

➤ Summary of 60-Day Notice: AC Rewards

Public Service Company of Colorado (“the Company”) posts this 60-Day Notice to make changes to the AC Rewards offering in response to the 2021 Comprehensive Evaluation.

The evaluation provided key findings in the areas of customer satisfaction, participation barriers and marketing effectiveness. The Company will implement the following recommendations in 2022:

- Enhancements to marketing and recruitment activities;
- Enhancements to communications regarding enrollment and event awareness;
- Enhanced analysis of event performance regarding thermostat set points and temperature thresholds; and
- Enhanced customer retention offerings and participation satisfaction tracking.

These changes are not expected to have a material impact on 2022 product forecasts.

Table 1: Summary of Forecasted Impacts: Residential Demand Response

	2022	
	<i>As Filed</i>	<i>Revised per 60-day</i>
Electric Savings (kWh)	113,371	113,371
Electric Demand Reduction (kW)	32,092	32,092
Budget*	\$9,525,000	\$9,525,000
MTRC Test Ratio	2.09	2.09

*Rebates only. While the anticipated expenditure impacts are forecasted, the Company acknowledges that this Notice does not change the filed budget.

Detailed responses to each of the Comprehensive Evaluation recommendations can be found in the matrix included with the report.

These documents can be found on our website at the following link:

http://www.xcelenergy.com/Company/Rates & Regulations/Filings/Colorado_Demand-Side_Management

AC Rewards Program Evaluation

Prepared for
Xcel Energy

Submitted by
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September 17, 2021



Executive Summary

Offering Summary

Xcel Energy’s AC Rewards program provides residential customers in Colorado the opportunity to earn financial incentives by allowing the Company to remotely manage the setting of customers’ program-eligible Wi-Fi thermostats in the summer months during times of peak demand. These instances, known as demand response (DR) events, are aimed at reducing residential central air conditioning (AC) loads on a limited number of summer days when system demand is high.

In recent years, the AC Rewards program has struggled to meet enrollment targets due largely to a cumbersome enrollment process. However, in 2020, Xcel Energy onboarded a new Demand Response Management System (DRMS) and implemented a new, user-friendly online enrollment process that led both Xcel Energy and thermostat vendor partners to renew their program marketing efforts. Collectively, these changes led to a tripling of customer enrollment between May 2020 and August 2020, to over 12,000 enrolled devices.

DR Events

2020

4-6 hours

4°F temperature adjustment

June-August 2020

15 events

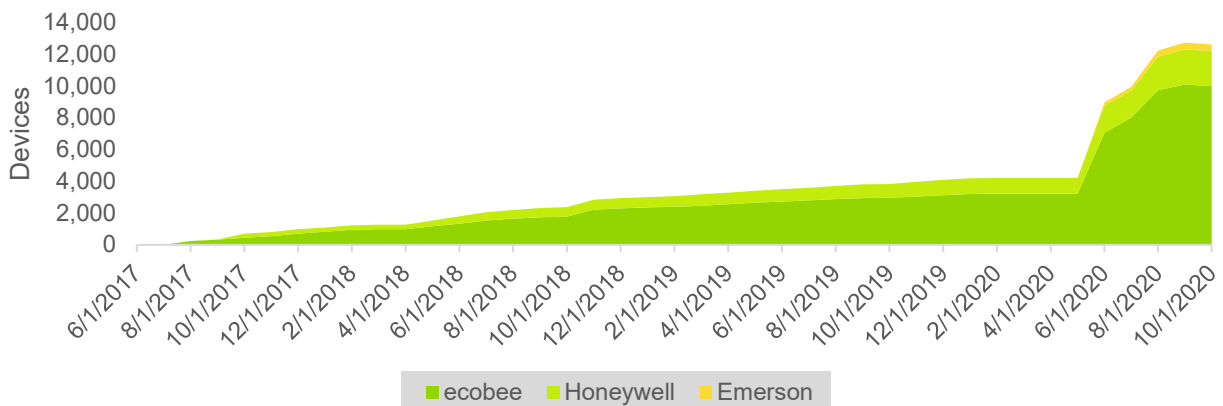
Set between 2 p.m.- 8 p.m. on non-holiday weekdays

Pre-cooling employed for 2 hours prior to each

Evaluation Findings Overview

The evaluation of AC Rewards in 2020 found that more engagement and education at customer touchpoints could improve customers’ AC Rewards experience. Xcel Energy has an opportunity to strengthen the program by addressing the needs of different customer types in marketing efforts, leveraging EE channels for recruitment, and enacting strategic adjustments to maximize program impact and participant satisfaction.

AC Rewards Enrollment Over Time: 2017-2020



Source: Guidehouse analysis

Evaluation Objectives

The principal evaluation objective was to identify strengths and areas of improvement related to current AC Rewards program design and delivery. Through discussion with Xcel Energy staff, the evaluation team identified five priority research areas.

Research Areas

Marketing and Recruitment

Enrollment

Event Awareness

Event Experience

Satisfaction and Attrition

The following table summarizes the evaluation approach.

Evaluation Approach

Evaluation Component

Description

Staff Interviews

Eight interviews with 13 staff members, with a diverse range of roles and varied levels of involvement with AC Rewards. The staff interviews helped inform key research questions.

Post-Event Survey

Surveyed customers to investigate customer satisfaction, comfort level, program awareness, pre-event notifications, and to better understand a customer's overall engagement after three events.

Post-Season Survey

Fielded surveys at the end of the cooling season to assess customer experience with the AC Rewards program.

Post-Enrollment Survey and Enrollment Analysis

Administered surveys to newly enrolled participants to assess their experiences with the new online enrollment process for AC Rewards. The survey also gathered information on participants' expectations for their experience in the program.

In addition, Guidehouse analyzed historical program enrollment data to estimate annualized attrition rates.

Focus Groups

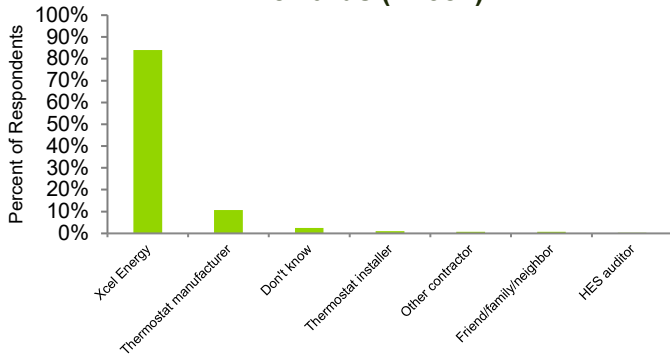
The Guidehouse team conducted four online focus groups for Xcel Energy. The primary goal of the focus groups was to explore barriers to enrollment and understand customer response to AC Rewards marketing materials.

Peer Benchmarking

Identified leading practices by benchmarking against eight peer companies with similar programs as Xcel Energy.

Evaluation Findings: Customer Experience

How Participants First Learned About AC Rewards (n=384)



Marketing and Motivations

Xcel Energy-branded marketing reaches more customers than does marketing from thermostat manufacturers. Most post-season survey respondents first learned about the program through an Xcel Energy email or the Xcel Energy website rather than through their thermostat manufacturer.

Non-participant focus group respondents questioned why their thermostat's manufacturer would email them about an Xcel Energy program.

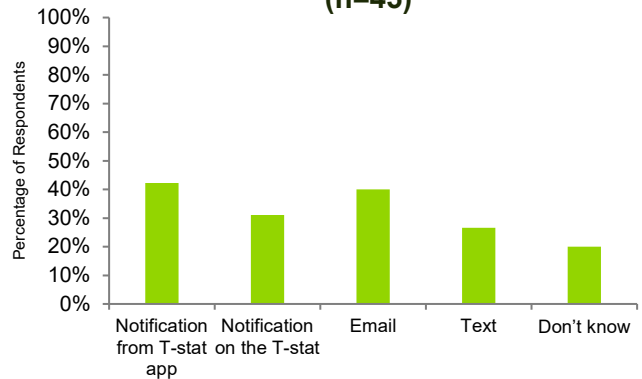
Enrollment and Expectations

Most newly enrolled respondents were satisfied with the process of enrolling. However, some respondents were unsure if they had successfully enrolled.

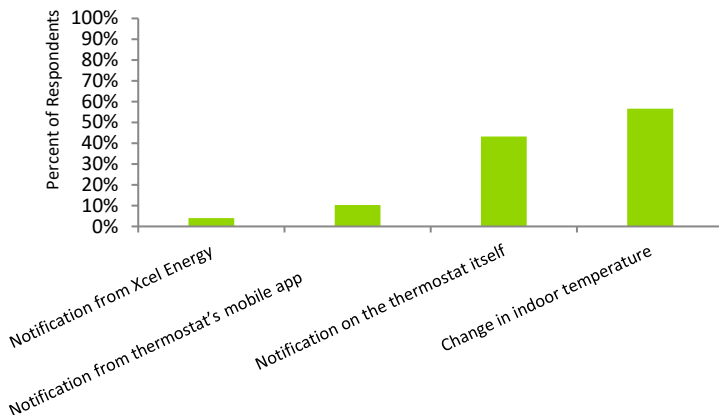
The majority of newly-enrolled survey respondents **expected to be notified of events in advance through their thermostat's app or email.** In practice, participants are not notified by email. The only form of advance notification is through the thermostat's app.

Additionally, most newly enrolled respondents were not aware of pre-cooling, despite this being a new program feature in 2020.

Expectations for Event Notifications (n=45)



How Participants Became Aware of Events (n=97)



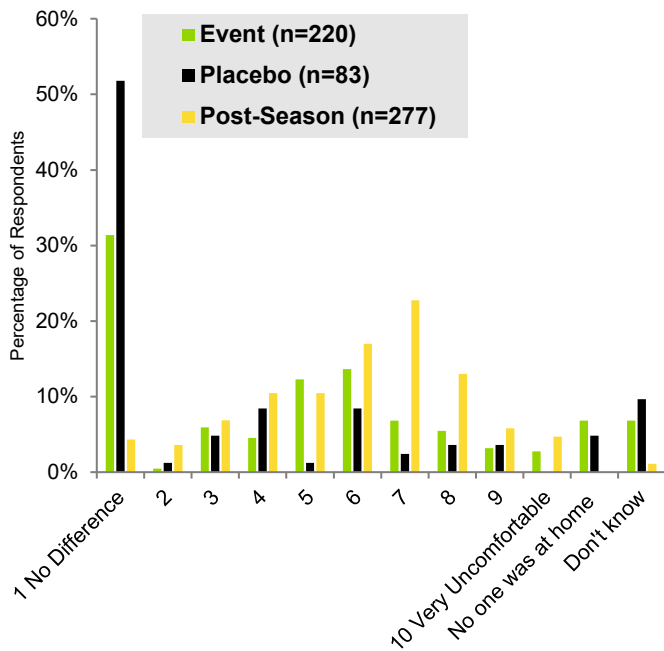
Event Awareness and Notification

Respondents generally learned about events **at the time of the event either through notifications on the thermostat itself or through a change in indoor temperature.**

A relatively small percentage of respondents recalled receiving advance notifications via their thermostat's app. The majority of those who did not recall receiving any event notification would like to receive it.

Evaluation Findings: Customer Experience

Reported Comfort Level During Events



Event Experience

Most survey respondents reported at least some change in comfort in their home.

However, nearly half of the respondents to a “placebo” survey (survey conducted when no event was called) also reported a change in comfort. This supports the notion that reported discomfort may not be wholly attributable to the events themselves.

Notably, comfort impacts reported immediately following events were significantly lower than those reported at the end of the season based on participants’ recollections of the summer as a whole. This may indicate event fatigue and/or recall bias.

In the post-event surveys, the self-reported **opt-out rate was 20%** on average, and 44% among those who were aware of the event.

Of the post-event respondents who did not opt out of the event and were aware of the event, **a majority did not take any actions to feel more comfortable**, despite many of them having noticed a change in comfort.

Satisfaction and Attrition

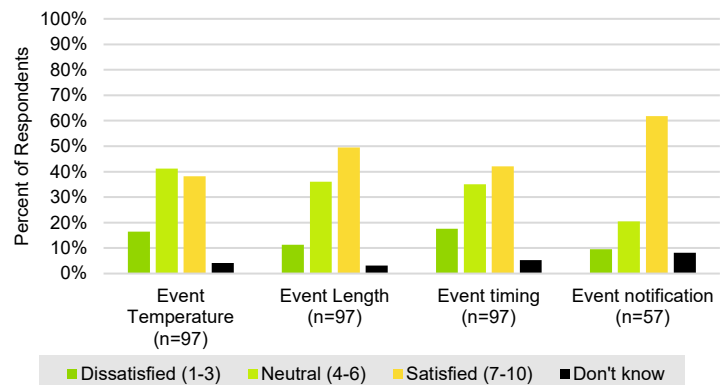
90% of customers reported being likely to continue participating in the program. Participants were satisfied with the program overall and had few areas of dissatisfaction.

Program attributes with the lowest satisfaction scores were event temperature and event timing. Reported satisfaction was lowest after a consecutive day event.

Attrition

The annualized rate of attrition ranges from 2% to 9%, depending on year of enrollment. Average annualized attrition was 4%.

Satisfaction of Program Aspects



Key Considerations

Description	
Topic	Suggestions for Improvement
Marketing and Recruitment	<ul style="list-style-type: none"> • Continue to send Xcel Energy-branded program marketing emails while also leveraging thermostat vendors for marketing. To enhance marketing, ideas from the workshop included, promoting the program and hosting smart thermostat giveaways at local sports events. Another method would be to partner with schools, boy/girl scouts, and realtors to reach new audiences and build a strong AC Rewards community. • Adjust messaging from emphasizing easing strain on the grid to emphasizing customer bill credits and the contributions of the program toward sustainability, grid stability, and resilience. Message on providing a cleaner environment for future generations. Highlight program as an opportunity to assist with grid flexibility and to be a part of the Clean Energy Transition and increasing use of renewables. Message on making the home smarter and adding value to the home. This will help minimize participant confusion about why the program increases cooling load via pre-cooling prior to events. • Fine-tune marketing messaging to communicate the value proposition. Prominently feature bill credit amounts, and clearly indicate when customers will be paid and for what behavior (i.e., thermostat purchase, AC Rewards enrollment, control event participation). Promote customer control of devices and emphasize comfort messaging. • Revise marketing collateral for greater transparency. Describe why Xcel Energy initiates control events, when and how often they occur, and for how long. Describe what customers can expect: event notifications, pre-cooling, thermostat setpoint increase vs. actual home temperature change. Consider providing an infographic showing the difference between setpoint change and home temperature change during a DR event. • Create new program materials that enable customers to access more granular information at their discretion. For example, provide an enhanced FAQs page, detailed program page (or individual landing pages) with videos, text, and infographics. Provide greater explanation of specific topics such as control events, DR, and home thermal dynamics. • Distinguish between AC Rewards, Saver's Switch, and thermostat vendor algorithms. Ensure AC Rewards marketing emails from thermostat vendors should be focused on AC Rewards rather than combining topics (e.g., eco+). Supplement marketing emails from thermostat vendors with emails directly from Xcel Energy. • Conduct additional customer segment research. Further examination of underrepresented customer segments is warranted to help understand what Xcel can do to increase Wi-Fi thermostat penetration and AC Rewards program participation among these segments. Consider conducting interviews with lower income homeowners and renters (those who do and do not have a Wi-Fi thermostat) to assess views on and engagement with smart home devices. Consolidate internal (Xcel Energy) customer research information and conduct additional customer segment research.

Key Considerations

Description	
Topic	Suggestions for Improvement
Enrollment	<ul style="list-style-type: none"> • Distribute an automatic confirmation email to customers once they successfully enroll in the program. This helps build a stronger relationship and rapport with the customers and leaves a positive initial impression.
Event Awareness	<ul style="list-style-type: none"> • Provide more information about how and when participants receive event notifications. Instruct and remind participants to enable push notifications from their thermostat app to receive advance notifications. Send updates on the number of DR events that have been called and estimated impacts in order to recognize individual and/or program-level accomplishments. • Consider offering additional forms of advance notification such as email or text notifications. Send advance notification via “Xcel Energy’s App”
Event Experience	<ul style="list-style-type: none"> • Provide tips on ways to stay cool during events via the program website, as messaging in event notifications, or periodic emails. • Consider sending customers an email after each event or a couple times over the course of the summer letting them know how they performed or how the collective program performed, and how their participation helped the grid, environment, and community. • Analyze setpoint and indoor temperature changes during events to confirm events are operating as expected. Consider imposing a temperature threshold (if not currently part of the program design).
Satisfaction and Awareness	<ul style="list-style-type: none"> • Consider giving customers a referral bonus for referring other Xcel Energy customers to enroll in AC Rewards. Referral bonuses is a strategy employed by many successful companies.* • If possible, to keep customers satisfied, avoid calling consecutive day events and limit event length to 4 hours or less. This could be achieved by calling events/event hours for a subset of participants at a time when consecutive event days or long duration events are anticipated. • Consistently capture and monitor customer reasons for unenrollment in the program over time and ensure this information is carried over when DRMS vendor transitions occur.

*Note that AC Rewards program manager noted that referral bonuses would be difficult to implement and track.

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About Guidehouse

Guidehouse is a leading global provider of consulting services to the public and commercial markets with brand capabilities in management, technology and risk consulting. We help clients address their toughest challenges with a focus on markets and clients facing transformational change, technology-driven innovation and significant regulatory pressure. Across a range of advisory, consulting, outsourcing, technology/analytics services, we help clients create scalable innovative solutions that prepare them for future growth and success. Headquartered in Washington DC, the company has more than 7,000 professionals in more than 50 locations. Guidehouse is a Veritas Capital portfolio company, led by seasoned professionals with proven and diverse expertise in traditional and emerging technologies, markets and agenda-setting issues driving national and global economies. For more information, please visit **www.guidehouse.com**.



AC Rewards Evaluation Report

Colorado

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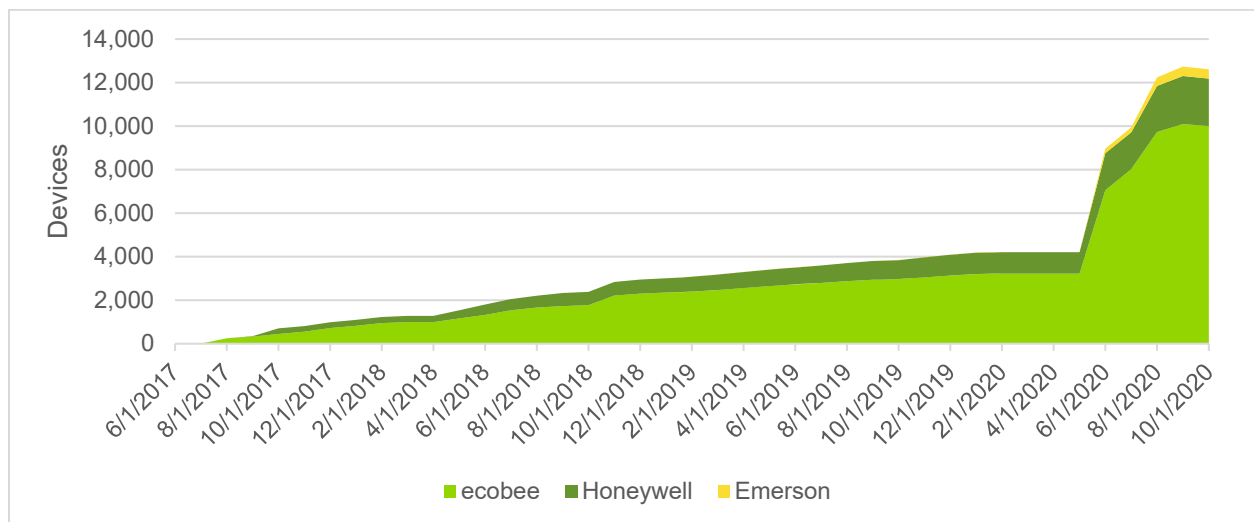
1. Background, Objectives, and Methodology

Xcel Energy’s AC Rewards program provides residential customers in Colorado the opportunity to earn financial incentives by allowing the Company to remotely manage the setting of customers’ program-eligible Wi-Fi thermostats in the summer months during times of peak demand. These instances, known as demand response (DR) events, are aimed at reducing residential central air conditioning (AC) loads on a limited number of summer days when system demand is high.

Events during the 2020 DR season were 4 or 6 hours with a 4-degree temperature adjustment. In 2020, 15 events were called June through August between the hours of 2 p.m. and 8 p.m. on non-holiday weekdays. Pre-cooling was employed for 2 hours prior to each event.

In recent years, the AC Rewards program has struggled to meet enrollment targets due largely to a cumbersome enrollment process. However, in 2020, Xcel Energy onboarded a new Demand Response Management System (DRMS) and implemented a new, user-friendly online enrollment process that led both Xcel Energy and thermostat vendor partners to renew their program marketing efforts. Collectively, these changes led to a tripling of customer enrollment between May 2020 and August 2020, to over 12,000 enrolled devices (Figure 1).

Figure 1. AC Rewards Enrollment Over Time (2017-2020)

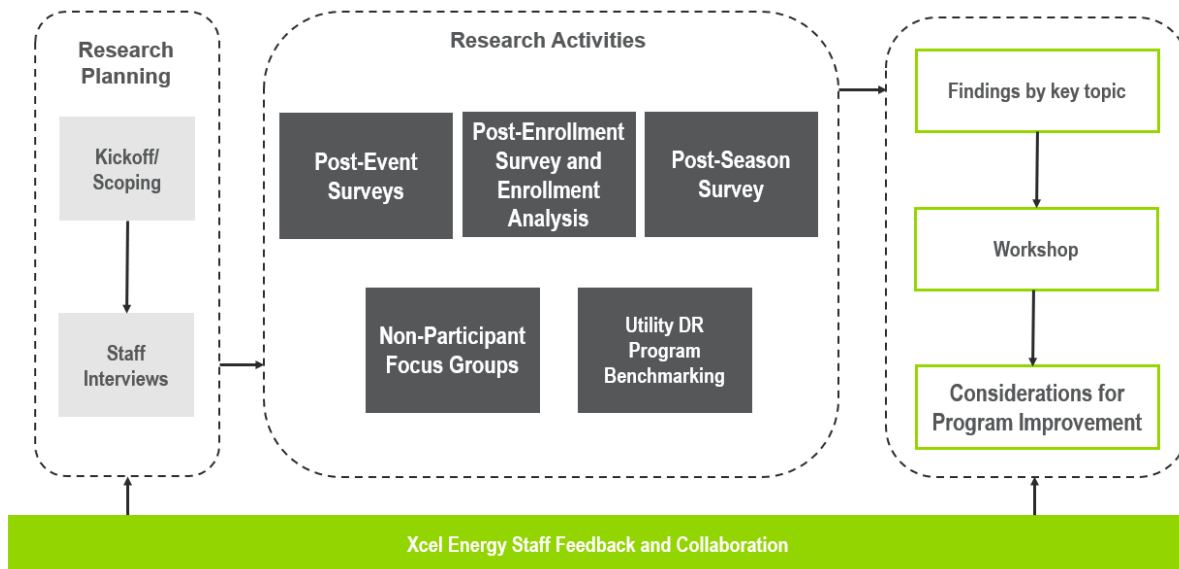


Source: Guidehouse analysis

The principal evaluation objective is to aid program managers by supplying information to enhance program design, delivery, and administration. Through discussion with Xcel Energy staff, Guidehouse (also referred to as the evaluation team) identified research objectives related to the following topics: marketing and recruitment, enrollment, event awareness, event experience, satisfaction, and attrition. Table A-1 in Appendix A contains the key research questions explored during this evaluation.

Figure 2 illustrates Guidehouse’s evaluation process. Following the completion of research activities and prior to the submission of this final report, the evaluation team conducted a workshop with Xcel Energy staff members. The outcomes of the workshop informed the final considerations described in this report.

Figure 2. Research Process



Note: This graphic represents the key research objectives, although other research topics were also investigated during the evaluation.

Source: Guidehouse

Post-enrollment survey and enrollment analysis. During the 2020 program year, Xcel Energy transitioned implementation of AC Rewards to a new DRMS provider, which resulted in a new online enrollment process for customers looking to enroll in the program. Guidehouse distributed a post-enrollment survey to newly enrolled participants to assess their experiences with the process, their expectations for the program, and their satisfaction with information provided about the program. In tandem with the survey, the evaluation team analyzed program enrollment data to investigate program enrollment and attrition rates.

Post-event and post-season surveys. Guidehouse conducted surveys with AC Rewards participants to investigate customer satisfaction, event awareness, and comfort level during events, and to better understand customers’ overall engagement with the program.

The evaluation team fielded both post-event and placebo surveys. A random sample of participants was selected and sent the survey invitation email.

Guidehouse also fielded a post-season survey to residential program participants after the DR season concluded.

Nonparticipant focus groups. The evaluation team conducted two online focus groups with nonparticipants in Colorado. The Blackstone Group (Blackstone) facilitated the focus groups using FocusVision software, an interactive web-based platform. The groups consisted of current Xcel Energy residential customers who had received a rebate from the utility for purchasing an AC Rewards-eligible Wi-Fi thermostat who were not enrolled in AC Rewards. Customers could purchase through the Xcel Energy online store or another retailer. The primary goal of the focus groups was to explore barriers to enrollment and understand customer response to AC Rewards marketing materials.

Table 1 lists the customer research completed as part of this evaluation.

