



# **SDG&E Agricultural Sector Market Study**

## *Final Report*

*Advice Letter 2627-E-A/2309-G-A (U902-M)  
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## Executive Summary

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This study assesses the effectiveness of San Diego Gas & Electric's (SDG&E's) agricultural sector energy efficiency incentive programs and offers recommendations for improvement.

### Research Objectives

The objectives established for this study include the following:

- Provide real-time feedback to program implementers with specific focus on improving program recruitment and delivery.
- Identify both implementation and program design problems for review and modification.
- Identify barriers and obstacles to meeting program goals.
- Assess the effectiveness of the programs.
- Provide recommendations for improvement including comparisons to current industry best practices and other California Investor-Owned Utility (IOU) programs.

### Data Collection and Analysis Methods

Our approach included three components:

- In-depth interviews with one of two main trade industries (the San Diego Flower and Plant Association) and SDG&E program staff.
- Mail survey of agriculture customers in SDG&E's service territory.
- Review of SDG&E and other California IOU agricultural program offerings and comparison to industry best practices.

### Summary of Results

Below are the findings from our research:

- SDG&E agriculture customers are interested in saving water, and are also interested in water-related measures.
- Agriculture customers may be more receptive to marketing and measure offerings if they are described in their own industry terms.
- When presenting to trade associations, SDG&E program managers use case studies that feature participating customers.
- Customers report lack of awareness and lack of having enough information as the two largest barriers to participating in SDG&E's programs.
- It is unclear if SDG&E incentivizes suggestions made through the Water Infrastructure and System Efficiency Program (WISE) inspection are incentivized.
- There are additional measures that save energy in this sector offered by other (non SDG&E) utilities that SDG&E might consider offering.

- About half of customers report that rebate amounts are too low, and most of the remainder report that the rebate amounts are just right. The presentation of the greenhouse curtain in square feet is complicated for customers to calculate.
- Crop-producing customers report that they would be a lot more likely to participate in SDG&E's offerings if there was the ability to get incentives at the supplier level.

Based on the study findings, we make the following recommendations for SDG&E to consider:

- Focus on both money and water savings wherever possible when marketing energy efficiency options to the agriculture sector. SDG&E could consider marketing their on-site audit as an irrigation checkup in order to appeal to the customer desire to save on water costs.
- Utilize agriculture specific terms for measures that can be utilized across industries in order to improve the odds that agriculture customers who are looking for assistance will easily find their offerings.
- Expand the use of customer testimonials to SDG&E's website.
- Continue working with industry organizations to inform and educate customers with the intent of increasing awareness of program offerings.
- Add clarity to documentation about WISE so that customers are aware of steps and offerings that follow an inspection.
- Research and consider additional measures presented in Section 3 of this report.
- Consider changing the way that the greenhouse cover is presented (and calculate the incentive per roll rather than per square foot).
- Consider a midstream rebate approach for crop producing (indoor and/or outdoor) growers.
- Consider connecting the data collected in the mail survey to customer information.

# 1 Introduction

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This study assesses the effectiveness of San Diego Gas & Electric's (SDG&E's) agricultural sector energy efficiency incentive programs and offers recommendations improvement.

## 1.1 Research Objectives

The major objectives established for this study include the following:

- Provide real-time feedback to program implementers with specific focus on improving program recruitment and delivery.
- Identify both implementation and program design problems for review and modification.
- Identify barriers and obstacles to meeting program goals.
- Assess the effectiveness of the programs.
- Provide recommendations for improvement including comparisons to current industry best practices and other California Investor-Owned Utility (IOU) programs.

## 1.2 Data Collection and Analysis Methods

Our approach includes three components:

- In-depth interviews with the San Diego Flower and Plant Association and SDG&E program staff.
- Mail survey of growers, greenhouse managers, egg ranchers and other agriculture-related enterprises in the SDG&E territory.
- Review of SDG&E and other California IOU agricultural program offerings and comparison to industry best practices.

### ***In-depth Interviews***

Evergreen conducted two telephone interviews: one with the San Diego County Flower and Plant Association and another with the staff member at SDG&E who performs outreach to the agricultural sector. We spoke with three members at the San Diego Flower and Plant Association about their opinions on program offerings and incentive levels. We also spoke with the SDG&E staff member about program offerings and outreach efforts. Findings from both interviews were used to inform the creation of the customer mail survey, which can be found in Appendix D.

### ***Mail Survey of SDG&E's Agricultural Businesses***

Through analysis of customer data, SDG&E identified three types of customers found in its service territory:

- Growers
- Greenhouses
- Egg ranchers

We worked with the San Diego County Farm Bureau to deliver a one-page, two-sided mail survey to 1,500 agriculture customers in SDG&E's service territory. By delivering surveys through the Farm Bureau, we were able to reach a large group of customers through a trusted source. The survey was printed on Farm Bureau letterhead. Surveys were delivered to the Farm Bureau on December 15, 2014, and the Farm Bureau addressed the surveys to their members and placed them in the mail on December 18 and 19.

The mail survey was intended to address the following research questions:

- Are you aware that SDG&E offers assistance to agricultural customers like you to help them save energy?
- Do you find offerings in the grower/agriculture catalog limiting?
- What factors related to operations hinders you from taking advantage of rebates?
- What would you find compelling that would move you to participate?
- Are there other technologies related to agriculture that you would like to see offered or rebated?
- Would a free, no cost audit make you more likely to participate in energy efficiency programs?
- Are the incentive levels adequate to ensure participation or would reasonable increases help the program reduce the barriers?

We made an effort to increase the response rate by including a pre-addressed stamped envelope and a two-dollar bill as an incentive.

The survey was in the field from December 19, 2014 to March 1, 2015. Over this period of time, we received a total of 452 responses of the 1,500 surveys that were sent, for a total response rate of 30 percent. We excluded 28 of the 452 responses from our analysis because the responses were from people who are either currently not farming, are not connected to SDG&E's electricity grid, are not the target respondents, or did not answer any questions. With the removal of the 28 invalid responses, the response rate is 28 percent.

### ***Review of Agricultural Program Offerings***

We reviewed SDG&E's current program offerings to inform our approach to the trade ally interviews and the design of the mail survey. We also reviewed the other California IOU agricultural program offerings as well as industry best practices (Section 3), which serve as context for the analysis and development of recommendations for possibly improving program offerings going forward.

The remainder of the report is organized as follows:

## 2. Customer Mail Survey Results

## 3. Agricultural Energy Efficiency Landscape

#### 4. Conclusions and Recommendations

Appendix A: In-depth Interview Questions for SDG&E Agricultural Sector Market Study  
(SDG&E Program Staff)

Appendix B: In-depth Interview Questions for SDG&E Agricultural Sector Market Study  
(San Diego Flower and Plant Association)

Appendix C: Mail Survey for SDG&E Agricultural Sector Market Study

Appendix D: In-Depth Interview Summary Memo

Appendix E: Responses to Recommendations



## 2 Customer Mail Survey Results

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This section presents the results of our agriculture customer mail survey. The section is organized as follows:

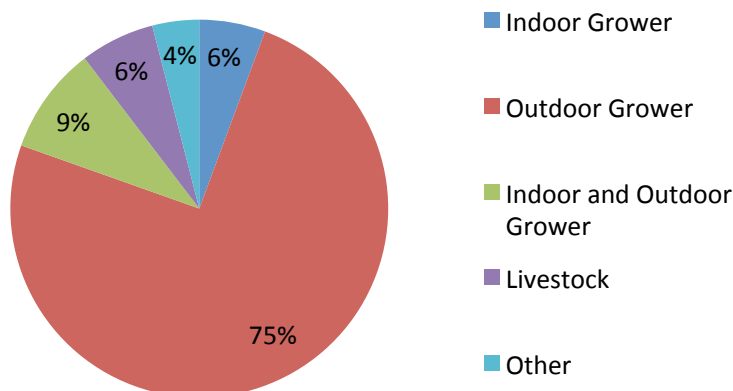
- Customer Profile
- Awareness and Past Participation
- Interest in Offerings
- Barriers to Participation
- Rebate Pricing

Throughout the section, we identify any meaningful and significant differences across customer type and survey responses and note these in the text.

### 2.1 Customer Profile

To develop a profile of San Diego County agriculture customers, we analyzed the 424 valid survey responses by customer type.

**Figure 1: Self Reported Farming Sector (n=424, Q10: Which of the following best describes your business?)**



Customers are categorized into five groups in Figure 1: indoor grower, indoor and outdoor grower, outdoor grower, livestock and other.<sup>1</sup> The figure shows that the majority of the agriculture customers that we heard from in San Diego County are strictly outdoor growers (75%) with an additional 9 percent of respondents having both indoor and outdoor farms.

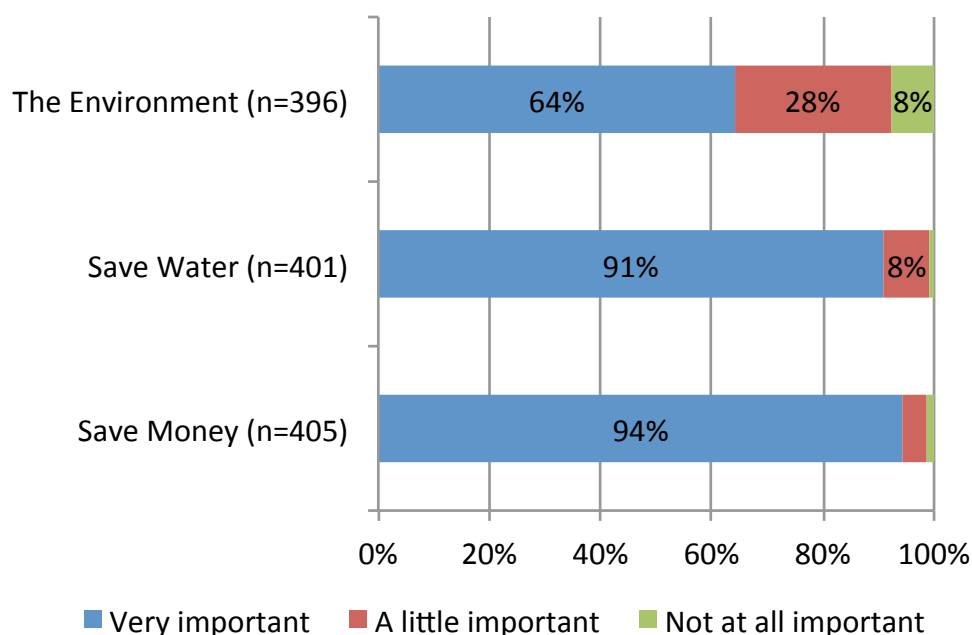
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<sup>1</sup> This category contains unknown business types, nurseries and miscellaneous agriculture businesses.

For our analysis purposes, livestock (6%) includes horses, cattle, egg farmers<sup>2</sup> and beekeepers.

In order to better understand customer actions, we asked farmers what motivates them to save energy. They were prompted to respond regarding the importance of three motivating factors: saving water, saving money and saving the environment.

**Figure 2: Customer Motivation for Saving Energy (Q7: How important are each of the following motivations for saving energy?)\***



\*Excludes responses that were blank or missing.

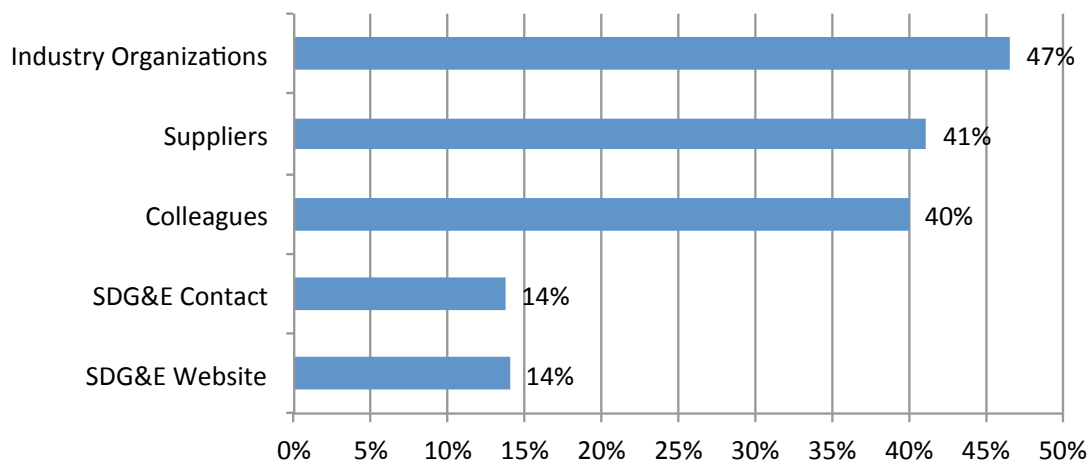
As shown in Figure 2, money and water were the two most important motivators, with 94 percent of respondents saying that saving money is very important and 91 percent of respondents saying that saving water is very important. Significantly more respondents said that money and water savings were more important motivators than said that saving the environment was an important motivator.

