

NAVIGANT

ENERGY

Agriculture Energy Efficiency: a view from California

Prepared for National Symposium on Market Transformation



April 22, 2015



DISPUTES & INVESTIGATIONS • ECONOMICS • FINANCIAL ADVISORY • MANAGEMENT CONSULTING

Introduction

Data Collection Activities

- » Sustainability Forums
 - 2 forums of 12 – 18 growers
 - Focus on programmatic needs
- » Subject Matter Interviews
 - 16 telephone interviews
 - Focus on market structure, technologies, energy efficiency drivers and barriers
- » Qualitative Interviews
 - 47 telephone interviews
 - Focus on market trends, costs, regulations and reference partners
- » Technical Survey
 - Telephone screening (95) and 1 to 2 hour on-site survey (86)
 - Focus on energy management, energy efficiency adoption, waste, water and information sources
 - Growers, warehouse operators and post-harvest processors

Key Learnings

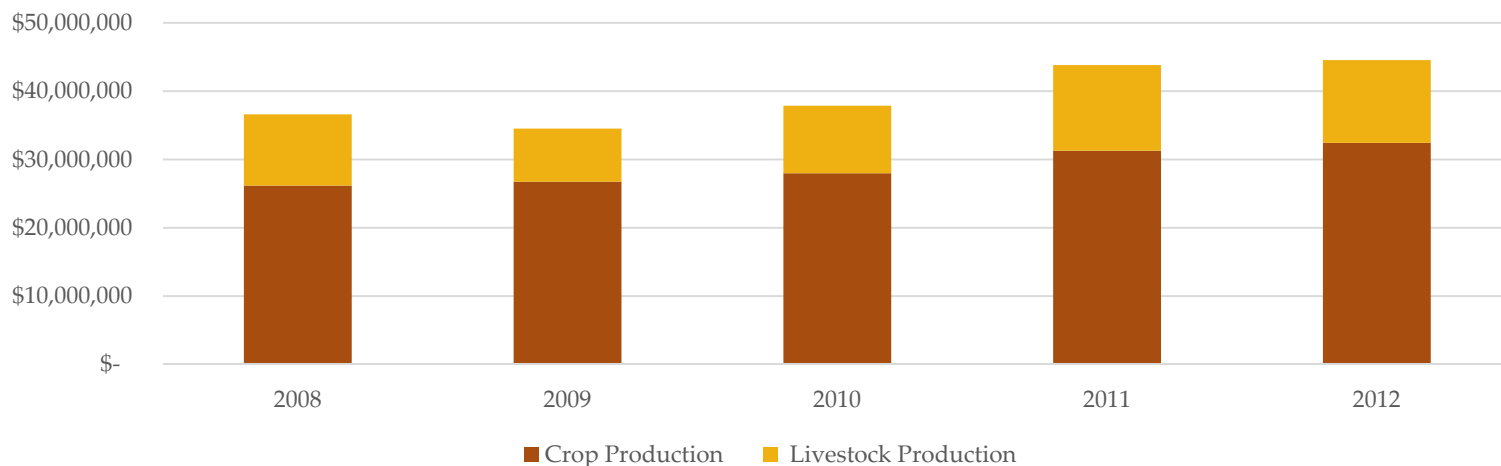
- » Agricultural customers are difficult for utilities and implementation contractors to understand
 - Present company excepted
- » Agriculture loads may be growing in unexpected directions
 - 16 telephone interviews
 - Focus on market structure, technologies, energy efficiency drivers and barriers
- » Program opportunities parallel those found in food processing

Characterization of California Agricultural Sector

2012 Census of Agriculture reaffirmed California's leadership in Agricultural production

- » \$44.7 Billion in farm output value (not including food processing)
- » 11% of national total
- » 350 crop and livestock commodities
 - One-third of national vegetable output
 - Two-thirds of national fruit and nut output

California Farm Output: 2008 - 2012



Differentiation » NAICS Codes

NAICS does not adequately segment or differentiate agricultural production for the purpose of DSM planning

- » Code designations are commonly out of date and do not reflect land use changes
 - Production shifts from field crops to orchards
 - Transition to new lines of business
 - Commercial warehousing
 - Cemeteries
- » Farm operations extend beyond primary crop or livestock production
 - Post-harvest processing
 - Greenhouse operations for seedlings
 - Machine shops
 - Residences

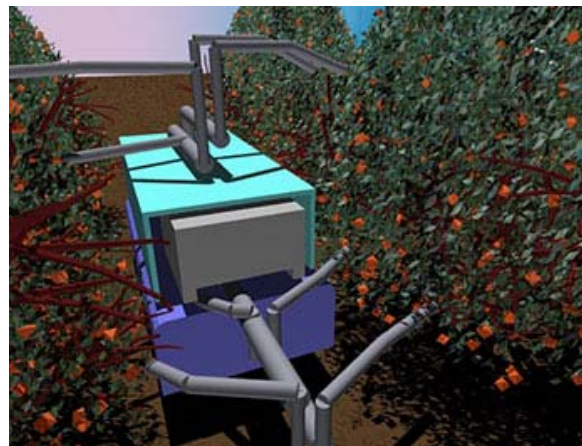
Differentiation » What actually happens on the farm

Water use and labor trends are more pertinent differentiators

- » Water – access to water will be a primary driver of electricity consumption for crop production
 - Deeper wells
 - Greater delivery distances



- » Labor – uncertain access to farm labor will increase mechanization
 - Greenhouses, nurseries and mushroom producers are already experimenting with automation



Needs of the Agricultural Sector

Farmers and ranchers want to produce as much product per acre as they can (and still make a profit).

- » Energy efficiency is not a major concern of the majority of California growers and ranchers (as expressed in surveys, interviews and forums to Navigant staff)
- » Growers vet new ideas with their community before taking action
 - Multi-generational businesses
 - Familial connection
- » Sustainability (i.e. staying in business) during a mega drought, is the major concern
- » For any DSM program planning, consider these three questions:
 - What is the most energy efficient method to secure access to water?
 - How can growers select automation options that minimize load growth?
 - How do energy projects affect existing regulatory burdens?

Innovators

On-farm DSM innovation correlates to vertical integration with food processing

- » Continuous process improvement approaches from food processing serve as a good examples for farmers and ranchers
- » Existing sanitary/phytosanitary protocols serve as good examples of data tracking and management
- » Center energy and water sustainability around management systems rather than equipment (pumps and lighting measures)

Key Lessons

On-farm DSM innovation correlates to vertical integration with food processing

- » Develop better utility data for agricultural customers
- » Focus on management systems rather than equipment
- » Parallel existing information infrastructure
- » Focus on integrating DSM into grower/rancher concerns:
 - Water
 - Labor
- » Do not add to regulatory burden

Key CONTACTS



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