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EE Business Plan Stage 2

Agricultural Policy, Portfolio and Programs

May 13, 2016

Coordinating Committee

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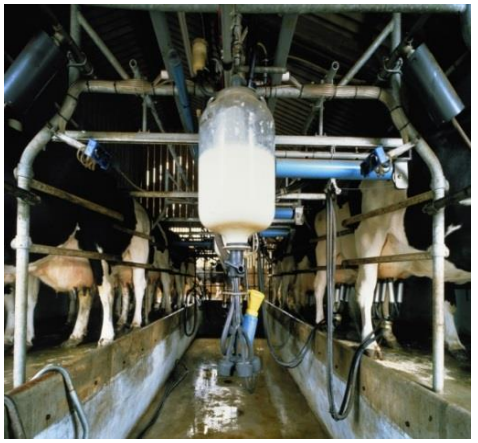
Agricultural Sector: Quick Facts

- California produces about half of U.S. grown fruits, nuts and vegetables, and its agricultural abundance includes more than **400 commodities**
- Billion-dollar commodities include milk and cream, almonds, grapes, and cattle/calves (see list on bottom right)
- Consumes **4 percent of the state's electricity**
  - **41 percent** of energy used for farming is **used to move water**
- Energy accounts for less than 5 to 10 percent of total costs for many farms
- Increased power rates can still have a major impact because profit margins are extremely low in this segment.

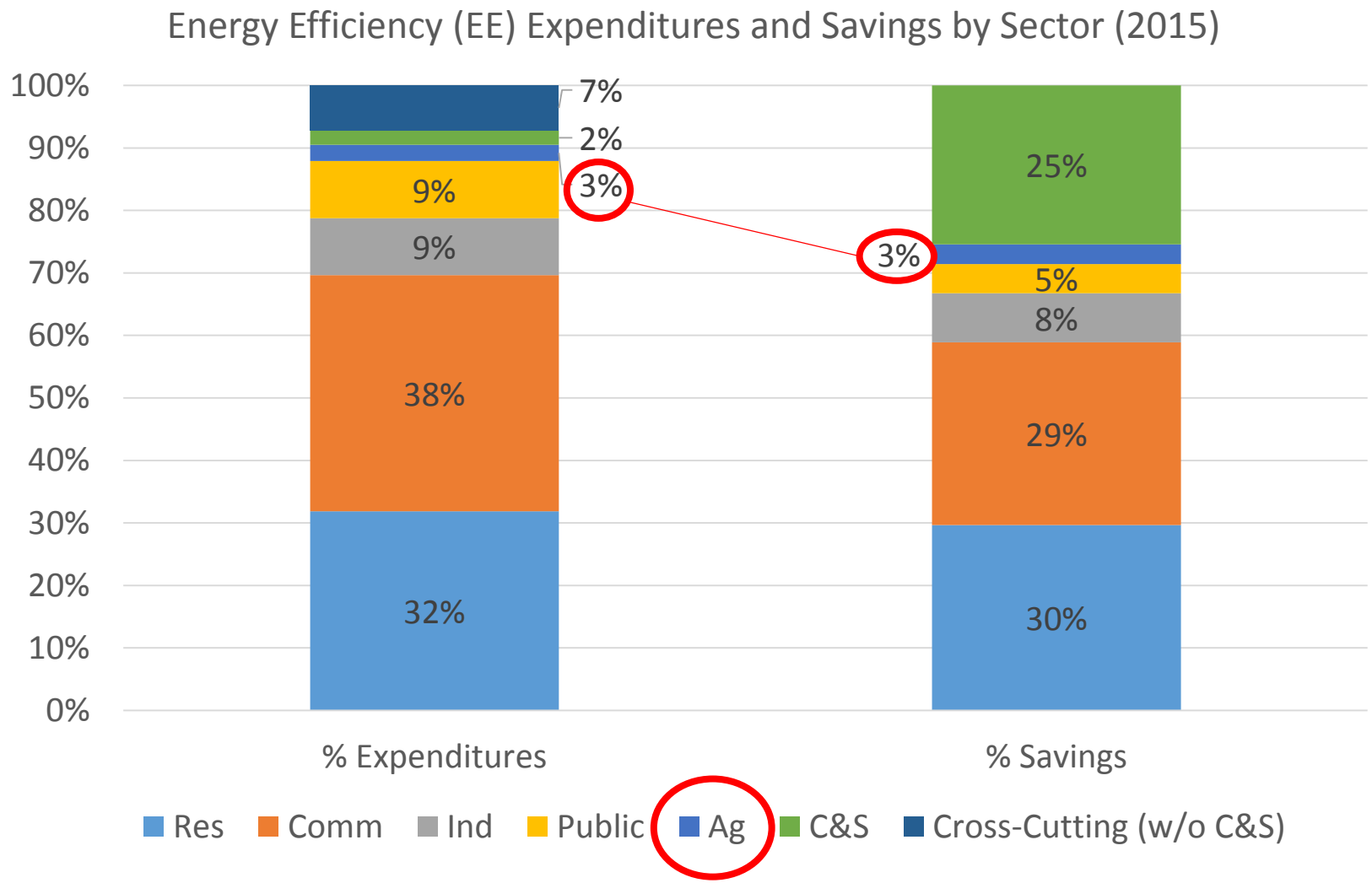


Top CA Ag Products (2014)

- **Milk — $9.4 billion**
- **Almonds — $5.9 billion**
- **Grapes — $5.2 billion**
- **Cattle, Calves — $3.7 billion**
- **Strawberries — $2.5 billion**
- **Lettuce — $2 billion**
- **Walnuts — $1.8 billion**
- **Tomatoes — $1.6 billion**
- **Pistachios — $1.6 billion**
- **Hay — $1.3 billion**

