated).

Figure 18. Industrial Potential by Segment⁵⁴



ii. Industrial Stranded and Operational Savings Potential

The latest Navigant study regarding AB 802 stranded and operational savings potential only addressed Residential and Commercial sectors. The CPUC plans to update the 2018 Potential & Goals study with further AB 802 savings potential detail in 2017.⁵⁵

2. Industrial Sector Drivers

There are several drivers in the Industrial sector that affect the sector EE goals, including EE portfolio trends and results of EM&V studies.

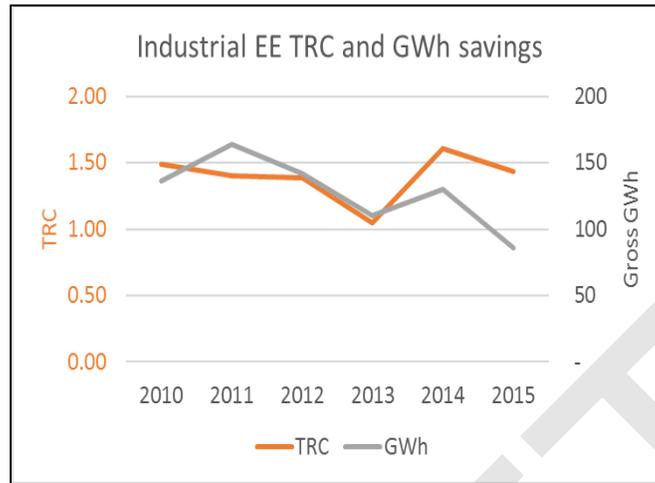
a. EE Portfolio Trends and EM&V Evaluation Takeaways

Like the Commercial sector, the Industrial sector has seen a decrease in energy savings while maintaining the same level of cost-effectiveness, as shown in Figure 19, following.

⁵⁴ "Energy Efficiency Potential and Goals Study for 2015 and Beyond," Navigant, Sept. 2015.

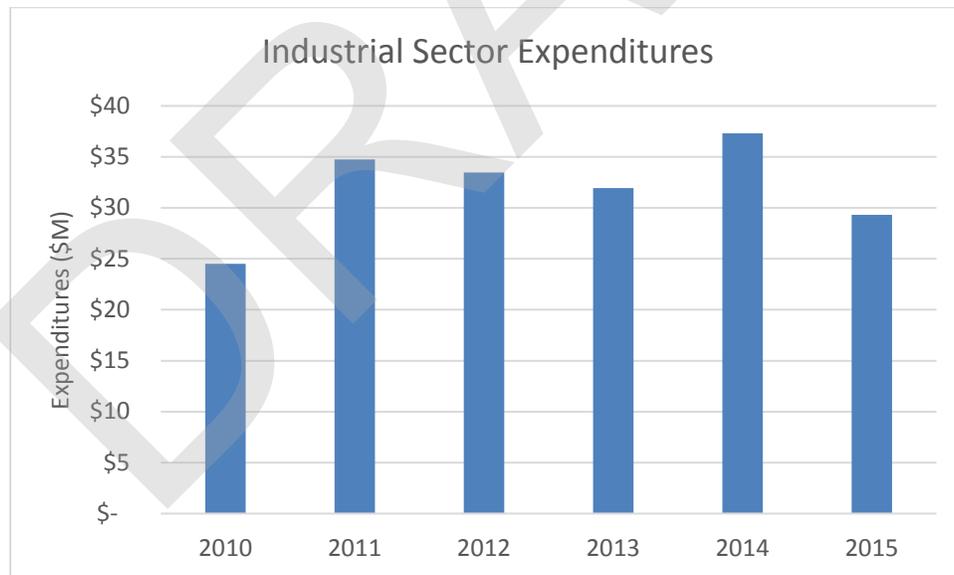
⁵⁵ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.

Figure 19. Industrial Sector Energy Savings and Cost-Effectiveness 2010-2015⁵⁶



Industrial sector expenditures have stayed about the same level even as it has gotten more and more costly to achieve energy savings cost-effectively as seen in Figure 20, Industrial Sector Expenditures 2010-2015. Similar to the Commercial sector, as it has become more expensive to achieve energy savings cost-effectively, savings have dropped almost in half.

Figure 20. Industrial Sector Expenditures 2010-2015⁵⁷



Further informing these broader five-year trends are a number of evaluation takeaways. A review of relevant Industrial sector studies provides a

⁵⁶ From EEStats. Does not include industrial non-resource program costs embedded in cross-cutting programs (e.g., ET, WE&T, etc.). Includes Public-related expenditures and TRC impacts as EEStats does not yet recognize the newly defined Public sector (e.g., wastewater facilities moved from Industrial to Public sector).

⁵⁷ Ibid.

number of insights that inform SCE's future approach. Key evaluation takeaways for SCE are as follows:

- Just like the Commercial sector, differing priorities by customer size is identified as a barrier in multiple MASI studies. SCE intends to transition its entire nonresidential portfolio to size-specific service delivery, as described in the Sector Vision section.
- The Industrial sector programs, like all nonresidential programs, could improve their gross realization and net realization rates through a common set of recommendations already described as part of the Commercial sector study takeaways. SCE expects a combination of process improvements, along with the Sector Vision tailoring of customized services according to client footprint, to contribute to improved net and gross realization rates.
- As reported in several of Navigant's MASI studies, industrial customers do not uniformly adopt Industry Standard Practices (ISPs). Larger and more sophisticated industrial customers may have more resources and devote more attention to EE practices, but the same is not typical for small and medium customers. ISPs, however, are applied across an industry regardless of customer size. SCE plans to lead or support evaluation of applicability of ISPs to various customer types.⁵⁸
- While EE benchmarking is important to all California customers, results may vary significantly based on specific industry segments. PAs may need a more targeted and specific benchmarking process for similar customers by industry inside and outside their territories, based on industrial output and specific production volume rather than energy usage and physical size of the facilities. SCE plans to address the above through its participation in statewide re-tooling efforts for the SEM program.

Appendix B provides additional evaluation takeaways SCE plans to incorporate into its future nonresidential portfolio by looking at the wide variety of studies applicable to the Commercial, Industrial, and Agricultural sectors.

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⁵⁸ SCE plans to monitor the recommendations of the ISP working group mandated by D.16-08-019 in hopes that future applicability of ISP is reconsidered and/or recommendations are made to research ISP applicability based on customer size or sophistication.

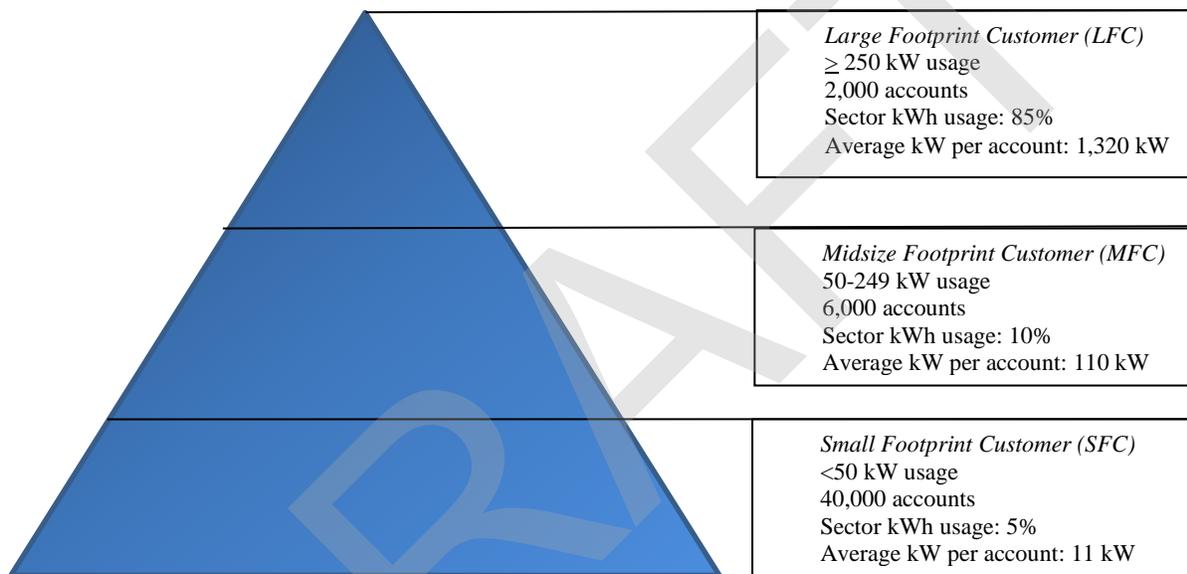
C. SCE’s Approach to Achieve Industrial Sector Goals

This section of the chapter describes SCE's approach to achieving sector goals including the sector vision, budgets and metrics, coordination, and future needs.

1. Industrial Sector Vision

For SCE’s Industrial sector, a customer segmentation approach as described in Figure 21 forms the basis for service delivery in the future. Customer energy usage drives SCE's segmentation approach, leading to characterization of large, mid-size, and small customers while recognizing that other factors may drive customer energy footprints and savings opportunities.

Figure 21. SCE Industrial Customer Segment Select Characteristics⁵⁹



Based on the level of savings opportunity a customer represents, SCE plans to offer different delivery approaches to serve customers. Table 2 in the Commercial Sector Vision section provides additional detail on SCE’s differing levels of service based on customer energy footprint. As previously mentioned, upon approval of its Business Plan, SCE plans to work with partners to fine-tune and implement strategies in support of this non-residential sectors approach in which delivery channels differ by segment type.

2. Industrial Sector Goals

Table 7, following, shows SCE’s overall EE goals for the Industrial sector for 2018 - 2027.

⁵⁹ SCE Customer Service System database, Year-To-Date as of March 2016. Does not include the breakout of Public sector customers from this sector.

Table 7. Industrial Sector Savings Goals⁶⁰

Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Energy Savings (GWh)	TBD									
Demand Reduction (MW)	TBD									

a. Existing Programs and Services

To help overcome market barriers to optimized energy management, SCE offers a number of programs for Industrial sector customers. They span the following:

- Industrial core programs (Calculated, Deemed, and Midstream)
- Savings By Design Program for nonresidential new construction
- Nonresidential HVAC Program
- Continuous Energy Improvement Program (benchmarking), and
- Nonresidential third party-implemented programs.

Based on qualifications, sector customers may also be eligible for additional programs and services such as OBF, OBR, DR, EV, time-of-use rates, and dynamic pricing.

SCE's nonresidential EE programs offer integrated energy management solutions through strategic energy planning support; technical support services, such as facility audits, and calculation and design assistance; and financial support through rebates, incentives, and financing options. Current sector offerings—several of which span across the Commercial, Industrial, and Agricultural sectors—are described in *Appendix E*.

b. Strategic Initiatives

The Commercial, Industrial and Agricultural sectors share similar intervention strategies and tactics. The intervention strategies applicable to the Industrial sector are the following:⁶¹

- Financing
- Customer Incentives
- Intelligent Outreach
- Midstream/Upstream Incentives
- Partnering
- Quality Assurance

⁶⁰ CPUC Decision (D.) 16-08-019 states that "Future energy efficiency goals analysis should be done in coordination with the CEC, through the JASC and the DAWG, and should incorporate cumulative goals in addition to the annual goals in time for the beginning of 2018." For this reason, energy savings goals will be provided upon completion of the energy efficiency goals analysis.

⁶¹ Detailed descriptions of these intervention strategies are included in the Portfolio Summary chapter.

- Single-Point of Contact
- Strategic Energy Management, and
- Sustainable Offerings.

Table 8 identifies the key strategies and tactics SCE expects to employ beginning in 2018. **Appendix H** contains a complete list of potential strategies SCE is considering, including continuation of existing ones. Each strategy and tactic has additional identifying data, such as:

- Expected timeline (short-, mid- and/or long-term)
- Sector focus (Commercial, Industrial and/or Agricultural)
- Customer size focus (Small, Mid-size and/or Large)
- Indication of new, existing, or modified activity
- Legislative, policy, or proceeding alignment, and
- Sector strategies alignment.

Table 8. Key Industrial Sector Characteristics and Strategies

Key Sector Characteristics	Sample Strategies (by customer size, where applicable)
<p>The top 5% of Industrial service accounts use 85% of sector energy.⁶²</p>	<ul style="list-style-type: none"> • <i>Large:</i> Re-tool Strategic Energy Management (SEM) as a resource, cost-effective program that serves as a cornerstone of SCE’s Large Industrial customer offering. • <i>SMB:</i> Address remaining electricity usage via lessons learned from SEM to develop cohort, web-based, or other “SEM lite” options that cost-effectively provide similar services to smaller Industrial customers.
<p>The top 75% of electricity usage is from the following segments: Industrial (Other), Food & Kindred Products, Transportation Equipment, Metals & Minerals, Chemicals, Plastics and Petroleum.</p> <p>A multi-pronged strategic approach is needed to tackle this diverse sector.⁶³</p>	<ul style="list-style-type: none"> • Customize energy efficiency best practices to each customer segment’s unique needs via SEM.

⁶² SCE Customer Service System database, Year-to-date March 2016 and SCE reported EE participation data, 2013-2015.

⁶³ SCE Customer Service System database. SCE recognizes that Industrial (Other) is large and needs to be disaggregated, and is still working on resolving this data issue before Jan 15, 2017 Business Plan deadline.

Key Sector Characteristics	Sample Strategies (by customer size, where applicable)
<p>The top three Industrial end-uses by potential savings are Machine Drive, HVAC and Lighting.⁶⁴</p>	<ul style="list-style-type: none"> • <i>Large</i>: SEM will address these top end-uses, plus many others, while including additional behavior, retro-commissioning and operational interventions that create savings claims opportunities per AB 802 guidelines. • <i>SMB</i>: Custom applications of top end-uses will be delivered through “SEM-lite” services. • <i>SMB</i>: Additionally, midstream distributor approaches will deliver HVAC and Lighting technologies in the near terms, and SCE will work with distributors to expand into general Machine Drive technologies. • <i>SMB</i>: Dispositions and Industry Standard Practice studies may be limiting measure availability and potential savings to select customer sizes. SCE plans to perform or support deeper analysis into past and future ISP guidance to clarify scope and ensure the appropriate technologies can still be offered to influence appropriate customer types.

As SCE engages with more third-party partners across its portfolio, SCE expects the strategies to evolve and grow.

3. Budget and Metrics

Table 9 shows SCE's planned budget for the Industrial sector over the next 10 years.⁶⁵

Table 9. Industrial Sector Budget 2018-2027

Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Industrial	TBD									

Table 10, following, provides SCE’s metrics for the Industrial sector based on customer size. Metrics will measure, over time, the effectiveness of programs to reach customers, engage them, and increase the depth of engagement.

⁶⁴ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.

⁶⁵ TBD until energy savings goals are updated (see Sector Goals section for pending CPUC direction).

Table 10. Industrial Sector Problem Statements, Market Barriers, Intervention Strategies, and Metrics

Energy Efficiency Business Plans: Sector Metric Table - Industrial Sector								
Problem Statement / Barrier	Desired Outcome	Strategies (Sample)	Metrics	Baseline	Metric Source	Short Term Target (1-3 years)	Mid Term Target (4-7 years)	Long Term Targets (8-10+ years)
Dispositions and ISPs may be artificially limiting measure availability to select customer sizes	Better understanding of the market through development and use of a greater number of well-documented ISPs and Dispositions to allow wider range of offerings to customers	<ul style="list-style-type: none"> • Develop more ISPs and Dispositions • Apply ISPs based on size and composition of customer segments 	Number of new ISPs and Dispositions	N/A	EM&V and market research study tracking data	TBD	TBD	TBD
SEM solves multiple customer problems, but its scale and adoption differs by customer size	Increase use of SEM in small industrial customers	<ul style="list-style-type: none"> • With lessons learned from Large and Mid SEM programs, develop tools to standardize self-help SEM • Leverage existing tools such as Energy Star Portfolio Manager 	Number of SCE small Industrial participants who use SEM	2015 Participation Levels	Program tracking data	TBD	TBD	TBD
	Increase use of SEM in mid-size industrial customers	<ul style="list-style-type: none"> • Evaluate and use "cohort" model (many customers to one CEI implementer) for cost-effective SEM development 	Number of SCE mid-size Industrial participants who use SEM			TBD	TBD	TBD

Energy Efficiency Business Plans: Sector Metric Table - Industrial Sector								
Problem Statement / Barrier	Desired Outcome	Strategies (Sample)	Metrics	Baseline	Metric Source	Short Term Target (1-3 years)	Mid Term Target (4-7 years)	Long Term Targets (8-10+ years)
	Increase use of SEM in large industrial customers	<ul style="list-style-type: none"> Targeted SEM approach for claiming savings beyond equipment upgrade opportunities Use whole building and whole facility strategies. 	Number of SCE large Industrial participants who use SEM			TBD	TBD	TBD
Customers have differing levels of financial resources available for energy efficiency opportunities	Increased use of OBF, OBR, and third party financing options.	<ul style="list-style-type: none"> Enhance participation in OBF or OBR program for small and mid-size industrial customers 	Number of SCE mid-size industrial customers who participate in utility financing programs.	2015 Participation Levels.	Program tracking data	TBD	TBD	TBD
		<ul style="list-style-type: none"> Develop and provide resources for small and mid-size industrial customers to navigate financing program process. 	Number of SCE small industrial customers who participate in utility financing programs.			TBD	TBD	TBD
		<ul style="list-style-type: none"> Promote OBR, OBF, and third party financing options to large industrial customers 	Number of SCE large industrial customers who participate in utility financing programs.			TBD	TBD	TBD
			Number of SCE customers who participate in non-utility financing programs	2017 Baseline Study (TBA)	Bi-annual process Evaluations or market surveys	N/A - Tracking only	N/A - Tracking only	N/A - Tracking only

4. Proposed Pilots

SCE anticipates conducting a number of pilots to support administration of sector strategies previously listed. Table 11 summarizes these efforts, which are discussed in further detail below. The proposals described below are expected to be in collaboration with stakeholders, and generate recommendations that kick-start a subsequent set of actions. SCE also anticipates modifications to current identified pilots based on future partnerships with third party collaborators.

