



San Diego Gas & Electric Demand Response Program Process Evaluation Final Report

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I Executive Summary

I.1 Introduction

This research is intended to improve effectiveness and increase customer satisfaction for three SDG&E demand response programs (Reduce Your Use (RYU), AC Cycling/Summer Saver (ACSS), and Programmable Communicating Thermostats (PCT)).

The evaluation objectives were to:

1. Provide customer feedback to program implementers with specific focus on improving program offerings and customer interactions with program signals.
2. Provide customer input on possible future program changes.
3. Assess reasons for customer disinterest in PCT program offerings.

Table 1 presents a summary of the key attributes of each of the three demand response programs.

Table 1: Current Program Attributes

| | PCT | ACSS | RYU (Alerts) |
|---------------------------|--|---|--|
| Bill credit | Varies, delivered monthly | Varies, delivered annually | Varies, higher with approved connected device, delivered monthly |
| DR-enabled device | No-cost Ecobee Smart Si and no-cost installation | Direct load control switch on air conditioner | None |
| Ability to Override Event | Yes | No | N/A |
| Notification Timing | Day ahead | Day of | Day ahead |
| Event Duration | 2 p.m. to 6 p.m. | Varies | 11 a.m. to 6 p.m. |

Customers may be on multiple programs at the same time. In total, we surveyed five program groups:

1. **RYU Only:** signed up for the Reduce Your Use Alerts only.
2. **PCT Only:** enrolled in Reduce Your Use (including installation of the no-cost Ecobee Smart Si from SDG&E) only.
3. **ACSS Only:** enrolled in the ACSS program (including installation of a DLC device on their air conditioner) only.

4. **ACSS & RYU**: enrolled in ACSS and signed up for RYU alerts.
5. **RYU & PCT**: enrolled in PCT and signed up for RYU alerts.

1.2 Data Collection and Analysis Methods

Evergreen Economics (Evergreen) launched program staff interviews in August of 2015 followed by a web survey in December of 2015 and January of 2016 to reach residential and commercial demand response program participants, including a conjoint exercise. We later removed the commercial customers from the study due to a lack of email contact information. Conjoint analysis is a stated preference survey technique that involves having respondents sort through and rank options that reflect different choices. As part of the web survey, participants were asked to rank choices that reflected different types of energy efficiency program scenarios. For all these scenarios, each choice was defined by several attributes, and respondents were asked to rank the options from most to least preferred based on these attributes, and then to indicate in which scenarios they would actually participate.

1.3 Findings and Recommendations

Findings from this research are presented below, along with their implications to be used for any future program planning. Recommendations are shown in bold text.

1.3.1 Satisfaction Levels

Survey respondents who participate in the Reduce Your Use alerts program *and* either the PCT program or the ACSS program report higher overall program satisfaction. When PCT participants are also enrolled in RYU, they are more engaged with the program and like certain features of the program smart thermostat more than those who are in the PCT program alone do. **SDG&E should continue to market co-participation in demand response programs to increase satisfaction and program interaction.**

1.3.2 Program Attributes

Demand Response Events

The programs are successfully communicating to participants about events. Survey respondents reported recalling an average number of events that was very close to the number of events that were actually called. This indicates that the program is successfully communicating to respondents and that respondents have good recollection of events, even those that occurred over six months ago.

There is room for additional participant action during events, as customers reported a low level of action taken outside of the automated program changes in air conditioning. The most common actions that respondents reported doing because of the program(s) (aside from any automated changes in air conditioning) were behavioral changes. Over half of the participants who participated in at least one event day reported visiting the My Energy

Use section of the SDG&E website to view how they performed during one or more events.

There is no consensus on what type of changes respondents would like to have occur to their AC systems during demand response events, **suggesting that the program should continue to allow different options (completely off, cycling, increased temperature by 4 degrees) to customers.**

Event Notifications

Across all programs, the majority of respondents favored day-before notifications for events. About half of PCT program participants preferred multiple methods of notifications and only a quarter of ACSS participants asked to be notified in more than one way. Voice calls were the least popular form of event notification, suggesting that **the ACSS program should offer additional alert options (beyond the current voice phone option) to participants.**

Override Option

Customers like knowing that they have the option to override a demand response signal. This option came up repeatedly in the conjoint analysis as one of the top three important attributes of a demand response program. **SDG&E should work to make it clear when talking to ACSS participants about other programs in which participants *do* have the ability to override signals.** SDG&E could balance this messaging with information about how per-event incentives are based on actions taken during events (to dissuade people from using the override feature).

Programmable Communicating Thermostat

Satisfaction levels were similar for both the program thermostat and with smart thermostats purchased outside of the program. The smart thermostat currently offered through SDG&E's PCT program (the Ecobee Smart Si, offered at no cost with installation) meets the needs of survey respondents. This was revealed through web survey questions and through the conjoint exercise. Part of the appeal of the current program thermostat offer may be the no-cost installation.

The PCT program thermostat differs from other independently purchased thermostats in its ability to display energy usage (which is not a largely reported feature in other thermostats). The most popular feature of the program thermostat was the ability to make remote adjustments. **These attributes may be worth highlighting in PCT program marketing.**

There are additional opportunities for enrollment in the PCT program for the other two residential demand response programs that we surveyed (ACSS and RYU). Twenty seven percent of RYU Only participants are eligible and willing to get a smart thermostat. These participants reported being willing to pay some amount of money for a smart thermostat

and some also reported being willing to do the installation. **SDG&E should use the findings in this report about revealed desirable traits of the Ecobee Smart Si to encourage current RYU participants to consider participation in the PCT program.**

1.3.3 ACSS Specific Customer Attributes

The participants in the ACSS program differ significantly from participants in SDG&E's other demand response programs in that they estimate having received higher bill savings, find a once a year incentive payment to be acceptable, and are more likely to use their bill to view energy usage. The ACSS program has been available to customers for longer than the other demand response programs, and participants in this program seem to be accustomed to the program traits (incentive levels and payment timing).

Participants who are only in the ACSS program are the least likely to be aware of the RYU program of all participant categories that we surveyed suggesting that **ACSS only participants should be a focus for future RYU alert marketing.**

2 Introduction

This research is intended to improve effectiveness and increase customer satisfaction for three San Diego Gas & Electric (SDG&E) demand response programs (Reduce Your Use (RYU), AC Cycling/Summer Saver (ACSS) and Programmable Communicating Thermostats (PCT)).

The evaluation objectives were to:

1. Provide customer feedback to program implementers with specific focus on improving program offerings and customer interactions with program signals;
2. Provide customer input on possible future program changes; and
3. Assess reasons for customer disinterest in PCT program offerings.

Evergreen Economics (Evergreen) performed the following tasks to meet these objectives:

- In-depth interviews with SDG&E program staff.
- Online survey of participants in all three programs (RYU, ACSS, PCT) across both the residential and non-residential sectors,¹ including a conjoint exercise.

2.1 Program Descriptions

This evaluation addresses three programs; each is described below. These program descriptions are informed by document review and in-depth interviews with program managers.

2.1.1 Programmable Communicating Thermostats

In this report, we refer to this program as the PCT program, but SDG&E markets it as the Reduce Your Use Thermostat program. We chose to call it the PCT program in this report to avoid confusion between this program and the RYU program. In 2015, there were a total of 6,862 program participants.² The PCT program has a goal of a total of 1,500 residential and commercial participants per month. SDG&E encourages participation in both of these programs simultaneously, but only 59 percent of PCT participants are also enrolled in the RYU program.³ The PCT program offers participants a no-cost Ecobee Smart Si thermostat along with no-cost installation of the device. This device counts as one of the enabling

¹ Due to low response rates, the commercial portion of this study was dropped in the second round of customer surveys.

² 2015 source for the participant counts in this section is IOU-provided tracking data received in October 2015.

³ This is based on our originally tally of PCT program participants in SDG&E's tracking data and includes accounts flagged as 'do not contact', suspected duplicate contacts, with an unknown sector, and without email addresses. The sample consists of 5,469 of these PCT program participants, including 5,467 residential and 2 commercial.

technologies mentioned in the program description of the RYU alerts program and is incentivized accordingly. The kWh savings are calculated for each event, and participants are incentivized at a rate of \$1.25 per kWh saved during each event.

The marketing for this program has been done through multiple channels including email blasts (four over the last year), advertisements in local newspapers, account executive outreach, Pandora ads, radio ads, social media posts, trade professional recommendations, community partner presentations and bill inserts. The most successful tactic thus far has been the outreach from account executives.

The Ecobee Smart Si thermostat has many traits including color display, vacation programming, summer day programming, humidity sensing and fan controls, and it has the ability to be accessed remotely by an app or Internet access. A notification about an upcoming event is displayed on the app and on the smart thermostat itself. The default setting is to automatically accept an event trigger. While an RYU event will run from 11 a.m. to 6 p.m., SDG&E will only signal residential devices between 2 p.m. and 6 p.m. on an event day. Customers have the ability to opt out of events, but to encourage participation, this feature is not marketed. Ecobee provides the first level of support for customers having an issue with their device, but not all customers remember to contact Ecobee directly.

2.1.2 Reduce Your Use Alerts

The RYU program encourages customers to sign up for RYU alerts, which are delivered the day before a demand response event by either phone (automated call or text) or email. Events run from 11 a.m. to 6 p.m. and use smart meter data to calculate customer bill credits after events based on the amount of reduction from their expected energy use during the event hours. In 2015, there were a total of 74,458 participants.⁴ Customers can receive one of two levels of bill credit depending on the use of a connected device. If customers have an enabling technology that allows SDG&E to send signals or alerts (such as certain smart thermostats), they can get a credit of \$1.25 per kWh. If customers do not have an enabling technology, the incentive is \$0.75 per kWh.

In 2015, four events were called. The utility has not placed a cap on the number of days it may call.

2.1.3 AC Cycling/Summer Saver

The ACSS program has been utilized by SDG&E for the past 10 years in order to have guaranteed load shed. Participants allow SDG&E to have contractors install a direct load control (DLC) device on their central air conditioning (AC) system. In 2015, the program

⁴ This is based on our originally tally of RYU program participants in SDG&E's tracking data. The sample consists of 56,874 of these RYU program participants.

had 26,989 participants, including 22,231 residential and 4,758 commercial participants.⁵ The DLC device does one of two things (depending on the customer's choice at the time of installation) at the time of a demand response event. The first option completely shuts off the AC (100% cycling), and the second option (50% cycling) cycles the AC on and off for the duration of the event. The incentive (paid annually via a bill credit) for both cycling options depends on the tonnage of the AC system. The 50 percent cycling option is incentivized at \$11.50 per ton. The 100 percent cycling option is incentivized at \$30 per ton. The incentive is paid regardless of whether the customer had their AC on or off. A total of 15 events were called in 2015.

A small percentage of participants in this program are signed up to receive day-of notifications for demand response events via phone. SDG&E markets to current participants about this feature once a year. Customers are unable to override the cycling,⁶ which may explain the low number of customers who request alerts. These days are not necessarily the same as the event days for the RYU/PCT programs.

Customers learn about this program through a variety of sources including the SDG&E website and outreach by account executives. This program is available for both commercial and residential customers, and the DLC device can be placed on multiple units at larger facilities.

2.2 Research Questions

The study research addressed the following questions, which were identified via in-depth interviews with program managers.

Devices

- Are participants aware of the various features of their PCT and the supporting website?
- Are customers satisfied with their PCTs?
- What features of the programs/devices do participants like the best/least?
- Are customers interested in other devices (i.e. pool pump or DVR)? If so, do they already have those? If they prefer those to the SDG&E program PCT, why?
- Why did some customers purchase their own PCT and decline to be on a demand response program?

⁵ This is based on our originally tally of ACSS program participants in SDG&E's tracking data. The sample consists of 20,252 of these ACSS program participants, including 16,639 residential and 3,613 commercial participants.

⁶ Though customers participating in the ACSS program cannot override either cycling option in case of an event, they can unenroll from the program and forfeit the annual incentive if desired.

- What do ACSS customers who prefer the DLC device to a PCT like about the DLC device?
- Would customers with pool pumps be comfortable letting them send a signal to their pool pump?

Customer Demographics

- Do customers have solar?
- Do customers have electric vehicles?

Energy Usage

- Do participants think they are saving energy as a result of being on the programs?
- How often do participants check their energy usage, and where are they most likely to check it?

Customer Experience

- What is the experience for participants during events?
- Have participants had any issues with the installation contractors for ACSS and PCTs?
- Do customers know about RYU (even if they are enrolled)?
- Once time of use comes into play, will this market be transformed and will customers feel enabled by these tools?

Program Modifications

- What program features should SDG&E consider when planning future demand response programs?
- What additional features would participants like to see?
- Are ACSS customers interested in converting to other programs (from direct load control to PCTs, to RYU for that and other devices)?
- What are acceptable forms of compensation (what would motivate them to participate?)
- What motivates PCT customers to participate?
- What are customer preferences related to notifications?
- Are there benefits to targeting certain areas (for events)?
- Would SDG&E be able to get a larger load reduction from customers if it allowed for a choice between an offset of 4 degrees instead of cycling?
- What is the best way to notify customers about program changes?

- For the participants that are in ACSS that signed up for RYU, why did they want that? (Do ACSS participants know about RYU and have they applied to it?)
- How can SDG&E encourage customers to get as much load drop as possible? Do customers need additional information from SDG&E to do more? If so, what is that information?

2.3 Data Collection and Analysis Methods

In this section, we describe the three research activities that were used to answer the above research questions: in-depth interviews with program staff, a participant web survey (see Appendix D – In-Depth Interview Guide), and conjoint analysis (imbedded in the web survey).

2.3.1 In-depth Interviews

Evergreen conducted three in-depth telephone interviews with program managers from each of the following programs in late August 2015:

- Reduce Your Use
- AC Cycling/Summer Saver
- Residential PCTs and Small Commercial PCTs

These interviews were designed to improve our understanding of SDG&E’s relevant demand response offerings, their challenges, successes, and how programs may overlap with each other. These interviews informed our research questions (Section 2.2) and program descriptions (Section 2.1). A copy of our final in-depth interview guide is provided in Appendix D – In-Depth Interview Guide.

2.3.2 Web Survey

This section describes our approach for conducting a web survey of participants in SDG&E’s Reduce Your Use, AC Cycling/Summer Saver, and Programmable Communicating Thermostat programs. The web survey included a series of questions and a conjoint exercise.⁷ The methods for conjoint data collection are included in this section with the rest of the web survey, but the methods for analyzing the data are provided separately in Section 2.3.3.

Sample Design

SDG&E provided Evergreen with a file that contained customer contact information and flags indicating whether each customer was currently a participant or a non-participant in

⁷ The conjoint survey was removed from the second round of surveys that were sent (including reminders for customers who did not respond to the first email) in order to encourage participation by shortening the survey, after enough conjoint responses were received.

each of the three demand response programs. We incorporated additional contact information from the program tracking data by account ID. Next, we employed three strategies to identify whether customers were residential or commercial:

1. For RYU participants, we assumed they were residential, as this is one of the criteria for program eligibility.
2. For ACSS participants, we used the AC cycling option code in the tracking data to identify customers as residential or commercial.
3. For the remaining customers, we referred to rate codes from their monthly billing records and a supplementary file with sector information for selected accounts.⁸

To construct our sample frame, we removed suspected duplicates (indicated by account ID or contact information), those who requested not to be contacted by SDG&E, customers we could not identify as residential or commercial, and customers with no email address listed. We were left with a sample frame of 75,943 viable contacts, as shown in Table 2.

Table 2: Web Survey Sample Frame

| Program Combination | Sector | Viable Contacts |
|----------------------------|---------------|------------------------|
| PCT Only | Residential | 2,427 |
| | Commercial | 1 |
| RYU & PCT | Residential | 3,040 |
| RYU Only | Residential | 50,223 |
| ACSS Only | Residential | 13,028 |
| | Commercial | 3,612 |
| ACSS & PCT | Commercial | 1 |
| ACSS & RYU | Residential | 3,611 |
| Total | | 75,943 |

Our target was to complete 100 web surveys in each of our strata, defined by the program combination and sector. There were insufficient viable contacts in two of these strata, PCT Only Commercial and ACSS & PCT, so these strata were removed from the sample.

⁸ We assumed the following rate codes are residential: DM, DR, DRLI, DRSES, DRTOD, DRTODPSH, DRTOU, EPEVH, EPEVL, EPEVM, EVTOU, and EVTOU2; and that the following are commercial: A, AD, ALTOU, ALTOUCP2, ALTOUDGR, ASTOD, ASTODPSW, ATC, ATOU, AYTou, AYTouCP2, OL1, OL2, PA. We excluded one rate code – COGEN – from the sector determination process.

Survey Recruitment

We performed survey recruitment in two waves in order to get an accurate reporting of response rate and to be sure to not contact more customers than necessary. In the first wave, on December 9, 2015, we sent emails to a total of 12,989 participants with invitations to the web survey. On sending these Wave 1 emails, we met our targets for the conjoint section of the web survey, but needed additional responses to survey questions for many of the strata (all except RYU Only). To improve the likelihood that participants would complete the survey, we removed the conjoint exercise and sent a second wave of emails.

We used the response rates for Wave 1 by stratum to determine the necessary sample size for Wave 2 to meet our targets. These response rates ranged from less than 1 percent of ACSS Only Commercial participants to 11 percent of ACSS & RYU participants. Based on this analysis, we concluded that there were not enough remaining viable contacts to meet our targets for ACSS Only Commercial, and dropped them from our sample for Wave 2. On January 12, 2016, we sent the second wave of survey recruitment emails to a randomly selected group of 5,573 participants across the strata listed below, along with 3,157 reminders to people we had invited in the first wave. Between these two waves, we contacted a total of 18,562 participants, as shown in Table 3.

Table 3: Survey Invitations Sent by Strata

| Strata | Sample Frame | Wave 1 Invites | Wave 2 Reminders | Wave 2 New Invites | Total N Contacted |
|-----------------------|---------------------|-----------------------|-------------------------|---------------------------|--------------------------|
| PCT Only Residential | 2,427 | 423 | 369 | 1,861 | 2,284 |
| RYU & PCT | 3,040 | 521 | 444 | 488 | 1,009 |
| RYU Only | 50,223 | 8,624 | 0 | 0 | 8,624 |
| ACSS Only Residential | 13,028 | 2,076 | 1,886 | 2,791 | 4,867 |
| ACSS Only Commercial | 3,612 | 802 | 0 | 0 | 802 |
| ACSS & RYU | 3,611 | 543 | 458 | 433 | 976 |
| Total | 75,943 | 12,989 | 3,157 | 5,573 | 18,562 |

Every survey respondent was asked to confirm their participation in the program(s) that their account was currently enrolled in according to SDG&E's records. If they were enrolled in the PCT program, we also confirmed that they had not uninstalled the smart thermostat or disconnected it from their wireless Internet. Our intention with these screening questions was to ensure we were surveying people who are current participants who are at least familiar with the program(s), and thus are able to give useful feedback about their experiences and preferences with the program(s).

These questions screened out 289 respondents across our final five strata (all residential), as shown in Table 4. Of these people, 40 percent said they were not participants, 2 percent uninstalled the PCT program smart thermostat, 10 percent still had it installed but had disconnected it from their wireless internet, and 48 percent were unsure about their enrollment or status of the PCT program smart thermostat. It is possible that the survey went to someone in the household that was unfamiliar with participation.

A total of 1,070 participants made it through the screening process and completed all of the web survey questions (Waves 1 and 2), and 492 participants completed the conjoint exercise (all from Wave 1).

Table 4: Completed Surveys by Strata

| Strata | N Screened Out | N Completed Surveys | |
|-----------------------|----------------|---------------------|--------------|
| | | Conjoint | Questions |
| PCT Only Residential | 37 | 20 | 193 |
| RYU & PCT | 31 | 52 | 171 |
| RYU Only | 139 | 320 | 327 |
| ACSS Only Residential | 61 | 44 | 212 |
| ACSS & RYU | 21 | 56 | 167 |
| Total | 289 | 492 | 1,070 |

Tabulations of Survey Questions

All references to statistical significance in the analysis of the survey questions are based on a 90 percent level of confidence. The survey responses were not weighted.

2.3.3 Conjoint Analysis Results

Conjoint Analysis Overview

Conjoint analysis is a stated preference survey technique that involves having respondents review and rank options that reflect different choice options. In this application, the conjoint data collection was done using a website that asked respondents to rank a series of choices relating different possible demand response program participation experiences. For the demand response scenarios, each program choice is defined by several attributes (discussed below), and respondents were asked to rank the options from most to least preferred based on these attributes. Respondents were also asked to identify which program choices they would actually be willing to participate in after they completed the ranking exercise.

Conjoint analysis has the advantage of presenting several program characteristics simultaneously, which forces the respondent to make tradeoffs between attributes. By presenting attributes simultaneously, respondents must decide which features are most important in deciding whether or not to participate in an energy efficiency program. Past experience as well as existing literature indicates that the most successful conjoint designs limit each exercise to ranking 16 choices at a time, with 4 to 6 attributes defining each choice. Including more than 16 options or additional attributes tends to overwhelm respondents and results in less reliable data.

For this conjoint exercise, respondents had confirmed that they were aware of their participation in one or more of SDG&E's demand response programs. Program descriptions can be found in Section 2.1.

With their current program participation as context, respondents are asked to rank 16 possible options.⁹ Each program option is defined as a combination of event incentives, thermostat incentives, event timing and duration, event override controls and event notification timing. The various attribute levels for each of these characteristics are shown in Table 5. These attribute levels are randomly assigned to create 16 possible programs that the respondent then ranked during the on-line conjoint session. Descriptions of these program attributes given to respondents during the survey are as follows:

- **Incentive Per Event:** Bill credit that households can expect to earn per demand response event on their monthly energy bill if they participate in the demand response program.
- **Smart Thermostat Incentive:** Thermostat incentive households can receive for participation in the demand response program.
- **Event Duration and Frequency:** Number of times that households can expect a demand response event to occur per year and the average duration per event.
- **Ability to Override Events:** Whether or not participants can override a demand response event.
- **Notification Timing:** When households can expect to receive notification of a demand response event relative to event's timing.

The values used to describe each choice option are randomly assigned, which forces the respondent to choose which attributes to focus on to rank the choices. To accomplish this, the conjoint application uses an orthogonal design, which means that there is zero correlation between each of the choice attributes. This is critical to the analysis, as correlation across attributes results in a loss of precision and makes it difficult to estimate

⁹ Respondents are first given a practice conjoint exercise to complete using a non-energy example in order to get them familiar with the online conjoint ranking process.

the importance that respondents place on each attribute. For example, consider the situation where the incentive per event and the ability to override events are two of the characteristics being evaluated, and on each choice, the incentive per event is high and the respondents are unable to override demand response events. Since these two factors are perfectly correlated, there is no way to determine from the data if a respondent is ranking the choices based on incentives or event control. For this reason, having an orthogonally designed study is essential.

Once all the choices are ranked, the respondent is then asked to indicate in which of the 16 program options (if any) they would be willing to participate, given their current living conditions. The participation choices and the ranking information are then automatically captured on the website for analysis.

The various attribute and levels for the demand response program in the conjoint exercise are shown in Table 5.

Table 5: DR Program Choice Characteristics

| DR Program Options | Possible Values |
|------------------------------|--|
| Incentive Per Event | \$2; \$10 |
| Smart Thermostat Incentive | No Thermostat; \$50 off smart thermostat of participant's choosing; Free Ecobee3 PCT with installation |
| Event Duration and Frequency | 4 hours, 10 events per year; 6 hours, 4 events per year |
| Ability to Override Event | Cannot Override; Can Override |
| Notification Timing | None; Day-of; Day-ahead Notification |

In order to give the reader context, the current attributes of the three demand response programs are shown in Table 6.

Table 6: Current Program Attributes

| | PCT | ACSS | RYU |
|---------------------------|--|-------------|-------------------|
| Incentive Per Event | Varies | None | Varies |
| Device Incentive | No-cost Ecobee Smart Si and no-cost installation | Varies | None |
| Ability to Override Event | Yes | No | N/A |
| Notification Timing | Day ahead | Day of | Day ahead |
| Event Duration | 2 p.m. to 6 p.m. | Varies | 11 a.m. to 6 p.m. |

Conjoint Discrete Choice Models

Once the conjoint surveys were completed, the conjoint data was used in a discrete choice model. Using the ranking data, a conditional logit model was developed to estimate how the attribute levels influence the rankings for program choices using the following equation:

$$Rank_i = \beta' BillCredit_i + \beta' ThermostatIncentive_i + \beta' Timing_i + \beta' Override_i + \beta' Notification_i + \varepsilon_i$$

Where:

Rank_i = Rank value between 1 and 16, based on respondents' relative assessment of each choice

BillCredit_i = Bill credit amount offered per event for option *i*

ThermostatIncentive_i = Incentive toward smart thermostat for option *i*

Timing_i = Estimated yearly number of events and duration of events for option *i*

Override_i = Ability for participant to override event for option *i*

Notification_i = Notification timing relative to event occurrence for option *i*

ε_i = Random error term assume to be logistically distributed

β = Coefficient to be estimated

A second model (a binomial logit) was estimated to determine the influence of the attribute levels on the willingness to participate in a demand response program:

$$Participate_i = \beta' BillCredit_i + \beta' ThermostatIncentive_i + \beta' Timing_i + \beta' Override_i + \beta' Notification_i + \varepsilon_i$$

Where:

$Participate_i$ = Indicator (0,1) of willingness to participate in program option i

$BillCredit_i$ = Bill credit amount offered per event for option i

$ThermostatIncentive_i$ = Incentive toward smart thermostat for option i

$Timing_i$ = Estimated yearly number of events and duration of events for option i

$Override_i$ = Ability for participant to override event for option i

$Notification_i$ = Notification timing relative to event occurrence for option i

ε_i = Random error term assume to be logistically distributed

β = Coefficient to be estimated

Relative Importance

While coefficient estimates from the logit models provide some information on the influence of the variable on total utility, it is misleading to look only at the coefficient to gauge the influence of that variable. For example, if the event override coefficient is 10 times the magnitude of the bill credit coefficient, this is due in part to differences in the magnitude of the variable values, where the indicator variable for event overrides (0,1) is only a fraction of the value of the bill credits (\$ per event). Looking only at the magnitude of the coefficients would give the misleading impression that comfort is considered much more important than savings. To address this issue, “relative importance statistics” are calculated that combine both the coefficient and attribute value to get an overall measure of the influence on total utility. The relative importance statistic can be interpreted as each attribute’s contribution to total “utility”, or the perceived benefit associated with that choice. This statistic measures the importance of one design feature relative to that of all other design features in determining the total utility for each program option.

The total utility of each option can be calculated by inserting attribute values into the estimated regression equation:

$$Total\ Utility_i = \beta' BillCredit_i + \beta' ThermostatIncentive_i + \beta' Timing_i + \beta' Override_i + \beta' Notification_i$$

Using the coefficient estimates and the values for the variables used in the conjoint analysis, the importance statistic is defined as:

$$\text{Relative Importance}_j = \frac{\Delta u_j}{\Delta U} = \frac{\text{Maximum utility change due to attribute } j}{\text{Maximum utility change due to all attributes}}$$

The importance statistic measures the percentage of the total maximum change in utility across all choices that is attributable to a single feature. Stated another way, the importance statistic measures each feature's contribution to the total utility based on the attributes included in the conjoint analysis.

Participation Probabilities

To assist in the interpretation of the binomial logit models, the probability of participating in the program is calculated by combining the coefficient estimates with program attributes within the logit probability function:

$$\text{Prob}(\text{Participate}) = \frac{\exp(\beta' X)}{1 + \exp(\beta' X)}$$

Where $\beta'X$ reflects the sum of the coefficient estimates used in the conjoint analysis.