We also investigated whether motivations differed across farming sectors, but found that there were no significant differences.

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<sup>2</sup> We only received valid responses from a total of three egg farmers.

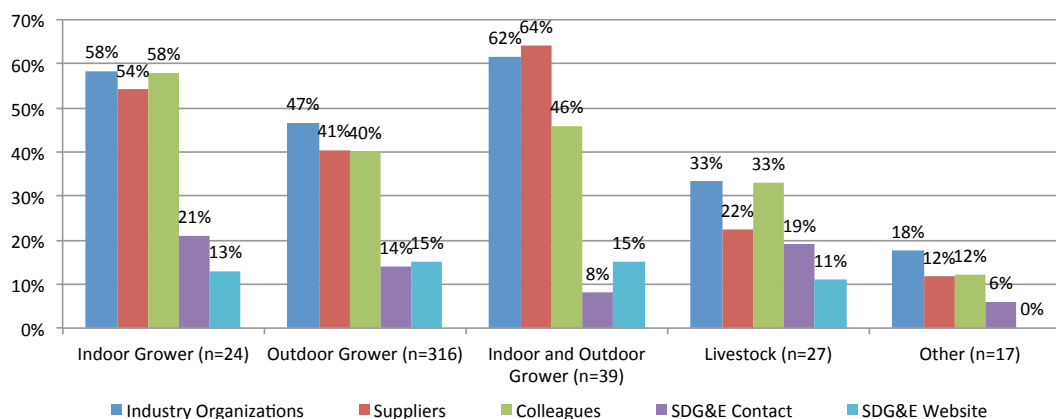
**Figure 3: Information Sources for How to Save Energy (n=423, Q6: *Where do you look for information about how to save energy?\**)**



\*Excludes responses that were blank or missing. Multiple responses allowed. Additional sources (to the five listed on the survey) were noted by two percent or less of all respondents and are therefore excluded here.

We asked respondents “Where do you look for information about how to save energy?” A significantly higher proportion of respondents receive their information from industry organizations, suppliers and colleagues when compared to an SDG&E contact or website (Figure 3). SDG&E’s agricultural sector program manager works directly with and through the relevant Trade Associations, often presenting at association meetings and collaborating with association leaders on energy efficiency messaging and communications. SDG&E likely influences some of the information that industry associations disseminate to their members.

**Figure 4: Reported Sources of Information, by Customer Type (n=423, Q6)\***



\*Excludes responses that were blank or missing. Multiple responses allowed.

We also looked at customer sources for information on how to save energy by customer type (Figure 4). We found that there are no significant differences between the types of sources used across crop-producing customer types (indoor only, outdoor only, and indoor/outdoor growers), but did find significant differences when comparing crop-producing customers to livestock producers and other customer types. Livestock-producing customers make up a much smaller part of the agriculture industry in San Diego County compared to crop-producing customers, so it is likely that there are fewer industry organizations.

Significantly more of the crop-producing farmers report receiving information from industry organizations, suppliers and colleagues when compared to the “other” customer category. We also found that indoor/outdoor growers are significantly more likely to get information from suppliers than livestock-producing customers. This finding suggests that while a midstream supplier-based approach may work for crop-producing growers, it would be less effective for other customer types and livestock-producing customers.

## 2.2 Awareness and Past Participation

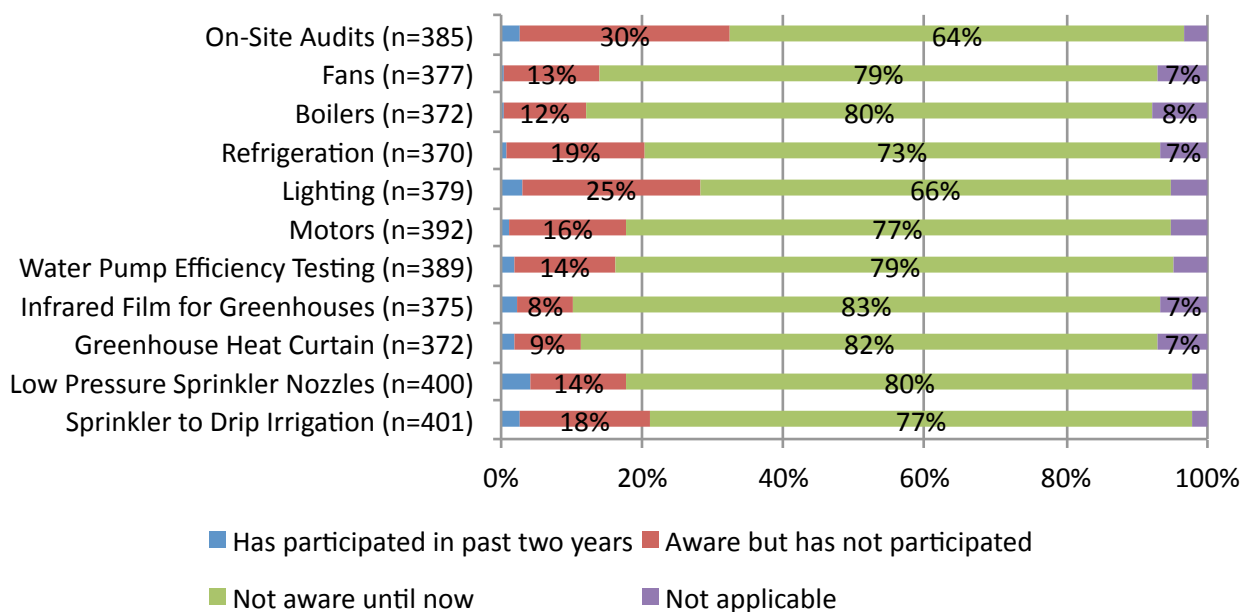
In this section, we examine respondent awareness of measures and whether they had received them in the past through an SDG&E program. The measures (all currently offered by SDG&E) included:

- Sprinkler to drip irrigation
- Low pressure sprinkler nozzles
- Greenhouse heat curtains
- Infrared film for greenhouses
- Water pump efficiency test
- Motors
- Lighting

- Refrigeration
- Boilers
- Fans
- On-site audits

This list was determined through discussions with SDG&E staff, review of SDG&E product catalogs, and our in-depth interview with the San Diego County Flower and Plant Association. For each offering, we asked whether the respondent was aware of the program or had participated in the past two years.

**Figure 5: Awareness and Self Reported Participation by Measure (Q1: For each offering listed below, please tell us if your business a) was not aware of the offering until now, b) was aware of the offering but hasn't taken advantage, or c) has participated in the SDG&E program and received that offering in the past two years)\***



\*Excludes responses that were blank or missing. While "not applicable" was not a response option on the survey, some participants wrote it as their response to this question. We have included this response here.

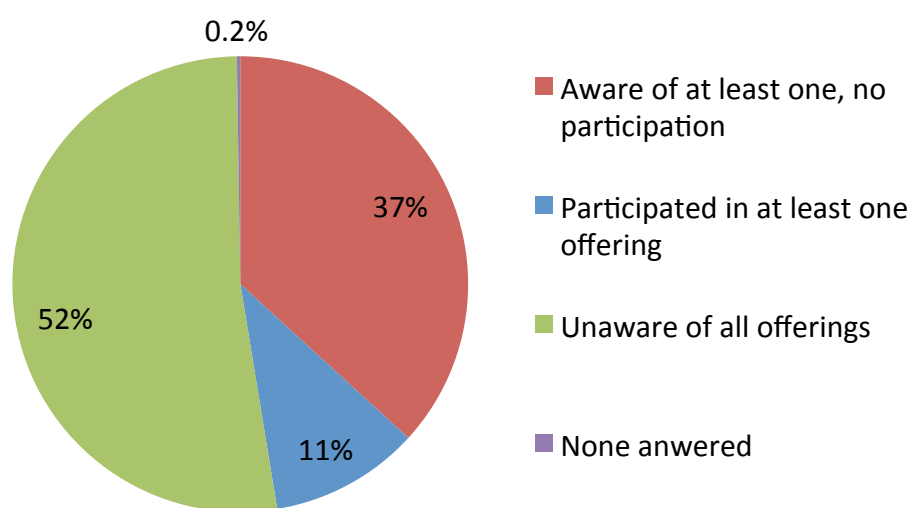
Figure 5 shows awareness and self-reported participation for each of the incentive program types (based on included measures) to understand if customers are more experienced (in terms of either participation or awareness) with certain offerings. For each measure, the majority of respondents reported being unaware of the measure. It is important to note that lack of awareness does not mean that they had not received marketing and information from SDG&E, but that they could not recall the measure.

The proportion of customers who reported being unaware of measures was significantly lower for on-site audits than for all other measures except lighting. Lighting had the second

lowest proportion of customers who reported being unaware, which was significantly higher than for all other measures except audits, sprinkler to drip irrigation and refrigeration.

The proportion of customers who were unaware of greenhouse-specific measures (greenhouse heat curtain and infrared film for greenhouses) was significantly higher than for all measures except boilers and sprinkler nozzles.

**Figure 6: Awareness and Self-Reported Participation in Relevant Measures (n=424, Q1)**



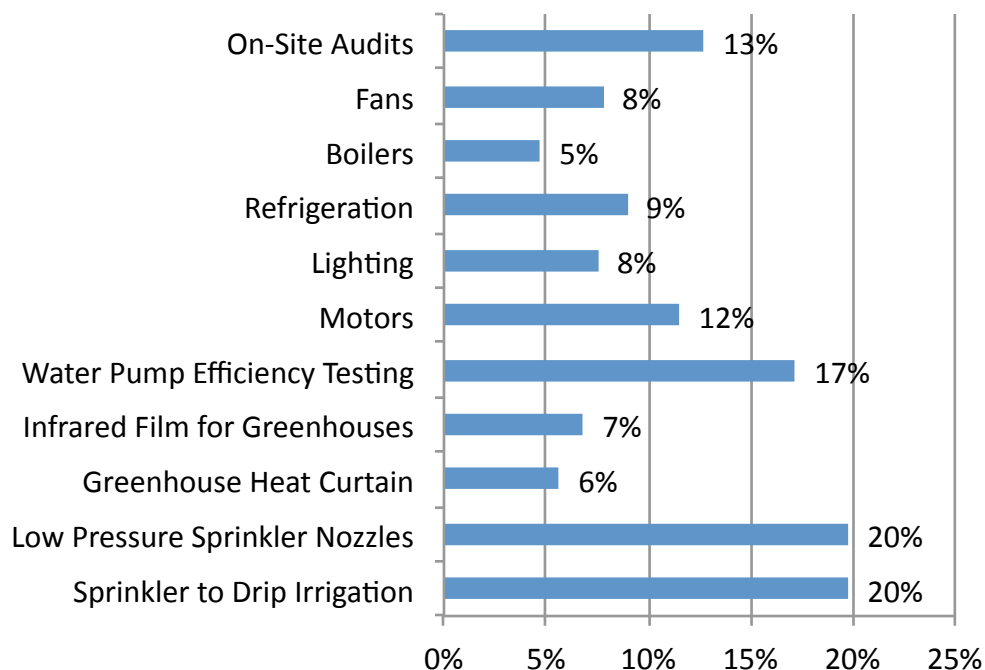
Next, we present awareness and participation across all measures and for all respondents. As shown in Figure 6, more than half of respondents were unaware of all measures from our list, and only 11 percent reported receiving one or more measures through an SDG&E program.