Table 11. Summary of Proposed Pilots

Identifier	Title	Support
a	Performance Based Industrial Energy Management System Pilot	California EE Strategy Plan, SB350, AB 793
b	Industrial Strategic Energy Management (SEM) Pilot Projects	California EE Strategy Plan, SB350, AB 753, AB 802
c	IDSMS Grid Reliability Rapid Response (GRRR) Pilot to Support Locational Needs <i>Joint funding with Commercial sector; see Commercial chapter</i>	California Industrial EE Strategy, SB350, AB 802, AB 758, AB 793
d	Nonresidential ZNE IDSMS Retrofit Pilot <i>Joint funding with Commercial sector; see Commercial chapter</i>	Same as above
e	Benchmarking Based on Production Output & Prioritization	California EE Strategy Plan, SB 350, AB 802, AB 758
f	ISP Viability and Standardization	California EE Strategy Plan, SB350, AB 802

a. Performance Based Industrial EMS Pilot

Many SCE industrial customers utilize Energy Management Systems (EMS) in a variety of facility spaces. To date, it has been a challenge to measure non-hardware based energy efficiency savings derived from the EMS usage. SCE would like to propose a pilot program to explore behavior energy savings from EMS adoption. This may take the form of one or more HOPPs project efforts rather than a program effort. The initial pilot scale will be limited. Once proven successful, this concept can be scaled into a HOPPs proposal.

SCE would like to consider developing a performance based pilot concept leveraging EMS in the customer facility. This may be an existing and/or new EMS application. Rather than following the existing residential behavior protocol (i.e., experimental design, comparative energy usage, and ex-post evaluation), this industrial pilot will start with a meter/measure approach to document the necessary methods to estimate energy savings and performance based pay-out and true-up. The program will consider offering incentive for EMS installation if budget permits. Beyond EMS, the balance of the pilot is about "performance incentive" for goal setting and behavior energy savings. Each pilot project, may require a comprehensive energy audit to get started.

Milestones:

- SCE will use the balance of 2017 to develop this pilot program concept and implementation details.
- In 2017, SCE plans to complete no more than 10 projects, based on availability and budget, using the developed pilot plan, utilizing a meter/measure approach, to test viability, energy savings and cost effectiveness.
- Once these pilot projects are completed, SCE will make a determination for the next steps (to be communicated to CPUC and other stakeholders).

b. Industrial SEM Pilot Projects

The SEM program currently under development statewide with CPUC is fundamentally different than SCE's current CEI program. SEM uses major account executive interface to engage customer organizations from top to bottom, starting with a company-wide examination of necessary operational improvements to improve bottom-line. Energy savings and conservation behaviors are often natural outcomes of these initiatives but are not necessarily end-goals. Tailored service is most appropriate for largest customers who are willing and capable, and this pilot would proposed to test implementation of several perceived benefits, including:

- SEM will allow customization of the energy management plan,
- SEM will plan activities over a meaningful time horizon for the participating companies,
- SEM will plan and engage all the tiers of decision making and makers,
- SEM will provide a clear playbook and a path to customized solution to meet needs.

This pilot may be best suited for a performance-based incentive using a metering/measuring approach. As a pilot effort, SCE will limit the initial implementation to no more than ten projects. This pilot may be combined with the Industrial EMS pilot proposed above.

Milestones:

- This is a co-funded pilot with SCE commercial program team. The industrial program team will lead this effort:
 - SCE will use the balance of 2017 to develop a pilot program concept and implementation details as a third party initiative.
 - In 2017, SCE will use a RFP process to solicit and engage the third party implementer. The scope of the pilot will be limited to less than 10 specific projects due to customer availability and budget commitment.

- SCE will use a meter/measure approach to document and report energy savings. This pilot can be structured as a "performance based incentive" payout.
- Once these pilot projects are completed, SCE will make a determination for the next steps. This will be communicated to ED/CPUC as appropriate.

c. IDSM Grid Reliability Rapid Response (GRRR) Pilot to Support Locational Needs

Please see the description in Section IV.C.1, Commercial Sector Proposed Pilots, above.

d. Nonresidential ZNE IDSM Retrofit Pilot

Please see the description in Section IV.C.1, Commercial Sector Proposed Pilots, above.

e. Benchmarking Based on Production Output & Prioritization

The EPA's Portfolio Manager benchmarking service and process may be too generic to be useful for industrial customers. It does not properly account for industry and/or business-specific outputs. There may be other metrics than account size (kW, kWh) to evaluate these industrial food-processing customers. This may be important to identify energy intensity for key industrial sectors as benchmarking information. The critical items that drive energy usage may be more about volume of production rather than site-specific energy efficiency.

SCE would like to explore this benchmarking concept to investigate the best way to collect the appropriate data. To be useful, this benchmarking would need to be more specific to the customer business and may need customer and business-confidential data. It is not clear how viable this would be. It is also not clear if there are industry data that may be available so the custom could receive this comparison data without making their score public.

For this pilot, SCE would like to go one step further, leveraging the concept of relevant energy usage intensity values to ask if these industrial sites can be ranked and/or rated to develop a sense of properties and sites most in-need of DSM services. For large customers, a package of targeted and tailored services can be offered. Smaller customers can be invited to participate in online Business Energy Advisor, and/or be referred to the list of distributor programs for further action. SCE understands that other PAs may be interested in exploring this pilot concept.

Milestones:

- Develop a statement of work and explore possible options to collect data.

- If this data is available, then engage a vendor to develop "benchmarking methodology" using this information. The resultant customer benchmarking data would be customer confidential. This information can be used in addition to kW/kWh energy benchmarking data.
- In parallel with the above developmental activities, SCE will develop analytical capabilities and methods to rank/rate these customers to develop a sense of priority.
- If successful, the next step is to develop a small-scale experiment providing this information to specific customers to test viability and reliability.
- If the above can be successful, then this pilot concept can be further scaled into broader applications.

f. ISP Viability and Standardization

As indicated in several of the Navigant MASI industrial segment studies, it is clear that large and minor operators may behave very differently. SCE is proposing to do a follow-up study to the completed Navigant MASI studies that follows food processing, wastewater treatment, and cross-cutting pump/motor industrial applications to assess the necessary conditions to embrace and adopt ISP practices. The purpose of this study is not to argue for more preferential workpaper dispositions, but to improve necessary customer communications to seek above-ISP energy savings and measures.

Milestones:

- Develop a follow-up M&E study to evaluate the necessary conditions for customers to adopt ISPs. If there are barriers to embracing the ISPs, this deliverable should clearly identify them.
- Identify necessary customer education/training to help industrial participants embrace ISPs.
- Identify above-ISP and to-ISP energy savings potential and how it can be measured.

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IV. Agricultural Sector

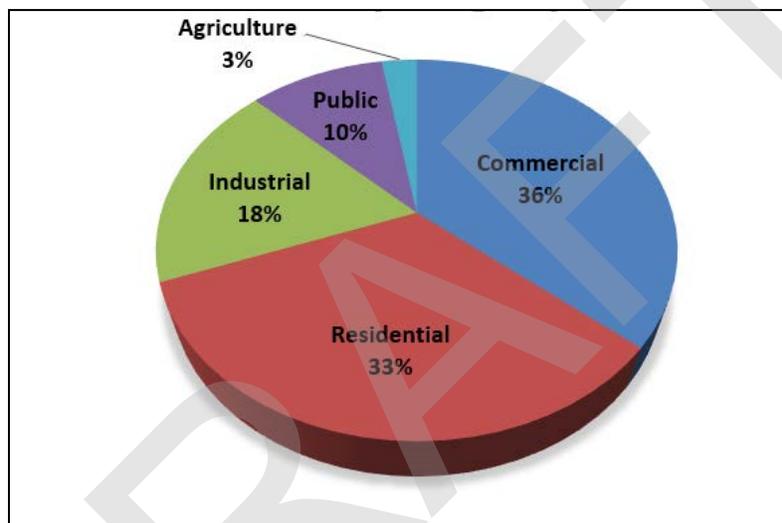
A. Agricultural Sector Executive Summary

TBD

B. Agricultural Sector Profile

In 2015, 2,000 of the 81,000 GWh electric consumption within SCE's service territory came from the Agricultural sector. This represents 3% of the total.⁶⁶

Figure 22. SCE Electricity Use by Sector



SCE's 30,000 Agricultural service accounts⁶⁷ represent a small portion of SCE's electric usage, but represent differing energy savings opportunities.

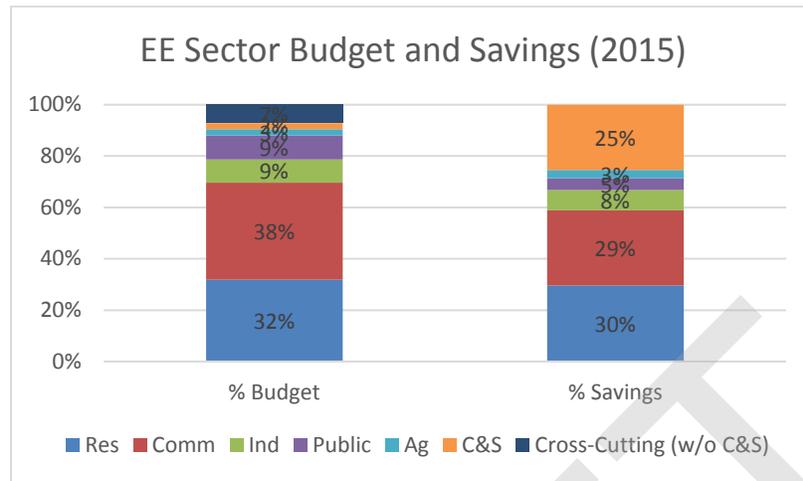
In 2015, the Agricultural sector is 9% of the EE portfolio budget, and 8% of GWh savings. See Figure 23, EE Sector Budget and Savings (2015), below.

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⁶⁶ SCE Customer Service System customer database, Year-To-Date as of March 2016.

⁶⁷ Agricultural sector originally had ~50,000 SA's, but with the creation of the Public sector category, our data teams are currently defining exactly what is and is not in Public. Now Ag does not include non-Ag-specific water or wastewater facilities, resulting in the transfer of 20,000 SAs from Ag to Public. Please see the Public sector for a description of the business plan strategies for those customers.

Figure 23. EE Sector Budget and Savings (2015)⁶⁸



1. Agricultural Sector Characteristics

a. Customer Landscape

SCE's Agricultural sector consists of the following customer segments

Note: In **bold** means total value is over \$500m in 2014, and **bold + italic** means it's a Top California Agricultural product per Table TK: Top California Agricultural Products 2015, above.⁶⁹

Field & Seed Crops	Barley, beans, cotton/cottonseed , corn grain, hay , oats, peppermint, potatoes, rice , sugar beets, wheat, oil crops (e.g., sunflower, safflower, etc.)
Fruit & Nut Crops	Almonds , apples, apricots, avocados, berries , cherries, dates, figs, grapefruit, grapes , kiwifruit, lemons, nectarines, olives, oranges , peaches, pears, pecans, pistachios , plums, tangerines, walnuts and others
Vegetables & Melons	Artichokes, asparagus, snap beans, broccoli , cabbage, carrots , cauliflower, celery, corn, cucumbers, garlic, lettuce , melons, onions, peppers, spinach, squash, tomatoes and others
Livestock, Poultry & Products	Cattle/calves , hogs, milk & cream , poultry/eggs , and miscellaneous (including sheep and lambs)
Floriculture	Cut flowers, potted plants, foliage plants, bedding plants and indoor decoratives

The following Agricultural products are the top 10 products by overall value in CA (see Table 12):

⁶⁸ SCE Reported Program Savings Data (2015).

⁶⁹ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

Table 12: Top 10 California Agricultural Products (2015)⁷⁰

Product	Value
Milk	\$6.29 billion
Almonds	\$5.33 billion
Grapes	\$4.95 billion
Cattle/Calves	\$3.39 billion
Lettuce	\$2.25 billion
Strawberries	\$1.86 billion
Tomatoes	\$1.71 billion
Poultry / Eggs	\$1.70 billion
Walnuts	\$977 million
Hay	\$945 million

Please see *Appendix G* for key customer segment trends, key product trends and electricity usage facts that support the focus of the main sector strategies.

i. Location

SCE's Agricultural sector is primarily located in its northern regions, as shown in Table 13:

Table 13. SCE Agricultural Customers by County⁷¹

SCE County Ranked by Production	California Farm Bureau Members	Major Products
Tulare (2nd)	1,694	Milk, oranges, cattle, grapes, hay, pistachios
Kern (4th)	688	Vegetables, strawberries, grapes, nursery, nuts
Ventura (8th)	876	Milk, cotton, cattle, alfalfa, tomatoes
Kings (11th)	618	Milk, cattle, tomatoes, cotton, nuts
Riverside (13th)	746	Nursery, milk, table grapes, eggs, vegetables
Santa Barbara (12th)	623	Berries, vegetables, wine grapes
San Bernardino (25th)	274	Milk, eggs, vegetables, cattle
Orange (31st)	116	Nursery-foliage, berries, vegetables
Los Angeles (32nd)	235	Nursery-foliage, vegetables, fruits, nuts
Inyo (53rd)	43	Cattle, hay, honey

⁷⁰ California Agricultural Production Statistics, California Department of Food & Agriculture, as of 10/17/2016.

⁷¹ SCE Ag Segment Optimization Plan, 2012.

ii. Drought Impacts

SCE recognizes that the sustained California-wide drought has wide-ranging impacts on the agriculture industry.

Key takeaways are:

- With less surface water available and dropping underground water levels, increased pumping requirements to access these deeper water levels are increasing pumping costs and electricity needs. This increase in pumping could mean more adoption of pump tests and overhauls, but it is difficult to deliver these services cost-effectively due to reduced ability for PAs to claim savings for pump-related measures.
- Water savings are much more important to farmers than electricity savings, exacerbating the existing EE engagement barrier that electricity is a very small portion of farmer's costs.

See *Appendix G* for additional Agriculture customer segment data, including drought impacts on customers and their electricity usage.

b. Electricity Consumption

i. Electricity Consumption by Customer Size⁷²

SCE has analyzed electricity consumption based on customer size.⁷³ Large customers make up 2% of all Agricultural Service Accounts (SAs), but 37% of annual Agricultural kWh energy usage. This indicates a high savings opportunity per customer. From 2013-2015, SCE installed EE measures in 59% of all large Agricultural SAs.

Mid-size customers make up 16% of Agricultural SAs, but 49% of annual Agricultural kWh energy usage. This is a moderate energy savings opportunity per customer. From 2013-2015, SCE installed EE measures in 38% of all mid-size Agricultural Service Accounts.

Small customers make up 82% of Agricultural SAs, but only 14% of annual Agricultural kWh energy usage. This is a low savings opportunity per customer (indicative of high cost to reach each customer with a comparatively low savings opportunity). From 2013-2015, SCE installed EE measures in 7% of all small Agricultural Service Accounts.

See *Appendix D* for considerations and challenges in evolving the customer size metric from peak demand to customer energy intensity.

⁷² SCE Customer Service System database, Year-to-date March 2016 and SCE reported EE participation data, 2013-2015.

⁷³ Large customers are ≥ 250 kW, mid-size customers are 50-250 kW, and small customers are < 50 kW.

c. Sector Potential and Goals

The Agricultural sector has primarily Machine Drive and Process Refrigeration Achievable Potential⁷⁴ through 2026. The top potential is Machine Drive (e.g., Pumps). This indicates that maintaining a sustainable pump-related program is important to achieving this potential.

See Figures 24 and 25, following, for the Agricultural sector's Achievable Potential GWh and MW respectively, broken out by End Use.