Table 1. Summary of Customer Research Activities

Research Activity	Fielding Schedule	Completes/ Participants
Post-Event Survey	Fielded after three events and one non-event between July and August 2020	201 event completes 83 placebo completes
Post-Enrollment Survey	September 16-25, 2020	54 completes
Post-Season Survey	November 18-December 1, 2020	402 completes
Nonparticipant Focus Groups	Two Colorado focus groups conducted October 14-15, 2020	10 participants total (4 and 6 participants per session)

Source: Guidehouse

Utility DR program benchmarking. Guidehouse conducted utility DR program benchmarking interviews to investigate program characteristics, processes and partners, recruitment strategies, enrollment, and the interaction between energy efficiency and DR programs. The evaluation team worked with Xcel Energy to identify peer utilities with similar programs that could best provide feedback on the defined research objectives. Ultimately, Guidehouse researched eight peer utility programs and conducted interviews with each utility (Table 2).

Table 2. Summary of Peer Utilities Benchmarked

Peer Utility	State
Arizona Public Service (APS)	AZ
Baltimore Gas and Electric (BGE)	MD
Commonwealth Edison (ComEd)	IL
Consumers Energy	MI
CPS Energy (CPS)	TX
DTE Energy (DTE)	MI
NV Energy	NV
New Mexico Power (PNM)	NM

Source: Guidehouse

The remainder of this report is organized as follows:

- Key findings
- Key considerations
- Appendices containing interim evaluation deliverables with detailed findings

2. Key Findings

The evaluation found that Xcel Energy is operating a well-run program and had recently made changes prior to the evaluation that significantly improved program enrollment. AC Rewards participants are generally satisfied with the program and would recommend it to others. Key findings from the evaluation include:

- Xcel Energy-branded marketing reaches more customers than does marketing from thermostat manufacturers.
- The new 2020 online enrollment process was a major success, with enrollment more than doubling between May 2020 and August 2020. This was supported by post-enrollment feedback from customers who enrolled in AC Rewards in 2020, with the overwhelming majority of survey respondents (87%) indicating they were satisfied or very satisfied with the enrollment process.
- Close to 90% of survey respondents indicated they are likely to continue participating in the program, and almost half (42%) indicated the AC Rewards program increased their satisfaction with Xcel Energy.

The remainder of this section presents key findings organized by the following research areas:

1. Marketing and Recruitment
2. Enrollment
3. Event Awareness
4. Event Experience
5. Satisfaction and Attrition

Detailed deliverables for the post-event customer surveys, post-season survey, post-enrollment survey, focus groups, and peer benchmarking tasks can be found in Appendix A through Appendix F.

2.1 Marketing and Recruitment

This section summarizes key evaluation findings related to marketing and recruitment.

Key takeaways include the following:

- Xcel Energy-branded marketing reaches more customers than does marketing from thermostat manufacturers.
- The primary motivations to enroll are to save money, receive bill credits, and save energy.
- Enrollment barriers include a lack of detailed information and hesitancy to relinquish thermostat control.

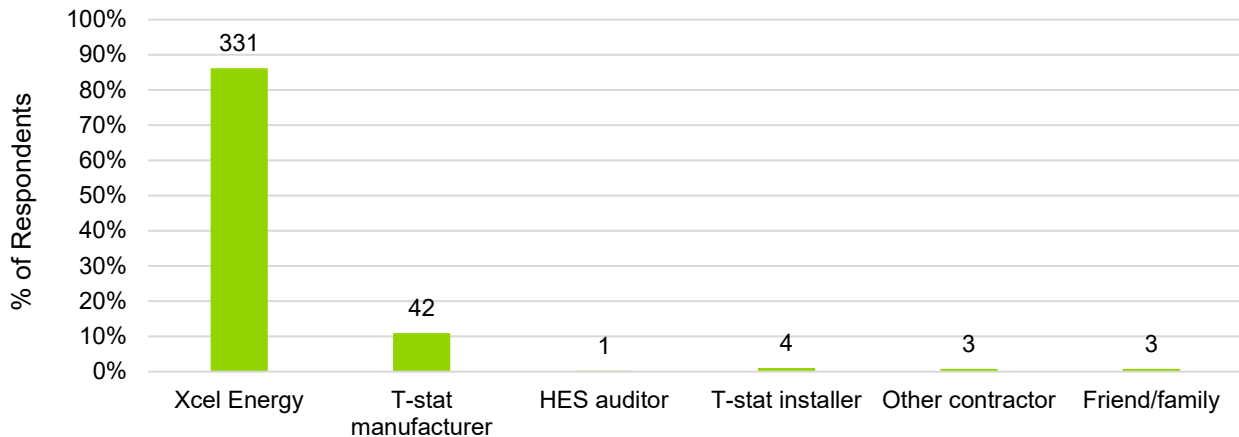
- AC Rewards participants tend to have higher incomes and reside in single-family homes (both detached and townhome).

Xcel Energy markets the AC Rewards program through a wide range of strategies including emails from Xcel Energy and thermostat manufacturers, TV commercials, Facebook ads, and other social media channels. Additionally, AC Rewards is beginning to leverage energy efficiency programs, such as the Home Energy Squad, to help promote the program. Due to the COVID-19 pandemic, following state and local guidelines, the program limited marketing efforts during closures (i.e., stopped sending program-specific Xcel Energy-branded emails) and halted direct install thermostat efforts for the majority of 2020. However, marketing for AC Rewards continued via thermostat vendor partners and Xcel Energy’s cross-marketing with the online marketplace.

Xcel Energy-branded marketing reaches more customers than does marketing from thermostat manufacturers. Of post-season survey respondents, 84% first learned about the program through Xcel Energy. Of those who learned about the program through Xcel Energy, over half (58%) learned about the program through an Xcel Energy email, while 40% learned about the program through the Xcel Energy website. Only 11% of program participants reported learning about the program through their thermostat manufacturer (Figure 3). These findings suggest marketing from Xcel Energy (by email and through the website) is an important marketing vehicle for the AC Rewards program.

When asked to provide feedback on AC Rewards marketing emails distributed by vendor partners, nonparticipant focus group respondents questioned why their thermostat’s manufacturer would email them about an Xcel Energy program. This confusion distracts from the program’s value proposition and may create hesitancy among customers.

Figure 3. How did you first learn about AC Rewards through Xcel Energy? (n=384)



Note: Don't know responses were removed.
HES = Home Energy Squad
Source: Guidehouse

The primary motivations to enroll are to save money, receive bill credits, and save energy. Customers are motivated to enroll in AC Rewards to lower their energy bills by reducing their energy use (64%), receive the bill credit (55%), and save energy (53%). Additionally, almost half (47%) of post-season respondents reported being motivated to help

reduce pressure on the grid and 38% enrolled to support their community’s energy initiatives. This finding suggests a good portion of AC Rewards participants are environmentally conscious. During the nonparticipant focus groups, nearly all respondents talked about environmental conservation and responsibility. Several respondents were primarily motivated to save energy for environmental purposes alone, although most felt saving energy and saving money go hand-in-hand. Benchmarked utilities are finding success with marketing messages that highlight saving money, saving energy, reliability benefits, and environmental benefits.

Enrollment barriers include a lack of detailed information and hesitancy to relinquish thermostat control. Nonparticipant focus group respondents showed a hesitancy to give up control and comfort, prized features of Wi-Fi thermostats. Most of these customers were motivated to acquire Wi-Fi thermostats because they deliver enhanced control and increased comfort, so their perspective is that the AC Rewards program compromises their reasons for getting a Wi-Fi thermostat. Peer utility research indicated that perceptions about loss of control are the biggest barrier preventing people from enrolling.


Additionally, nonparticipant focus group respondents require detailed program information upfront. When asked to comment on AC Rewards program marketing, respondents wanted to see more information regarding the number of degrees their setpoint would be increased during control events, the frequency and length of events, their ability to regain control or opt out, and Xcel Energy’s motivation for the events themselves. Some focus group respondents confused AC Rewards with Saver’s Switch.

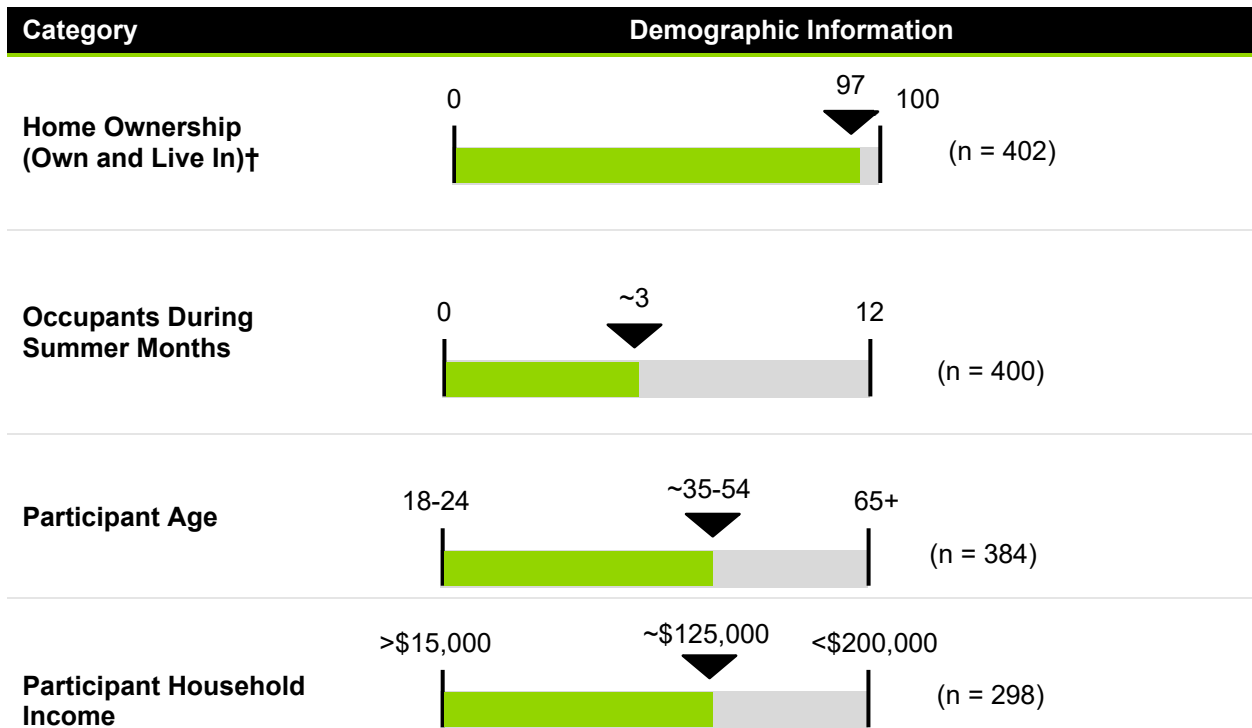
Benchmarked utilities employ different strategies for increasing enrollment in their Wi-Fi thermostat programs. Most benchmarked utilities employed email blasts, 15- and 30-second videos, Facebook ads, Instagram posts, TV commercials, bill inserts, newsletters, and printed articles to promote their DR programs. Several attribute their successful program recruitment to routinely offering thermostat promotions (with enhanced rebates), particularly around the holidays. One utility conducts marketing and promotions during times when customers are transitioning from heating to cooling and from cooling to heating. Relatedly, Earth Day and Black Friday are a good opportunity for special promotions.

Peer utilities acknowledged the challenge of attrition due to moving. Some are focused on targeting recent movers for program marketing, including when customers connect with the call center for support.

In terms of demographics, **AC Rewards participants tend to have higher incomes and reside in single-family homes (both detached and townhome).** Most post-season respondents were male (69%), with most having a college or post-graduate education. Table 3 shows additional household and participant demographic information.

Table 3. Key Participant Demographic Information

Category	Demographic Information
Home Type (Single-Family)*	 <p>0 88 100</p> <p>(n = 402)</p>



* These results display the percentages of reported single-family homes, which was the primary response. Full results for the question are displayed in the appendix D.6.7.

† These results display the percentages of reported homes owned by respondents. Full results for the question are displayed in the appendix D.6.7.

Source: Guidehouse analysis of responses to post-season surveys fielded November 18-December 1

2.2 Enrollment

This section summarizes key evaluation findings related to program enrollment.

Key takeaways include the following:

- The new 2020 online enrollment process was a major success, with enrollment more than doubling between May 2020 and August 2020. This was supported by post-enrollment feedback from customers who enrolled in AC Rewards in 2020, with the overwhelming majority of survey respondents (87%) indicating they were satisfied or very satisfied with the enrollment process.
- Newly enrolled participants understand the goals of the program from Xcel Energy's perspective.
- Expectations of newly enrolled participants related to certain aspects of the program do not fully align with the program delivery model (i.e. when participants expect events to occur and how they will receive notification of the events).
- Peer utilities stress the importance of making enrollment easy.

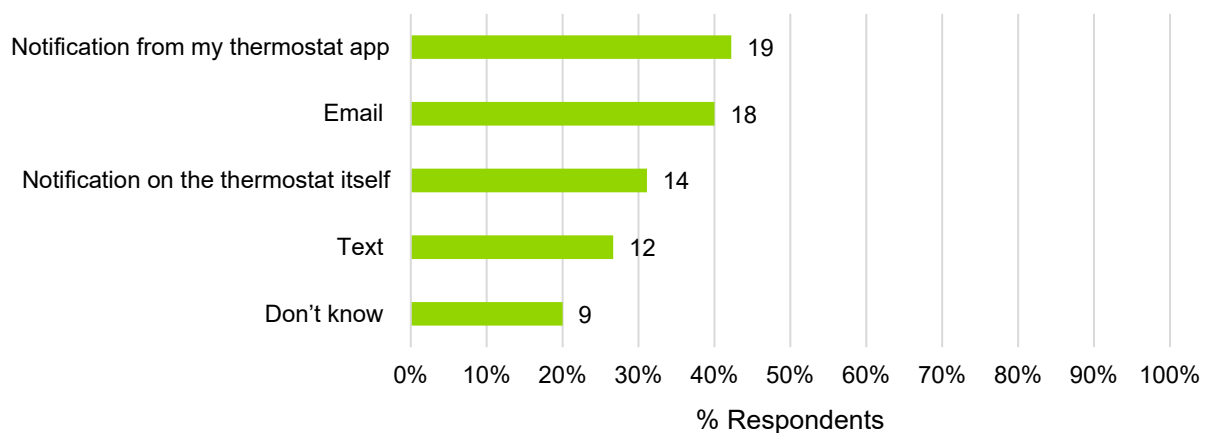
In recent years, the AC Rewards program has struggled to meet enrollment targets. Xcel Energy staff largely attributed this to issues with the online enrollment process, which had led thermostat vendors to stop sending AC Rewards recruitment emails to their customers in 2019. To counteract this, Xcel Energy, along with its new DRMS provider onboarded in 2020, implemented a new more user-friendly enrollment approach.

The new online enrollment process was a success from the customer standpoint. Of post-enrollment survey customers, 87% rated their enrollment process experience as a 6 or above on a 1-10 scale, indicating it was a simple process.¹ Of the 8 respondents who indicated they experienced enrollment challenges, most (6 respondents) attributed these challenges to not knowing if they were successfully enrolled in the program. One customer commented, “I think it was pretty convenient to enroll, but finding out whether I was approved or not was not as simple.”

Newly enrolled participants understand the goals of the program from Xcel Energy’s perspective. Over two-thirds of respondents cited “easing strain on the electrical grid when demand for electricity is highest” as a goal of the program.

Expectations of newly enrolled participants related to certain aspects of the program do not fully align with the program delivery model (e.g., when participants expect events to occur and how they will receive notification of the events). Only 10% of post-enrollment survey respondents expected events to occur during the window that was stated on the website: between 3 p.m. and 7 p.m. on weekdays. Over half of respondents expected their thermostat would be adjusted 2-3 degrees during events (versus the 4-degree adjustment that was actually made during events in 2020). Additionally, many respondents expected to be notified of an event via their thermostat app (42%) or email (40%) (Figure 4). Although Xcel Energy did not send event notifications via email in 2020, the website stated email notification was an option. Finally, about half of respondents indicated they expected to be notified of events well in advance instead of when the event begins.

Figure 4. As a participant of AC Rewards, how do you expect to be notified of a control event that is set to occur? (select all that apply)



Source: Guidehouse

¹ Satisfaction questions were asked on a scale of 1 to 10. Where 1 is “very dissatisfied” and 10 is “very satisfied.”

Peer utilities stress the importance of making enrollment easy. Some utilities provide a seamless pre-enrollment experience for customers purchasing Wi-Fi thermostats through the online marketplace. Effective website features reported include opting customers in, by default, to DR program enrollment (requiring them to uncheck the option to opt out) and listing any energy efficiency rebate, DR enrollment incentive, or special promotions as separate line items that get deducted from the price of the thermostat at checkout.

Only two peer utilities require customers to provide their account number during DR program enrollment. Those that do not ask for account numbers typically verify customers by using name and service address.

2.3 Event Awareness

This section summarizes key evaluation findings related to event awareness.

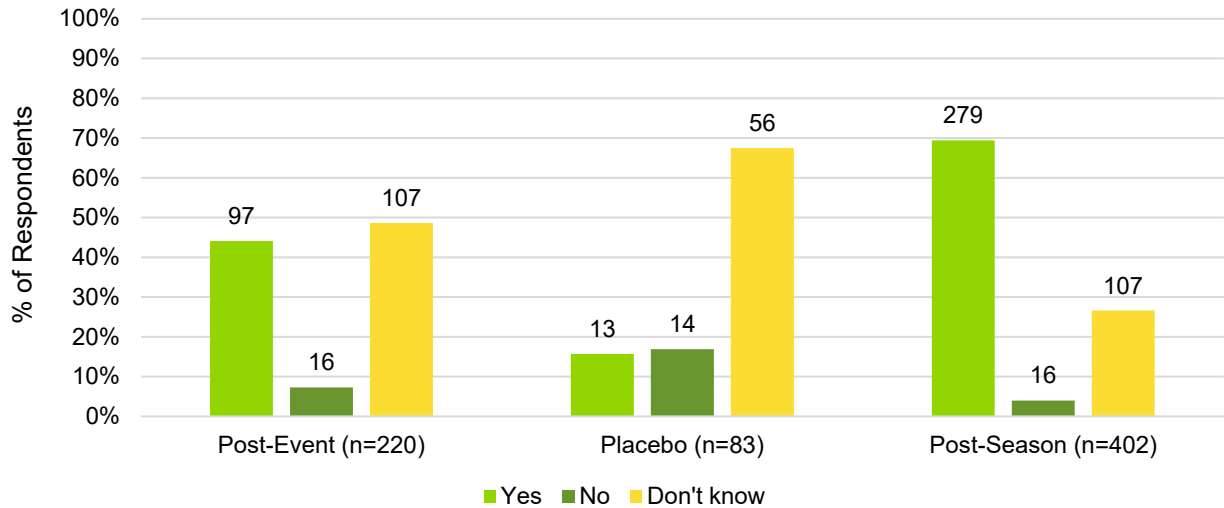
Key takeaways include the following:

- Most survey respondents indicated they became aware of events either through a notification on the thermostat itself (visible once the event has initiated) or by the change in indoor temperature.
- Respondents who were aware of event notifications were relatively satisfied with them. The majority of those who were not aware of event notifications would like to receive them.
- Most peer utilities distribute advance notifications to customers.

In program years prior to 2020, participants were notified that an event was going to occur via an email from Xcel Energy, notifications on the thermostat itself, and through the thermostat's mobile app. Xcel Energy has adjusted its notification approach to accommodate the capabilities of partners and no longer sends event notifications via email. Thermostat vendor partners notify customers of events by sending in-app notifications in advance of the event and displaying a message directly on the thermostat itself once the event is in progress.

Participant awareness of any given event in 2020 was relatively low. In post-event surveys, less than half of post-event respondents (44%) were aware that an event occurred. Over two-thirds of post-season survey respondents recalled at least one event over the course of summer 2020 (Figure 5).

Figure 5. Did Xcel Energy initiate a control event today / any control events this past summer?



Source: Guidehouse

Most survey respondents indicated they became aware of events either through a notification on the thermostat itself (visible once the event has initiated) or by the change in indoor temperature. Of post-season survey respondents, 66% became aware of events through a notification on the thermostat itself (visible once the event has initiated) and 47% became aware by the change in indoor temperature. Only 21% reported becoming aware of events in advance via notifications from their thermostat app.

Respondents who were aware of event notifications were relatively satisfied with them. The majority of those who were not aware of event notifications would like to receive them. Of the respondents who received a notification, most participants were relatively satisfied with the timing and method of the notification, providing mean satisfaction ratings of 7.1 and 7.4, respectively.² Less satisfied respondents requested that notification be sent in advance of the events and for other forms of event notification to be offered. Many respondents indicated they did not receive any event notification, but most would like to. Customer preferences for event notification lean heavily toward email and text messages.

Most peer utilities distribute advance notifications to customers. Five of the benchmarked peer utilities provide event notifications, while two elect not to send notifications for thermostat types that do not require it. Only one utility sends its own email notifications to bring your own thermostat (BYOT) participants prior to events; most rely on thermostat manufacturers to notify participants of events.

One utility only sends notifications for emergency events. Program participants were required to opt in to receive notifications; otherwise, there were not notified before events.

² Satisfaction questions were asked on a scale of 1-10, where 1 is “very dissatisfied” and 10 is “very satisfied.”

2.4 Event Experience

This section summarizes key evaluation findings related to participants' experiences during events.

Key takeaways include the following:

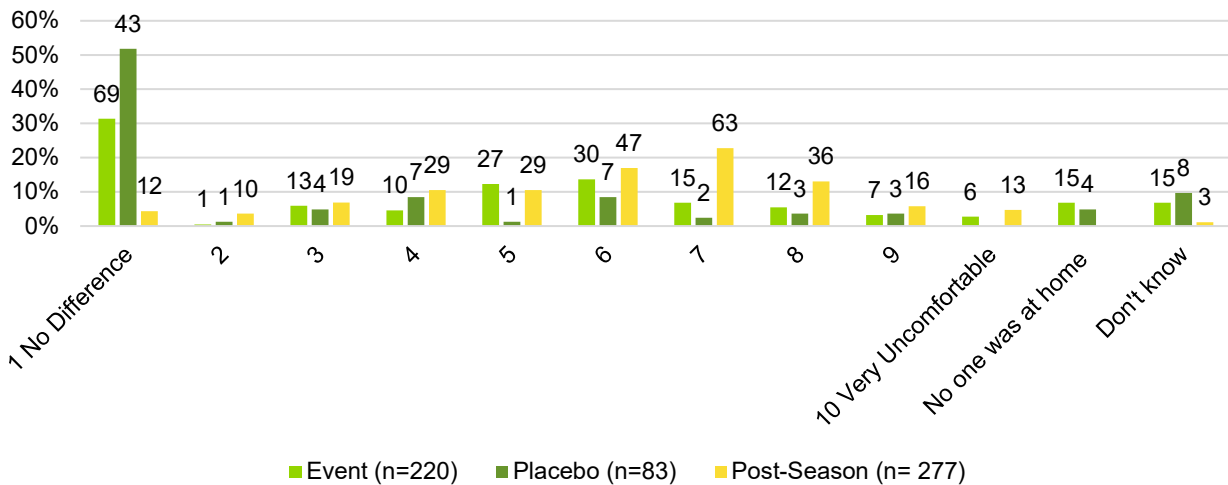
- Most survey respondents reported at least some change in comfort in their home during control events.
- Less than one-quarter of post-season survey respondents noticed their home was automatically pre-cooled before an event.
- When post-event respondents who were aware of the event in question were asked if they opted out of the event, almost half indicated they opted out.
- Of the post-survey respondents who were aware of events, approximately half did not take any actions to feel more comfortable, despite the majority of them having noticed a change in comfort.
- Participants want to know “who is controlling their thermostat and when.”
- Multiple peer utilities employ ongoing communications with participants to build a rapport.

In preparation for an event being called, the AC Rewards program may pre-cool the home to limit potential discomfort during the time of an event. For Honeywell and Emerson devices, Xcel Energy decreases thermostat setpoints by 2 degrees during a pre-cooling phase. ecobee employs its own pre-cooling algorithm. During control events in 2020, customers' smart thermostats were adjusted 4 degrees. If a customer does not want to participate in an event, they are able to opt out. They can do so by manually adjusting the temperature on their thermostat during the pre-cool phase or the actual control event.

Most survey respondents reported at least some change in comfort in their home during control events, but survey responses related to comfort should be taken with a grain of salt. Among post-event survey respondents, about 5% reported a change in comfort in their home (a score of 2 or higher).³ Interestingly, for placebo survey respondents, around 34% also reported a change in comfort. This finding supports the idea that survey responses may not fully reflect the reality of respondents' experiences or that reports of discomfort among those who were actually signaled for an event may not be wholly attributable to the event itself. With the whole summer perspective in mind, 95% of post-season respondents reported at least some change in comfort in their home during events called in 2020 (Figure 6).

³ The figure combines the results of questions C1 and C1b in the survey to accurately report on comfort levels.

Figure 6. How would you rate your comfort level during control events using a scale of 1 to 10 where 1 is "No change" in comfort and 10 is "Very uncomfortable"?



Source: Guidehouse

Less than one-quarter of post-season survey respondents (20%) noticed their home was automatically pre-cooled before an event. Respondents were given the opportunity to provide open-ended feedback on pre-cooling. Of the respondents who were less than satisfied with pre-cooling, just over one-third (n=10) reported it caused their home to become too cold, while about 19% (n=5) indicated pre-cooling did not help their home stay cool during the event.

When post-event respondents who were aware of the event in question were asked if they opted out of the event, almost half (44%) indicated they opted out. This is an overall opt-out rate of 20% when including those who were *not* aware of the event (assuming those who were unaware of the event did not opt out). A vast majority of those who opted out were aware an event was occurring due to the change in the temperature of their home (rather than through event notification).

Of the post-survey respondents who were aware of events, approximately half did not take any actions to feel more comfortable, despite the majority of them having noticed a change in comfort. This finding suggests an opportunity for Xcel Energy to engage with its customers by providing information and communications to participants with tips about ways to stay comfortable during control events.

