

DR Strategies for Cold Storage-Barriers to Implementation

DR 06.13 Report



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EXECUTIVE SUMMARY

The goal of the project was to obtain information on Southern California Edison's large-scale cold storage customers' awareness and perception about demand response programs. Cold storage customers store and/or process products at refrigerated and/or freezing temperatures.

The project focused on their ability and willingness to participate in SCE's demand response programs, the existence of technological or other barriers to participation, as well as their views on promotion channels and technical assistance. This study was conducted in response to the observed lack of participation in SCE's demand programs by cold storage customers.

Southern California Edison (SCE) conducted in-depth interviews, focus groups and a quantitative survey of customers with large-scale cold storage operations to determine their awareness and perceptions about demand response programs.

SCE's cold storage customers are familiar with the term "demand response" and understand that demand response programs involve a temporary reduction in electric load. However, they have not considered and fully examined participation in these programs for a variety of reasons including: (1) they do not understand that different types of programs and different approaches to reducing load exist, as well as how these programs are structured; (2) their DR program knowledge is, for the most part, negative – based on stories about customers who paid enormous penalties – and they are, therefore, extremely wary of programs with penalties; and (3) many customers associate demand response programs with the need to shut down their operations entirely. In general, therefore, the major barriers to cold storage facilities participating in demand response programs appear to be barriers that would apply to all customers (not barriers exclusive to cold storage customers).

Cold storage customers may also face technological barriers, although this could not be confirmed during the focus groups or the quantitative survey. While some customers acknowledged that they have the necessary controls to shut down individual pieces of equipment, it is not clear that they currently have the ability to reduce load short of shutting down entirely (i.e. operate equipment at part load).

For customers with an SCE Account Representative (generally those with demand greater than 200 kW), the representatives are an important source of information regarding the requirements and types of demand response programs available to customers. The project reveals that the efforts of Account Representatives to promote demand response programs to cold storage facilities have not been effective in recruiting participants. The level of interaction with SCE varied among cold storage facilities participating in our qualitative and quantitative research efforts. Almost all of the focus group participants with an assigned Account Representative have had some contact with this representative, or their representative has tried to contact them. However, only one of the eight focus group participants meeting this criterion had been approached about participating in a demand response program, and seven of the eight did not have a good idea of what participation in a demand response program would entail. Similarly, only 7% of respondents to the quantitative survey have heard about SCE's demand response programs, despite the fact that 45% report having an Account Representative.

The respondent information (as well as information gathered from account reps through in-depth interviews) indicated that SCE Account Representatives are not actively promoting or

discussing demand response programs with customers. These customers mentioned interactions with SCE on rebate programs, service connections, service issues, and questions regarding rate structures. Focus group participants without an Account Representative appear to be even less informed about these programs – they generally knew programs were available but did not understand the value of these programs. Given that these customers do not have Account Representatives, SCE should consider improved efforts to promote programs to these customers – the interest in learning more about these programs is there.

In general, cold storage customers have some ideas about what they could do to reduce load, but they cannot easily quantify the reductions associated with specific actions. As a result, they cannot easily understand their ability to participate or the risk of not meeting required load reductions. Customers do not currently have the tools that they need to quantify the reductions that could be made in their facilities and do not seem to gain insights on their ability to reduce demand from typical energy audits. Notably, none of the interviewed customers had heard about the TA&TI (Technical Assistance and Technical Incentives) audits, although they expressed an interest in this and felt that having someone come to their facility would be the best way to understand what they could do.

Further, while some customers are aware of and have used SCE's Energy Manager Tool, particularly focus group participants with Account Representatives, this tool does not provide customers with the information they need to support a decision to participate in a demand response program. In other words, without further instruction, it does not offer the ability to quantify load reductions associated with specific actions. The Energy Manager Tool thus does not aid in identifying the types of load reduction actions that can be taken in order to participate in a demand response program.

Unlike energy efficiency equipment rebate programs, the value proposition associated with interruptible or demand bidding programs (as currently promoted) is not immediately clear to customers. Awareness and understanding of demand response programs is a barrier, i.e., both awareness and understanding of these programs appears to be low. This is particularly the case for smaller customers (those with electricity demand of between 100 and 200 kW). However, even if customers are informed of the basic details, perceptions of these programs are negative – sometimes based on accounts of negative experiences by others – and the risks and rewards to the customer are not apparent and cannot easily be explained. Interestingly, while ultimately the amount of the penalty and incentive will affect participation rates, on first blush, the dollar amounts per kW do not matter since customers cannot easily understand the total impacts associated with participation. Moreover, demand bidding (while less understood by customers) is more palatable than interruptible programs since demand bidding programs involve incentives rather than penalties.

Based on the results of the project, the following recommendations are made:

- In addition to current promotional efforts designed to raise awareness of these programs, it is suggested that Account Representatives or appropriate third parties talk to customers one-on-one to educate them.
- Provide Account Representatives or appropriate third parties with case studies of positive examples of savings specific for cold storage facilities to overcome negative perceptions of these programs.
- Work through Account Representatives or appropriate third parties to provide customers with an understanding (on a case-by-case basis) of what specific actions can be taken at the customer's site, and what reductions are achievable from these actions.
- Work through Account Representatives or appropriate third parties to help customers understand the financial implications of the program under various scenarios (e.g.,

do incentives still outweigh penalties if the facility is only able provide the required load reductions 75% of the times that it is called to reduce load? Do the financial incentives outweigh the operational expenses and risks associated with participation given the nature of the actions taken to provide the required reductions in load?)

- If program participation by smaller customers (i.e., between 100 and 200 kW demand) is desired, more effective ways of educating these customers about the availability and benefits of demand response programs need to be devised and implemented.

INTRODUCTION

BACKGROUND

SCE currently offers several types of demand response programs to its commercial customers. Demand response programs are designed to reduce electrical usage during periods when the state's electric system is stressed due to high demand. These programs offer a financial incentive to participants who reduce their electrical load when called upon to do so by Southern California Edison (SCE). To date, customers engaged in large-scale cold storage operations have been slow to participate in SCE's demand response programs. Large-scale cold storage facilities store and/or process products at refrigerated and/or freezing temperatures. SCE's large-scale cold customers are classified under the following Standard Industrial Classification (SIC) codes:

- **SIC 20** – Food and Kindred Products: 511 customers
- **SIC 283** – Chemical and Allied Products-Drugs: 153 customers
- **SIC 4222** – Motor Freight Transportation And Warehousing-Refrigerated Warehousing and Storage: 39 customers
- **SIC 514** – Wholesale Trade Non-Durable Goods-Groceries And Related Products: 1,081 customers

SCE contracted with Opinion Dynamics Corporation to conduct research into the reasons for this lack of participation and to collect information for strategies that could promote participation by this customer group. This report summarizes the findings and recommendations.

OBJECTIVE

The goal of the project was to obtain information on cold storage customers' awareness and perception of demand response programs, their ability and willingness to participate in SCE's demand response programs, the existence of technological or other barriers to participation, as well as their views on promotion channels and technical assistance. This study was conducted in response to the observed lack of participation in SCE's demand programs by cold storage customers.