Figure 24. Achievable Potential (Agricultural Sector, GWh, 2016-2026)⁷⁵

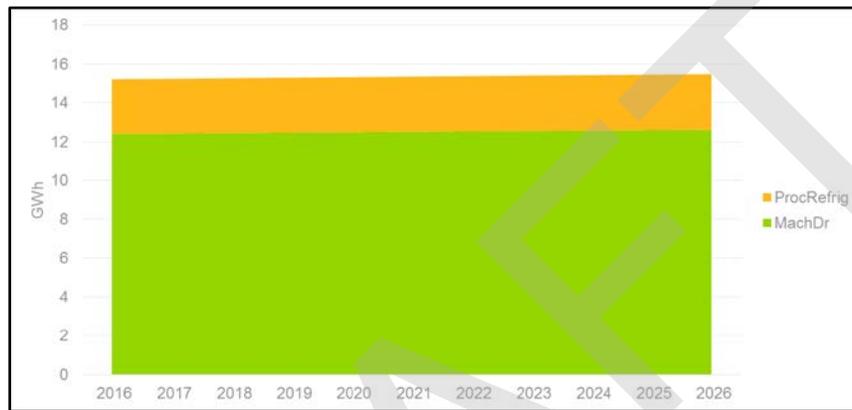
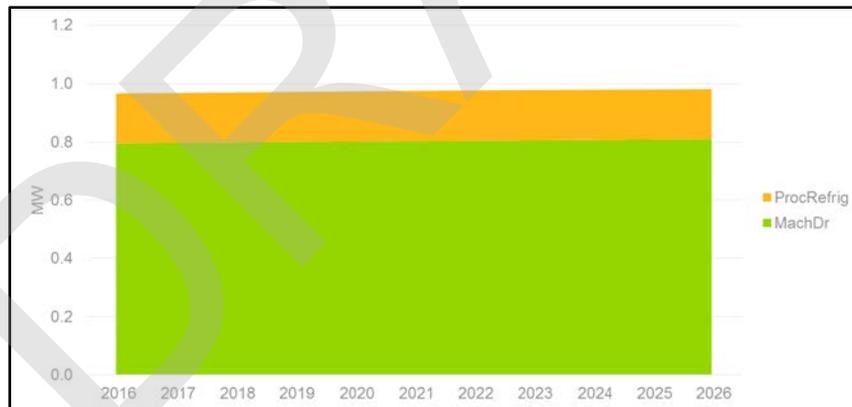


Figure 25. Achievable Potential (Agricultural Sector, MW, 2016-2026)⁷⁶



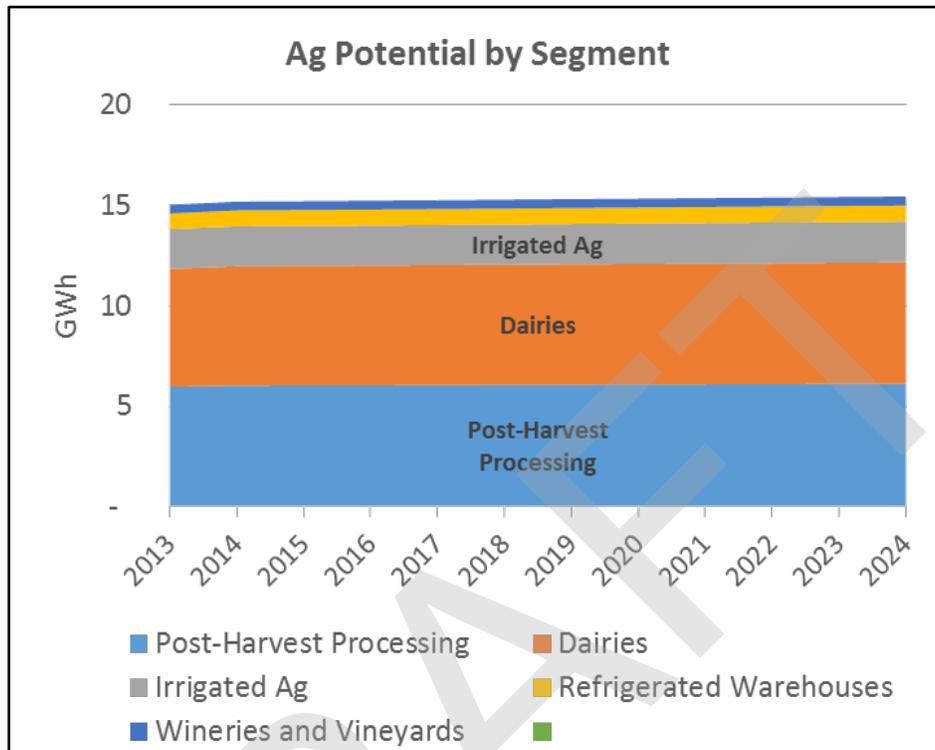
⁷⁴ Achievable Potential is defined as the cost-effective Technical Potential (by measure TRC) and then filtered to the energy efficiency savings that could be expected in response to specific levels of incentives and assumptions about policies, market influences, and barriers. Technical Potential is defined as the amount of energy savings that would be possible if the highest level of efficiency for all technically applicable opportunities to improve energy efficiency were taken. Technical potential represents the immediate replacement of applicable equipment-based technologies regardless of the remaining useful life of the existing measure.

⁷⁵ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. *Note:* The savings above are pre-AB 802 savings.

⁷⁶ Ibid.

By Segment, the top potential is Post-Harvest Processing (e.g., nut-shelling), Dairies, and Irrigated Ag.⁷⁷

Figure 26. Agricultural Potential by Segment



The latest Navigant study regarding AB 802 stranded and operational savings potential only addressed Residential and Commercial sectors. The CPUC plans to update the 2018 Potential & Goals study with further AB 802 savings potential detail in 2017.⁷⁸

2. Agricultural Sector Drivers

There are a number of factors in the Agricultural sector that drive the EE landscape, including EE portfolio trends and EM&V study results.

a. EE Portfolio Trends and EM&V Evaluation Takeaways

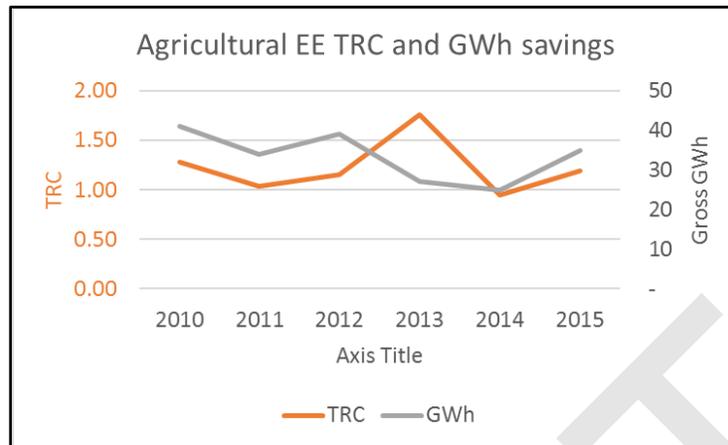
The Agricultural sector cost-effectiveness and annual electricity savings have fluctuated year-to-year but over the five-year period have stayed about the same level.

See Figure 27, following.

⁷⁷ Please note that these are Navigant's Agricultural customer segments, and there is not enough detail in that study to break this out by the industries' recognized customer segments.

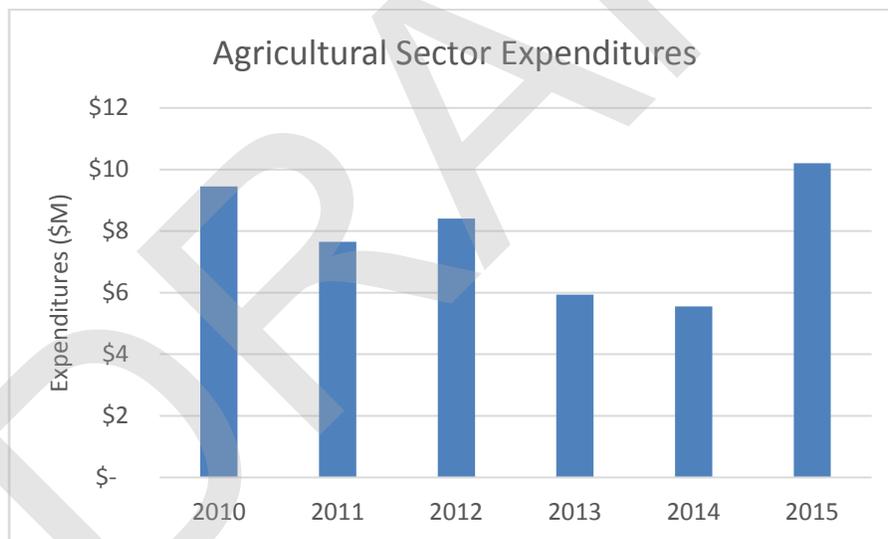
⁷⁸ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.

Figure 27. Agricultural Sector Energy Savings and Cost-Effectiveness 2010-2015⁷⁹



Similarly, the Agricultural sector expenditures have fluctuated but stayed roughly the same as shown in Figure 28, Agricultural Sector Expenditures 2010-2015.

Figure 28. Agricultural Sector Expenditures 2010-2015⁸⁰



In the future, SCE expects policy dispositions around claiming savings for pump overhauls to reduce SCE's capability to offer pump tests and overhauls at the scale they were once offered, as it will either be a limited early retirement resource offering or a non-resource cost, decreasing the EE portfolio's overall cost-effectiveness.

⁷⁹ From EEStats, which does not include agricultural non-resource program costs embedded in cross-cutting programs (e.g., ETP, WE&T). Includes Public-related savings (e.g., water districts) and TRC impacts, since EEStats does not yet recognize the newly defined Public sector.

⁸⁰ Ibid.

Further informing these broader five-year trends are a number of evaluation takeaways. A review of relevant Agricultural sector studies provides a number of insights that inform SCE's future approach. Key evaluation takeaways for SCE are as follows:

- Just like the Commercial and Industrial sectors, treating customers with greater variation is recommended. SCE intends to transition its entire nonresidential portfolio to size-specific service delivery, as described in the Sector Vision section.
- California's agriculture and water supply systems have been challenged in recent years by prolonged drought periods. Groundwater remains in substantial overdraft in many areas, which has increased energy demands due to additional well installations to tap lowered water tables resulting in more pumping. SCE aims to address these challenges by revamping its pump services programs and seeking integrated water-energy opportunities as part of a "Whole Farm" approach.
- Crop fallowing as a result of water shortages is estimated to be approximately 80 thousand acres relative to average water supply conditions, representing just below 1% of all irrigated acreage statewide.⁸¹ About 90% is predominantly within the Central Valley area.⁸² Adoption of more efficient irrigation technologies has been a constant barrier with significant impacts to pumping energy usage. As SCE explores "Whole Farm" approaches, these and other sector-specific strategic initiatives are expected to rely heavily on trade association partnerships.

Appendix B provides additional evaluation takeaways that SCE plans to incorporate into its future nonresidential portfolio by looking at the wide variety of studies applicable to the Commercial, Industrial, and Agricultural sectors.

C. SCE's Approach to Achieve Agricultural Sector Goals

This section of the chapter describes SCE's approach to achieving sector goals including the sector vision, budgets and metrics, coordination, and future needs.

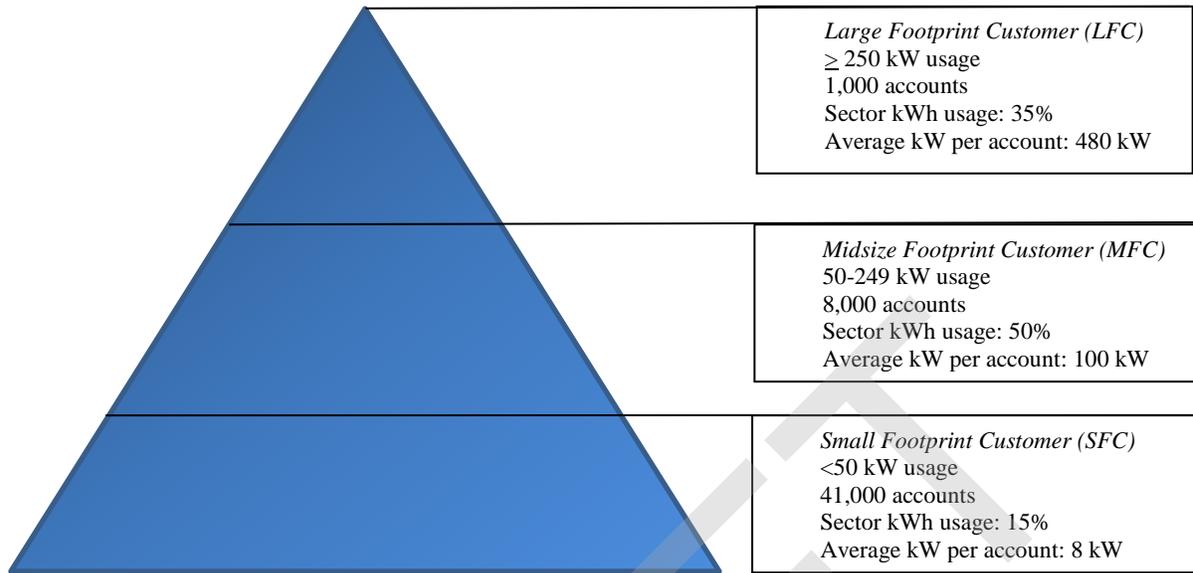
1. Agricultural Sector Vision

For SCE's Agricultural sector, a customer segmentation approach as described in Figure 29, following, forms the basis for service delivery in the future. Customer energy usage drives SCE's segmentation approach, leading to characterization of large, mid-size, and small customers while recognizing that other factors may drive customer energy footprints and savings opportunities.

⁸¹ *Economic Analysis of the 2016 California Drought on Agriculture*, Center for Watershed Sciences - UC Davis, August 15, 2016.

⁸² *Ibid.*

Figure 29: SCE Agricultural Customer Segment Select Characteristics



Based on the level of savings opportunity a customer represents, SCE plans to offer different delivery approaches to serve customers. Table X in **Section IV.A., Commercial Sector Vision**, above, provides additional detail on SCE’s differing levels of service based on customer energy footprint. As previously mentioned, upon approval of its Business Plan, SCE plans to work with partners to fine-tune and implement strategies in support of this non-residential sectors approach in which delivery channels differ by segment type.

2. Agricultural Sector Goals

Table 14 shows the EE goals for the Agricultural sector for 2018-2027.

Table 14. Agricultural Sector Savings Goals⁸³

Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Energy Savings (GWh)	TBD									
Demand Reduction (MW)	TBD									

⁸³ CPUC Decision (D.) 16-08-019 states: "Future energy efficiency goals analysis should be done in coordination with the CEC, through the JASC and the DAWG, and should incorporate cumulative goals in addition to the annual goals in time for the beginning of 2018." For this reason, energy savings goals will be provided upon completion of the energy efficiency goals analysis.

a. Existing Programs and Services

To help overcome market barriers to optimized energy management, SCE offers a number of programs for Agricultural sector customers. They span the following:

- Agricultural core programs (Calculated, Deemed, and Midstream)
- Savings By Design Program for nonresidential new construction
- Nonresidential HVAC Program, and
- Continuous Energy Improvement Program (benchmarking).

Based on qualifications, sector customers may also be eligible for additional programs and services such as OBF, OBR, DR, EV, time-of-use rates, and dynamic pricing.

SCE's nonresidential EE programs offer integrated energy management solutions through strategic energy planning support; technical support services, such as facility audits, and calculation and design assistance; and financial support through rebates, incentives, and financing options. Current sector offerings — several of which span across the Commercial, Industrial, and Agricultural sectors — are described in *Appendix E*. As previously mentioned, while these programs have experienced elements of success in engaging all customer types regardless of footprint, opportunities to improve products and services to fit more targeted needs still exist.

b. Strategic Initiatives

The Commercial, Industrial, and Agricultural sectors share similar intervention strategies and tactics. The intervention strategies applicable to the Agricultural sector are the following⁸⁴:

- Financing
- Customer Incentives
- Intelligent Outreach
- Midstream / Upstream Incentives
- Partnering
- Quality Assurance
- Single-Point of Contact
- Strategic Energy Management, and
- Sustainable Offerings.

Key new strategies and tactics under consideration by SCE are highlighted in Table 15. *Appendix H* contains a complete list of potential strategies, including continuation of existing ones, that SCE is considering. Each strategy and tactic has additional identifying data, such as:

- Expected timeline (short-, mid- and/or long-term);

⁸⁴ Detailed descriptions of these intervention strategies are included in the Portfolio Summary chapter.

- Sector focus (Commercial, Industrial and/or Agricultural);
- Customer size focus (Small, Mid-size and/or Large)
- Indication of new, existing, or modified activity
- Legislative, policy, or proceeding alignment, and
- Sector strategies alignment.

Table 15. Key Agricultural Sector Characteristics and Strategies

Key Sector Characteristics	Sample Strategies (by customer size, where applicable)
California produces about half of U.S. grown fruits, nuts, and vegetables, and its agricultural abundance includes more than 400 commodities. ⁸⁵	<p>Large: Given this sector diversity, target key products, and largest customers within those key products, for SCE offerings.</p> <p>SMB: Provide distributor-based programs that can reach broadly across these diverse customer segments.</p>
Billion-dollar commodities by value include milk and cream, almonds, grapes, and cattle/calves. ⁸⁶	Large: Adopt a "Whole Farm" approach to bundling energy efficiency education and programs into a broader suite of support programs (e.g., electricity, water, gas, soil quality, etc.) that customize energy efficiency best practices to each customer segment's unique needs.
Approximately 40% of energy used for farming is used to move water. ⁸⁷	Evolve pumping-related offerings to be cost-effective and cost-efficient will be key to maintaining this offering.
Energy accounts for less than 5% to 10% of total costs for many farms. ⁸⁸	<p>Engage with farmers' trusted partners (e.g., trade associations) to help bring energy efficiency to the forefront of customers' priorities.</p> <p>Bundle energy efficiency education and programs through a "Whole Farm" approach to help raise the importance of energy efficiency to farmers by integrating with other crop production concerns.</p>
Emerging markets (particularly Indoor Agriculture, including recreational cannabis) can dramatically increase the Agricultural sector's electricity usage. ⁸⁹	Monitor changes to state laws around legalizing recreational cannabis and leverage research on EE programs' best practices in reaching this new market.