Participants want to know "who is controlling their thermostat and when." Several focus group respondents who are current AC Rewards participants indicated they have eco+ and were unable to distinguish between control events and optimization adjustments made based on their thermostat settings, leading them to feel frustrated. This feedback was corroborated by benchmarked peer utilities who have encountered this issue with their program participants. One utility has found that participants who are also enrolled in an optimization program through their thermostat vendor drop out of the DR program at a higher rate than other participants.

Multiple peer utilities employ ongoing communications with participants to build a rapport. One peer utility indicated it communicates with participants after each event, which has had a positive impact on its relationship with customers. The utility sends a follow-up email after each event to say, "Thank you for participating; here's how you did." The open rates are high

and customers are pleased with these emails, which has contributed to high customer satisfaction scores. Another utility engages program participants three times to maintain a relationship with customers:

- After the summer DR season ends
- Right before incentive is paid
- At the end of the year when it provides a message about switching thermostats to heating

2.5 Satisfaction and Attrition

This section summarizes key evaluation findings related to participant satisfaction and attrition.

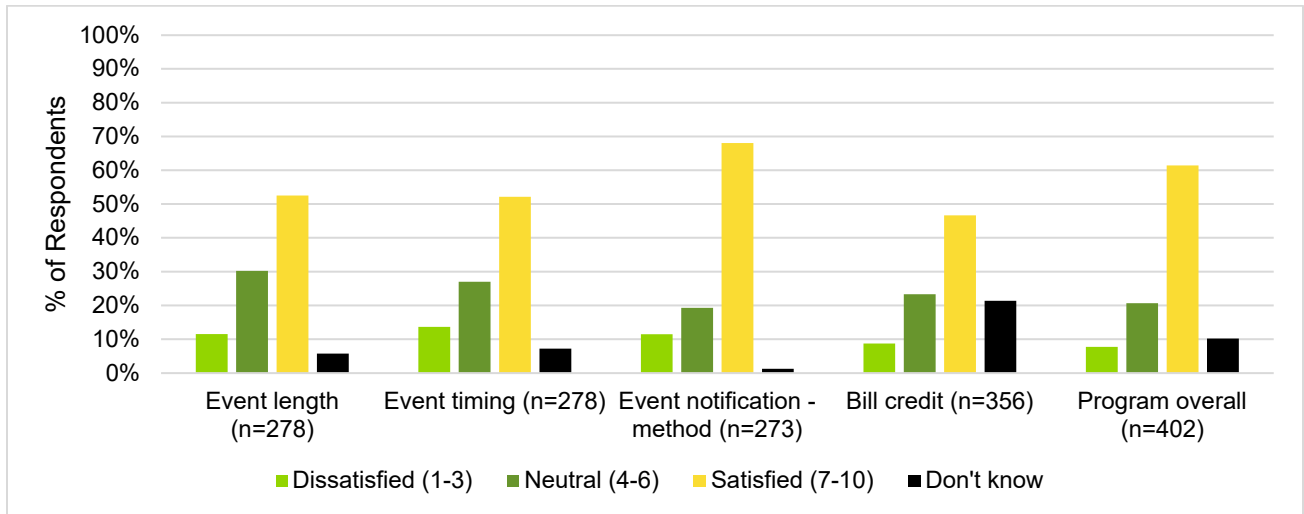
Key takeaways include the following:

- AC Rewards participants are generally satisfied with the program and Xcel Energy. Close to 90% of survey respondents indicated they are likely to continue participating in the program.
- Satisfaction reported through the post-event survey was lowest after a consecutive day event
- Program attrition is relatively low. The annualized attrition rate from October 2017 to 2020 was 4%.

Guidehouse assessed participant satisfaction with different aspects of the AC Rewards program including the annual bill credit, number of events, length of events, and timing of events in summer 2020 to identify areas of improvement. Surveys asked respondents to rate their satisfaction on a 1, “very dissatisfied,” to 10, “very satisfied,” scale.

AC Rewards participants are generally satisfied with the program. Post-season survey respondents were somewhat less satisfied with the length of events and timing of events than with other aspects. When asked to provide a reason for their satisfaction rating, a majority of respondents indicated the events were too long and the temperatures in their home were too warm because the events occur at the warmest period of the day and at a time of meal preparation (Figure 7).

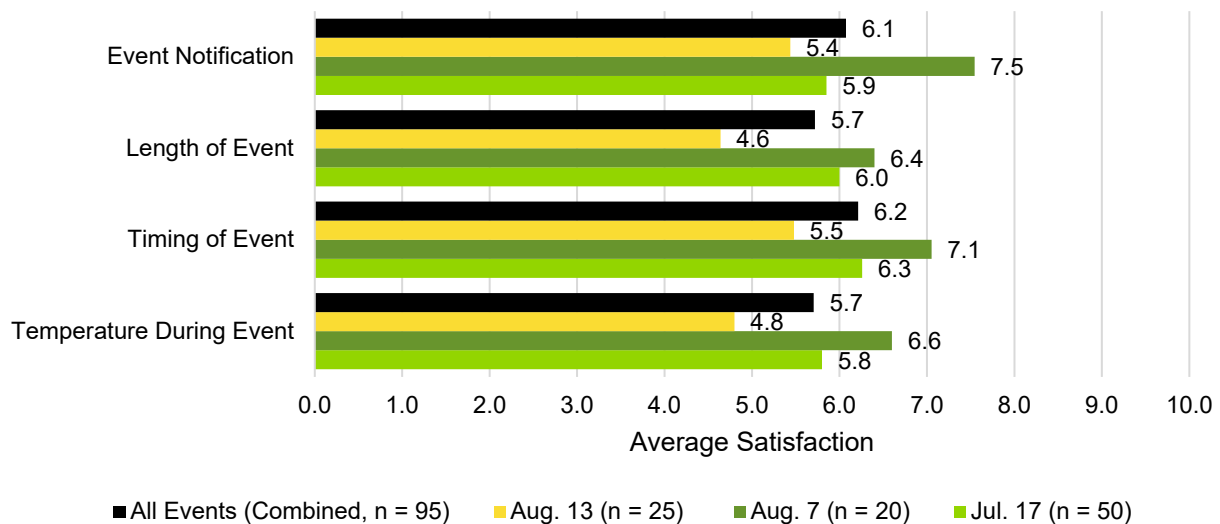
Figure 7. How satisfied are you with your AC Rewards experience?



Source: Guidehouse

Satisfaction reported through the post-event survey was lowest after a consecutive day event. When comparing average satisfaction results across post-event survey efforts, it is evident that reported satisfaction results were lower during the event on August 13. The difference in satisfaction ratings associated with the August 13 event relative to other events for event temperature, timing, and length is statistically significant.⁴ This difference may be attributed to a 6-hour event occurring on August 12 from 3 p.m. to 9 p.m. (Figure 8).

Figure 8. How satisfied are you with your AC Rewards experience?



Source: Guidehouse

⁴ Satisfaction results were significantly lower on this date for the temperature during the event (p-value = 0.047), time of the event (p-value = 0.074), and length of the event (p-value = 0.018). Guidehouse conducted a Welch Two Sample T-Test to compare the mean satisfaction scores at the 90% confidence level of the event on August 13 to all other event dates.

Overall, customers are satisfied with AC Rewards and Xcel Energy. Close to 90% of survey respondents indicated they are likely to continue participating in the program, and almost half of respondents (42%) indicated the AC Rewards program increased their satisfaction with Xcel Energy.

Respondents offered the following suggestions for program improvement:

- Provide opportunities for more rewards.
- Provide additional forms of event notifications (emails and texts) and provide notification in advance of events.
- Provide more information to participants. Participants would like more detail about how the programs works and how they performed during events. One customer phrased this well by saying, “It’s nice to hear measurable results from my and other participating customers on how much energy was saved.”

Program attrition is relatively low. The average rate of sustained enrollment was 92% across customers who enrolled in AC Rewards between 2017 and October 2020. The annualized attrition rates for this period range from 2% to 9%, depending on year of enrollment, for an average of 4% (Table 4). Reasons for unenrollment are not documented prior to 2020. In 2020, roughly 300 cancellations have a reason cited but most are uninformative. Main reasons for unenrolling were discomfort during events (10), misunderstanding of program requirements (8), and dislike pre-cooling (2).

Table 4. AC Rewards Unenrollment Over Time (2017-2020)

Metric	Enrollment Period				Total
	September 30, 2016 - September 29, 2017	September 30, 2017 - September 29, 2018	September 30, 2018 - September 29, 2019	September 30, 2019 - September 29, 2020	
[A] All Enrolled Devices	440	2,296	1,705	9,259	13,700
[B] Canceled	122	354	211	208	895
[C] Not in DRMS vendor file as CO/MN	9	69	90	14	182
[D] Currently Approved	309	1,873	1,404	9,037	12,623
[E] Sustained Enrollment	70%	82%	82%	98%	92%
[F] Annualized Attrition	7%	6%	9%	2%	4%

Currently Approved [D] = [A] – [B] – [C]; Sustained Enrollment [E] = [D] / [A]; Annualized Attrition [F] = (([A] – [D]) / [A]) / number of years back from Sep 30, 2019 – Sep 29, 2021.

Source: Guidehouse analysis of Xcel Energy AC Rewards enrollment data

3. Key Considerations

Based on the previously described key findings, Guidehouse developed suggestions for program improvement.

Table 5. Key Suggestions for Improvement

Topic	Considerations
Marketing and Recruitment	<p>Continue to send Xcel Energy-branded program marketing emails while also leveraging thermostat vendors for marketing. To enhance marketing, ideas from the workshop included, promoting the program and hosting smart thermostat giveaways at local sports events. Another method would be to partner with schools, boy/girl scouts, and realtors to reach new audiences and build a strong AC Rewards community.</p>
	<p>Adjust messaging from emphasizing easing strain on the grid to emphasizing customer bill credits and the contributions of the program toward sustainability, grid stability, and resilience. Message on providing a cleaner environment for future generations. Highlight program as an opportunity to assist with grid flexibility and to be a part of the Clean Energy Transition and increasing use of renewables. Message on making the home smarter and adding value to the home. This will help minimize participant confusion about why the program increases cooling load via pre-cooling prior to events.</p>
	<p>Revise marketing collateral for greater transparency. Describe why Xcel Energy initiates control events, when and how often they occur, and for how long. Describe what customers can expect: event notifications, pre-cooling, thermostat setpoint increase vs. actual home temperature change. Consider providing an infographic showing the difference between setpoint change and home temperature change during a DR event.</p>
	<p>Fine-tune marketing messaging to communicate the value proposition. Prominently feature bill credit amounts, and clearly indicate when customers will be paid and for what behavior (i.e., thermostat purchase, AC Rewards enrollment, control event participation). Promote customer control of devices and emphasize comfort messaging.</p>
	<p>Create new program materials that enable customers to access more granular information at their discretion. For example, provide an enhanced FAQs page, detailed program page (or individual landing pages) with videos, text, and infographics. Provide greater explanation of specific topics such as control events, DR, and home thermal dynamics.</p>
	<p>Distinguish between AC Rewards, Saver’s Switch, and thermostat vendor algorithms. Ensure AC Rewards marketing emails from thermostat vendors should be focused on AC Rewards rather than combining topics (e.g., eco+). Supplement marketing emails from thermostat vendors with emails directly from Xcel Energy.</p>
<p>Conduct additional customer segment research. Further examination of under-represented customer segments is warranted to more fully understand what Xcel Energy can do to increase Wi-Fi thermostat penetration and AC Rewards program participation among these segments. Consider conducting interviews with lower income homeowners and renters (those who do and do not have a Wi-Fi thermostat) to assess views on and engagement with smart home devices. Consolidate internal (Xcel Energy) customer research information and conduct additional customer segment research.</p>	

Topic	Considerations
Enrollment	<p>Distribute an automatic confirmation email to customers once they have successfully enrolled in the program. This communication helps build a stronger relationship and rapport with the customers and leaves a positive initial impression.</p>
Event Awareness	<p>Provide more information about how and when participants receive event notifications. Be sure to clearly instruct and remind participants to enable push notifications from their thermostat app to receive advance notifications. Send updates on the number of DR events that have been called and estimated impacts to recognize individual and program-level accomplishments.</p> <p>Consider offering additional forms of advance notification such as email or text notifications, as possible. Send advance notification via Xcel Energy's app.</p>
Event Experience	<p>Provide tips on ways to stay cool during events via the program website, as messaging in event notifications, or via periodic emails.</p> <p>Consider sending customers an email after each event or a couple times over the course of the summer to let them know how they performed or how the collective program performed and how they helped the grid, environment, and community by participating.</p> <p>Analyze setpoint and indoor temperature changes during events to confirm events are operating as expected. Consider imposing a temperature threshold (if not currently part of the program design).</p>
Satisfaction and Attrition	<p>Consider providing customers with a referral bonus for referring other Xcel Energy customers to enroll in AC Rewards. Referral bonuses is a strategy employed by many successful companies.*</p> <p>If possible, to keep customers satisfied, avoid calling consecutive day events and limit event length to 4 hours or less. This could be achieved by calling events/event hours for a subset of participants at a time when consecutive event days or long duration events are anticipated.</p> <p>Consistently capture and monitor customer reasons for unenrollment in the program over time and ensure this information is carried over when DRMS vendor transitions occur.</p>

*The AC Rewards program manager noted that referral bonuses would be difficult to implement and track.

Appendix A. Detailed Research Objectives

Table A-1 lists the research questions from the Research Objectives Memo provided to Xcel Energy to consider for this evaluation, including those questions developed for optional research activities. These research questions were further informed and refined through interviews with Xcel Energy staff.

Table A-1. AC Rewards Program Research Questions and Study Methods by Topic

Topic	Research Question	Study Methods
Marketing and Recruitment	<ul style="list-style-type: none"> • What are the motivations for getting a Wi-Fi thermostat and for enrolling in AC Rewards? • What types of customers are enrolling in AC Rewards? • What are the barriers to enrollment? • How do customers respond to program marketing? • What do nonparticipants value? What motivates them? • What recruitment strategies do peer programs employ? 	<ul style="list-style-type: none"> • Enrollment Survey • Post-Season Survey • Nonparticipant Focus Groups • Peer Benchmarking
Enrollment	<ul style="list-style-type: none"> • How are BYOT participants experiencing the new online enrollment process? • How satisfied are participants with the program information available to them? • What are participant expectations for the program? 	<ul style="list-style-type: none"> • Enrollment Survey • Peer Benchmarking
Event Awareness	<ul style="list-style-type: none"> • How aware are participants of events? • How did participants become aware of events? • How satisfied are participants with event notification? • Do participants understand how DR events work and why Xcel Energy initiates them? 	<ul style="list-style-type: none"> • Post-Event Survey • Post-Season Survey • Peer Benchmarking
Event Comfort and Behavior	<ul style="list-style-type: none"> • How comfortable are participants during events? • How aware are participants of pre-cooling and what is their satisfaction with it? • How and why do people opt out of events? What other actions do participants take during events, if any? 	<ul style="list-style-type: none"> • Post-Event Survey • Post-Season Survey • Peer Benchmarking
General Usage Behavior	<ul style="list-style-type: none"> • How do participants generally use their thermostats and air conditioners during summer 2020? 	<ul style="list-style-type: none"> • Post-Season Survey

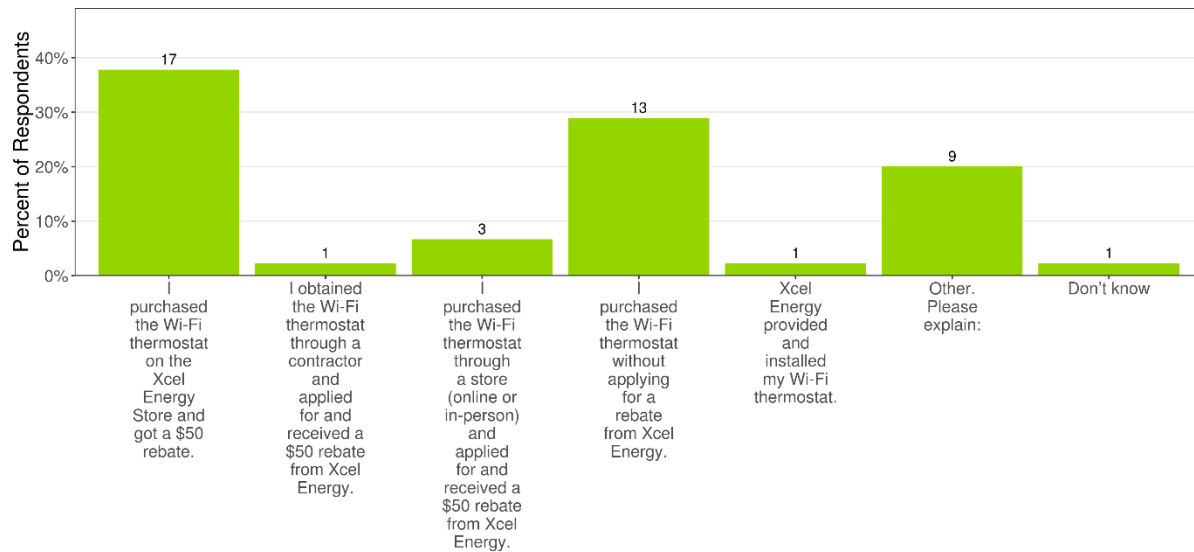
Topic	Research Question	Study Methods
Satisfaction	<ul style="list-style-type: none"> • How satisfied are participants with their AC Rewards experience? • How has program participation impacted satisfaction with Xcel Energy? • How can AC Rewards participants' experience with the program be improved upon? 	<ul style="list-style-type: none"> • Post-Event Survey • Post-Season Survey • Peer Benchmarking
Attrition	<ul style="list-style-type: none"> • What portion of AC Rewards participants unenrolled by the end of the 2020 summer season? How does this rate vary by number of years enrolled? • Are there any trends in when participants drop out throughout the year? 	<ul style="list-style-type: none"> • Unenrollment Analysis • Peer Benchmarking
Additional Insights from Peer Programs	<ul style="list-style-type: none"> • What are the primary drivers of other utilities' programs? • How are other utilities thinking about how to use the installed base of Wi-Fi thermostats in a more flexible way in the future? • How have other utilities approached the integration of energy efficiency and DR? What energy efficiency channels do other utilities use to increase Wi-Fi thermostat adoption and DR program participation? 	<ul style="list-style-type: none"> • Peer Benchmarking

Source: Guidehouse

Appendix B. Interim Deliverable: Post-Enrollment Survey Results

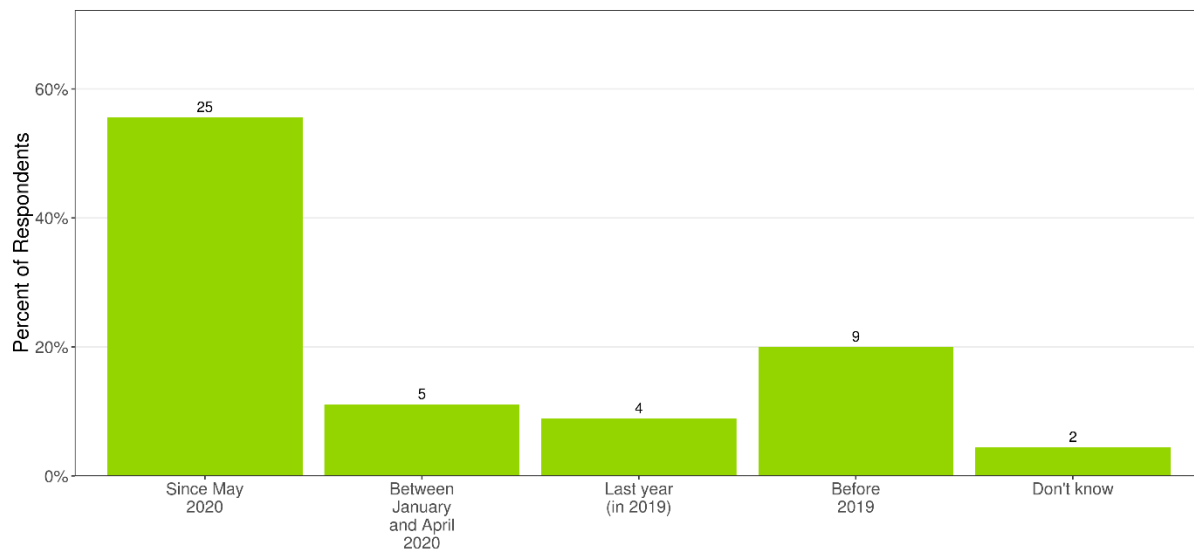
B.1 Enrollment

Figure B-1. Which of the following best describes how you acquired the Wi-Fi thermostat(s) that you enrolled in AC Rewards?



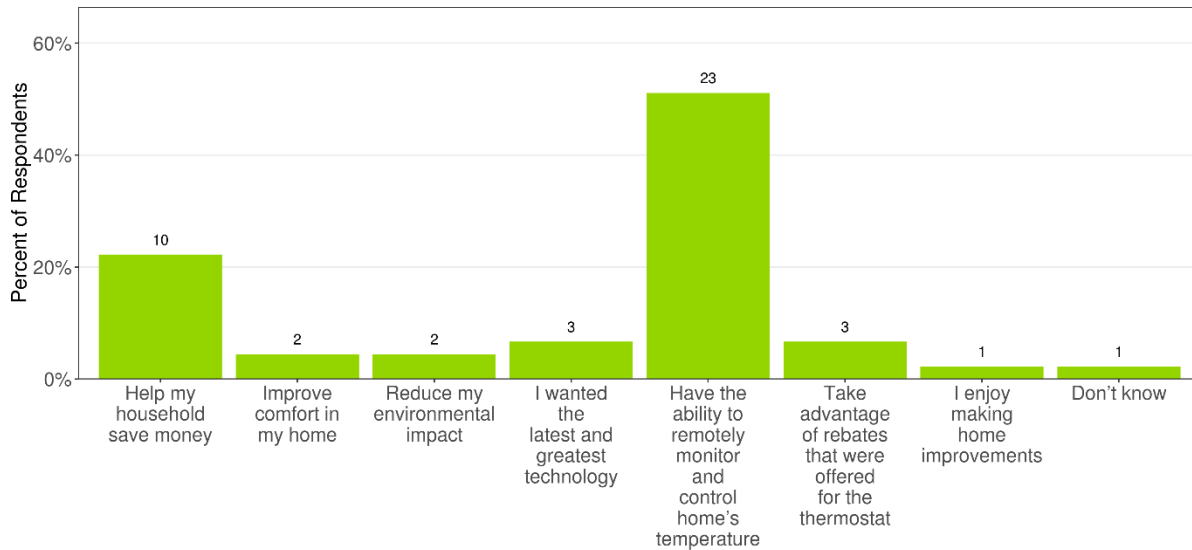
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-2. Approximately when did you get the Wi-Fi -thermostat(s) that are enrolled in AC Rewards?



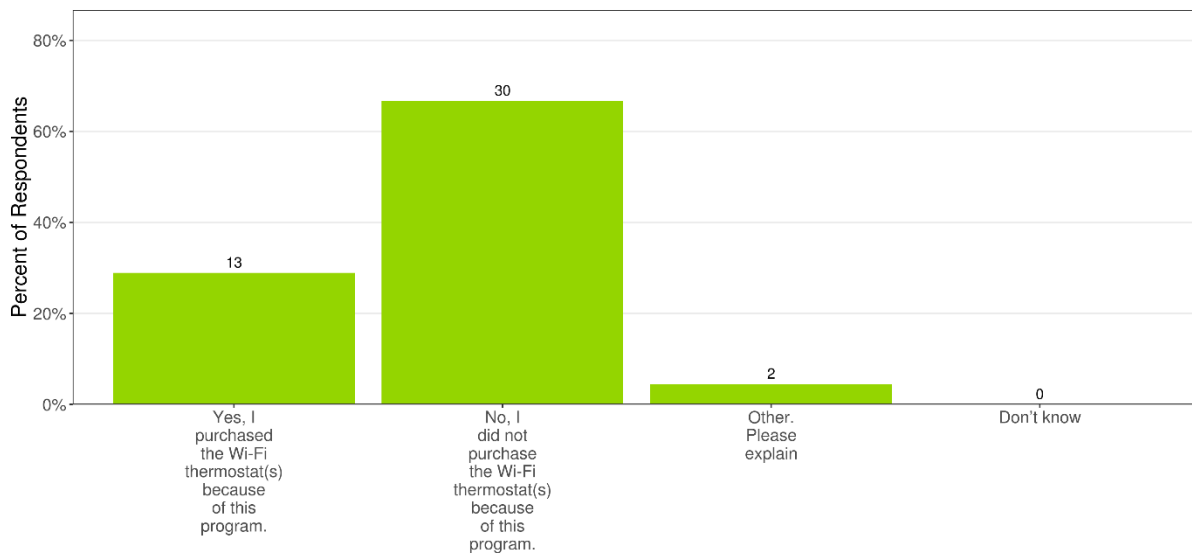
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-3. What were your main reasons for getting a Wi-Fi-thermostat? Please select your first and second reasons by dragging and dropping one response item into each box.