TOOLS/METHOD FOR DEVELOPMENT

In developing the findings presented in this report, a three-pronged primary data collection approach was used. In-depth interviews were first conducted with facilities that currently participate in SCE demand response programs. Two focus groups were then conducted with facilities that do not participate. The final survey was a quantitative survey of non-participant SCE cold storage customers. These three survey efforts are described in more detail below.

IN-DEPTH INTERVIEWS

In-depth interviews are one-on-one conversations between the interviewer and a program actor, designed to collect qualitative information about a research topic of interest. While in-depth interviews, by design, only capture information from a small sample of respondents and are thus not representative of the overall population, they allow for more detailed exploration of topics of interest. In-depth interviews are, therefore, an important tool used to frame questions and topics for further primary research.

In support of this effort, five in-depth interviews were conducted with SCE Account Representatives who represent cold storage customers who currently participate in one of SCE's demand response programs, as well as five in-depth interviews with cold storage customers enrolled in one of SCE's demand response programs. The purpose of these interviews was to develop an understanding of the perceived benefits and drawbacks to demand response programs, the appropriate professionals to engage in discussions regarding programs, the types of information required to make the decision to participate, the types of load most often and easily curtailed, and the types of controls required to curtail loads in order to participate.

Since this report focuses on the perceptions of customers who operate cold storage facilities and do not currently participate in SCE's demand response programs, the information gathered in these in-depth interviews was primarily used to inform development of the discussion guides for the focus groups with non-participants and the quantitative survey of non-participants.

FOCUS GROUPS

Like in-depth interviews, focus groups are a form of qualitative survey instrument designed to gather detailed information about research topics of interest. Unlike in-depth interviews, focus groups include multiple participants and allow for the sharing of ideas and discussions among participants.

On March 20 and 21, 2007, two telephone focus groups were conducted with SCE cold storage customers who are not currently participating in SCE's demand response programs. The March 20 group included eight customers who have an assigned SCE Account Representative; the March 21 group included four customers without an SCE Account Representative. The goal of the focus groups was to obtain information on customers' awareness and perception of demand response programs, their ability and willingness to participate in SCE's demand response programs, barriers to participation, as well as their views on promotion channels and technical assistance. This information was used to develop the questions for the quantitative survey of non-participating customers.

Table 1 presents general profile information for the 12 focus group participants.

TABLE 1. PROFILE OF FOCUS GROUP PARTICIPANTS

PARTICIPANT TITLE	TYPE OF OPERATION	KW DEMAND
Group 1: Customers with Account Reps (March 20)		
Engineering Manager	Cool sauce/produce/raw ingredients for soup	>500
Maintenance Manager	Concentrate for juice	>500
V.P.	Tropical Fruit	>500
General Manager	40,000 sq. ft. produce facility	200-499
Assistant Plant Manager	Food Production/Cold Storage	200-499
Owner	Ice Cream	200-499
General Manager	Eggs	200-499
Executive V.P. *	Food, meat	200-499
Group 2: Customers without Account Reps (March 21)		
Owner	Frozen Ravioli, meat, etc.; fresh mozzarella	200-499
Director of Operations	Blood Products	100-199
Controller	Fruits/Vegetables	100-199
V.P. Manager	Produce	100-199

* Joined late and did not participate in discussion.

QUANTITATIVE SURVEY

The goal of the quantitative survey was to further investigate the topics covered in the focus groups and to determine if the focus group findings are representative of not only the focus group participants but also of the population at large.

As with the focus groups, the survey was used to quantify customers' awareness and perception of demand response programs, their ability and willingness to participate in SCE's demand response programs, barriers to participation, as well as their views on promotion channels and technical assistance.

SURVEY DISPOSITION

A total of 102 quantitative telephone interviews were attempted; 55 with customers operating cold storage facilities with greater than 200 kW demand, and with 47 with customers operating facilities with between 100 and 200 kW demand. This sample design was selected to allow for extrapolation of survey results to the two respective populations of SCE cold storage customers with 90% confidence and a 10% margin of error.

Due to the limitations of the available sample data, it was not possible to conduct the desired number of interviews. After several attempts to contact each of the **407** cold storage customers, a total of 38 interviews were successfully completed. The following bullets provide summary information about the main types of sample disposition. Note that in all cases where the person most knowledgeable about energy matters at the facility – generally the plant manager, engineer, or owner –

could not be reached, multiple call backs were made. This includes dispositions such as no answer, answering machine, busy signal, or when a secretary or other company personnel was reached and could not transfer the call to the most knowledgeable person. A citation for complete sample disposition information¹ is provided in the Reference section.

- **Completed interviews: 38 (9.3%)**
- Answering machine: 74 (18.2%)
- Could not identify or transfer call to most knowledgeable person: 48 (11.8%)
- Hard refusal: 44 (10.8%)
- No answer: 30 (7.4%)
- Residential phone: 29 (7.1%)
- Facility has no cold storage: 28 (6.9%)
- Other: 116 (28.5%)

PROFILE OF SURVEY RESPONDENTS

SCE provided a sample of 407 commercial customers assumed to operate facilities with cold storage equipment or processes. The following bullets present a brief profile of the 38 cold storage customers who completed a quantitative interview. More detailed information regarding the firmographic and other characteristics of survey respondents can be obtained through Reference 2.² Of the 38 cold storage facilities participating in the quantitative survey:

- 55% have an energy demand of more than 200 kW, 45% have an energy demand of between 100 and 200 kW
- 53% own their facility, 42% lease their facility (5% "other" or "don't know")
- 29% have large-scale refrigeration, 8% have large-scale freezing, 63% have both
- 29% cool fruit or produce, 16% cool ice, 55% cool another food product
- 66% have production and/or processing operations, 34% do not
 - Of the 66% with production and/or processing operations, 84% require cooling for these operations, 16% do not
- 34% have had an energy audit at their facilities during the last three years and 50% have not (16% "don't know")
- 24% have a facility of less than 20,000 square feet; 34% between 20,000 and 50,000 square feet, and 24% greater than 50,000 square feet (for 18%, this information was not available)
- 5% devote less than 10% of their facility's total square footage to cold storage, 18% devote between 10% and 25% to cold storage, 32% devote between 26% and 50% to cold storage, and 16% devote more than 50% of their facility's area to cold storage. (For 29%, this information was not available)
- 35% have 20 employees or less, 29% have between 21 and 50 employees, 18% have between 51 and 100 employees, 13% have more than 100 employees (5% "don't know")

- 24% have a facility 10 years old or less, 16% 11 to 20 years, 18% 21-30 years, and 26% 31 years or more
- 39% have refrigeration equipment 4 years old or less, 21% 5-10 years, 10% 11 to 20 years, 3% 21 years or more (26% "don't know")

FINDINGS/PROJECT OUTCOME

This section presents integrated findings from the two focus groups and the quantitative survey. The study findings focus primarily on respondents' awareness and perception of demand response programs, their ability and willingness to participate in SCE's demand response programs, and perceived barriers to participation. In addition, this section presents general results regarding interactions with SCE, awareness of energy efficiency programs, and views on promotion channels and technical assistance.