As SCE engages with more third-party partners across its portfolio, SCE expects the strategies to evolve and grow.

⁸⁵ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

⁸⁶ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

⁸⁷ SCE Agricultural Segment Overview, 2012.

⁸⁸ SCE Agricultural Segment Overview, 2012.

⁸⁹ *As Pot Growing Expands, Electricity Demands Tax U.S. Grids*, Bloomberg, Dec. 2015.

3. Budget and Metrics

Table 16 shows SCE's planned budget for the Agricultural sector over the next 10 years.⁹⁰

Table 16. Agricultural Sector Budget 2018-2027

Sector	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Agricultural	TBD									

Table 17 (p. 57, below), provides the metrics for the Agricultural sector based on customer size. Metrics are intended to follow over time the effectiveness of programs to reach customers, engage them, and increase the depth of engagement.

4. Proposed Pilots

SCE's anticipated pilot activity for the Agricultural sector focuses on alignment with applicable Electric Program Investment Charge (EPIC) program initiatives, which will support investments in clean energy technologies that provide benefits to investor-owned electric utility partners. Table 18, following, indicates select EPIC initiatives in which SCE plans to participate with other industry partners. Additional information will be available after November 28, 2016, the EPIC grant application submission deadline.

Table 18. Summary of Proposed Pilots

Identifier ⁹¹	Title	Support
a.	Wastewater Treatment Recycled Water Pilot (EPIC grant application IMT-2016-0252)	AB 32, SB 7, SB350
b.	Innovative Control Strategies for Water Pumping and Food Processing Pilot (EPIC grant application IMT-2016-0251)	AB 32, SB 7, SB350
c.	Future Farm Water and Energy Optimization Pilot (EPIC grant application IMT-2016-0258)	AB 32, SB 7, SB350
d.	Water-related Demand Response and Load Shifting Pilot (EPIC grant application IMT-2016-0267)	AB 32, SB 7, SB350

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⁹⁰ TBD until energy savings goals are updated (see Sector Goals section for pending CPUC direction).

⁹¹ Corresponding pilot descriptions and milestones similar to information provided in Commercial and Industrial sectors will be provided in final Business Plan.

Table 17. Agricultural Sector Problem Statements, Market Barriers, Intervention Strategies, and Metrics

Energy Efficiency Business Plans: Sector Metric Table — Agricultural Sector								
Problem Statement / Barrier	Desired Outcome	Strategies (Sample)	Metrics	Baseline	Metric Source	Short Term Target	Mid Term Target	Long Term Targets
						(1-3 years)	(4-7 years)	(8-10+ years)
Dispositions and ISPs may be artificially limiting measure availability to select customer sizes	Better understanding of the market through development and use of a greater number of well-documented ISPs and Dispositions to allow wider range of offerings to customers	<ul style="list-style-type: none"> Develop more ISPs and Dispositions Apply ISPs based on size and composition of customer segments 	Number of new ISPs and Dispositions	N/A	EM&V & market research study tracking data	TBD	TBD	TBD
Customers have differing levels of financial resources available for energy efficiency opportunities	Increased use of OBF, OBR, and third party financing options.	<ul style="list-style-type: none"> Enhance participation in OBF, OBR, or third party financing (such as PACE) for small and mid-size agricultural customers 	Number of SCE small agricultural customers who participate in utility financing programs.			TBD	TBD	TBD
		<ul style="list-style-type: none"> Develop and provide resources for small and mid-size agricultural customers to navigate financing program process. 	Number of SCE mid-size agricultural customers who participate in utility financing programs.			TBD	TBD	TBD
		<ul style="list-style-type: none"> Promote OBR, OBF, and third party financing options to large agricultural customers, including PACE. 	Number of large agricultural SCE customers who participate in utility financing programs.	2015 Participation Levels	Program tracking data	TBD	TBD	TBD
		<ul style="list-style-type: none"> Offer financing instead of rebates or incentives with NMEC approach. 	Number of SCE customers who participate in non-utility financing programs	2017 Baseline Study (TBA)	Bi-annual process evaluations or market surveys	N/A Tracking only	N/A Tracking only	N/A Tracking only

Energy Efficiency Business Plans: Sector Metric Table — Agricultural Sector								
Problem Statement / Barrier	Desired Outcome	Strategies (Sample)	Metrics	Baseline	Metric Source	Short Term Target	Mid Term Target	Long Term Targets
						(1-3 years)	(4-7 years)	(8-10+ years)
Irrigation systems are a significant factor in pumping energy usage yet high-efficiency systems have ongoing barriers to adoption	Increased use of higher-efficiency irrigation systems	Offer customers a water / energy co-funded program that influences farms to transition to higher efficiency irrigation systems.	Milestones: <ul style="list-style-type: none"> Identify partnership opportunities to support grant funding applications Develop white papers to show comprehensive value for efficient irrigation systems, customized to crop type Design and test new offering Implement new offering Conduct early process evaluation and incorporate feedback 	N/A	Program tracking data	Milestones 1-5	Refine and expand program	Refine and expand program
Costly to develop one-to-one relationship with each farmer for EE education and services	SCE agricultural customers can refer to a trusted advisor for EE education and services	<ul style="list-style-type: none"> Transition towards marketing primarily through trusted trade associations and other distributors of information for Agricultural customers Align messaging with other priorities Coordinate with expertise in trade associations and other trusted Ag. partners on developing and promoting new measures and program design 	% of SCE agricultural customers who report they have a trusted advisor for EE education and services	2016 Baseline Study (TBD)	Annual Process Evaluations or Market surveys	TBD	TBD	TBD

IV. Common Business Plan Elements Across the Nonresidential Sectors

A. Key Partners to Meet Goals

SCE's success within this sector is dependent on a number of partnerships, including the following:

- **Regulatory and Legislative agencies:** Examples include the CPUC, CEC, and Federal and State governments.
- **Fellow administrators:** Entities that oversee EE programs, these have historically been key SCE partners in program development, implementation, and coordination. Select examples include PAs, RENs, CCAs, and other third party administrators. The role of administrators is expected to evolve in the years ahead as third party administrators play an increasing role in designing, developing, and implementing programs.
- **Advocacy Groups:** Parties that offer their perspective through formal participation in CPUC proceedings. These parties—which include NGOs, NPOs, PAs, RENs, and more—shape programs and guidelines around them. Most if not all intervenors participate in CAEECC along with formal proceeding events.
- **Trade partners:** Companies providing implementation and technical support for EE programs, or associations representative of industry participants. Some participate directly in EE proceedings and/or CAEECC to influence guidelines and programs, and others serve as key allies in broadening EE program scope within an industry without participation in proceedings or CAEECC.

Successful delivery of a diverse, cost-effective, and innovative portfolio that aligns with sector-specific goals and strategies depends on close coordination with the partners described above. The sections below touch on key areas of collaboration.

1. Statewide Administration

D.16-08-019 requires all PAs to include proposals in the upcoming Business Plans for statewide administration of upstream, midstream, and market transformation programs (along with piloting select downstream programs). At this time, the following programs related to the Commercial, Industrial, or Agricultural sectors have been identified for statewide administration:

- HVAC – up/midstream (SDG&E);
- Savings by Design (SCE);
- Financing: New Finance Offerings (PG&E).

For more details on guiding principles and roles and responsibilities associated with statewide administration, see the Statewide Administration of Programs section in the Portfolio chapter.

2. Third Party Administration

SCE plans to utilize a robust procurement strategy and process to meet or exceed the outsourcing requirements of D.16-08-019. The process will enable bidders to submit unique proposals across all sectors and key intervention strategies identified in SCE's Business Plan; however, bidders will also be encouraged to submit proposals for intervention strategies that have not been included in the Business Plan. The Procurement Strategy section of the Portfolio Sector chapter provides more details on SCE's general approach to procurement.

3. Cross-Cutting Coordination

SCE's Commercial Sector programs will continue close coordination with the following cross-cutting EE programs:

- ETP will continue to work with the sector on piloting and testing the next generation of EE technology.
- C&S will work with the sector to promote reach codes and to provide code compliance training and code impact analysis, while driving the sector towards Zero Net Energy goals.
- WE&T will help the sector expand the reach of trainings on the value of energy efficiency, on building codes, and on EE-related technical skills.

a. Emerging Technology Program (ETP)

Advanced, integrated solutions with traditional, standalone measures is a critical long-term ETP focus for reaching the largest possible set of Commercial customers. To successfully execute this dual approach, ETP will work upstream with product developers to integrate energy-saving attributes in the product design phase, motivate technology developers to build integrated solutions, and build on existing partnerships with the EPIC and PIER programs.

In terms of integrated solutions support, ETP plans to support emerging AB 802-related opportunities in the nonresidential sectors around the convergence of new data streams, connected building systems, and advanced control strategies with meter-based measurement and verification protocols. To help facilitate adoption of new integrated solutions, ETP is investigating advanced meter-based verification approaches, which directly measure energy savings of facility upgrades (traditional methods typically can typically only offer an estimate based on field or laboratory testing). Thus, a meter-based approach offers utilities and commercial customers a more accurate picture of energy savings — particularly with complex, integrated systems — while also identifying unexpected performance issues.

To support development of single-technology measures, ETP plans to continue to help advance IDSM initiatives, including DR-dispatchable batteries in buildings or fleets of electric vehicles. Though these types of technologies are in their infancy, ETP is contributing to utility efforts to

ensure a stable market evolution comes about in a way that both benefits customers and leads to a more flexible, energy-efficient grid.

The dedicated ETP chapter contains further detail and strategies for the program area.

b. Codes & Standards

For this sector, the C&S program actively supports the CLTEESP goal of delivering ZNE new commercial buildings by 2030. To that end, the C&S program's role is supporting the CEC in developing a succession of Title 24 building energy standards that have a goal of requiring all new commercial buildings to be designed and built as ZNE buildings by 2030.

The C&S program's compliance improvement activities support the purchase and installation of HVAC systems, water-heating equipment, and plug loads so that they are installed in conformance with Title 24 and Title 20 standards. This is accomplished by supporting the CEC, building departments, distributors, dealers, and installing contractors to better understand applicable requirements.

The C&S program advocates for cost-effective higher efficiency plug loads (including computers, multi-faceted reflector lamps, battery chargers, etc.) and various cost-effective higher efficiency agricultural equipment (including motors, pumps, heating, cooling, refrigeration equipment, battery chargers, etc.) that save energy for all agricultural customers. The C&S program provides this advocacy to both the CEC (Title 20 regulations) as well as the US DOE to support their rulemaking process by providing technical, economic, market, and performance data to justify higher efficiency levels than what would otherwise occur.

These ongoing long-term efforts are expected to continue in close conjunction with the Nonresidential sector evolution in the years ahead. The dedicated C&S chapter contains further detail and strategies for the program area.

c. WE&T

Key relevant WE&T initiatives in support of the Commercial, Industrial, and Agricultural sectors include enhanced training for evolving HVAC and Pump Services offerings; AB 802 implementation capability; and strategic energy management assistance. Existing HVAC and pump-focused classes will require new modules due to shifting program elements potentially tied to meter-based savings. To-code savings opportunities identified in D.16-08-019 require both new training for newly eligible activities, plus classwork on meter-based savings measurement. SEM's tie-in to long-term education of customers is also anticipated to result in leveraging of WE&T coursework and facilities. Finally, as SCE transitions downstream offerings to midstream, a focus on educating distributors through new and existing coursework about energy efficiency equipment is expected.

SCE is committed to developing new WE&T needs for its nonresidential sectors with cost considerations in mind. To support this approach, SCE expects to partner where possible our training needs with already established training facilities, trade organizations and associations, and colleges and universities. Training initiatives would also be informed in the future by random inspection and verification of installation and/or quality installations, and relevant ongoing support of Building Owner Certification Training (BOC) where relevant to continue to emphasize product and installation importance.

The dedicated WE&T chapter contains further detail and strategies for the program area.

4. Coordination with Associated DSM Activities

SCE expects to offer additional steps or details on this section after further internal research is completed.

a. Demand Response

In the Nonresidential sectors, SCE will provide ongoing support for customers to participate in select DR programs. As indicated by the 2015 California DR potential study, the State of California will continue to rely on residential and nonresidential program intervention as a part of resources. Key relevant DR end-uses for this sector would be HVAC, lighting, and refrigerated warehouses. SCE currently offers a full range of DR program interventions to nonresidential customers and will continue to do so to support California energy resource and environmental requirements.

For the future, SCE is also monitoring several technology advancements with DR applications to improve cost, performance and propensity of DR adoptions. These include rapid scale-up of renewable generation opportunities, advancing energy storage technologies, and evolving information technology capabilities. SCE expects future Commercial sector DR opportunities to emerge from developments in these or similar areas.

SCE's procurement strategy will include encouragement of offerings that integrate DR and other technologies with EE.

b. Rate Proceedings⁹²

Many changes are currently taking place in the rate proceedings, especially for migration to Time-of-Use. Energy efficiency offerings will:

- Help reduce load during peak periods, and
- Provide customers with information and tools on their usage and how best to manage their activities in light of anticipated rate profile changes.

⁹² For this section, SCE has provided descriptive text and is continuing to identify and describe sector impacts for its final draft.

c. Marketing, Education and Outreach

While statewide Marketing Education and Outreach Program (ME&O) will continue to provide umbrella marketing and mass media support, the SCE commercial program will support sector-specific marketing initiatives to support local needs. This may include the following activities:

- For LFCs, specific EE marketing and education materials covering the suite of offerings and program requirements.
- For MFCs and SFCs, enhanced website to build awareness of midstream offerings.
- For participating distributors, appropriate marketing materials to promote EE or related DSM benefits to educate sales staff.
- For WE&T-related items, promotions of classes to improve knowledge and skills.
- EE services and benefits promotion in appropriate trade association publications.
- If the proposed Customer Care package and communication pilot is successful, then repeat usage on an annual basis for customer engagement will also be considered.

d. Alternative Fueled Vehicles, Energy Storage, Low Income, Energy Assistance Programs, and Other Proceedings

Not applicable.

B. M&V Anticipated Needs & Internal Performance Analysis

SCE expects a number of study and internal customer data analysis needs to support its Nonresidential sector plans. Among the needs, listed in order of priority, are the following:

- Data segmentation to update new definitions of Public and non-residential sectors, and to support nonresidential customer footprint service model.
- Given expected changes around AB 802 implementation and other drivers, periodic updates to relevant market characterization studies are needed.
- Another priority consideration should be one or more process evaluations related to the segmented delivery approach SCE is planning to implement. Because this segmentation approach, with new emphasis on working with distributors, is new, a nonresidential study for nonresidential distribution channels and touch-points would be important.
- For any pilots implemented in the future, related implementation actions will require early feedback and M&V evaluations.
- SCE also welcomes an updated commercial saturation survey study.

The items identified above have yet to be balanced against budget allocation or other additional statewide priorities. These items and future sector needs will be incorporated into the M&E roadmap process. SCE will also explore the funding of appropriate activity through program budgets where sensible.

Appendix A: Market Barrier Definitions

Market barriers outlined and defined in Eto, Prahel and Schlegel's scoping study on *Energy Efficiency Market Transformation by California Utility DSM Programs*.⁹³ The definitions are used when analyzing the barriers affecting the nonresidential sector energy efficiency. More detailed definitions can be found in the published paper; however, below are the following definitions which have been modified for clarity and brevity.

- **Information or search costs:** The costs of identifying energy-efficient products or services or of learning about energy-efficient practices.
- **Performance uncertainties:** The difficulties consumers face in evaluating the claims about future benefits made for many EE-related investments and activities. Building level usage data and ongoing monitoring can assist with evaluating these claims and verifying savings.
- **Hassle or transaction costs:** The indirect costs of acquiring energy efficiency, including the time, materials, and labor involved in obtaining or contracting for an energy-efficient product or service. These costs are particularly high in the public sector because of the lengthy approval process.
- **Access to financing:** The difficulties associated with the lending industry's historic inability to account for the unique features of loans for EE projects, reflecting lenders' uncertainty about the reliability of future savings. Generally, public sector customers are limited to certain types of financing, and even when allowed to access more options, the approval process is considerably more complicated than for commercial customers.
- **Organizational practices or customs:** Organizational behavior or systems of practice that discourage or inhibit cost-effective energy efficiency decisions. The public sector is by nature risk-averse. Changes to practices or customs can take a long time.
- **Misplaced or split incentives:** The incentives of an agent charged with purchasing energy efficiency that are not aligned with those of the persons who would benefit from the purchase. This is particularly true in the public sector, where building maintenance and capital projects departments often do not receive the benefits of lower energy costs.
- **Product or service unavailability:** A market barrier created by product manufacturers and distributors and/or service providers that inhibits consumer demand and may result in higher prices reflecting the fact that supplies are limited.

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⁹³ Eto, Prahel, Schlegel, "A Scoping Study on Energy-Efficiency Market Transformation by California Utility DSM Programs," The California Demand-Side Measurement Advisory Committee, July 1996.