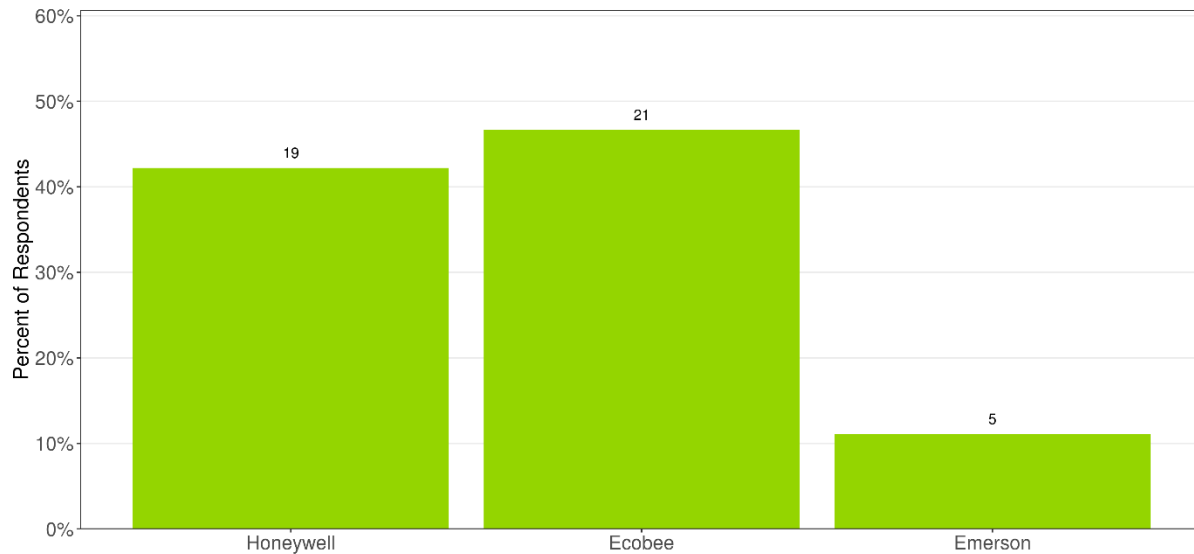
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-4. Did the AC Rewards program influence your decision to get a Wi-Fi thermostat?



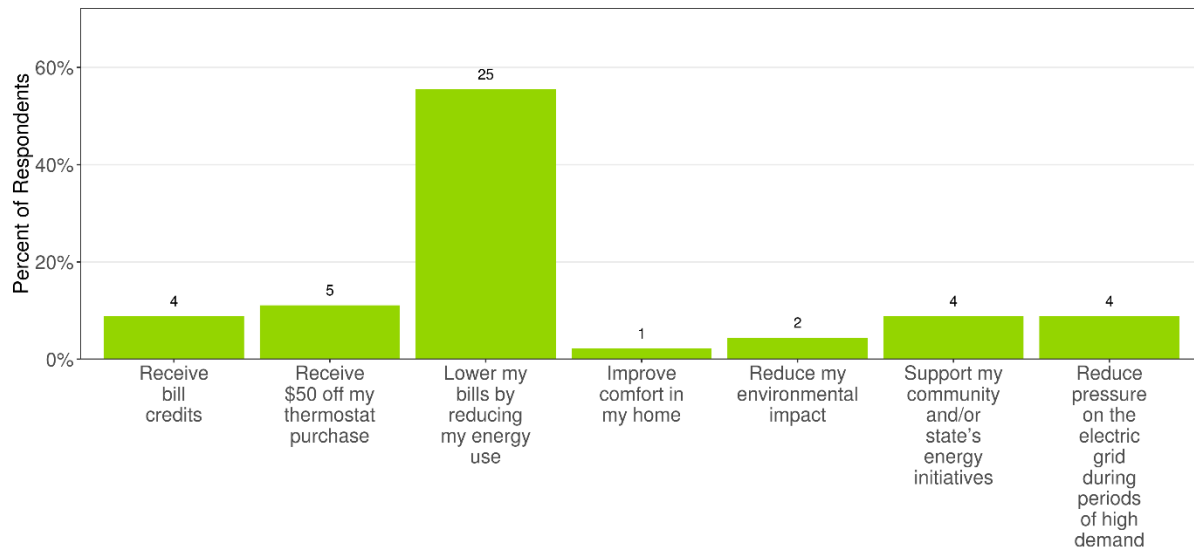
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-5. What brand of Wi-Fi thermostat(s) do you have? (Select all that apply).



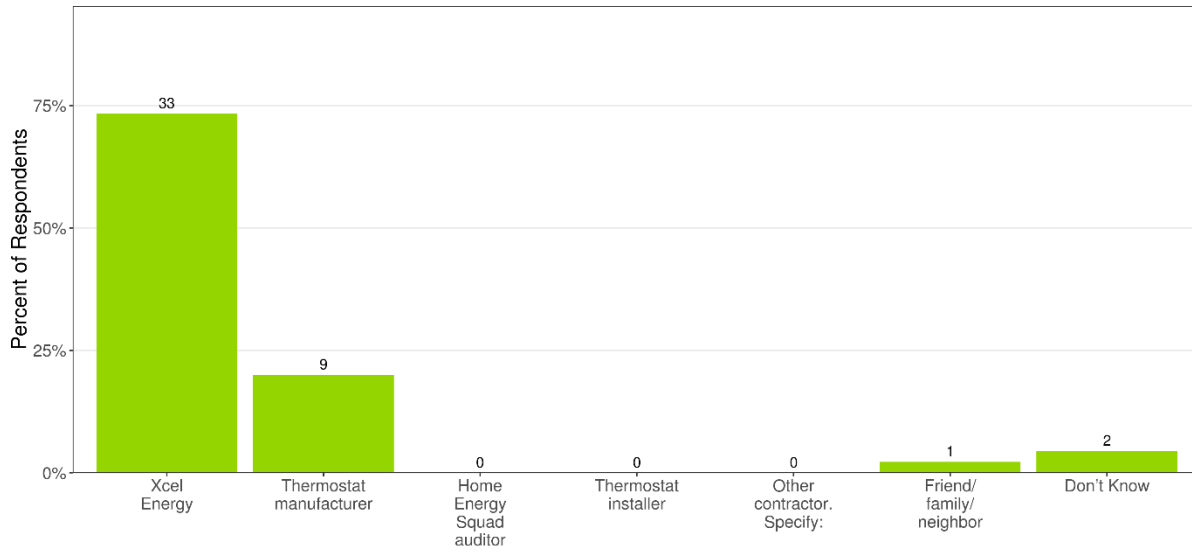
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-6. What were your main reasons for enrolling in AC Rewards? Please select your first and second reasons by dragging and dropping one response item into each box.



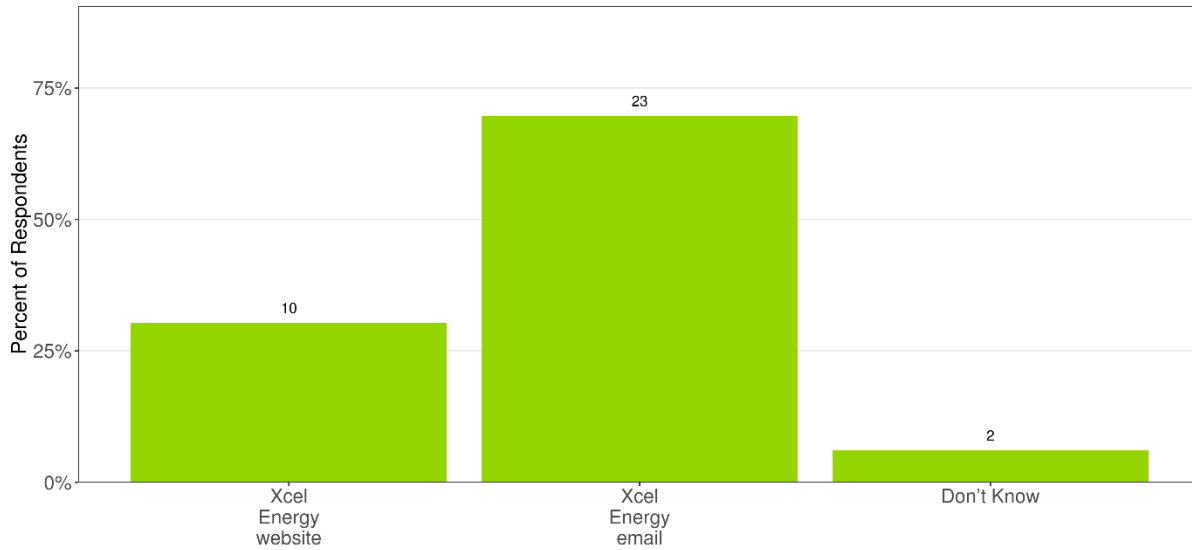
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-7. How did you first learn about AC Rewards? Try to remember your initial source of information.



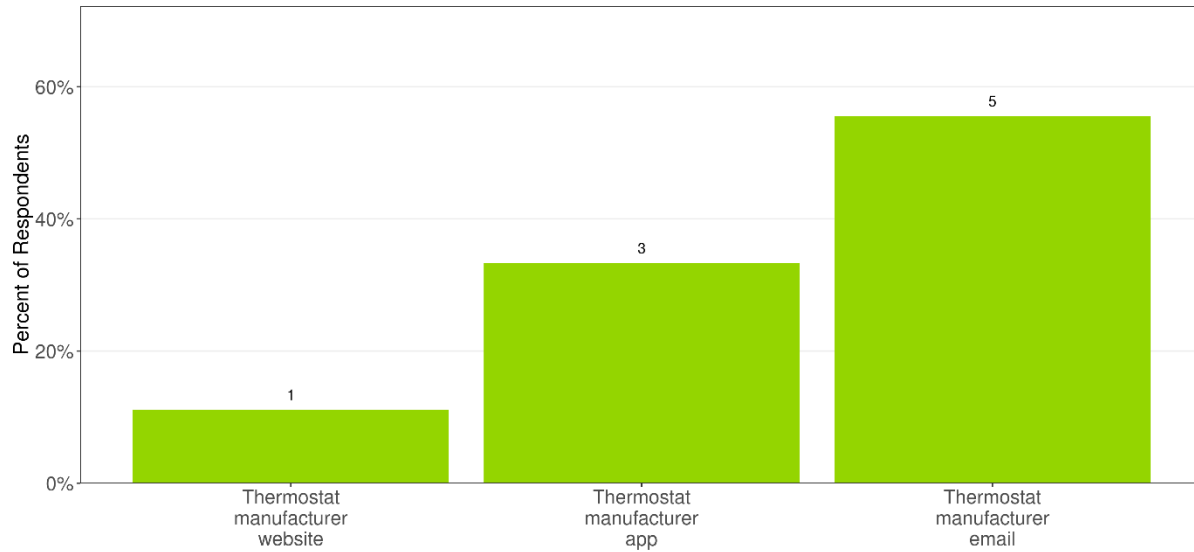
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-8. How did you learn about AC Rewards through Xcel Energy? (Select all that apply).



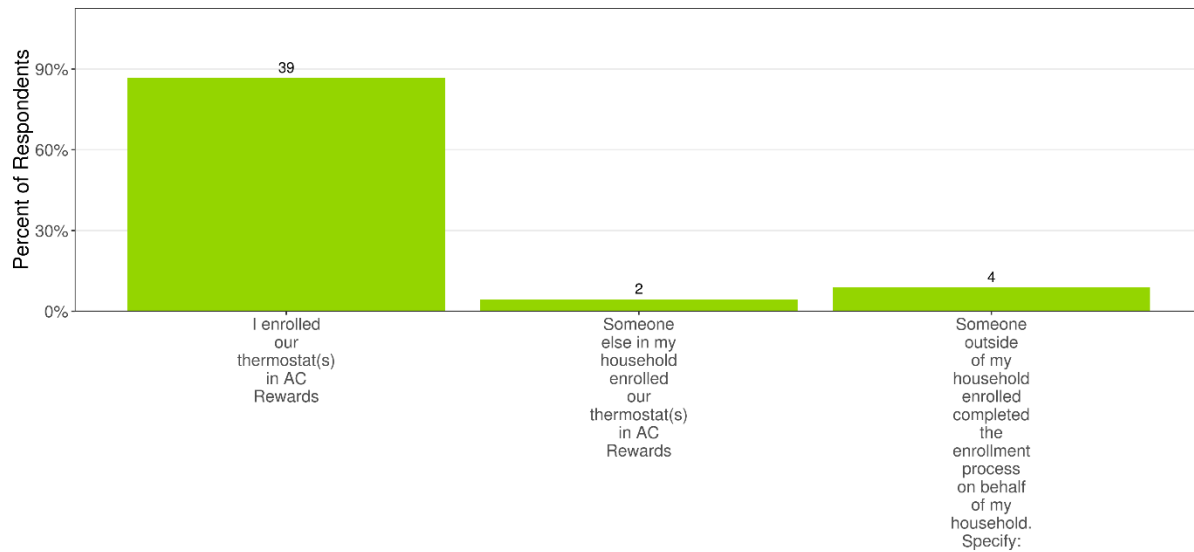
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-9. How did you learn about AC Rewards through your thermostat manufacturer? (Select all that apply).



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

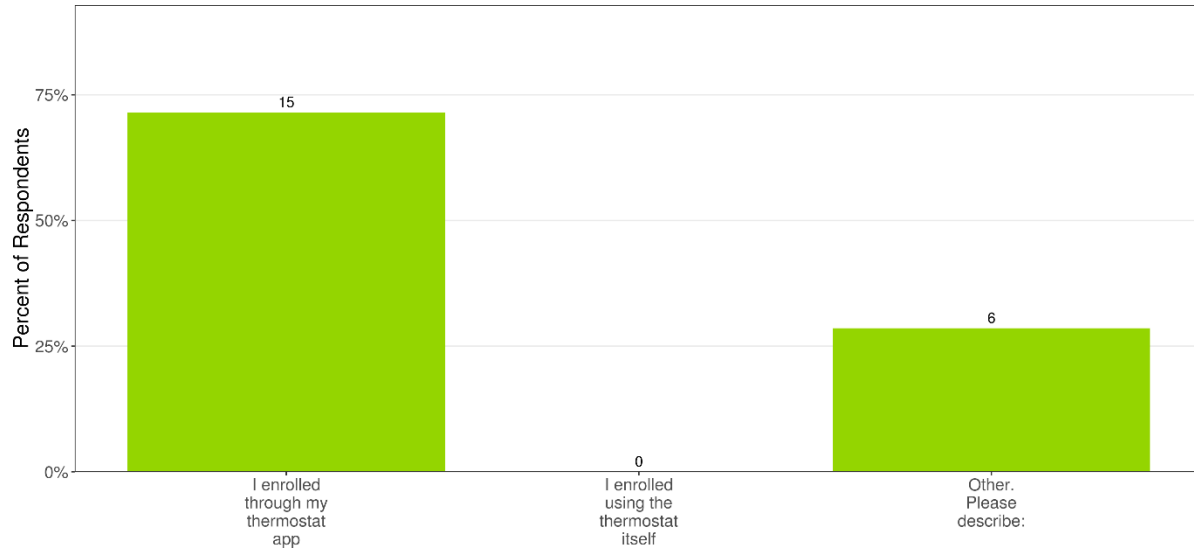
Figure B-10. Did you enroll in AC Rewards or did someone else complete the AC Rewards enrollment process on behalf of your household?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

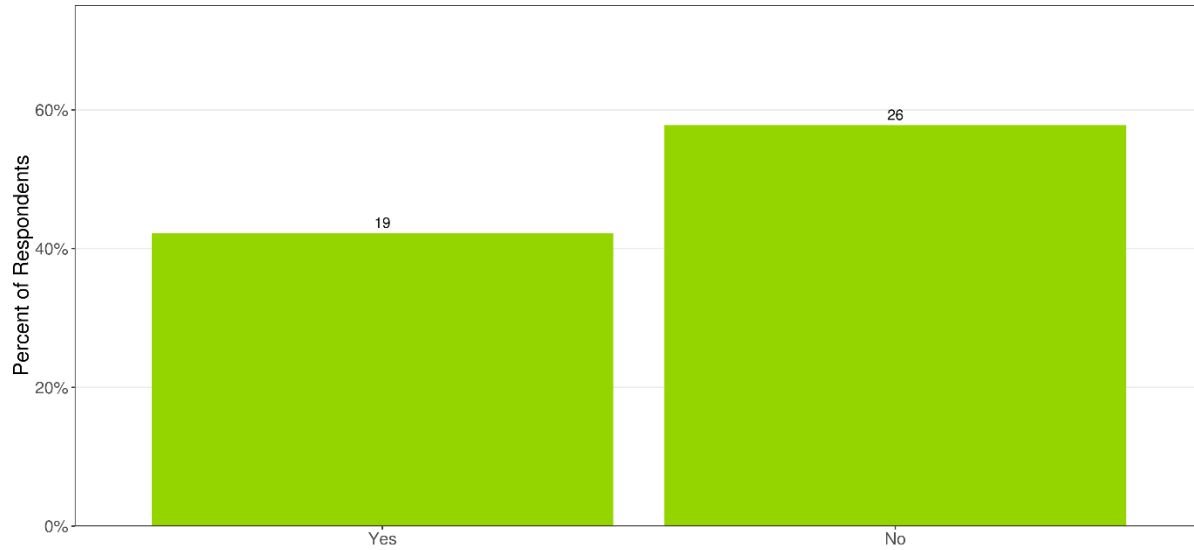
B.2 Enrollment Experience

Figure B-11. Before enrolling in AC Rewards, did you review information about the program on either of the following web pages? AC Rewards Program Page



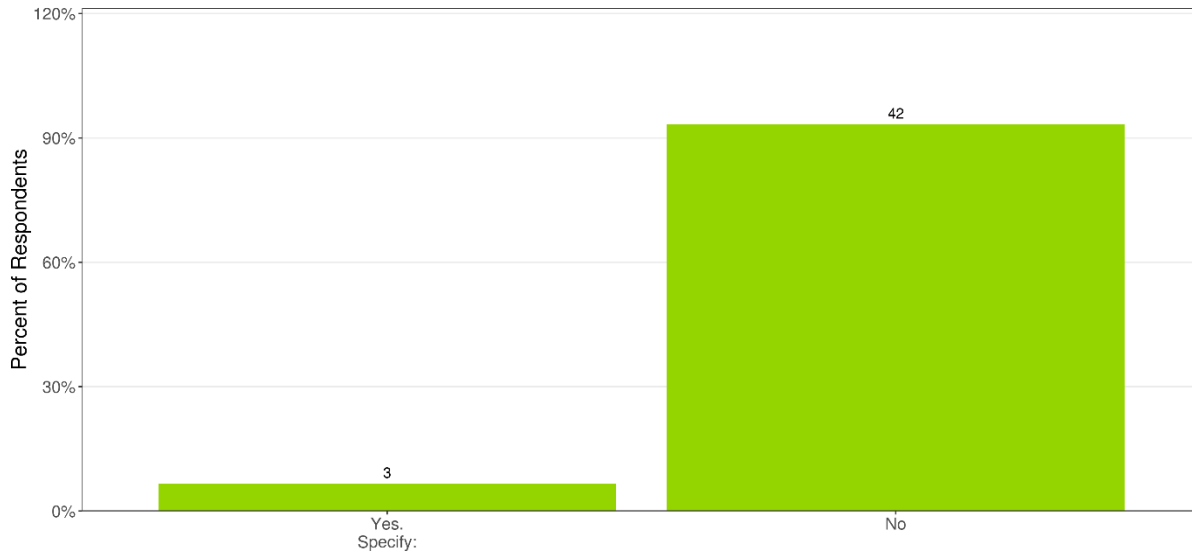
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-12. Before enrolling in AC Rewards, did you review information about the program on either of the following web pages? Marketplace AC Rewards Page



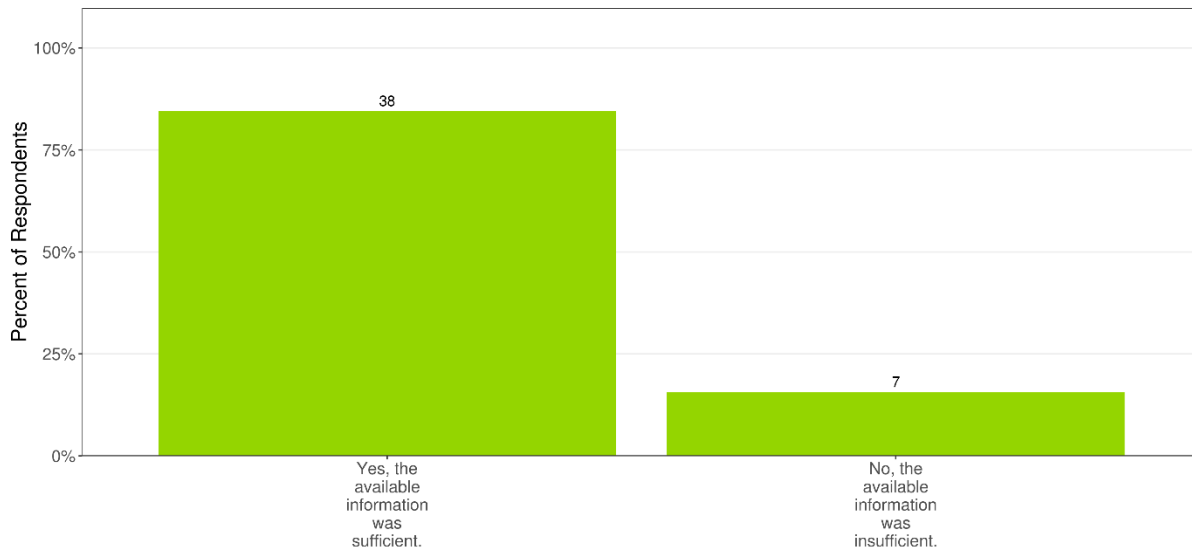
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-13. Did you seek or review information about AC Rewards from any other sources prior to enrolling?



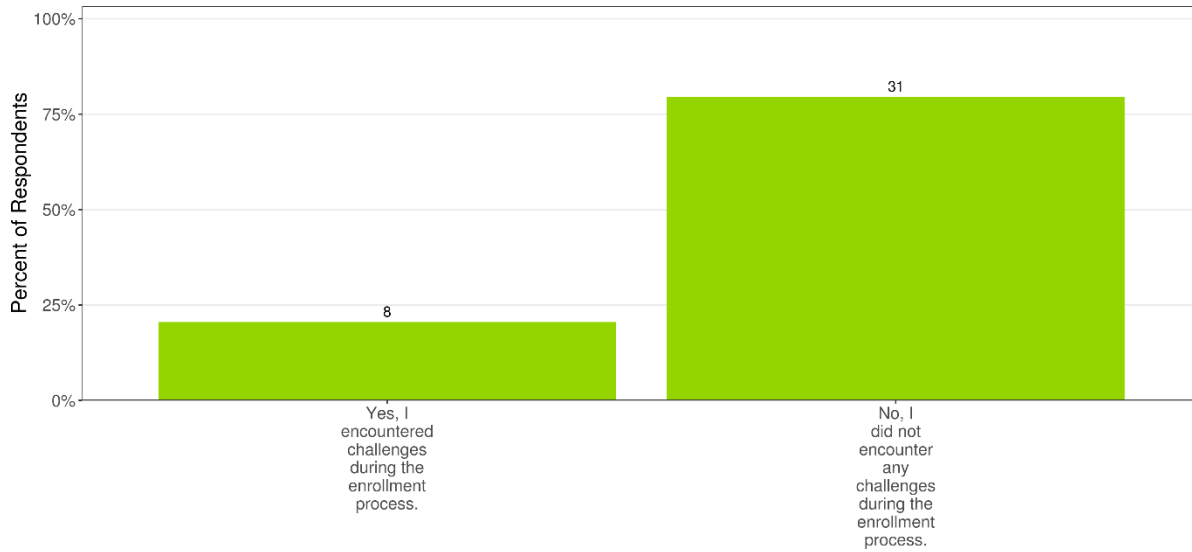
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-14. Was the information available to you about AC Rewards sufficient to meet your needs?



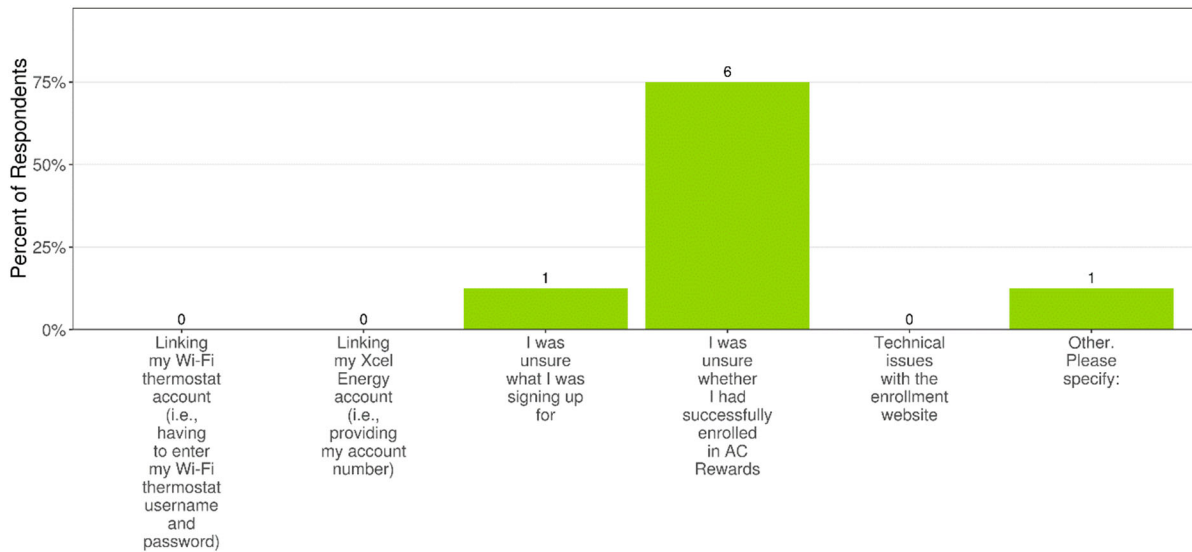
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-15. Did you encounter any challenges or difficulties during the enrollment process?