Both the focus group results and the quantitative survey data demonstrate that the concept of demand response programs is both somewhat foreign and confusing to cold storage customers. Customers (1) are generally unaware of SCE's demand response programs, (2) do not understand the details of the programs, (3) do not have sufficient information about the types of energy use reductions they can take at their facilities, and (4) do not know what electricity savings are associated with different types of energy use reductions. Because of these limitations in awareness/knowledge about the programs and the technical feasibility of participating in them, customers generally could not answer specific questions about their likely participation in these programs and the program terms that would be acceptable to them. For example, not knowing what would be required to reduce energy usage by a certain percentage, customers could not comment on program design aspects such as levels of incentives and penalties, advance notification times, and an acceptable number of callable events.

This general lack of information and understanding among customers also contributed to some inconsistencies in the responses provided, particularly in the case of the quantitative survey. For example, customers' responses of how likely they would be to participate in three specific SCE demand response programs were sometimes inconsistent with their responses to questions about which of the three programs they were most and least likely to participate in and why. Where relevant, the following sections discuss these data discrepancies.

CUSTOMERS CURRENTLY ENGAGE IN SOME LOAD REDUCTION ACTIONS AND PERCEIVE LIMITED ABILITY TO PARTICIPATE IN DEMAND RESPONSE PROGRAMS

Before discussing specific SCE demand response programs, both focus group participants and quantitative survey respondents were probed for their current energy efficiency actions and their perceived ability to participate in a program that requires reduction of electricity usage at certain times.

CUSTOMERS CURRENTLY ENGAGE IN SOME LOAD REDUCTION ACTIONS

Most focus group participants were aware of some of SCE's energy efficiency programs, but participation in them has been limited. Some participants have taken energy savings measures on their own, but only a few did so with SCE involvement. All focus group participants were generally very interested in services such as energy audits and information on energy use and savings potential that was specific to their facilities. For a more complete discussion of respondent interest in these services, see "Customers Face Information Barriers to Participation in Demand Response Programs" section.

Among the quantitative survey respondents, 58% indicated that their facilities are currently undertaking efforts to reduce their electric load at times when the state's electric system is stressed due to high demand. The most commonly mentioned efforts to reduce load were turning off lights, shutting down or reducing use of some process or cooling equipment, and shifting production hours. Table 2 summarizes the energy reduction efforts currently undertaken by respondents.

TABLE 2. CURRENT ENERGY REDUCTION EFFORTS

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Turn off lights	8	40%
Shut down some process or cooling equipment	4	20%
Shift production hours year-round	3	15%
Reduce use of some process or cooling equipment	3	15%
Run back-up generator	1	5%
Other	5	25%
Don't know/Refused	1	5%
TOTAL	20	100%

CUSTOMERS PERCEIVE LIMITED ABILITY TO PARTICIPATE IN DEMAND RESPONSE PROGRAMS

When asked about their ability to reduce their electric load during certain times of high energy demand, the initial reaction of most focus group participants was that they could not achieve significant load reductions because they have to keep their cooling and other operations going. ("The doors can't be closed or we can't be working so I would have to say [the load is] probably 95% essential.")

However, after being probed, many participants indicated that they could take some actions to reduce their load. Specific actions include delaying the use of specific non-essential electrical equipment until off-peak periods (load shifting); turning off some lights; turning down/off some refrigerators or freezers; pulling product out of cold storage ahead of time (to avoid having to open doors); and shifting production hours. One participant stated that freezers will hold their temperatures for hours, so they can be off for 2-4 hours, if necessary. Some participants also mentioned the possibility of switching to back-up power generation to reduce load.

Participants expressed a general need for more information about what they could do to temporarily reduce load at their facilities given the nature of their individual operations and equipment, and the implications of taking those specific actions on operations and costs. Participants thought that SCE could provide support/assistance in finding these facility-specific opportunities.

When asked if they could achieve a 10-15% reduction of load for a 2-hour duration, some of the focus group participants with Account Representatives said they could definitely or maybe achieve such a reduction, although for some it might require a major shift and have production implications. However, there was a general interest in looking into the feasibility of achieving such a reduction, including specific measures required and their costs as well as incentives. None of the participants without Account Representatives thought that such a reduction would be feasible given their operating requirements.

Not having sufficient information about load reduction options and their cost was cited as a major uncertainty. In the words of one focus group participant: “[...] we’d need somebody to come out. I’m kind of lost as far as where we could cut back and what we could do.”

The quantitative survey instrument included a series of similar questions, designed to gauge their perceived ability to reduce electric load and potential activities that would achieve these load reductions. Specifically ODC asked survey respondents about their ability to reduce electrical load during periods when the state’s electric system is stressed due to high demand, typically on hot summer days, in return for a financial incentive. ODC first asked respondents to indicate if it was possible for them to shut down the electrical load entirely in part of their facility for 1-2 hours without affecting their product. ODC then asked if respondents if they could reduce their facility’s load by 10% for 1-2 hours without affecting their product. Table 3 summarizes the responses to these questions.

Approximately four in ten respondents indicated that they could curtail load at their facility without adversely impacting the product they store or produce. Between 30% and 40% did not believe they could reduce their load, with the remainder being uncertain. This perceived ability or inability to reduce load does not appear to be correlated to any key facility characteristics, including their electricity demand.

TABLE 3. SUMMARY OF PERCEIVED ABILITY TO REDUCE ELECTRIC LOAD (NUMBER / PERCENTAGE OF RESPONDENTS)

Response	Shut Down Part of Facility	Reduce Load by 10%
Yes	14 / 37%	15 / 39%
No	15 / 39%	12 / 32%
Maybe	4 / 11%	7 / 18%
Depends on Reward	5 / 13%	3 / 8%
Don’t know/Refused	--	1 / 3%
TOTAL	38 / 100%	38 / 100%

Customers who indicated that they could reduce their load by 10% were asked to list the actions they would take to provide that reduction. These respondents most frequently indicated that they would turn off some cooling equipment, keep the doors to refrigerated spaces and freezers closed, and turn off lights. Note that this question was unaided. That is, the interviewer did not read a list of potential responses to survey respondents. Other measures are presented in Table 4 below.

TABLE 4. SUMMARY OF LOAD REDUCTION ACTIONS (MULTIPLE RESPONSE; NUMBER / PERCENTAGE OF RESPONDENTS) (N=26)

RESPONSE	REDUCE BY 10%
Turn off some of the refrigeration/cooling equipment	10 / 38%
Keep doors to refrigerated areas or freezers closed/reduce frequency of opening doors	6 / 23%
Turn off lights	5 / 19%
Cycle compressors on large-scale refrigeration	3 / 12%
Turn off air conditioning in office space	3 / 12%
Delay battery recharging	1 / 4%
Shift production hours	1 / 4%
Other	1 / 4%
Don't know/refused	4 / 15%

In addition to asking customers who indicated that they could reduce their load by 10% to list the specific actions they would take to reduce load, respondents were asked to indicate their ability to take a specific set of actions identified as common low-cost approaches to reducing electric loads. Taken together, 79% of respondents indicated that they could turn off some lights, while 68% of respondents could keep the doors to refrigerated spaces or freezers closed. Further, 50% indicated that they could cycle compressors, and 42% indicated that they could turn off some refrigeration or cooling equipment.