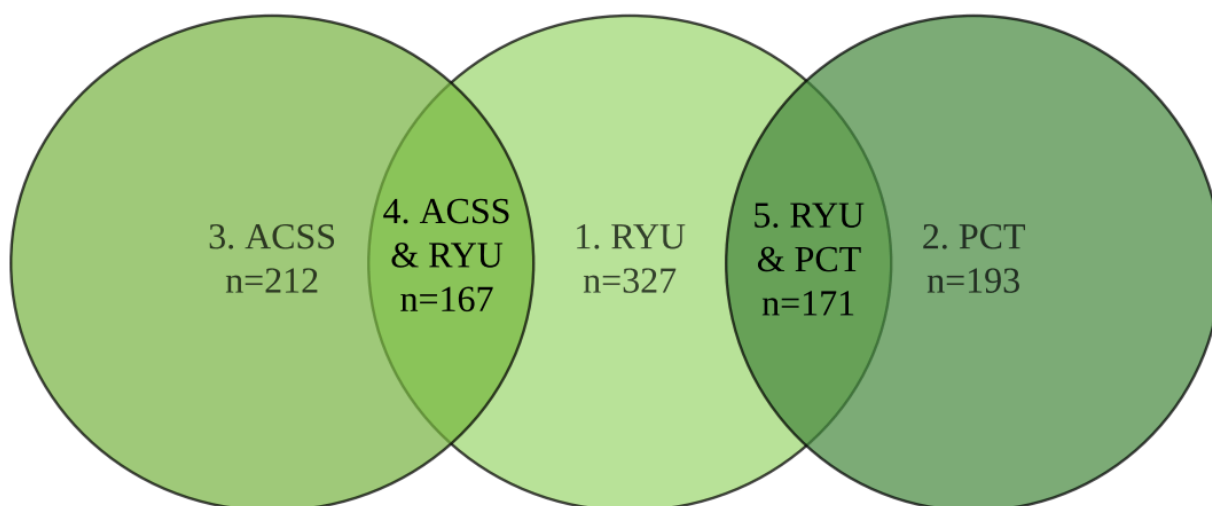
By using different values for event incentives, thermostat incentives, event duration and frequency, ability to override events, and event notifications to simulate different programs, this equation can be used to determine the overall effect on utility of alternative program designs. The probabilities can also be used to determine the value a respondent places on thermostat incentives and event notifications, for example.

Given that this estimate is determined using only five factors included in the conjoint, when in reality there are many other factors that are influencing this decision, the result should not be interpreted as a direct estimate of potential market share in alternative program designs. Nevertheless, we explored options for using the probability calculations to determine a threshold level of willingness to participate.

3 Web Survey Results

In this section, we present results from the web survey. Figure 1 shows the number of completed surveys in each program including where there was overlap between programs, with participation in two of the three demand response programs that we evaluated as a part of this study.

Figure 1: Completed Surveys by Program



Throughout our analysis, we present results by five strata.¹⁰

1. **RYU Only:** SDG&E residential customers who participate in the Reduce Your Use alerts program but do not participate in the ACSS program and do not have the device provided through the RYU Thermostat (PCT) program.
2. **PCT Only:** SDG&E residential customers who have received a no-cost Ecobee Smart Si from SDG&E (called the Reduce Your Use thermostat), but who have not signed up for the RYU alerts.
3. **ACSS Only:** This group does not have the SDG&E smart thermostat (Ecobee Smart Si), but they do have a direct load control device and are participating in the ACSS program.

¹⁰ We did not survey participants in both ACSS and PCT together since there was only one viable contact. Due to the low response rates and a low number of contacts in the commercial sector, this analysis only includes residential participants.

4. **ACSS & RYU:** This group does not have the SDG&E smart thermostat (Ecobee Smart Si) but they do have the DLC device and are participating in the ACSS program. They are also signed up for RYU alerts.
5. **RYU & PCT:** SDG&E residential customers who have received a no-cost Ecobee Smart Si from SDG&E and who are also signed up for the RYU alerts.

The following subsections report results on demographics, program satisfaction, event days (experiences and preferences), smart thermostats, program specific preferences and information about additional widgets.

All references to statistical significance in the analysis of the survey questions are based on a 90 percent level of confidence. The survey responses were not weighted.

3.1 Demographics

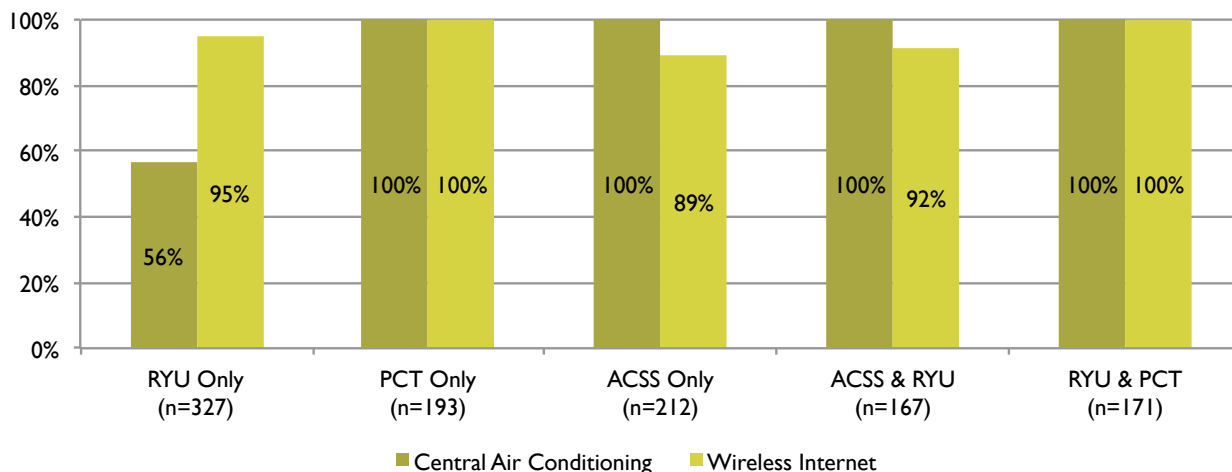
This section includes a brief description of the traits of the survey respondents in order to frame later findings about program participation. Additional detail can be found in Appendix A.

The majority of people who responded to the survey reported living in a single family home. The RYU Only participants were statistically significantly more likely than all other participant categories to report living in a multi-family home (e.g. apartment, duplex, townhouse), with 24 percent in multifamily buildings (compared to a range of 4 to 8 percent in other participation groups). Similarly, RYU Only participants is the group most likely to rent their home (30%) compared to less than 6 percent among other participation groups. This may be related to different air conditioning requirements for the widget-based (ACSS and PCT) programs. PCT participants are required to own their home, and ACSS participants are not required to own their home, but are required to have permission from their landlord to install the device.

The vast majority of respondents from every program type reported having wireless Internet (which is a requirement for participation in the PCT program) as shown in Figure 2. The United States Census estimates that 88 percent of San Diego household have access to the Internet, although all of these connections may not be wireless. Among RYU Only participants, just over half (56%) have central air conditioning which leaves less than 50 percent of RYU Only participants eligible for the PCT program. This group is more likely to have central air conditioning than the population of SDG&E customers (35% have central AC).¹¹ Just over 10 percent of ACSS Only participants do not have wireless Internet. This may pose a problem in working towards encouraging ACSS participants to participate in the PCT program (where wireless Internet is a requirement)

¹¹ 2003 California Residential Appliance Saturation Survey (RASS), KEMA-XENERGY, Itron, RoperASW

Figure 2: Prevalence of Central Air Conditioning and Wi-Fi



We did not ask PCT or ACSS program participants if they had central air conditioning, and we did not ask PCT program participants if they had wireless internet.

On average, household occupancy was similar across the different program types, at just under three people per household, which is close to the RASS¹² reported average of 2.75 people per household in SDG&E territory. However, program groups that participated in the PCT program were significantly more likely than the other groups to report having only one full-year resident, with 6 percent of PCT Only and 9 percent of RYU & PCT compared to 15 to 21 percent in the other groups.

Prevalence of smart thermostats is similar for the three groups of participants that did not receive a smart thermostat from SDG&E's PCT program, with between 8 and 11 percent having purchased their own smart thermostat.¹³

¹² 2003 California Residential Appliance Saturation Survey (RASS), KEMA-XENERGY, Itron, RoperASW

¹³ Smart thermostats are significantly more common in respondent households that have rooftop solar (19% versus 7% of no-solar households), among respondents who live in single family homes (10% versus 4% all other home types), and among respondents who own their home (11% versus 1% who rented).

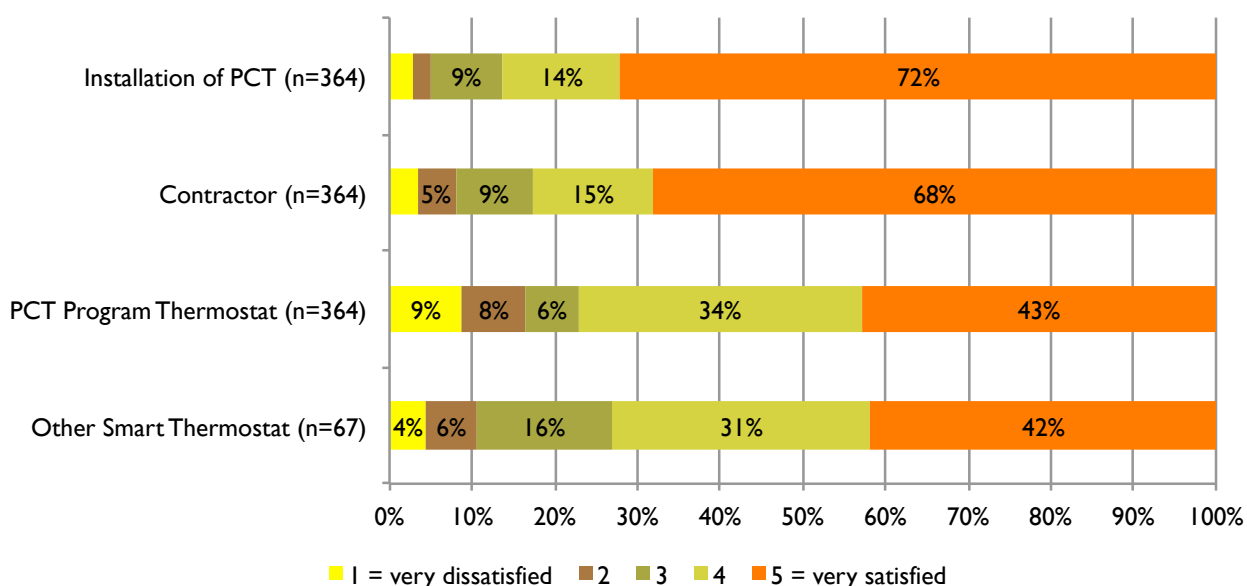
3.2 Program Satisfaction

In the following subsections, we report on the overall satisfaction of participants in the various programs, along with specific program traits.

3.2.1 PCT Participants

Most of the PCT program participants (n=364) reported being very or somewhat satisfied with multiple aspects of their participation including the installation process (86%), their contractor (83%) and the smart thermostat provided by the program (77%), as shown in Figure 3.

Figure 3: PCT Satisfaction Ratings



Additional detail on satisfaction related to smart thermostats and their installation are presented below.

Thermostat

Satisfaction ratings for the smart thermostat itself were significantly higher among those who noticed a reduction in energy usage after installing the smart thermostat – with an average rating of 4.5, compared to 3.5 among those that did not notice a reduction in usage. However, satisfaction did not vary significantly when comparing those who participated in only the PCT program or the PCT program in addition to RYU (3.9 versus 4.0).

People who purchased their own smart thermostat outside of SDG&E's PCT program (n=67) had similar levels of satisfaction on average, with smart thermostats from the PCT program receiving an average rating of 4.00 (on a scale of 1 to 5 with 1 being very

dissatisfied and 5 being very satisfied) and other smart thermostats receiving an average rating of 3.95.

Among those who were dissatisfied with the smart thermostat provided by the PCT program (n=60), the most common reasons they gave for their dissatisfaction were:

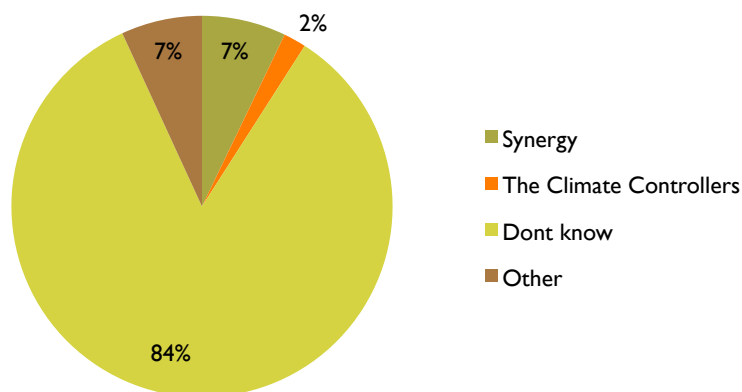
- That the thermostat has inaccurate temperature readings (17%);
- They have not seen any reductions in their energy usage or bill (10%);
- The thermostat has imprecise temperature controls (8%);
- It overrides their settings (8%);
- They were unable to program it correctly (8%); or
- They do not know how to use its features (7%).

Installation

Among those who were dissatisfied with the installation process of their smart thermostat (n=18), the most common reasons given were that the thermostat was not installed correctly (22%) or it stopped working (11%). Among those who were dissatisfied with the contractor who installed their thermostat (n=29), the most common reasons stated were that the contractor did not install it correctly (24%) or did not teach them to use the thermostat's features (21%). The majority of these participants were not able to identify their contractor company. Further detail on respondent opinions regarding smart thermostats is presented in the following section.

The vast majority (84%) of PCT program participants could not remember which contractor installed their smart thermostat. This did not differ significantly between PCT Only and RYU & PCT participants.

Figure 4: Contractor Who Installed PCT Program Smart Thermostat (n=364)



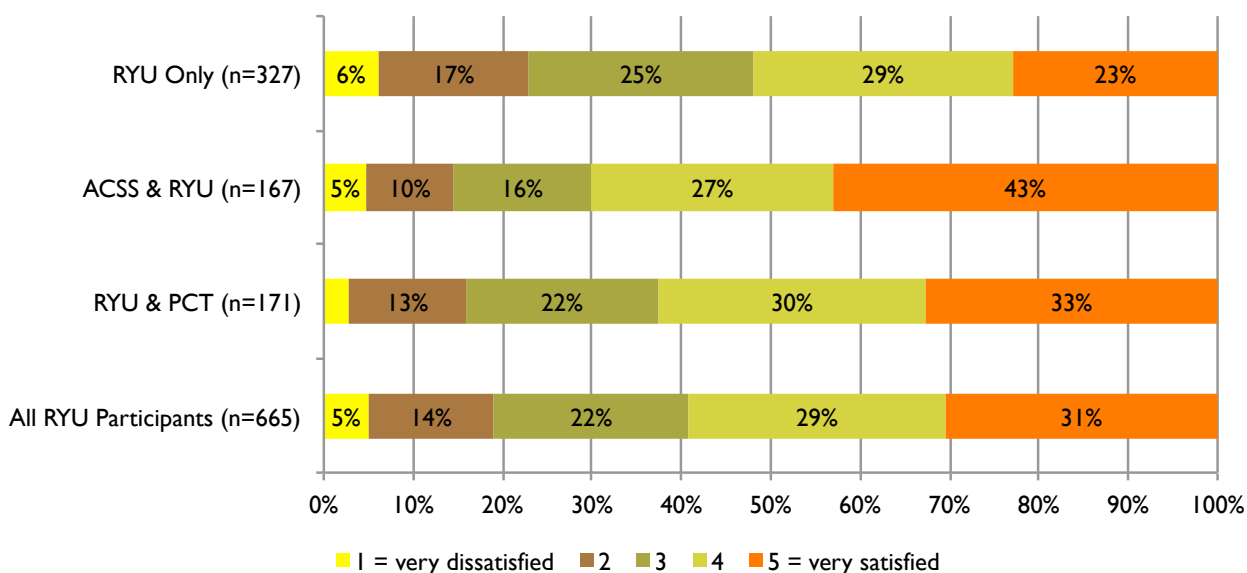
Other contractors PCT participants mentioned were Ecobee (n=5), SDG&E (n=5), Corix (n=5), Precision Temperature (n=1), self-install (n=2), and unspecified (n=6).

3.2.2 RYU Participants

Over half of all RYU participants reported being very or somewhat satisfied with the RYU program, as shown in Figure 5. Satisfaction with RYU was significantly lower for those not participating in multiple programs (i.e. also in ACSS or PCT). The average satisfaction ratings were 3.9 for ACSS & RYU participants, 3.8 for RYU & PCT participants, and 3.5 for those only participating in RYU. Each average satisfaction rating is statistically significantly higher than the lowest possible score (1).

Among all RYU participants, those who said they prefer to be notified of an event on the day of the event were less likely to report being dissatisfied (i.e. gave a rating of 1 or 2) with the RYU program (8%) than those who prefer day before notification (19%), both day of and day before notification (22%), or no notification (22%). RYU satisfaction does not have any clear or significant relationships with the number of events recalled, incentives earned in 2015, home type, presence of rooftop solar or own versus rent.

Figure 5: RYU Program Satisfaction



Among those who were dissatisfied with RYU (n=126), the most common reasons they gave for their dissatisfaction were:

- That the incentive was too low (29%);
- It was difficult to participate and reduce their usage (29%); or
- The events occurred at an inconvenient time (11%).

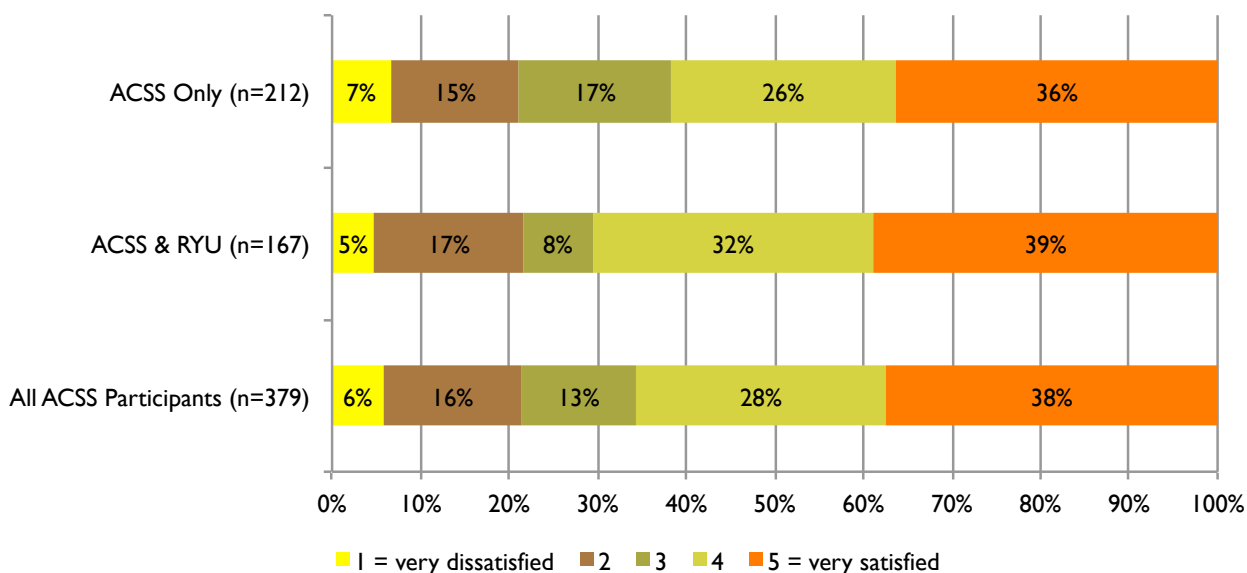
Most of the people who said it was difficult to participate in the program were RYU Only participants, so they do not have a smart thermostat or DLC device controlled by SDG&E

and had to find other ways to reduce their energy consumption during events. Those also participating in ACSS or PCT were more likely than the RYU Only participants to say that their dissatisfaction with RYU came from the low incentives.

3.2.3 ACSS Participants

Two-thirds of the ACSS participants we surveyed reported being very or somewhat satisfied with the program. ACSS Only participants were significantly less likely to report being satisfied with the ACSS program (i.e. gave a rating of 4 or 5) than ACSS & RYU participants, as shown in Figure 6.

Figure 6: ACSS Program Satisfaction



Among those who were dissatisfied (i.e. gave a rating of 1 or 2) with the ACSS program (n=81), the most common reasons they gave for their dissatisfaction were:

- That the air conditioner was turned off when they needed it most (22%);
- The incentive was too low (17%);
- They were not notified/given enough notice (17%); or
- The events were too long (12%).

We investigated whether satisfaction differed across participant opinions regarding the number of events recalled, incentives earned in 2015, or notification preferences and found no clear or significant relationships.

3.3 Smart Thermostats

This section provides an overview of respondents' experiences with and preferences for smart thermostats, with a focus on understanding what current smart thermostat owners (program delivered or otherwise) like or dislike about their thermostats. For this analysis, the three main categories of interest are:

- PCT program participants (n=364), (i.e. have program provided smart thermostat);
- People who purchased their own smart thermostat and are enrolled in one or more of SDG&E's demand response programs (n=67); and
- Those that do not have a smart thermostat, but do have central AC, and are enrolled in one or more of SDG&E's demand response programs (n=491).¹⁴

Types of Thermostats

We asked those who purchased their own smart thermostat outside the SDG&E PCT program about what type of smart thermostat they had in order to gauge interest in other thermostat types and inform future program design. The most common thermostats purchased outside of the program (n=67) were the Ecobee3, Honeywell Wi-Fi Smart and Nest Learning Thermostat. Three people reported purchasing the same thermostat that is offered by the PCT program, the Ecobee Smart Si (Table 7).

¹⁴ The remaining respondents include 140 people who do not own a smart thermostat and do not have central AC, and 8 people who were not sure whether or not they owned a smart thermostat (but have central AC).

Table 7: Smart Thermostat Model Purchased (n=67)

| Model Purchased | % |
|-----------------------------|----------|
| Ecobee3 | 16% |
| Honeywell Wi-Fi smart | 16% |
| Nest Learning Thermostat | 16% |
| Honeywell (unsure of model) | 10% |
| Carrier Infinity | 6% |
| Honeywell Lyric | 6% |
| Ecobee Smart Si | 4% |
| Emerson Sensi | 3% |
| Trane | 3% |
| Venstar | 3% |
| Other* | 9% |
| Don't know | 6% |

*Other includes 3M CT-30, Hunter, Lennox, Radio Thermostat CT-80, RiteTemp, and Schneider Electric Wiser Air

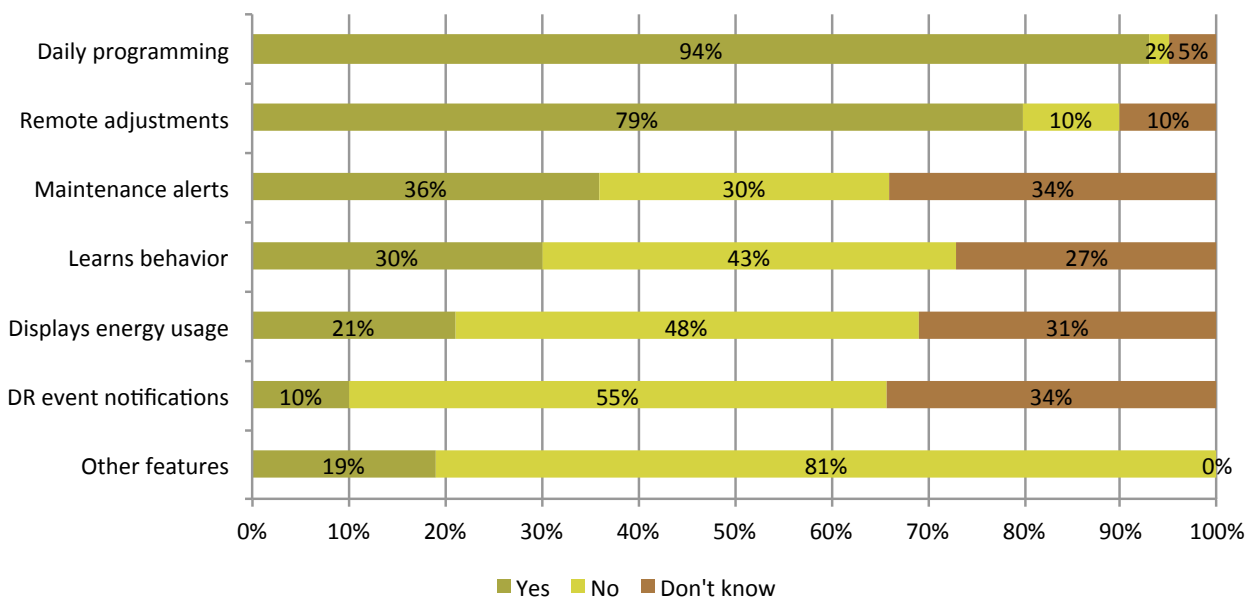
Thermostat Features

We asked all respondents who reported having a smart thermostat that was not provided by the PCT program (n=67) to tell us about their smart thermostat's features to shed light on which thermostat features factored into their purchase decision, and how their features compare to those offered by the Ecobee Smart Si. It is important to note that there are many additional factors that may have factored into their purchase decision such as household needs or heavy advertising of the Nest.

This exercise allowed us to see that some features that *do* exist in the Ecobee Smart Si (the current PCT program thermostat) *do not* exist in some of the smart thermostats purchased outside of the program. Figure 7 shows the proportion of non-PCT program smart thermostats that have each feature. This list is based on respondent recollection and may not align with the actual features of the device. We researched the types of thermostats reported by participants and were able to confirm that they could be considered smart

thermostats.¹⁵ The PCT program’s smart thermostat has all of the features listed in Figure 7 with the exception of the ability to learn behavior.¹⁶

Figure 7: Respondent Recollection of Features of Non-PCT Program Smart Thermostats (n=67)



Other features include weather forecast display, indicator for efficient settings, application program interface (API) that connects to other devices, vacation mode, multiple separate control zones, or connection to a security system.

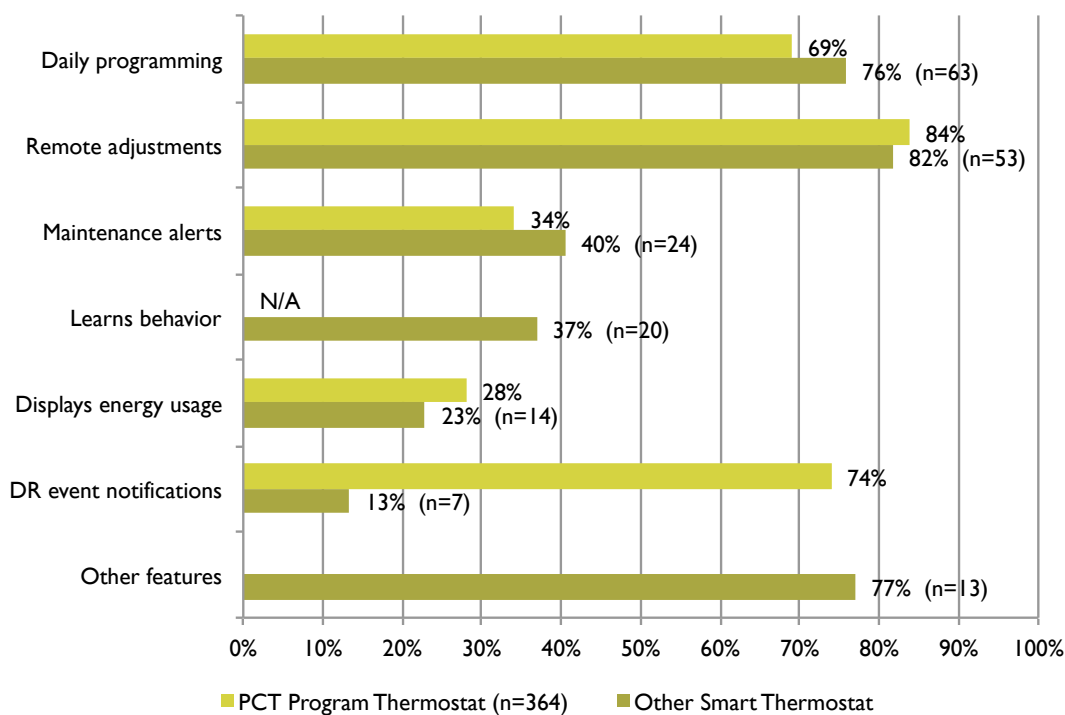
¹⁵ All of these thermostat models appear to be Wi-Fi connected smart thermostats. If only a manufacturer name was provided, and not a model, we confirmed that the manufacturer offers at least one smart thermostat.

¹⁶ The three people who purchased the same thermostat offered through the PCT program, the Ecobee Smart Si, correctly reported most of their thermostat’s features. The only discrepancies were that two people were unsure whether it had the capability to display energy usage or maintenance alerts.