We investigated participation rates across customer types and found that there are no significant differences.

### 2.3 Interest in Offerings

As a follow up to the questions of awareness, we asked about the level of interest in the same group of measures. In this section, we examine customer interest in each measure type.

**Figure 7: Percent of Respondents that were Interested in Measure<sup>3</sup> (n=424, Q2, What products or services, if any, are you interested in from list?)**

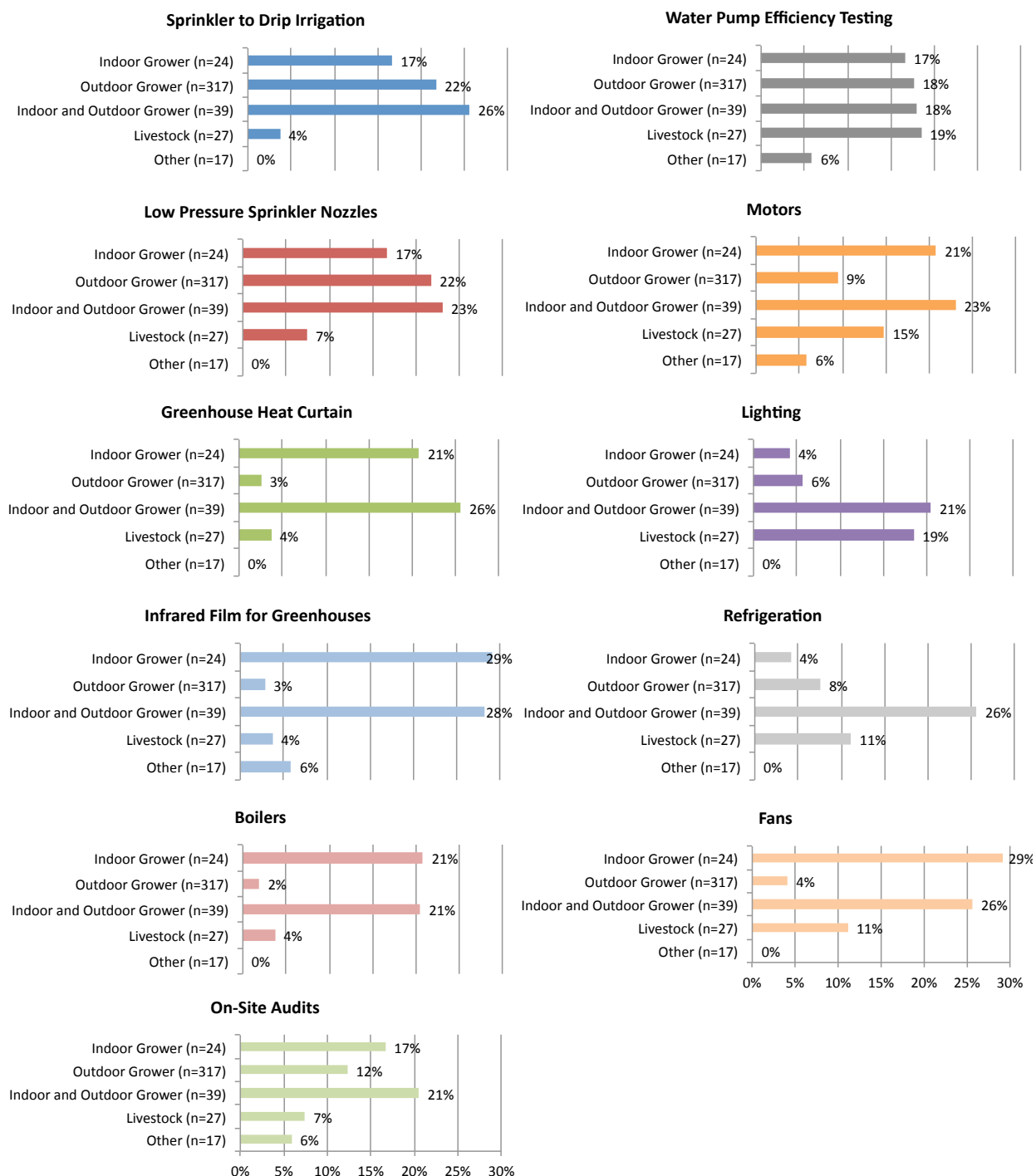


Awareness ranges from 5 to 20 percent of respondents across measures. Figure 7 shows that customers were significantly more interested in water-related measures, including sprinkler to drip irrigation (20%), low pressure sprinkler nozzles (20%), and water pump efficiency testing (17%) compared to the other eight (non water) measures. This aligns with customer motivations shown in Figure 2 where 91 percent of respondents said that saving water is very important as a motivator to save energy. In marketing documentation that we reviewed on SDG&E’s website, we did not see mention of water savings related to SDG&E’s energy efficiency offerings; though there may be other marketing materials and messages that mention water.

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<sup>3</sup> This excludes customers who reported having received the measure from an SDG&E offering sometime in the past two years.

**Figure 8: Percent Interested in Each Offering by Customer Type (Q2)\***



\*Excludes responses that were blank or missing.

Figure 8 shows measure by customer type. Indoor crop growers report higher interest in measures across the board rather than in one specific type of measure. Indoor growers are



significantly more interested in boilers and fans when compared to outdoor growers and are significantly more interested in infrared film when compared to outdoor growers and livestock-producing customers. This is unsurprising given the nature of their operations.

Respondents could write in additional measures that they were interested in. Responses included: solar measures (PV panels, well pumps; 3%), irrigation systems (automated, efficient; less than 1%), wells (less than 1%), carbon credits (less than 1%), and generators and related fuel (less than 1%).

## 2.4 Barriers to Participation

We asked respondents about barriers to participation with two survey questions. For both questions, the sources for barriers and program options were from industry research and in-depth interviews (see Appendix D). The first question (Q4) asked customers to indicate whether potential barriers are either large, small or not a barrier. The list of barriers included:

- They do not know how much longer they will be in business;
- They do not own the property;
- The incentive amount does not make it worth their time and money;
- They do not have enough time to make upgrades;
- They do not have enough money to replace the equipment;
- They do not have enough information about the offerings; and
- They were not aware of the offerings for agricultural customers.

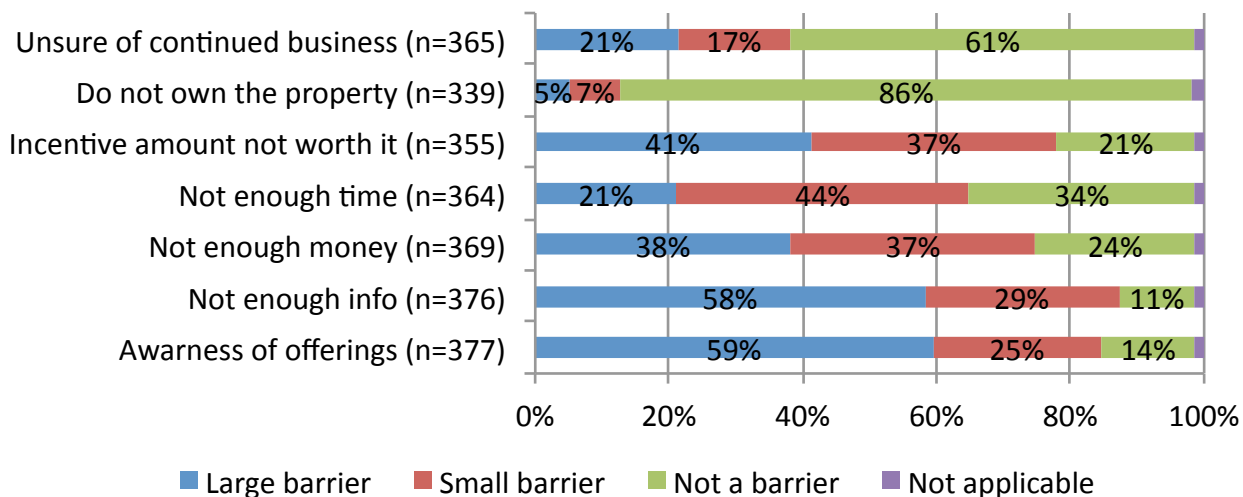
The second question we asked (Q5) related to a list of program features or elements. For each of the three items (listed below), we asked customers to note if it would make them more likely to take advantage of SDG&E's agricultural customer offerings, a little more likely to participate, or if it would have no effect. The three features listed were:

- Having the rebate deducted from their suppliers' invoice (midstream rebate);
- Getting a free energy audit; and
- Removing the requirement for a pre-inspection for the greenhouse curtain.

### 2.4.1 Barriers to Current Program Offerings

In this section we review barriers specific to the program offerings.

**Figure 9: Barriers to Taking Advantage of SDG&E's Program Offerings (Q4, Indicate which of the following is a large barrier, a small barrier or not a barrier)\***



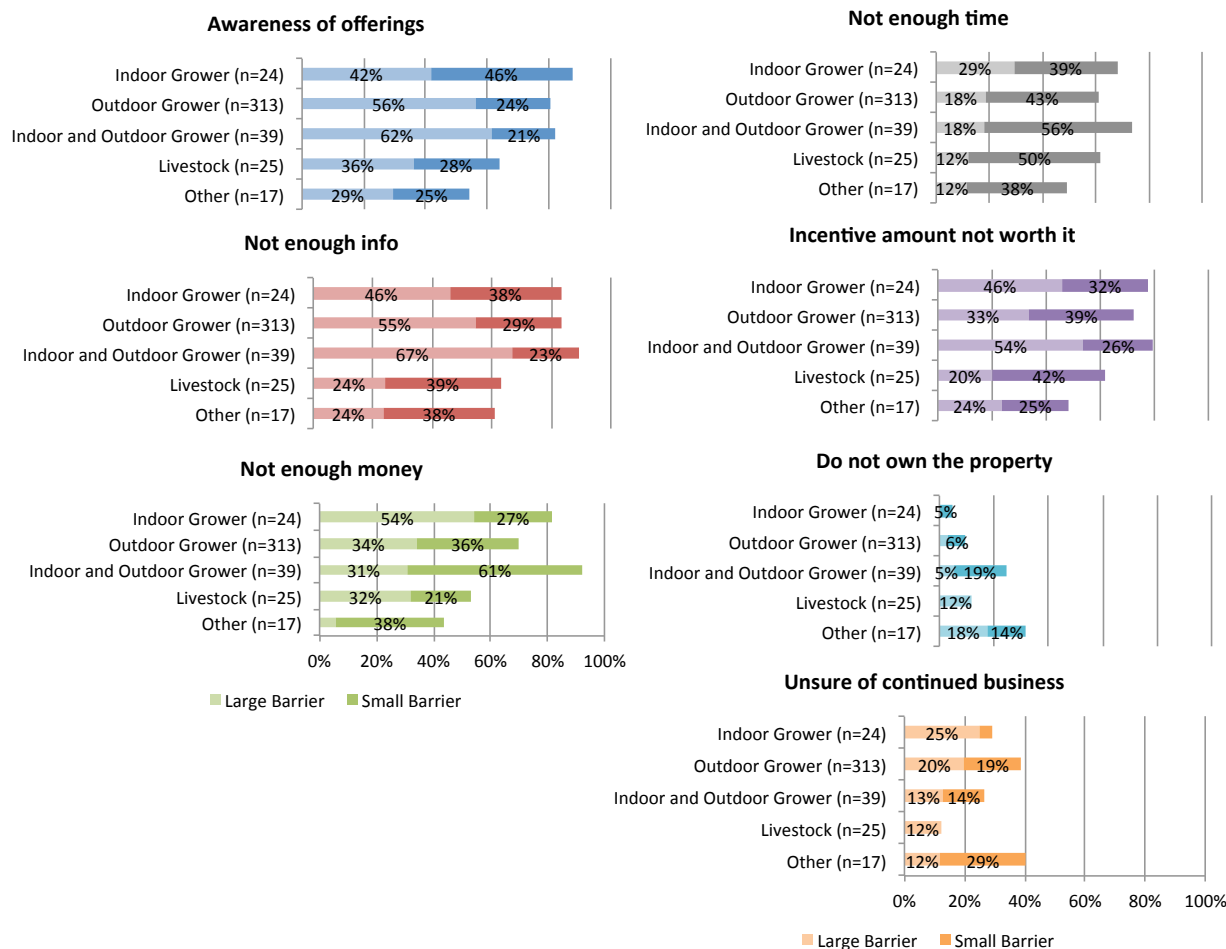
\*Excludes responses that were blank or missing.