Though not directly comparable, it is notable that customers indicating that they could provide a 10% load reduction were less likely to list, unaided, the specific actions tested via the survey. Note that only the 26 customers who indicated that they were able to reduce their load by 10% for 1-2 hours were asked the unaided question about specific actions (see Table 4).

In contrast, the responses in Table 5 include all 38 survey respondents. These findings suggest that customers are not aware of or have not considered key low-cost or no-cost options for curtailing load and that additional technical support and outreach designed to help customers identify and quantify savings associated with these options may be beneficial.

TABLE 5. IF YOU WERE ASKED TO REDUCE ELECTRICAL LOAD JUST ONE TIME, ON ONE SUMMER DAY DURING YOUR PEAK OPERATING HOURS, WOULD YOU BE ABLE TO... (N=38)

ACTION	NUMBER AND PERCENTAGE OF THOSE WHO ANSWERED YES
Turn off some lights	30 / 79%
Reduce the frequency of opening doors	26 / 68%
Turn off air conditioning in office space	20 / 53%
Cycle compressors	19 / 50%
Turn off some of the refrigeration/cooling equipment	16 / 42%
Shift production hours	8 / 21%
Switch to back-up generation	4 / %

To verify the reasonableness of responses provided about the ability to reduce load, information was requested about the percentage of the facility's electrical load that is considered to be essential. Table 6 shows that half (50%) of respondents indicated that they consider 90% or more of their load to be essential. This is consistent with the information provided in Table 3 about load reduction capabilities. However, while respondents feel that the vast majority of their load is essential, they also indicated that they need help to identify load shedding opportunities and quantifying savings associated with these opportunities. As such, the estimate of essential load may not be based on a complete understanding of the load profile of the facility.

TABLE 6. APPROXIMATELY, WHAT PERCENTAGE OF YOUR ELECTRICAL LOAD DO YOU CONSIDER TO BE ESSENTIAL TO YOUR BUSINESS OPERATIONS?

RESPONSE	TOTAL (N=38)
95-100%	29%
90-94%	21%
85-89%	5%
80-84%	13%
70-79%	3%
60-69%	--
50-59%	--
40-49%	5%
30-39%	3%
20-29%	3%
10-19%	3%
1-9%	3%
Don't know/Refused	13%

COLD STORAGE CUSTOMERS ARE GENERALLY UNAWARE OF SCE'S DEMAND RESPONSE PROGRAMS

Responses to questions about demand response programs in general and SCE programs in specific reveal that SCE's cold storage customers generally have little awareness of demand response programs and that SCE offers these programs. Customers have even less understanding of how these programs work and if it is feasible for their facility to participate in them.

Only a few focus group participants indicated that they have a general awareness of demand response programs. Similarly, only 11% and 8%, respectively, of survey respondents indicated being "very familiar" or "somewhat familiar" with SCE's demand response programs and special rate schedules. Half of all survey respondents had never heard of SCE's demand response programs, while 32% had heard of them but weren't familiar with any details. In general, smaller customers (those with electricity demand of between 100 and 200 kW) are less aware of SCE's demand response programs than larger customers.

Of the 19 survey respondents with some awareness of SCE's demand response programs, only three are aware of the Demand Bidding Program, three are aware of the TOU-BIP program, and one is aware the Summer Discount Plan. These respondents heard about the programs from their Account Representative (42% of the 19), through SCE promotional materials (21%) or through other means (26%) (11% could not recall how they had heard about these programs).

Most focus group participants associated demand response programs with the potential for high penalties and the need to curtail or shut down their operations entirely in order to participate. Most focus group participants therefore had a rather negative perception of these programs.

COLD STORAGE CUSTOMERS HAVE A PREFERENCE FOR MORE FLEXIBLE PROGRAMS

In addition to general awareness, participants in both focus group and survey respondents were probed about specific demand response program SCE currently offers or will be offering in the near future. During the focus groups, an "Interruptible Program" and the "Demand Bidding Program" were discussed. The survey included questions about an "Interruptible Program," a "Demand Bidding Program" and a "Monthly Capacity Bidding Program". Findings about customer awareness and perception of these three programs are discussed below.

INTERRUPTIBLE PROGRAM

Focus group participants were provided with the following explanation of an interruptible program:

"[...] a program (or rate) where you would be required to reduce your electrical usage to a specified firm service level after being notified that there will be an interruption event. In exchange you would receive a monthly credit or a reduced bill rate [...]"

SCE customers participating in the focus groups were familiar with the general concept of interruptible programs. The key feature participants associated with this type of program was the risk of having to pay high penalties when it is not possible for them to provide the load reductions required. The perception of interruptible programs was therefore very negative, and many participants said they would not consider participating in this type of program. Note that for some participants in the first focus group, this negative perception might have been triggered by one or two participants who shared negative experiences with interruptible programs early on in the focus group.

Similarly, respondents to the quantitative survey were provided with the following explanation of an interruptible program:

"Under the Interruptible Program, during periods when the state's electric system is stressed due to high demand, you would be required to REDUCE YOUR LOAD for a few hours BY A SPECIFIC PERCENTAGE that you and SCE agree on when you join the program. In exchange, you would receive a bill credit each month, even if an interruption event is not called. If you are unable to reduce your electrical usage to the specified level during an event, SCE would assess a penalty."

Respondents were then asked how likely they would be to participate in an Interruptible Program and what they considered the main barriers to their facility's participation in this program. Table 7 and Table 8 present the responses to these two questions.

TABLE 7. LIKELIHOOD OF PARTICIPATING IN SCE'S INTERRUPTIBLE PROGRAM

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Very likely	4	11%
Somewhat likely	6	16%
Neither likely nor unlikely	1	3%
Somewhat unlikely	9	24%
Very unlikely	11	29%
Don't have enough information	5	13%
Don't know/refused	2	5%
TOTAL	38	100%

TABLE 8. MAIN BARRIERS TO FACILITY PARTICIPATION IN SCE'S INTERRUPTIBLE PROGRAM (MULTIPLE RESPONSE)

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Can't reduce load/electricity usage without compromising products/operation	16	42%
Don't know how much certain actions will reduce load/electricity usage	4	11%
Don't like penalties/incentives aren't worth the penalties	4	11%
Don't know what actions to take to reduce load/electricity usage	2	5%
Don't understand the program/program sounds too complicated	1	3%
Other	6	16%
Don't know/refused	6	16%
TOTAL	38	100%

The responses to these two questions show that interviewed customers are generally disinclined toward participation in the Interruptible Program with only 27% indicating that they are very or somewhat likely to participate. In contrast, 53% indicate that they are very or somewhat unlikely to participate. Approximately one-sixth (13%) of respondents indicate that they do not have sufficient information about this program in order to judge the likelihood of their participation. This lack of information affects smaller customers (those with electricity demand of between 100 and 200 kW) more often than larger customers. The barrier to participation most frequently cited by these customers is the inability to reduce load/electricity usage without compromising their products or operations.

DEMAND BIDDING PROGRAM

Focus group participants were provided with the following explanation of the Demand Bidding or Capacity Bidding programs:

“The Demand Bidding or Capacity Bidding Programs are flexible, Internet-based bidding programs that allow you to receive bill credits for voluntarily reducing power without incurring any financial penalties. If you participate in the program, you can lower your operating costs and help alleviate power shortages in California.”