Appendix B: Sector Studies: Lessons Learned Report Summary

Sector Applicability <i>(C = Commercial; I = Industrial; A = Agricultural)</i>	Study Name	Lessons Learned & Fit with Strategy
C	Statewide Benchmarking Process Evaluation NMR Group Inc 4/12/2012 CPU0055.02	<p>It is clear the implementation of California benchmarking goal can be challenging. There is a long list of implementation and market barriers for this activity as outlined above.</p> <p>There is another impediment to this program to date. The California IOUs have not been able to claim energy savings from Benchmarking program results to date. As indicated by this study, many workshop participants cited the information for Building Score and EUI really modified their energy usage behavior. The study consultants indicated the fact that it should be possible to measure energy savings from the benchmarking program intervention.</p>
C, I, A	Impact Evaluation of 2013-14 Commercial Quality Maintenance Program (HVAC3) DNV GL 4/1/2016 CPU0117.01	<p>As a result of a previous study and the 2013 HVAC disposition, SCE is transitioning from an aggregated-approach to its QM offerings, with SCE measures consolidated into 4 measures, to PG&E's individual measure approach with over 40 measures, tracking individual treatment by equipment type. The ED preferred the individual treatment WP approach and this is the reason for SCE adopting the PG&E disaggregated WP approach, even though this current study has showed that the aggregated approach has a higher realization rate (82% vs 43%-56% for the other IOUs)</p> <p>Generally, SCE continues to review barriers outlined by participating contractors, customers, and the CPUC and to evaluate opportunities to improve the cost-effectiveness of the program. SCE has (a) streamlined the program's incentive processing for customers by reducing hands-off and touch points, (b) reduced third-party software support issues, (c) held stakeholder forums with all stakeholders to obtain input into the assessment process, (d) in 2016, SCE planned and aligned administrative program improvements,</p> <p>Data Collection: Program manager continues to align implementers' data on the installed measures, with the standardized savings claims database submitted to the CPUC.</p> <p>Workpaper: SCE recently overhauled its CQM Work paper for CPUC approval to claim energy savings by individual treatment performed vs a weighted expected savings per unit. This will result in more accurate energy savings claimed and TRC improvement. SCE is also working on improving the link between claimed savings and the implementer data because this could be contributing to some low realization rates.</p> <p>Changes to programs, measures, and the evaluation of impacts present challenges to assessing and tracking program performance, and as a result, SCE continues to maintain on-going documentation of CQM program improvements. This enhances the evaluability of the program.</p>

Sector Applicability <i>(C = Commercial; I = Industrial; A = Agricultural)</i>	Study Name	Lessons Learned & Fit with Strategy
C, I, A	Impact Evaluation of 2013-14 Upstream HVAC Programs (HVAC1) DNVGL 4/1/2016 CPU0116.01	Explored market opportunities to adjust and enhance performance tiers for all categories affected by 2015 Federal code updates Actively promote the program to build on contractor, distributor and manufacturer participation and engage those who have not yet participated, to increase distributor participation and increase growth in overall program participation Continues to promote new technologies and/or related equipment categories, such as package equipment that meets or exceed the U.S. DOE "RTU Challenge," variable refrigerant flow equipment, ductless equipment, air-cooled chillers and water-cooled chillers.
C, I, A	2013 Custom Impact Evaluation Industrial, Agriculture and Large Commercial Itron Inc. 7/17/2015 CPU0107.01	This study found SCE's Custom Calculated Program to have a lifecycle gross realization rate of 0.52 and a weighted Net-To-Gross (NTG) of 0.57. To improve on these results, while improving program cost-effectiveness, the nonresidential Custom Calculated Program must improve on program's process and procedure. As indicated in the summary, proper baseline specification and more accurate reporting of operating conditions can improve program's gross realization rate. To improve on program NTG, the program must improve on its targeting and customer measure recommendation to focus on attributable actions due to program intervention.
C, I, A	Evaluation of the Southern California Edison Commercial Midstream LED Lighting Distributor Pilot Program Evergreen Economics 5/13/2015 SCE0376.01	As a result of this study, SCE scaled its Lighting Distributor Program as a midstream offering. This program has been very successful to date. It is important to note that this midstream distributor program is designed to serve commercial and other nonresidential customers. With the success of this Lighting Distributor Program and the pressing need to improve program cost-effectiveness, in 2017, the nonresidential programs are proposing to expand its mid-stream offering to cover additional lighting measures and adding other technologies that lend themselves to capturing savings through distributor/dealer/wholesaler; like food service and potentially controls.
C, I, A	Nonresidential Downstream Lighting Impact Evaluation Report Itron Inc. 8/26/2014 CPU0078.01	It is clear that the IOUs could improve program process and procedure to improve program's gross realization rate. The importance of lighting measures in the IOUs nonresidential program portfolio will continue to be important, however, much of the energy savings have diminished due to workpaper and Codes and Standards updates. For Large Footprint Customers, this short list of customers is likely to continue to receive downstream lighting incentives and services, allowed by Codes. For all other customers, these above-code lighting measures will be delivered via the Distributor Channel to provide broader customer reach and more cost-effective delivery.

Sector Applicability <i>(C = Commercial; I = Industrial; A = Agricultural)</i>	Study Name	Lessons Learned & Fit with Strategy
C, I, A	California Nonresidential Program Assessment Study – IOU Core Calculated Program Group Report Itron, ERS 12/24/2012 CPU0103.01	SCE has continued to (a) offer comprehensive bonus opportunity to encourage the development of projects with deeper energy savings and demonstrated DSM activities, (b) has integrated retro-commissioning into the Custom Retrofit Offering, which eliminated the need for a separate retro-commissioning program, (c) and implemented a requirement for project narratives for all large Customized Retrofit projects to demonstrate program influence on all project submissions, increase project quality, reduce cycle time for CPUC ED reviews and decrease the number of declined projects, (d) and Implemented a \$2,200 minimum incentive project submission threshold to increase program cost-effectiveness.
C, I, A	2013 Custom Impact Evaluation Industrial, Agriculture and Large Commercial, by Itron July 17, 2015 CPU0107.01	Key study findings include: <ul style="list-style-type: none"> • A life-cycle gross realization rate of 0.52 and a weighted Net-To-Gross (NTG) of 0.57. • To improve on these results, while improving program cost effectiveness, the non-residential Custom Calculated Program must improve on program's process and procedure. • Proper baseline specification and more accurate reporting of operating conditions can improve program's gross realization rate. • Better targeting and customer measure recommendation to focus on attributable actions due to program intervention would help improve NTG. This may include not engaging on replacing burn-out measures, encouraging the customers to opt for above-code equipment for upgrades. SCE plans on a number of process and procedure improvements to support above as part of its sector strategies.
C, I, A	Nonresidential Downstream Lighting Impact Evaluation Report By Itron, 8/26/2014 CPU0078.01	Key study findings include: <ul style="list-style-type: none"> • IOUs could improve program process and procedure to improve program's gross realization rate. SCE expects that, in the future, larger customers will continue to receive customized downstream lighting incentives and services, allowed by Codes. Other customers will receive these types of measures via distributor channels to broaden customer reach and provide more cost-effective delivery.

Sector Applicability <i>(C = Commercial; I = Industrial; A = Agricultural)</i>	Study Name	Lessons Learned & Fit with Strategy
C, I, A	Evaluation of the Southern California Edison Commercial Midstream LED Lighting Distributor Pilot Program, By Evergreen Econ 5/13/2015 SCE0376.01	<ul style="list-style-type: none"> • SCE scaled its Lighting Distributor Program into a midstream program intended for non-residential customers through assistance provided by this study and its findings. • SCE plans to expand midstream offerings to cover lighting, HVAC, and other motors/pumps related measures and applications.
C, I, A	California Nonresidential Program Assessment Study – IOU Core Calculated Program Group Report By Itron/ERS 12/24/2012 CPU0103.01	<p>In partial response to this study's findings, SCE has</p> <ul style="list-style-type: none"> • Continued to offer its comprehensive bonus opportunity to encourage the development of projects with deeper energy savings and demonstrated DSM activities; • Integrated retro-commissioning activity into the Customer Retrofit Offering, which eliminated the need for a separate retro-commissioning program; • Implemented a requirement for project narratives for all large customized retrofit projects to demonstrate program influence, increase project quality, reduce cycle time for CPUC reviews, and decrease the number of declined projects; and • Implemented a \$2,200 minimum incentive project threshold to increase program cost-effectiveness.
C, I, A	Measure, Application, Segment, Industry (MASI): Motors Baseline and Opportunities in the Industrial, Food Processing, and Agricultural Sectors, and Early Motor Retirement in Refineries, By Navigant Consulting & ASW Engineering 2/27/2015 SCE0377.02	<p>Key study findings include the following:</p> <ul style="list-style-type: none"> • Each customer segment's motor/pump applications and energy efficiency level may vary based on their business focus; • For some of these customers, energy efficiency is not a priority. For others, such as refineries, maximizing production would take a priority over energy efficiency upgrades. • A mandatory short pay-back requirement (i.e., less than two years) is another difficult barrier to overcome. <p>SCE plans to respond to these challenging findings by varying its available services based on customer size. Larger energy users would have a range of services available to them. Smaller and mid-size customers would largely be limited to midstream services via distributors.</p>

Sector Applicability <i>(C = Commercial; I = Industrial; A = Agricultural)</i>	Study Name	Lessons Learned & Fit with Strategy
I, A	<p align="center"> Measure, Application, Segment, Industry (MASI): New Opportunities for Oil and Gas Extraction and Produced Water Management and Recycling By Navigant Consulting & ASW Engineering 3/31/2015 SCE0377.07 </p>	<p>Key study findings include:</p> <ul style="list-style-type: none"> Major and minor oil producers do not behave the same and industry practice is not common to all. It is a good idea to tailor the program offering based on the size of the customer in this segment. <p>These recommendations are consistent with SCE's planned approach to delivering services in the Industrial sector. SCE aims to offer custom-tailored direct services to major producers. For smaller producers, SCE will leverage a distributor-based program delivery approach focused on focus on lighting, HVAC and pump/motor measures.</p> <p>A study to investigate ISP gaps between the large and smaller producers may be required in the future as well.</p>
I	<p align="center"> Measure, Application, Segment, Industry (MASI): Food Processing Industry By Navigant Consulting & ASW Engineering 3/31/2016 SCE0377.06 </p>	<p>Key study findings include:</p> <ul style="list-style-type: none"> Metrics besides account size (kW, kWh) should be considered to better evaluate industrial food processing customers. Identifying energy intensity for key industrial sectors could be needed as part of benchmarking information collected. Critical factors that drive energy usage may be more about volume of production than site-specific energy efficiency. <p>A key list of measures and services to support industrial customers was also identified that informs SCE's future approach in this sector. Besides the need for SEM, energy audits, energy management tools, and improved training for non-energy staff, water awareness and recycling opportunities were also identified. Industrial segments that are both energy and water intense include cheese manufacturing, fruits/vegetables processing and canning, and wineries.</p>
A	<p align="center"> SDG&E Cannabis Agriculture Energy Demand Study by Evergreen Econ July 17, 2016 SDG0301.01 </p>	<p>Key study findings include:</p> <ul style="list-style-type: none"> Almost all utilities in regions with legal recreational cannabis growth reported an increase in energy demand due to increases in growing operations. Electricity costs comprise between 20 and 50 percent of growers' operational costs. Lighting is the biggest source of energy consumption, particularly in indoor and greenhouse operations. While some cannabis growers have chosen to install LEDs, a preference for T5s remains due to the belief of many growers that crop yield with LEDs is lower, and upfront cost for LEDs is prohibitory given the numerous start-up costs for new facilities. The benefits of indoor growing are at the expense of increased energy usage compared to greenhouse and outdoor growing. <p>SCE plans to explore future strategies targeting this potentially emerging marketplace in its territory.</p>

Sector Applicability <i>(C = Commercial; I = Industrial; A = Agricultural)</i>	Study Name	Lessons Learned & Fit with Strategy
<p style="text-align: center;">A</p>	<p style="text-align: center;">Measure, Application, Segment, Industry (MASI): Agriculture</p> <p style="text-align: center;">by Navigant 3/31/2015 SCE0377.03</p>	<p>Key study findings for greenhouse and irrigated agriculture market segments include:</p> <ul style="list-style-type: none"> • While growers consider water and energy efficiency to an extent, their primary concern is the health and yield of their crops. • Growers will select equipment based on the needs of the crop that they are growing. This may mean that growers will forego systems that are more efficient because the crop requires more water to grow. • The source of an operation's irrigation water can also play a large role in growers' equipment decisions, particularly in irrigated agriculture operations. <p>SCE plans to explore future strategies targeting combined water and energy savings that would look to leverage findings from this study.</p>
<p style="text-align: center;">A</p>	<p style="text-align: center;">SDG&E Agricultural Sector Market Study</p> <p style="text-align: center;">by Evergreen Econ 3/26/2015 SDG0292.01</p>	<p>Key study findings include:</p> <ul style="list-style-type: none"> • Customers are interested in saving water and in water-related measures. • Barriers to participation reported by customers included lack of awareness and information. • About half of customers reported that the rebate amounts are too low, and most of the remainder report that the amounts are just right. • Additional measures that save energy in this sector that may be worth considering. • Updating the terminology used to describe energy efficiency measures for this sector. <p>SCE plans to explore incorporating findings from this study into current or future strategies.</p>

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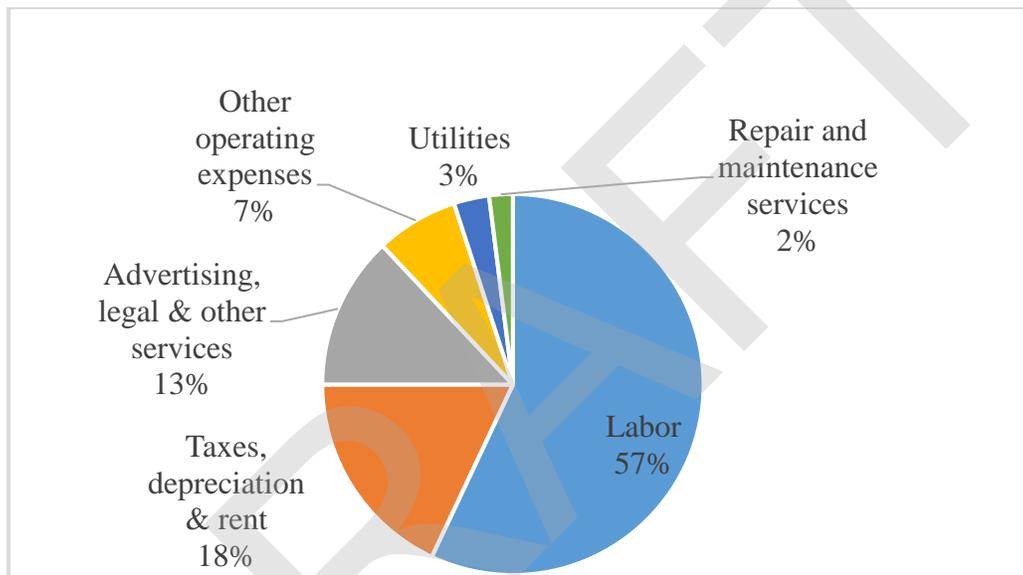
Appendix C: Commercial Key Customer Segment Trends and Electricity Usage Facts

Below is information on the top three Commercial customer segments by electricity usage:

1. Retail Key Trends and Electricity Usage Facts ⁹⁴

- Retail customers' utilities are ~3% of their total costs, resulting in energy efficiency having a low impact on their bottom line and making it more difficult to get these customers engaged.⁹⁵ Please see Figure 30, Retail Operating Expenses by End-Use, below.

Figure 30. Retail Operating Expenses by End-Use



- In the U.S., more than 95 percent of all retailers have only one store and nearly 90 percent have fewer than 20 employees.⁹⁶
- Online retail sales trends are increasing customer base without increasing facility costs.⁹⁷
- Midsize retailers have significant energy costs but might not have the personnel to manage them.⁹⁸
- As one industry observer put it, "Most retailers say they want to be green, but being green must first be cost-justifiable."⁹⁹

⁹⁴ Retail Sector Snapshot, Esource, 2012.

⁹⁵ Ibid.

⁹⁶ Ibid.

⁹⁷ Ibid.