Figure 9 shows the proportion of respondents who reported that a barrier was a large barrier, small barrier, or not a barrier for each of the seven potential barriers that were listed on the survey.

The two largest barriers reported by customers were lack of information (58%) and/or not being aware of offerings (59%). Not being an owner is a barrier for a significantly small proportion of agricultural businesses in San Diego County.<sup>4</sup> Customer concerns about going out of business was a significantly lower barrier compared to not having enough time to make upgrades or not having enough money to replace equipment.

<sup>4</sup> Eighty-five respondents left the question blank (not applicable) but some owners may have selected “not a barrier”.

**Figure 10: Barriers to Taking Advantage of SDG&E's Program Offerings by Customer Type (Q4)\***



\*Excludes responses that were blank or missing. Multiple mentions allowed.

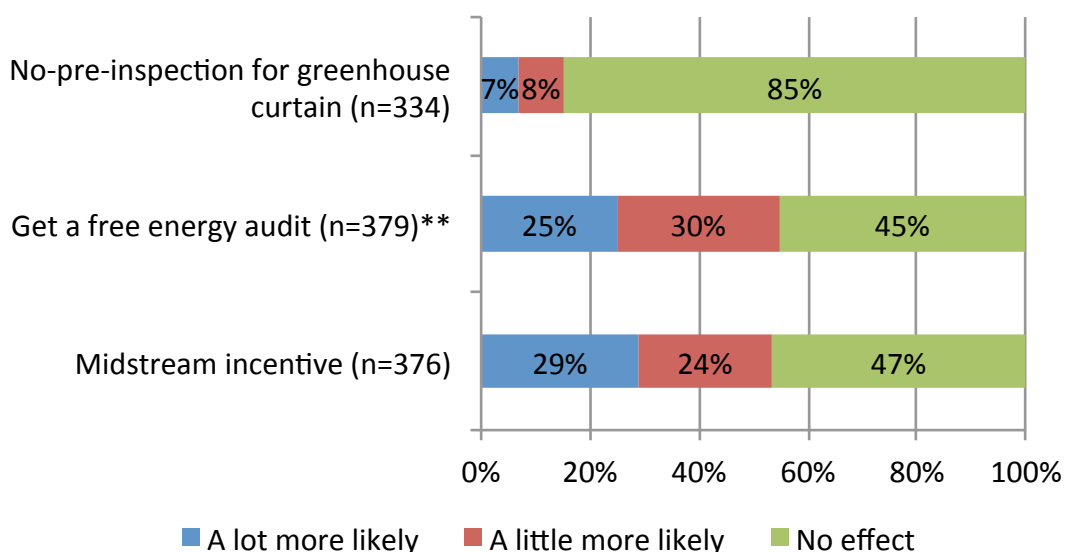
We also examined barriers by customer type (Figure 10). We found the following significant differences:

- **Lack of information** was a more significant barrier for indoor/outdoor growers and outdoor growers than it was for other customer types.
- **Lack of money** was a more significant barrier (both large and small) for more indoor/outdoor growers than for livestock producers and other groups.
- **Business security** is a more significant barrier (both large and small) for more outdoor growers than it is for livestock producers.

## 2.4.2 Barriers Related to Program Features

This subsection reviews the effect of different program strategies on reducing participation barriers.

**Figure 11: Influence of Program Changes or Elements on Likelihood to Participate (Q5: Below is a list of features. For each, please tell us if this would make you a lot more likely to take advantage of SDG&E's agricultural customer offerings, a little more likely to participate, or if it would have no effect.)\***



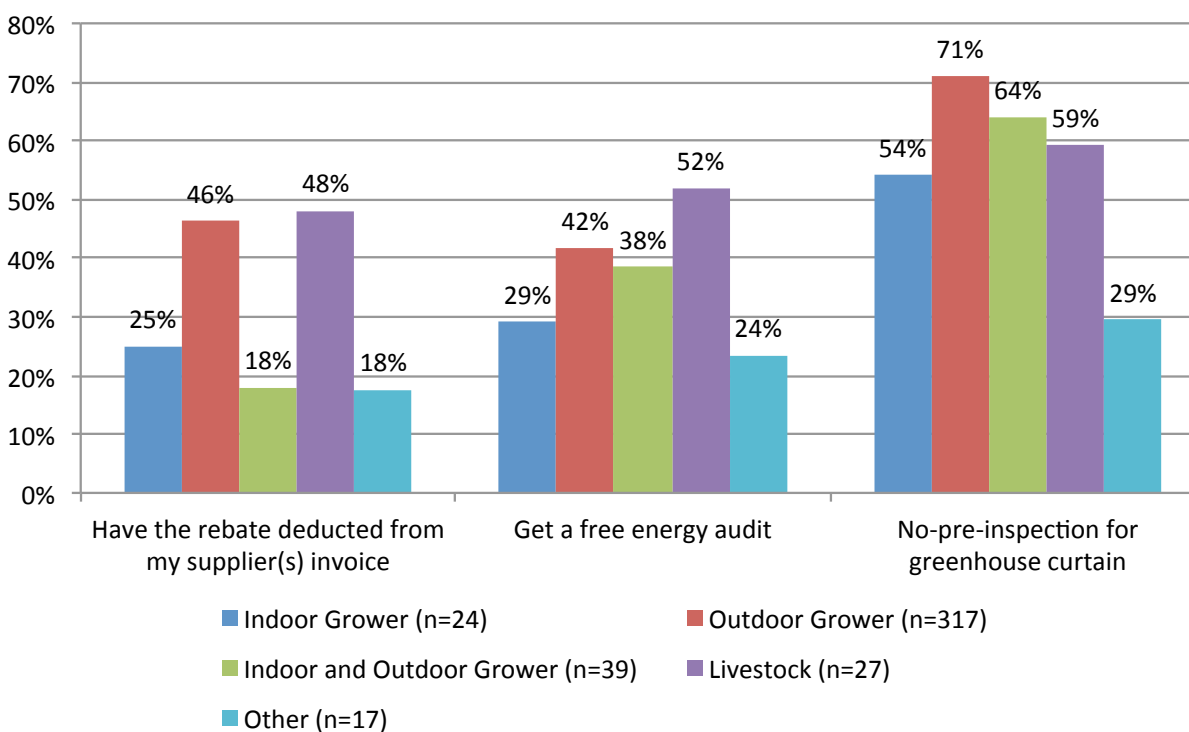
\*Excludes missing responses along with respondents where relevant measure was reported as N/A in Q1.

\*\*Current Program feature.

Figure 11 shows the three program elements that were presented to respondents in order to understand if each program feature would make respondents a lot, a little or not at all more likely to participate in the program. The figure shows that removing the inspections requirement for green house curtains (which is a current requirement) would have no reported effect on the majority of customers. Eighty-five percent of customers remark that this change would have no effect. Fifty-eight percent of indoor growers report that removing the requirement would have no effect.

Figure 11 also shows that free energy audits (a current feature) would increase the likelihood of participation for more than half of respondents, with 25 percent reporting that they would be a lot more likely to participate. The same is true of a midstream incentive (not a current feature) with 29 percent responding that they would be a lot more likely to participate.

**Figure 12: Percent of Customers that Said “A lot more likely” Regarding Influence of Program Changes or Elements on Likelihood to Participate by Customer Type (Q5)\***



\*Excludes missing responses along with respondents where relevant measure was reported as N/A in Q1.

Figure 12 explores the influence of program features by customer type. The most effective strategy for increasing participation among the crop-producing customers is removing the pre-inspection.

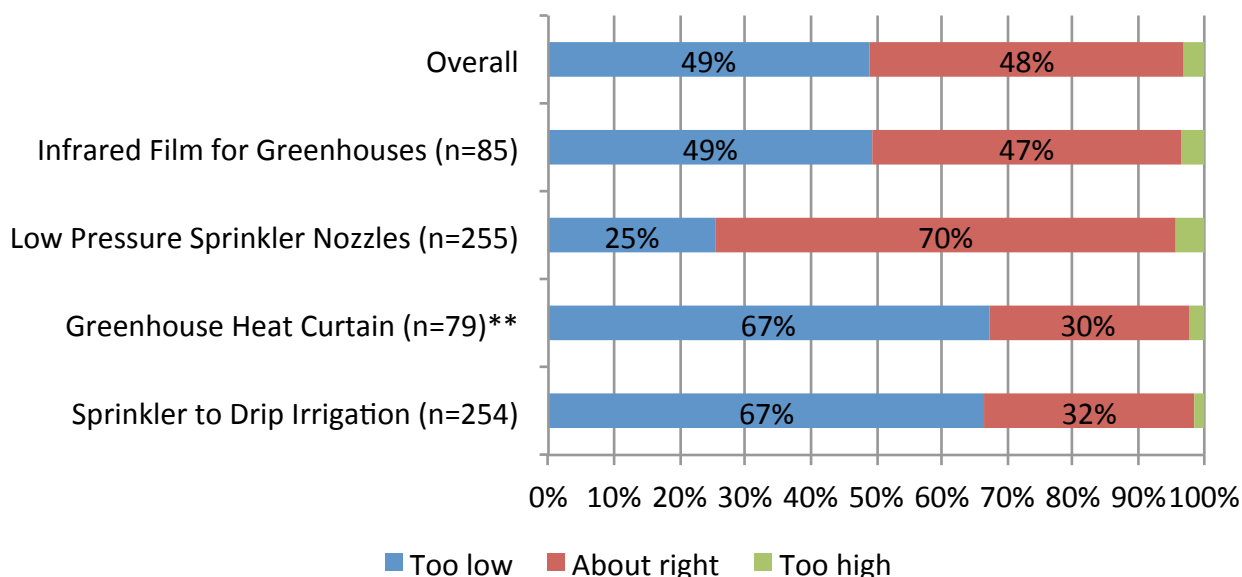
## 2.5 Rebate Pricing

We asked SDG&E’s agriculture customers for their opinions on the incentive amounts for the agricultural specific offerings, including:

- Sprinkler to drip irrigation (\$44/acre);
- Greenhouse heat curtain (\$0.40/square foot);<sup>5</sup>
- Low Pressure Sprinkler Nozzles (\$1.15/nozzle); and
- Infrared film for greenhouses (\$0.05/square foot).

<sup>5</sup> The survey had the incorrect price listed for this measure (\$0.04 per square foot rather than the actual \$0.40 per square foot).

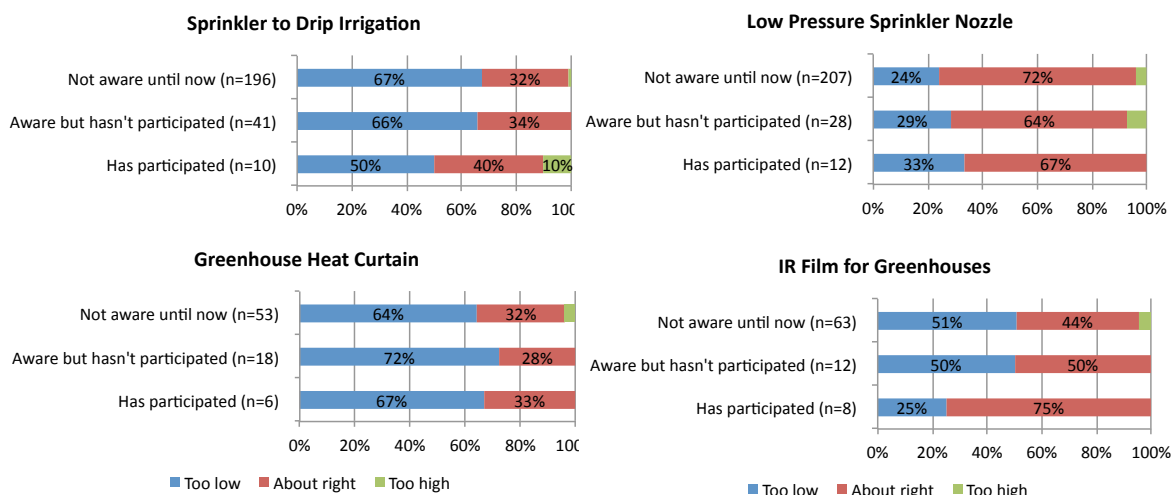
**Figure 13: Respondent Opinions Regarding Current Incentive Amounts (Q3, For each example below, please indicate whether you think the following rebate amounts are too low, about right or too high to motivate you to adopt these measures.)\***



\*Excludes not answered and not applicable. \*\* The survey had the incorrect price listed for this measure (\$0.04 per square foot rather than the actual \$0.40 per square foot).