None of the participants in either group were familiar with SCE’s demand bidding program. After having the general concept of demand bidding explained, participants were interested in learning more about the program and finding out if participation could be feasible for them. Focus group participants were generally much more favorably inclined toward the demand bidding program – or another form of voluntary credit program – than the interruptible program because it is more flexible and does not entail the risk of high penalties.

Similarly, respondents to the quantitative survey were provided with the following explanation of SCE’s Demand Bidding Program:

“Under the Demand Bidding Program, during periods when the state’s electric system is stressed due to high demand, you would be notified and could voluntarily SUBMIT A BID via the Internet to reduce your electric load ON THAT DAY. Your bid may or may not be accepted. If your bid is accepted and you reduce your load, you would receive a bill credit based on the reduction you provide. If you are unable to fulfill your bid, there are no penalties for that event but you do not receive a bill credit. And if your bid is not accepted, you do not receive a payment.”

Respondents were then asked how likely they would be to participate in SCE’s Demand Bidding Program and what they considered the main barriers to their facility’s participation in this program. Table 9 and Table 10 present the responses to these two questions.

TABLE 9. LIKELIHOOD OF PARTICIPATING IN SCE’S DEMAND BIDDING PROGRAM

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Very likely	6	16%
Somewhat likely	13	34%
Neither likely nor unlikely	1	3%
Somewhat unlikely	9	24%
Very unlikely	4	11%
Don’t have enough information	5	13%
TOTAL	38	100%

TABLE 10. MAIN BARRIERS TO FACILITY PARTICIPATION IN SCE'S DEMAND BIDDING PROGRAM (MULTIPLE RESPONSE)

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Can't reduce load/electricity usage without compromising products/operation	15	39%
Don't know how much certain actions will reduce load/electricity usage	5	14%
Don't like penalties/incentives aren't worth the penalties	2	5%
Don't know what actions to take to reduce load/electricity usage	2	5%
Don't understand the program/program sounds too complicated	2	5%
Other	7	18%
Don't know/refused	7	18%
TOTAL	38	100%

The responses to the questions about the Demand Bidding Program show a more positive attitude to this program compared to the Interruptible Program: 50% of respondents indicate that they are very or somewhat likely to participate. Only 35% of respondents indicate that they are very or somewhat unlikely to participate. As with the Interruptible Program, the inability to reduce load/electricity usage without compromising products or operations is the most frequently cited barrier to participation.

MONTHLY CAPACITY BIDDING PROGRAM

The Monthly Capacity Bidding Program is a new program currently being designed by SCE. This program was not discussed explicitly in the focus groups but was included in the quantitative survey. Respondents to the quantitative survey were provided with the following explanation of this program:

"Under the Monthly Capacity Bidding Program, each MONTH you would tell SCE how much you think you could reduce your electric load IF there is an event. Then, during periods when the state's electric system is stressed due to high demand, you would be notified and asked to reduce your load by the amount that you specified. You would receive a monthly bill credit whether or not an event is called; and if an event is called, you would receive an additional payment based on the actual reduction you provided. In this program, penalties are assessed only if you fail to reduce power by at least 50% of your specified reduction."

Similar to the other two programs, respondents were then asked how likely they would be to participate in the Monthly Capacity Bidding Program and what they considered the main barriers to their facility's participation in this program. Table 11 and Table 12 present the responses to these two questions.

TABLE 11. LIKELIHOOD OF PARTICIPATING IN SCE'S MONTHLY CAPACITY BIDDING PROGRAM

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Very likely	1	3%
Somewhat likely	11	29%
Neither likely nor unlikely	3	8%
Somewhat unlikely	6	16%
Very unlikely	11	29%
Don't have enough information	5	13%
Don't know/refused	1	3%
TOTAL	38	100%

TABLE 12. MAIN BARRIERS TO FACILITY PARTICIPATION IN SCE'S MONTHLY CAPACITY BIDDING PROGRAM (MULTIPLE RESPONSE)

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Can't reduce load/electricity usage without compromising products/operation	13	34%
Don't know how much certain actions will reduce load/electricity usage	4	11%
Don't like penalties/incentives aren't worth the penalties	3	8%
Don't know what actions to take to reduce load/electricity usage	3	8%
Don't understand the program/program sounds too complicated	1	3%
Other	5	13%
Don't know/refused	9	24%
TOTAL	38	100%

In terms of likelihood of participation, the responses to this program fall in between those for the other two programs: 32% of respondents indicate that they are very or somewhat likely to participate, while 45% indicate that they are very or somewhat unlikely to participate. Similar to the other two programs, the inability to reduce load/electricity usage without compromising products or operations is the most frequently cited barrier to participation.

For ease of comparison of the results discussed above, Table 13 and Table 14 summarize the responses to the likelihood of and barrier to participation questions for the three demand response programs.

TABLE 13. SUMMARY: LIKELIHOOD OF PARTICIPATING IN SCE'S DEMAND RESPONSE PROGRAMS

RESPONSE	INTERRUPTIBLE	DEMAND BIDDING	CAPACITY BIDDING
Very likely	11%	16%	3%
Somewhat likely	16%	34%	29%
Neither likely nor unlikely	3%	3%	8%
Somewhat unlikely	24%	24%	16%
Very unlikely	29%	11%	29%
Don't have enough information	13%	13%	13%
Don't know/refused	5%	16%	3%

TABLE 14. SUMMARY: MAIN BARRIERS TO FACILITY PARTICIPATION IN SCE'S DEMAND RESPONSE PROGRAMS (MULTIPLE RESPONSE)

RESPONSE	INTERRUPTIBLE	DEMAND BIDDING	CAPACITY BIDDING
Can't reduce load/electricity usage without compromising products/operation	42%	39%	34%
Don't know how much certain actions will reduce load/electricity usage	11%	14%	11%
Don't like penalties/incentives aren't worth the penalties	11%	5%	8%
Don't know what actions to take to reduce load/electricity usage	5%	5%	8%
Don't understand the program/program sounds too complicated	3%	5%	3%
Other	16%	18%	13%
Don't know/refused	16%	18%	24%

As shown in Table 3, about 40% of respondents indicated that they could reduce load by 10% without compromising products. Nonetheless, the fear of compromising products or operation remains a key barrier to participation. This may indicate that customers may feel like more substantial load reductions are required to participate in demand response programs. It is necessary to address this concern.

COMPARISON OF THE THREE PROGRAMS

In addition to discussing the three programs individually, the quantitative survey also asked respondents to compare the three programs by naming (1) the program they would be most likely to participate in and the most appealing aspect of that program and (2) the program they would be least likely to participate in and the least appealing aspect of that program. The responses to these questions are summarized in the four tables below.

When interpreting the responses to these questions, it is important to note that some respondents provided answers that are not consistent with answers provided to other questions in the survey. For example, two respondents indicated they would be most likely to participate in the Interruptible Program because of the level of flexibility and the low risk of penalty and that they would be least likely to participate

in the Capacity Bidding Program because of the high risk of penalty. Similarly, three respondents indicated they would be most likely to participate in the Capacity Bidding Program even though in the three program-specific questions, they indicated a higher likelihood of participating in at least one of the other two programs. These answers suggest a lack of understanding of the terms and attributes of the different programs which likely represents an important barrier to participation.