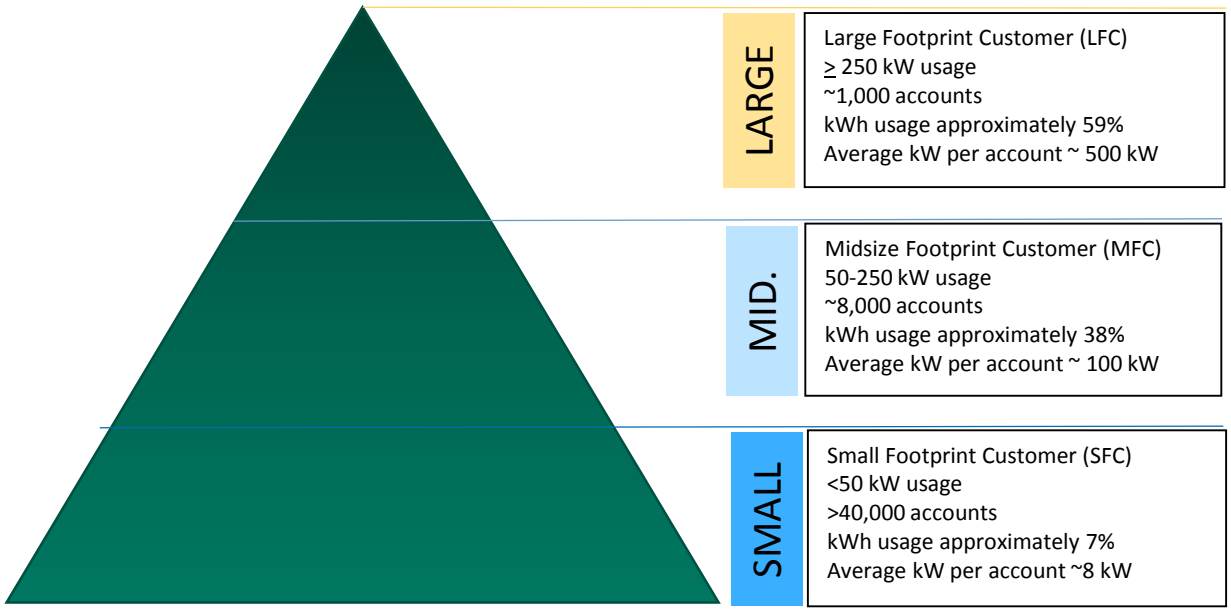
Source: SCE Ag Segment Optimization Plan, 2012

Sector Overview: Expenditures and Savings



Source: SCE CSS participation data (draft, to be finalized at 2015 EE Annual Report)

Sector Overview: Proposed Segmentation



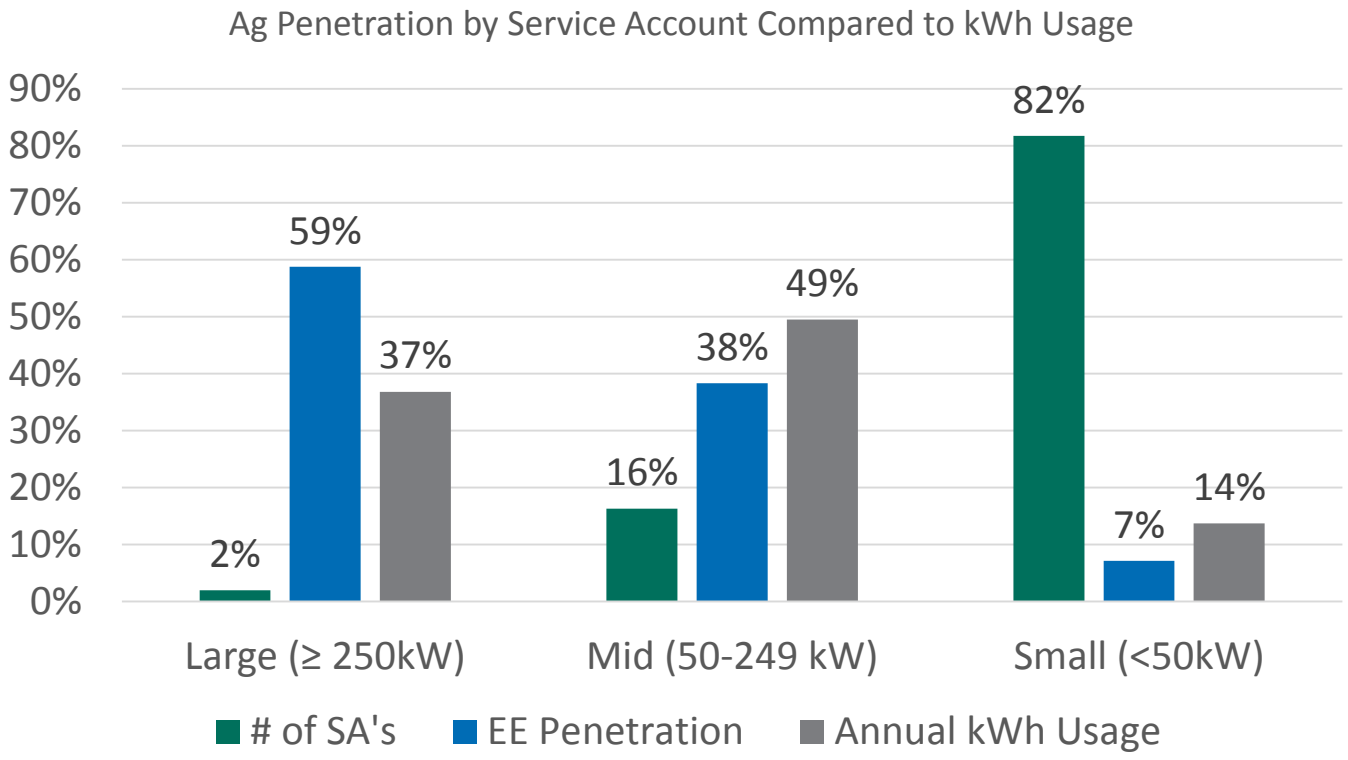
More EE resources

Less EE resources

Source: SCE CSS participation data , 2013-15 (draft, to be finalized at 2015 EE Annual Report)