We next asked everyone with a smart thermostat (program provided or otherwise) whether or not they use specific features of their thermostat, to get a better idea of which features they found useful. Figure 8 shows the percentage of people who use each feature of the thermostat, out of the total number of people who reported that their thermostat has that feature. PCT participants were prompted based on a list of features known to be included on the Ecobee Smart Si.

People with the PCT program smart thermostat and non-program smart thermostats use most of these features at a similar rate. However, respondents who received their smart thermostat through the PCT program are significantly more likely to use the demand response event notifications feature (74% versus 13%) when compared to those who got their smart thermostats without program assistance. RYU & PCT participants were significantly more likely to use the event notification feature (78%) than PCT Only participants (70%), although this may be because those in the PCT program *and* in the RYU alerts program may be referring to their phone, email or text alerts.

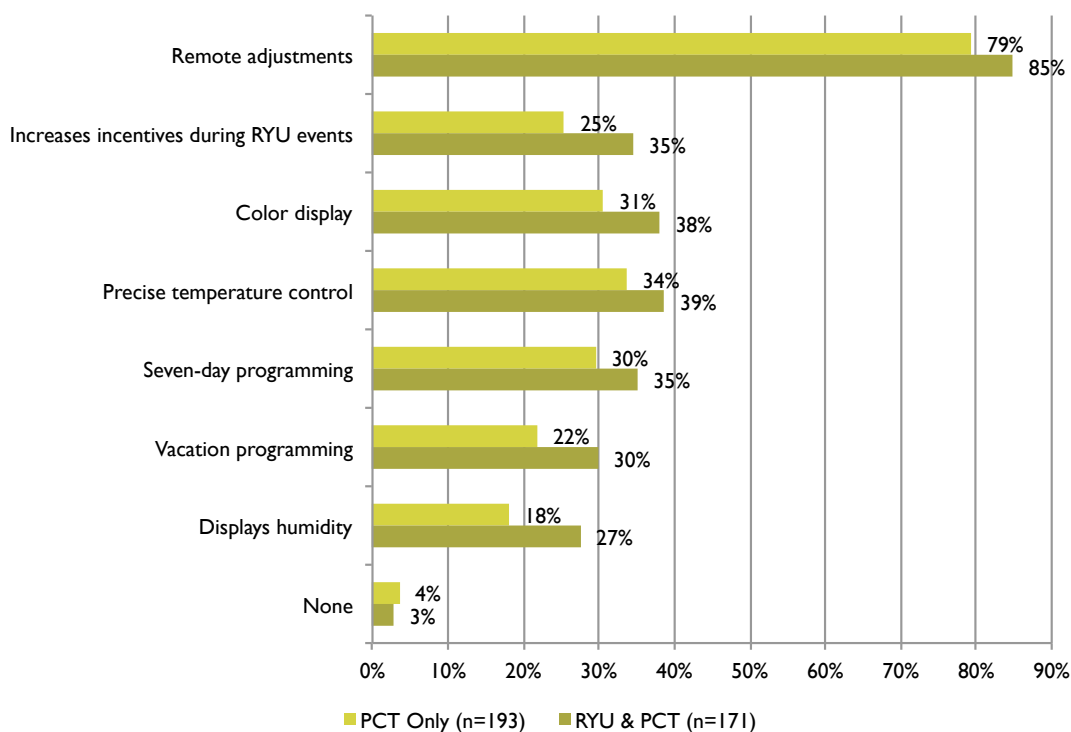
Figure 8: Smart Thermostat Features Used



NOTE: The sample size for Other Smart Thermostats varies because we only asked about the features that respondents said their thermostat has.

The most popular feature of the PCT program smart thermostat was the ability to make remote adjustments, with 79 percent of PCT Only and 85 percent of RYU & PCT participants indicating that this was one of the features that they like best. SDG&E should consider including information about the remote adjustment feature of the smart thermostat when marketing the PCT program. RYU & PCT participants (n=171) were significantly more likely than PCT Only participants (n=193) to say that their favorite aspects of the smart thermostat included increasing incentives during RYU events (35% versus 25%), vacation programming (30% versus 22%), and/or the humidity display (27% versus 18%).

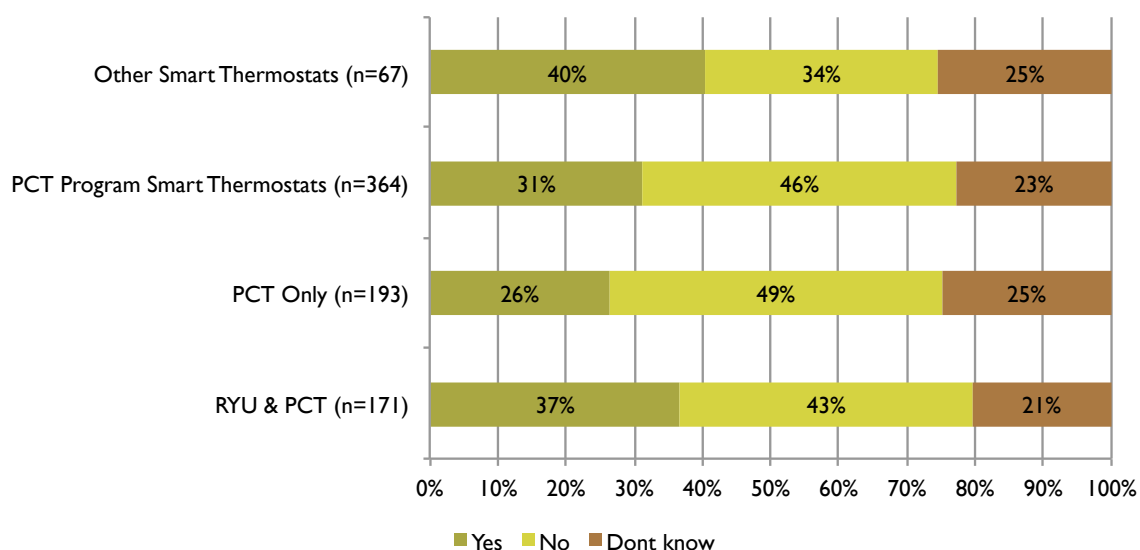
Figure 9: Favorite Aspects of the PCT Program Smart Thermostat



NOTE: Respondents were prompted with this list of features and were asked to check all that apply; percentages will not add up to 100%.

People who purchased their own smart thermostat were significantly more likely to report seeing a reduction in energy use than PCT Only participants (i.e. a subset of all PCT participants), with 40 percent of people who purchased their own PCT noticing a reduction versus 26 percent of PCT Only program participants. This is likely because those with their own smart thermostats were motivated to research and purchase a device on their own, and would be more likely to want to use the features they researched and picked, whereas customers who received a PCT program-delivered thermostat may be less motivated to access specific features such as energy use monitoring. These customers may be motivated more by the incentive itself than the individual features such as the ability to monitor energy use.

Figure 10: Noticed a Reduction in Energy Usage from Smart Thermostat



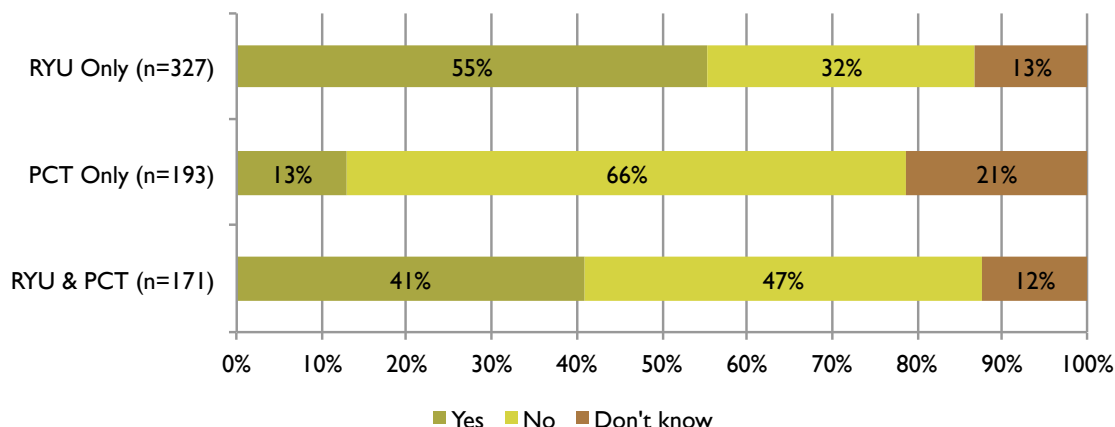
3.4 Program Incentives

In this section, we provide information regarding customer perceptions of the incentive amount they have received through SDG&E's demand response programs, as well as regarding their incentive preferences. We already discussed interest in non-bill incentives including the no-cost Ecobee Smart Si thermostat and installation, so in this section, we focus on the bill credit incentives. We start by first looking at customer awareness of their current bill credits.

RYU participants were significantly more likely to recall seeing payment/credit on their bill for their participation in 2015, as shown in Figure 11, compared to those in the PCT

program.¹⁷ It is possible that respondents did not achieve any reductions in usage in 2015 and therefore did not receive any bill credits.

Figure 11: Saw Payment/Credit on Bill for Participation in 2015

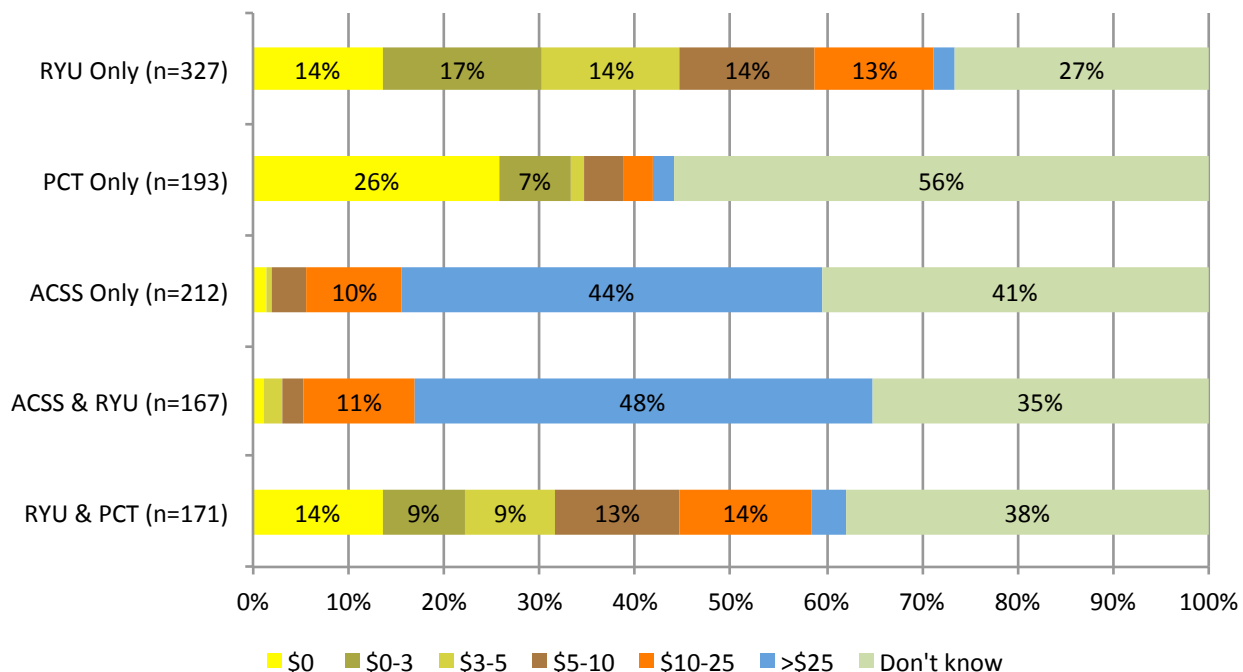


We asked all respondents to estimate how much payment/credit they received for their participation in the summer of 2015, regardless of their recollection of seeing payment/credit on their bill. More than a third of respondents said they did not know how much money they had received from the program in 2015 (Figure 12). Those who participated in ACSS (either ACSS Only or ACSS & RYU) reported receiving much higher incentives than the other groups, with over 40 percent saying they received over \$25 in 2015. This is consistent with what we would expect given what we know about program incentives. Of those who said that they received more than \$25, the average amount they reported receiving ranged from \$40 among RYU & PCT participants to \$142 among ACSS & RYU participants.

PCT Only participants were less likely to know how much they earned (56%) and were significantly more likely to say they did not earn any incentives (26%) than other program participants. This is not the case for those who are PCT participants and also receive RYU alerts, suggesting that those who received RYU event alerts were more likely to notice savings on their bill (although the average estimation of savings were similar, as shown in Figure 13).

¹⁷ Please note that we did not ask ACSS Only or ACSS & RYU participants this question because the ACSS incentives had not yet been paid and we did not want to cause concern.

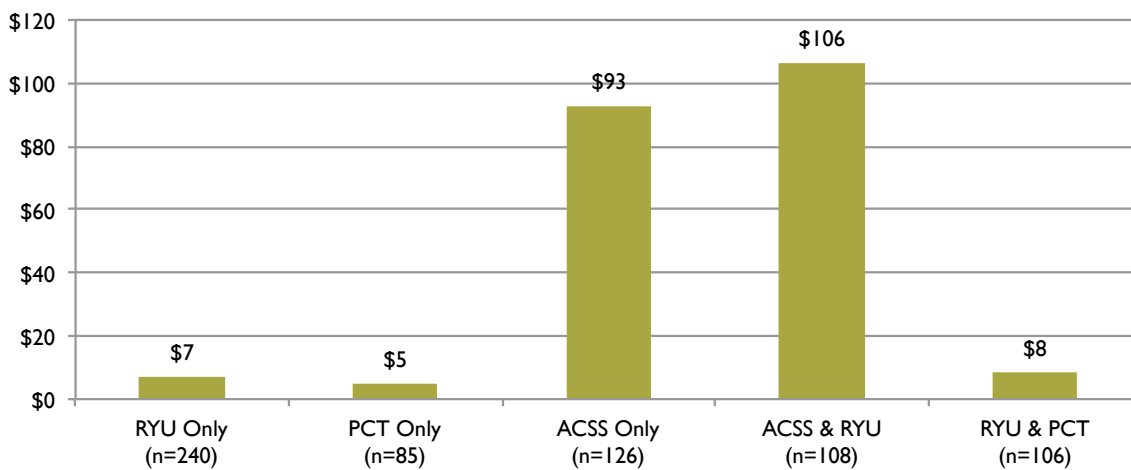
Figure 12: Self-Reported Payment/Credit Amount Totals in 2015



In order to get an overall estimate of how much these respondents believe they earned from incentives in 2015, we excluded responses of “don’t know” and used the midpoint of each stated range if no specific amount was specified.¹⁸ As with the previous chart, ACSS participants reported much higher incentives on average than RYU or PCT participants.

¹⁸ For example, we used \$4 if a respondent said their incentive was “less than \$5 (but greater than \$3)”.

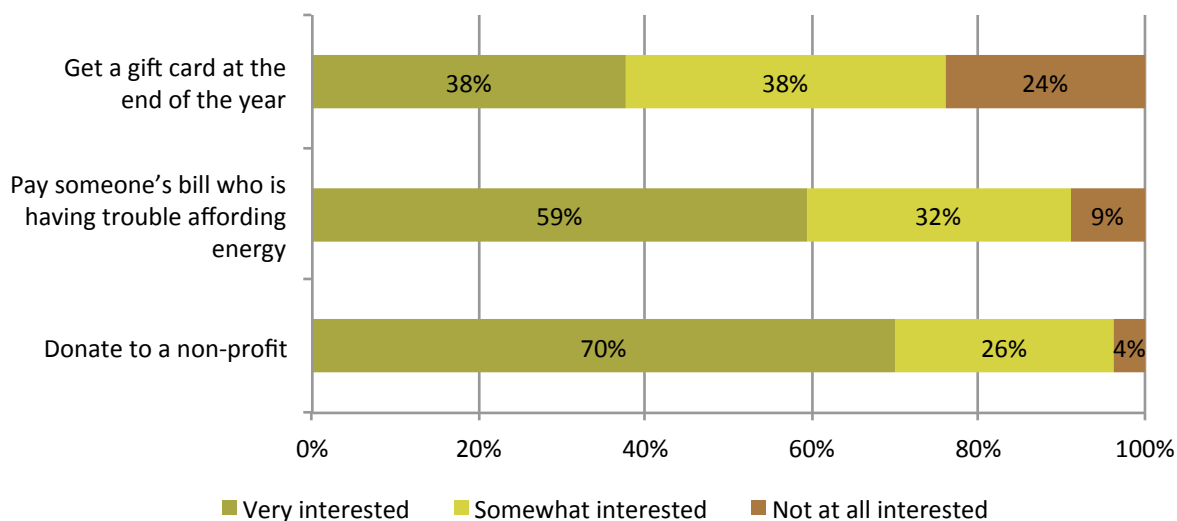
Figure 13: Average Self-Reported Incentive Amount Totals in 2015



We excluded responses of “don’t know” and used the midpoint of the reported range of incentive amounts to estimate the average unless a specific dollar amount was provided.

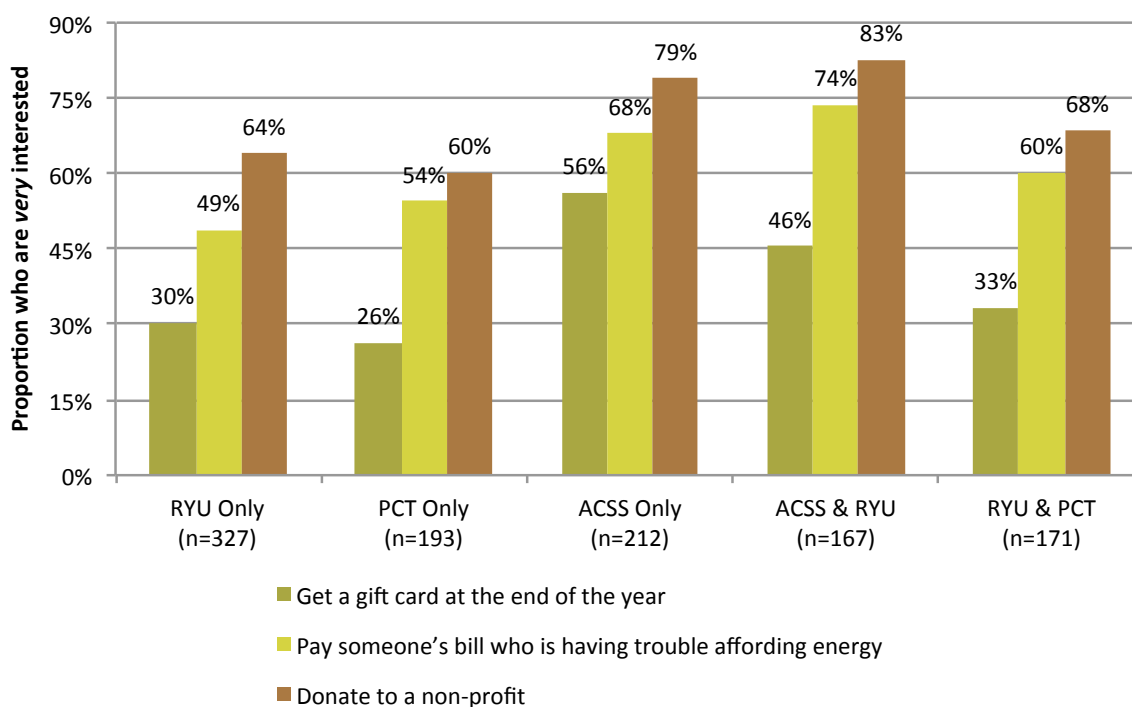
Program staff were curious to see if other incentive payment types or frequencies would be desirable to participants. At least 75 percent of all respondents were somewhat or very interested in each of the alternative incentives we asked about, as shown in Figure 14. Respondents said they were significantly more interested in the option to donate the incentives to a non-profit, with 70 percent *very* and 26 percent *somewhat* interested in this option (though there may be social desirability bias).

Figure 14: Interest in Other Incentive Types



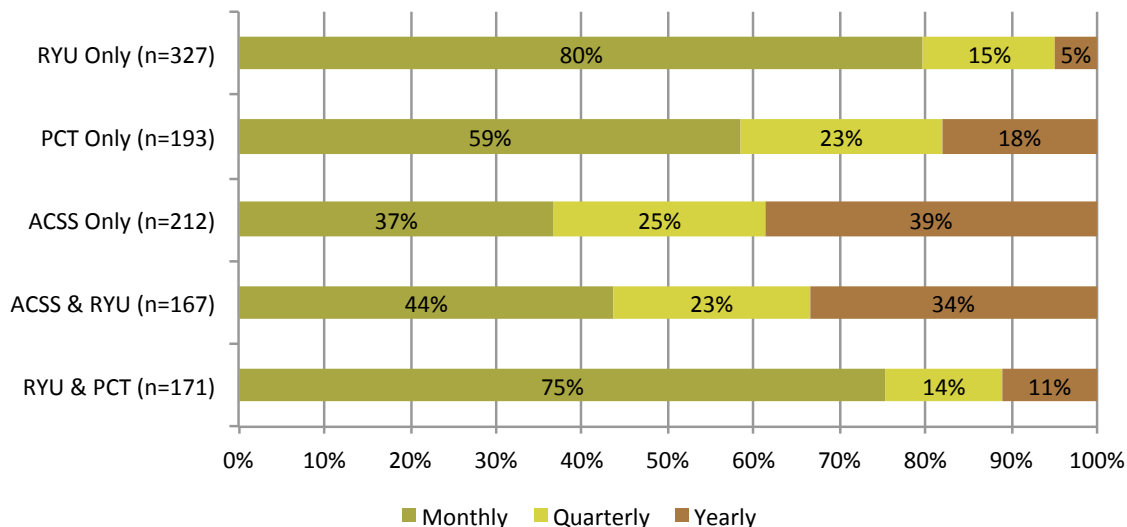
The rank order of these preferences, as shown in Figure 15, is the same for all participant types: 1) donate to a non-profit, 2) pay someone else’s bill who is having trouble affording energy, and 3) get a gift card at the end of the year. Participants in the ACSS program (either alone or with RYU) were significantly more likely than the other groups to be *very* interested in donating their incentives to a non-profit and/or getting a gift card at the end of the year.

Figure 15: Participants that are *Very Interested* in Other Incentive Types



We also asked respondents about their preferences regarding the frequency with which they receive bill credits. The overwhelming preference was monthly for RYU and PCT participants, but many ACSS participants were interested in annual credits, as shown in Figure 16. This aligns with the current program incentive dispersion schedule, where ACSS gives the bill credit annually and RYU incentives are given out monthly.

Figure 16: Preferred Incentive Frequency



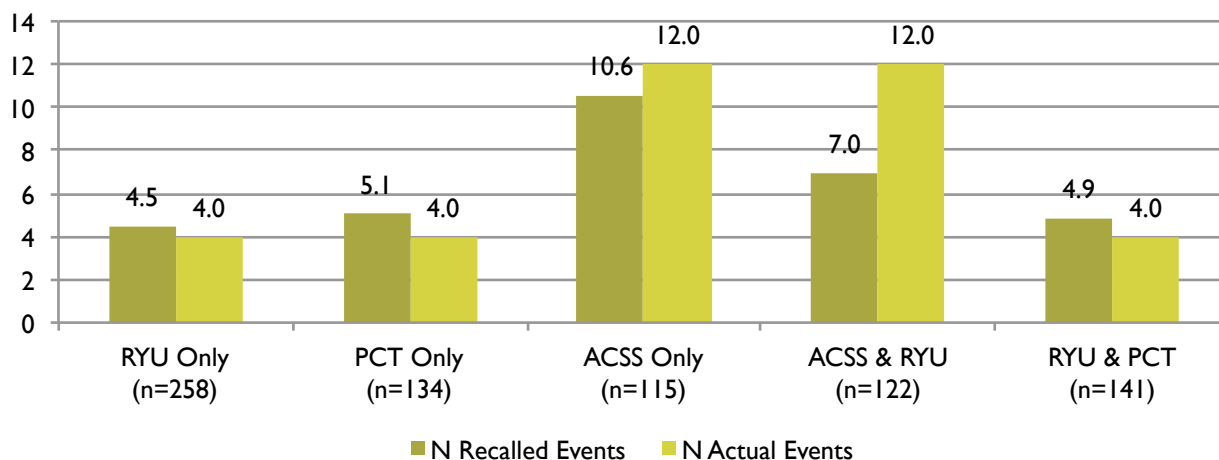
3.5 Event Days

In this section, we review findings on customers experience with past events and their preferences for event days. We also explore what participants report doing once they are alerted of an event.

3.5.1 Experience with Events

The average number of event days recalled by respondents is close to the actual number of events that had occurred in the summer of 2015, as shown in Figure 17 (excluding *don't know* responses). The actual number of demand response event days in the summer of 2015 was 4 for RYU, 4 for PCT, and 12 for ACSS (not including the three ACSS event days in October¹⁹). ACSS & RYU participants recalled an average of 7 event days in the summer of 2015; this value falls between the actual number of RYU events (4) and ACSS events (12).

Figure 17: Average Number of Event Days Recalled



NOTE: This chart excludes the 300 respondents who were unsure and did not want to give an estimate.

ACSS Only participants are not able to opt out of events, meaning that they participate in 100 percent of the event days. In the ACSS program, SDG&E sends a signal to a direct load control (DLC) device that controls the participant's central AC.

PCT participants *do* have the ability to override event signals sent to their smart thermostats by SDG&E. We wanted to understand what respondents did to actively participate in events, and their responses indicate that for those in the PCT and/or RYU programs, 20 percent report doing something to lower their energy usage for event hours

¹⁹ We excluded these three events in October from our analysis because we only asked respondents about events that occurred in the summertime.

for one or more of the event days that they recalled. More than half (63%) said they did not participate in any of the events and only 7 percent said they participated in all of the events. These reported participation numbers likely exclude participants who did *not* override the signal that SDG&E sends to their smart thermostat and therefore took action in an automated way. A prior study completed by Itron indicated that 20 percent of PCT participants overrode the signal sent to the smart thermostat for at least one event, leaving a balance of 80 percent of PCT participants who never overrode the signal sent to their smart thermostat by SDG&E.²⁰

Across all program types (excluding ACSS Only²¹), the most common reasons participants gave for not participating in all event days were that they needed to use the air conditioning (n=100) or they were not home during the event (n=32). Some other explanations provided by many RYU participants, including ACSS & RYU, were that they were not notified/ given enough notice (n=18) or they found it difficult to reduce their usage (n=12).

We asked respondents whether they made any changes to reduce their energy usage in general, besides controlling their air conditioner, as a result of being in the program (not necessarily during events). Around 69 percent of respondents reported they did something else, with the most common response being behavioral changes (41%) such as turning off lights or waiting until after the event (or peak hours) to use their energy intensive equipment.

RYU Only participants were significantly more likely than other participant groups to report making behavioral changes. This may indicate that either these program participants are more willing to take action beyond controlling their AC, or simply that only 56 percent of RYU Only participants have central AC and those without cooling systems have to find other ways to save energy during (and outside of) events. We explore the PCT eligibility among RYU participants further in Section 3.7.

²⁰ Jiang, Hanna, Elliot, Itron, Smith, SDG&E (February, 2016), "Drop it like it's Hot: SDG&E's 2014 Residential Peak Time Rebate and Programmable Thermostat Programs", presentation at AESP 2016 National Conference, Phoenix, AZ.

²¹ We excluded ACSS participants from this part of the analysis since they do not have the ability to override SDG&E signals during an event, and therefore are unable to determine whether they do or do not participate in an event. .