TABLE 15. MOST LIKELY PROGRAM TO PARTICIPATE IN

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Demand Bidding Program	16	42%
Monthly Capacity Bidding Program	7	18%
Interruptible Program	5	13%
I wouldn't participate in any of them	6	16%
I would participate in all of them	1	3%
Don't know/refused	3	8%
TOTAL	38	100%

TABLE 16. MOST APPEALING ASPECTS OF MOST LIKELY PROGRAM (MULTIPLE RESPONSE)

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Level of flexibility	12	41%
Low risk of penalty	7	24%
Potential for reward	4	14%
Other	1	3%
None	1	3%
Don't know/refused	4	14%
TOTAL	29	100%

TABLE 17. LEAST LIKELY PROGRAM TO PARTICIPATE IN

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Interruptible Program	12	38%
Monthly Capacity Bidding Program	12	38%
Demand Bidding Program	3	9%
I would participate in all of them	1	3%
Don't know/refused	4	13%
TOTAL	32	100%

TABLE 18. LEAST APPEALING ASPECTS OF LEAST LIKELY PROGRAM (MULTIPLE RESPONSE)

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Lack of flexibility	12	43%
High risk of penalty	8	29%
Not enough potential for reward	3	11%
Other	3	11%
Don't know/refused	2	7%
TOTAL	28	100%

The responses to the four questions about the most and least preferred program and the most and least appealing program aspects confirm the findings from the program-specific questions: Respondents have a preference for the Demand Bidding Program over the other two program designs. The results indicate that this preference is driven by the flexibility offered by the Demand Bidding Program as described and the low risk of incurring a penalty, compared to the other two programs. Note that the potential for financial reward ranked much lower in the decision-making process. However, this may be at least partially due to the fact that the program descriptions given to the respondents did not provide specific reward levels.

These results also confirm the findings from the two focus groups: Participants were generally much more favorably inclined toward the demand bidding program – or another form of voluntary credit program – than the interruptible program because it is more flexible and does not entail the risk of high penalties.

Interestingly, smaller customers (those with electricity demand of between 100 and 200 kW) are less likely to consider participating in any of the demand response programs about which they were asked: five of the six respondents who would not participate in any of the programs are smaller customers.

CUSTOMERS FIND PROGRAM DETAILS HARD TO EVALUATE WITHOUT MORE INFORMATION

Both the focus groups and the quantitative survey effort were used to probe customers about certain design details of the demand response programs. These included (1) levels of incentives and penalties, (2) acceptable number of called events, and (3) notification time before events.

LEVELS OF INCENTIVES AND PENALTIES

In general, focus group participants said they did not have enough information about the discussed demand response programs to make a statement regarding levels of incentives or penalties. They stated that they would have to identify their load reduction options and the associated costs, and run “what-if” scenarios. They would also need more concrete information from SCE regarding the structure of the programs and realistic estimates of the likely frequency, duration and timing of callable events. Only then could they decide what the required incentive and acceptable penalty would need to be. All participants agreed that the decision to participate would be contingent on a cost-benefit analysis since, in the end, the

bottom line is what matters. Even those participants who did not think they could do much to reduce loads indicated that they would make “a heck of an effort” to do so, if the incentive was right, e.g., avoiding demand surcharges during peak times.

The (somewhat incorrect) perception of potentially very high penalties was the biggest issue cited with respect to interruptible programs. All participants agreed that penalties cannot be so high as to discourage participation.

Participants generally agreed that an incentive in the form of cash credit per event of load reduction would be preferable. They also generally agreed that more flexibility in when to participate was preferable to a long-term commitment.

Given the focus group findings that levels of incentives and penalties could not be judged without more detailed information about the programs, no questions on this topic were included in the quantitative survey.

ACCEPTABLE NUMBER OF CALLED EVENTS

An acceptable number of callable events was not discussed in the focus groups. However, the quantitative survey instrument included the question:

“In a program that included a penalty or a higher rate for not reducing load during a called event, how many events would be acceptable to you in one summer season?”

Table 19 summarizes the responses to this question. Nearly half (45%) of those responding indicate that any number of callable events would be unacceptable under an interruptible program design, while another 24% did not know. The responses seem to indicate that customers do not fully understand the concept of an interruptible program, do not feel that it is possible for them to participate in such a program, or simply cannot make an informed judgment about this issue without more detailed information about the programs.

TABLE 19. ACCEPTABLE NUMBER OF CALLABLE EVENTS IN ONE SUMMER SEASON

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
None/Zero	17	45%
1	3	8%
2	3	8%
3	--	--
4	1	3%
5	1	3%
6	--	--
7	--	--
8	--	--
9	--	--
10 or more	2	5%
Depends on the amount of penalty	2	5%
Don't know/refused	9	24%
TOTAL	38	100%

NOTIFICATION TIME BEFORE EVENTS

Both focus group participants and quantitative survey respondents were asked about the notification time they would require before a called event began.

Focus group participants' thoughts about required notification time varied. Approximately half of the participants with Account Representatives indicated that they would require between 30 minutes and 1 hour advance notice. Participants who would have to meet load reductions through changes in their production schedules would require longer notification periods of one day up to one week. One participant suggested that more notification would encourage participation. Two participants suggested that for them there is not much of a difference between a couple of hours and 1 day advance notice, as long as they know their load reduction options and the costs associated with them.

The quantitative survey asked customers how much lead time they would need before being able to reduce their load when called to do so. Table 20 summarizes the responses to this question.

TABLE 20. REQUIRED NOTIFICATION TIME BEFORE CALLED EVENTS

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Less than one hour	5	15%
1 hour	2	5%
2 hours	1	3%
3 hours	2	5%
More than 3 hours but less than one day	6	16%
One day or more	18	47%
Don't know/refused	4	11%
TOTAL	38	100%

Almost half of the respondents report requiring one day or more of advance notification time before they could participate in a called event. An additional 16% indicate requiring at least three hours. Interestingly, 15% of respondents indicate needing less than one hour of advance notification time. However, these responses do not appear to be associated with customers' perceived understanding of the load reductions they could provide, the actions they could take to reduce load, or any of the technical characteristics of their facilities. Given this result, it is difficult to draw any firm conclusions regarding the ideal notification period prior to a called event, as it is unclear if the responses represent fully informed estimates.

CUSTOMERS FACE INFORMATION BARRIERS TO PARTICIPATION IN DEMAND RESPONSE PROGRAMS

Most participants cite informational and operational rather than technological barriers to participation. The main reason that focus group participants are not currently participating in demand response programs are (1) lack of awareness of the types of programs that exist and negative perceptions of the programs of which they are aware (primarily programs with potential for penalties) and (2) the perception that

they do not have the potential to reduce load and/or a lack of information about the magnitude of potential load reductions and their associated costs and implications on operations.