Sector Overview: Customer Penetration

- Large customers participate in EE; focus on opportunities with deeper savings
- Mid-size customers represent potentially strong growth opportunity for EE
- Small customers present limited EE opportunities; partnered offerings could be focus



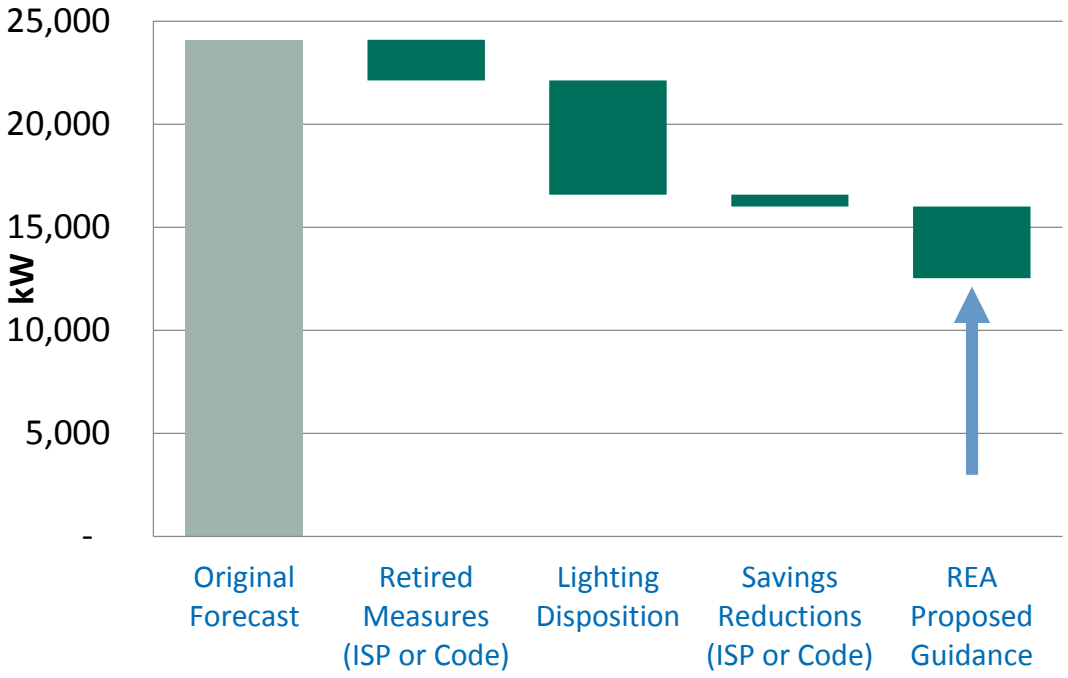
Source: SCE CSS participation data, 2013-15 (draft, to be finalized at 2015 EE Annual Report)

1. Measure Mix Reduction

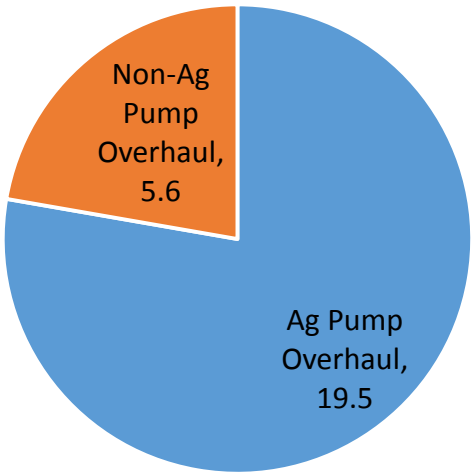
Problem: Dispositions and ISPs may be artificially limiting measure availability to select customer sizes, particularly Ag. pumping services

- Pump overhaul measures represented over 75% of all Ag. customer EE participation in 2014
- Current trend is growth in Ag. pumping due to the drought
- CPUC guidance impacts savings claims (and incentives) for Ag. pumping services activity

2015 Core Programs Forecast with Guidance Impacts



Ag EE Measure Participation (GWh, 2014)



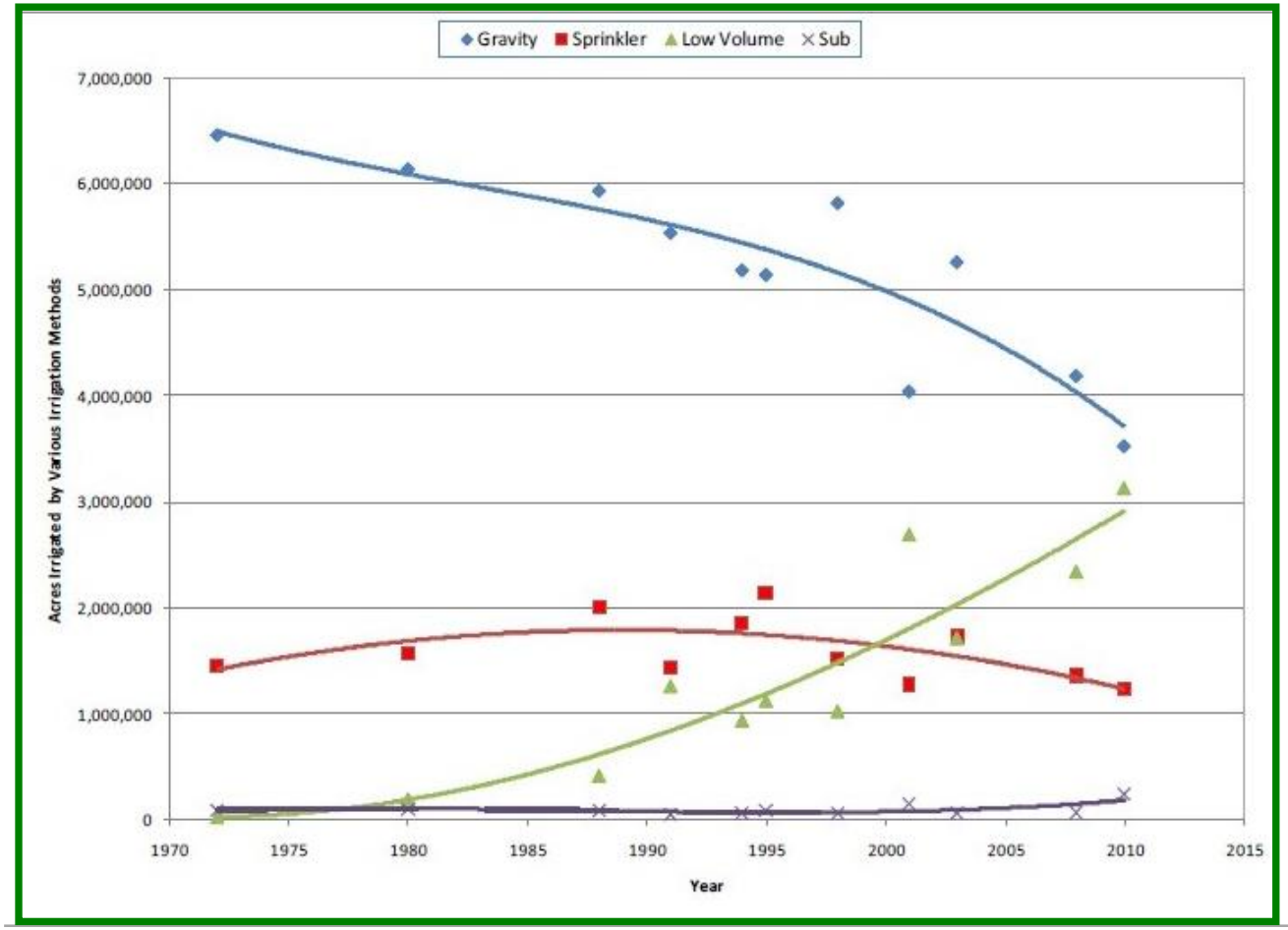
1. Measure Mix Reduction (cont'd)