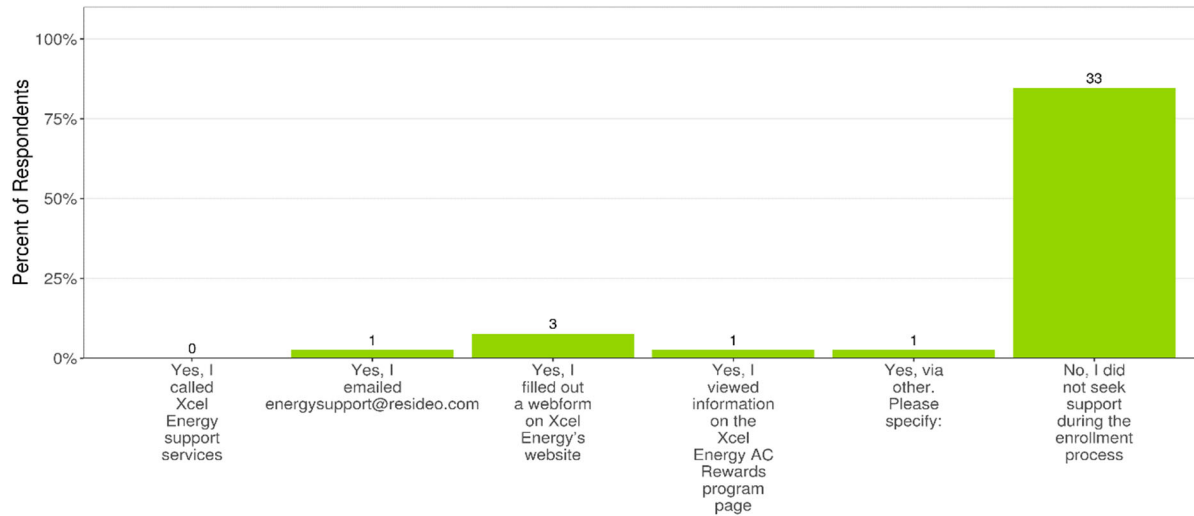
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-16. What aspect(s) of the enrollment process was challenging?



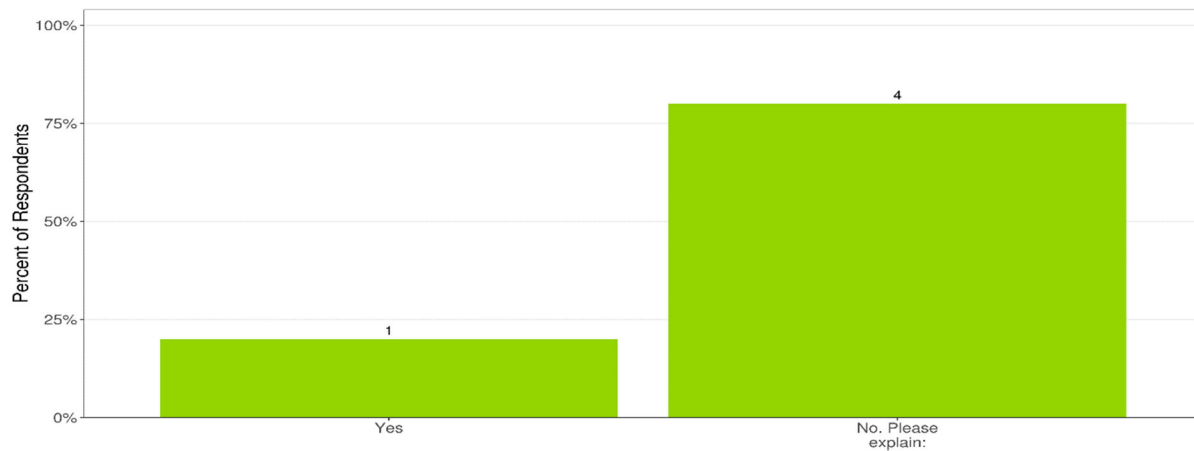
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-17. Did you seek support during the enrollment process?



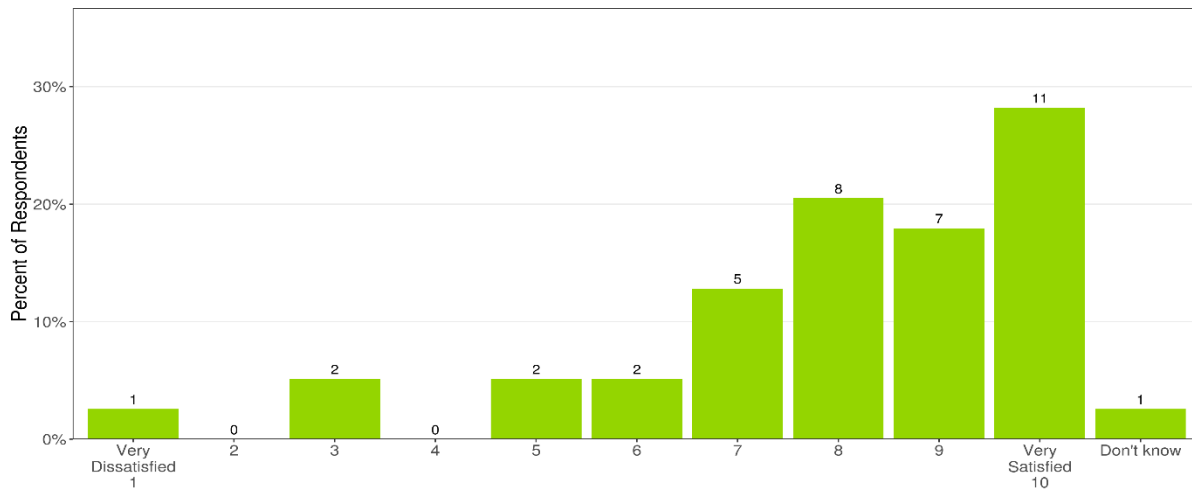
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-18. Did you get the support you were seeking?



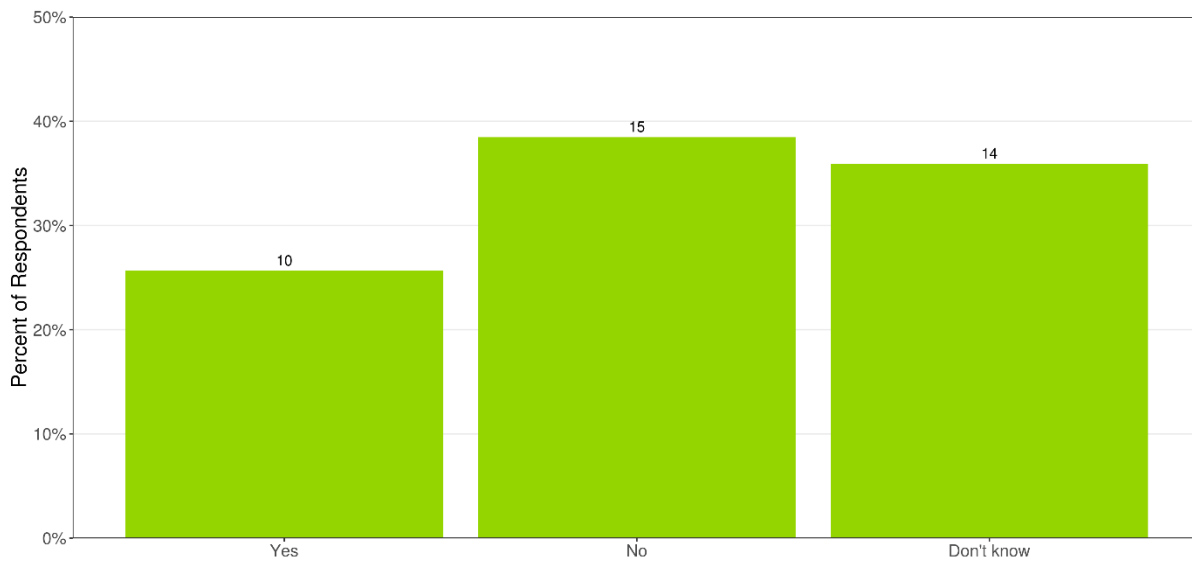
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-19. Using a scale of 1 to 10 where 1 indicates “Very Dissatisfied” and 10 indicates “Very Satisfied,” how satisfied were you with the process of enrolling in AC Rewards?



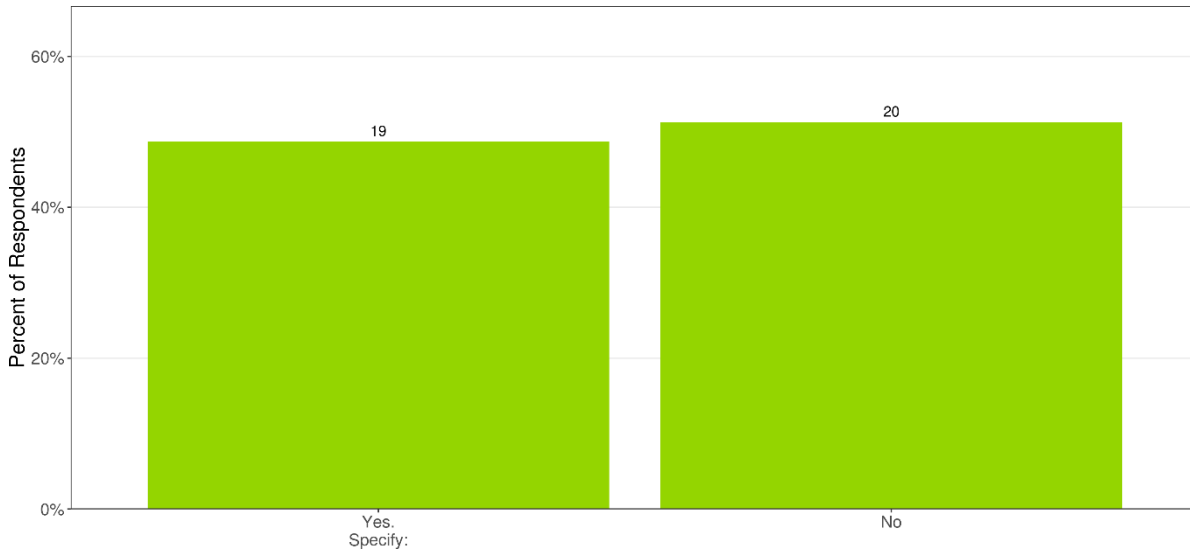
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-20. At some point following enrollment, to the best of your recollection, did you receive a confirmation from Xcel Energy that you were enrolled in AC Rewards?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

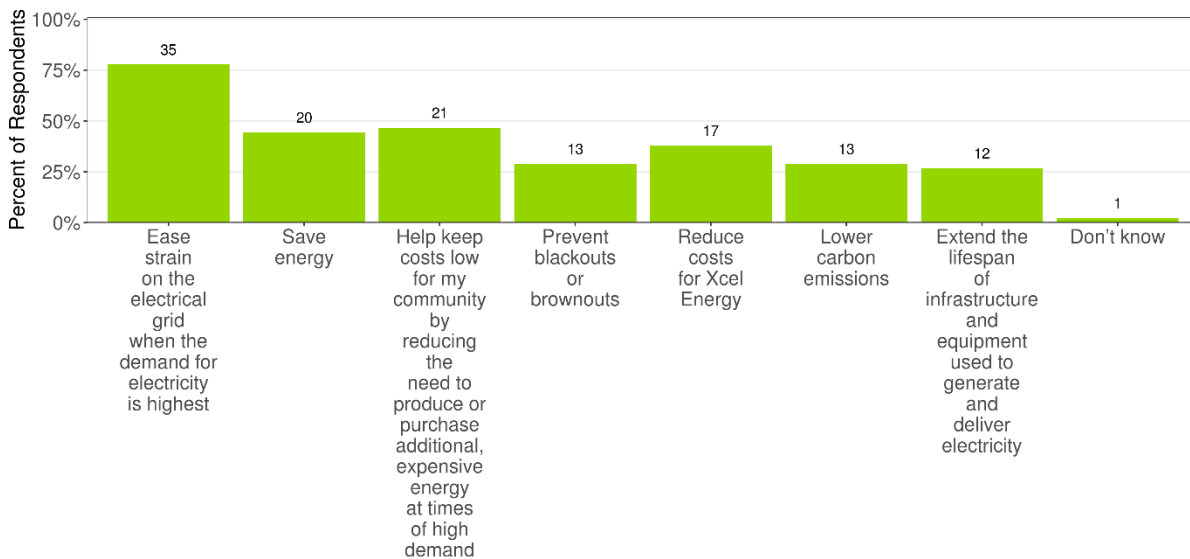
Figure B-21. Thinking about your AC Rewards enrollment experience from start to finish, are there any ways in which the experience could be improved?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

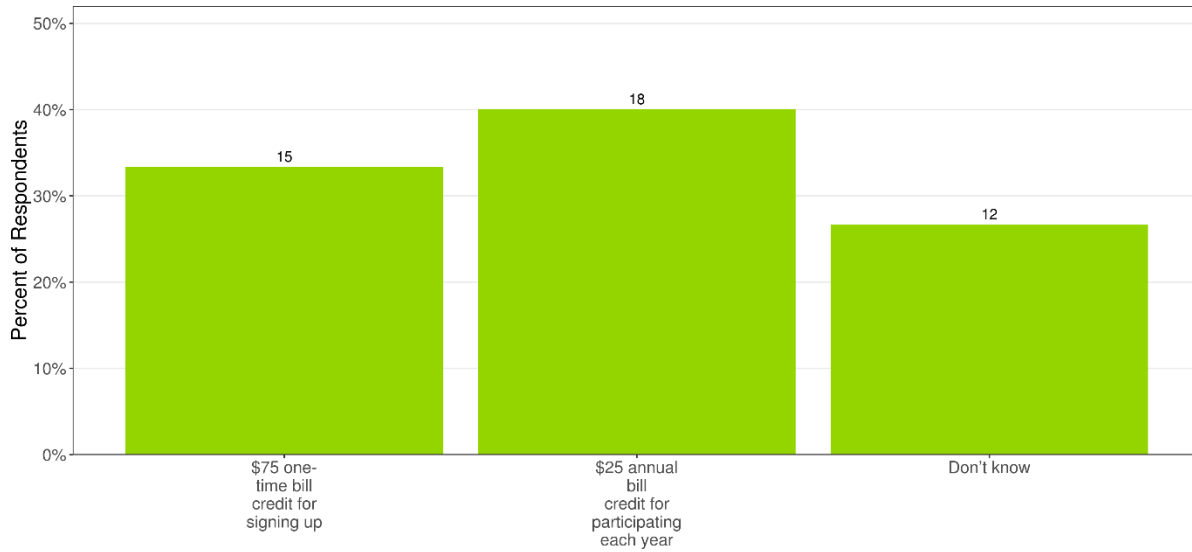
B.3 AC Rewards Expectations

Figure B-22. To the best of your understanding, what is the goal of the AC Rewards program for Xcel Energy? (select all that apply)



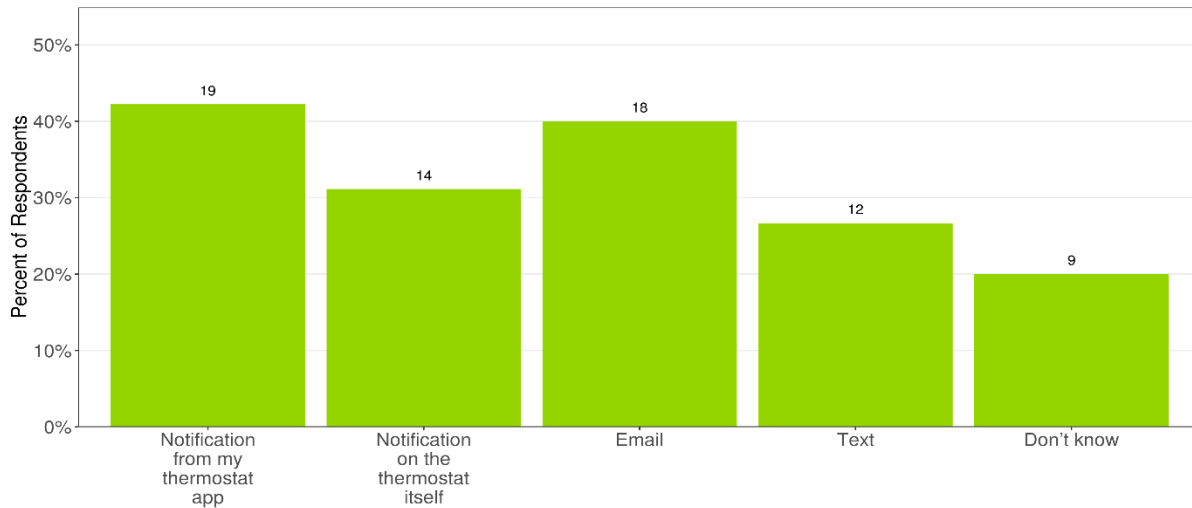
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-23. As a participant of AC Rewards, which of the following do you expect to receive as a part of your participation in the program?



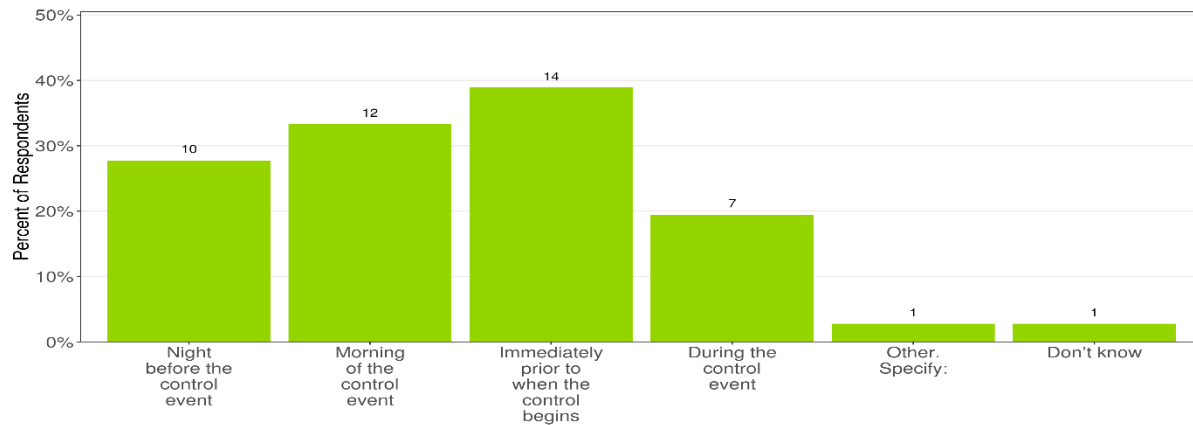
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-24. As a participant of AC Rewards, how do you expect to be notified of a control event that is set to occur? (select all that apply)



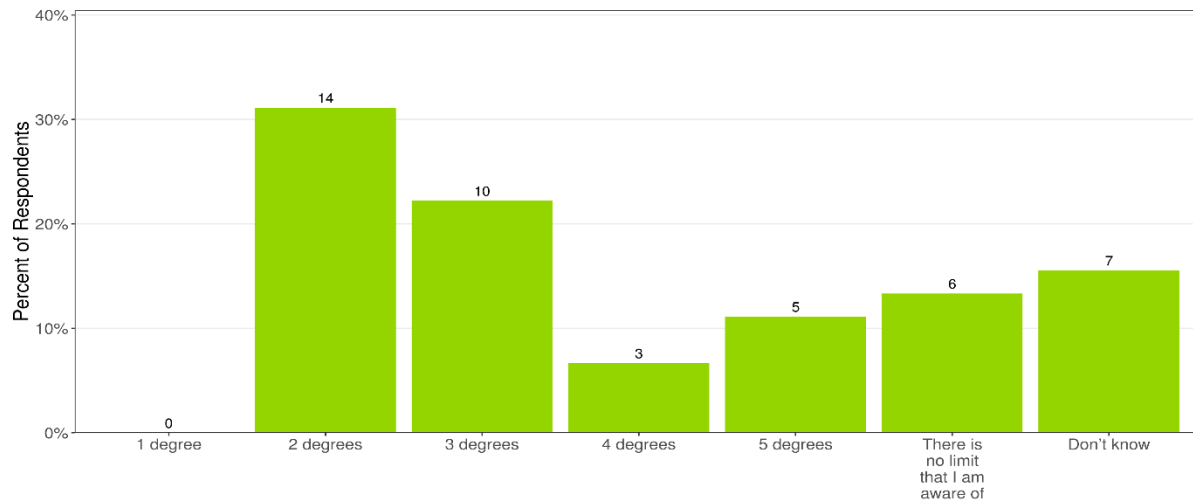
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-25. What are your expectations of when you will be notified that a control event is set to occur? (select all that apply)



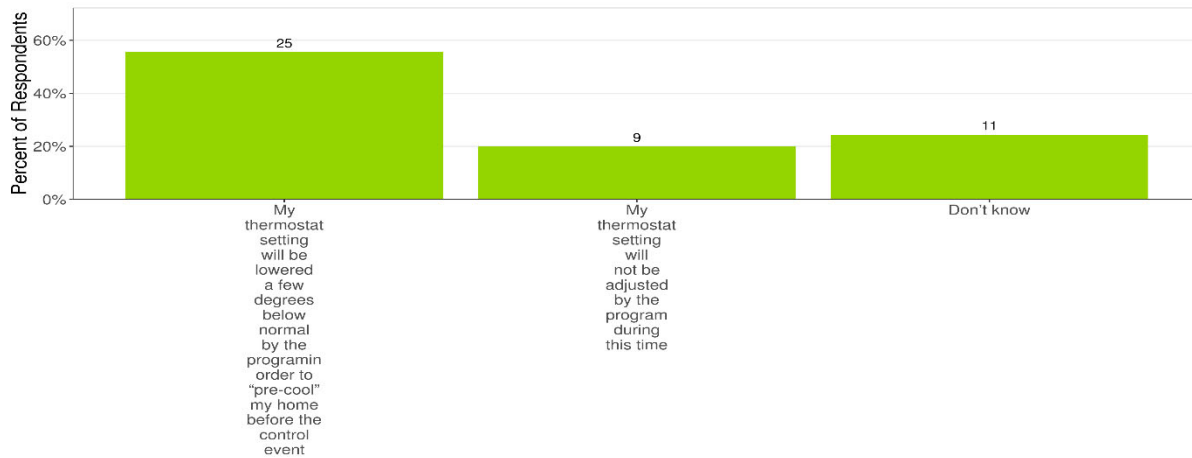
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-26. As a participant of AC Rewards, how many degrees AT MOST do you expect your thermostat to be raised above its normal setting during a control event?



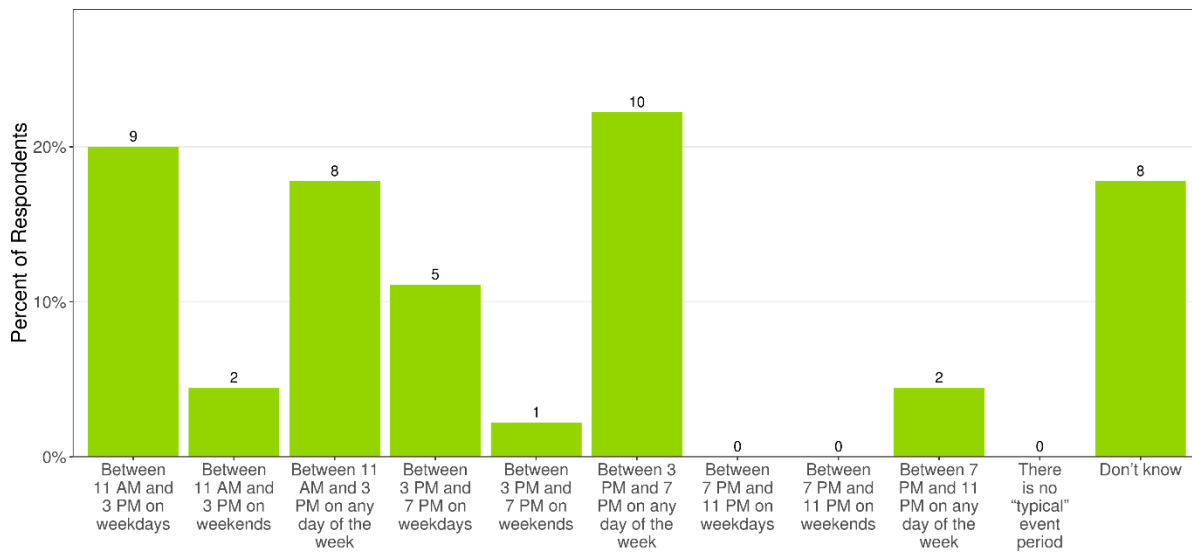
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-27. As a participant of AC Rewards, in the hour or two before a control event, what do you expect will happen to your thermostat setting? Please assume that you do not change your thermostat's settings during this time.