Table 8: Actions Participants Took to Reduce Their Energy Usage, During and/or After Events²²

| Actions Taken to Reduce Usage | Total (n=1,070) | RYU Only (n=327) | PCT Only (n=193) | ACSS Only (n=212) | ACSS & RYU (n=167) | RYU & PCT (n=171) |
|--------------------------------------|----------------------------|-----------------------------|---------------------------------|----------------------------------|---------------------------------------|--------------------------------------|
| Behavioral changes* | 41% | 61% | 21% | 29% | 50% | 33% |
| Lighting | 7% | 3% | 9% | 7% | 10% | 6% |
| Solar PV | 6% | 2% | 11% | 7% | 3% | 8% |
| Building envelope | 4% | 2% | 5% | 5% | 2% | 6% |
| Major EE appliance** | 2% | 2% | 2% | 2% | 1% | 3% |
| Use non-AC for cooling | 2% | 1% | 0% | 5% | 3% | 1% |
| Minor EE appliance | 1% | 1% | 1% | 1% | 2% | 2% |
| Energy management/monitoring | 0% | 0% | 1% | 0% | 0% | 1% |
| Equipment maintenance | 0% | 0% | 0% | 0% | 1% | 1% |
| Many changes (not specified) | 1% | 1% | 0% | 1% | 1% | 1% |
| Don't know | 5% | 3% | 8% | 5% | 4% | 5% |
| No other changes | 31% | 23% | 42% | 38% | 23% | 35% |

*Behavioral changes include turning off lights, shifting use of equipment to after the demand response events (e.g. appliances, pool pumps, TVs, computers), unplugging appliances, or leaving the house for the duration of the event. We considered using fans, window shades, or other options for space cooling separate from behavioral changes if they specifically said that they were doing so to limit their need for AC during the events.

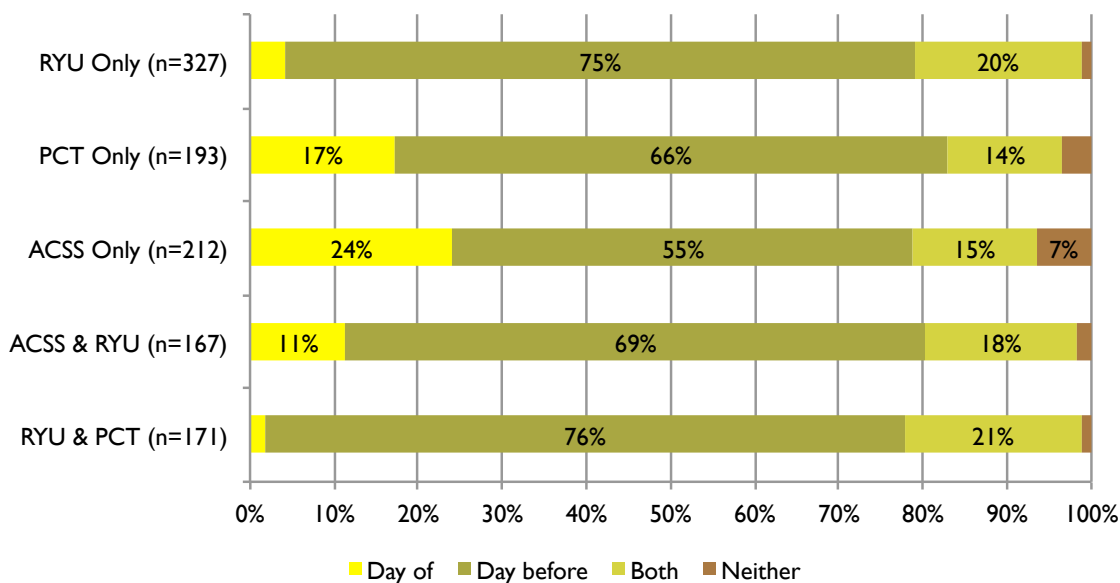
**Major appliances include water heaters, HVAC and refrigerators, while minor appliances include dishwashers, clothes washers and pool pumps.

3.5.2 Preferences for Events

Respondents overwhelmingly prefer day ahead notifications. ACSS Only participants are significantly more likely than the other groups to prefer day of notifications; this may be related to the fact that ACSS participation is fully automatic (i.e. their air conditioner is controlled by SDG&E and there is no option to override the signal during the event). While this is important to keep in mind, findings from the conjoint analysis in the following section suggest that this program attribute is not as important to respondents as the ability to override, the widget incentive, and bill credit amounts.

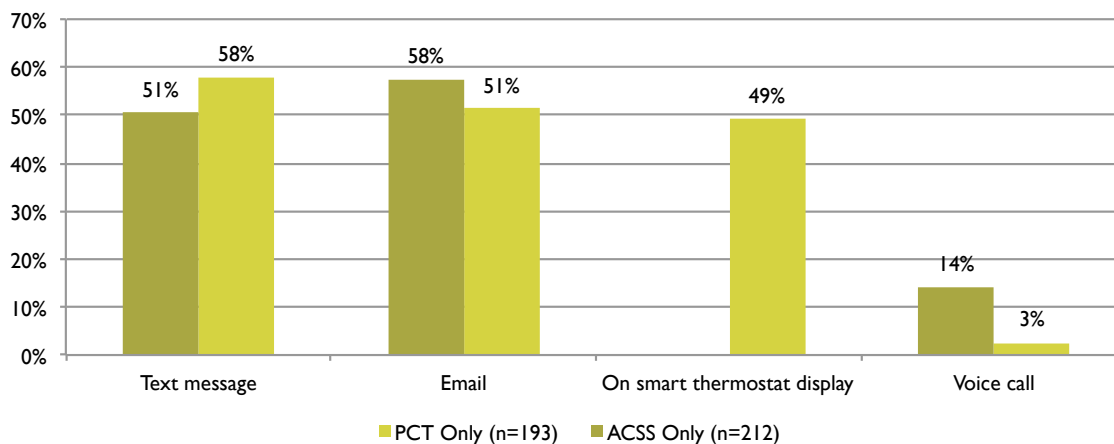
²² This table is a categorization of open-ended responses, based on the action mentioned that would lead to the most substantial change in household energy usage (e.g. if they said they installed solar PV, a new efficient clothes washer, and changed their lighting to LEDs, then we categorized them as solar PV).

Figure 18: Preferences for Event Notifications



RYU participants have already informed program staff of their notification preferences upon signing up for the program, so we asked the two groups not enrolled in RYU which mode of notification they preferred. About half of the respondents from both the PCT Only and ACSS Only groups were interested in each mode of notification, with the exception of a voice call. This includes participants who reported preferring notifications from two or more of these methods. The preference for multiple notification modes was more common among PCT Only participants (50%) than ACSS Only participants (25%). The much higher preference for voice calls among ACSS Only participants compared to PCT Only participants aligns with what we know about ACSS notification offerings.

Figure 19: Preferred Event Notification Method

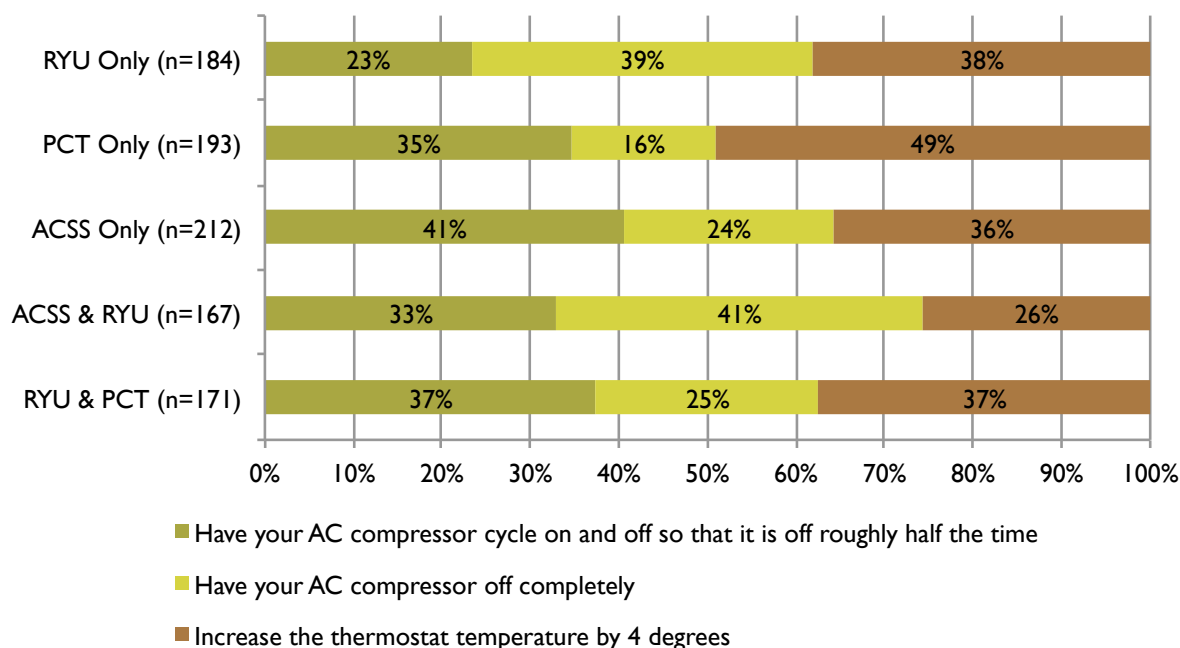


To understand how SDG&E can incentivize participants with central air conditioning to take further action during events, we asked them which of the following cycling options they would prefer for a 4 to 6 hour event; responses are shown in Figure 20. Respondents were quite diverse in their preferences, with roughly a third selecting each option. The only statistically significant differences between participants of each program type are that:

- RYU Only participants are less likely to prefer having their air conditioner off half the time (23%) than other program participation groups;
- PCT Only participants are less likely to prefer having their air conditioner off completely (16%) than other program participation groups; and
- ACSS & RYU are less likely to prefer having their thermostat adjusted by 4 degrees (26%) than other program participation groups.

These findings suggest that no singular option is universally preferred, and participation rates may improve if all three options are made available and/or advertised so that participants could select whichever they prefer.

Figure 20: Preferred AC Option for a 4 to 6 Hour Event



We then asked these same people with central air conditioning whether they had ever precooled their home prior to an event, and 18 percent said they did. This did not differ significantly by program type or their preferred cycling option (options shown in Figure 20).

We provided an opportunity for all respondents (n=1,070) to tell us about any other program features, devices or offers that they believe would make them more likely to participate in demand response event days; responses are shown in Table 9. The table excludes the 85 percent of respondents who had no suggestions. The most common suggestions were for new incentives for specific measures (n=30), a different smart thermostat for the PCT program (n=19), more options for people with solar generation (n=18), higher incentives (n=16), or a better notification system (n=12).

Table 9: Suggested Program Features, Devices or Offers of All Respondents with Suggestions (n=157)

| Suggested Program Changes | n | % |
|---|----------|----------|
| Incentives for energy saving measures ²³ | 30 | 19% |
| Change PCT program's thermostat (e.g. offer Nest) | 19 | 12% |
| More options for solar incentives (e.g. for generation during events) | 18 | 11% |
| Increase incentives | 16 | 10% |
| Better notification system or earlier notification | 12 | 8% |
| Offer no-cost energy efficiency/demand response measures | 11 | 7% |
| Improve website/app (for energy usage and cost data) | 8 | 5% |
| Change (or at least clarify) credit calculations | 7 | 4% |
| Easy override option | 6 | 4% |
| Interested in TOU rates | 4 | 3% |
| More PCT features (e.g. outdoor temp sensor, max temp, vent controls) | 4 | 3% |
| Add ability to control other equipment remotely | 2 | 1% |
| Lower goal for energy reduction (make it more realistic) | 2 | 1% |
| Send out tips for participants (e.g. using PCT, meeting RYU targets) | 2 | 1% |
| More event days | 1 | 1% |
| Options for low use homes | 1 | 1% |
| Shorten events | 1 | 1% |
| Other | 10 | 6% |
| (No specific suggestions provided) | 3 | 2% |

²³ Specific measures mentioned include efficient HVACs, window film, LEDs, home energy management systems, tankless water heaters, smart power strips, whole house fans, dimmer switches, energy storage options and others.

Table 10 shows the top five suggestions broken out by program type. The suggestion to change the PCT program smart thermostat was most popular among participants in the PCT program, which may suggest that respondents may still want a different program thermostat but will participate in the program anyways.

Despite the fact that ACSS participants (ACSS Only and ACSS & RYU) reported receiving an average of over \$90 in incentives during the summer of 2015, compared to \$5 to \$8 for the other groups (as shown in Figure 13), ACSS participants were still among those who requested that SDG&E increase the program incentives. Since ACSS participants do not have the ability to opt out of events and there were three times as many ACSS event days than RYU or PCT events during the summer of 2015 (Figure 17), this finding suggests that the current high ACSS incentives may be necessary to compensate participants for these differences in program design (i.e. event frequency and ability to opt out).

No one participating in the PCT program (i.e. PCT Only and RYU & PCT) asked for changes to the current notifications. This aligns with the high preference for day ahead notifications across all participant groups as shown in Figure 18.

Table 10: Top Five Suggested Program Features, Devices or Offers by Strata

| Top Five Suggested Program Changes | Total (n=1,070) | RYU Only (n=327) | PCT Only (n=193) | ACSS Only (n=212) | ACSS & RYU (n=167) | RYU & PCT (n=171) |
|--|----------------------------|---------------------------------|---------------------------------|----------------------------------|---------------------------------------|--------------------------------------|
| Incentives for energy saving measures | 19% | 26% | 18% | 20% | 16% | 8% |
| Change PCT program's thermostat | 12% | 7% | 14% | 4% | 16% | 24% |
| More options for solar incentives | 11% | 7% | 7% | 16% | 16% | 16% |
| Increase incentives | 10% | 11% | 7% | 8% | 16% | 8% |
| Better notification system or earlier notification | 8% | 9% | 0% | 12% | 16% | 0% |

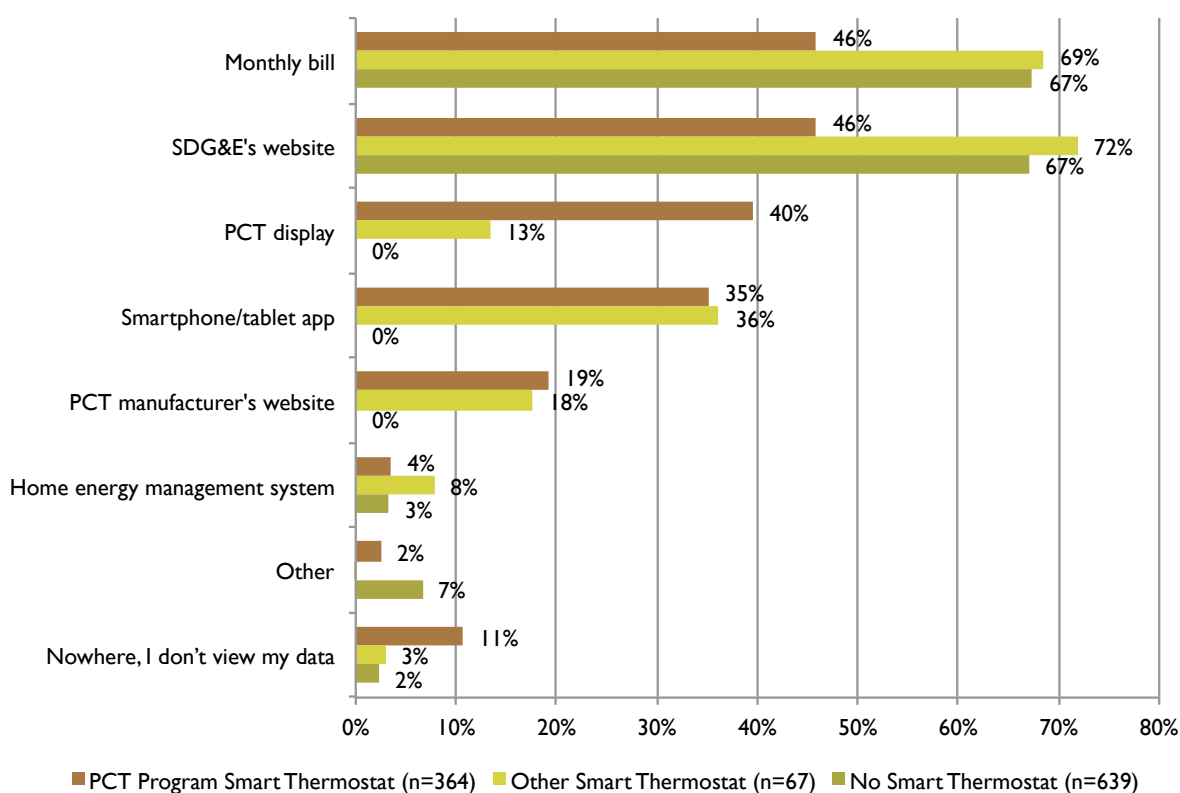
3.6 Energy Usage Data

The most common place where participants view their energy usage is on their monthly bill and/or SDG&E's website. These two locations were significantly less common among people who have the PCT program smart thermostat (46%) than those with another smart thermostat or no smart thermostat at all (67% to 72%). This suggests that PCT participants are choosing to use their thermostat to see energy usage rather than the website or bills (Figure 21), whereas this is not an option for those without a smart thermostat.

Overall, PCT program participants are less likely to view their energy usage at all when compared to other program participants. This is especially common among PCT Only participants (17%) when compared to PCT & RYU (4%), suggesting that those in the PCT Only category may have more of a “set it and forget it” mentality than other participants. This has implications for marketing the RYU program to this particular set of customers.

When PCT participants do view their usage, they were significantly more likely to view usage on the thermostat display (40%) than people who purchased their own smart thermostat (13%). This is likely related to the fact that all of the PCT program thermostats display energy usage, compared to only 21 percent of those purchased outside the program (from Figure 7).

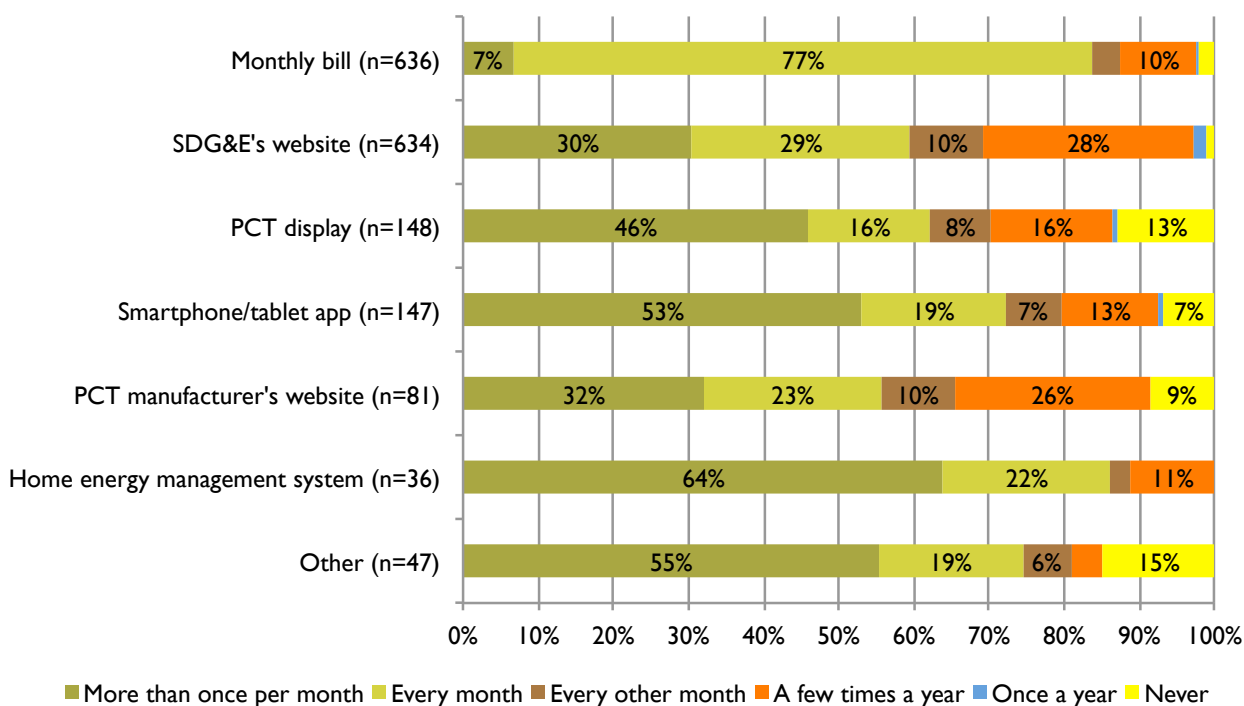
Figure 21: Where Participants View their Energy Usage



Other includes SDG&E emails (n=42), Home Energy Report mailers (n=3), the Manage-Act-Save website (n=2), solar system reports (n=2), and a home energy tracking application (n=2).

The frequency with which participants view their energy usage varies significantly, depending on the specific location used to check energy use. Customers who reported using their bill to check usage are significantly more likely to check this monthly than those who reported checking the SDG&E website (84% versus 59%) for usage information. Only 36 respondents (3%) reported using a home energy management system to check their energy usage, but it appears to be the most regularly used of all the locations we asked about.

Figure 22: How Often Participants View their Energy Usage, by Location



These statistics exclude anyone who did not report viewing their energy use data in that location and those who said they "don't know" how often they check.

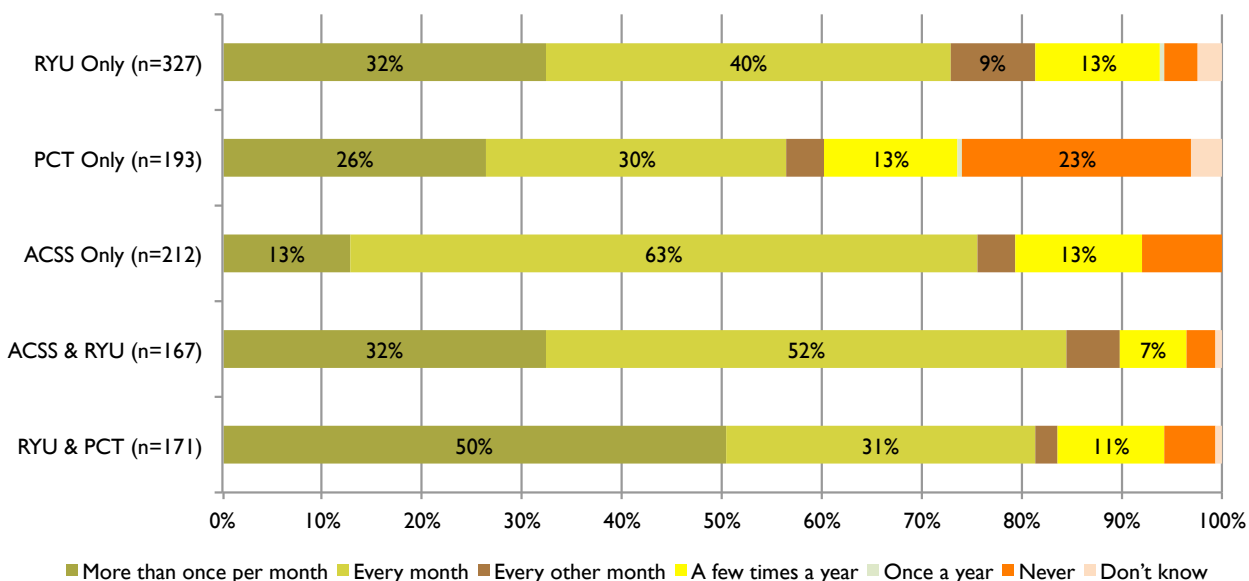
The location where participants viewed their energy usage varied across program groups significantly, with ACSS participants more likely to reference their bill and RYU Only participants more likely to view usage on the SDG&E website. SDG&E should keep these differences in mind for future marketing efforts.

- ACSS participants (ACSS Only and ACSS & RYU) were significantly more likely to view their usage on their monthly bill (74 and 76%, respectively) than other participant categories (43-58%);
- RYU Only participants were significantly more likely to view their usage on SDG&E's website (83%); and

- PCT Only participants were significantly less likely to use the SDG&E website (35%) than the other participant categories (47-64%).

We also investigated the frequency with which participants check their energy usage, regardless of location, to see how that varied by participation group. Figure 23 shows an estimate of how often participants view their energy usage, based on all of the locations we asked about in Figure 22. PCT Only participants check their energy usage with the lowest frequency compared to other groups, again suggesting that these participants may have a “set it and forget it” attitude. They were also significantly more likely to say they never checked their usage (23% versus 3-8%).

Figure 23: How Often Participants View their Energy Usage, by Program Type



My Energy Use Website

Almost two-thirds (63%) of the people who reported participating in at least one demand response event in 2015 reported visiting the My Energy Use section of the SDG&E website to view how they performed during one or more events. The website has also been used by over half (54%) of those that reported not participating (or not recalling participating) in any 2015 events, although they did not visit it necessarily to see how they performed during an event.

The frequency with which respondents visited the My Energy Use website did not differ significantly by program type.

3.7 Program Choices

This section provides insight into the eligibility and interest respondents have in demand response programs in which they are not currently participating. Before looking at specific program participation decisions, we look at what motivates the survey respondents.

We asked customers about their motivation for participation in order to better understand the value that they see in these programs. We gave them the following list of possible motivations for their participation in the program and asked them to select *true* or *false* for each.

- To lower my utility bill/for the incentives (87% of all respondents said true);
- Helping my community during rolling blackouts (64% of all respondents said true);
- To avoid paying more when electric rates are higher (58% of all respondents said true);
- To help with grid instability (43% of all respondents said true); and
- A sense of civic duty (40% of all respondents said true).

The most commonly reported motivation overall was “to lower my utility bill/for the incentives” as shown above. While this was also the most popular motivation among PCT Only program participants, the percentage of respondents who reported this to be true was significantly lower among this group than the other demand response program participation groups (73% of PCT Only participants compared to 87% to 92% in the other groups). One reason for this could be that these participants are more motivated by the free smart thermostat and installation offer than the event incentives.

3.7.1 PCT Program

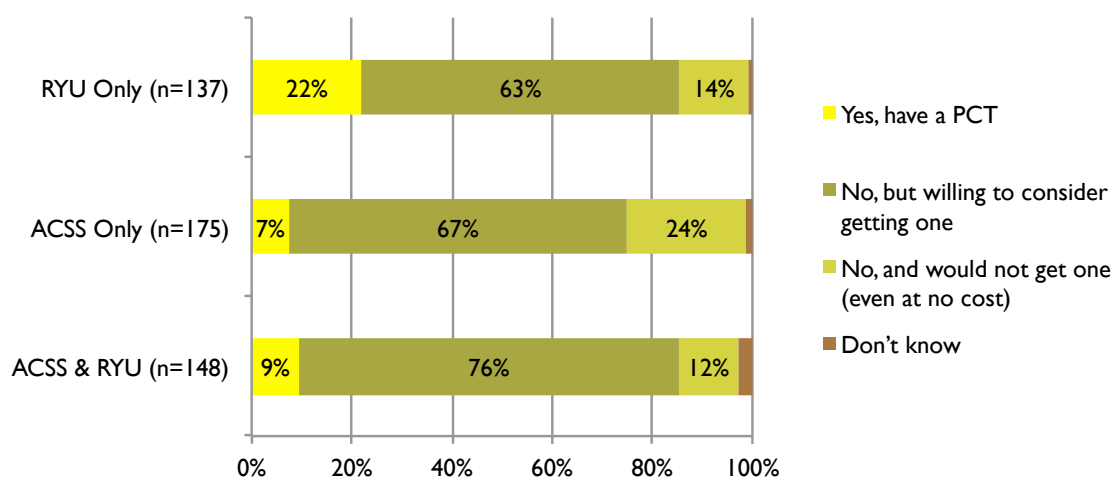
One of the major objectives for this evaluation was to understand why participants decided to participate in one demand response program over another. In order to understand this decision, we asked additional questions of participants who appear to be eligible for the PCT program but are currently participating in RYU Only or ACSS Only. Findings from this section may help SDG&E to guide future participants to the program that best fits their interests.

We asked everyone who appears to be eligible for the PCT program (those who have central AC, wireless internet, and own their homes (n=460)), whether they would be willing to get a smart thermostat at no cost. As shown in Figure 24, some respondents already had a smart thermostat (more likely among RYU Only participants), but the majority of participants who were eligible were still willing to consider getting one. Participants in both ACSS and RYU alert programs were more willing to consider getting one, and those in the ACSS program alone were most likely to say they would not get one even if it was offered at no cost (24%).