Problem: Dispositions and ISPs may be artificially limiting measure availability to select customer sizes, particularly Ag. pumping services

	Observations	Potential Solution/Strategy
LARGE	• Industry Standard Practices (ISPs) and dispositions applied holistically	• Perform additional market research on past and future ISPs and dispositions on applicability to customers based on customer size, historical participation, and sub-sector
MID.	• Addressing energy- and water- intensive ag. pumping can capture significant EE savings	• Re-position pumping services activity to a Net Metered Energy Consumption (NMEC) savings approach • Pump systems typically metered separately, lending to accurate, measurable, and verifiable NMEC savings
SMALL	• Lack of diversity in Ag. measures	• Offer financing in place of rebates or incentives with NMEC approach

2. Efficient Irrigation Program

Problem: Irrigation systems are a significant factor in pumping energy usage yet high-efficiency systems have ongoing barriers to adoption



Ranked by Efficiency:

1. Sub (sub-surface)
2. Low Volume (drip)
3. Sprinkler
4. Gravity (flood)

Source: Ag Irrigation Overview – Water Energy Summit, November 2014

2. Efficient Irrigation Program (cont'd)

Problem: Irrigation systems are a significant factor in pumping energy usage yet high-efficiency systems have ongoing barriers to adoption

	Observations	Potential Solution/Strategy

LARGE	• Trend is towards higher water efficiency irrigation systems (and thus less pumping and electricity requirements)
	• Certain crops have a high productivity barrier to more efficient irrigation systems, so transitioning to other crops may be the only water-efficient option
	• Decision to change irrigation systems is complicated, based on dynamic market conditions
	• Generations of farmers have irrigated a certain way, presenting a barrier to change
	• Need to avoid the perception of a "non-farmer telling a farmer how to farm" issue
		• Evaluate potential for a water and energy efficiency co-funded program that influences farms to transition to higher efficiency irrigation systems
		  • Identify partnership opportunities to support grant funding applications
		  • Develop white papers to show comprehensive value for efficient irrigation systems, customized to crop type
		  • Include financial, water, and energy savings, regulation compliance, yield improvement, and other benefits as relevant to the customer
		  • Include complimentary technologies that can be bundled with efficient pumping systems (e.g., soil moisture sensors)
		  • Leverage trade association relationships so information is coming from a farmer's trusted source

MID.		
SMALL		

3. Emerging Markets

Problem: Emerging crops and markets may significantly increase Ag. sector electricity usage without naturally occurring efficiency

LARGE

MID.

SMALL

Observations	Potential Solution/Strategy

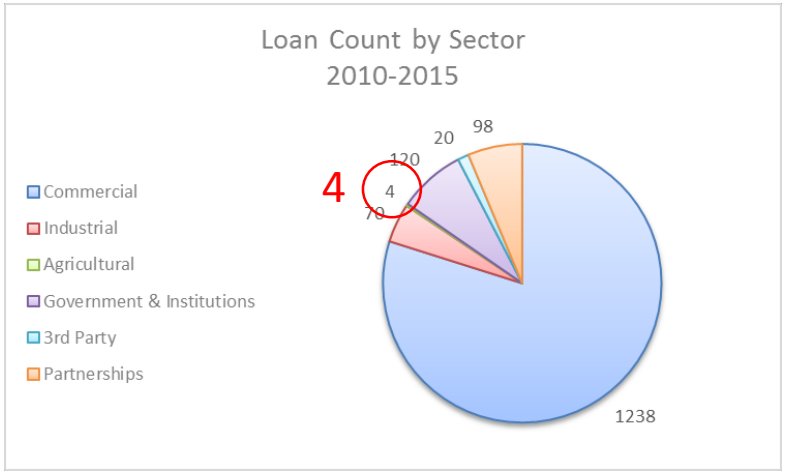
• Indoor Ag. market is growing, potentially increasing Lighting, Process, and HVAC electricity requirements
  • Supplying local markets with fresh food, and reducing food miles in transporting products, are among Indoor Ag. drivers
  • New industry is very capital (and energy) intensive, but local products are valuable
  • Creates new loads and customers for utility companies
 	