We gave respondents three options: Is the incentive too low, about right or too high? Nearly half of all respondents reported that incentive amounts were too low, and half reported that incentive amounts were about right (Figure 13). Significantly more respondents reported that that the low-pressure sprinkler nozzle incentive was about right when compared to responses for the other measures.

**Figure 14: Opinions Regarding Incentive Amount for Four Offerings by Awareness and Participation (Q3)\***



\*Excludes missing responses along with respondents where relevant measure was reported as N/A in Q1.

We investigated whether there is a relationship between customer perceptions of incentive amounts and whether they had participated or were interested in participating. Figure 14 shows that whether a customer has participated is not indicative of their opinions about incentive levels. Statistically equal proportions of self-reported participant and non-participant customers believe that incentive levels are too low, too high or just right across all four measure categories.<sup>6</sup>

<sup>6</sup> Note that the overall n for each measure is low, especially for greenhouse-specific measures.

### 3 Agricultural Energy Efficiency Landscape

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Evergreen Economics performed research in order to understand the landscape in which San Diego County agriculture customers operate in addition to where they fit within the state's agriculture sector as a whole. We then looked outside of California to identify relevant programs, measures and strategies that are not currently a part of SDG&E's offerings. The following sections are organized as follows:

- San Diego County Agriculture Sector Overview
- California Agriculture Program Review
- Outside of California Agriculture Program Review

Evergreen Economics focused reporting of the landscape findings on those that are most salient to SDG&E's agriculture customers based on what we learned through program interviews and the mail survey results. In addition to taking into account the specific customer types that responded to the mail survey, we considered that customers have a strong desire to save water, lack awareness of program offerings, and believe that energy audits may lead to more holistic participation in SDG&E's offerings.

#### 3.1 San Diego County Agriculture Sector Overview

In this section, we review the landscape in which San Diego County growers operate. It is important to consider that San Diego County houses a unique agriculture community with smaller than average farms, a dry climate, high water costs and many high value per acre crops.

According to the San Diego County Farm Bureau, San Diego County has the 12<sup>th</sup> largest farm economy among more than 3,000 counties in the United States and is comprised of a total of 6,000 farmers. Sixty-five percent of farms in the county have fewer than 10 acres each.

San Diego has a Mediterranean climate and a high cost of water (over \$600/acre foot). According to a University of California, Davis, report, San Diego County growers pay some of the highest water prices in the state; the report notes that water rates in the County "can be as high as 30-times more than those of the Central Valley Project or the Imperial Irrigation District."<sup>7</sup>

The dry climate and high water costs necessitate that growers produce high value crops.<sup>8</sup> San Diego County ranks in the top ten counties nationally for production of avocados,

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<sup>7</sup> <http://cesandiego.ucdavis.edu/files/54278.pdf>

<sup>8</sup> <http://www.sandiegocounty.gov/content/dam/sdc/awm/docs/2013%20Crop%20Report%20-%20Copy.pdf>



nursery crops, honey, lemons, strawberries and egg-laying hens. The county also ranks in the top ten in terms of acres of guavas, pomegranates, limes and macadamias.

**Figure 15: 2013 Agriculture Production as Percentage of Total Monetary Value**

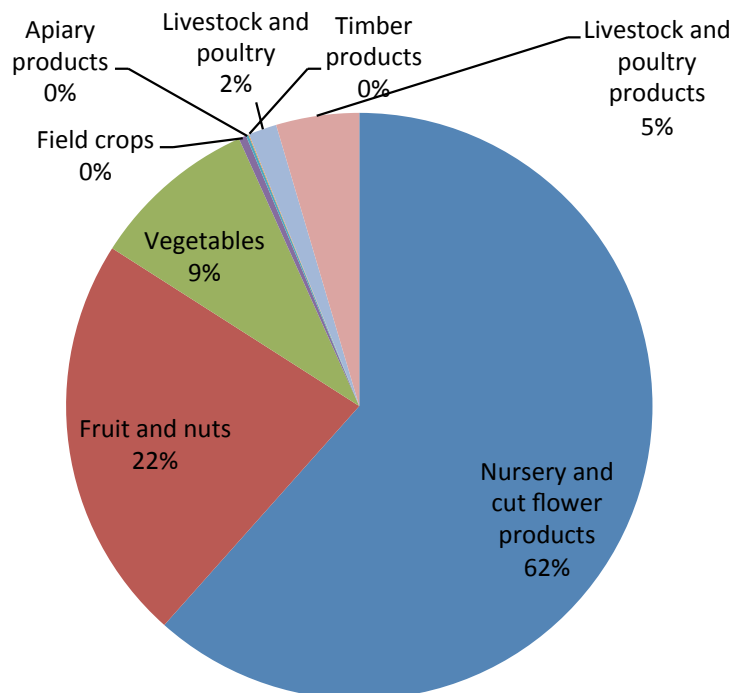


Figure 15 reports San Diego County agriculture production as a percentage of total monetary value and shows that 62 percent of the total value came from nursery and cut flower products in 2013.

### 3.2 California Agriculture Program Review

In this section, we introduce the California IOU program structure and then explain relevant offerings from SDG&E for their agricultural customers. We then review offerings or strategies from the other California IOUs that may be beneficial for SDG&E agriculture customers.

### 3.2.1 Statewide IOU Agriculture Program

The California IOUs' Statewide Agriculture Energy Efficiency Program works with irrigated agriculture growers, post-harvest processors,<sup>9</sup> greenhouses and dairy farmers to deliver a suite of products and services through four subprograms:

- **Agriculture Energy Advisor:** Provides audits, benchmarking, pump tests, and financial analysis.
- **Agriculture Deemed Energy Efficiency Program:** Provides incentives for mass marketed efficiency measures at set prices.
- **Agriculture Calculated Energy Efficiency Program:** Provides a more customized calculation method that may include comprehensive design assistance.
- **Agriculture Continuous Energy Improvement:** Provides long term and strategic energy planning by reintroducing the importance of energy management.

### 3.2.2 SDG&E Agricultural Offerings

There are four grower-specific items in SDG&E's rebate catalog:

- Drip irrigation sprinklers
- Low pressure nozzles
- Greenhouse heat curtains
- Infrared greenhouse film

In addition to these grower-specific items, growers can take advantage of additional commercial customer deemed and custom measures including water pump testing, water pump upgrades, variable speed drives on pumps, energy audits, lighting, refrigeration, motors, air to air heat exchangers, boilers, outside air economizers, electronically commutated motor fans, energy management system and fans. They can also take advantage of time of use rates.

Many of the items listed above were recommended for agriculture customers in our research of other programs and offerings outside SDG&E territory with regards to saving energy in the agriculture sector, suggesting that SDG&E provides many of the appropriate offerings for this sector. The remaining research is dedicated to identifying any additional measures that SDG&E may want to consider adding to their suite of offerings.

### 3.2.3 Other California IOU Agricultural Offerings

We looked at the offerings of other California IOUs to identify offerings or marketing messages that are not currently offered by SDG&E but may be beneficial for its agriculture customers. Our research focused on livestock, indoor and outdoor farms and excluded processing and dairy farms (that are a large part of the California agricultural sector, but a

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<sup>9</sup> Processing is likely only served by the Agriculture Program when the processing is integrated with the growers.

smaller share of the SDG&E customers compared to the other IOUs). Below are the programmatic aspects, strategies and measures that may be beneficial for SDG&E to consider.

- **Single agriculture catalog or web page:** The way the agriculture-specific rebates are presented to customers on utility websites vary for each IOU. According to the SDG&E website, the agricultural catalog was recently combined into the “other technology” catalog. Pacific Gas and Electric Company (PG&E) presents all of its agricultural and food-processing items in one catalog, and Southern California Gas Company (SoCalGas) has one web page for the agricultural sector. We suggest that SDG&E consider creating a central place or document for agricultural customers to use that presents the suite of measures in which they may be interested (see list in Section 3.2.3) without creating the need to sort through measures that are not industry specific.

Our mail survey findings show that indoor and indoor/outdoor growers are more likely interested in a suite of measures (motors, boilers, fans, on-site audits, infrared film for greenhouses, and greenhouse heat curtains) rather than just a single measure. By creating marketing material that contains all of these measures in one place, customers will have an easier time accessing the full suite of offerings.

- **Presentation of agriculture-related measures using agriculture terminology:** SDG&E offers many of the same measures as other IOUs but does not always use (e.g., on its website) the terminology utilized in the agriculture sector. By using agriculture-specific terms, SDG&E can improve the odds that agriculture customers who are looking for assistance will easily find their offerings. Measures that are currently offered at other IOUs with agriculture-specific language include:
  - **Agricultural Irrigation Pump Variable Frequency Drives (VFD):** SDG&E incentivizes VFDs but does not refer to them in relation to agriculture irrigation pumps.
  - **Horizontal Air Flow Fans:** SDG&E offers incentives for a variety of fans but does not use the specific terminology that agriculture customers are familiar with.
  - **Root Zone Heating:** While SDG&E has many custom heating options, using the terminology “root zone heating” would make it more identifiable to agricultural customers.
- **Presentation of agricultural irrigation pump overhaul evaluation next steps:** SDG&E uses its Water Infrastructure and System Efficiency Program (WISE) to offer evaluations of agriculture water pump equipment. The available information refers

to rebate programs to offset upgrades, but more detail is not easily available.<sup>10</sup> We recommend that SDG&E provide additional clarity on the upgrade rebates that are available after the evaluation. PG&E presents the upgrade options in its agriculture catalog and offers rebates on a wide variety of pump systems or pump system improvements including turbine, submersible well, submersible booster, or centrifugal pump system overalls, and turbine booster or well pump systems.

- **Addition of natural ventilation:** Natural ventilation can allow for improved air flow in greenhouses by adding side wall vents, ridge vents and controls.<sup>11</sup> Natural ventilation is more efficient if these measures are incorporated as greenhouses are built. This is recommended in PG&E's documentation on agricultural offerings<sup>12</sup> and, given the temperate nature of San Diego County, may be a useful option for customers.
- **Use of customer testimonials:** SDG&E presents customer examples in its presentations to trade ally groups. A review of IOU websites found that SoCalGas presents customer testimonials<sup>13</sup> on its website. If SDG&E also added customer testimonials to its website, it may reach a wider audience, including agricultural customers, directly.<sup>14</sup>

### 3.3 Outside of California Agriculture Program Review

Evergreen Economics performed a review of other (non California IOU) agricultural customer programs or strategies used across the United States. In this section, we identify measures<sup>15</sup> that are incentivized elsewhere or were identified as a tool to help reduce energy use in the agricultural sector that were not already reported on previously in this section. We organized each measure by application in the following subsections:

- Irrigation
- Greenhouses
- Egg Farms
- Livestock

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<sup>10</sup> <http://www.sdge.com/water-infrastructure-and-system-efficiency-program>

<sup>11</sup> <http://massfarmenergy.com/wp-content/uploads/2014/03/Passive-Ventilation-Tip-sheet.pdf>

<sup>12</sup>

[http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/agriculture/pge2001mo\\_collateral\\_factsheets\\_greenhouses.pdf](http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/agriculture/pge2001mo_collateral_factsheets_greenhouses.pdf)

<sup>13</sup> [www.socialgas.com/for-your-business/agriculture/agriculture-testimonials.shtml](http://www.socialgas.com/for-your-business/agriculture/agriculture-testimonials.shtml)

<sup>14</sup> Fourteen percent of customers in our mail survey reported that they use the SDG&E website as a source of information on ways to save energy.

<sup>15</sup> Our research found no programs that are radically different from SDG&E's programs in terms of approach, so this section focuses on measures rather than program strategies.