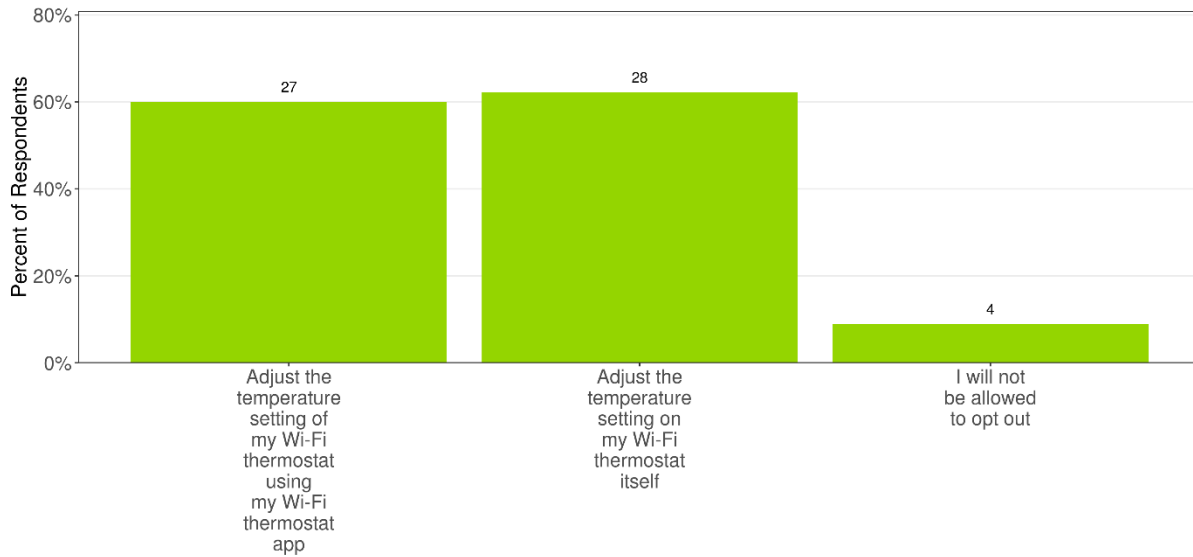
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-28. When do you expect a control event will typically occur...?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

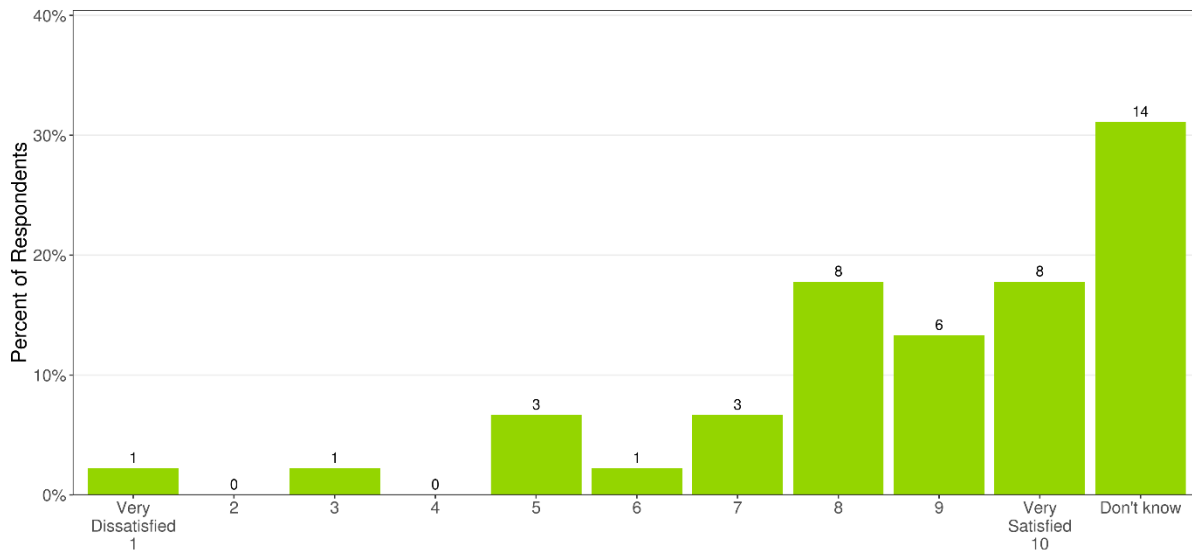
Figure B-29. There may be a day when you are unable or do not wish to participate in a control event. How would you expect to be able to opt out? Please select all that apply:



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

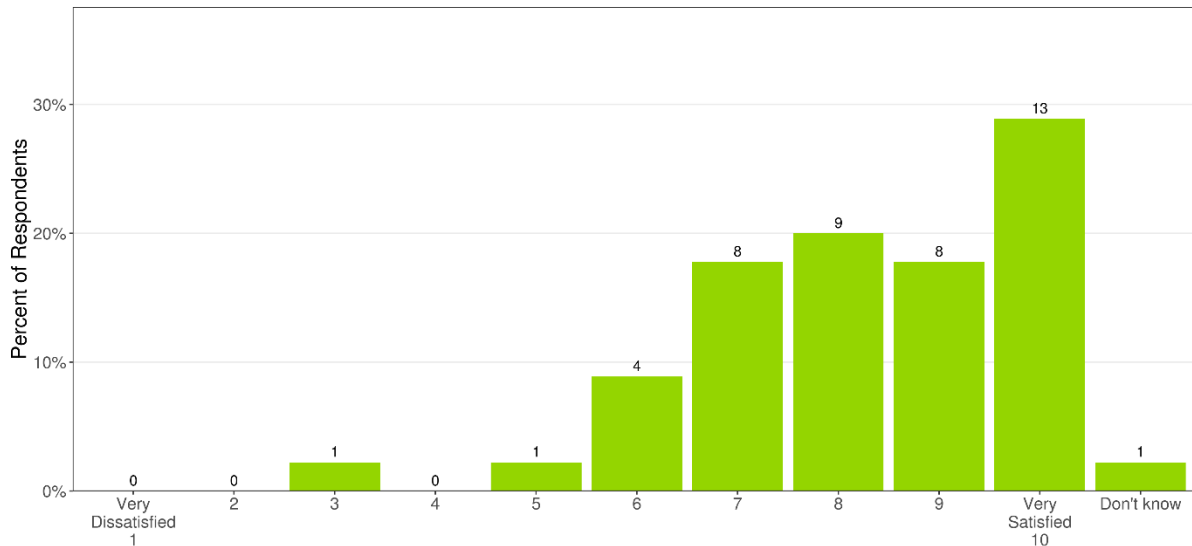
B.4 Satisfaction

Figure B-30. On a scale of 1-10, how satisfied are you overall with your AC Rewards program experience to-date?



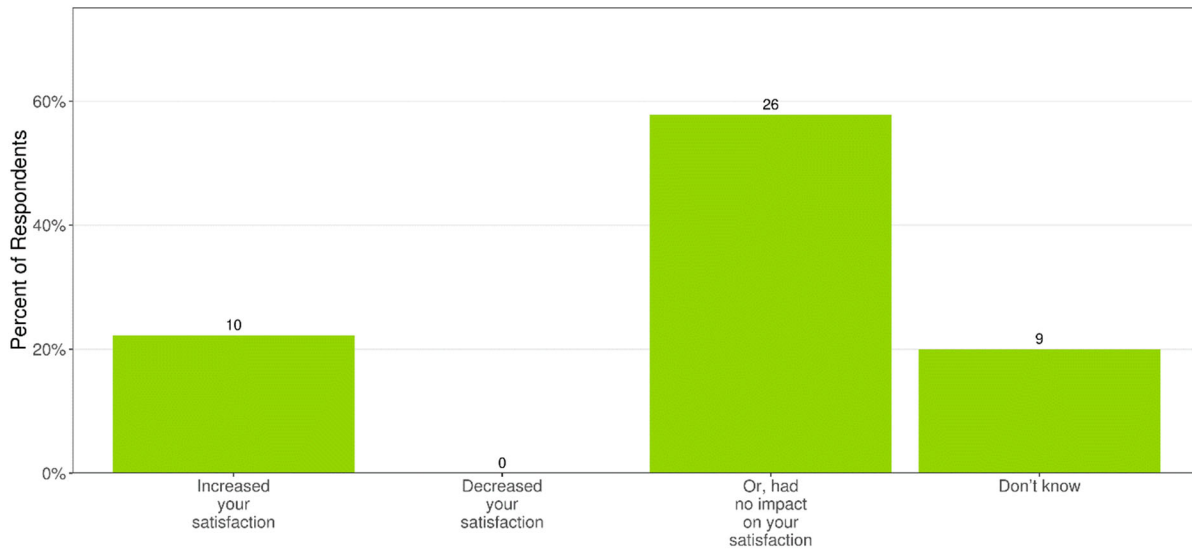
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-31. Now, thinking about Xcel Energy, your electricity provider, and not the AC Rewards program, on a scale of 1 to 10, how satisfied are you with Xcel Energy in general?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

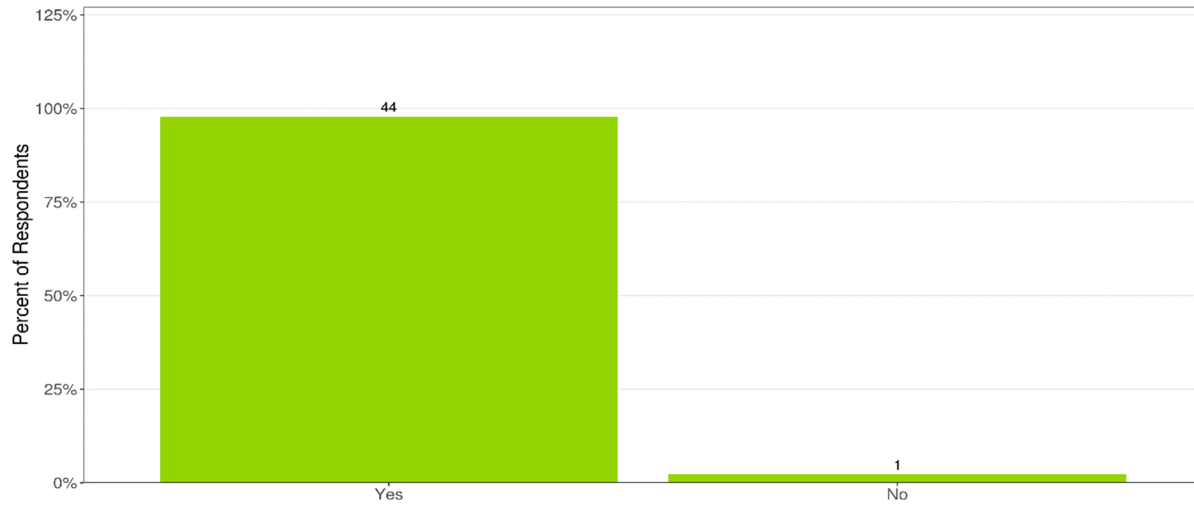
Figure B-32. How has your participation in AC Rewards impacted your satisfaction with Xcel Energy overall? Has it...?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

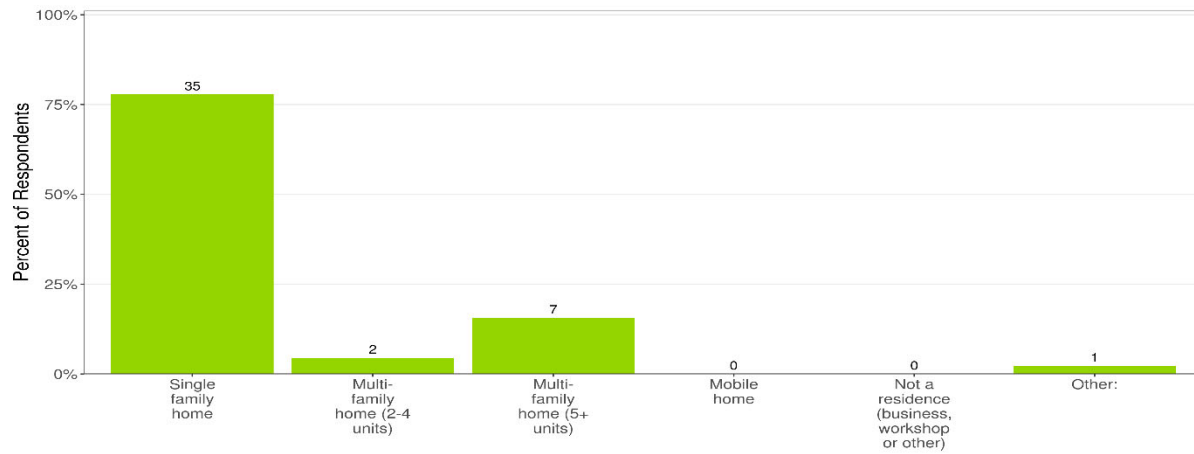
B.5 Demographics

Figure B-33. Is this your primary home?



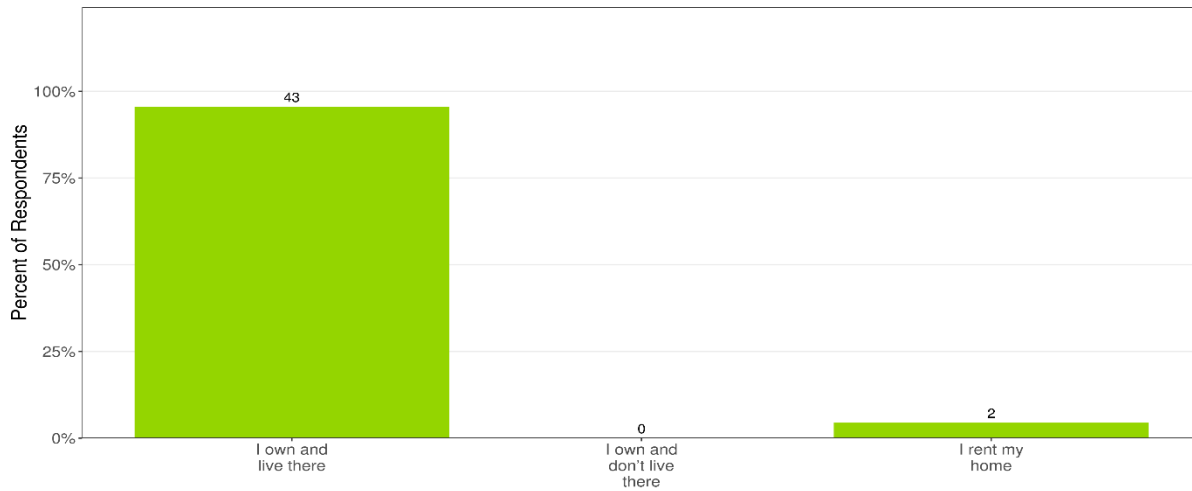
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-34. Which of the following best describes the property type at `#{e://Field/STREET_ADDRESS}`?



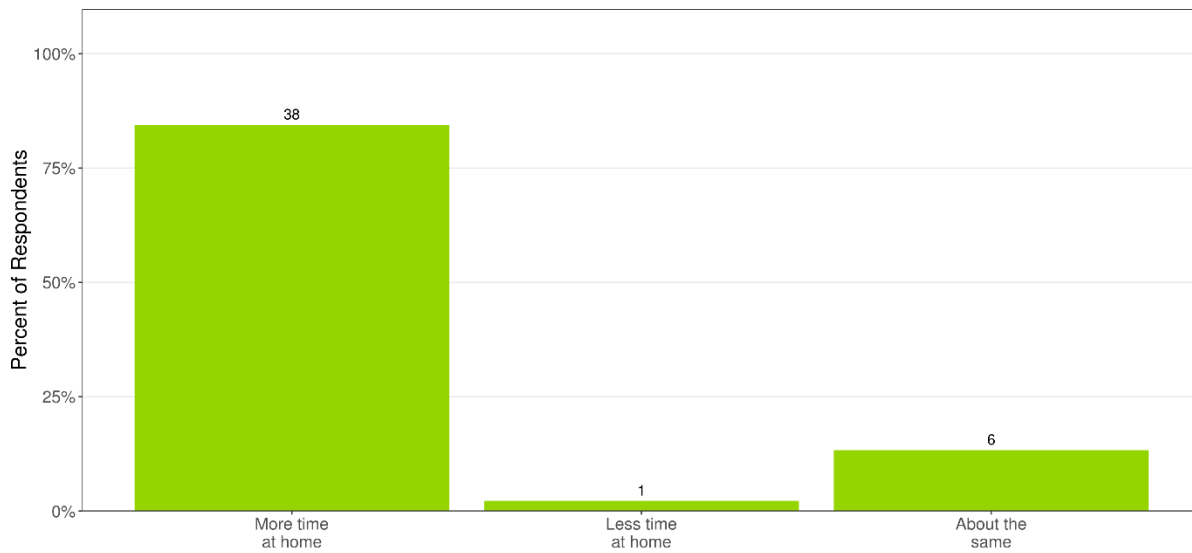
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-35. Which of the following best describes you and your home?



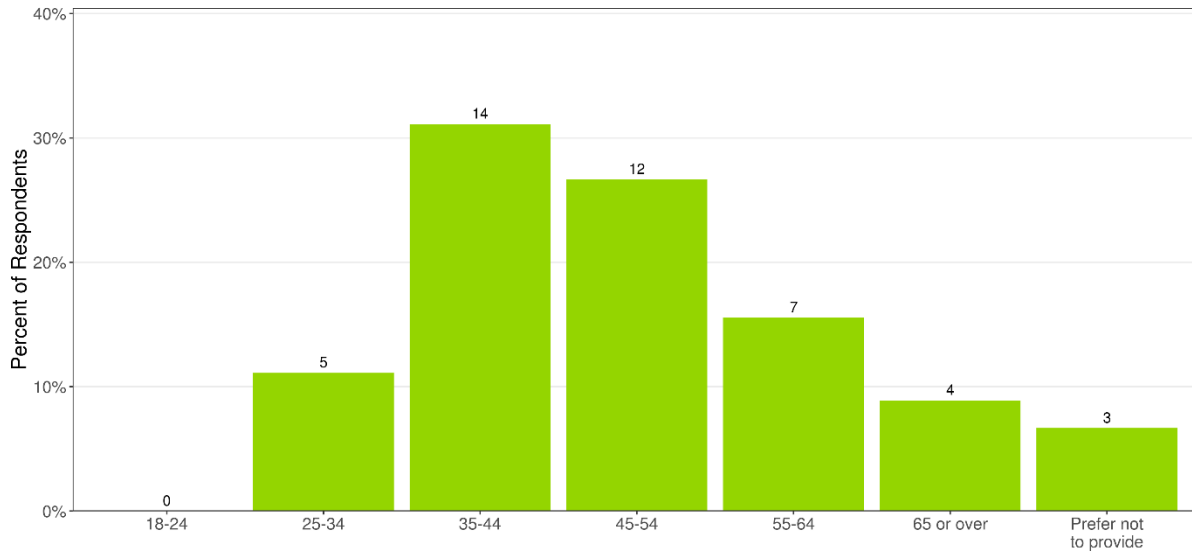
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-36. Compared to last summer, how has the amount of time you spend at home on weekdays during the summer changed?



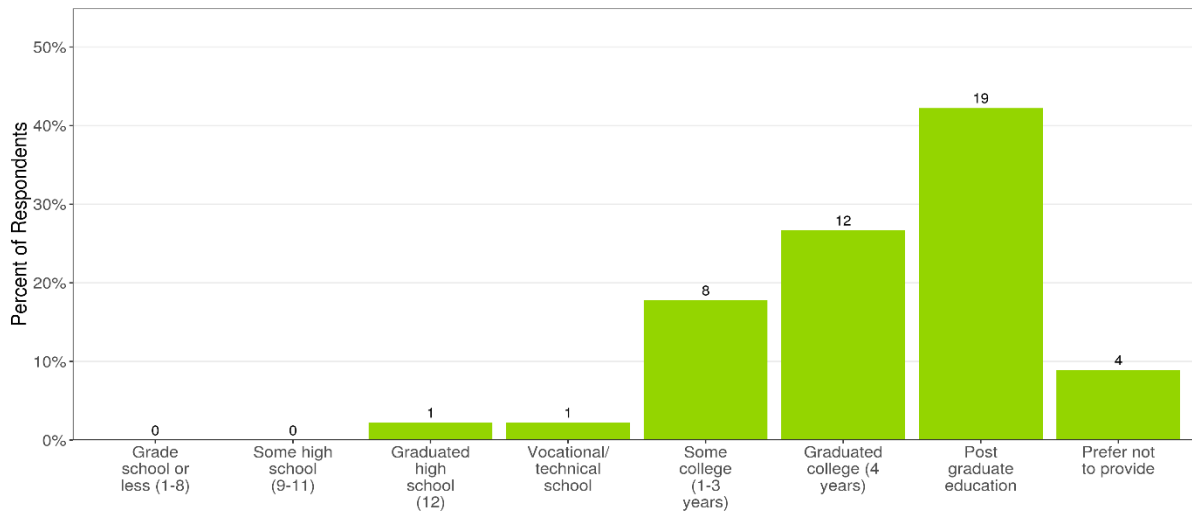
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-37. Which of the following age categories do you fall into?



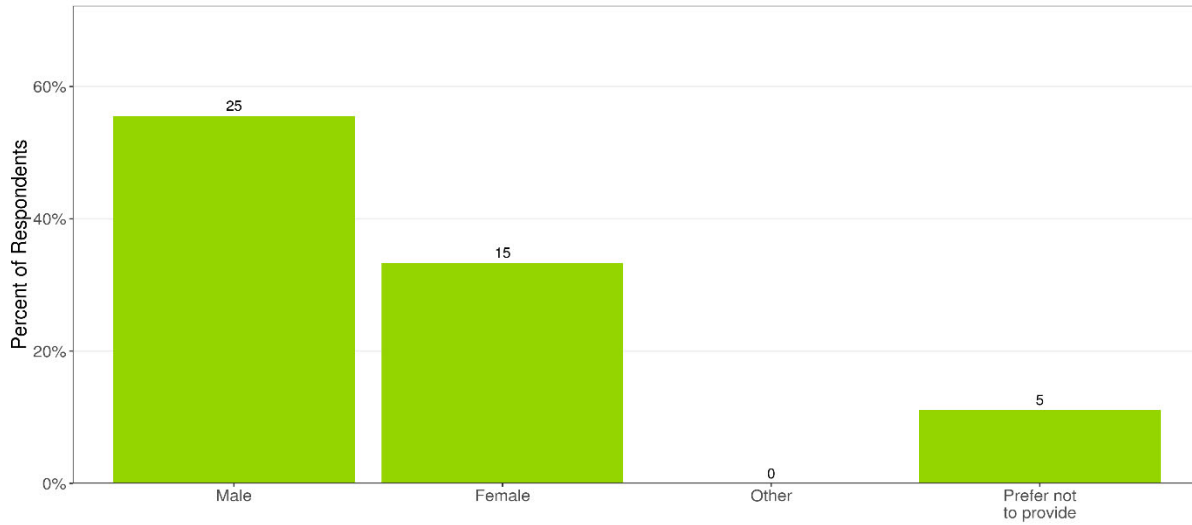
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-38. What is the last grade of school you completed?



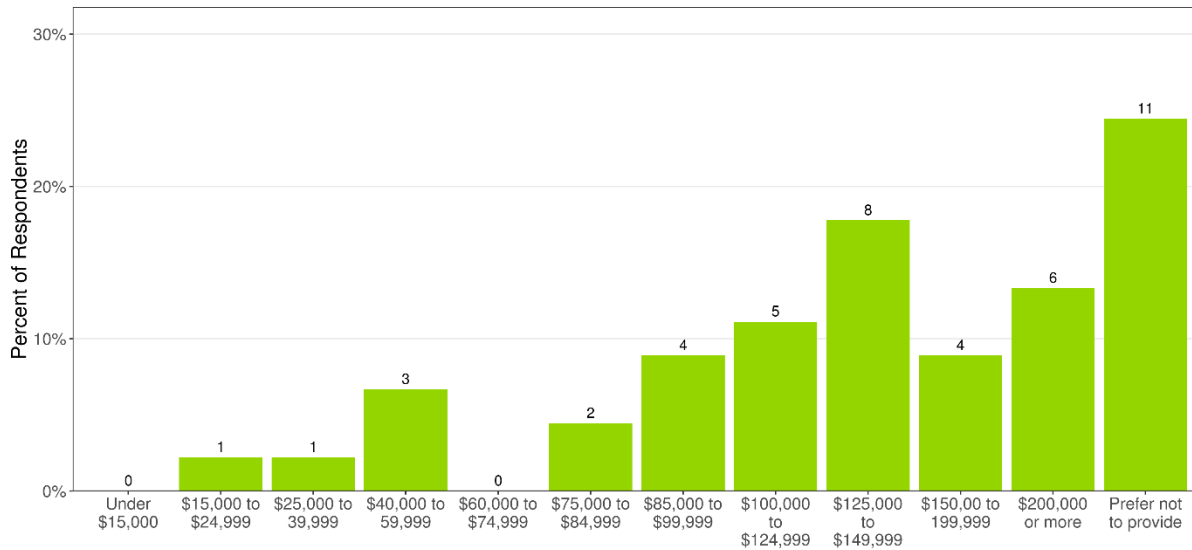
Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-39. Which category best describes your gender?



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Figure B-40. Please indicate which range best describes the annual income of your entire household (everyone living in your home).



Source: Guidehouse analysis of responses to post-enrollment surveys fielded on September 16-25, 2020

Appendix C. Interim Deliverable: Post-Event Survey Memo

To: Nick Minderman, Meagan Madden (Xcel Energy)
From: Nicole Buccitelli, Meg Campbell, Stuart Schare (Guidehouse)
 Lenore Zeuthen (Zeuthen Management Solutions)
Date: January 28, 2021
Re: AC Rewards Program Evaluation Post-Event Survey Findings – Colorado

C.1 Executive Overview

The AC Rewards program allows Xcel Energy’s residential customers in Colorado to earn an incentive by providing the company control of their smart thermostat during times of seasonal peak demand when demand response (DR) direct load control (DLC) events are called. Resideo, the program’s demand response management system (DRMS) provider, plays a large role in program implementation and customer notification. In the summer of 2020, Guidehouse fielded a survey immediately following three events (post-event surveys) and on a day when conditions were similar to a typical event day (placebo survey). Customer responses to the placebo survey provide a measure of baseline customer comfort, actions, and satisfaction against which the post-event survey customer responses can be compared.

This memo presents preliminary findings from the survey emphasizing awareness of events, the impact events have on customer comfort, participant opt-out behavior, and drivers for current levels of satisfaction. Table C-1 lists the key takeaways.