One thing to keep in mind is that this figure excludes participants who are not eligible for the PCT program. The following lists the percentage of each group of respondents who would not be able to participate in the PCT program due to lacking one or more of the following: internet, home ownership and/or central AC:

- RYU Only: 58 percent not eligible for PCT program
- ACSS Only: 17 percent not eligible for PCT program
- ACSS & RYU: 11 percent not eligible for PCT program

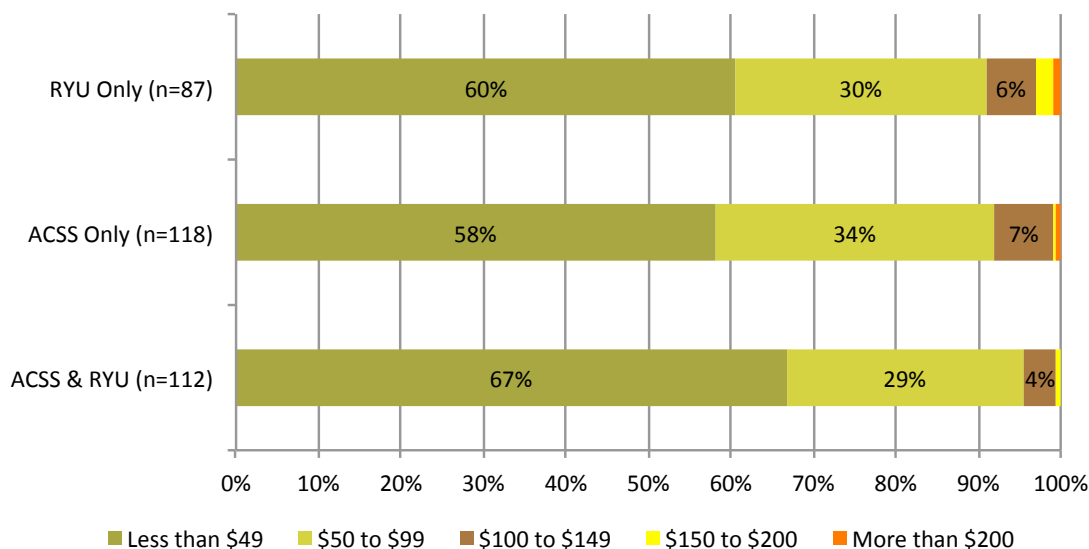
Figure 24: Prevalence of Smart Thermostats and Interest, of Eligible



The response category of “No, and would not get one (even at no cost)” includes people who said that they do not have a smart thermostat, and then selected the option “I wouldn’t get one, even if it was offered at no cost” when we asked how much they would be willing to pay for a smart thermostat.

Across all three programs, the majority of participants who were eligible and willing to get a thermostat (at least at no cost) said they were willing to pay some amount (up to \$100) for a smart thermostat.

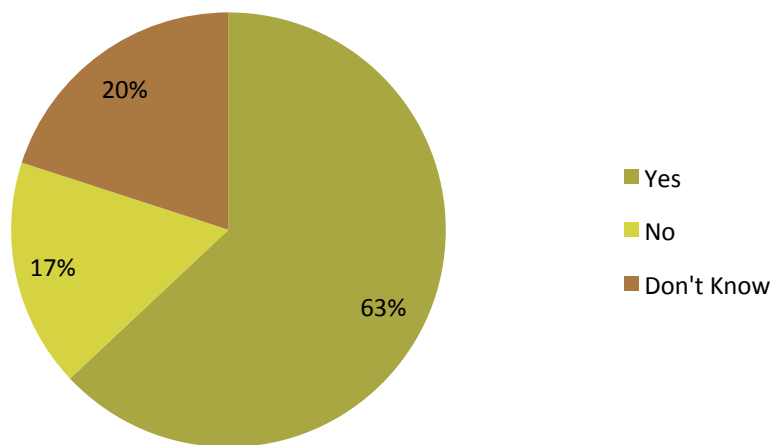
Figure 25: Willingness to Pay for a Smart Thermostat, of Eligible and Willing



This figure excludes respondents who already have a smart thermostat, respondents that do not meet the eligibility criteria (i.e. no wireless internet, no central AC, or rent their home), and respondents who said they were not willing to get a smart thermostat (even at no cost).

We asked the respondents who are eligible and willing to get a smart thermostat if they would be willing to install the thermostat themselves. The majority of people said *yes* (63%) and the remainder were split between *no* and *don't know*. This suggests that installation by SDG&E is a positive aspect of the PCT program.

Figure 26: Willing to Self Install a Smart Thermostat, of Eligible and Willing (n=317)

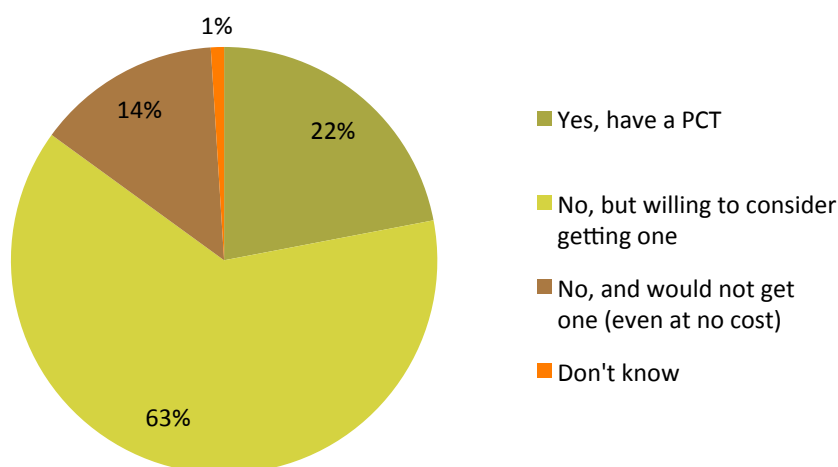


RJU Only Participants

This section highlights why some customers who participate in the RJU program do not participate in the PCT program. We estimate that 42 percent of the RJU Only participants we surveyed are eligible for participation in the PCT program, based on the fact that they reported having central air conditioning and wireless Internet and own their homes.

We asked all of these PCT-eligible RJU program participants (n=137) if they had a smart thermostat and if not, whether they would be willing to get one (at least at no cost), to gauge whether they might be interested in the PCT program in the future. Twenty-two percent already had a smart thermostat. About three quarters of the remaining respondents do not have a smart thermostat (77%), including 63 percent who are willing to consider getting one and 14 percent who would not get one, even if it were offered at no cost.

Figure 27: Prevalence of Smart Thermostats, of Eligible RJU Only Participants (n=137)



The response category of “No, and would not get one (even at no cost)” includes people who said that they do not have a smart thermostat, and then selected the option “I wouldn’t get one, even if it was offered at no cost” when we asked how much they would be willing to pay for a smart thermostat.

In addition to understanding who would be willing to consider getting a smart thermostat, we wanted to gain some insight into their willingness to pay for one. The majority (60%) of willing and eligible smart thermostat purchasers (currently in the RJU Only program) are willing to pay less than \$49 for a smart thermostat and an additional 30 percent would pay \$50 to \$99. The remaining 10 percent of respondents were willing to pay \$100 or more.

We asked the 137 RYU Only participants who would qualify for the PCT program based on the fact that they own their home, and have central air conditioning and wireless Internet a few specific questions about their awareness of the PCT program to see if lack of awareness may be responsible for their lack of participation. Twenty percent of these people were aware of the PCT program already, including 40 percent of people who already have a non-program smart thermostat and 15 percent of those who do not.

Table 11 shows some common reasons that the RYU Only participants who were both eligible and aware of the PCT program decided not to participate.

- Twenty percent of those who were aware but did not participate in the PCT program reportedly tried to enroll in the PCT program but were told they were not eligible.²⁴ This was the case for nearly half of those who currently have a non-program smart thermostat.
- A few respondents said they learned about the program *after* they had already purchased the smart thermostat. It was more common for them to have learned about the program *before* making the purchase.
- The most common reason for not participating is that they did not want the Ecobee Smart Si.

Table 11: Reasons for Not Participating in the PCT Program, of Eligible and Aware

| Reasons for Not Participating in the PCT Program | All RYU Only who are Qualified for PCT Program and Aware (n=25) | Has a Smart Thermostat (n=9) | Does Not Have a Smart Thermostat (n=16) |
|---|--|-------------------------------------|--|
| Did not want the Ecobee Smart Si | 40% | 55% | 31% |
| Tried to, but told not eligible | 20% | 44% | 6% |
| Had already purchased a smart thermostat | 8% | 22% | n/a |

Respondents were prompted with these three possibilities and selected *yes, no, or don't know*. Percentages will not add up to 100%. Excludes three participants who got the Ecobee Smart Si out side of the program.

Of the 40 percent of eligible and aware participants who reported not wanting the Ecobee Smart Si despite being eligible and aware of the PCT program (n=10), the most common reason they gave for not wanting the PCT program smart thermostat was that they wanted

²⁴ Current eligibility requirements include having a central AC system, owning the home and having wireless internet.

a Nest or something other than the Ecobee Smart Si (n=4). Some said that the Ecobee is not compatible with their current equipment (n=3).

While an interpretation of these findings could lead to a conclusion that customers may be more likely to participate if the PCT program offered another type of thermostat, it is important to keep in mind that this is a very small percentage of the total respondent group. The conjoint exercise reveals that current participants in demand response programs prefer the no-cost Ecobee3 smart thermostat with installation to a \$50 rebate on the thermostat of their choice, suggesting that the no-cost program selected thermostat with installation is more appealing than an incentive on the thermostat of their choice.

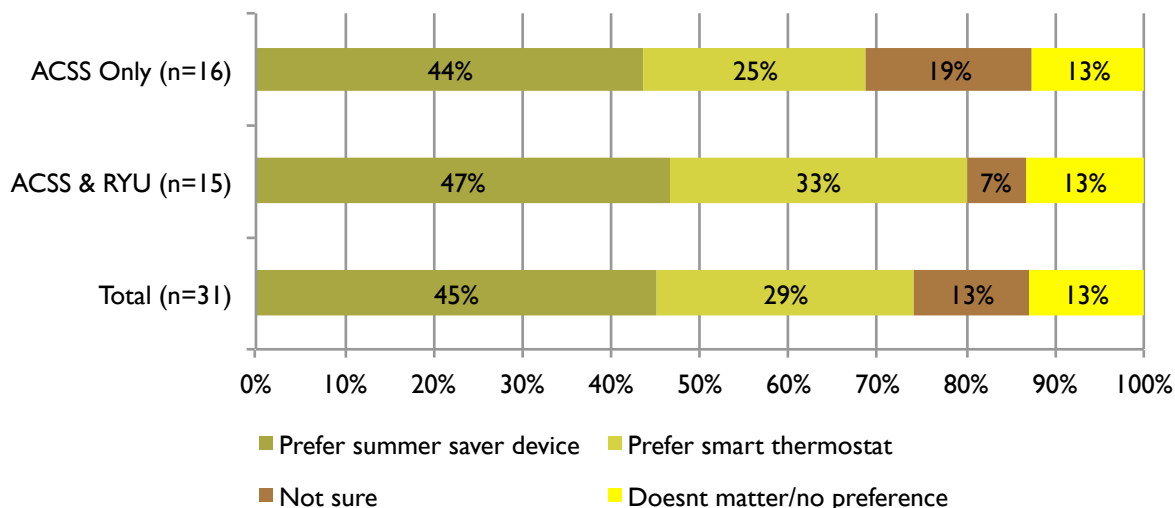
Other reasons eligible and aware RYU Only participants gave for not also participating in the PCT program were that they did not want any type of smart thermostat (n=3), they did not want SDG&E to control their settings (n=2), they need more information about the program (n=2), or they have not yet been able to schedule the PCT program thermostat installation (n=2).

ACSS Participants

Eight percent of ACSS participants (including those also participating in RYU) have a smart thermostat along with their DLC device. We asked this group which of their devices they prefer. More people said they preferred the ACSS DLC device to their smart thermostat (45% versus 29%). The most common reason they gave for preferring the ACSS DLC device was that they do not want SDG&E to control their thermostat (n=5).

Respondents could be uncomfortable with SDG&E controlling their thermostat for a number of reasons including data privacy or a lack of understanding of SDG&E's ability to trigger events. Respondents also reported that they do not want to have to switch to a different thermostat (n=4), think the device is easier (n=2), or they believe the savings with the device are the same or better than with the smart thermostat (n=2). Please keep in mind that none of these people received a smart thermostat through the PCT program.

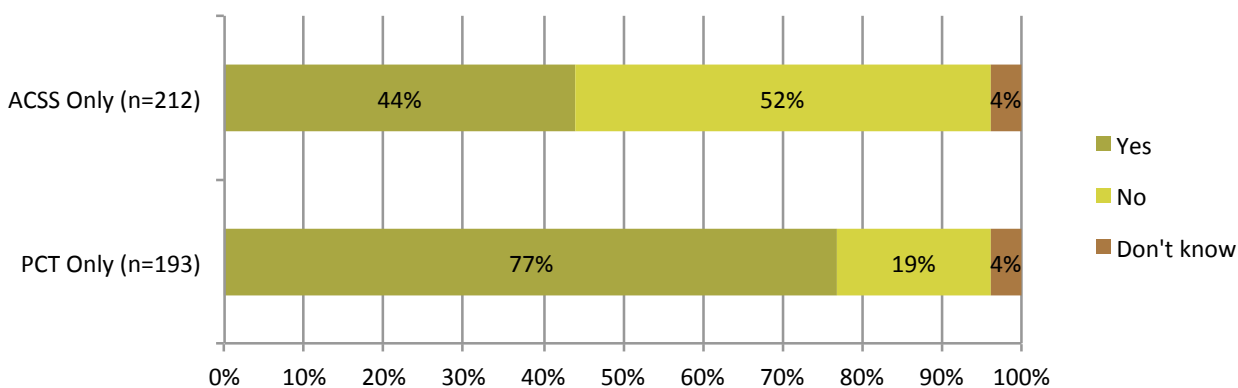
Figure 28: Preference for ACSS Device or Smart Thermostat, Among Those Who Own Both



3.7.2 RYU Program

All of the households participating in PCT Only or ACSS Only are eligible for RYU; however, not all current participants are also enrolled in RYU (55% of all residential PCT participants are also enrolled in RYU and 21% of all residential ACSS participants are enrolled in RYU). We asked about awareness of the RYU program among the participants who were in PCT Only or ACSS Only and not enrolled to get RYU alerts, to understand if lack of awareness was a barrier to participation. Awareness of the RYU program was much higher among those in the PCT program (77%) than in the ACSS program, as shown in Figure 29.

Figure 29: Awareness of RYU Program



This difference in awareness level is in part because the majority of the people who said they were aware of RYU thought they were already participating in the program,

including 85% of PCT Only participants and 63% of ACSS Only participants. Other common reasons for not participating in the RYU program were that they do not want notifications (3%), did not care about the money (2%), were told they are not eligible (2%), are planning to do it soon (2%), or they need more information about the program (2%).

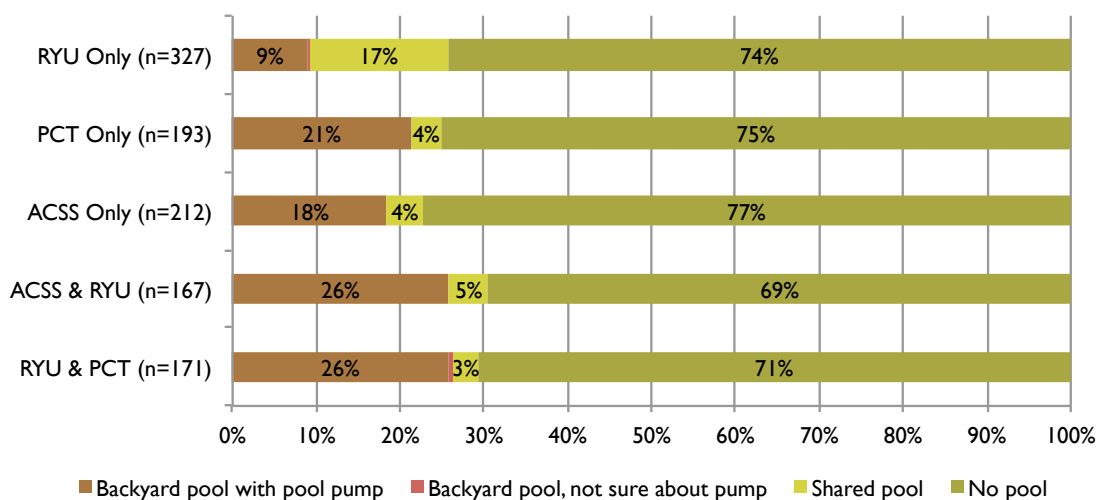
3.7.3 Additional Device Widgets

We included a few additional questions intended to gauge potential interest among current demand response program participants in two additional device widget options: devices for pool pumps and electric vehicle chargers.

Pool Pump

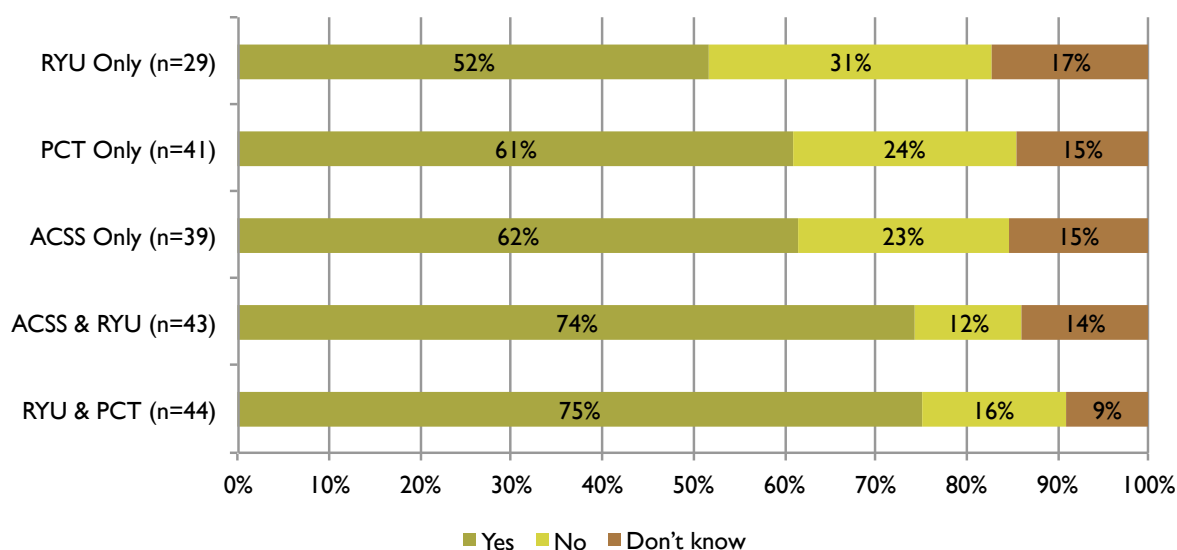
Eighteen percent of the participants we surveyed said they had backyard pools with pool pumps, including 26 percent of both RYU & PCT and ACSS & RYU participants but only 9 percent of RYU Only participants. This difference is likely due to the fact that 24 percent of RYU Only participants live in multifamily homes compared to only 5 percent of all other participant groups suggesting that current PCT and ACSS participants may be better targets if SDG&E considers a smart pool pump control device.

Figure 30: Prevalence of Pools with Pool Pumps



Willingness to participate in a pool pump device program seems high, with over half of all eligible participants (i.e. have backyard pool with pool pump) being willing to let SDG&E put a device on their pool pump that would allow them to delay or turn it off during peak events in return for an incentive (Figure 31). Those who are currently participating in multiple demand response programs (ACSS & RYU and RYU & PCT) appear to be more likely than others to be interested in the pool pump device (with about 74% expressing interest compared to 52% to 62% among the other participant categories), although this difference is not statistically significant.

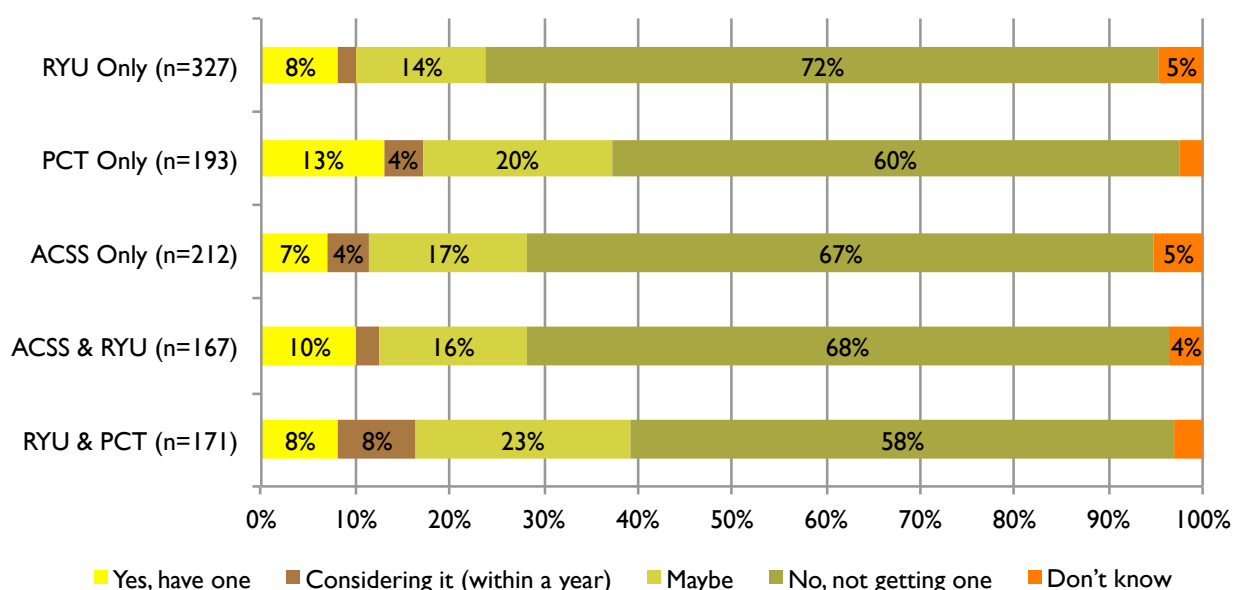
Figure 31: Willing to Let SDG&E Install Device on Pool Pump, of Eligible



Electric Vehicles

Overall, 9 percent of respondents said they have an electric vehicle and another 4 percent reported considering purchasing one sometime within the next year (Figure 32). All PCT program participants combined (PCT Only and RYU & PCT) were significantly more likely than each of the other groups to say that they had or were considering an electric vehicle (i.e. more likely to say *yes*, *considering*, or *maybe* getting one), suggesting that this may be a particularly valuable group to target for programs related to electric vehicles compared to other demand response program participants.

Figure 32: Participants with Electric Vehicles



3.8 Survey Analysis Findings

Findings from this research are presented below, along with their implications to be used for any future program planning. Recommendations are shown in bold text. Bullets expand upon the findings where useful.

3.8.1 Satisfaction Levels

Survey respondents who participate in the Reduce Your Use alerts program *and* either the PCT program or the ACSS program reported higher overall program satisfaction. When PCT participants are also enrolled in RYU, they are more engaged with the program and like certain features of the PCT program-provided smart thermostat more than those who are in the PCT program alone. **SDG&E should continue to market co-participation in demand response programs to increase satisfaction and program interaction.**

- 52 percent of RYU Only participants reported being satisfied with the program, but this number increases to 70 percent when the RYU participants are also enrolled in the ACSS program and to 66 percent when they are also enrolled in the PCT program.
- Those who participate in both the PCT program and the RYU alerts program are more likely to view their energy usage compared to those who are just in the PCT program.
- Most of the respondents who reported that it was difficult to participate in the RYU program were only enrolled in RYU alerts and thus did not have a smart thermostat or DLC device controlled by SDG&E and had to find other ways to reduce their consumption during events.
- A higher percentage of PCT participants who are also enrolled in the RYU alert program reported liking certain thermostat attributes compared to PCT Only participants. Respondents enrolled in both the PCT program and the RYU alert program were significantly more likely than those enrolled only in the PCT program to say their favorite aspects of the smart thermostat were increasing incentives during RYU events (35% versus 25%), vacation programming (30% versus 22%), and/or the humidity display (27% versus 18%), suggesting that these would all be beneficial things to advertise when telling customers about the Ecobee Smart Si.

3.8.2 Program Attributes

Demand Response Events

The programs are successfully communicating to participants about events. Survey respondents reported recalling an average number of events that was very close to the number of events that were actually called. This indicates that the program is successfully communicating to respondents and that respondents have good recollection of events, even those that occurred over six months ago.

There is room for additional participant action during events, as customers reported a low level of action taken outside of the automated program changes in air conditioning. The most common actions that respondents reported doing because of the program(s) (aside from any automated changes in air conditioning) were behavioral changes. Over half of the participants who participated in at least one event day reported visiting the My Energy Use section of the SDG&E website to view how they performed during one or more events.

- PCT program participants and RYU participants reported taking some sort of action to reduce their usage on 20 percent of the event days that they recall. This may exclude automatic actions performed due to SDG&E signals sent to smart thermostats and DLCs but still suggests that there are additional savings that could be achieved.

- We asked respondents whether they made any changes to reduce their energy usage in general, besides controlling their air conditioner, as a result of being in the program. Around 69 percent of respondents reported they did something else, with the most common being behavioral changes (41%).

There is no consensus on what type of changes respondents would like to have occur to their AC systems during demand response events, **suggesting that the program should continue to allow different options (completely off, cycling, increased temperature by 4 degrees) to customers.**

Event Notifications

Across all programs, the majority of respondents favored day-before notifications for events. About half of PCT program participants preferred multiple methods of notification, and only a quarter of ACSS participants asked to be notified in more than one way. Voice calls were the least popular form of event notification, suggesting that **the ACSS program should offer additional alert options (beyond the current voice phone option) to participants.**

Programmable Communicating Thermostat

Satisfaction levels were similar across both the program thermostat and with smart thermostats purchased outside of the program. The smart thermostat currently offered through SDG&E's PCT program (the Ecobee Smart Si, offered at no cost with installation) meets the needs of survey respondents.

- Satisfaction with the program thermostat is fairly high (77% said they were satisfied or very satisfied).
- Though some customers reported wanting different thermostats, those who bought their own thermostat outside of the program were just as satisfied with it as those who received one through the program were with theirs.
- Eighty six percent of PCT participants were satisfied with their thermostat installation.

The PCT program thermostat differs from other independently purchased thermostats in its ability to display energy usage (which is not a largely reported feature in other thermostats). The most popular feature of the program thermostat was the ability to make remote adjustments. **These attributes may be worth highlighting in program marketing.**

- The ability to display energy usage (a trait in the program-offered thermostat) was only reported to be a trait in 21 percent of non-program thermostats.
- The most popular feature of the PCT program smart thermostat was the ability to make remote adjustments, with 79 percent of PCT Only and 85 percent of RYU & PCT participants indicating that this was one of the features that they like best.

There are additional opportunities for enrollment in the PCT program for the other two residential demand response programs that we surveyed (ACSS and RYU). Twenty seven percent of RYU Only participants are eligible and willing to get a smart thermostat. These participants reported being willing to pay some amount of money for a smart thermostat and some also reported being willing to do the installation. **SDG&E should use the findings in this report about revealed desirable traits of the Ecobee Smart Si to encourage current RYU participants to consider participation in the PCT program.**

- A quarter of the current RYU Only program participants who responded to the survey are both eligible and willing to get a smart thermostat. Of the 42 percent of RYU alerts participants who are eligible (own home, have central AC, and have wireless internet) but not enrolled in the PCT program, 63 percent are willing to get one.
- These customers are also reportedly willing to pay for a smart thermostat.
- Most of the eligible and willing participants are willing to install the thermostat themselves. (63 percent of respondents who are eligible and willing to get a smart thermostat are willing to do the installation.)
- Eligibility for the PCT program is higher among those in the ACSS program (85%), compared to those who are only in the RYU program (42%) due to the existence of a central AC and higher rates of home ownership, suggesting there is more potential for possible PCT participants amongst those currently in the ACSS program.