• Newly legalized marijuana crops in other states have quickly become the most electricity-intensive crop in their Ag. sector[1]
  • CA indoor marijuana growing is already 3% of total electricity consumption[2]
  • Expanded legalization measures to be voted in CA in fall 2016
	• Monitor legalization, and emerging crop and market growth
	
	• Identify historical efficiency baseline for medical growing community, and/or research other state markets
	
	• Prepare EE measures and programs to respond to these new markets

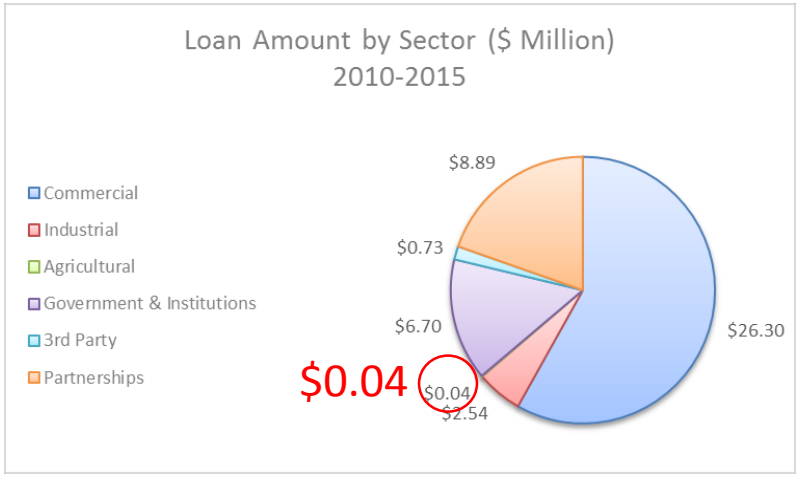
1. As Pot Growing Expands, Electricity Demands Tax U.S. Grids, Bloomberg, Dec. 2015
2. Regulating Pot to Save the Polar Bear: Energy and Climate Impacts to the Marijuana Industry, Gina S. Warren, Columbia Journal of Environmental Law, June 2015

4. Integrating Finance (cont'd)

Problem: Customers have differing financial resources available, which helps influence varying levels of EE participation

- Historically, low Ag. participation in OBF (SCE and statewide)
- Customers have shorter-term borrowing needs
- Limited understanding of financial instruments





Source: Ikerd John E. Financial Management on New Farms, http://web.missouri.edu/ikerdj/papers/SFT-New%20Farm%20Finance%20(7-07).htm

4. Integrating Finance

Problem: Customers have differing financial resources available, which helps influence varying levels of EE participation

	Observations	Potential Solution/Strategy
LARGE	• Larger capital needs with competing priorities • Longer time horizon for capital investments • More financing options available	• Leverage On-bill Repayment (OBR) pilots to promote third party-financing options and utilize On-bill Financing (OBF) where applicable • PACE is based on property value, which Ag. predominately has more than other sources, so connecting financial and Ag. communities could enable more Energy Management
MID.	• Smaller capital needs with competing priorities • Shorter time horizon for capital investments	• Enhance adoption of OBF program (and OBR where appropriate) • Develop and provide resources to navigate financing application and process
SMALL	• Fewer financing options available	• PACE is based on property value, which Ag. predominately has more than other sources, so connecting financial and Ag. communities could enable more Energy Management

5. Trusted Partner Marketing

Problem: Costly to develop one-to-one relationship with each farmer for EE education and services

Observations	Potential Solution/Strategy
• High cost segment to service due to diverse challenges (need for face-to-face) and geographical spread • Still resistance to change in adoption of technological solutions • Prefer costly one-on-one customer contact and education – high value on trusted relationships • Set "windows of opportunity" to meet with the decision makers • Too many programs confuse and overwhelm, causing them to not participate or participate in the wrong program • Program requirements are seen as overly burdensome and onerous • Developing new measures and programs requires in-depth knowledge of the particular crop and customer base that can be costly to research	• Transition towards marketing primarly through trusted trade asociations and other distributors of information for Ag. 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

Final Summary

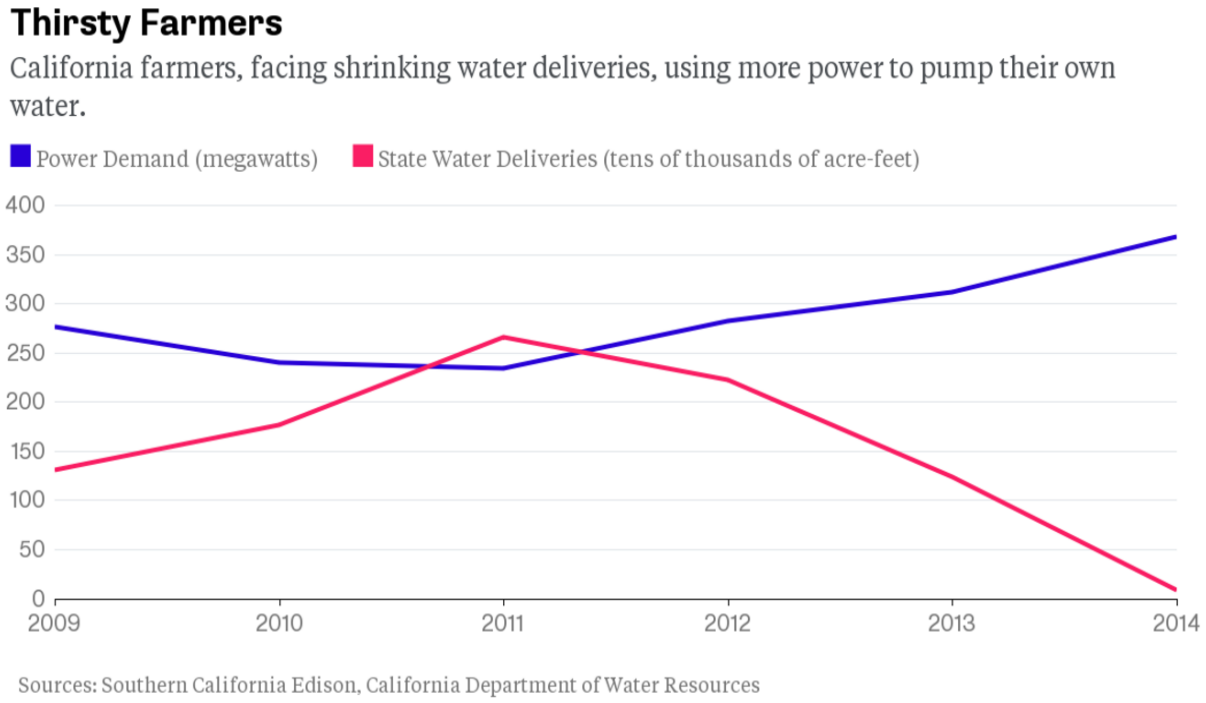
I. Measure Mix Reduction
II. Efficient Technology Program
III. Integrating Finance
IV. Emerging Markets
V. Trusted Partner Marketing