We also reviewed measures related to refrigeration (in the context of food storage) but found no measures that SDG&E does not already offer.

### 3.3.1 Irrigation

In our mail survey, we identified that customers are more interested in water-related measures than non-water-related measures. The measures listed below could be marketed to customers for both their water saving and energy saving elements.

- **Scientific irrigation (thermal irrigation monitoring or scientific irrigation scheduling):** We reviewed two products that use technology that monitors and evaluates soil conditions to more efficiently allocate water. ICAROS has a product that uses thermal energy technology to identify areas with inefficient irrigation.<sup>16</sup> The product also helps to detect pest infestation, which was reported as a major problem faced by SDG&E's agriculture customers in our in-depth interviews. Using soil moisture monitors, weather station data, and analysis of evapotranspiration rates, Energy Trust of Oregon works with a third-party vendor that uses the above data to save energy by as much as 10 percent.<sup>17</sup> Energy Trust of Oregon delivers its incentive to customers at the end of the growing season.
- **Low Energy Precision Application (LEPA) irrigation:** This type of irrigation works for row crops and uses applicators placed about a foot off the ground. This more precise application reduces evaporation losses. Washington State University is working with the Bonneville Power Association to investigate the technology as it compares to Mid-Elevation Spray Application (MESA).<sup>18</sup> SDG&E may want to review research of this application in warmer climates such as the research done by Texas A&M AgriLife in partnership with the Texas Alliance for Water Commission.<sup>19</sup>
- **Solar well pump:** Solar powered well pumps are able to pump water during the sunny part of the day, when water is needed most. This would likely be incentivized through the Self-Generation Incentive Program (SGIP), which is administered by the Center for Sustainable Energy in SDG&E's territory. While this does not fit in to one of SDG&E's current programs (downstream or custom), it may be useful to include when presenting a holistic list of options to agriculture customers.
- **Gooseneck elbow for drop tubes:** Drop tubes allow water to be released lower to the ground (with less wind interference) and allow water to be spread over a larger area. The gooseneck elbow allows the higher sprinkler to be covered for the

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<sup>16</sup> <http://www.icaros.us/solutions/agriculture-forestry/>

<sup>17</sup> <http://energytrust.org/industrial-and-ag/incentives/agriculture/irrigation-equipment/scientific-irrigation-scheduling>

<sup>18</sup> <http://e3tnw.org/ItemDetail.aspx?id=288>

<sup>19</sup> <http://today.agrilife.org/2014/08/05/agrilife-research-study-center-pivot-does-not-always-mean-efficiency/>

addition of the drop tube.<sup>20</sup> Both the Energy Trust of Oregon and Mission Valley Power offer incentives for these.

- **Sprinkler repairs and replacement.** Energy Trust of Oregon and Inland Power and Light Company offer incentives for rebuilt or new sprinklers, drains and gaskets for wheel lines, hand lines or pivot systems, and cut and pipe press repair for leaking lines.<sup>21</sup> Energy Trusts of Oregon also offers incentives for various replacements to impact and low-pressure sprinklers including rotating-type sprinklers and multi-trajectory sprays, and drop tube or hose extensions.<sup>22</sup>
- **Control systems.** Two of the outdoor growers that participated in our mail survey expressed interest in some form of controls. One respondent noted that they would be interested in control upgrades and the other said they would be interested in an automatic valve controller.
- **Irrigation system conversion:** Energy Trust of Oregon offers custom incentives for drip irrigation or linear/pivot system conversions from “big-gun” watering systems.<sup>23</sup> This allows for both increased water and energy efficiency.

### 3.3.2 Greenhouses

Greenhouses make up a significant portion of the agriculture sales in San Diego County. In this section, we identify programs and incentives that exist in other parts of the United States. It is important to keep in mind San Diego’s unique (more temperate) climate when considering these options, which may limit their applicability. We have attempted to note such caveats below.

- **Perimeter insulation:** Perimeter insulation around greenhouses keeps temperatures more constant but may be more valuable in less temperate regions.
- **Greenhouse climate controls:** Wisconsin Focus on Energy offers an incentive to greenhouses for climate controls at the rate of \$0.03 per square foot of controlled area.<sup>24</sup>
- **Triple polycarbonate glazing:** Wisconsin Focus on Energy also offers an incentive of \$0.07 per affected square foot of greenhouse for triple polycarbonate glazing.

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<sup>20</sup> <http://energytrust.org/industrial-and-ag/incentives/agriculture/irrigation-equipment/sprinklers-nozzles-gaskets>

<sup>21</sup> <http://energytrust.org/industrial-and-ag/incentives/agriculture/greenhouse-upgrades/greenhouse-upgrades>

<sup>22</sup> <http://energytrust.org/industrial-and-ag/incentives/agriculture/irrigation-equipment/sprinklers-nozzles-gaskets>

<sup>23</sup> <http://energytrust.org/library/GetDocument/1875>

<sup>24</sup> <https://focusonenergy.com/business/efficient-equipment/agribusiness>

SDG&E agriculture program staff have completed a proposal to the Emerging Technologies group at SDG&E to look at this measure and can review information gathered by Focus on Energy<sup>25</sup> to assist with any further assessment of this measure.

### 3.3.3 Egg Farms

Egg farms can benefit from many of the HVAC-related measures that SDG&E offers. We found one additional measure that may be of interest to SDG&E depending on the heating needs of egg farms in its service territory.

- **Chicken Litter Gasification:** The National Resources Conservation Service and the West Virginia Department of Agriculture have worked together to test a process that turns chicken waste into heat.<sup>26</sup> This heat can be used to warm the space occupied by the birds. The process has the added benefit of creating ash that can be used as fertilizer.

### 3.3.4 Livestock

The livestock measures that we found come from cooler climates and are all related to heating. These measures may be unnecessary in SDG&E territory as only 5 percent of all respondents (livestock and others) were interested in heating measures based on the mail survey. If SDG&E would like to support more efficient heating in the livestock segment, watering systems,<sup>27</sup> heating pads, heating pad controllers and heat lamps<sup>28</sup> may be useful measures for consideration.

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<sup>25</sup> <https://focusonenergy.com/business/efficient-equipment/agribusiness>

<sup>26</sup> <http://www.coaltecenergy.com/wp-content/uploads/2012/05/JanuaryInDEPth.pdf>

<sup>27</sup> <http://www.extension.org/pages/32596/livestock-watering-systems-energy-efficiency-checklist-and-tips#.VP8Q9GTF9zM>

<sup>28</sup> <http://www.cecnet.net/content/agricultural-rebates>

## 4 Conclusions and Recommendations

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This section presents our conclusions and recommendations based on the study findings. We present our conclusions below, followed by conclusions with relevant recommendations in bulleted text.

SDG&E Agriculture customers are significantly more interested in water-related measures (sprinkler to drip irrigation, low pressure sprinkler nozzles and water pump efficiency testing) than other agriculture-related offerings, and significantly more respondents said that money and water savings were more important motivators than saving the environment.

- Wherever possible, SDG&E should focus on money and water savings when marketing its energy efficiency options to the agriculture sector. SDG&E could consider marketing its on-site audit as an irrigation checkup in order to appeal to the customer desire to save on water costs.

Our mail survey findings indicate that indoor and indoor/outdoor growers are more likely to be interested in a suite of measures (motors, boilers, fans, on-site audits, infrared film for greenhouses, and greenhouse heat curtains) rather than being interested in just a single measure.

- SDG&E should consider creating a central place or document for agricultural customers to access that presents the full suite of measures that may be of interest to them.

Our research found three examples of rebated measures that SDG&E could refer to using agricultural-specific language, which might improve uptake. These measures are: agricultural irrigation pump VFDs, horizontal air flow fans, and root zone heating.

- SDG&E should use agriculture-specific terms for measures when marketing directly to their agricultural customers to increase interest, for example:
  - Agricultural Irrigation Pump Variable Frequency Drives
  - Horizontal Air Flow Fans
  - Root Zone Heating

When presenting to trade associations, SDG&E program managers use case studies that feature participating customers.

- SDG&E should expand its use of customer testimonials to its website.

Self-reported participation is low, with customers reporting having received an average of 0.2 items out of 11 relevant offerings. Customers report lack of awareness and lack of having enough information as the two largest barriers to participation. Awareness is lowest for greenhouse measures. Respondents were significantly more likely to get their



information from industry organizations, suppliers and colleagues as compared to an SDG&E contact or website.

- SDG&E should continue working with industry organizations in order to inform and educate customers with the intent of increasing awareness of program offerings.

It is unclear if SDG&E incentivizes suggestions made through the Water Infrastructure and System Efficiency (WISE) Program inspection.

- SDG&E should add clarity to documentation about WISE so that customers are aware of next steps and offerings that follow an inspection.

While SDG&E provides many of the offerings appropriate for this sector, we found additional energy efficient measures that do not exist among SDG&E's offerings. These include natural ventilation, scientific irrigation, low energy precision application irrigation, solar well pumps, gooseneck elbows for drop tubes, sprinkler repairs and replacement, irrigation system conversions, perimeter insulation, greenhouse climate controls, triple polycarbonate glazing, and chicken litter gasification. Note that some of these measures (specifically the ones related to heating and cooling) may not be as appropriate in San Diego County due to the temperate nature of the locale.

- SDG&E should research and consider additional measures presented in Section 3 of this report.

Close to half of all respondents thought that incentive amounts were too low, and half thought incentive amounts were about right. Though we noted that self-reported participants were just as likely to report that rebate levels were too low, even though they said they participated. Likewise, customers may be tempted to say that rebates are too low so they might be increased. There are no downsides for customers indicating they would like to increase rebate levels. These results may be most useful for providing relative comparisons of rebate levels across measures: low-pressure nozzles stood out from the other measures in that respondents were more likely to think that the pricing for that measure was about right. Finally, lack of awareness and information seemed to be a more significant barrier.

We found that the way that the incentive for greenhouse cover rolls (in amount per square foot rather than per roll) is confusing to customers and creates the need for them to multiply and estimate square footage to understand the full cost benefit of the rebate.

- SDG&E may consider changing the way that the greenhouse cover roll is presented (and calculate the incentive per roll rather than per square foot).

Our mail survey found that just over half of respondents said that the ability to receive an incentive at the supplier would make them either a little or a lot more likely to participate in SDG&E's offerings. We also found that indoor/outdoor growers are significantly more

likely to get information from suppliers than livestock customers. Additionally, indoor/outdoor growers are significantly more likely to say that the midstream approach would make them a lot more likely to take advantage of SDG&E's offerings when compared to outdoor growers and livestock customers.

- SDG&E should consider a midstream rebate approach for crop producing (indoor and/or outdoor) growers.

Close to seventy-five percent of customers reported their business name, providing an opportunity to attempt to match to SDG&E's customer tracking data. This matching effort (while not completed for this report) could provide context on the energy usage of a sample of the participating business, and whether size is correlated with customer barriers and drivers to participation. However, we note that attempting to match this data could require substantial effort and not all customers who provided their business name would be successfully matched.

- SDG&E should consider connecting the data collected in the mail survey to customer information.

## Appendix A: In-depth Interview Questions for SDG&E Agricultural Sector Market Study (SDG&E Program Staff)

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This section contains the Memorandum sent to Arnie Garcia on November 14, 2014 that included the in-depth interview questions that were used for a discussion on November 17.

### MEMORANDUM

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November 14th 2014

**To:** Arnie Garcia, San Diego Gas & Electric Company

**Re:** In-depth Interview Questions for SDG&E Agricultural Sector Market Study

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The questions in this memorandum are meant to guide discussion regarding the study of SDG&E agriculture sector customers. The purpose of the study is to assess the effectiveness of the agriculture programs and to develop recommendations for changes to program design or delivery that will improve the effectiveness of the programs and ultimately increase customer participation. We plan to collect customer feedback by sending out 2,000 mail surveys in early December and will complete our analysis in March 2015.