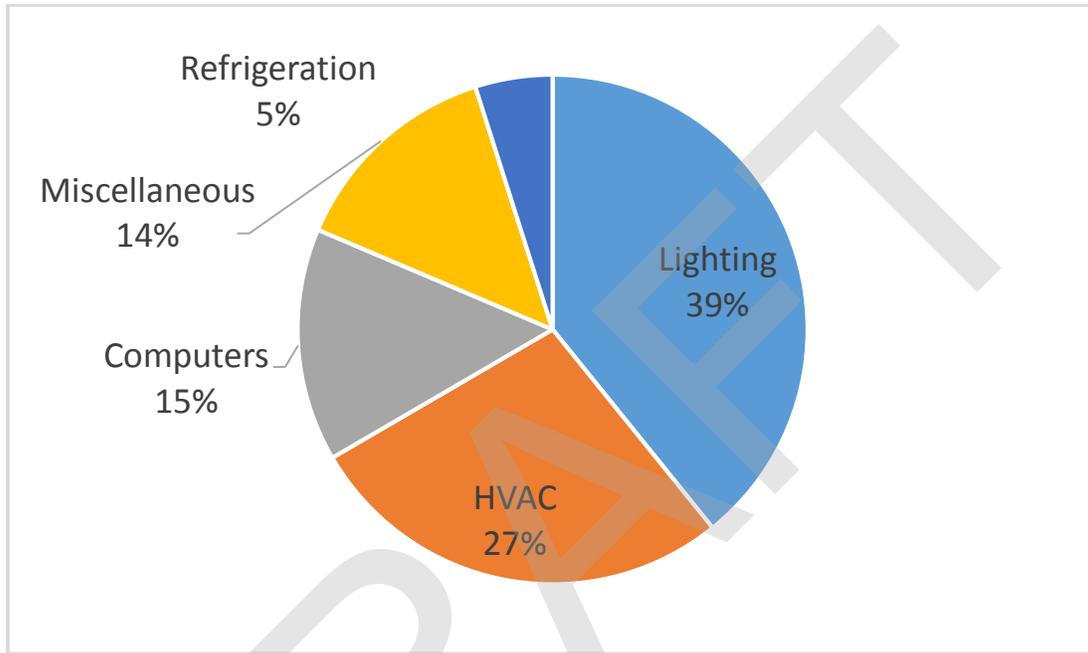
⁹⁸ Ibid.

⁹⁹ Ibid.

2. Office Key Trends and Electricity Usage Facts¹⁰⁰

- The top 80% of office electricity usage is Lighting, HVAC and Computers. This is why SCE is focusing on a wide variety of downstream and midstream Lighting and HVAC programs, with future midstream work on Office Equipment-related technologies to be developed. See Figure 31, Office Energy Usage by End Use below.

Figure 31. Office Energy Usage by End Use



- Offices represent 19 percent of all commercial floor space and more than 17 percent of commercial buildings.¹⁰¹
- The utility bill is often the largest operating expense for office spaces in the U.S. (~30%, includes natural gas and other).¹⁰²
- The top 50 property management firms control nearly half of U.S. commercial office lease space, but they are not the end users of energy in office buildings, as the tenants are, nor are they the beneficiary of capital improvements, as the owners are.¹⁰³

¹⁰⁰ Office Sector Snapshot, Esource, 2011.

¹⁰¹ Ibid.

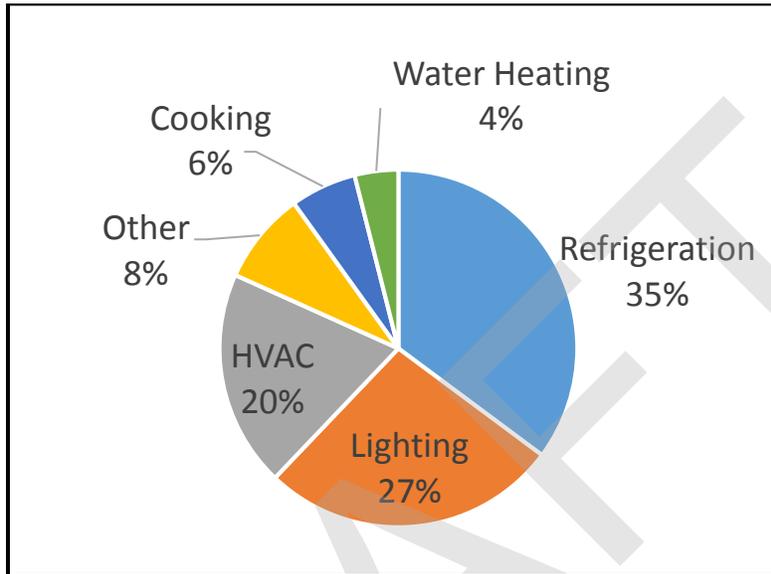
¹⁰² Ibid.

¹⁰³ Ibid.

3. Restaurants Key Trends and Electricity Usage Facts¹⁰⁴

- Top 80% of restaurant's electricity usage is Refrigeration, Lighting and HVAC. This is why SCE is focusing on a wide variety of downstream and midstream Refrigeration, Lighting and HVAC programs.¹⁰⁵

Figure 32. Restaurant Electricity Usage by End Use



- The average profit margin is 4 to 6 percent for U.S. restaurants.¹⁰⁶
- Utility expenditures account for 9 percent of operating expenses (food costs not included in operating expenses).¹⁰⁷
- For 43% of restaurant operators, energy efficiency is an important consideration for the next equipment purchase.¹⁰⁸
- However, EE does not rank among the top five factors influencing food service operators' equipment purchases, which are price; perceived quality; ability of the equipment to increase productivity; operator's experience with the manufacturer; and operator's experience with the dealer.¹⁰⁹

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¹⁰⁴ Restaurants Sector Snapshot, Esource, 2012.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

Appendix D: Nonresidential Customer Energy Intensity Metric:

SCE recognizes that another metric for describing and prioritizing nonresidential customers' electricity consumption that is more customer-centric than customer's electricity usage (peak kW or annual kWh) is the customer's energy intensity. Energy intensity is their electricity usage (kW and/or kWh) normalized by a meaningful metric to that segment (such as per product sold, per square footage, etc.).

However, defining a segment-specific metric where data is **available** — avoids disclosing confidential information that could create competitive advantages and procuring research that is costly relative to the expected energy savings opportunity — and **standardized** — the industry agrees that this is a useful metric over other metrics — is to be determined. This is expected to be a multi-year issue to be developed in coordination with regulators, industry and researchers.

The Commercial sector is fortunate (relative to the Industrial and Agricultural sectors) that sector-wide electricity characterization studies have been completed recently. An update to the 2006 CA Commercial End Use Survey, the CA Commercial Saturation Survey Report (CSS, August 2014), provided an assessment of commercial energy intensity, choosing kWh/square footage as the normalized metric. However, the study's customer size definitions were based on kWh usage and don't line up with:

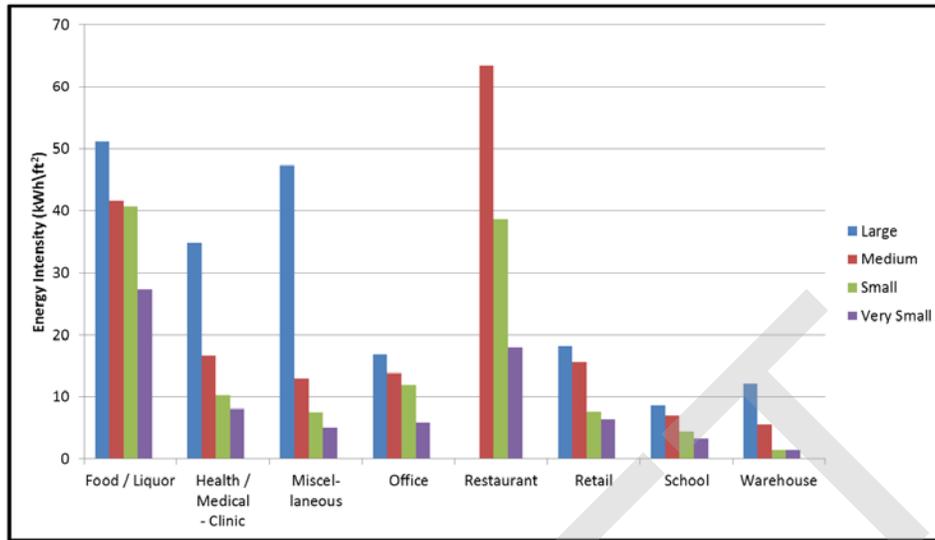
- This Business Plan's categorization of customer size by peak kW, and
- The Business Plan sector definitions between the Commercial and Public sectors. (E.g., the Public sector now encompasses private schools).

These metrics would need to be aligned going forward in order to leverage this data to better understand SCE's customers' electricity usage and support targeted marketing and programs.

See Figure 33, Average Energy Intensities by Business Type and Size, below, for the CSS's assessment of CA's commercial customer segment's energy intensities.

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Figure 33. Average Energy Intensities by Business Type and Size¹¹⁰



* The results presented above have been weighted by site weight.

SCE would like to evaluate using energy intensity in the future to track effectiveness of program change over time. For example, business types with substantial declines in average whole business energy intensity (EI) from the CEUS (2006) to the CSS (2014) include Offices, Retail, Schools and Warehouses.¹¹¹

Table 19: Mean Energy Intensities by CSS and CA CEUS Building Types, below, shows the average change in EI between the CEUS and the CSS:

- The EI for Offices has fallen from 16.1 kWh/ft² in the CEUS to 13.2 to 13.4 kWh/ft² in the CSS, and
- Retail has fallen from 14.1 kWh/ft² to 11.2 to 11.0 kWh/ft².¹¹²

¹¹⁰ California Commercial Saturation Survey Report, Itron, August 2014.

¹¹¹ The business type definitions between the CSS and CEUS are not exactly the same. The CEUS sample design was based on SIC codes. The CSS sample design was based on NAICS codes. Both studies include appendices with a business type to NAICS/SIC code mapping. Additional information on business type differences is provided in Sections 2 and 4. For example, the CSS Food / Liquor business type includes Grocery stores and the CEUS Grocery category includes businesses that would be characterized as Food / Liquor, but while these two business types are largely comparable they do not overlap 100%.

¹¹² California Commercial Saturation Survey Report, Itron, August 2014.

Table 19. Mean Energy Intensities by CSS and CA CEUS Building Types¹¹³

CSS Business Type	Mean Energy Intensity from CSS, Site Weighted	Mean Energy Intensity from CSS, kWh Weighted	CA CEUS Business Type	Mean Energy Intensity from CA CEUS, kWh Weighted	Change in EI from CEUS to CSS
Food/Liquor	43.4	43.4	Grocery	41.0	6%
Miscellaneous	10.5	9.8	Miscellaneous	9.8	7% to 0%
Office	13.2	13.4	Office ⁹	16.1	-16.8% to -18%
Restaurant	40.9	39.1	Restaurant	40.2	-3% to 2%
Retail	11.0	11.2	Retail	14.1	-21% to -22%
School	6.1	6.1	School	7.5	-19%
Warehouse	3.1	3.4	All Warehouse	6.7	-49% to -54%

* The CSS results are presented both weighted by site weight and kWh. The CA CEUS results are kWh weighted. The right most column shows the percentage change in EI between the CEUS and the CSS where a negative number represents a decrease in EI and a positive represents an increase.

The substantial decline in whole building EI for Offices, Retail, Schools and Warehouses is likely due in part to their substantial improvement in lighting efficiency combined with the importance of the lighting end-use within these business types.¹¹⁴ This requires further detail to see utility attribution towards this drop, but those three customer segments have been top priorities for SCE’s EE programs based on size and amount of customers for commercial programs for many years.

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¹¹³ Ibid.

¹¹⁴ Ibid.

Appendix E: Existing Programs and Services

Program Name	Applicable Sector	Program Description
Energy Advisor Services (EAS)	C, I, A	EAS brings together under one program all audit services offered to support customer education and participation in energy efficiency, demand response, and self-generation energy-reducing opportunities and benefits, along with awareness of greenhouse gas and water conservation activities. These services include benchmarking, an online energy audit tool, nonresidential site audits, pump efficiency services, retro-commissioning (RCx), and coordination with the Continuous Energy Improvement program (below).
Calculated	C, I, A	The Calculated program offering provides standardized incentives for customized and integrated EE/DR projects for retrofit and RCx projects while also providing technical and design assistance. Customized calculation methods that can consider system and resource interactions, it will be the preferred approach for supporting the integrated, whole system, and multi-resource management strategies of the Strategic Plan and concurrently overcome technical and financial barriers. Calculated savings for the Savings by Design Program are achieved through the agricultural new construction component
Deemed	C, I, A	The Deemed Incentives program offering provides IOU representatives, equipment vendors, and customers an easy-to-use mechanism to cost-effectively subsidize and encourage adoption of mass-market efficiency measures through fixed incentive amounts per unit or measure.
Continuous Energy Improvement (CEI)	C, I, A	CEI is a consultative service that targets long-term and strategic energy planning. CEI is designed to reintroduce the importance of energy management by transforming the market and to help reduce energy intensity through a comprehensive energy management approach including IOU and non-IOU products and services customized to fit different customer profiles. CEI will address technical and management opportunities for agricultural customers while creating sustainable practices through a high-level energy commitment from executive and board-level management.
Nonresidential HVAC	C, I, A	The Nonresidential HVAC program delivers a comprehensive set of upstream, quality installation, and quality maintenance strategies built around education, marketing efforts, and leveraged relationships within the HVAC industry geared to transform the market towards a sustainable, quality driven market.
Direct Install	C (Third Party)	The Commercial Direct Install Program provides small business customers that have a small peak demand the opportunity to have a third-party contractor retrofit existing systems to energy efficient systems at no cost to the customer.
Data Center EE	C (Third Party)	The Data Center Energy Efficiency program provides a comprehensive solution for the growing needs of data centers. It will provide a wide range of energy saving activities to data centers including HVAC/mechanical, controls, and lighting load reduction. The program uses a combination of traditional technologies combined with emerging technologies to offer comprehensive solutions. The program takes a holistic approach towards influencing behavior in data center

Program Name	Applicable Sector	Program Description
		management, including establishing industry metrics for data center energy intensity, creating tools and guidelines to drive continuous improvement, supporting third party certification processes, and providing recognition for data centers to achieve a high level of energy savings and demand reduction.
Healthcare EE	C (Third Party)	The Healthcare EE Program targets existing private medical facilities, including hospitals, acute care facilities, medical office buildings, service buildings, and central plants. The program encompasses energy efficiency opportunities with the following design features: comprehensive energy audits covering all key end-uses and measures for energy efficiency, technical assistance including support for measures specification, procurement, and project management, retro-commissioning for large-space conditioning systems, post-installation inspection to verify performance, workforce training and education of facility staff, incentives coordination SCE's other programs, and customer satisfaction surveys and resolution. Note: Public medical facilities are now served under the Public sector.
Lodging EE	C (Third Party)	The Lodging EE program (LEEP) is a comprehensive EE retrofit program that delivers multi-measure IDSM retrofits and RCx to small, medium, and large lodging facilities. Target facilities include existing hotels and motels as well as spas and resorts, especially those with central plants and in-house laundry service.
Commercial Utility Building Efficiency	C (Third Party)	The Commercial Utility Building Efficiency (CUBE) program is a multi-source cooperative approach designed to pinpoint privately owned commercial office and retail buildings for an equipment-incentive-centric plan enabling a consultant to introduce EE and DR measures as well as RCx. These measures traditionally have a low degree of penetration in commercial office and retail buildings. CUBE provides comprehensive energy audits and financial projections, and the internal and external funding sources of the Energy Services Company ("ESCO") model, to a market where lack of capital has traditionally been a significant barrier to the upgrading of capital equipment. This allows for extended repayment periods, positive cash flows, and low or no net up-front cost.
Enhanced Retro-commissioning	C (Third Party)	The Enhanced Retro Commissioning Program helps facilities realize both short-term and long-term energy savings through an innovative approach leveraging technology applications such as whole-building meter data analysis, while reducing the amount of time conducting on-site audits to find potential EE projects.
Comprehensive Chemical Products	I (Third Party)	The Comprehensive Chemical Products program addresses industrial customers in the chemical processing industry, and offers a wide full range of energy efficiency opportunities from low-cost improvements to entire system upgrades to participants. The program is centered on a comprehensive approach to energy savings and permanent demand reduction.
Comprehensive Petroleum Refining	I (Third Party)	The Comprehensive Petroleum Refining program targets all the major petroleum refineries in SCE's service territory to produce long-term, cost-effective electrical energy savings. The program achieves this goal by implementing a comprehensive set of calculated and deemed

Program Name	Applicable Sector	Program Description
		approaches to address every major electric operation within the oil refining industry.
Oil Production	I (Third Party)	The Oil Production program offers oil and gas producers and transportation equipment manufacturers support through all energy efficiency project phases - from project identification through development, installation, and review. This is a comprehensive program for energy efficiency utilizing motors and equipment, lighting, air conditioning, and refrigeration.
Food & Kindred Products	I (Third Party)	The Food & Kindred Products program plans to deliver energy savings and demand reduction by offering facility audits, design and technical assistance, and incentives for the installation of energy efficiency measures to qualifying customers served by SCE. The program targets facility owners in the Food & Kindred Products industry, ranging from small food companies to large food companies. The customers represent a broad spectrum of food producers, from bread and breakfast cereals to starch and sugar producers.
Primary & Fabricated Materials	I (Third Party)	The Primary & Fabricated Metals program plans to deliver energy savings and demand reduction by offering facility audits, design and technical assistance, and incentives for the installation of energy efficiency measures to qualifying customers served by SCE. Target customers for the program include facilities in the primary and fabricated metals industry.
Non-Metallic Minerals & Products	I (Third Party)	The Non-Metallic Minerals & Products program provides energy efficiency and demand reduction services to cement production plants, primary cement distribution terminals, and large ready-mix plants throughout SCE's service territory. Cement plants are part of the classification of manufacturers producing non-metallic minerals and products. This also includes bricks, ceramics, glass, and glass products.
Mid-Size Industrial Customers	I (Third Party)	The Mid-Size Industrial Customers program provides mid-size industrial customers with detailed in-depth energy assessments that identify EE opportunities, accurately estimates potential savings and costs, and provides a path leading to implementation. Primarily focusing on manufacturing and processing businesses using 2,000,000 kWh and below.