QUESTIONS?

Appendix

Impact of the Drought on SCE and farmers

Change	Impact
Increase in the number of new and existing Ag & Domestic pump service requests	80 MW (equivalent of 10 circuits) of load added 2014 of which approximately 70% was Ag related
Each SCE Area Planner currently working on 20-40 pump work orders	Planning approved 130 work orders in March 2015 for a total of 5,075HP



Impact on Farmers

"We are using about two-and-a-half times more power than we would in a normal year," Fresno ranch owner

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

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

Additional Ag Trends

Drought Impacts:

- Longer the drought lasts – more fields will be fallowed or used for other purposes
- More energy will be needed to extract water from wells
- Production/job loss due to reduced acreage
- Increased conversion of fields to power production (PV)
- Increase in acceptance and adoption of technology solutions to sustainability challenges (sub-surface irrigation, greenhouses, photovoltaic systems)

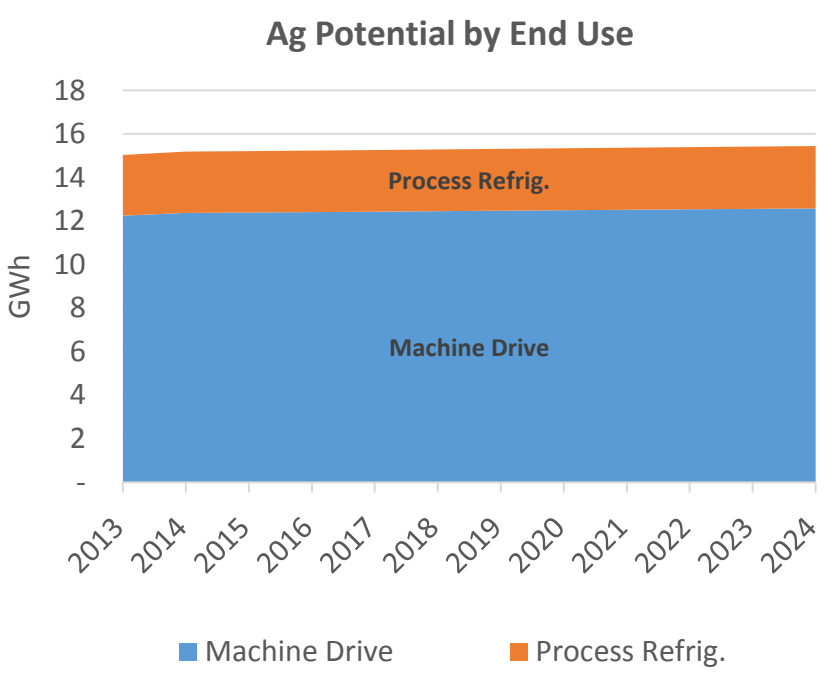
Renewable Generation:

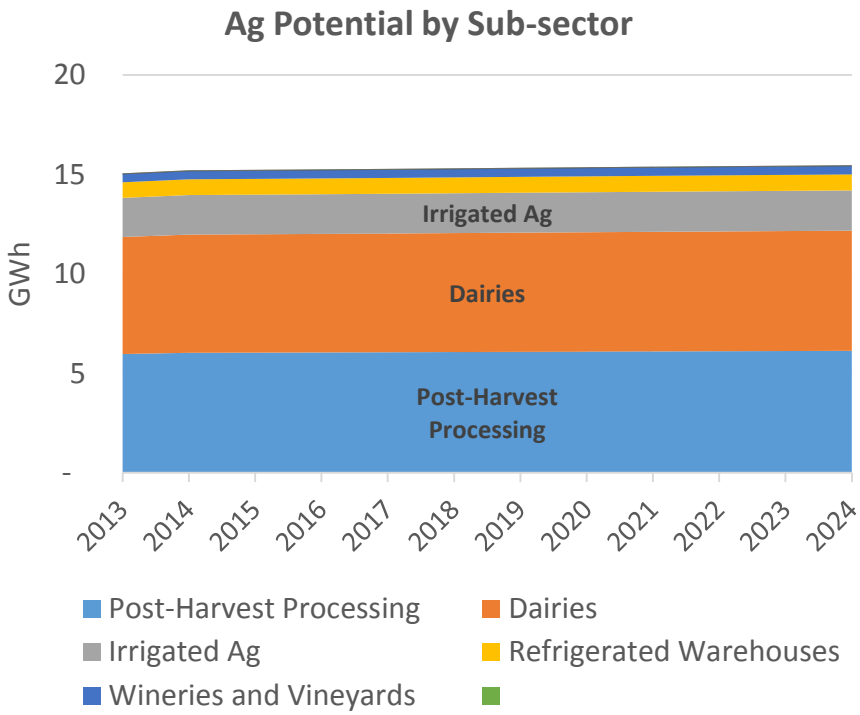
- Increase in NEM - May prevent SCE from providing EE Opportunities/Pump Testing services

Source: SCE Ag Segment Optimization Plan, 2012

CPUC EE Potential Study Analysis

- Top End Use: Machine Drive (e.g., pumps)
- Top Sub-sectors: Post-Harvest Processing (e.g., nut shelling), Dairies, and Irrigated Ag





Source: Navigant potential study by SCE territory. Potential savings does not include C&S.