#### Questions

**Q1.** Overview of Mail Survey:

- We plan to send a box of surveys, ready to address, to the San Diego County Farm Bureau. This will include 9x12 envelopes that are already stuffed with the survey, a pre-addressed stamped envelope, and a \$2 bill. We are then hoping that they can print and stick the addresses of their members onto the envelopes and send them out. We are aiming to do this the first or second week of December. As for the mail survey itself; we are aiming for it to be one page front and back and to be printed on the Farm Bureau letterhead (which we assume they can send us digitally).
- We are aiming to work with two organizations to send three reminders to customers targeted for the mailing. We can provide you with text to review for the following reminders:
  - Farm Bureau list serve reminder (timed with mail out)
  - Farm Bureau Q1 email newsletter reminder to complete and turn in survey
  - Flower and Plant Growers Association December newsletter notification of sent survey

- Q2.** Overview of Study:
- Are customers aware that SDG&E offers assistance to them to help them save energy? (Probe on differences by type of customer, size, etc.)
  - What has program participation been like in the past? Does this differ by the type of customer, measures or types of services?
  - What are the major barriers to participation? Does this differ by the type of customer, measures or types of services?
  - Do customers think that the options from SDG&E are limiting? Specific offerings include:
    - Sprinkler to Drip Irrigation (\$44 per acre)
    - Low Pressure Sprinkler Nozzles (\$1.15 per nozzle)
    - Greenhouse Heat Curtain (\$0.04 per square foot and requires inspection)
    - Infrared film for Greenhouses (\$0.05 per square foot)
    - Are there offerings from other programs that the agriculture sector can benefit from? (Probe on differences by type of customer, size, etc.)
  - What gets in the way of customers taking advantage of rebates?
  - What do customers think would help compel them to take advantage of SDG&E's agriculture sector offerings?
  - Are there other technologies related to agriculture that you think customers would like to see offered or rebated?
  - Can you describe past efforts to add/accommodate any requests related to program offerings? Were there any barriers?
  - Would customers be more likely to take advantage of SDG&E offerings if there was a free, no-cost audit available? (Confirm audit options)
  - Do you know what customers think about the amount of the rebates for the various offerings? Do you think a reasonable increase would help increase the number of customers that take advantage of the SDG&E offerings?
- Q3.** Do you have any questions for specific groups (egg farmers, etc.)?
- Q4.** Who is the best person to reach at the San Diego County Farm Bureau? Would you be willing to do an introductory email or phone call that I could then respond to?
- Q5.** Who is the best person to reach at the San Diego County Flower and Plant Association? Would you be willing to do an introductory email or phone call that I could then respond to?

## Next Steps/Schedule

Below we present the next steps and timeline.

- **In-Depth Interviews** with San Diego County Flower and Plant Association and San Diego County Farm Bureau (week of November 17<sup>th</sup>)

- Draft mail survey, research plan and draft notifications submitted for review by SDG&E (week of November 25<sup>th</sup>)
- **Mail survey in field** (Week of December 8<sup>th</sup>)
- **Data collection and entry** (December 2014 through January 2015)
- **Analysis and reporting** (February through March 2015)

## Appendix B: In-depth Interview Questions for SDG&E Agricultural Sector Market Study (Flower and Plant Growers Association)

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This section contains the Memorandum sent to Arnie Garcia and the San Diego Flower and Plant Association on November 17, 2014 that included the in-depth interview questions that were used for a discussion on November 24.

### MEMORANDUM

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November 17th 2014

**To:** Flower and Plant Growers Association and Arnie Garcia, San Diego Gas & Electric Company

**Re:** In-depth Interview Questions for SDG&E Agricultural Sector Market Study

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Evergreen Economics is assisting SDG&E with a study of SDG&E agricultural customers. The purpose of the study is to assess the effectiveness of the agriculture programs at SDG&E and to develop recommendations for changes to program design or delivery that will improve the effectiveness of the programs and ultimately increase customer participation. We plan to collect customer feedback by sending out 2,000 mail surveys in early December with stamped return envelopes. This memorandum serves as a guide for an interview with the Flower and Plant Growers Association, which will help to inform our research and drafting of the mail survey.

#### Questions

- Q6. Are growers aware that SDG&E offers assistance to them to help them save energy?
- Q7. Have any Flower and Plant Grower Association members received rebates in the past, to your knowledge? If yes, what was their experience like?
- Q8. What gets in the way of growers taking advantage of rebates? Does this differ by type of growers?
- Q9. Do growers think that the options from SDG&E are limiting? Specific offerings include:
  - Sprinkler to Drip Irrigation (\$44 per acre)
  - Low Pressure Sprinkler Nozzles (\$1.15 per nozzle)
  - Greenhouse Heat Curtain (\$0.04 per square foot and requires inspection)
  - Infrared film for Greenhouses (\$0.05 per square foot)

- Water Pump Efficiency Testing
  - In-person Audit (free)
- Q10.** What are your thoughts on the rebate amounts?
- Q11.** Are there offerings from other SDG&E programs that growers can benefit from? (Lighting, motors, etc.?)
- Q12.** When growers purchase any of the above items, are there other major renovations or items that are purchased at the same time?
- Q13.** What would make growers more likely to take advantage of SDG&E's agriculture sector rebates and offerings?
- Q14.** Are there other technologies related to agriculture that you think growers would like to see offered or rebated?

## **Appendix C: Mail Survey for SDG&E Agricultural Sector Market Study**

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This section contains the final version of the mail survey that was sent to the Farm Bureau for distribution to its members.





## FARM BUREAU SAN DIEGO COUNTY

1670 East Valley Parkway, Escondido, CA 92027-2409  
 Phone: (760) 745-3023 • Fax: (760) 489-6348  
 E-mail: [sdcfb@sdfarmbureau.org](mailto:sdcfb@sdfarmbureau.org) • Website: [www.sdfarmbureau.org](http://www.sdfarmbureau.org)

December 10, 2014

Hello! I am writing to ask for your help. We want to hear your thoughts about SDG&E's current energy efficiency rebate offerings to help us improve the services for agricultural customers like yourself. The best way we have to know how to do this is by asking you directly. We are asking that you please have **the person at your business who is most likely to make decisions about buying, repairing and replacing farming equipment** fill out this questionnaire. We kept it very short, so it would only take a minute or two!

After filling out the questionnaire, please place it in the postage-paid envelope and return it to us. We have included a **small token of appreciation** to thank you for your help.

Your responses will be kept completely confidential, and will only be used for the purposes of this study. Your participation is, of course, voluntary.

If you have any questions about this study, please feel free to call Martha Thompson of Evergreen Economics at (510) 899-5558. SDG&E is partnering with Evergreen to collect and report on our study.

**Thank you for your time and consideration. It is only with your generous help that our study can be successful.**

Eric Larson  
 San Diego County Farm Bureau

**Q1. SDG&E has rebates and offerings to help you save energy. For each offering listed below, please tell us if your business:**

- a) Was not aware of the offering until now
- b) Was aware of the offering but hasn't taken advantage, or
- c) Has participated in the SDG&E program and received that offering in the past two years.

	Not aware until now	Aware but has not participated	Has participated in past two years
Sprinkler to Drip Irrigation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low Pressure Sprinkler Nozzles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse Heat Curtain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infrared Film for Greenhouses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water Pump Efficiency Testing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lighting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Refrigeration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boilers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-Site Audits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q2. What products or services, if any, are you interested in from above list or that are not listed above?**  
 Specify: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

*Serving San Diego County Agriculture Since 1913*

**Q3. We'd like you to think about the amount a rebate would need to be in order to be effective. For each example below, please indicate whether you think the following rebate amounts are *too low*, *about right* or *too high* to motivate you to adopt these measures. (If not applicable to your type of farming operation, check *not applicable*.)**

	Too low	About right	Too high	Not applicable
Sprinkler to Drip Irrigation (\$44/acre)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse Heat Curtain (\$0.04/sq ft)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low Pressure Sprinkler Nozzles (\$1.15/nozzle)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infrared Film for Greenhouses (\$0.05/sq ft)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q4. Below is a list of reasons that might prevent you from taking advantage of SDG&E's offerings for agricultural customers. Indicate whether each of the following is a *large barrier*, a *small barrier* or *not a barrier*.**

	Large barrier	Small barrier	Not a barrier
Not aware of the offerings for agricultural customers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Don't have enough information about offerings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Don't have enough money to replace equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Don't have enough time to make upgrades	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The incentive amount doesn't make it worth my time and money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't own the property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't know how much longer I'll be in business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q5. Below is a list of features. For each, please tell us if this would make you a *lot more likely* to take advantage of SDG&E's agricultural customer offerings, a *little more likely* to participate or if it would have *no effect*.**

	A lot more likely	A little more likely	No effect
Have the rebate deducted from my supplier(s) invoice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get a free energy audit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No pre-inspection for greenhouse curtain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q6. Where do you look for information about how to save energy? Check all that apply.**

- Industry Organizations
  - Suppliers
  - Colleagues
  - SDG&E contact
  - SDG&E website
- Describe: \_\_\_\_\_

**Q7. How important are each of the following motivations for saving energy? (Check all that apply.)**

	Very important	A little important	Not at all important
Save money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Save water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q8. Business Name:** \_\_\_\_\_

**Q9. Business Address:**

Address: \_\_\_\_\_  
City, Zip: \_\_\_\_\_

**Q10. Which of the following best describes your business? (Select one.)**

- Grower - Outdoor only
- Grower - Indoor only
- Grower - Outdoor and Indoor
- Egg Rancher
- Other (Please tell us:) \_\_\_\_\_

*Thank you very much for your help. Please place in the stamped envelope provided and return to us.*

## Appendix D: In-Depth Interview Summary Memo

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Evergreen conducted two telephone interviews: one with the San Diego Flower and Plant Association (SDFPA) and another with the staff member at SDG&E who performs outreach to the agricultural sector. We spoke with three members at the San Diego Flower and Plant Association about their opinions on offerings and incentive levels. We also spoke with the SDG&E staff member about program offerings and outreach efforts. Findings from both interviews were used to inform the creation of the mail survey and are presented below.

### **Target Audience**

In our interview with the SDG&E program staff member, we discussed how best to reach our target group for mail surveys and communications. The staff person reported that almost all of the members of the SDFPA belong to the Farm Bureau. The members of the SDFPA noted that we should also look into Landscapers Association members. After exploring this option, Evergreen noted that this group does not match the target group of our mail surveys.

By having the Farm Bureau address and send out mail surveys, we will be able to reach most SDFPA members in addition to the people who own groves and egg ranches.

### **Farm Bureau Structure and Communication**

During our interview with the SDG&E staff member, we discussed the structure and timeline of the Farm Bureau's communication with its members. In addition to weekly emails sent out to Farm Bureau members every Monday afternoon, there is also a quarterly newsletter (the first of which will be delivered in February).

### **San Diego Flower and Plant Association Structure and Communication**

We discussed plans for our first communication through the SDFPA: a notice to members that a survey would soon arrive in their mailbox. This message was delivered between the first and the tenth of December.

The SDFPA members have two meetings a year that are more highly attended than the rest. The SDG&E staff member has presented at one of them, and one member reported, "We thought [their] speech was great and I think [they're] really effective." In addition to having a presence at meetings, one SDFPA member reported that SDG&E also has a presence on their website. The SDFPA also noted that they have a casino night in January where members will be in attendance.

### **Customer Awareness**

The SDG&E staff member we interviewed thinks that customers are aware of the SDG&E incentive opportunities but are not taking advantage of the program. When other organizations offer classes that present popular topics such as insecticides and workers' compensation that tend to attract larger crowds, SDG&E staff members have piggybacked on those presentations to provide incentive information.

We discussed two specific events where this occurred:

- In 2009, as the Agricultural Segment Research Advisor, an SDG&E staff member worked with Davis Extensions' satellite office in Riverside to present incentive information in conjunction with Davis Extensions' class on insect infestations.
- The SDG&E staff member worked with Altman Nursery's research facility to present incentive information when the nursery offered a class presentation on insecticides.

When we interviewed members of the SDFPA, we learned that these types of events are effective in disseminating information about incentives; one of the members we interviewed said that they were not aware of the incentives until they attended one of the classes at which the SDG&E staff member spoke.

Members, however, need to be repeatedly educated about these incentives. The member who reported that they became aware of the incentives only when attending a class emphasized that SDG&E needs to "publish over and over again what is available." A second member added, "you just have to keep hitting growers up."