3.8.3 ACSS Specific Customer Attributes

The participants in the ACSS program differ significantly from respondents in SDG&E's other demand response programs in that they estimate having received higher bill savings, find a once a year incentive payment to be acceptable, and are more likely to use their bill to view energy usage. Participants who are only in the ACSS program are the least likely to be aware of the RYU program of all participant groups that we surveyed, suggesting that **ACSS Only participants should be a focus for future RYU alert marketing.**

- ACSS participants are more likely to find getting rebates once a year to be acceptable when compared to other program participants, but over a third of ACSS participants would prefer to get their incentive monthly.
- ACSS participants estimate their 2015 bill incentives to be higher than participants in the other demand response programs. Despite incentives being higher on average compared to other programs, the second most common complaint among ACSS participants was that the incentive was too low.
- ACSS participants are less likely to suggest that SDG&E should consider incentivizing a different type of smart thermostat compared to respondents who are currently participating in the PCT program. This may indicate that the ACSS

participants do not know much about the Ecobee Smart Si, or do not have as many concerns with it.

- The PCT program offering of free installation would benefit ACSS participants who are eligible for PCT program participation. Of those that say they would consider getting a smart thermostat, 62 percent are willing to install it themselves. This leaves a third of PCT-eligible ACSS participants needing assistance with installation.
- ACSS participants are more likely to use their bill to view energy usage, and RYU Only participants are more likely to view usage on the SDG&E website.
- ACSS only participants are significantly less likely to be aware of the RYU program when compared to PCT Only participants.

4 Conjoint Analysis

This section provides the results of the conjoint models and participation probability scenarios.

4.1 Program Rank Model

A total of 492 respondents were asked to rank 16 program design options with varying attributes for the event incentive amounts, smart thermostat incentive, event duration and frequency, ability to override events, and event notification timing. The varying characteristics are shown in Table 12.

Table 12: DR Program Choice Characteristics

| DR Program Options | Possible Values |
|------------------------------|---|
| Incentive Per Event | \$2; \$10 |
| Smart Thermostat Incentive | No smart thermostat; \$50 off smart thermostat of your choice; Free Ecobee3 smart thermostat, free installation |
| Event Duration and Frequency | 4 hours, 10 events per year; 6 hours, 4 events per year |
| Ability to Override Event | Cannot Override; Can Override |
| Notification Timing | None; Day-of; Day-ahead Notification |

To estimate the model, one of the thermostat options and one of the notification options was dropped to avoid collinearity. In this case, the ‘no incentive’ and ‘no notification’ variables are omitted from the model and consequently, the results reflect preferences relative to these omitted options.

This ability to see which traits matter most (and least) to customers is a key feature of conjoint analysis. When customers are forced to make decisions and tradeoffs between different program traits, event duration and frequency had very little influence on ranking. Customers rarely track all features of a complex program, suggesting that utilities should focus on features that most interest customers (thermostat incentives, event incentives and override abilities) above other features in their marketing and outreach.

Note that the thermostat model presented to customers (Ecobee3) is slightly different than the current PCT program offering of the Ecobee Smart Si. This represents a newer model that has a few additional features. For the purpose of our analysis, we believe the important distinction between the “smart thermostat incentive options” is that one option gives the consumer the ability to choose their thermostat, and the other option trades that freedom for a no-cost smart thermostat that they cannot choose and that is installed for

free. We also believe that the type of thermostat (beyond the brand) was not a large focus in the selection due to the quick nature of the prioritization exercise. Results should be interpreted knowing that customers saw the Ecobee3 name rather than the Ecobee Smart Si name, but the reader should focus on the other important distinctions that were the focus of that variable (no-cost smart thermostat and no-cost installation).

The coefficients on event incentives (shown in the second column of Table 13), thermostat incentives and notification timing variables are positive, indicating that respondents prefer higher bill credits, incentives toward a thermostat, and pre-event notifications, holding all other program attributes constant. The coefficient on the variable reflecting a customer’s inability to override events is negative, indicating that respondents prefer the ability to override demand response events, holding all else constant.

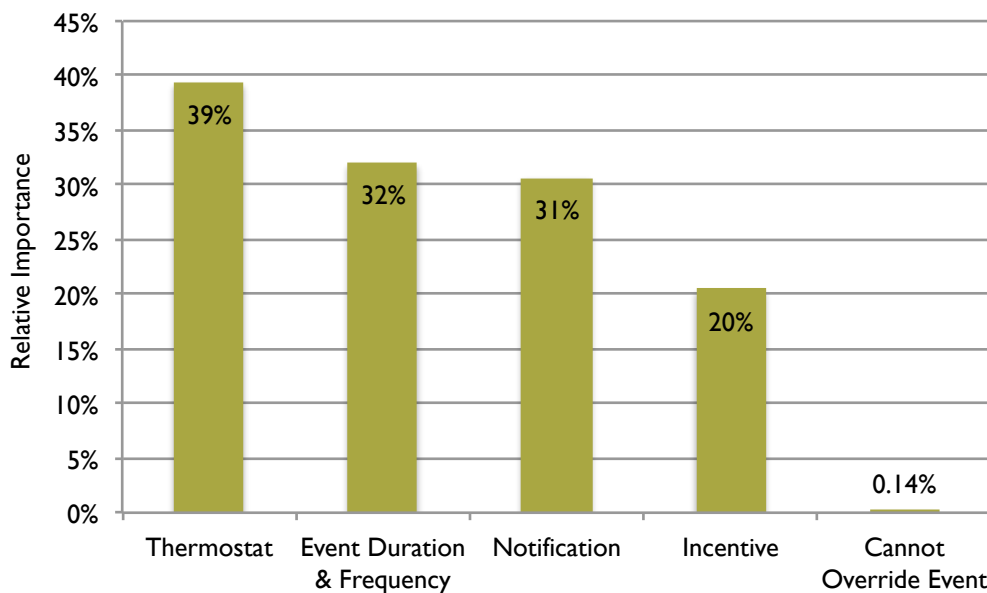
As shown in Table 13, six of the seven variables included in the regression are statistically significant at the 5 percent level or better. The coefficient on event duration and frequency is not statistically significant – meaning it is not statistically different from zero – so no inference about this variable's effect can be made from this model.

Table 13: Conjoint Results - Rank Model

| Attribute | Estimate | Standard Error | Significance | Relative Importance |
|--------------------------------------|-----------------|-----------------------|---------------------|----------------------------|
| Incentive Per Event | 0.081 | 0.003 | <1% | 20.5% |
| \$50 Thermostat Incentive | 0.233 | 0.040 | <1% | 7.4% |
| No-cost Ecobee3 with installation | 1.016 | 0.036 | <1% | 32.0% |
| Event Duration and Frequency (4, 10) | 0.004 | 0.025 | 86% | 0.1% |
| Unable to Override Event | -0.722 | 0.027 | <1% | 22.7% |
| Day-of Notification | 0.252 | 0.033 | <1% | 7.9% |
| Day-of Notification | 0.297 | 0.033 | <1% | 9.3% |

The far right column of Table 13 shows the relative importance statistics calculated for each of the attributes, with higher numbers indicating a greater influence on the stated preferences for demand response program traits. From these results, receiving a no-cost smart thermostat was the most important (Relative Importance = 32%) followed by the inability to override events (Relative Importance = 22.7%), and incentive per event (Relative Importance = 20.5%). Day-ahead notifications, day-of notifications and a \$50 incentive toward a smart thermostat were all less influential, with relative importance statistics of less than 10 percent. The relative importance is also shown in Figure 33 in the form of a bar chart. For the thermostat and notification bars, the relative importance of both variables are summed.

Figure 33: Relative Importance of Attributes



Since the conjoint survey respondents already participate in at least one of SDG&E’s demand response program offerings, or already own a smart thermostat, we also ran models by respondent segment to understand if preferences varied by customer segment. The four segmentation groups we looked at included:

- RYU participants versus non-RYU participants
- ACSS participant versus non-ACSS participants
- Those with a smart thermostat versus those without a smart thermostat (given by the program or otherwise)
- Have a widget versus do not have a widget (with a widget being either a smart thermostat or an AC cycling device)

Table 14 shows the relative importance statistics of each rank model by customer segment such that each row totals 100 percent. All relative importance statistics that are statistically significantly different at the 5 percent alpha level between each set of participant and non-participant groups have been bolded and shaded.

Table 14: Conjoint Results - Rank Model Attribute Relative Importance by Customer Segment

| Participant Group | Relative Importance Estimates* | | | | | | |
|-------------------|--------------------------------|-----------------|---------------------------|-------------------------------|---------------------------|---------------------|------------------------|
| | n | Event Incentive | \$50 Thermostat Incentive | No-cost Ecobee3, Installation | Unable to Override Events | Day-of Notification | Day-ahead Notification |
| All | 492 | 20.5% | 7.4% | 32.0% | 22.7% | 7.9% | 9.3% |
| RYU Part. | 428 | 21.4% | 6.3% | 31.4% | 22.4% | 8.3% | 10.3% |
| RYU Nonpart. | 64 | 14.5% | 13.9% | 36.1% | 25.8% | 5.4% | 3.4% |
| ACSS Part. | 100 | 20.9% | 12.2% | 33.1% | 18.0% | 6.8% | 7.6% |
| ACSS Nonpart. | 392 | 20.3% | 6.1% | 31.6% | 23.8% | 8.2% | 9.8% |
| Have PCT | 117 | 16.8% | 18.7% | 37.4% | 19.9% | 3.9% | 3.2% |
| No PCT | 375 | 22.2% | 1.7% | 29.4% | 24.3% | 9.8% | 12.2% |
| Have Widget | 208 | 17.9% | 16.3% | 36.5% | 19.2% | 4.8% | 4.7% |
| No Widget | 284 | 22.4% | 2.2% | 25.9% | 25.5% | 10.4% | 13.5% |

*The relative importance statistics for “Event Duration and Frequency” have been omitted as this variable is not statistically significant in all models.

In the following paragraphs, we analyze these results by feature (smart thermostat incentive, ability to override, etc.). The results are presented in order of relative importance to customers surveyed overall, with the offer of a no-cost Ecobee3 with installation being the most important feature, and an ability to override events being the second most important feature.

Thermostat Incentive

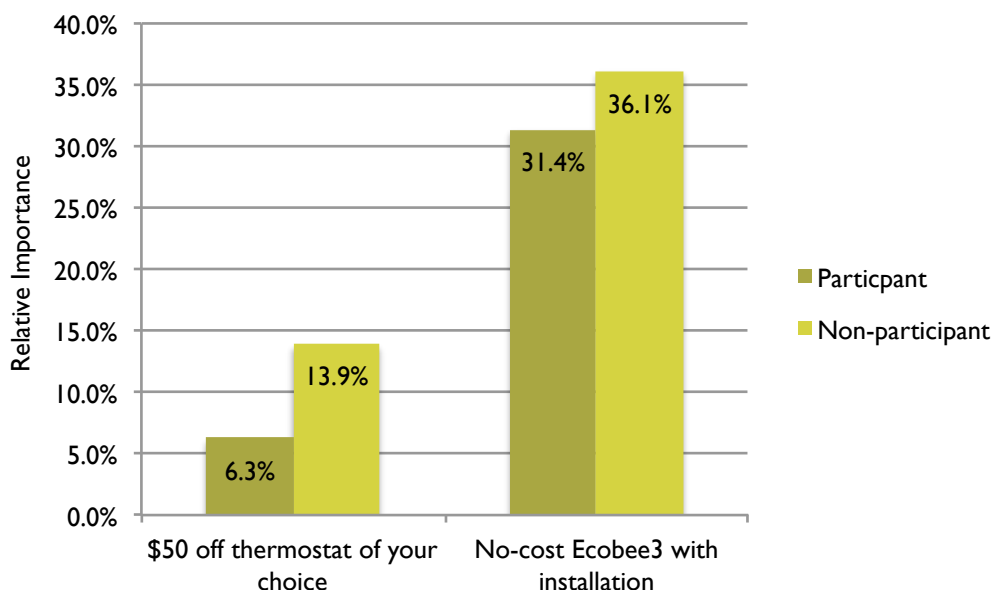
The coefficients on the thermostat incentives are of particular interest for all customer segments we examined. We compare the relative importance of receiving the \$50 incentive on the smart thermostat of their choice across the three program groups where there were significant differences between the various participant and non-participant categories.

Both RYU participants and non-participants place higher importance on the no-cost Ecobee3 and free installation compared to the \$50 off a thermostat of their choice. RYU

non-participants place more weight on both options, however, which may reflect that these customers do not yet have a smart thermostat.

The relative importance statistics corresponding to Reduce Your Use (RYU) participants and non-participants suggest that non-participants value a \$50 incentive toward a smart thermostat or a no-cost thermostat more than current program participants. The group of customers that are RYU participants is largely comprised of people without a smart thermostat (78% do not have smart thermostats), as it is the only program we looked at that did not involve some sort of widget (either a smart thermostat or AC cycling device). Among non-RYU participants, 21.7 percent do not have smart thermostats. It is not surprising that non-RYU participants are more likely to value a smart thermostat to a higher degree, because there are more of them who do not yet have a smart thermostat.

Figure 34: Relative Importance of Thermostat Incentive by RYU Participation



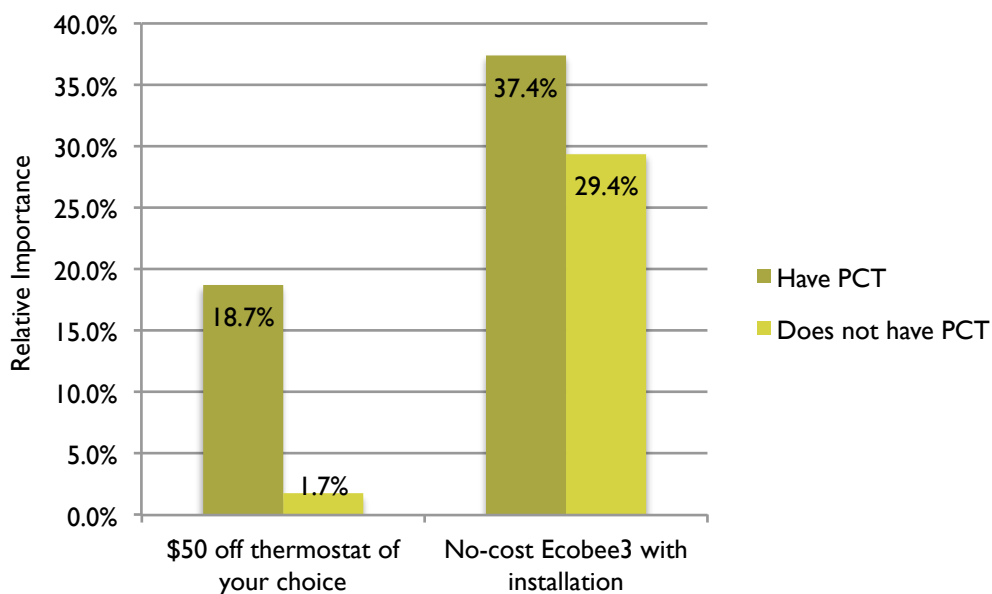
When we dive deeper and compare those who have a smart thermostat with those who do not (Figure 35), it becomes clear that those with a smart thermostat highly value the PCT offerings (either \$50 off the thermostat of their choice or a no-cost designated thermostat and installation) much more than those who do not have a smart thermostat. This suggests that those without a smart thermostat do not yet have one because they are not interested in the device or do not value smart thermostats as much as those who already have a smart thermostat. It is also possible that they may be unable to get a smart thermostat through the program if they rent their home rather than owning, or if they do not have a central AC system.

One explanation for the difference in finding that RYU participants value the thermostats less than non-participants do, but those who already have smart thermostats value them

more, may be related to the offer of installation that is tied to the no-cost smart thermostat. There is a smaller difference between the relative importance of each of the thermostats among those who have smart thermostats that could be in part because they already handled the installation.

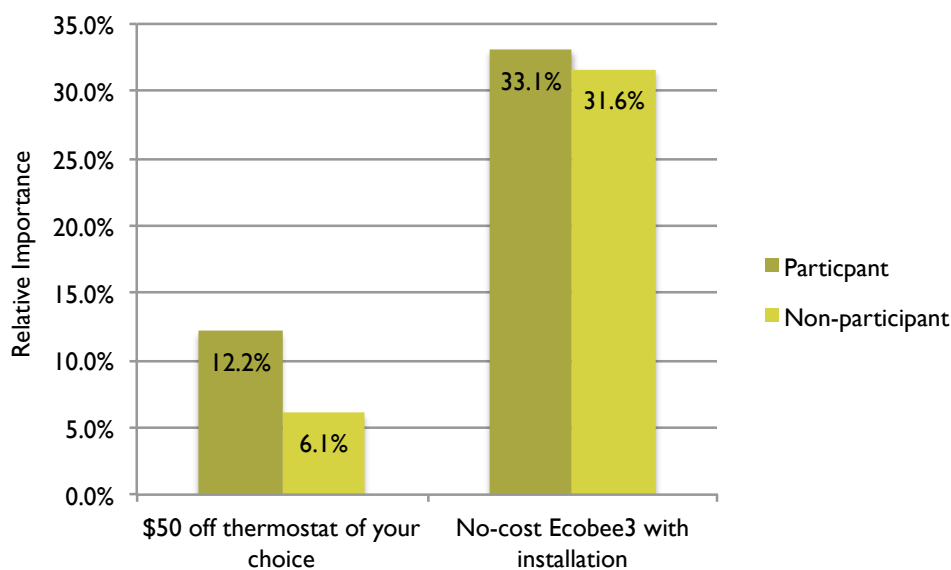
Regardless, a thermostat being no-cost and program-specified are important features compared to other thermostat features. Those that do not currently have a smart thermostat prefer the no-cost specified smart thermostat with no-cost installation over a \$50 rebate on the smart thermostat of their choice. This suggests that SDG&E should consider their current PCT program offerings to be more desirable than opening up their incentive program to a system where customers get a \$50 incentive on the smart thermostat of their choice.

Figure 35: Relative Importance of Thermostat Incentive by PCT Ownership



When looking at those customers who are currently participating in the ACSS program, we see that if they had to choose between a \$50 incentive on the thermostat of their choice, compared to a no-cost program-specified thermostat and no-cost installation, they prefer the no-cost specified thermostat and installation (Figure 36) as well.

Figure 36: Relative Importance of Thermostat Incentive by ACSS Participation Status

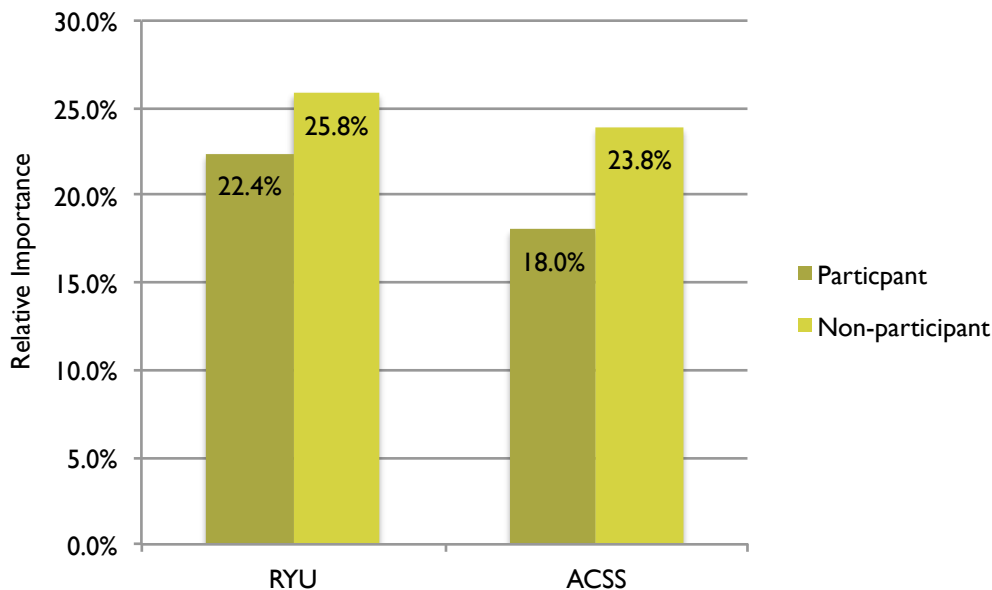


Ability to Override

As demonstrated by the coefficient and relative importance estimates for demand response event overrides, all survey groups strongly dislike the inability to override a demand response event. This is more important to demand response program participants than the number of events, duration of events, type of notifications and incentive amounts for event participation.

As illustrated in Figure 37, our results also suggest that ACSS and RYU program non-participants find the override feature to be more important (relative to other program attributes) than current participants do. This is not surprising among ACSS customers since the inability to override is a feature of the current ACSS program although it is clear that even current participants do not like the inability to override events. Though we cannot be certain of the cause, it may be that survey respondents who participate in a demand response program may not find the events to be as disruptive as non-participants perceive them to be. Additionally, current smart thermostat owners also responded negatively toward the inability to override events compared to non-smart thermostat owners.

Figure 37: Relative Importance of Ability to Override by ACSS and RYU Program Participation Status

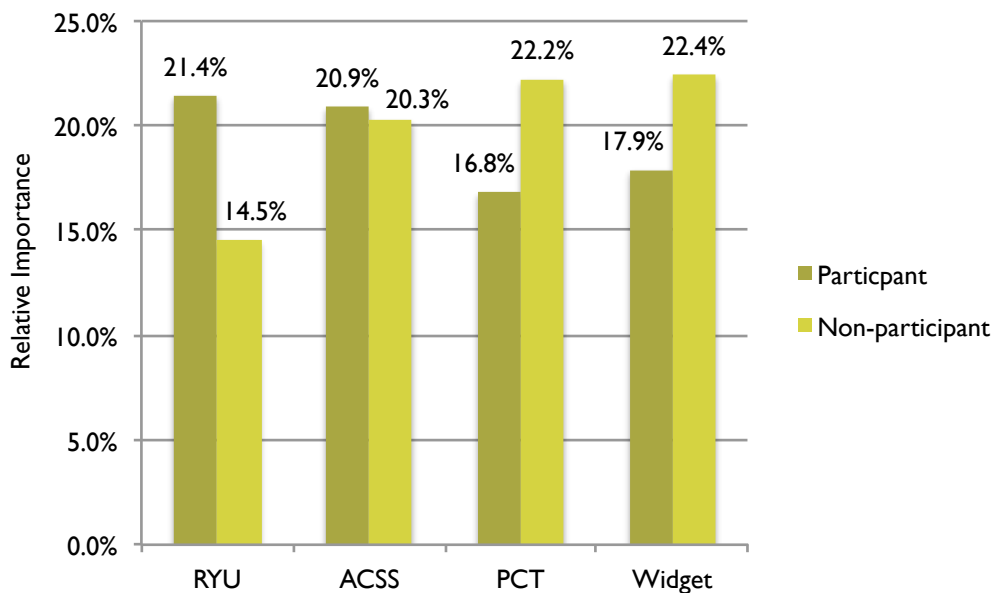


Incentive Amount

The coefficients and relative importance statistics corresponding to event incentives (in the form of bill credits) indicate that this was one of the more important program aspects to correspondents. Accordingly, we compare the relative importance of receiving a \$10 incentive per event across all four program groups in Figure 38.

In particular, the coefficients corresponding to RYU participants and non-participants suggest that participants value an incentive equal to \$10 per demand response event significantly more than non-participants (Relative Importance = 21.4% versus 14.5%). This may be explained by the fact that the RYU program's singular monetary incentive is based on behavior after the alert (rather than having a no-cost widget), although both groups (RYU and non-RYU participants) include some customers who participate in a widget-based program.

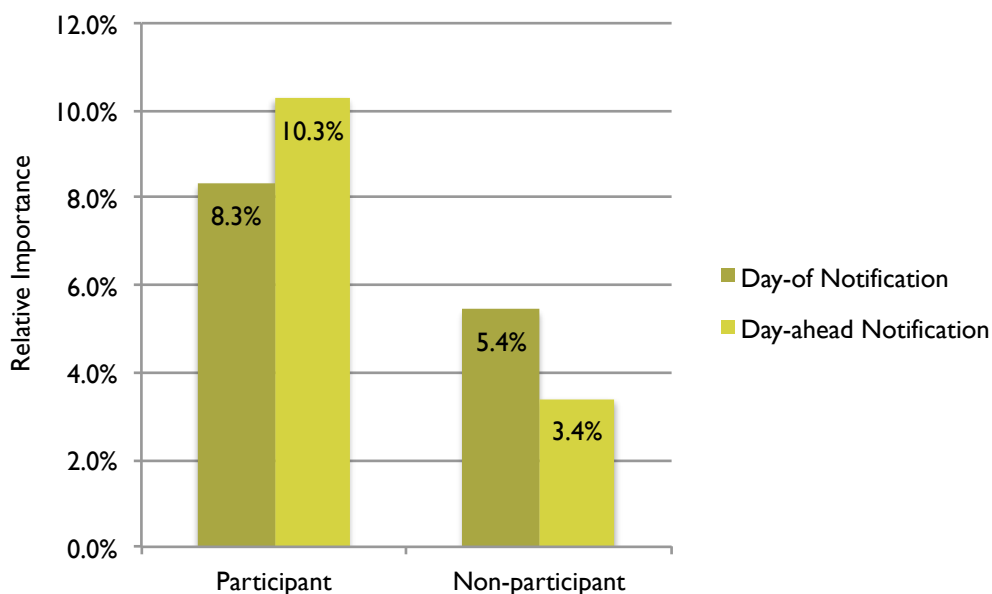
Figure 38: Relative Importance of Event Incentive by Customer Segment



Notification Timing

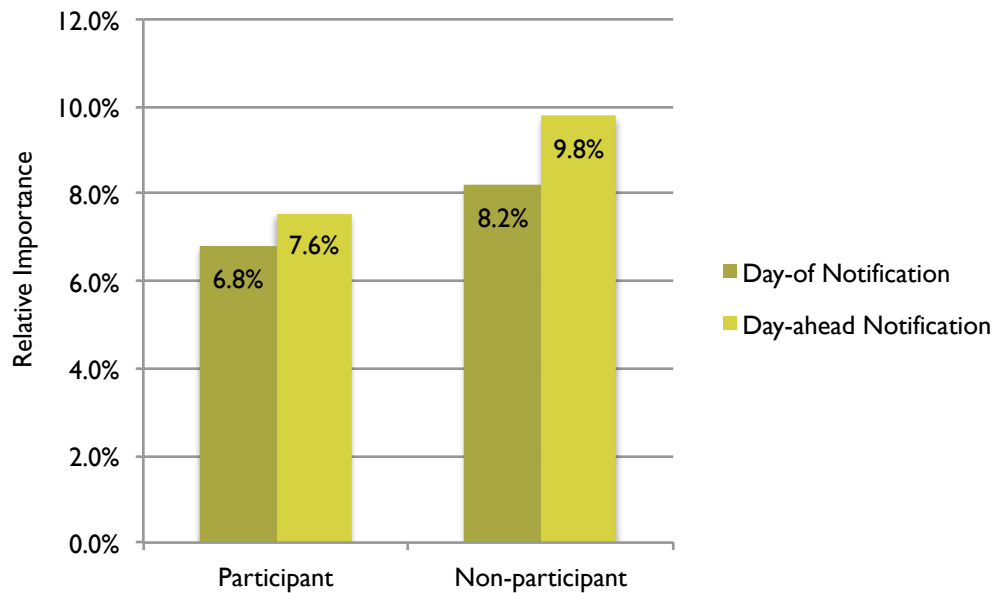
The notification timing importance varied by all customer segments, but ranked lower in importance than the thermostat incentive, event incentive and ability to override. As shown in Figure 39, RYU participants prefer day-ahead notifications (which is how the program is set up currently) and non-participants prefer day-of notifications. RYU participants also place more importance on notifications than non-participants.

Figure 39: Relative Importance of Notification Timing by RYU Participation Type



On the other hand, ACSS participants place less importance on notifications (possibly because they currently do not have the ability to override events and are now used to or accept this condition), and both participants and non-participants prefer day-ahead notifications.

Figure 40: Relative Importance of Notification Timing by ACSS Participation







Both those who have a smart thermostat and those with any widget overall place less importance on notifications than those that do not have a smart thermostat or any program widget.

4.2 Program Participation Model

The participation model looks at results from the second part of the conjoint exercise, in which respondents are presented with their ranked program packages and are asked to select how many (if any) of the top ranked packages they would be interested in pursuing. Figure 41 shows a screen capture of part of this ranking exercise. The respondent can drag their mouse down to select the lowest ranked combination that they would choose.