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Overview of Ag EE Programs (not including Cross-cutting)

Program	Summary
Ag Core	• Calculated and Deemed rebates to incent efficiency equipment • Retrocommissioning for efficient equipment operation • Energy Advisor for audit and benchmarking services • **Pump Test Services for specialized efficiency services for pumps**
Continuous Energy Improvement	• Promote Strategic Energy Management planning • Impacted by drought, where water availability became more important to participants than continuing with electricity-related CEI
Third Party Programs	• Food & Kindred Products (where processing occurs at the farm)

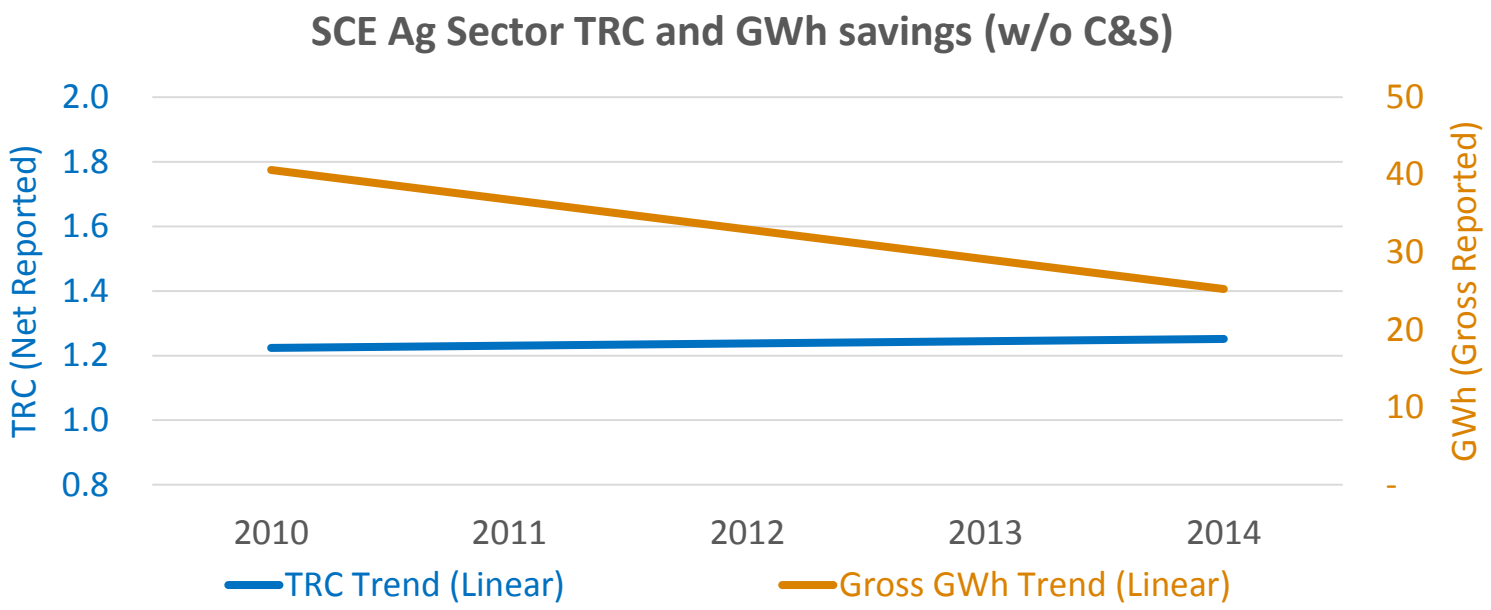
Marketing Challenges

- High cost segment to service due to diverse and geographical challenges
- Still resistance to change in adoption of technological solutions
- Prefer one on one customer contact and education – High value on relationships
- Set “windows of opportunity” to meet with the decision makers
- Too many programs confuse and overwhelm, causing them to not participate or participate in the wrong program
- Program requirements are seen as overly burdensome and onerous

Source: SCE Ag Segment Optimization Plan, 2012

Ag Sector Cost-Effectiveness Overview

Cost-effective potential is decreasing (total savings dropping to maintain cost-effectiveness)



Past Drivers of Ag sector cost-effectiveness and savings

- Simpler incentive application process
- The drought has increased the cost for pump overhauls by more than double