Table C-1. Key Takeaways

Topic	Key Finding
Comfort	<ul style="list-style-type: none"> Among post-event survey respondents, about 55% reported a change in comfort in their home (a score of 2 or higher).[*] Interestingly, for placebo survey respondents, around 34% also reported a change in comfort. This supports that survey responses may not fully reflect the reality of respondents’ experiences or that reports of discomfort among those who were actually signaled for an event may not be wholly attributable to the event itself. Some post-event respondents reported relatively high comfort impacts during the event. A little over 35% of post-event respondents who were home on event day reported a comfort rating of 6 or higher (compared to 21% of placebo respondents). Of the post-event respondents who did not opt out of the event, 78% did not take any actions to feel more comfortable, despite the majority of them having noticed a change in comfort

Topic	Key Finding
Awareness and Notification	<ul style="list-style-type: none"> • Less than half of post-event respondents (44%) were aware that an event occurred. • Of respondents, 55% indicated they became aware of the event through a change in indoor temperature; 87% of these respondents indicated they did not receive any event notification but most would like to. • 43% became aware of the event through a notification on their thermostat itself. Only 10% indicated they became aware of the event through their thermostat’s mobile app. • Of those who reported receiving event notification, 40% (or 23) rated their satisfaction as a 5 or lower on a 1 (very dissatisfied) to 10 (very satisfied) scale, indicating opportunities for improvement. • When asked if post-event respondents took any actions on their own to prepare for the event, a vast majority (94%) indicated they did not take any action to prepare for the event. This is not surprising given that vast majority of respondents did not report receiving advance notification (through their thermostat’s mobile app) and thus would not have known that an event was going to take place.
Opt-Out Behavior	<ul style="list-style-type: none"> • When post-event respondents who were aware of the event were asked if they opted out of the event, almost half (44%) indicated they opted out. This is an overall opt-out rate of 20% when including those who were not aware of the event. 50% of those who reported a change in comfort level opted out of an event. • A vast majority of those who opted out were aware an event was occurring due to the change in the temperature of their home (rather than through event notification). This finding suggests that advance notification of the event does not contribute appreciably to increasing opt-out behavior and, in fact, could help to lower opt outs by allowing for advance preparations.
Satisfaction	<ul style="list-style-type: none"> • Ratings for event notification, length, timing, and temperature during the event indicate there may be opportunities for improvement. Across all events, satisfaction ratings for these event attributes ranged from 5.7 to 6.2. • Reported satisfaction results were lower during the event on August 13, which may be attributed to a consecutive, 6-hour event occurring on August 12. • Post-event survey respondents responded positively to both the AC Rewards program and Xcel Energy, providing average satisfaction scores of 7.0 and 8.0, respectively. Placebo respondents also provided high satisfaction ratings. • Suggestions for program improvement included providing advance notification of event, calling fewer events and making smaller setpoint adjustments, and increasing incentives.

* Where 1 is “no change in comfort” and 10 is “very uncomfortable.”

C.2 Post-Event Survey Methods

C.2.1 Sampling Method

Guidehouse leveraged two AC Rewards enrollment files, one dated June 23, 2020 and one dated July 16, 2020, to develop the post-event survey and placebo survey sample frames for Colorado. The team performed the following data cleaning on both datasets to prepare survey sample frames:

- Removed duplicate device IDs

- Checked for duplicate email addresses with different states
- Transformed device-level data to participant-level data (i.e., removed duplicate email addresses)
- Filtered for DR SubProgram = Xcel CO Residential
- Filtered for State = Colorado
- Filtered for Enrollment Status = Approved
- Removed emails containing “@none.com”

Because there were four discrete survey efforts (surveys fielded after three different events and one placebo event), AC Rewards participants who had previously been invited to take a survey were excluded from the sample frames for subsequent survey efforts. These exclusions were done to minimize the number of communications any one individual received and maximize the number of unique individuals from which surveys efforts were able to obtain feedback.

From the sample frame developed for each survey effort, a random sample of participants was selected and sent the survey invitation email.

C.2.2 Fielding Logistics and Survey Response Rates

Guidehouse designed the post-event surveys to assess participant comfort, awareness of events, event pre-cooling, opt-out behavior, actions taken during events, satisfaction, and general demographic information. The team fielded post-event and placebo surveys online through Qualtrics, a user-friendly survey platform. Table C-2 shows the distribution information from each post-event and placebo survey. Participants were given 48 hours to respond to the survey after receiving the survey invitation email, as the goal was to receive immediate feedback. Reminder emails were not sent to participants unless the response rate was low.⁵

To effectively plan, Guidehouse recorded the response rates and emails distributed to Xcel Energy participants for each survey to ensure the team collected a sufficient number of results (shown in Table C-2). After the survey closed, respondents who completed the survey received a \$5 incentive as a token of appreciation for their feedback.

Table C-2. Post-Event and Placebo Survey Distribution

Event Type and Date	Event Time	Time Email Sent (MT)	Emails Sent	Completes	Response Rate
Event (7/17)	2-6 p.m.	6:30 p.m. (7/17)	892	120	13.5%
		8:00 p.m. (7/17)			
		7:30 a.m. (7/18)			
Placebo (7/29)	2-6 p.m.	7:45 p.m. (7/29)	988	83	8.4%
		9:30 a.m. (7/30)			
Event (8/7)	2-6 p.m.	6:30 p.m. (8/7)	470	43	10.6%
Event (8/13)†	2-8 p.m.	8:30 p.m. (8/13)	644	57	8.7%

Source: Guidehouse analysis

⁵ A reminder email was sent on 8/8 for the second post-event survey, as the response rate was lower than expected.

Weather Conditions During Events

All event and placebo surveys were distributed on days with similar weather conditions. As Table C-3 outlines, the temperature, relative humidity, average windspeed, and perceived temperatures were relatively similar. The temperature on the day when the placebo survey was fielded was slightly lower than the event days when post-event surveys were fielded; however, the maximum temperature was still above 90°F.

Table C-3. Weather Conditions on Event and Placebo Survey Dates

Event Type and Date	Event Time	Max Temp.	Min Temp	Avg. Temp	Avg. Relative Humidity	Avg. Windspeed (mph)	Perceived Temp.*
Event (7/17)	2-6 p.m.	98°F	64°F	81°F	33%	10.7	97°F-101°F
Placebo (7/29)	2-6 p.m.	93°F	61°F	77°F	45%	12.1	93°F-98°F
Event (8/7)	2-6 p.m.	97°F	67°F	82°F	36%	9.3	97°F-100°F
Event (8/13)†	2-8 p.m.	96°F	61°F	79°F	34%	7.7	96°F-98°F

This information shows the average weather information in Denver, Colorado.

* A range is provided for perceived temperature to encompass the range of possible temperatures during the events. The upper bound takes the maximum temperature and relative humidity into consideration while the lower bound incorporates windspeed, as a breeze would decrease perceived temperature.

† Xcel Energy also called an event on August 12. As a result, two consecutive events were called for all Colorado customers, which may have impacted satisfaction levels (see p. 13). Additionally, event duration on August 13 was longer than typical events (6 hours instead of 4 hours).

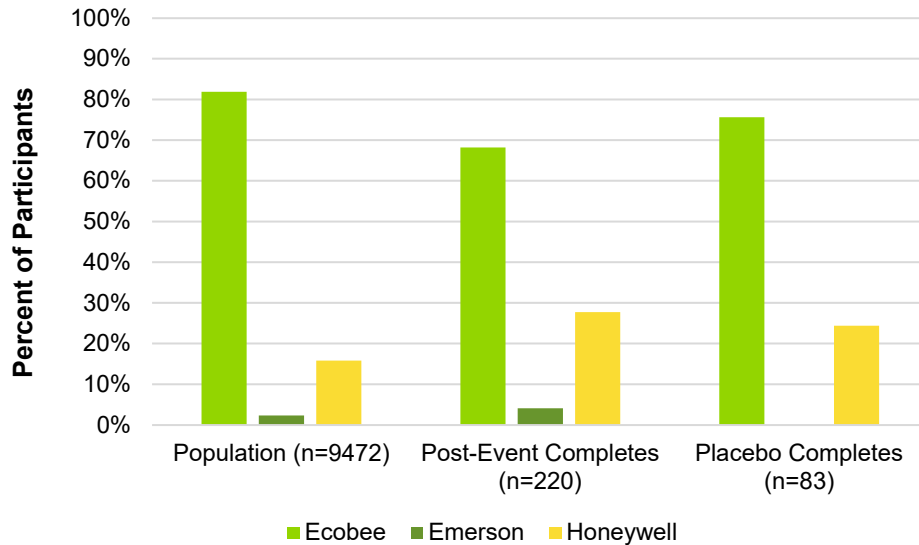
Source: National Weather Service

C.3 Representativeness of Survey Samples

The samples for the post-event survey fielded on July 17 and the placebo survey fielded on July 29 were based on active AC Rewards enrollments as of June 23, 2020, while the samples for the post-event surveys fielded on August 7 and August 13 were based on active AC Rewards enrollments as of July 16, 2020. For simplicity, to provide an indication of representativeness of the samples, the following charts show how the samples for all post-event surveys combined and the placebo survey compare to the AC Rewards population for Colorado as of July 16, 2020.

The post-event and placebo survey samples were roughly proportional to the AC Rewards population as of July 16, 2020 in terms of the distribution of thermostat types.

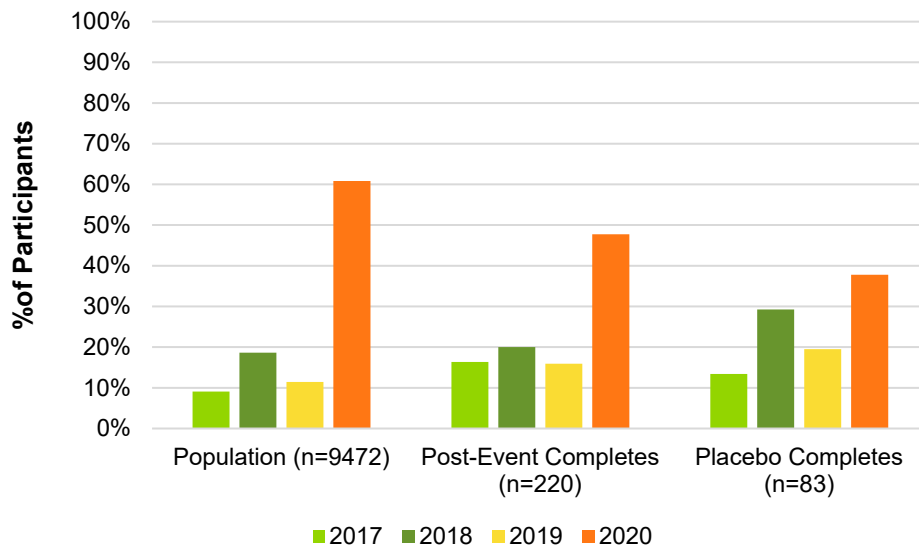
Figure C-1. Population (as of July 16) vs. Survey Completes – Thermostat Type



Source: Guidehouse analysis of AC Rewards enrollment data as of July 16, 2020, post-event surveys fielded on July 17, August 7, and August 13, 2020, and the placebo survey fielded on July 29, 2020

Relative to the AC Rewards population as of July 16, 2020, both post-event and placebo survey samples were somewhat skewed toward participants who enrolled prior to 2020 (particularly the placebo survey sample). This is at least partially because the first post-event survey and placebo survey sample frames were developed based on AC Rewards enrollments as of June 23, 2020, whereas the population of AC Rewards participants shown on the chart is as of July 16, 2020.

Figure C-2. Population (as of July 16) vs. Survey Completes – Enrollment Year



Source: Guidehouse analysis of sample frame based on enrollment data as of July 16, 2020, historical enrollment data as of February 19, 2020, post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

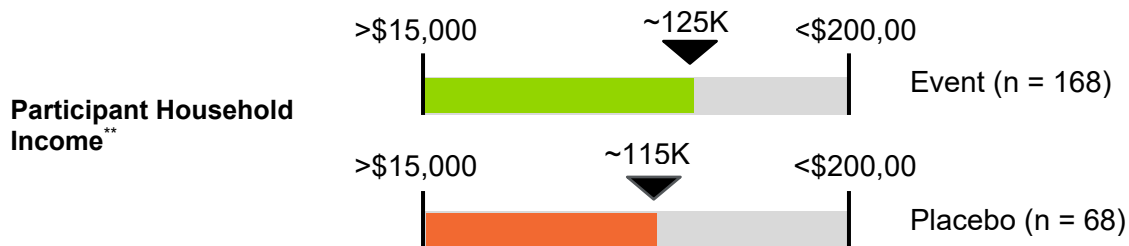
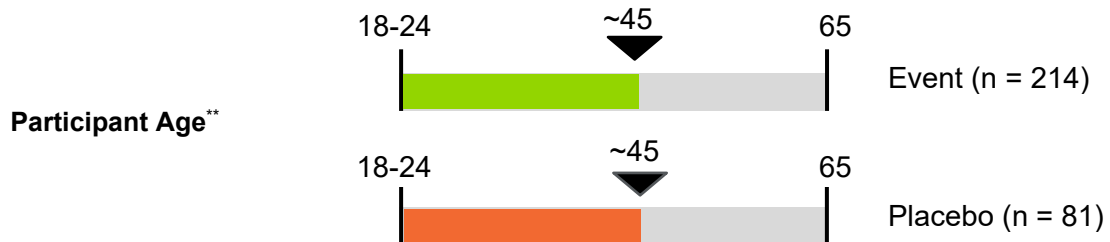
C.4 Demographics

The post-event and placebo surveys solicited information on program participant demographics to learn about what types of customers enroll in AC Rewards and to inform recruitment strategies. Most event and placebo respondents were male, 66% and 69%, respectively, with many having a college or post-graduate education. Table C-4 shows additional household and participant demographic information and compares event and placebo customers.

Table C-4. Key Participant Demographic Information (Post-Event vs. Placebo)***

Category	Post-Event vs. Placebo
Home Type (Single-Family)*	<p>Event (n = 220)</p> <p>Placebo (n = 83)</p>
Home Ownership (Own)†	<p>Event (n = 220)</p> <p>Placebo (n = 83)</p>
Occupants During Summer Months	<p>Event (n = 220)</p> <p>Placebo (n = 83)</p>
Time Spent at Home Compared to Last Summer	<p>Event (n = 220)</p> <p>Placebo (n = 83)</p>

Category	Post-Event vs. Placebo
----------	------------------------



* These results display the percentages of reported single-family homes, which was the primary response. Full results for the question are displayed in the appendix.

† These results display the percentages of reported homes that are owned by respondents. Full results for the question are displayed in the appendix.

** "Prefer not to respond" responses were removed from analysis.

*** The n values change because respondents were not forced to respond to demographic questions. They could skip to the next question without responding.

Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

C.5 Post-Event Survey Findings

This section describes key findings from the post-event and placebo surveys. Guidehouse designed the survey instrument to ask specific questions of certain respondents, dependent on whether the respondent received an event or placebo survey and their responses to previous questions.

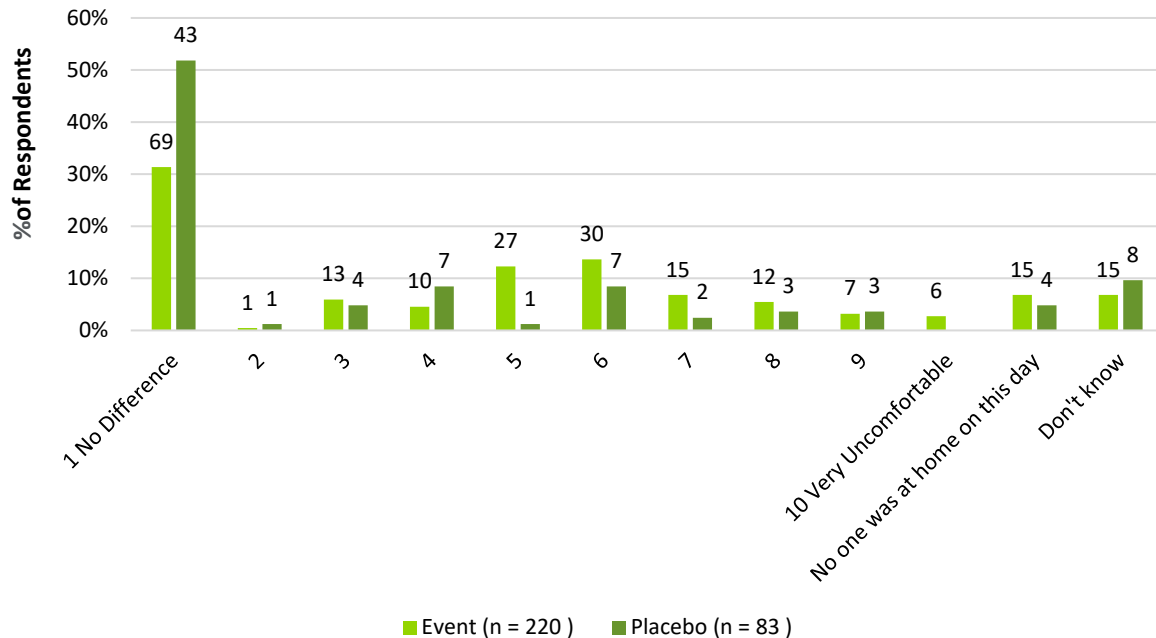
C.5.1 Comfort

During a control event, Xcel Energy sends a signal to adjust the setpoint of a participant's smart thermostat by a maximum of 4 degrees. An event can last up to 6 hours. As a result, the participant may experience a change in their comfort. Both the post-event and placebo surveys first asked respondents to provide feedback on their level of comfort during the event period (or placebo event period) before asking questions about event awareness, behavior and other topics. The placement of questions about comfort was intentional to ensure comparability between post-event and placebo survey feedback related to comfort.⁶

⁶ Comfort questions were asked before the survey acknowledged that an event had occurred in the case of the post-event survey.

Guidehouse compared post-event and placebo survey respondent comfort during the event (or placebo event) times to help Xcel Energy better understand the customer experience and satisfaction with the program. Respondents to both the post-event and placebo surveys were asked whether they noticed a difference in the comfort level of their home during the period in question relative to other summer days with similar outdoor temperatures. As Figure C-3 shows, Guidehouse assessed comfort ratings on a 1 (no change in comfort) to 10 (very uncomfortable) scale.

Figure C-3. Did you or another household member notice a difference in the comfort level of your home? How would you rate the comfort level of your home?



The figure combines the results of questions C1 and C1b in the survey to accurately report on comfort levels.

Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Among post-event survey respondents, 55% reported a change in comfort in their home (a score of 2 or higher)⁷. Interestingly, for placebo survey respondents, around 34% also reported a change in comfort⁸. This provides some support that survey responses may not fully reflect the reality of respondents' experiences or that reports of discomfort among those who were actually signaled for an event may not be wholly attributable to the event itself.

Some post-event respondents reported relatively high comfort impacts during the event. A little over 35% of post-event respondents who were home on the event day reported a comfort change rating of 6 or higher (compared to 21% of placebo respondents)⁹. Of the post-event and placebo survey respondents who reported a change in comfort, a vast majority

⁷ The percentage excludes respondents "don't know" and "no one was home."

⁸ Ibid.

⁹ Ibid.

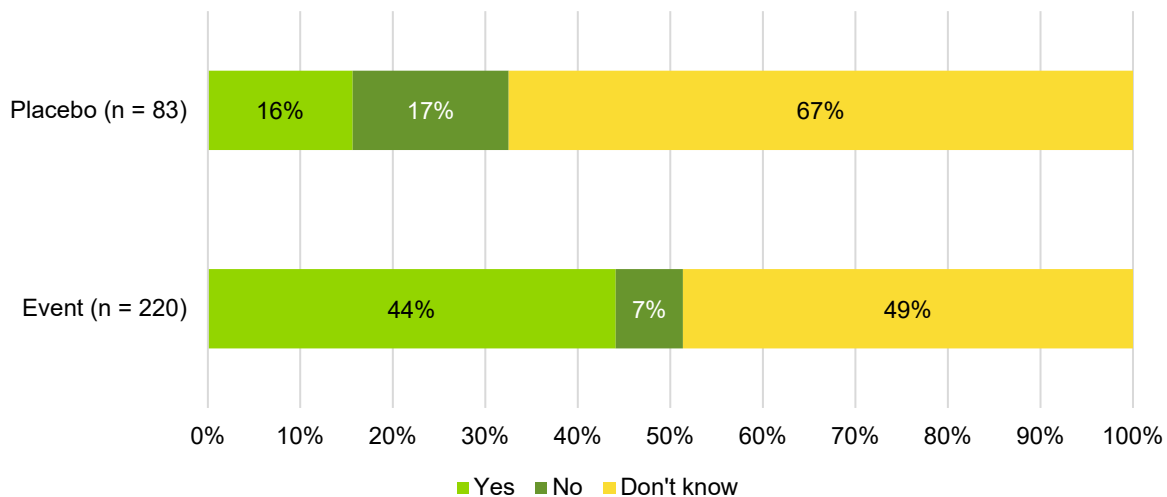
attributed their discomfort to it being too warm inside their home.¹⁰ Of respondents who reported noticing a change in comfort, 80% of post-event respondents and 66% of placebo respondents recognized a change in comfort between the hours of 2:00 p.m. and 6:00 p.m. (MT).

C.5.2 Event Awareness and Notification

In program years prior to 2020, participants were notified that an event was going to occur via an email from Xcel Energy, notifications on the thermostat itself, and through the thermostat’s mobile app. Starting in 2020, event notifications were no longer sent via email from Xcel Energy. In terms of the timing of notifications in 2020, notifications appearing on the thermostat itself were visible only once events were in-progress. In-app notifications were typically sent a few hours before events.

As Figure C-4 shows, **less than half of post-event respondents (44%) were aware that an event occurred.** Notably, 16% of placebo survey respondents reported that an event had been called. Similar to the questions about comfort, this supports that survey responses may not fully reflect the reality of respondents’ experiences.

Figure C-4. As far as you are aware, did Xcel Energy initiate a control event on [Event Date]?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13 and the placebo survey fielded on July 29

As context around event awareness, post-event survey respondents were asked if they were home during the event; 90% of post-event respondents indicated they were home for the entire event or a period of the event. Only 8% of post-event respondents were not home for the entire event and were not actively monitoring their home’s temperature.

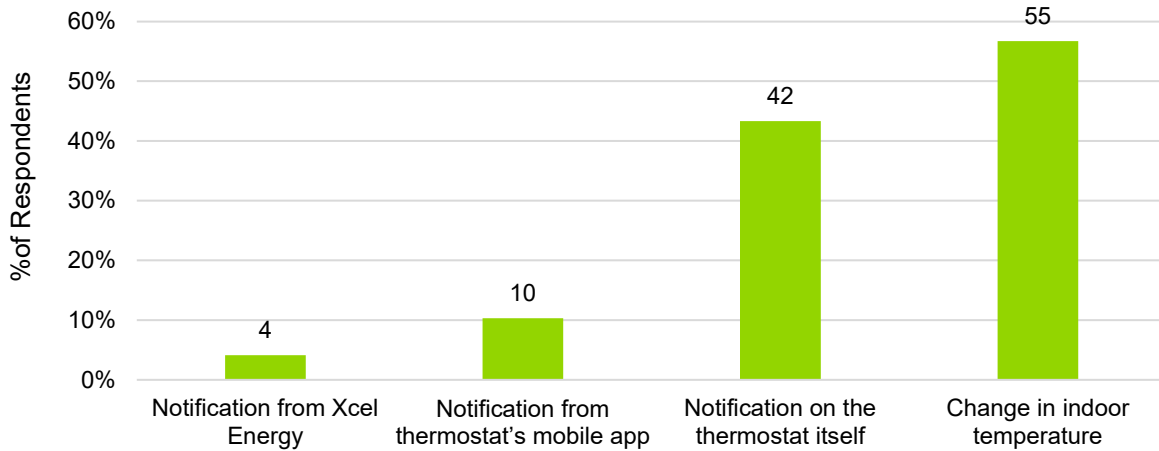
Additionally, post-event survey respondents were asked *how* they became aware of the event. As Figure C-5 shows, **55% indicated they became aware of the event through a change in**

¹⁰ Question C2 asked “Which of the following best describes the reason for your discomfort on [DAY OF WEEK], [DATE]? Select all that apply.” Response options included “Too cold,” “Too warm,” “Too humid,” “Other (Please specify),” and “Don’t know.” This was asked of everyone who indicated they noticed some difference in comfort on the event or placebo event day in C1.

indoor temperature. Of these respondents, 87% were not aware of any event notification but most would like to receive some form of notification.

Of post-event survey respondents, 43% became aware of the event through a notification on the thermostat itself.¹¹ **Only 10% indicated they became aware of the event through their thermostat’s mobile app.** This may be because they have their thermostat app’s push notifications suppressed.

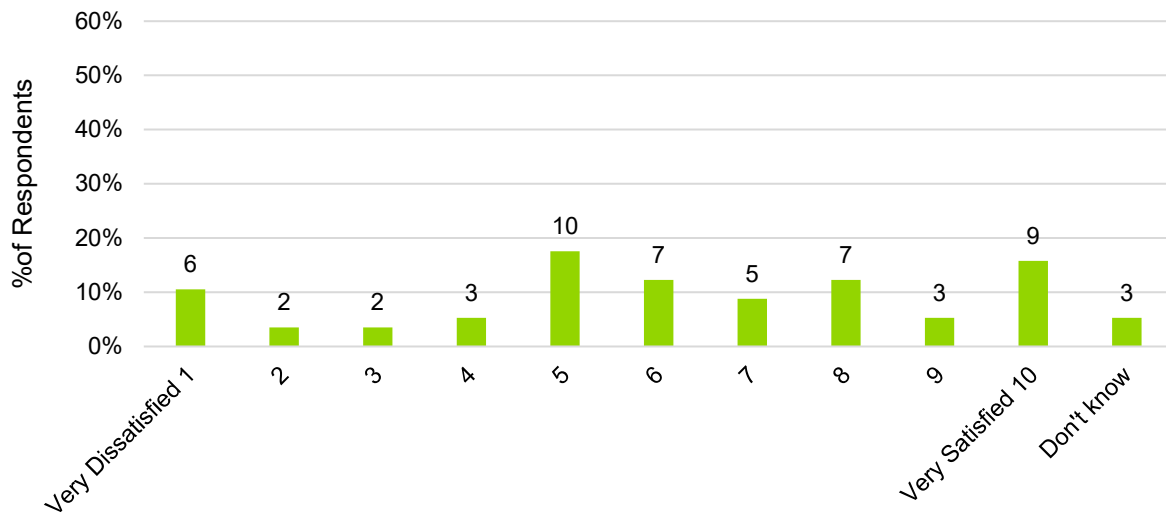
Figure C-5. How did you become aware of the control event? (n=97)



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Those who reported receiving some form of event notification were asked how satisfied they are with the notification provided (Figure C-6). **40% (or 23) of those who reported receiving event notification rated their satisfaction as a 5 or lower on a 1 (very dissatisfied) to 10 (very satisfied) scale, indicating opportunities for improvement.**

¹¹ The percentage of respondents with ecobee thermostats who became aware of the program via the thermostat itself was 49%; for those with Honeywell thermostats, 25% became aware via their thermostat.