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Appendix F: Industrial Key Customer Segment Trends and Electricity Usage Facts

The following are deep dives into the top Industrial electricity-using customer segments, with a focus on how electricity is consumed and associated energy efficiency opportunities.

Food & Kindred Products:

- Food processing is the third-largest and one of the most energy-intensive manufacturing industries in California.¹¹⁵
- 75% of electricity costs at food process facilities occurs in processing and assembly systems.¹¹⁶
- California's food processing industry consumes more than 3.7 billion kilowatt hours (kWh) of electricity.¹¹⁷
- The Dairy sector and the Fruit and Vegetable sector are expanding.¹¹⁸
- Chilling takes 79% of the total electricity usage in meat processing.¹¹⁹
- The food processing industry has the following market trends arranged in the order of importance to energy efficiency adoption:¹²⁰
 - Certain food processing sub-segments such as wineries and food canning are seasonal in their operation. Facilities with seasonal operations tend to install energy-efficiency equipment during the downtime of the year.
 - The food processing segment is very aware of energy costs affecting their bottom line and prefers payback of three years or less when making retrofits/installing new equipment.
 - The food processing industry has been slow to adopt new technologies as the industry is heavily regulated by food safety and sanitation standards. All energy efficiency upgrades activities must not jeopardize the facility's compliance with food safety and sanitation standards.

Minerals, Metals & Chemicals:¹²¹

- California ranks fourth in terms of nonfuel mineral production in the U.S. California's \$3.6 billion is about 6.3 percent of the national industry value.

¹¹⁵ SCE Food Processing Segment Optimization Plan, 2012.

¹¹⁶ Ibid.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

¹²⁰ Measure, Application, Segment, Industry (MASI): *New Opportunities in the Food Processing Industry*, Navigant, March 2015.

¹²¹ SCE Manufacturing Segment Optimization Plan, 2012.

- Principal minerals from California include sand and gravel, cement, boron minerals, stone and soda ash.

Plastics:¹²²

The California plastics industry is the third largest manufacturing industry in the U.S. 1,500 businesses in California are involved with plastic and plastic products manufacturing. Of the 99 establishments in California engaged in plastic material and resin manufacturing:

- 34 are located in Los Angeles County and 7 in Riverside County.
- Plastics are typically large industrial facilities.
- Plastics manufacturing uses various chemical, heating and cooling processes that require special equipment and technology.
- Because plastics are made from petrochemicals, their manufacturing facilities are often located near refineries to maximize efficiency of supply or "feedstocks."

Petroleum Refining:¹²³

- Electricity represents a relatively small portion of a refinery's energy consumption – making up only about 3 percent.
- Refiners depend on energy in their production process; they are particularly sensitive to energy costs as it erodes profit margins.
- Availability of uninterrupted electricity is critical to refineries, which are exploring options of cogeneration, mitigation technologies, power protection systems, and more.
- California is in the top three states for petroleum refining.
- Petroleum refiners are the largest users of electricity in California manufacturing sector.

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¹²² SCE Manufacturing Segment Optimization Plan, 2012.

¹²³ Ibid.

Appendix G: Agricultural Key Customer Segment Trends and Electricity Usage Facts

The following are Agricultural market trends on the four significant agricultural products (dairies, almonds, grapes and cattle & calf) by revenue.

Dairies:

- California's dairies produced 42.3 billion pounds of milk, accounting for almost 21 percent of the nation's milk supply in 2015.¹²⁴
- Milk production in California in 2015 was 3 percent below 2014 (fig. 2). In 2015, U.S. production, excluding California, was up 2 percent from 2014.¹²⁵
- Due in part to declining dairy product exports, prices received by California producers have declined significantly from 2014 levels, when prices were at record highs. In 2015, prices averaged below \$15.41 per hundredweight, a drop of 30 percent from 2014 levels.¹²⁶
- California has lost approximately 500 dairies from 2008 to 2015.¹²⁷
 - Other states are luring CA dairies with promises of water, stable feed supply and abundant land.¹²⁸
 - A U.S. Department of Agriculture economist said it's not just the drought and high cost of feed that has been hurting California dairy producers but a decline in the dry milk market that's been "a big export market for them. They've taken a disproportionate hit on that market. Strong dollar is contributing and China has retreated from the market."¹²⁹

Almond Growers:

- California almonds make up about 80% of the global and virtually 100% of the U.S. supply.¹³⁰
- Consistent California growth of almond production, even into drought years.¹³¹

¹²⁴ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

¹²⁵ *California Drought: Livestock, Dairy, and Poultry Sectors*, United States Department of Agriculture Economic Research Service, as of September 6, 2016.

¹²⁶ Ibid.

¹²⁷ Outside states to California dairy farmers: We have water, CNBC, February 10, 2015, <http://www.cnbc.com/2015/02/10/california-drought-states-tempt-california-dairy-farms--we-have-water.html>

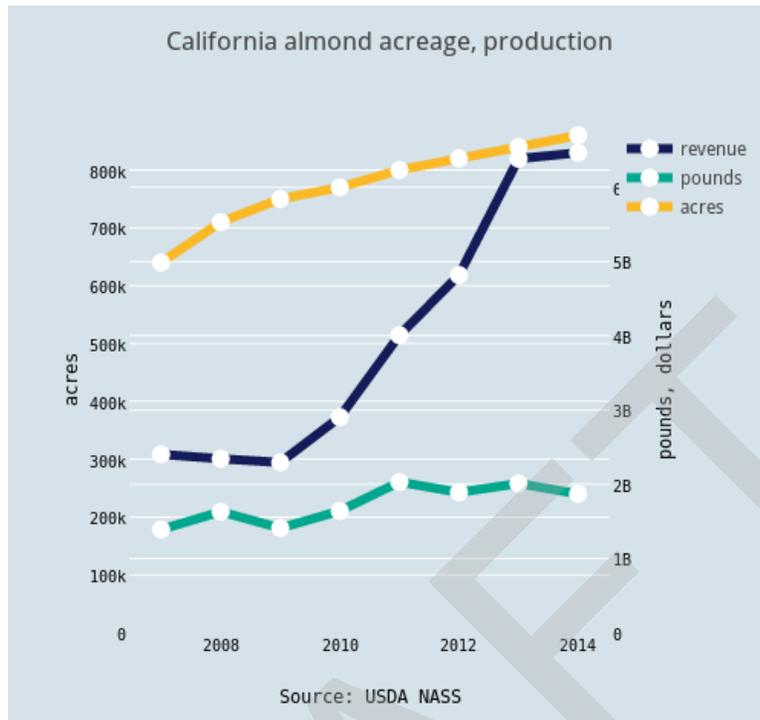
¹²⁸ Ibid.

¹²⁹ Ibid.

¹³⁰ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

¹³¹ Ibid.

Figure 34. California Almond Acreage and Production:¹³²



- Bees are important to California agriculture as a majority of the nation's colonies were needed for almond pollination in 2014.¹³³

Grapes:

- 85% of U.S. wine comes from California.¹³⁴
- 4,400 = total number of CA wineries.¹³⁵
- Industry initiated the Sustainable Winegrowing Program (SWP) in 2002 to give growers and vintners educational tools to increase adoption of sustainable practices, to measure and demonstrate ongoing improvement and increase adoption of technology solutions.

Cattle & Calf:

- California's total cattle and calve inventory on January 1, 2015 was 5,150 thousand.¹³⁶
- Domestic consumption of chicken increased by 17 percent in 2014.¹³⁷

¹³² United States Department of Agriculture, National Agriculture Statistics Service.

¹³³ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

¹³⁴ *California Wine Community Sustainability Report 2015*, California Sustainable Winegrowing Alliance

¹³⁵ Ibid.

¹³⁶ California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.

¹³⁷ Ibid.

Segment-Level Market Trends:

Field & Seed Crops:¹³⁸

- Total value of California field crop production is \$3.70 billion in 2014, down 14.9% from 2013.
- Dry edible beans, hay (alfalfa and other), fall potatoes, and sunflowers (non-oil) were the only field crops in California whose total value increased from 2013 to 2014.
- Large-to-moderate decreases in most field crop values led to the decrease in total field crop value.

Fruit & Nut Crops:¹³⁹

- The state's total value of all fruits and nuts in 2014 was \$21.4 billion.
- In 2014, California accounted for over 57% of the U.S. non-citrus fruit and nut production.
- California accounts for 37 percent of the U.S. citrus production and 56 percent of the national value.
- California is the number one producer of almonds and pistachios in the world, producing over 80 percent of the world's almonds and around 40 percent of the world's pistachios.

Vegetable & Melons:¹⁴⁰

- The total value of California's 2014 fresh and processing vegetable and melon production was \$7.8 billion.
- California led production with 47 percent of the U.S. harvested vegetable acres, 52 percent of the national production, and 60 percent of the value.
- California led the nation in processing vegetable production during 2014, with 28 percent of the U.S. harvested acreage, 74 percent of the national production and 60 percent of the total value.

Livestock & Poultry:¹⁴¹

- California's total livestock and livestock products cash receipts were \$15.3 billion in 2014, up 20 percent from 2013 (dairy receipts were the primary reason for increase).
- Receipts for hogs and pigs were down 6 percent from the previous year.
- Poultry and egg cash receipts were up 4 percent from 2013.
- Cash receipts for cattle and calves increased 20 percent from 2013.

¹³⁸ Ibid.

¹³⁹ Ibid.

¹⁴⁰ Ibid.

¹⁴¹ Ibid.

Floriculture:¹⁴²

- 26% (~\$270m) of the U.S. total floriculture wholesale value (\$1.05b) in 2014.
- California producers decreased from 732 in 2013 to 582 in 2014.
- California was the dominant state in cut flower production, accounting for about 77 percent of the total cut flower wholesale value (\$275m).

Emerging Segment: Indoor Agriculture (e.g., Cannabis):

- The Indoor Agriculture market is growing, increasing Lighting, Process, and HVAC electricity usage for the Agricultural sector.¹⁴³
- Strong growth in “local food” demand (estimated growth from \$1b in 2005 to nearly \$7b in 2014) has meant a unique market entry point for indoor farms’ higher price point products.¹⁴⁴
- Since 2011, \$52m in venture capital-like funds were invested in indoor agriculture in the U.S., with more than 60% in 2014 alone.¹⁴⁵
- Newly legal crops in other states have quickly become the most electricity-intensive crop in their Agricultural sector.¹⁴⁶
- CA indoor marijuana growing is already 3% of total electricity consumption.¹⁴⁷

Drought Impacts:

- Farmers are requiring more electricity to power deeper wells for pumping groundwater as surface water allocations shrink.¹⁴⁸
- Farmers in the Central Valley, the state's main agricultural region, may tap groundwater for more than 60 percent of their needs in 2015, up from one-third in a normal year.¹⁴⁹
 - "We are using about two-and-a-half times more power than we would in a normal year," Fresno ranch owner.¹⁵⁰
 - The longer the drought lasts, more fields will be fallowed or used for other purposes (photovoltaics - PV); more energy will be needed to extract water from wells.¹⁵¹

¹⁴² Ibid.

¹⁴³ *Indoor Crop Production Feeding the Future*, Newbean Capital, March 2015.

¹⁴⁴ Ibid.

¹⁴⁵ Ibid.

¹⁴⁶ *As Pot Growing Expands, Electricity Demands Tax U.S. Grids*, Bloomberg, Dec. 2015

¹⁴⁷ *Regulating Pot to Save the Polar Bear: Energy and Climate Impacts to the Marijuana Industry*, Gina S. Warren, Columbia Journal of Environmental Law, June 2015.

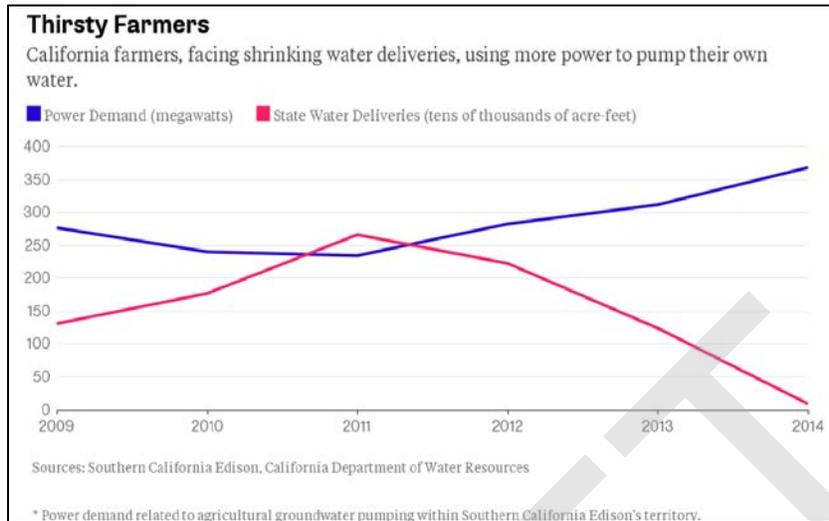
¹⁴⁸ "In Parched California, a Farmer's Market is Emerging for Power," Bloomberg, September 2, 2015.

¹⁴⁹ Ibid.

¹⁵⁰ Ibid.

¹⁵¹ Ag Irrigation Overview – SCE Water Energy Summit, November 2014.

Figure 35. Farm Power Demand and State Water Deliveries



- Production/job loss due to reduced acreage.¹⁵²
- Increased conversion of fields to power production (PV).¹⁵³
 - Increase in Net Energy Metering due to increased PV may prevent SCE from providing Ag EE Opportunities such as Pump Testing services, since only kWh sales from SCE's grid can participate in EE programs.
- Increase in acceptance and adoption of technology solutions to sustainability challenges (sub-surface irrigation, greenhouses, photovoltaic systems).¹⁵⁴
- Trend is towards higher water efficiency irrigation systems (and thus less pumping and electricity requirements).¹⁵⁵
- Certain crops have a high productivity barrier to more efficient irrigation systems, so transitioning to other crops may be the only water-efficient option.¹⁵⁶
- Decision to change irrigation systems is complicated, based on dynamic market conditions.¹⁵⁷
- Generations of farmers have done it a certain way; there may be a barrier to change.¹⁵⁸
 - Need to avoid the perception of a "non-farmer telling a farmer how to farm" issue.¹⁵⁹

¹⁵² Ibid.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

¹⁵⁵ Ibid.

¹⁵⁶ Ibid.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid.

**Appendix H:
Strategies & Sample Tactics (Commercial, Industrial and Agricultural)**
(sorted by Intervention and New, Modified or Existing Strategy)

Intervention	Timing: S = 1-2 yrs M = 3-4 yrs L = 5+ yrs	Sector Focus: C = Commercial I = Industrial A = Agricultural	Customer Size Focus: S = Small M = Mid-size L = Large	N = New M = Modified E = Existing	Intervention Strategies Descriptions	Tactics (Samples)	Legislation, Policy, or Proceeding Support	Sector Overarching Strategies			
								Tailor Service by Customer Size	Increase Cost-Effectiveness	Innovations	Customer Education/Quality Contractor Workforce
Customer Incentives	S	C, I, A	L	E	Provide performance-based custom incentives to large, sophisticated customers	<ul style="list-style-type: none"> Target large, complex energy efficiency technologies and projects for Custom program Transition smaller, simpler energy efficient technologies and projects to pre-approved, cost-efficient deemed incentives 		X	X		
	S	C, I, A	S, M, L	E	Provide deemed incentives programs	Continue Deemed Incentive program (see Existing Programs section)			X		
	S	C, I, A	S, M, L	E	Provide incentives for integrated EE/DR HVAC offerings	Commercial HVAC Quality Maintenance incents the EE portion of smart thermostats and DR-enabling HVAC technology	DR				X
	S	C, I, A	S, M, L	E	Provide incentives to new construction market to prepare for future codes	<ul style="list-style-type: none"> Collaborate and provide incentives to new construction market for above-energy-code construction Coordinate with Codes & Standards program to integrate in-development codes into a new construction program 	CAEESP Comm Goal 1 ZNE Commercial Buildings		X		
	S	C, I, A	S, M, L	E	Provide a Pump Test program	Continue Pump Test program (see Existing Programs section), but tied to new value proposition based on 2016 CPUC guidance			X		X

Intervention	Timing: S = 1-2 yrs M = 3-4 yrs L = 5+ yrs	Sector Focus: C = Commercial I = Industrial A = Agricultural	Customer Size Focus: S = Small M = Mid-size L = Large	N = New M = Modified E = Existing	Intervention Strategies Descriptions	Tactics (Samples)	Legislation, Policy, or Proceeding Support	Sector Overarching Strategies			
								Tailor Service by Customer Size	Increase Cost-Effectiveness	Innovations	Customer Education/ Quality Contractor Workforce
	S, M	C, I, A	M, L	M	Leverage meter-based best practices to lower implementation costs for calculating energy savings methodologies	Test different meter-based methodologies to replace calculated energy savings methodologies to achieve lower costs	AB 802	X	X	X	
	S	C, I, A	M, L	M	Focus sophisticated pre- and post-testing and customized energy solutions towards larger savings projects to align costs with benefits	Raise minimum incentive threshold for custom projects (waiver may be applied for grid-constrained regions)		X	X		
	S, M	C, I, A	S, M, L	M	Make energy efficiency more relevant to the customer by evaluating customer's actual savings instead of average technology savings	Set deemed incentive ahead of time, and calculate savings based on customer's actual usage			X		X
	M	C, I, A	S, M, L	M	Maintain cost-effectiveness of energy support services by sharing costs	Evaluate co-pay scenarios with customers			X		
	S, M	C, I, A	S, M	M	Encourage property owners to make investments to replace HVAC systems, but reward both tenants and the property owners with portions of a performance-based incentive tied to energy savings persistence.	<ul style="list-style-type: none"> • Host regular trainings to educate the property management communities about the benefits of energy efficiency improvement • Talk to the right person – the energy decision maker • Provide incentives to one or multiple parties involved 		X	X	X	X