CUSTOMERS LACK INFORMATION ABOUT DEMAND RESPONSE PROGRAMS

Both focus groups and the quantitative survey showed that there is very little knowledge among cold storage customers about the demand response programs SCE offers. Customers know that demand response programs involve a temporary reduction in load. However, for a variety of reasons, they have not considered and fully examined participation, including: (1) they do not understand the structure of these programs and that different types of programs and different ways of reducing load exist; (2) what they do know about the programs is negative – based on stories about customers who paid enormous penalties – and they are, therefore, extremely wary of programs with penalties; and (3) most participants associated demand response programs with the need to shut down their operations entirely.

Almost all focus group participants and many of the survey respondents indicated that they need more information on these programs. Many of the interviewed customers indicated that they would be interested in further exploring the possibility of participating in these programs, if they understood them better. The most desired mode of receiving information on these programs is a visit from an SCE Account Representative or other qualified individual. Such a visit would have two purposes: to learn more about the various programs SCE offers and to obtain facility-specific information about the types of load reduction activities are possible and the magnitude of the reductions they would generate. (See also in the next subsection.) Table 21 summarizes the most desired modes of receiving program information from SCE.

TABLE 21. HOW WOULD YOU PREFER TO RECEIVE THIS INFORMATION OR THESE SERVICES? (MULTIPLE RESPONSE)

RESPONSE	TOTAL (N=25)
Visit from SCE representative or other qualified individual	44%
Written information in the mail	36%
Electronic information, via e-mail or SCE website	28%
Phone call from SCE representative or other qualified individual	12%
Don't know/refused	4%

CUSTOMERS LACK INFORMATION ABOUT POSSIBLE DEMAND SAVINGS ACTIONS AND THEIR EFFECTIVENESS

Most of the customers interviewed stated that they do not have enough information about what load reduction measures would be feasible at their facilities and that it would be helpful to have an expert come to their facility and help them identify the “low-hanging fruit”. (“In terms of what we can get away with shutting down one or two compressors for the freezers or refrigerators, I don’t even know where we’d begin to measure that.”) The inability to reduce their electric load was the most frequently cited barrier to participation. However, based on the focus groups and follow-up questions in the quantitative survey, this perception is partially the result of insufficient information about what types of load reduction actions could be taken. In the quantitative survey, when prompted about specific load reduction actions,

more customers indicated the ability to engage in those actions than when asked in general about actions they could take.

The quantitative survey also asked for a self assessment of the level of understanding the interviewed customers have about the load reduction actions customers could take at their facilities and the resulting energy savings. Only 21% reported having a good understanding of these actions and 26% reported having some understanding. In contrast, 39% reported needing more information.

Both focus group participants and survey respondents indicated that a visit from an SCE representative or another qualified individual would be very beneficial to them. In addition to conveying information about SCE's demand response programs, customers expressed interest in obtaining facility-specific information about load reduction actions and their energy savings potential. ("They need to come in and if they do come in [...] they need to have some concrete numbers. This is what you're going to get if you spend this. This is the return. We can't make a decision without it. [...] You really need to know up front exactly what we're talking about.")

TECHNICAL BARRIERS TO PARTICIPATION COULD NOT BE ASSESSED IN THIS STUDY

Given the complex nature of demand response programs and the lack of knowledge among customers about demand reduction actions available to them, it was not possible to assess potential technical barriers to participation. However, some focus group participants noted the lack of monitoring equipment as a barrier to program participation. ("I have no way of knowing. I don't have meters out here that I can go up and take a look at and see what the load is running on.") Focus group participants also expressed concern about implications on production and about long start-up times:

- **Implications on production:** Many focus group participants were very concerned about the potential implications on production. Specific concerns associated with reduced production to meet load reduction requirements included: idle labor during downtimes and delays in completing scheduled production and potential subsequent loss of business. Several unassigned focus group participants thought they could participate if they could use a back-up generator to reduce load.
- **Start-up times:** While all participants agreed that it would be easy to shut down those parts of their operation required to meet certain load reduction goals, some expressed concern about the amount of time it would take to restart operations. One participant indicated that the machines take several hours to reach temperature.

The quantitative survey also requested information about three technical aspects of a customer's facilities: (1) the presence of 15-minute communicating interval meters, (2) the presence of controls to make short-term reductions to the load, and (3) the ease with which such reductions could be made. The following tables summarize the responses to these questions.

Table 22 shows that few large-scale cold storage customers have, or are aware of having 15-minute communicating interval meters. More than half of survey respondents (53%) do not know if they had such a meter, and 39% indicate that they do not have a 15-minute communicating interval meter.

TABLE 22. DOES YOUR FACILITY HAVE 15-MINUTE COMMUNICATING INTERVAL METERS?

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Yes, all meters are 15-minute communicating interval meters	3	8%
Yes, some meters are 15-minute communicating interval meters, but others are not	--	--
No, my facility doesn't have 15-minute communicating interval meters	15	39%
Don't know/refused	20	53%
TOTAL	38	100%

Table 23 shows that more than half (58%) of large-scale cold storage customers do not have the controls to make short-term reductions to their load, short of completely shutting down some parts of their facility. Only about one third of surveyed customers report having such controls.

TABLE 23. AT YOUR FACILITY, DO YOU HAVE THE CONTROLS TO MAKE SHORT-TERM REDUCTIONS TO LOAD, SHORT OF SHUTTING DOWN SOME PARTS COMPLETELY? OR WOULD YOU SAY YOUR FACILITY CURRENTLY DOES NOT HAVE THOSE CONTROLS?

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Yes	12	32%
No	22	58%
Other	1	3%
Don't know/refused	3	4%
TOTAL	38	100%

Table 24 shows that respondents who have the variable controls to make short-term reductions to their load are divided over how easy it is to make these reductions: 38% find it very or somewhat easy and 46% find it very or somewhat difficult to make short term reductions to their load.

TABLE 24. WOULD YOU SAY IT IS VERY EASY, SOMEWHAT EASY, NEITHER EASY NOR DIFFICULT, SOMEWHAT DIFFICULT, OR VERY DIFFICULT TO MAKE SHORT-TERM REDUCTIONS TO YOUR LOAD USING VARIABLE CONTROLS?

RESPONSE	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Very easy	3	23%
Somewhat easy	2	15%
Neither easy nor difficult	1	8%
Somewhat difficult	4	31%
Very difficult	2	15%
Don't know/refused	1	8%
TOTAL	13	100%

LIMITATIONS OF THE ANALYSIS

There are two key factors that readers of this report should keep in mind when interpreting this analysis and the results of the primary research efforts conducted in support of this analysis:

- (1) The sample size of the quantitative survey was insufficient to allow for extrapolation beyond the sample.
- (2) The information needed to participate in and the complexity of demand response programs in general, combined with the lack of customer awareness and understanding of these programs, limited the type of information that could be collected from the customers and created inconsistencies in survey responses.

Both of these issues were discussed earlier in this report and are recapitulated in the two subsections below.

INSUFFICIENT SAMPLE SIZE TO GENERALIZE FINDINGS FROM QUANTITATIVE SURVEY

As described above, an attempt was made to complete interviews with 55 of 250 cold storage facilities with greater than 200 kW demand, and with 47 of 157 facilities between 100 and 200 kW demand, for a total of 102 completed interviews. These numbers would have allowed extrapolation of survey results to the two respective populations with 90% confidence and a 10% margin of error, a standard confidence interval in U.S. energy efficiency evaluations.