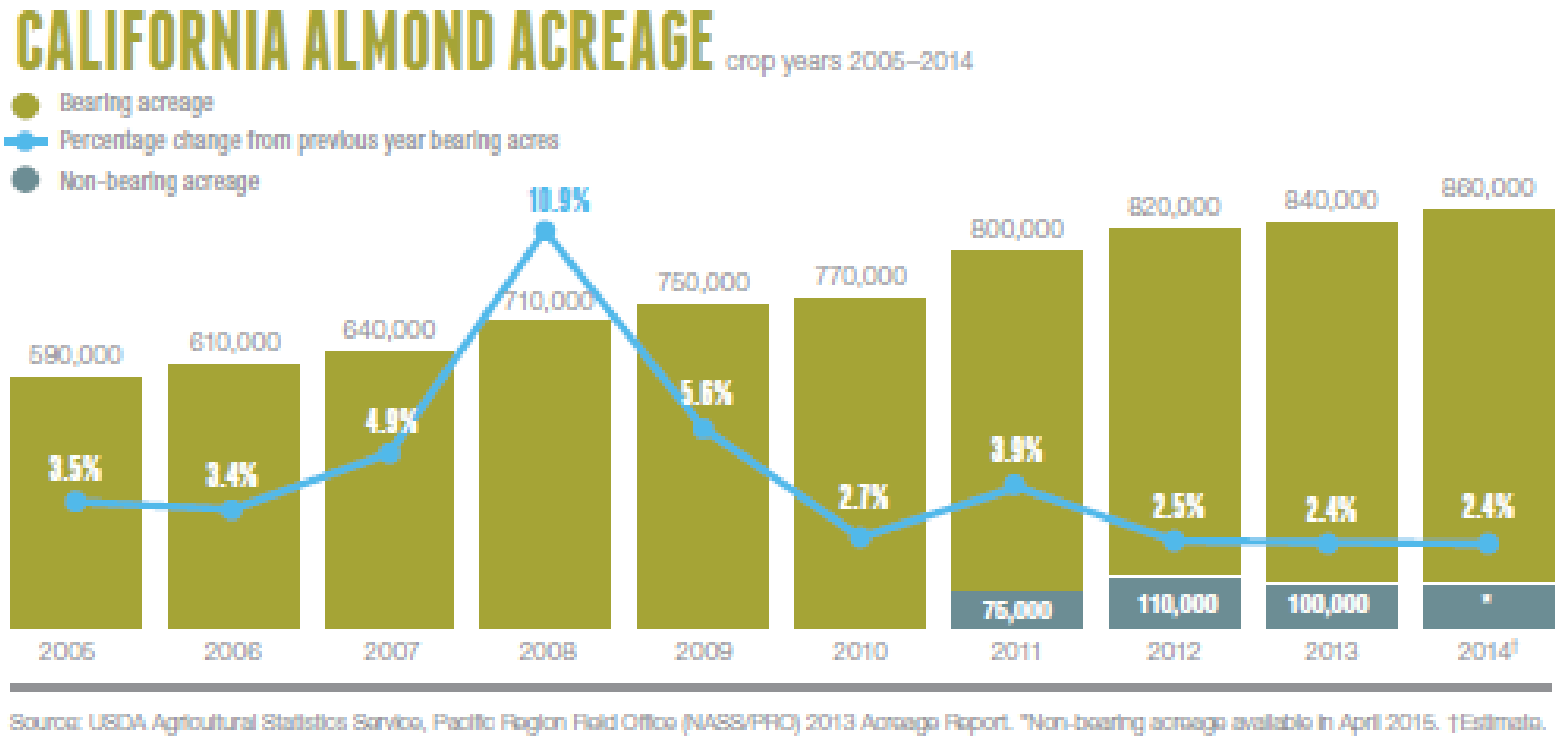
Future Drivers of Ag sector cost-effectiveness and savings

- Ineligibility of Ag Pump Overhaul measures
- Matching energy efficiency technology to solutions for sector's sustainability challenges

Source: EEStats (does not include non-resource program costs embedded in cross-cutting programs (e.g., ET, WE&T, etc.) and C&S cost and benefits

CA Almond Industry Characterization

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



Almond Almanac 2014, Almond Board of California

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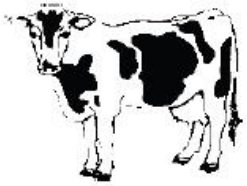
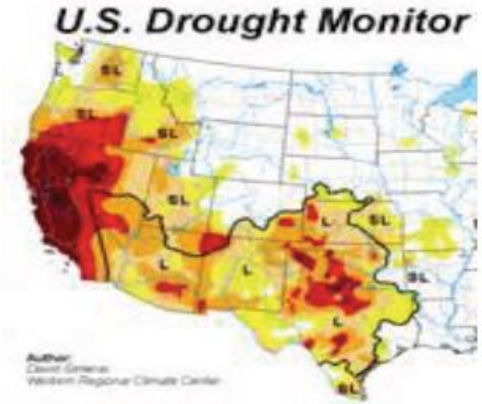
CA Grapes Industry Characterization

- California is the fourth leading wine producer in the world, behind Italy, France and Spain
- 5,900 = total number of winegrape growers
- 4,100 = total number of bonded wineries
- 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

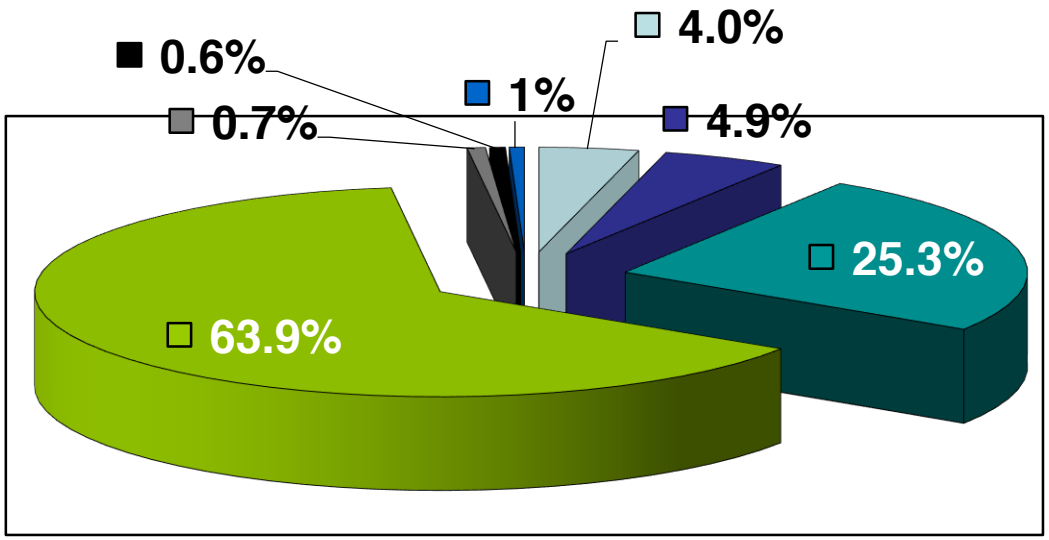
Challenges Facing Dairy Industry



- Severe drought in West is limiting water supplies for crop irrigation and livestock
- Dramatic rise in water cost and drilling for ground water with land subsidence
- Reduced availability of local feed supplies with significant increase in cost of cattle feed
- Rising cost of fertilizer
- Managing manure wastes
- Increasing salinity of ground water
- Declining water and air quality
- Situation is threatening survivability and sustainability of dairy industry, some are going under or shutting down



SCE Ag Background – Where are they located in SCE Territory?



Source: SCE Ag Segment Optimization Plan, 2012