Figure 41: Demand Response Rank Options

| Rank | Incentive amount per event ⁱ | Smart thermostat ⁱ | Event duration and frequency ⁱ | Ability to override event ⁱ | Notification ⁱ |
|---|---|---|---|--|---------------------------|
| 1  | \$10 | \$50 off a smart thermostat of your choice, self installation | 4 hours, 10 times a year | Can not override | Day ahead/day before |
| 2  | \$2 | Free Ecobee3 smart thermostat, free installation | 6 hours, 4 times a year | Can override | Day ahead/day before |
| 3  | \$2 | Free Ecobee3 smart thermostat, free installation | 4 hours, 10 times a year | Can't override | Day of |
| 4  | \$10 | \$50 off a smart thermostat of your choice, self installation | 6 hours, 4 times a year | Can not override | Day of |

In this model, the coefficients (shown in Table 15) should be interpreted as contributing to the overall probability of the customer participating in a program with a certain set of features. Some of the signs on the coefficient estimates contradict what we would expect after our analysis of the program rank model. One example is the negative coefficient for the offer of \$50 off the smart thermostat of their choice. This may be, in part, because customers already are participating in a program and are therefore less likely to value a smart thermostat if they already have one. Another explanation may be that they are reacting to the fact that they would have to install the thermostat themselves, and they find that to be a barrier.

In addition to the thermostat finding, we also see that notification variables are negative. While initially that seems to contradict our earlier findings that people see notifications as a positive part of the program, it does align with our findings that the notifications are not among the most important program features for program participants (when compared to the event incentives, override ability and thermostat offerings). It is also possible that as the respondents were in the program at the time of the survey, they were already used to the notification, and it was less of a concern.

The far right column of Table 15 shows the relative importance statistics calculated for each of the attributes, with higher numbers indicating a greater influence on the stated preferences for demand response program traits. From these results, the inability to override events was the most important (Relative Importance = 33.1%) followed by the \$50 thermostat incentive (Relative Importance = 22.5%). Since the coefficient on the \$50 incentive variable was negative and the coefficient on the no-cost Ecobee3 with installation variable was positive (Relative Importance = 6.4%), this indicates that receiving a \$50 rebate for a thermostat is strongly less preferred than receiving a no-cost Ecobee3 with installation. Event duration, day-ahead notifications and day-of notifications were all less influential, with relative importance statistics of less than 10 percent.

Similar to the program rank model, the relative importance ranks the type of smart thermostat incentive and the inability to override an event the highest, suggesting that these are the two features that should be prioritized for future program design efforts.

Table 15: Conjoint Results – Participation Model

| Attribute | Estimate | Standard Error | Significance | Relative Importance |
|--------------------------------------|-----------------|-----------------------|---------------------|----------------------------|
| Incentive Per Event | 0.063 | 0.005 | <1% | 15.7% |
| \$50 Thermostat Incentive | -0.720 | 0.065 | <1% | 22.5% |
| No-cost Ecobee3 with installation | 0.204 | 0.052 | <1% | 6.4% |
| Event Duration and Frequency (4, 10) | -0.269 | 0.047 | <1% | 8.4% |
| Unable to Override Event | -1.060 | 0.048 | <1% | 33.1% |
| Day-of Notification | -0.269 | 0.055 | <1% | 8.4% |
| Day-of Notification | -0.179 | 0.056 | <1% | 5.6% |

4.2.1 Program Option Participation Probabilities

Using the estimates shown in Table 15 allowed a prediction of the probability of program participation for different combination of features by combining the coefficient estimates with attribute levels for different scenarios.

Participation probabilities were calculated using a combination of features to determine the minimum and maximum values that reflect likelihood of program participation. The least and most attractive participation scenarios had the following characteristics, as shown in Table 16.

Table 16: Demand Response Program Participation Probabilities – Least and Most Attractive Participation Scenarios

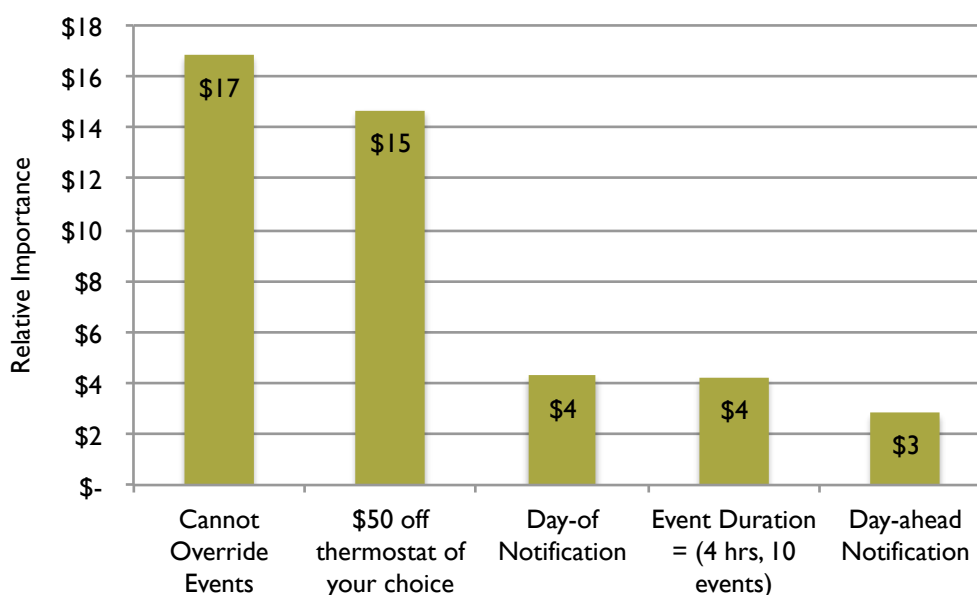
| Participation Scenario | Attribute Values |
|-------------------------------|--|
| "Least Attractive" | Bill Credit Per Event: \$2 Thermostat Incentive: \$50 Event Duration: 4 hours, 10 events Event Override: No Notification: Day-of and Day-ahead |
| "Most Attractive" | Bill Credit Per Event: \$10 Thermostat Incentive: No-cost program-specified smart thermostat and installation Event Duration: 6 hours, 4 events Event Override: Yes Notification: None |

Using the purchase probabilities above for the two program scenarios and assuming a linear trend, we were able to calculate the per-event bill credit amount that is equivalent to:

- 1) Offering a \$50 incentive instead of a no-cost Ecobee3 smart thermostat and no-cost installation;
- 2) Having a program with 10 events lasting up to 4 hours each per annum;
- 3) Not allowing participants to override demand response events;
- 4) Displaying event notifications on the day of the events; and
- 5) Displaying event notifications a day before demand response events.

As exhibited in Figure 42, participants would need to realize an additional \$15 in bill credits for every event if the program were to offer a \$50 incentive toward a smart thermostat instead of a no-cost Ecobee3 with installation and if the same level of program participation were to be maintained. Similarly, a program that does not allow participants to override demand response events is equivalent to an additional \$17 in bill credits per event. In other words, if customers had no control over their demand response measures, they would need an additional \$17 in bill credits to maintain the same levels of participation. Given the high amount in bill credit equivalence, it is apparent that a no-cost thermostat and the ability to voluntarily participate in demand response events are more important to customers than other factors when determining program participation.

Figure 42: Event Bill Credit Amounts Needed to Compensate Participants for Including Suboptimal Program Features

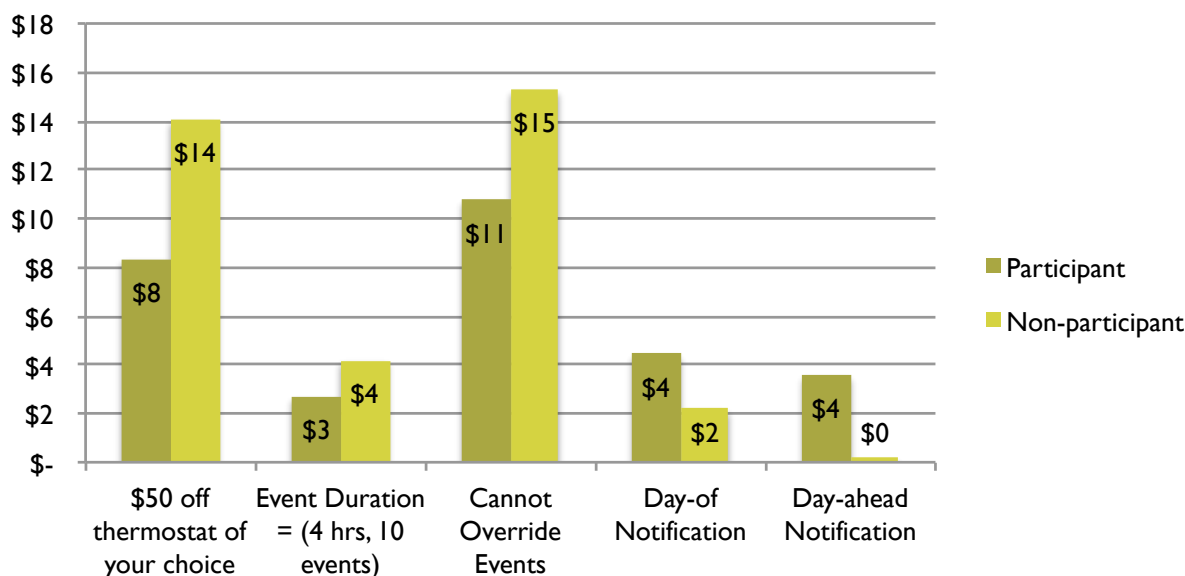


We repeated this exercise among those that are current participants in the ACSS program and found that participants would need to realize an additional \$8 in bill credits for every event if the program were to offer a \$50 incentive toward a smart thermostat instead of a no-cost Ecobee3 with installation and if the same level of program participation were to be maintained. Non-participants on the other hand would require nearly twice as much in compensation at \$14 for every event.

Similarly, a program that does not allow participants to override demand response events would be equivalent to an additional \$11 in bill credits per event for participants, and \$15 in bill credits for non-participants. In other words, if customers had no control over their measures, they would need an additional \$11 to \$15 in bill credits to maintain the same levels of participation. Given the high amount in bill credit equivalence, it is apparent that

a no-cost thermostat and the ability to voluntarily participate in demand response events are still more important to both ACSS participants and non-participants than other factors when determining program participation.

Figure 43: Equivalent Event Bill Credit Amounts Needed to Compensate for Including Suboptimal Program Features by ACSS Participation



4.3 Findings

Several general conclusions can be drawn from the conjoint results:

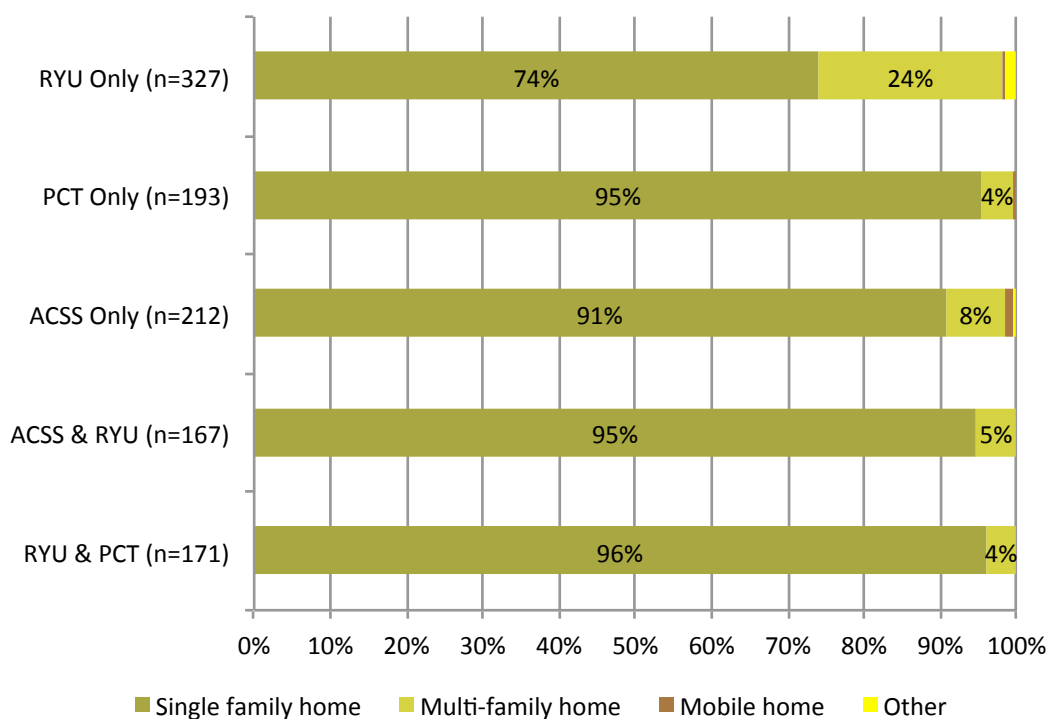
- **The ability to override an event is an important driver of participation.** In addition to incentives (bill credits, thermostats), the option of overriding an event was considered an important factor in both the ranking and participation model. It was also considered generally more important among non-participants, indicating that this may be a participation barrier for some customers. A prior study done by Itron found that 20 percent of PCT program participants chose to override an event at least once, which is consistent with the conjoint results presented here.
- **A no-cost smart thermostat with installation is likely to encourage program participation when compared to the other program features.** The conjoint analysis revealed that the offer of a no-cost Ecobee smart thermostat with no-cost installation was consistently found to be important among respondents across all the conjoint models we tested. It was even considered more important than the financial incentives offered for each event.
- **The importance placed on the Ecobee thermostat may be reflecting a preference for free installation.** The conjoint models consistently rank the Ecobee thermostat with free installation higher than the \$50 incentive toward a thermostat that

customers install themselves. For those without a smart thermostat, the preference for the Ecobee over the do-it-yourself installation was most pronounced, which further suggests that having the free thermostat installation might be an important participation driver.

Appendix A – Additional Survey Analysis Demographics

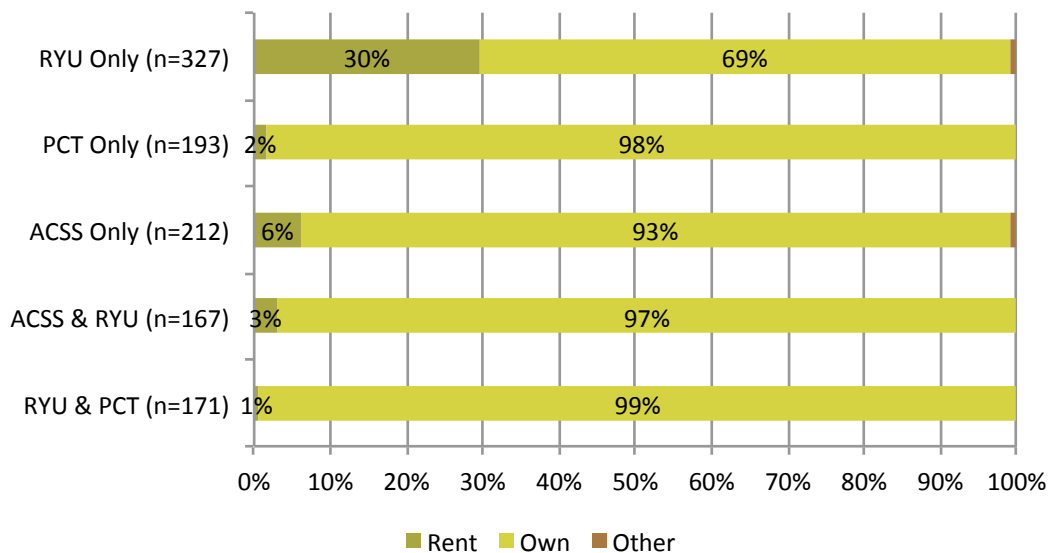
Most of the people we surveyed (88%) reported living in a single family home. RYU Only participants were statistically significantly more likely than all other participant categories to report living in a multifamily home (e.g. apartment, duplex, townhouse), with 24 percent in multifamily buildings.

Figure 44: Home Type



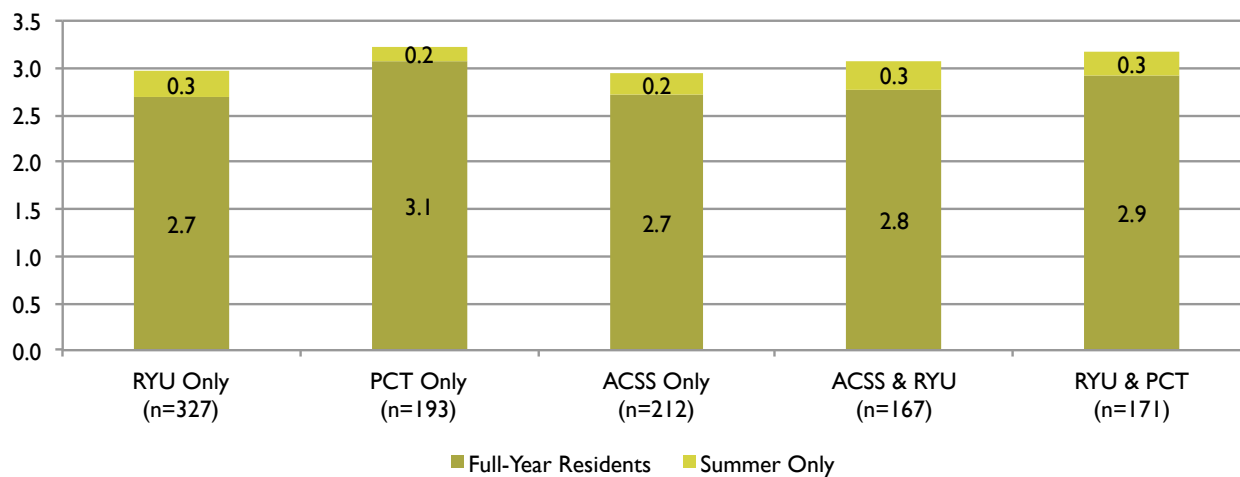
Most of the people we surveyed (88%) reported owning their home. RYU Only participants were significantly less likely than all other participants to report owning their home, with 30 percent renting. This difference cannot be explained entirely by the high proportion of RYU Only participants living in multifamily homes because 52 percent of RYU Only renters live in single family homes. Overall, 59 percent of renters (n=119) report living in single family homes compared to 92 percent of homeowners (n=946).

Figure 45: Home Tenure



Just over 14 percent of respondents said they had at least one additional person living with them during the summer for more than a month; this includes college students.

Figure 46: Average Number of Residents



NOTE: If respondents selected a range of 3-5 or 6-8 residents, we used the midpoint of the stated range (i.e. 4 and 7) when calculating the overall average.

Appendix B – Additional Conjoint Analysis Results

Table 17 presents the raw coefficients for the rank model by customer segment.

Table 17: Conjoint Results – Rank Model Coefficients by Customer Segment

| Participant Group | n | Coefficient Estimates | | | | | |
|-------------------|-----|-----------------------|---------------------------|-------------------------------|---------------------------|---------------------|------------------------|
| | | Event Incentive | \$50 Thermostat Incentive | No-cost Ecobee3, Installation | Unable to Override Events | Day-of Notification | Day-ahead Notification |
| All | 492 | 0.0811 | 0.2333 | 1.0159 | -0.7217 | 0.2521 | 0.2967 |
| RYU Part. | 428 | 0.0842 | 0.1966 | 0.9850 | -0.7024 | 0.2614 | 0.3230 |
| RYU Non-part. | 64 | 0.0616 | 0.4715 | 1.2236 | -0.8754 | 0.1842 | 0.1152 |
| ACSS Part. | 100 | 0.0819 | 0.3813 | 1.0358 | -0.5656 | 0.2128 | 0.2369 |
| ACSS Non-part. | 392 | 0.0812 | 0.1954 | 1.0129 | -0.7639 | 0.2624 | 0.3130 |
| Have PCT | 117 | 0.0933 | 0.8306 | 1.6581 | -0.8806 | 0.1749 | 0.1406 |
| No PCT | 375 | 0.0785 | 0.0490 | 0.8302 | -0.6875 | 0.2758 | 0.3452 |
| Have Widget | 208 | 0.0852 | 0.6217 | 1.3900 | -0.7297 | 0.1846 | 0.1801 |
| No Widget | 284 | 0.0806 | -0.0621 | 0.7448 | -0.7319 | 0.3000 | 0.3869 |

*The coefficients for “Event Duration and Frequency” have been omitted as this variable is not statistically significant in all models.

**All coefficient estimates that are statistically significantly different between participant and non-participant groups at the $\alpha = 5$ percent have been bolded and shaded (e.g. “RYU Part.” and “RYU Non-part.”).

Appendix C– Recruitment Email Scripts

This appendix provides the email templates we used to recruit participants to complete the web survey. Text enclosed in curly brackets indicates what information was custom to that participant, such as their name and the program(s) in which they participate.

Initial Invitation Email

Dear {{user.first_name}},

We are an independent research firm writing today on behalf of San Diego Gas & Electric (SDG&E) to ask you about your recent experience with {{your Ecobee thermostat / the SDG&E Summer Saver AC Cycling program / SDG&E Reduce Your Use days}}. **Now we need you to tell us how it's going and give us your input on some possible future changes to these programs.** We want to ask if you could give us just a few minutes of your time to complete a brief online questionnaire with your experiences and opinions.

To get started, just click on the link below, or cut and paste the link into a browser window.

<http://sdgedr.evergreenecon.com/?userid={{user.userid}}>

Your response may help the people at San Diego Gas & Electric improve their programs to better serve customers like you.

Please feel free to contact me at Evergreen Economics at (510) 899-5558 or email me at demandresponse@evergreenecon.com if you have any questions regarding the Demand Response Study.

Thank you for your help.

Sincerely,

Martha Thompson
Study Manager

EVERGREEN ECONOMICS
demandresponse@evergreenecon.com
(510) 899-5558
evergreenecon.com



Reminder Group 1: No response at all

Dear {{name_clean}},

We are an independent research firm writing today on behalf of San Diego Gas & Electric (SDG&E) to ask you about your recent experience with {{ProgramCombo}}.

Because your {{sector}} {{ProgramDesc}}, **your experiences and opinions are particularly valuable to us.** We are still very interested in getting your input to help shape future program changes, and are asking again if you could please take a few minutes to help us improve these programs.

To get started, just click on the link below, or cut and paste the link into a browser window. Thank you very much!

{{link}}

Your response may help the people at San Diego Gas & Electric improve their programs to better serve customers like you.

Please feel free to contact me at Evergreen Economics at (510) 899-5558 or email me at demandresponse@evergreenecon.com if you have any questions regarding the Demand Response Study.

If you have concerns about this study and would like to speak with someone at SDG&E please call Brenda Gettig at 858-654-8755.

Sincerely,

Martha Thompson
Study Manager

EVERGREEN ECONOMICS
demandresponse@evergreenecon.com
(510) 899-5558
evergreenecon.com

Reminder Group 2: Made it to right before the conjoint, and then quit

Dear {{name_clean}},

Thank you for taking the time to start filling out our survey. Because your {{sector}}



{{ProgramDesc}}, your experiences and opinions are particularly valuable to us.

We have removed the ranking portion of the survey and have just a few more questions for you to answer. Unfortunately, we won't be able to use your responses unless you finish answering these questions.

To finish, just click on the link below, or cut and paste the link into a browser window. **You will be able to pick up from where you left off.** Thank you very much!

[{{link}}](#)

Your response may help the people at San Diego Gas & Electric improve their programs to better serve customers like you.

Please feel free to contact me at Evergreen Economics at (510) 899-5558 or email me at demandresponse@evergreenecon.com if you have any questions regarding the Demand Response Study.

If you have concerns about this study and would like to speak with someone at SDG&E please call Brenda Gettig at 858-654-8755.

Sincerely,

Martha Thompson
Study Manager

EVERGREEN ECONOMICS
demandresponse@evergreenecon.com
(510) 899-5558
evergreenecon.com

Reminder Group 3: Answered a few questions or clicked the link

Dear {{name_clean}},

We are an independent research firm writing today on behalf of San Diego Gas & Electric (SDG&E) to ask you about your recent experience with {{ProgramCombo}}.

Because your {{sector}} {{ProgramDesc}}, **your experiences and opinions are particularly valuable to us.** We are still very interested in getting your input to help shape future program changes. **We have shortened the survey** and are asking for a few minutes of your time.

Just click on the link below, or cut and paste the link into a browser window. **If you already**



started filling out the survey, you will be able to pick up from where you left off. Thank you very much!

[{{link}}](#)

Your response may help the people at San Diego Gas & Electric improve their programs to better serve customers like you.

Please feel free to contact me at Evergreen Economics at (510) 899-5558 or email me at demandresponse@evergreenecon.com if you have any questions regarding the Demand Response Study.

If you have concerns about this study and would like to speak with someone at SDG&E please call Brenda Gettig at 858-654-8755.

Sincerely,

Martha Thompson
Study Manager

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demandresponse@evergreenecon.com
(510) 899-5558
evergreenecon.com

Appendix D – In-Depth Interview Guide

Evergreen conducted four in-depth telephone interviews with program managers from the following programs:

- Reduce Your Use (RYU)
- AC Cycling/Summer Saver (ACSS)
- Residential PCTs (PCTs)
- Small Commercial PCTs (PCTs)

These interviews were designed to improve our understanding of SDG&E's relevant demand response offerings, their challenges, successes, and how programs may overlap with each other. Below is the guide that we used to facilitate this discussion. We started with questions that are applicable to all program managers and then continued with questions devoted to discussing singular programs.

Introduction/Program Information

1. I'd like to confirm my understanding of [Program]. [*will explain high level of program understanding*]
2. Have you managed other DR programs in the past? If so, for how long? How long have you been managing this program?
3. Our understanding is that there are [number] participants in this program. How has program participation varied over the past three years?
4. How do participants learn about the program? [Probe on marketing strategies, other programs, etc.]

Program Participation

5. What are the high level goals of the program? Are there quotas you are aiming to reach regarding participation or savings numbers?
6. What do you think motivates customers to participate in the program?
7. Are there any demographic segments that are more likely to participate in [Program] than other demographic segments? Are any segments more likely to drop out once enrolled?
8. What barriers exist for customers to participate in the program? [Probe specifically about the research questions regarding consumers who purchase their own PCT and reject the RYU program; do those contribute to drop out rates?]
9. [If PYT or RYU] We understand that some of your participants are also in the [PTR/RYU] program.
 - a. What percentage of your participants are in the other program?

- b. How do you coordinate with the [PTR/RYU] program? Is there coordinated marketing?
- c. Of the customers who do not participate in [PTR/RYU], why do you think they do not participate in both programs?

Program Structure

10. What improvements would you like to see made to the program? What would be the benefits?
11. [for ACSS and RYU] What is the customer experience during an event? Is there past customer satisfaction research we could look at? If so, what were the main findings?
12. [for ACSS and RYU] What does the installation process entail? What does it require of the customer?
13. [for RYU] How does an event differ for those that have the Ecobee (SDG&E) thermostat compared to another PCT?
14. Is there a desire to get ACSS customers to move toward PCTs? (related to a question in SOW about if customers are willing to make that move) Please tell me about how [PROGRAM] is structured?

Reduce Your Use

[Ask following questions to RYU Program Manager only]

15. What is the amount customers are required to save on a RYU day? Is it a percentage of total usual energy use or is it a flat fee?
16. Do customers prefer to learn about events via their phone or via email? Are phone alerts in the form of text?
17. Do you market the PCT offer to program participants who do not already participate in the PCT program? If so, how does that coordination work?

Programmable Communicating Thermostats

[Ask following questions to PCT Program Managers only]

18. What features are available to PCT participants (online and through the thermostat)?
19. Do you track customer use of website?
20. What feedback have you received from customers on the Ecobee?
21. What other PCTs have customers expressed interest in?
 - a. What makes other PCTs more appealing to customers?

- b. Are there plans to incentivize other PCTs in the future? If not, what are the barriers to doing so?
- 22. Are there plans to change the incentive amount (no cost) in the future?
- 23. Is it possible for customers to have both the PCT and a direct load control device?
- 24. Do you have an understanding of if customers prefer one to the other? If so, why?
- 25. What is the process like for connecting PCT participants to the RYU program? How does that handoff occur?

AC Cycling/Sumer Saver

[Ask following questions to AC Sumer Saver Program Manager only]

- 26. How are customers notified of an event? How soon does this occur before the event?
- 27. Do all participants get notifications?
- 28. Do you have email addresses for all of the participants?
- 29. How many customers choose the 50% cycling option over the 100% cycling option? Is that dependent on time of enrollment?