Intervention	Timing: S = 1-2 yrs M = 3-4 yrs L = 5+ yrs	Sector Focus: C = Commercial I = Industrial A = Agricultural	Customer Size Focus: S = Small M = Mid-size L = Large	N = New M = Modified E = Existing	Intervention Strategies Descriptions	Tactics (Samples)	Legislation, Policy, or Proceeding Support	Sector Overarching Strategies			
								Tailor Service by Customer Size	Increase Cost-Effectiveness	Innovations	Customer Education/ Quality Contractor Workforce
	S, M	I, A	S, M, L	M	Expand inclusion of non-Lighting technologies into new construction programs	Evaluate Refrigeration cost-effective technologies for Industrial and Agricultural new construction			X		
	S, M	C, I, A	S, M	N	Provide incentives for leased energy efficient products to distributors and end-users	<ul style="list-style-type: none"> Research leased products' customer and distributor decision-making to identify appropriate program intervention Design program to push leased energy efficient products 		X	X	X	
	M, L	C, I, A	S, M, L	N	Provide incentives for new construction occupancy-related energy savings	Pilot performance-based incentive structure to realized vs. modeled savings (called "Savings by Operation" in PG&E because it includes occupancy operation of the building)			X	X	
Delivery Channel	S, M, L	C	S	M	Accelerate incentive transition from direct install to more cost-efficient channels like mid/upstream or Codes & Standards	<ul style="list-style-type: none"> Evaluate technologies periodically for applicability for transitioning to the mid/upstream programs Evaluate market and technology solutions to identify where a direct install delivery channel is the ideal approach channel to influence customers 		X	X		
	S	C, I, A	S, M, L	M	Increase speed of program delivery by including deemed versions of new construction offerings	Transition system-approach new construction measures to deemed	CAEESP Comm Goal 1 ZNE Commercial Buildings		X	X	

Intervention	Timing: S = 1-2 yrs M = 3-4 yrs L = 5+ yrs	Sector Focus: C = Commercial I = Industrial A = Agricultural	Customer Size Focus: S = Small M = Mid-size L = Large	N = New M = Modified E = Existing	Intervention Strategies Descriptions	Tactics (Samples)	Legislation, Policy, or Proceeding Support	Sector Overarching Strategies			
								Tailor Service by Customer Size	Increase Cost-Effectiveness	Innovations	Customer Education/ Quality Contractor Workforce
Direct Install	S	C	S	E	Provide a Direct Install program for small business customers	Continue Direct Install Program (see Existing Programs section)		X	X		
	S	C	S	M	Target direct install delivery channel for new technologies (beyond Lighting)	Evaluate including non-Lighting end-uses like Pumps (Variable Speed Drive Pool Pumps)		X	X	X	
	M, L	C	S	M	Provide locational targeted offerings to support grid reliability	Redesign existing Commercial DI program for "rapid response" deployment in targeted regions, separate from existing Commercial DI	Locational			X	
Financing	S	C, I, A	S, M, L	E	Provide financing services for energy efficiency projects	Provide OBF and pilot OBR programs	AB 758 S5 Accessible and affordable financing mechanisms		X		
	S, M	C, I, A	S, M, L	M	Leverage financing to cover all incentive and non-incentive program services provided to customers	Costs born by ratepayers for non-incentive services (e.g., pump tests, lab services, audits, etc.) that collectively result in energy savings (with or without incentives) could be paid for through financing. This could increase the availability of these services while saving ratepayer dollars.	AB 758 S5 Accessible and affordable financing mechanisms		X	X	
	S	C, I, A	S, M, L	M	Incorporate financing of to-code activity	Evaluate methods for incorporating to-code activity into OBF and OBR programs	AB 802		X	X	

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	S, M	C, I, A	S, M	N	Provide financing options for distributors to stock and push energy efficient technologies	Evaluate OBF and OBR influence and effectiveness in distributor's purchasing and selling decisions, then create financing offering if found to be cost-effective	AB 758 S5 Accessible and affordable financing mechanisms	X	X	X	
Intelligent Outreach	S	C, I, A	S, M, L	E	Provide continuous RFP intake, review, and approval process for new Third Party programs	Continue IDEEA365 program (see Existing Programs section)				X	
	S	C, I, A	M, L	E	Provide trusted energy advisors to support large energy usage customers in whole building, complex energy efficient projects	Proactively outreach to large customers with dedicated personnel to identify and influence large energy efficiency projects		X	X		X
	S	C, I, A	S, M	E	Provide tools to support on-site audits, focused on a narrower audience with potentially higher energy savings potential per customer, aligning ratepayer-funded cost of service with potential	Continue providing online and on-site energy advisory services to customers		X	X		X
	S	C, I, A	M, L	E	Provide tools to support self-service audits, focused on a broader audience with potentially smaller energy savings potential per customer, aligning ratepayer-funded cost of service with potential	Develop, support, and improve based on customer feedback to Benchmarking and EEAT	AB 758 S2.1 Easy-to-access data and analytics	X	X		X

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	S, M	C, I, A	M, L	M	Pilot new data-based tools to identify energy savings opportunities	Identify untapped stranded potential energy savings opportunities through evaluation of capabilities of data-mining tools	AB 802	X	X	X	
	S, M	C	S	M	Expand direct install to new customer segments where beneficial	Expand to national accounts	AB 758 S4.2 Targeted marketing, education, and outreach	X	X		
	S	C, I, A	S, M	M	Adopt best practices for customer outreach across auditing programs	Social media delivery channel success in one energy audit service can be spread to other energy audit services					X
	M	C, I, A	S, M, L	M	Evaluate audit tool improvements due to increased data access from AB 802	Review new capabilities in audit tools to achieve AB 802 evaluation requirements	AB 802				X
	S, M	C, I, A	S, M	M	Evaluate effectiveness of remote audits for lower cost audit and targeted marketing solutions	Continue pilots and evaluations on remote audit services to prove efficacy		X	X	X	
	S, M	C, I, A	S, M, L	M	Improve technologies and services supporting new construction	Evaluate new construction software for enabling additional EE measures into new construction programs	CAEESP Comm Goal 1 ZNE Commercial Buildings			X	X
	S, M	I, A	S, M	N	Use remote audits to identify high opportunity customers	Test remote audits for ability to evaluate unique Industrial and Agricultural customers		X	X	X	X

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	M	C, I	S, M	N	Engage customers through behavioral offerings to drive energy efficiency adoption and conservation	Explore Non-residential Tenant Behavior Pilot (similar to 10-10-10 in Multifamily)		X		X	X
	S, M	C, I, A	S, M	N	Provide low-cost direct touchpoint for small/mid-size commercial customers' EE awareness	Small & mid-size customers to receive some basic level of services such as a "Customer Care Package" & customer outreach memo on an annual basis. The Commercial Customer Care Package may also include cost-effective LED bulbs, energy-efficient power strips, & other items.		X	X	X	X
	S, M, L	C, I, A	S, M, L	N	Develop new programs to achieve stranded potential in customer's HVAC equipment	<ul style="list-style-type: none"> Pilot HOPPs combining existing HVAC Early Retirement, Quality Maintenance and Quality Installation into a single menu of HVAC offerings Ensure project quality with spot-checks for systems for initial assessment Spot checks mitigate risk of meter-based usage showing fluctuations due to changes in behavior 	AB 802		X	X	
	S, M	C, I, A	S, M	N	Leverage targeted outreach to identify high-opportunity customers for HVAC programs	Leverage customer targeting through looking at their metered usage for small/medium businesses (e.g., remote audits and disaggregation to identify high HVAC energy consumption)		X	X	X	

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	S	A	S, M, L	N	Prepare EE measures and programs to respond to new Ag markets (e.g., legalized recreational cannabis)	<ul style="list-style-type: none"> Identify historical baseline for medical growing community, and/or research other state markets Monitor legalization & emerging crop & market growth 		X	X	X	
Midstream / Upstream Incentives	S, M	C, I, A	S, M, L	E	Provide incentives to distributors and vendors for energy-efficient equipment	Influence customer/contractor purchase decisions in Replace-on-Burnout or Normal Replacement scenarios by offering distributor incentives for equipment		X	X		
	S, M, L	C, I, A	S, M	E	Lower administration costs of programs by transitioning downstream deemed incentives to midstream interventions	Periodically evaluate downstream measures for whether distributor incentives can effectively influence customer adoption of efficient technologies			X		
	M	C, I, A	S, M, L	M	Provide locational targeted offerings for early retirement and upstream HVAC delivery channels to support grid reliability	Evaluate program design to provide simple, fast-track HVAC distributor and contractor-focused incentives in targeted regions	Locational		X	X	
	S, M	C, I, A	S, M	M	Provide cost-effective incentives to all energy saving technologies offered by distributors	Evaluate expanding incentives beyond current Lighting and HVAC technologies to Controls and Refrigeration as savings become claimable by PAs	AB 793	X	X	X	X

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	M	C, I, A	S, M	M	Leverage distributor market positions and relationships with customers to influence early retirement	Develop cost-effective, easy-to-participate distributor/customer co-incentive early retirement program with compliant preponderance of evidence requirements		X	X	X	
	M	C	S	N	Provide incentives at the most cost-effective step in the technology supply chain	Evaluate effectiveness and costs of coupons for EE technology sales for customers to distributors in a midstream program vs. the more costly door-to-door direct install delivery channel		X	X	X	X
	M, L	C, I, A	S, M	N	Ensure lowest cost / highest effect for customer incentives by using market forces to set incentive levels	Pilot reverse-auction mechanism for high-volume technologies and projects		X	X	X	
Partnering	S	C	S	E	Reduce direct install administration costs through market forces	Launch competitive solicitations to reduce costs			X		
	S, M, L	C, I, A	S, M	E	Ensure lowest cost / highest effect for customer incentives by keeping up to date on changing technology costs	Use distributor partnerships to maintain up-to-date technology costs to maintain appropriate incentive levels and cost-effectiveness			X		
	S, M, L	C, I, A	S, M, L	M	Ensure lowest cost / highest effect for customer incentives by keeping up to date on changing technology costs	Use customer authorized agent partnerships to maintain up-to-date technology costs to maintain appropriate incentive levels and cost-effectiveness			X		

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	S, M, L	C, I, A	S, M, L	M	Leverage industry experts for understanding HVAC O&M-based energy savings for customers and program administrators	Participate and apply information from Western HVAC Performance Alliance (WHPA) working groups around evaluating energy savings from Fault Detection & Diagnostic equipment and other HVAC equipment	CAEESP HVAC Goal 4 New HVAC Technologies and Systems Diagnostics		X		X
	S	C, I, A	S, M, L	M	Expand outreach to the new construction market	Improve program design and market adoption of new construction offerings by partnering with relevant trade associations	CAEESP Comm Goal 1 ZNE Commercial Buildings		X		X
Quality Assurance	S, M, L	C, I, A	S, M, L	E	Push market towards quality installation and maintenance of HVAC equipment	Provide incentives and training to customers and contractors for quality maintenance and installation of HVAC equipment	CAEESP HVAC Goal 2 Quality HVAC Installation & Maintenance				X
	S, M	C, I, A	S, M	M	Expand quality maintenance to small/medium customers	Evaluate lessons learned from large customer participation in quality maintenance incentive and training programs to expand cost-effectively to small/medium customers	CAEESP HVAC Goal 2 Quality HVAC Installation and Maintenance	X	X		X
Single Point of Contact	M, L	C	S, M, L	N	Target specific Commercial businesses to achieve ZNE retrofit goals	<ul style="list-style-type: none"> Develop whitepaper on how to target and provide services/incentives to achieve ZNE businesses. Pilot would explore how to stitch together all funding sources (EE, DR, IDSM, etc.) under this EE program. 	IDER; CAEESP Comm Goal 1 ZNE			X	

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Single Point of Contact	M, L	C, I, A	S, M, L	N	Develop fast-acting IDSM program for targeting businesses in targeted regions for grid reliability solutions	When SCE is experiencing a grid congestion situation (i.e., Aliso Canyon, SONGS-affected area, other identified transmission and distribution congested locations, etc.), this pilot will supply a rapid response set of EE, DR, Solar, & IDSM responses to help alleviate grid constraints.	Locational		X	X	
	S	C, I, A	S, M, L	M	Cross-promote additional EE measures when working with the customer-critical EE products and services	Establish activities like the pump test as the influence point for additional measures installation					X
	S	C, I, A	S, M, L	M	PA-run customer support services should link to 3P programs	Assure linkage for PA-run pump test preliminary findings to 3P administered programs			X	X	
	S, M, L	C, I, A	S, M, L	M	Integrate non-EE energy solution options for customer's HVAC equipment	Continuously evaluate integrated DR solutions into efficient HVAC equipment such as DR-enabled Thermostats (currently offering DR-enabling Automatic Digital Economizer Controls [ADEC])	DR			X	X
	L	C, I, A	S, M, L	M	Integrate new construction market with Distributed Energy Resources	Evaluate and claim benefits of EE's interactive consequence to reduce Distributed Generation's (DG) size requirements	CAEESP Comm Goal 1 ZNE Commercial Buildings; IDER/IRP		X		X
	S, M	C, I, A	S, M, L	M	Integrate non-EE energy solution options for customer pumping equipment	Evaluate including DR-capability into pumps and pump tests (such as Base Interruptible Program [BIP])	DR			X	

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Strategic Energy Management (SEM)	S	C, I, A	S, M, L	M	Discuss policy changes to enable cost-effective approved savings methodology (meter-based) for CEI, claim savings for impacts of nonresource activities such as audits, and allow SEM beyond Commercial into Industrial and Ag energy usage, as appropriate	Coordinate with CPUC/Energy Division to align state policies with SEM goals	AB 802	X	X	X	
	M, L	A	S, M, L	M	Based on lessons learned on high potential Comm and Ind SEM programs, adapt CEI program to Ag sector	Develop a cohort, web-based, or other "SEM lite" options that can be integrated into Ag customer's business models		X	X	X	X
	M	C, I	S, M	M	Based on success of years 1-2, plus AB 793 implementation, spread the SEM model or variations further to Commercial in years 3-4.	<ul style="list-style-type: none"> Develop a cohort, web-based, or other "SEM lite" options that are lower cost Evaluate method to claim AB 793 technology energy savings through CEI M&V methodology 	AB 793; AB 758 S2.2 Strategic energy plans	X	X	X	X
	L	C, I, A	L	N	Solution provider for larger customer's energy management needs and utilities' grid reliability and cost-effectiveness requirements beyond EE	Integrate EE into IDER offerings	IDER/IRP	X	X	X	X

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	S	C, I	L	N	Implement resource Strategic Energy Management for large business customers (Comm and all Ind)	PAs are developing methodology for SEM savings claims including data collection protocols and guidebooks for implementation		X	X	X	X
	M, L	C, I, A	S, M	N	Train SEM implementer workforce	WE&T pilots for driving engagement with SEM contractors and customers to scale SEM assuming it is cost-effective	AB 758 S2.2 Strategic energy plans	X	X	X	X
Sustainable Offerings	S, M	C, I, A	S, M, L	M	Reduce administration costs of third party programs	<ul style="list-style-type: none"> Consolidate similar third party program contracts by sector (e.g., consolidate all Commercial Third Party programs into one contract) Include Diverse Business Enterprise (DBE) contracting requirements to maintain current levels of DBE market support 			X		
	S	C, I, A	S, M, L	M	Reduce overhead costs by applying best practices for energy support services contracts	<ul style="list-style-type: none"> Merge contracts Use fixed-costs contracts 			X		
	S, M	C, I, A	S, M, L	M	Ensure sustainability of pump testing program by transitioning existing offering to be more cost-effective	<ul style="list-style-type: none"> Validate savings impacts and customer benefits Evaluate customer co-pay for increasing program cost-effectiveness Consider applicability for pump tests as an AB 802 resource measure 	AB 802		X		

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						<ul style="list-style-type: none"> Evaluate whether pump tests affect customer behavior and reducing energy usage, and consider revamping into a non-incentive resource offering 					
	M, L	C, I, A	S, M, L	N	Increase non-incentive services to the customer by showing influence of cost-effective energy efficiency savings	<ul style="list-style-type: none"> Incentives to the customer may not just be cash to the customer, but paid-for services (e.g., pump tests, workforce education, lab services, etc.) that can be connected to energy savings M&V research validates that services, not just incentives, can influence EE activity 		X	X	X	X
	S, M, L	C, I, A	S	N	Energy Management Systems upgrades to be evaluated for resource benefits to enable greater incentives and ratepayer cost-effectiveness	<ul style="list-style-type: none"> Work with customers to upgrade EMS Work with EMS developers for software upgrades (that could also count for resource benefits) 	AB 793	X	X	X	X