### **Customer Participation**

The staff member reported that this year four participants took advantage of agricultural specific rebates. The SDG&E staff member we spoke with could not identify any specific customer traits that made a customer more likely than others to participate other than prior participation. They reported that some customers participate once they become eligible (by doing infrared film and heat curtains) and then participate again when they are eligible again three years later. One of these customers is featured in email blasts to demonstrate benefits of participation to other customers.

### **Participation Barriers**

Below, we discuss four major barriers to participation brought up by interviewees: time, upfront cost, replacement timing and economic uncertainty.

**Time.** Due to the cyclical nature of the industry, the SDG&E staff member views lack of time and timing as the largest barriers to participation. The staff member reported that there are only certain windows of time when construction can be done on greenhouses. The interviewee gave an example of a poinsettia grower who was willing to participate in a greenhouse polymer retrofit trial that ended in having to pay construction workers overtime to get the job done within a specific window of time.

The pre-inspection required for greenhouse heat curtains was described as a barrier to participation by SDFPA members. One member had purchased the greenhouse heat curtain and despite learning of the rebate from SDG&E, did not recall that she needed to have a pre-inspection done before installing the measure. Because of this she was not able to get the incentive on the product.

When we asked the SDFPA members what types of growers are more likely to participate in the SDG&E offerings, one noted that those who have participated thus far have more time and staff. “What makes them different is that they have office staff that can research that, a lot of times it is time consuming to schedule the appointment and then wait for the money to come in. If the roof needs to be done you’ll want it in a week. You don’t have time to schedule the person and figure out when you are going to get your rebate...”

**Upfront Cost.** Upfront cost and presentation of that cost were also reported as barriers to participation. One interviewee said that the way that rebates are presented are “too abstract” and seem low when the customer is busy “juggling multiple things at the same time.” The SDG&E staff member reported that customers have to deal with labor challenges related to workers' compensation and vermin and believes that when they see incentive amounts, they have to compare them to their energy consumption, and they do not have a point of reference for what those numbers mean.

The barrier of upfront cost was also echoed in our SDFPA interviews: “Don’t think there are a lot of growers that have deep pocket books... a lot of it goes into upfront money, you have to have the money to do it and if you don’t have the money to do it, it doesn’t help unless you have someone that is willing to put in the money. We are dealing with pennies that we are getting. Probably one of the biggest obstacles is the upfront money.”

When we asked the members what types of growers are more likely to participate in the SDG&E offerings, one noted that “some of those players, they have deeper pocket books. Not that they are necessarily bigger, but just how deep your pockets can go. For some people waiting four months, it doesn’t matter to them and they can cover it. A lot of us can’t.”

**Replacement Timing.** One member reported that growers often wait until the “absolute last possible minute” to update measures and often they “don’t know when they are going to lose their plastic due to strong winds or four inches of rain.”

**Economic Uncertainty.** The staff member suggested that economic uncertainty may be a reason that customers are not participating. Payback of three to four years is a concern for customers who worry they may not be in business that much longer due to persisting water issues. This lack of permanence was also mentioned by one of the SDFPA members who said, “Because I’m leasing the building I’m not that permanent.”

### **Potential Solutions to Overcoming Barriers**

Possible ways around the barriers that we discussed with interviewees included:

- Creating a vendor list so that the vendor search takes less time;
- Providing a step-by-step guide that communicates the simplicity of the steps to be taken by growers in addition to the cost of the project;

- Performing free inspections ahead of time so that growers already have the pre-inspection for the greenhouse heat curtain before they find themselves in need of immediate replacement;
- Repeating messaging often in order to align timing with when customers may be ready to make changes;
- Explaining that financing options exist for customers who are interested in a project that costs at least \$5,000 and can be paid in five years or less. At least one agricultural customer has taken advantage of the financing program;
- Incentivizing greenhouse covers at the supplier (such as American Horticulture, Crop Protection Services, T&R Lumber) rather than through a separate application process. Members report that growers replace their covers at the end of the summer before the rainy season. One respondent predicted that about 20 percent of growers buy the covers every year; and
- Aligning presentation of rebate amounts with the product specifications so that greenhouse cover incentives are per roll rather than per square foot so that customers avoid having to multiply and estimate square footage to understand the full cost benefit of the rebate.

The program staff also discussed legislation that may encourage customers to participate. The first (discussed below) is part of the Sustainable Water Management Act, which will require customers to track their water usage for water that they pump. The second is legislation from a 2008 state ballot measure known as the Standards for Confining Farm Animals that relates to ventilation and space of egg ranches that is set to go into full effect on January 1, 2015. This could encourage egg growers to purchase new motors, lighting, fans, refrigeration and doors.

### **Broader Rebate Offerings**

In addition to the rebates that are considered to be sector-specific offerings (sprinkler to drip irrigation, low pressure sprinkler nozzles, greenhouse heat curtain and IR film for greenhouses), we asked what other type of products and programs apply to this group. The SDG&E program staff member believed that lighting and water pump efficiency testing could benefit consumers.

The staff member described the Water Pump Efficiency Testing Pilot where a software application takes advantage of GIS consumption and water flow data without having to weld a water flow-measuring tool to the pipeline. While this has been advertised to customers, it has not yet been taken advantage of. This may change when new legislation (the Sustainable Water Management Act, which goes into effect January 1, 2015) requires customers to track their water flow rates. One SDFPA member added that they think that water pump awareness would increase with additional audits.

Interest in efficient lighting upgrades was reported to vary from year to year depending on what is grown. There is also an emphasis on the full spectrum of lighting in this industry. In

addition to lighting, SDFPA members added that boilers and motors are also of interest. Boilers are their “...biggest heating cost. The biggest part of our bill is when the heaters have to come on.” Another measure discussed by an SDFPA member was controls that minimize the amount of time that water is used.

In our discussions with the SDFPA members, one interviewee brought up the need for a material for walls that is more like fiberglass. The SDG&E program staff member mentioned that SDG&E had done a pilot project looking into 8mm polycarbonate but that the measure fell below the on bill finance threshold due to a drop in the price of natural gas.

In addition to actual measures, one interviewee expressed interest in assistance with a highly variable bill. The interviewee spoke with a SDG&E customer who had their SDG&E bills averaged across the year so that they did not have to worry as much about late fees due to variable monthly bills.

## Appendix E: Responses to Recommendations

Below we have included the Responses to Recommendations form.

### EM&V Impact, Process, Market Assessment Study Recommendations 2015 Agriculture Study

Study ID	Study Type	Study Title	Study Manager	Author	Pub Date
CALMAC ID SDG0292.01	Market Study	SDG&E Agricultural Sector Market Study	SDG&E	Evergreen Economics	March, 2015

Item #	Program	Document	Page	Findings	Best Practice / Recommendations	Recommendation Recipient	Accepted	Rejected	Under further review	Notes: Specific program change/ Reason for rejection or further review
1	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	30	SDG&E Agriculture customers are significantly more interested in water-related measures (sprinkler to drip irrigation, low pressure sprinkler nozzles and water pump efficiency testing) than other agriculture-related offerings, and significantly more respondents said that money and water savings were more important motivators than saving the environment.	Wherever possible, SDG&E should focus on money and water savings when marketing its energy efficiency options to the agriculture sector. SDG&E could consider marketing its on-site audit as an irrigation checkup in order to appeal to the customer desire to save on water costs.	SDG&E				
2	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	30	Mail survey findings indicate that indoor and indoor/outdoor growers are more likely to be interested in a suite of measures (motors, boilers, fans, on-site audits, infrared film for greenhouses, and greenhouse heat curtains) rather than being interested in just a single measure.	SDG&E should consider creating a central place or document for agricultural customers to access that presents the full suite of measures that may be of interest to them.	SDG&E				



Item #	Program	Document	Page	Findings	Best Practice / Recommendations	Recommendation Recipient	Accepted	Rejected	Under further review	Notes: Specific program change/ Reason for rejection or further review
3	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	30	The research found three examples of rebated measures that SDG&E could refer to using agricultural-specific language, which might improve uptake. These measures are: agricultural irrigation pump VFDs, horizontal air flow fans, and root zone heating.	SDG&E should use agriculture-specific terms for measures when marketing directly to their agricultural customers to increase interest, for example: -Agricultural Irrigation Pump VFDs -Horizontal Air Flow Fans -Root Zone Heating	SDG&E				
4	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	30	SDG&E utilizes past customers (who have take advantage of offerings) as examples when presenting information to trade associations	SDG&E should expand its use of customer testimonials to its website.	SDG&E				
5	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	30, 31	Self-reported participation is low, with customers reporting having received an average of 0.2 items out of 11 relevant offerings. Customers report lack of awareness and lack of having enough information as the two largest barriers to participation. Awareness is lowest for greenhouse measures. Respondents were significantly more likely to get their information from industry organizations, suppliers and colleagues as compared to an SDG&E contact or website.	SDG&E should continue working with industry organizations in order to inform and educate customers with the intent of increasing awareness of program offerings.	SDG&E				
6	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	31	It is unclear if SDG&E incentivizes suggestions made through the Water Infrastructure and System Efficiency (WISE) Program inspection.	SDG&E should add clarity to documentation about WISE so that customers are aware of next steps and offerings that follow an inspection.	SDG&E				

Item #	Program	Document	Page	Findings	Best Practice / Recommendations	Recommendation Recipient	Accepted	Rejected	Under further review	Notes: Specific program change/ Reason for rejection or further review
7	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	31	While SDG&E provides many of the offerings appropriate for this sector, we found additional energy efficient measures that do not exist among SDG&E's offerings. These include natural ventilation, scientific irrigation, low energy precision application irrigation, solar well pumps, gooseneck elbows for drop tubes, sprinkler repairs and replacement, irrigation system conversions, perimeter insulation, greenhouse climate controls, triple polycarbonate glazing, and chicken litter gasification. Note that some of these measures (specifically the ones related to heating and cooling) may not be as appropriate in San Diego County due to the temperate nature of the locale.	SDG&E should research and consider additional measures presented in Section 3 of the report (listed under findings).	SDG&E				
8	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	31	Close to half of all respondents thought that incentive amounts were too low, and half thought incentive amounts were about right. Though it is noted that self-reported participants were just as likely to report that rebate levels were too low, even though they said they participated. Likewise, customers may be tempted to say that rebates are too low so they might be increased. There are no downsides for customers indicating they would like to increase rebate levels. These results may be most useful for providing relative comparisons of rebate levels across measures: low-pressure nozzles stood out from the other measures in that respondents were more likely to think that the pricing for that measure was about	SDG&E may consider changing the way that the greenhouse cover roll is presented (and calculate the incentive per roll rather than per square foot).	SDG&E				

Item #	Program	Document	Page	Findings	Best Practice / Recommendations	Recommendation Recipient	Accepted	Rejected	Under further review	Notes: Specific program change/ Reason for rejection or further review
				right. Finally, lack of awareness and information seemed to be a more significant barrier. We found that the way that the incentive for greenhouse cover rolls (in amount per square foot rather than per roll) is confusing to customers and creates the need for them to multiply and estimate square footage to understand the full cost benefit of the rebate.						
9	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	31, 32	Just over half of mail survey respondents said that the ability to receive an incentive at the supplier would make them either a little or a lot more likely to participate in SDG&E's offerings. We also found that indoor/outdoor growers are significantly more likely to get information from suppliers than livestock customers. Additionally, indoor/outdoor growers are significantly more likely to say that the midstream approach would make them a lot more likely to take advantage of SDG&E's offerings when compared to outdoor growers and livestock customers.	SDG&E should consider a midstream rebate approach for crop producing (indoor and/or outdoor) growers.	SDG&E				
10	Agriculture Energy Efficiency Program	SDG&E Agricultural Sector Market Study	32	Close to seventy-five percent of customers reported their business name, providing an opportunity to attempt to match to SDG&E's customer tracking data. This matching effort (while not completed for this report) could provide context on the energy usage of a sample of the participating business, and whether size is correlated with customer	SDG&E should consider connecting the data collected in the mail survey to customer information.	SDG&E				

Item #	Program	Document	Page	Findings	Best Practice / Recommendations	Recomm- endation Recipient	Accept ed	Rejected	Under further review	Notes: Specific program change/ Reason for rejection or further review
				barriers and drivers to participation. However, it is noted that attempting to match this data could require substantial effort and not all customers who provided their business name would be successfully matched.						