However, despite contacting all 407 cold storage customers with facilities in the two demand ranges, only 38 interviews could be completed. These included 21 interviews with facilities with greater than 200 kW demand and 17 interviews with facilities with between 100 and 200 kW demand.

Given these sample sizes, the results of the quantitative survey cannot be considered representative of the overall population of cold storage customers. Rather, these results should be interpreted as qualitative results that support and/or refine the qualitative results gleaned from the in-depth interviews and focus groups. To

underscore this fact, all tables of survey results present the total number of respondents.

LACK OF UNDERSTANDING OF DEMAND RESPONSE PROGRAMS LIMITED TYPE OF INFORMATION COLLECTED AND PRODUCED INCONSISTENT SURVEY RESPONSES

Previous sections described the lack of understanding of demand response programs among interviewed cold storage customers. Unlike other types of energy efficiency programs, demand response programs tend to be complex and require a solid understanding of a facility's operations to gauge the potential for participation. The vast majority of interviewed cold storage customers do not currently have this understanding.

As a result of this lack of understanding, this research effort could not fully assess technological barriers to participation. Customers will first need to understand what types of energy savings actions can achieve the required load reduction before they can assess their technological ability to carry out these actions.

This general lack of information and understanding also contributed to some inconsistencies in the responses customers provided, particularly in the quantitative survey. Many customers had never heard of demand response programs before participating in the survey. They were presented with very brief descriptions of the three programs and had to process this information on the spot and answer questions about likelihood of participation and potential barriers. Even in the focus groups, which benefited from a dialogue-style format and more detailed information about the programs, customers had difficulty providing the requested information. In the quantitative survey, which by definition limits the type of clarification an interviewee can request, this lack of understanding resulted in many "don't know" responses and some inconsistencies.

These inconsistencies were discussed in this report but should be kept in mind, independent of this discussion, when viewing the attached data tables in this report.

CONCLUSIONS/RECOMMENDATIONS

SCE's cold storage customers are familiar with the term "demand response" and understand that demand response programs involve a temporary reduction in electric load. However, they have not considered and fully examined participation in these programs for a variety of reasons including: (1) they do not understand the construct of these programs and that different types of programs and different approaches to reducing load exist; (2) what they do know about the programs is, for the most part, negative – based on stories about customers who paid enormous penalties – and they are, therefore, extremely wary of programs with penalties; and (3) many customers associate demand response programs with the need to shut down their operations entirely. In general, therefore, the major barriers to cold storage facilities participating in demand response programs appear to be barriers that would apply to all customers (not barriers exclusive to cold storage customers).

Cold storage customers may also face technological barriers, although this could not be confirmed during the focus groups or the quantitative survey. While some customers

acknowledged that they have the necessary controls to shut down individual pieces of equipment, it is not clear that they currently have the ability to reduce load short of shutting down entirely (i.e. operate equipment at part load).

For customers with an SCE Account Representative (generally those with demand greater than 200 kW), the representatives are an important source of information regarding the requirements and types of demand response programs available to customers. The study reveals that the efforts of Account Representatives to promote demand response programs to cold storage facilities have not been effective in recruiting participants. The level of interaction with SCE varied among cold storage facilities participating in our qualitative and quantitative research efforts. Almost all of the focus group participants with an assigned Account Representative have had some contact with this representative, or their representative has tried to contact them. However, only one of the eight focus group participants meeting this criterion had been approached about participating in a demand response program, and seven of the eight did not have a good idea of what participation in a demand response program would entail. Similarly, only 7% of respondents to the quantitative survey have heard about SCE's demand response programs, despite the fact that 45% report having an Account Representative.

This respondent information (as well as information gathered from account representatives through in-depth interviews) indicates that SCE Account Representatives are not actively promoting or discussing demand response programs with customers. These customers mentioned interactions with SCE on rebate programs, service connections, service issues, and questions regarding rate structures. Focus group participants without an Account Representative appear to be even less informed about these programs – they generally knew programs were available but did not understand the value of these programs. Given that these customers do not have account reps, SCE may wish to consider improved efforts to promote programs to these customers – the interest in learning more about these programs is there.

In general, cold storage customers have some ideas about what they could do to reduce load, but they cannot easily quantify the reductions associated with specific actions. As a result, they cannot easily understand their ability to participate or the risk of not meeting required load reductions. Customers do not currently have the tools that they need to quantify the reductions that could be made in their facilities and do not seem to gain insights on their ability to reduce demand from typical energy audits. Notably, none of the interviewed customers had heard about the TA&TI (Technical Assistance and Technical Incentives) audits, although they expressed an interest in this and felt that having someone come to their facility would be the best way to understand what they could do.

Further, while some customers are aware of and have used SCE's Energy Manager Tool, particularly focus group participants with Account Representatives, it does not appear that this tool (without further instruction) provides customers with the information they need to support a decision to participate in a demand response program, i.e., the ability to quantify load reductions associated with specific actions. The Energy Manager Tool thus does not aid in identifying the types of load reduction actions they could take in order to participate in a demand response program.

Unlike energy efficiency equipment rebate programs, the value proposition associated with interruptible or demand bidding programs (as currently promoted) is not immediately clear to customers. Awareness and understanding of demand response programs is a barrier, i.e., both awareness and understanding of these programs appears to be low. This is particularly the case for smaller customers (those with electricity demand of between 100 and 200 kW). However, even if customers are informed of the basic details, perceptions of these programs are negative – sometimes based on accounts of negative experiences by others – and the risks and rewards to the customer are not apparent and cannot easily be explained. Interestingly, while ultimately the amount of the penalty and incentive will affect participation rates, on first blush, the dollar amounts per kW do not matter since customers

cannot easily understand the total impacts associated with participation. Moreover, demand bidding (while less understood by customers) is more palatable than interruptible programs since demand bidding programs involve incentives rather than penalties.

Based on the results of the research completed in support of this effort, the following recommendations are made:

- In addition to current promotional efforts designed to raise awareness of these programs, it is recommended that Account Representatives or appropriate third parties talk to customers one-on-one to educate them about these programs.
- Provide Account Representatives or appropriate third parties with case studies of positive examples of savings specific for cold storage facilities to overcome negative perceptions of these programs.
- Work through Account Representatives or appropriate third parties to provide customers with an understanding (on a case-by-case basis) of what specific actions can be taken at the customer's site, and what reductions are achievable from these actions.
- Work through Account Representatives or appropriate third parties to help customers understand the financial implications of the program under various scenarios (e.g., do incentives still outweigh penalties if the facility is only able provide the required load reductions 75% of the times that it is called to reduce load? Do the financial incentives outweigh the operational expenses and risks associated with participation given the nature of the actions taken to provide the required reductions in load?).
- If program participation by smaller customers (i.e., between 100 and 200 kW demand) is desired, more effective ways of educating these customers about the availability and benefits of demand response programs need to be devised and implemented.

REFERENCES

¹ Sample Disposition Summary. SCE internal document, August 2007.

² Quantitative Survey Data. SCE internal document, August 2007.