Wrap Up

- 30. [Ask all] What are your top priorities from our study? How do you see us addressing that?

Thank you for taking the time to speak with me! Please feel free to reach out if you think of anything else.

Appendix E – Web Survey Instrument

Table 18 shows the six participant categories we recruited for this survey. The shaded cells show in which program(s) customers in each category participate. A more detailed description is shown in the last column of the table. Respondents were asked different questions based on their program participation.

Table 18: Participant Groups Surveyed

| Group Name | Program | | | Description |
|---------------|---------|-----|-----|--|
| | ACSS | PCT | RYU | |
| PCT_ONLY_RES | | | | Residential customers who have participated in the Programmable Communicating Thermostat (PCT) program but are not a part of the Reduce Your Use (RYU) program |
| RYU_PCT | | | | Residential customers who have participated in both SDG&E's PCT program and are a part of the RYU program |
| RYU_ONLY | | | | Residential customers who are only enrolled in the RYU program |
| ACSS_ONLY_RES | | | | Residential customers who are participating in AC Cycling/Summer Saver (ACSS), but are not enrolled in RYU or PCT |
| ACSS_ONLY_COM | | | N/A | Commercial customers who are participating in ACSS, but not PCT |
| ACSS_RYU | | | | Residential customers who are participating in ACSS while also enrolled in RYU, but not PCT |

Table 19 presents the web survey instrument, including all the questions we asked. The first two columns provide the question number and any relevant skip patterns that relied on responses provided in response to previous questions. To facilitate review of the guide by those interested in specific programs, we have shaded cells in green based on the participant

group that was asked each question.²⁵ The last column presents further detail or explanations that appeared on the screen when customers clicked on a question mark in the top right corner of the screen.

Table 19: Web Survey Questions

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|--|-----------|------------|--------------|---------|----------|---------------|---------------|----------|---|--------------------------------|
| Confirmation of Participation/Awareness | | | | | | | | | | |
| Q 1 | | | | | | | | | <p>Our records show that your [Business/Home] has received a Reduce Your Use thermostat from SDG&E. It is sometimes called a programmable communicating thermostat (PCT) or "smart thermostat". This thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. [Include photo of incentivized Ecobee thermostat] Is that correct?</p> <p>1) Yes, we have it installed 2) Yes, we have it but we uninstalled it 3) No, we don't have the pictured thermostat, but have another communicating thermostat [Thank and terminate (T&T)] 4) No we don't have a programmable communicating thermostat [T&T] 5) I'm not sure [T&T]</p> | |
| Q 1b | [IF Q1=2] | | | | | | | | <p>Why did you uninstall the thermostat?</p> <p>1) _____ [T&T]</p> | |

²⁵ Cells that are not shaded green but have a "Y" in this field indicates that we did not ask this question of that participant group because we could reasonably assume their response would be "Yes", based on the eligibility criteria of the program(s) in which they were participating.

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|-----|-----------|------------|--------------|---------|----------|---------------|---------------|----------|---|---|
| Q 2 | [IF Q1=1] | and | | | | | | | <p>Is your smart thermostat from SDG&E still connected to your internet (Wi-Fi)?</p> <p>1) Yes, it is still connected 2) No [T&T] 3) Don't know [T&T]</p> | <p>A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT).</p> |
| Q 3 | [IF Q2=1] | and | | | | | | | <p>What is the name of the contractor who installed your smart thermostat?</p> <p>1) Synergy 2) The Climate Controllers 3) Mad Dash 4) Don't know 5) Other [please specify]</p> | <p>A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT).</p> |
| Q 4 | | | | | | | | | <p>Are you enrolled in SDG&E's for Reduce Your Use Program where they either send alerts or automatically control equipment for reduce energy for Reduce Your Use events. This is when there is a high need (or "event") that day, where customers can receive an incentive for lowering their energy usage.</p> <p>1) Yes [continue] 2) No [T&T] 3) Don't know [T&T]</p> | <p>A demand response event can be called by SDG&E on very hot days and is a request to have customers lower their energy use during a certain time period where there is a high level of demand on the electric grid.</p> |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|---------------------------------|----------|------------|--------------|---------|----------|---------------|---------------|----------|---|---|
| Q 5 | | | | | | | | | <p>SDG&E has an AC Cycling/Summer Saver program. This is a program where you get an annual credit on your bill for allowing SDG&E to cycle your AC on and off for a few hours during event days? Are you part of SDG&E's AC Cycling/Summer Saver program?</p> <p>1) Yes [continue] 2) No [T&T] 3) Don't know [T&T]</p> | <p>During normal operation your central air conditioning turns "on and off" based on your thermostat setting. This is called cycling.</p> <p>Whenever there is a power emergency or critical peak demand, your Summer Saver device will be activated for a conservation period of two to four hours. While your central air conditioner is in a conservation mode the run-time of the condenser (the cooling portion) will be reduced to save energy. However, your fan, which requires little energy to operate, continues to circulate air for added comfort.</p> |
| PCTs (connected devices) | | | | | | | | | | |
| Q 6 | | | Y | Y | | Y | Y | Y | <p>Do you have a central air conditioning? [Assume yes for PCT and ACSS programs]</p> <p>1) Yes 2) No 3) Don't know</p> | |
| Q 7 | | | Y | Y | | | | | <p>Do you have wireless internet?</p> <p>1) Yes 2) No 3) Don't know</p> | |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|-----|-----------|------------|--------------|---------|----------|---------------|---------------|----------|---|--|
| Q 8 | | | | | | | | | <p>Do you have a smart thermostat in your [home/business]? A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT).Some examples include the Nest or ecobee.</p> <ol style="list-style-type: none"> 1) Yes 2) No 3) Don't know 4) No, but I'd consider getting one | |
| Q 9 | [IF Q8=1] | or | | | | | | | <p>What features do you like best about your smart thermostat? (select all that apply)</p> <ol style="list-style-type: none"> 1) It allows me to adjust the thermostat remotely by website or through a phone/tablet app 2) It increases my bill credits (incentives) during Reduce Your Use days 3) Color display 4) More precise temperature control of +/- 1°F 5) Seven-day programming 6) Vacation programming 7) It displays humidity 8) Other 9) None | <p>If you save enough electricity between 11AM and 6PM on a Reduce Your Use Rewards day (when there is a high demand for energy among SDG&E customers) you'll earn a credit on your SDG&E bill. SDG&E will send you a text, phone, or email alert on the event days to remind you to save electricity.</p> |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|---------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--------------------------------|
| Q | 10 | | | | | | | | | <p>Where have you viewed your energy usage data? (select all that apply) [IF no PCT, show only options 4-8. Don't allow someone to select 7) nowhere and others at the same time.]</p> <ol style="list-style-type: none"> 1) On the thermostat display 2) On thermostat manufacturer's website (e.g. ecobee, Nest) 3) On my smartphone/tablet app 4) On SDG&E's website 5) On my monthly bill 6) On a home energy management system 7) Nowhere, I don't view my data 8) Other [specify] | |
| Q | 11 | [IF Q10 NE 7] | | | | | | | | <p>How often do you check your energy in each location? [ask for each tool listed above if they said yes]</p> <ol style="list-style-type: none"> 1) more than once per month 2) every month 3) every other month 4) a few times a year 5) once a year 6) never 7) don't know | |
| Q | 12 | [IF Q8=1] | or | | | | | | | <p>Have you noticed a reduction in your energy usage while using the smart thermostat?</p> <ol style="list-style-type: none"> 1) Yes 2) No 3) Don't know | |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--------------------------------|
| Q | 13 | [IF Q8=1] | or | | | | | | | <p>On a scale from 1 to 5 with 1 being very dissatisfied and five being very satisfied, how satisfied are you with your smart thermostat?</p> <p>1) 1 = very dissatisfied 2) 2 = somewhat dissatisfied 3) 3 = neither satisfied nor dissatisfied 4) 4 = somewhat satisfied 5) 5 = very satisfied</p> | |
| Q | 14 | [IF Q13<3] | | | | | | | | <p>Why do you say that?</p> <p>1) _____</p> | |
| Q | 15 | [IF Q8=1] | and | Y | Y | | | | | <p>For each of the following, please indicate if your smart thermostat has the given feature: [Response options for each: Yes, No, Don't know]</p> <p>1) A feature that allows you to program temperature setting for different times of day. 2) A feature that notifies you of utility demand response events. 3) A feature that learns your usage behavior and adjusts the settings accordingly. 4) [Residential only] A feature that displays how much energy you have used. 5) A feature that allows you to adjust the thermostat remotely through website or through a phone app. 6) [Businesses only] A lockout feature to prevent unauthorized changes to the temperature. 7) A feature that alerts you when HVAC maintenance is needed, where there are issues with the HVAC, or when there are issues with the thermostat.</p> | |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|-----------------------------------|------------|--------------|---------|----------|---------------|---------------|----------|--|--------------------------------|
| Q | 16 | [IF Q8=1] | and | | | | | | | Does your smart thermostat have any other features? If so, what are they? 1) _____ | |
| Q | 17 | [IF Q15=1 (yes) for that feature] | | | | | | | | For each of the following, please indicate whether or not you use the given feature on your smart thermostat: [Ask about all features for PCT programs. For all non-PCT programs, ask only about features they said "yes" to previously.] [Response options for each are: Yes, No, and Don't know] 1) The feature that allows you to program temperature setting for different times of day. 2) The feature that notifies you of utility demand response events. 3) The feature that learns your usage behavior and adjusts the settings accordingly. 4) [Residential only] The feature that displays how much energy you have used.P17 5) The feature that allows you to adjust the thermostat remotely through website or through a phone app. 6) [Businesses only] The lockout feature to prevent unauthorized changes to the temperature. 7) The feature that alerts you when HVAC maintenance is needed, where there are issues with the HVAC, or when there are issues with the thermostat. | |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|------------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--|
| Q | 18 | [IF Q16=1] | and | | | | | | | <p>You indicated that your smart thermostat has some other features not mentioned above. Do you use these features?</p> <p>1) Yes 2) No 3) Don't know</p> | |
| Q | 19 | [IF Q8=1] | and | | | | | | | <p>What type of smart thermostat do you have? [may include photos of thermostats]</p> <p>1) Nest Learning Thermostat 2) Ecobee3 3) Honeywell Lyric 4) Ecobee Smart Si 5) Radio Thermostat CT-80 6) Emerson Sensi 7) Honeywell Wi-Fi smart 8) Energate Foundation Fz100 9) Energate Pioneer Z100 10) Other _____</p> | |
| Q | 20 | [IF Q7=1 & Q6=1] | and | | | | | | | <p>Were you aware that SDG&E offers a no cost Ecobee Smart Si and no cost installation of the thermostat as part of its Reduce Your Use Thermostat Program?</p> <p>1) Yes 2) No 3) Don't know</p> | SDG&E's Reduce Your Use Thermostat Program offers the Ecobee Smart Si thermostat at no cost along with no cost installation. |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|----------------------|------------|--------------|---------|----------|---------------|---------------|----------|--|--|
| Q | 21 | [IF Q19≠4 and Q20=1] | and | | | | | | | Did you try to get one from SDG&E through its Reduce Your Use Thermostat Program , but they told you that you weren't eligible? 1) Yes 2) No 3) Don't know | SDG&E's Reduce Your Use Thermostat Program offers the Ecobee Smart Si thermostat at no cost along with no cost installation. |
| Q | 22 | [IF Q19≠4 and Q20=1] | and | | | | | | | Had you already bought one? 1) Yes 2) No 3) Don't know | |
| Q | 23 | [IF Q19≠4 and Q20=1] | and | | | | | | | Did you not want the Ecobee Smart Si thermostat? 1) Yes 2) No 3) Don't know | |
| Q | 24 | [IF Q23=1] | and | | | | | | | What didn't you like about it? 1) _____ | |
| Q | 25 | [IF Q19≠4 and Q20=1] | and | | | | | | | Was there some other reason you did not get a thermostat from the Reduce Your Use Thermostat Program? (Leave this question blank if no other reason.) 1) _____ | |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------|------------|--------------|---------|----------|---------------|---------------|----------|--|--|
| Q 26 | | | | | | | | | <p>The SDG&E Reduce Your Use Program is a program where customers sign up to receive alerts by text, phone or email to reduce energy when demand is high. When certain “events” happen, SDG&E will send the alerts and will pay customers from \$0.75 to \$1.25 per kWh of energy they reduce or don’t use. These happen during certain periods of time where a lot of people and businesses are using energy. Have you heard of this Program?</p> <p>1) Yes 2) No 3) Don’t know</p> | <p>If you save enough electricity between 11AM and 6PM on a Reduce Your Use Rewards day (when there is a high demand for energy among SDG&E customers) you'll earn a credit on your SDG&E bill. SDG&E will send you a text, phone, or email alert on the event days to remind you to save electricity.</p> |
| Q 27 | [IF Q26=1] | and | | | | | | | <p>Below is a list of reasons why you may have chosen to not participate in SDG&E's Reduce Your Use Program. Please check all that apply.</p> <p>1) I thought I already was signed up 2) [Ask if ACSS_ONLY_RES & pct_have] My device isn't compatible 3) I was planning to do it soon 4) I don't want notifications 5) I don't care about the money 6) I did and was told I was not eligible 7) Other: _____</p> | <p>If you save enough electricity between 11AM and 6PM on a Reduce Your Use Rewards day (when there is a high demand for energy among SDG&E customers) you'll earn a credit on your SDG&E bill. SDG&E will send you a text, phone, or email alert on the event days to remind you to save electricity.</p> <p>Not all devices are approved by SDG&E at this time. You don't need a device to participate, but a device can increase your incentive from \$0.75 per kWh to \$1.25 per kWh reduced. Select this if you tried to sign up with your device but it wasn't program-eligible.</p> |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|---------------------|--------------------|------------|--------------|---------|----------|---------------|---------------|----------|--|--|
| Q 28 | [IF Q8=2 or =4] | and | | | | | | | At what price would you purchase a new smart thermostat ? 1) I wouldn't get one, even if it was offered at no cost 2) less than \$49 3) \$50 to \$99 4) \$100 to \$149 5) \$140 to \$200 6) more than \$200 | A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT). |
| Q 29 | [IF Q28>=1] | and | | | | | | | Would you be willing to install a new smart thermostat yourself? 1) Yes 2) No 3) Don't know | |
| Satisfaction | | | | | | | | | | |
| Q 30 | | | | | | | | | On a scale from 1 to 5 with 1 being very dissatisfied and five being very satisfied, how satisfied are you with the contractor who installed your smart thermostat ? 1) 1 = very dissatisfied 2) 2 = somewhat dissatisfied 3) 3 = neither satisfied nor dissatisfied 4) 4 = somewhat satisfied 5) 5 = very satisfied | A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT). |
| Q 31 | | | | | | | | | Do you have any comments about the contractor? [Requires a response if satisfaction was <3] 1) _____ | |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|----------|------------|--------------|---------|----------|---------------|---------------|----------|--|---|
| Q 32 | | | | | | | | | <p>On a scale from 1 to 5 with 1 being very dissatisfied and five being very satisfied, how satisfied were you with the installation process of your smart thermostat?</p> <p>1) 1 = very dissatisfied 2) 2 = somewhat dissatisfied 3) 3 = neither satisfied nor dissatisfied 4) 4 = somewhat satisfied 5) 5 = very satisfied</p> | <p>A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT).</p> |
| Q 33 | | | | | | | | | <p>Please tell us why you chose that answer. [Requires a response if satisfaction was <3]</p> <p>1) _____</p> | |
| Q 34 | | | | | | | | | <p>On a scale from 1 to 5 with 1 being very dissatisfied and five being very satisfied, how satisfied are you with the experience of being in the AC Cycling/Summer Saver program?</p> <p>1) 1 = very dissatisfied 2) 2 = somewhat dissatisfied 3) 3 = neither satisfied nor dissatisfied 4) 4 = somewhat satisfied 5) 5 = very satisfied</p> | <p>SDG&E's Summer Saver program is a no cost program that allows SDG&E "cycle" your central AC (or other connected device) on and off during summer event days (up to 15 per year) in exchange for an annual credit on your SDG&E bill.</p> |
| Q 35 | | | | | | | | | <p>Please tell us why you chose that answer. [Requires a response if satisfaction was <3]</p> <p>1) _____</p> | |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|--|----------|------------|--------------|---------|----------|---------------|---------------|----------|--|---|
| Q 36 | | | | | | | | | <p>On a scale from 1 to 5 with 1 being very dissatisfied and five being very satisfied, how satisfied are you with the experience of being in the Reduce Your Use program?</p> <p>1) 1 = very dissatisfied 2) 2 = somewhat dissatisfied 3) 3 = neither satisfied nor dissatisfied 4) 4 = somewhat satisfied 5) 5 = very satisfied</p> | <p>If you save enough electricity between 11AM and 6PM on a Reduce Your Use Rewards day (when there is a high demand for energy among SDG&E customers) you'll earn a credit on your SDG&E bill. SDG&E will send you a text, phone, or email alert on the event days to remind you to save electricity. Without connecting your device you get \$0.75 per kWh but if you connect your device you get \$1.25 per kWh reduced.</p> |
| Q 37 | | | | | | | | | <p>Please tell us why you chose that answer. [Requires a response if satisfaction was <3]</p> <p>1) _____</p> | |
| Conjoint | | | | | | | | | | |
| | | | | | | | | | <p>Please rank the following program packages below in terms of which you would be most likely to participate.</p> | |
| Participation and Event Knowledge | | | | | | | | | | |
| Q 38 | | | | | | | | | <p>How many event days do you recall from this past summer (2015)? If not sure, please give us your best guess. [Don't allow entry of both # and don't know]</p> <p>1) Enter number _____ 99) Don't know</p> | <p>A demand response event can be called by SDG&E on very hot days and is a request to have customers lower their energy use during a certain time period where there is a high level of demand on the electric grid.</p> |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------------------|------------|--------------|---------|----------|---------------|---------------|----------|---|---|
| Q 39 | [IF Q38>0 & Q38<99] | | | | | | | | For how many of those event days did you do something to lower your energy usage during the event hours? If not sure, please give us your best guess. 1) Enter number _____ 99) Don't know | |
| Q 40 | [IF Q38>1 and Q39<Q38] | | | | | | | | Do you remember why you didn't always participate on the event days? Please tell us why. 1) _____ | |
| Q 41 | | | | | | | | | <p>[If recall event (and participated in at least one):] During the past year, did you ever visit the My Energy Use section of the SDG&E website to view how you performed during an event?</p> <p>1) Yes 2) No 3) Don't know</p> <p>[If don't recall any events OR don't know if recall OR did not participate in any events ask instead:] Do you visit the My Energy Use section of the SDG&E website?</p> <p>1) Yes 2) No 3) Don't know</p> | My Energy Use is the section of the SDG&E website that tells you how you performed during an event and lets you know what your bill credit will be. |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--|
| Q 42 | [IF Q41=1] | | | | | | | | <p>About how often would you estimate you have visited the My Energy Use section of the SDG&E website over the past year?</p> <ol style="list-style-type: none"> 1) more than once per month 2) every month 3) every other month 4) a few times a year 5) once a year 6) never 7) don't know | <p>My Energy Use is the section of the SDG&E website that tells you how you performed during an event and lets you know what your bill credit will be.</p> |
| Q 43 | [IF Q41=1] | | | | | | | | <p>How many times did you visit the site specifically to check your energy usage over the past year? [Don't allow this to be more frequent than the previous question.]</p> <ol style="list-style-type: none"> 1) more than once per month 2) every month 3) every other month 4) a few times a year 5) once a year 6) never 7) don't know | |
| Q 44 | [IF Q41=1] | | | | | | | | <p>Have you ever seen the payment/credit on your bill for your participation in an event over the past summer?</p> <ol style="list-style-type: none"> 1) Yes 2) No 3) Don't know | <p>This would look like a negative charge on your bill so you would be required to pay less than you would have paid if you did not participate in an event.</p> |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--|
| Q 45 | | | | | | | | | <p>How much would you estimate you've earned in total from your participation in [PROGRAM] during (2015)?</p> <ol style="list-style-type: none"> 1) \$0 2) less than \$3 (but more than \$0) 3) less than \$5 (but more than \$3) 4) less than \$10 (but more than \$5) 5) less than \$25 (but more than \$10) 6) more than \$25, enter amount \$ _____ 7) Don't know | |
| Q 46 | [IF Q6=1] | OR | | | | | | | <p>During a 4 to 6 hour period when demand is high, which of the following adjustments to your AC would you choose in return for a small incentive?</p> <ol style="list-style-type: none"> 1) Have your AC compressor cycle on and off during the 4 to 6 hour period so that it is off roughly half the time 2) Have your AC compressor off completely during the 4 to 6 hour period 3) Increase the thermostat temperature by 4 degrees during the 4 to 6 hour period | A demand response event can be called by SDG&E on very hot days and is a request to have customers lower their energy use during a certain time period where there is a high level of demand on the electric grid. |
| Q 47 | [IF Q6=1] | OR | | | | | | | <p>Precooling is when someone lowers the temperature lower than normal before an event to make sure your [home/business] is very cool prior to an event. Have you ever precooled your [home/business] before an event?</p> <ol style="list-style-type: none"> 1) Yes 2) No 3) Don't know | This means you would have turned the desired temperature even lower than normal to make sure your space was very cool before the event. |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|----------|------------|--------------|---------|----------|---------------|---------------|----------|--|--------------------------------|
| Q 48 | | | | | | | | | <p>Are there alternative incentives to a bill credit that you would prefer? For example, How interested would you be in receiving the following for participating in the demand response event days?</p> <p>Read all, then tell us whether you are very, somewhat, or not at all interested in each.</p> <ol style="list-style-type: none"> 1) Gift card at the end of the year 2) SDG&E donates to a non-profit 3) SDG&E uses the money to help pay someone's bill who is having trouble affording energy 4) None | |
| Q 49 | | | | | | | | | <p>When would you prefer to be notified of a <i>demand response event</i>? Please check all that apply. [Don't allow respondent to select 3 with 1 (or 2), but allow them to select 1 and 2 together.]</p> <ol style="list-style-type: none"> 1) The day of the event 2) The day before the event 3) I don't want to be notified of an event at all | |
| Q 50 | | | | | | | | | <p>How often would you prefer to get your credit for participation in events?</p> <ol style="list-style-type: none"> 1) Monthly 2) Quarterly 3) Yearly | |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|------------|------------|--------------|---------|----------|---------------|---------------|----------|--|--------------------------------|
| Q | 51 | [IF Q49<3] | and | | | | | | | <p>How would you like to be notified of an event? Please check all that apply. [multiple responses allowed]</p> <p>1) Text message 2) Voice call 3) Email 4) [IF have a PCT] On smart thermostat display 5) Other: _____</p> | |
| Q | 52 | | | | | | | | | <p>Please check all the reasons why you are participating in an SDG&E demand response program [multiple responses allowed]:</p> <p>1) Helping my community avoid rolling blackouts 2) A sense of civic duty 3) To lower my utility bill / for the incentives 4) To help with grid instability 5) To avoid paying more when electric rates are higher 6) Other _____</p> | |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|--|------------|--------------|---------|----------|---------------|---------------|----------|--|--|
| Q | 53 | [IF Q8=1 OR PCT_ACS S_COMM =1] | and | | | | | | | <p>If you had to choose one, would you rather have your current summer saver device on your AC or would you rather have a smart thermostat?</p> <p>Your summer saver device is installed on your air conditioning unit and allows SDG&E to cycle your AC "on and off" for a few hours when electricity is at its peak.</p> <p>A smart thermostat is connected to the internet and allows you to program and remotely control your heating and air conditioning. It also allows SDG&E to send a signal [IF PCT_ACSS_COMM=0: "(with your permission via program enrollment)"], which you can override, to use less energy for a few hours when electricity is at its peak.</p> <p>1) Prefer summer saver device 2) Prefer smart thermostat 3) Not sure 4) Doesn't matter/no preference</p> | |
| Q | 54 | [IF Q53=1] | | | | | | | | <p>Why do you prefer your current device to the smart thermostat?</p> <p>1) _____</p> | <p>A smart thermostat is connected to the internet and allows customers to program and remotely control their heating and air conditioning. These are also known as programmable communicating thermostats (PCT). It also allows SDG&E to send a signal which you can override to use less energy for a few hours when electricity</p> |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--|
| | | | | | | | | | | is at its peak. |
| Q 55 | | | | | | | | | Are there any program features, devices, or offers that we haven't talked about that would make you more likely to participate in programs that help to reduce your energy use during demand response event days ? (Leave this question blank if there are no other features, devices, or offers.) 1) _____ | A demand response event can be called by SDG&E on very hot days and is a request to have customers lower their energy use during a certain time period where there is a high level of demand on the electric grid. |
| Q 56 | | | | | | | | | Did you make any changes to reduce your energy usage besides controlling your AC as a result of being in the program? 1) Yes 2) No 3) Don't know | |
| Q 57 | [IF Q56=1] | | | | | | | | Please describe the changes you've made. 1) _____ | |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------------------------------|--------------------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--------------------------------|
| Demographic Questions | | | | | | | | | | |
| Q 58 | | | | | | | | | Do you rent or own your [building/home]? 1) Rent 2) Own 3) Other _____ | |
| Q 59 | | | | | | | | | Do you have a pool? 1) Yes, in my back yard 2) Yes, a shared pool 3) No 4) Don't know | |
| Q 60 | [IF Q59=1] | | | | | | | | Does your pool have a pool pump? 1) Yes 2) No 3) Don't know | |
| Q 61 | [IF Q60=1 & Q59=1] | and | | | | | | | Would you be willing to let SDG&E put a device on your pool pump that would allow them to delay or shift it to off during peak events for an incentive? 1) Yes 2) No 3) Don't know | |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------|------------|--------------|---------|----------|---------------|---------------|----------|--|---|
| Q 62 | [IF Q61=1] | | | | | | | | How many pool pump event days per year would be acceptable to you if participation in each event was <i>optional</i> ? 1) 0 2) 2 3) 4 4) 6 5) 8 6) 10 7) 12 | |
| Q 63 | | | | | | | | | Do you have rooftop solar ? 1) Yes 2) No 3) Don't know | Electricity generating solar panels mounted on your rooftop |
| Q 64 | | | | | | | | | Do you have an electric vehicle ? [If business say: "Do you have electric vehicle charging available at your business?"] 1) Yes 2) No 3) Don't know | An electric vehicle is a automobile that is propelled by electric motor(s) using electrical energy stored in rechargeable batteries or another energy storage device. |
| Q 65 | [IF Q64=2] | | | | | | | | Are you considering getting an electric vehicle [if business add "charging station"] within the next year? 1) Yes 2) No 3) Don't know 4) Maybe | An electric vehicle is a automobile that is propelled by electric motor(s) using electrical energy stored in rechargeable batteries or another energy storage device. |

| Q# | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|------|------------|------------|--------------|---------|----------|---------------|---------------|----------|---|--------------------------------|
| Q 66 | | | | | | | | | <p>Do you live in a single family home, multi-family home, or mobile home?</p> <p>1) Single family home 2) Multi-family home 3) Mobile home 4) Other _____</p> | |
| Q 67 | | | | | | | | | <p>How many people live in your home year-round?</p> <p>1) 1 2) 2 3) 3-5 4) 6-8 5) 9+</p> | |
| Q 68 | | | | | | | | | <p>Do you have additional people living with you during the summer for more than a month? This includes college students home for the summer.</p> <p>1) Yes 2) No 3) Don't know</p> | |
| Q 69 | [IF Q68=1] | | | | | | | | <p>How many additional people live with you during the summer, for more than a month?</p> <p>1) 1 2) 2 3) 3 4) 4 5) 5+</p> | |

| Q# | | Prior Qs | Or/ and | PCT_ONLY_RES | RYU_PCT | RYU_ONLY | ACSS_ONLY_RES | ACSS_ONLY_COM | ACSS_RYU | Question text and responses | More Information Drop Down Box |
|----|----|----------|------------|--------------|---------|----------|---------------|---------------|----------|---|--------------------------------|
| Q | 70 | | | | | | | | | Have you heard of the following lighting types: Please check all that apply. 1) LED lamps 2) CFLs (compact fluorescent lamps) 3) Neither | |
| Q | 71 | | | | | | | | | Do you use any of the following lighting types in your home/business: Please check all that apply. 1) LED lamps 2) CFLs (compact fluorescent lamps) 3) Neither | |