Figure C-6. How satisfied are you with the event notification? (n=57)


Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

In an open-ended question, respondents who recalled receiving notification and were not fully satisfied with the notification they receive provided the following feedback:

1. Would like notification via email (2 mentions)
2. Would like notification via text message, indicating this occurred in previous years (1 mention)
3. Generally, would like to receive better communication about events, including more advance notification. Respondents only recognized an event was occurring when they viewed their thermostat (8 mentions).

C.5.3 Event Behavior

This section describes the behavior of post-event survey respondents who were aware an event occurred.

Pre-Cooling

In preparation for an event being called, Xcel Energy may pre-cool the home to limit potential discomfort during the time of an event. During a pre-cooling phase, for Honeywell and Emerson devices, Xcel Energy decreases thermostat setpoints by 2 degrees. In the case of ecobee devices, ecobee employs its own pre-cooling algorithm.

Less than one-quarter of post-event survey respondents (21 respondents) noticed that their home was automatically pre-cooled before the event. Respondents were given the opportunity to provide open-ended feedback on pre-cooling. None indicated dissatisfaction with it.

When asked if post-event respondents took any actions on their own to prepare for the event, a vast majority (94%) indicated they did not take any action to prepare for the

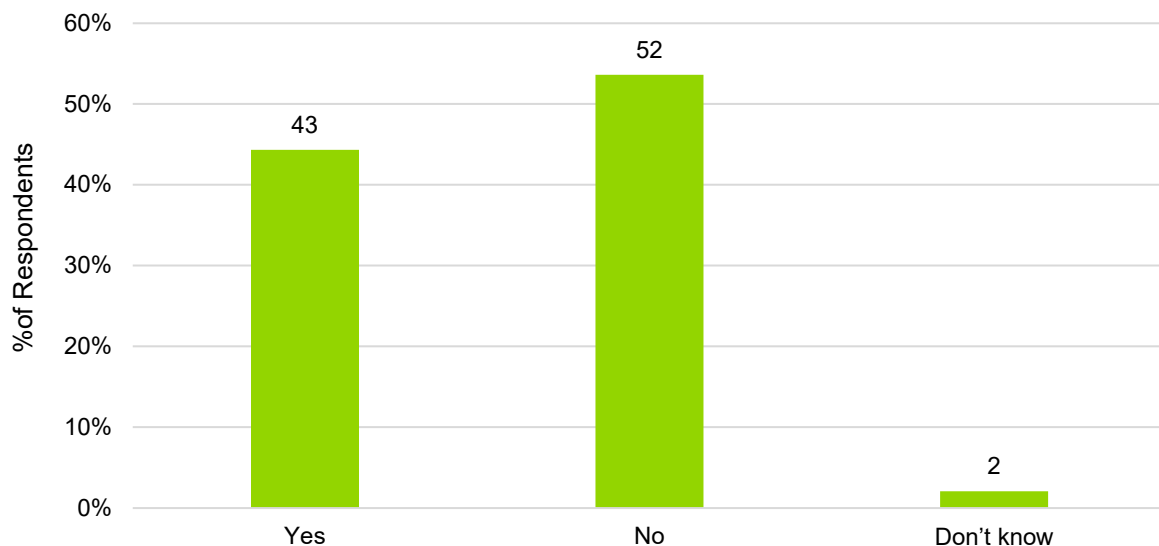
event. This is not surprising given the vast majority of respondents did not report receiving advance notification¹² and would not have known an event was going to take place.

Opt-Out Behavior

Participants have the option to opt out of an event at any time; they can do so simply by overriding the event temperature setpoint. The survey included questions focused on understanding participants' opt-out behavior.

When post-event respondents who were aware of the event were asked if they opted out of the event, almost half (44%) indicated they opted out, as Figure C-7 shows. This is an overall opt-out rate of 20% when including those who were not aware of the event (and, therefore, likely would not have opted out). Fifty percent of those who reported a change in comfort level opted out of an event.

Figure C-7. Did you or another household member override or “opt out” of the control event? (n=97)



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020.

Of the respondents who opted out, a majority overrode the event by adjusting the temperature setting on their Wi-Fi thermostat itself (74%) as opposed to through their Wi-Fi thermostat's app.

When comparing opt-out behavior to the notification post-event respondents received, a vast majority were aware an event was occurring due to the change in the temperature of their home rather than through notification of the event. This finding suggests that notification of the event does not contribute appreciably to increasing opt-out behavior, and, in fact, could help to lower opt outs by allowing people to make advance preparations.

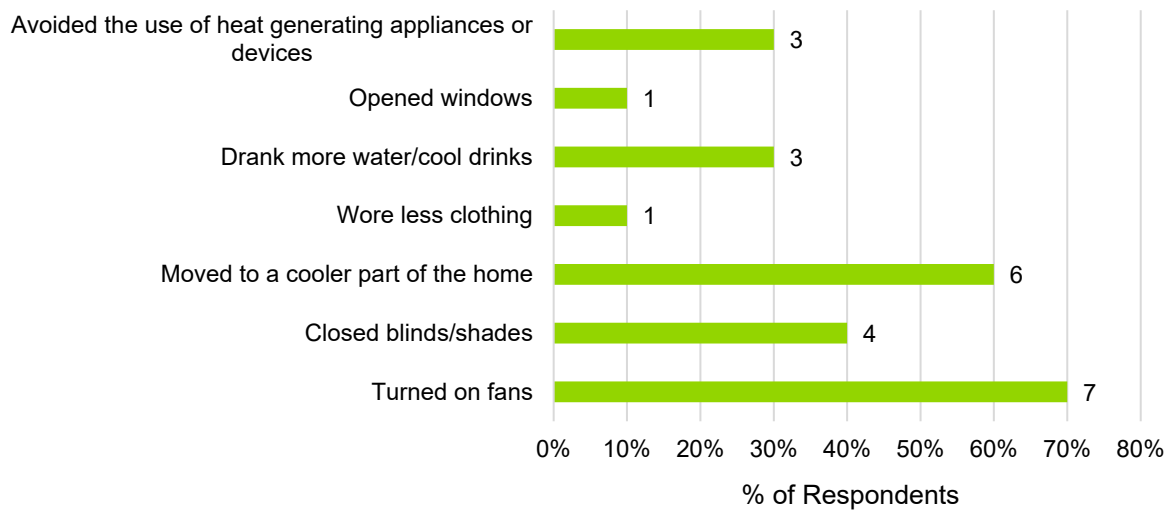
¹² Most respondents became aware of the event either by noticing a change in temperature or seeing a notification on the thermostat itself that an event was in-progress.

Other Actions

During an event, participants may take steps to stay cool and increase their comfort level. The survey asked post-event respondents about the actions they may have taken to avoid discomfort during the event. **Of the post-event respondents who did not opt out of the event, 78% did not take any actions to feel more comfortable, despite the majority of them having noticed a change in comfort.** This finding suggests informing respondents about ways to stay comfortable during a control event could increase customer satisfaction.

Those who did make a change in their actions during an event indicated they turned on fans, closed blinds, moved to a cooler part of the home, wore less clothes, drank more water/cool drinks, opened windows, and avoided the use of heat generating appliances, as Figure C-8 shows.

Figure C-8. What changes to your routine did you make? (n=9)



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Needs for Assistance

The survey assessed customer support provided to AC Rewards program participants. Post-event respondents were asked if they contacted Xcel Energy with any questions or concerns related to the program.

Very few post-event respondents (7 respondents) reached out to Xcel Energy with questions or concerns regarding the AC Rewards program. Of those who did reach out, they contacted Xcel Energy to learn more about the control event, time of the event, and pre-cooling.

Satisfaction with Events

The surveys assessed the current levels of participant satisfaction with aspects of the AC Rewards program including the temperature during the event, length of the event, time of the

event, and event notification¹³ to identify areas of improvement. Guidehouse assessed satisfaction of these topics by asking respondents to rate their satisfaction on a 1 (very dissatisfied) to 10 (very satisfied) scale.

Ratings for event notification, length, timing, and temperature during the event indicate there may be opportunities for improvement (Figure C-9). Across all events, satisfaction ratings for these event attributes ranged from 5.7 to 6.2.

Post-event respondents were somewhat satisfied with the timing of events and event notifications, providing an average satisfaction rating of 6.2 and 6.1, respectively. Of those who reported receiving event notifications, some offered suggestions for improvement such as sending notifications through text message or email and generally providing better communication about control events. Related to the timing of events, post-event respondents indicated frustration that events occur at the hottest time of the day, but they acknowledged the reasoning for calling events at that time to relieve pressure on the grid.

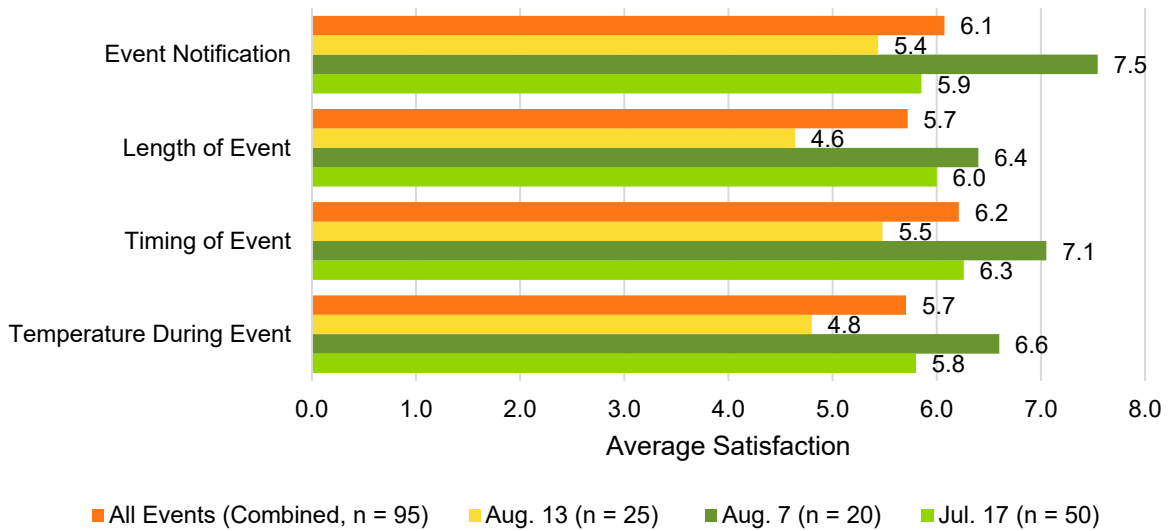
Across all events, post-event respondents were less satisfied with the temperature during the event and the length of the event. Respondents provided mean satisfaction ratings of 5.7 for both program aspects. When asked to provide a reasoning for their satisfaction rating, post-event respondents indicated the events were too long and the temperatures in their home were too warm because the events occur at the warmest period of the day and at a time of meal preparation.

Comparing average satisfaction results across post-event survey efforts (see Table C-3 for temperature information on the day of the event), it is evident that **reported satisfaction results were lower during the event on August 13**. The difference in satisfaction ratings associated with the August 13 event relative to other events for event temperature, timing, and length is statistically significant.¹⁴ **This may be attributed to a consecutive, 6-hour event occurring on August 12 from 3:00 p.m. to 9:00 p.m.**

¹³ Satisfaction with event notification was summarized in this memo under Event Awareness and Notification. Findings are also included in this section for completeness.

¹⁴ Satisfaction results were significantly lower on this date for the temperature during the event (p-value = 0.047), time of the event (p-value = 0.074), and length of the event (p-value = 0.018). Guidehouse conducted a Welch Two Sample T-Test to compare the mean satisfaction scores at the 90% confidence level of the event on August 13 to all other event dates.

Figure C-9. How satisfied are you with your AC Rewards experience?



Note: Don't know responses were excluded from analysis. The n values may differ by event.

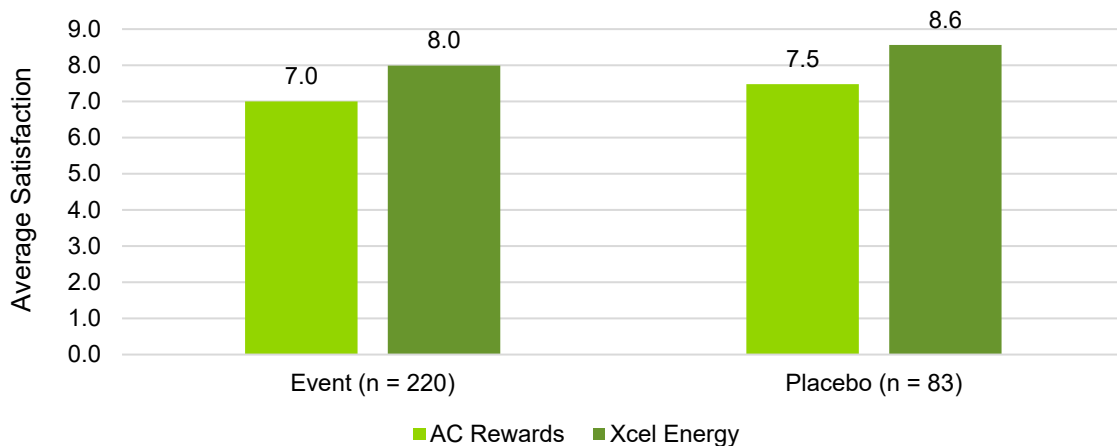
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

C.5.4 Overall Satisfaction

In addition to questions related to participant satisfaction with event attributes, the survey solicited feedback on respondents' satisfaction with the AC Rewards program overall and Xcel Energy in general.

As Figure C-10 shows, **post-event survey respondents responded positively to both the AC Rewards program and Xcel Energy, providing average satisfaction scores of 7 and 8, respectively. Placebo respondents also provided high satisfaction ratings.**

Figure C-10. How satisfied are you with AC Rewards and Xcel Energy?

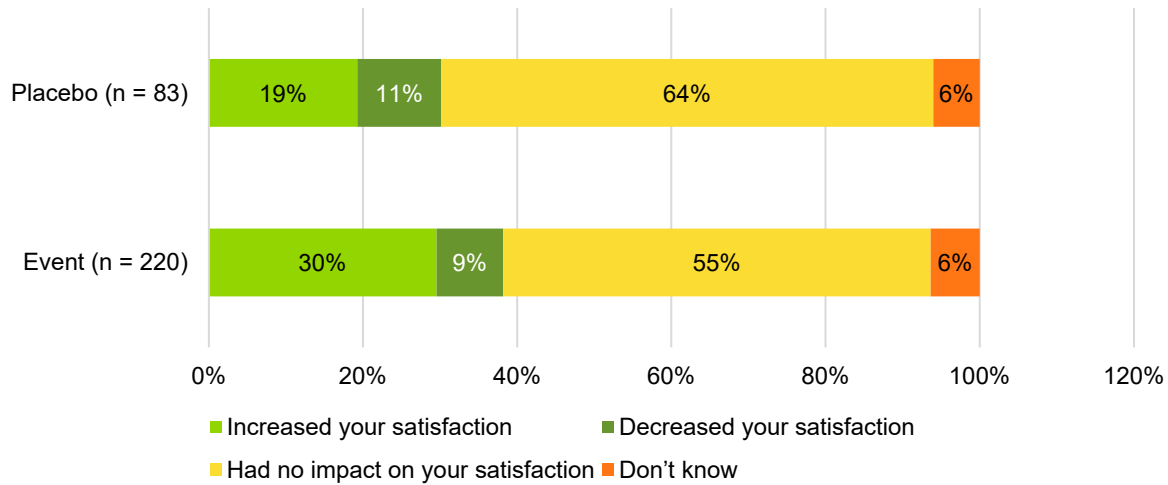


Note: Don't know responses were excluded from analysis.

Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020 and the placebo survey fielded on July 29, 2020

Additionally, as Figure C-11 shows, few respondents indicated their AC Rewards experience has negatively impacted their satisfaction with Xcel Energy. In fact, roughly one-third of post-event respondents indicated the AC Rewards program increased their satisfaction with Xcel Energy.

Figure C-11. How has AC Rewards impacted your satisfaction with Xcel Energy overall?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Although high satisfaction scores were provided, respondents offered suggestions to improve the program. The following three common themes arose from customer feedback:

1. Increase the incentive and better understanding of rewards for participation (13 mentions)
2. Provide event notifications in the form of emails and texts and provide more advanced notification (29 mentions)
3. Call fewer events and less aggressive thermostat adjustments (19 mentions)

Many respondents left positive remarks about the program. Respondents commented they enjoy the program. They enjoy helping the environment, saving energy, and saving money (~40 mentions). Although many respondents noted energy and cost savings, one respondent framed it particularly well by stating, “It’s great to save money and resources for something so simple” In the final comments, respondents showed their desire to help conserve energy and relieve pressure on the grid in times of capacity constraints. One respondent noted, “[I’m] happy to be a part of this program knowing the value and environmental benefit it achieves”

C.5.5 Considerations

Guidehouse summarizes key findings and considerations in Table C-5.

Table C-5. Key Findings and Considerations

Topic	Key Finding	Considerations
Comfort	<ul style="list-style-type: none"> • Among post-event survey respondents, about 55% reported a change in comfort in their home (a score of 2 or higher).[*] Interestingly, for placebo survey respondents, around 34% also reported a change in comfort. This supports that survey responses may not fully reflect the reality of respondents' experiences or that reports of discomfort among those who were actually signaled for an event may not be wholly attributable to the event itself. • Some post-event respondents reported relatively high comfort impacts during the event. A little over 35% of post-event respondents who were home on event day reported a comfort rating of 6 or higher (compared to 21% of placebo respondents). • Of the post-event respondents who did not opt out of the event, 78% did not take any actions to feel more comfortable, despite the majority of them having noticed a change in comfort 	<ul style="list-style-type: none"> • Provide helpful tips about ways to stay cool during events via the program website as messaging in event notifications or via periodic emails.
Awareness and Notification	<ul style="list-style-type: none"> • Less than half of post-event respondents (44%) were aware that an event occurred. • Of respondents, 55% indicated they became aware of the event through a change in indoor temperature; 87% of these respondents indicated that they did not receive any event notification, but most would like to. • Only 10% indicated they became aware of the event through their thermostat's mobile app. • Of those who reported receiving event notification, 40% (or 23) rated their satisfaction as a 5 or lower on a 1 (very dissatisfied) to 10 (very satisfied) scale, indicating opportunities for improvement. • When asked if post-event respondents took any actions on their own to prepare for the event, a vast majority (94%) indicated they did not take any action to prepare for the event. This is not surprising given that vast majority of respondents did not report receiving advance notification, and thus would not have known that an event was going to take place. 	<ul style="list-style-type: none"> • Provide more information about how and when participants receive event notifications. • Remind people to allow push notifications from their thermostat's app to receive notifications in advance of events. • Consider offering additional forms of advance notification such as email notifications, as possible.

Topic	Key Finding	Considerations
Opt-Out Behavior	<ul style="list-style-type: none"> When post-event respondents who were aware of the event were asked if they opted out of the event, almost half (44%) indicated they opted out. This is an overall opt-out rate of 20% when including those who were not aware of the event. 50% of those who reported a change in comfort level opted out of an event. A vast majority of those who opted out were aware an event was occurring due to the change in the temperature of their home (rather than through event notification). This finding suggests that advance notification of the event does not contribute appreciably to increasing opt-out behavior and, in fact, could help to lower opt outs by allowing for advance preparations. 	<ul style="list-style-type: none"> Analyze setpoint and indoor temperature changes during events to confirm events are operating as expected. Consider imposing a temperature threshold (if not currently part of the program design).
Satisfaction	<ul style="list-style-type: none"> Ratings for event notification, length, timing, and temperature during the event indicate there may be opportunities for improvement. Across all events, satisfaction ratings for these event attributes ranged from 5.7 to 6.2. Reported satisfaction results were lower during the event on August 13, which may be attributed to a consecutive, 6-hour event occurring on August 12. Post-event survey respondents responded positively to both the AC Rewards program and Xcel Energy, providing average satisfaction scores of 7 and 8, respectively. Placebo respondents also provided high satisfaction ratings. Suggestions for program improvement included providing advance notification of event, calling fewer events and making smaller setpoint adjustments, and increasing incentives. 	<ul style="list-style-type: none"> If possible, avoid calling consecutive day events or shorten consecutive day events. Make information related to incentives more prominently displayed on the program website, including when to expect both the enrollment and annual incentive and where to see it on bill.

* Where 1 is “no change in comfort” and 10 is “very uncomfortable.”

C.6 Appendix 1. Post-Event Survey Guide

Xcel Energy AC Rewards Program Participant Post-Event Survey Instrument

C.6.1 Program Overview

The AC Rewards (ACR) program provides Xcel Energy’s residential customers in Colorado and Minnesota the opportunity to earn incentives by allowing Xcel Energy to remotely control their A/C usage via their Wi-Fi thermostat(s) in the summer months during periods of peak demand (“control events”). Guidehouse will conduct surveys with program participants following up to two control events and a “placebo” event on a hot non-event day. The tables below describe the survey attributes and objectives.

Table C-6. ACR Post-Event Survey Summary

Section	Description
Statement of purpose	The key evaluation research objectives addressed through this survey will include evaluating participant awareness and comfort level during actual control events as compared to a non-event, as well as understanding participant awareness of pre-cooling, opt out behavior and other actions taken during events. The survey also serves to assess participant satisfaction with events and with the program generally.
Qualified respondent	For post-event survey: All enrolled ACR participants targeted for a given event, ¹⁵ including those who may have opted out of the event and those who were offline during the event. For the placebo survey: All enrolled ACR program participants. ¹⁶
Target number of completes	100 (per state, per post-event/placebo survey)
Estimated survey length	5-10 minutes
Survey timeline	Survey will be sent to sample within two hours of event or “placebo” event end time
Survey Protocols	<ul style="list-style-type: none"> Any data collection must subscribe to Do Not Contact regulations, should not exceed more than 5 attempts, and supply the Company with final dispositions for any sample provided. Any customer/participant complaint issues related to the programs, the evaluation process or any other Company issues must be forwarded immediately to the Company’s evaluation lead.

Table C-7. ACR Post-Event Survey Variables

Survey Variables	Description	Source
CUSTOMER NAME	Customer name	Xcel Energy Tracking Data
EVENT TYPE	EVENT or PLACEBO	Xcel Energy Tracking Data
DATE (EVENT)	(example, 6/27/2020)	Xcel Energy Tracking Data
DAY OF WEEK (EVENT)	(example, Tuesday)	Xcel Energy Tracking Data
EVENT_STARTTIME	(example, 2:00pm)	Xcel Energy Tracking Data
EVENT_ENDTIME	(example, 6:00pm)	Xcel Energy Tracking Data
STATE	State of residence (COLORADO or MINNESOTA)	Xcel Energy Tracking Data
STREET_ADDRESS	Street address of enrolled residence	Xcel Energy Tracking Data

¹⁵ If an event is region-specific, the sample frame for the corresponding post-event survey would include only those targeted for the event.

¹⁶ Since weather varies by region, the placebo survey may target participants living in certain regions to limit the survey to only those experiencing event-like conditions.

C.6.2 Sample

This table outlines Guidehouse’s sampling techniques.

Table C-8. ACR Post-Event Sample Plan

Topic	Description	Population
Sample size	How many completes will you need to reach a precision level of $\pm 10\%$ at the 90% confidence level?	<ul style="list-style-type: none"> 6 samples are needed – a sample for each state and survey effort (Post-Event 1, Post-Event 2, and Placebo). Guidehouse will target 100 completes per survey and state, for a total of ~600 completes. Assuming a 10% response rate, each survey sample will consist of 1,000 participants (6,000 total). Each survey sample will be mutually exclusive (if feasible)¹⁷
Stratification	How complex is the sample? Do you need to stratify?	<ul style="list-style-type: none"> The survey sample will be stratified by state (CO and MN)
Unique attributes	What is the ability level of the population? Are there language barriers? Do you need to consider literacy rates? Do you need to specialize the training of your surveyors?	No special training or unique attributes are expected.
Incentives	Any incentives or persuasion techniques?	\$5 per complete

C.6.3 Survey Overview

Table C-9. ACR Post-Event Survey Sections

Research Objective	Survey Questions
Intro	INTRO1-2
Comfort	C1-C2
Event Awareness and Notification	AN1-AN5
Pre-Cooling	PC1-PC3
Opt Out Behavior	OO1-OO5
Other Actions	OA1-OA2
Needs for Assistance	NA1-NA3
Satisfaction with Control Events	S1-S2

¹⁷ Meaning any given participant will only be contacted for 1 post-event/placebo survey regardless of whether or not they respond to the survey.

Research Objective	Survey Questions
Overall Satisfaction	S3-S5
Demographics	QD1-QD11
Closing	C1-C2

C.6.4 Online Survey Email Recruitment Script

Subject Line: Get \$5 for Telling Us What You Think - Xcel Energy's AC Rewards Program

Sender: Xcel Energy

Dear Valued Customer,

Thank you for participating in Xcel Energy's AC Rewards Program!

Xcel Energy would like to hear about your experience. As a thank you for your time, we are offering you a \$5 Amazon eGift Card* to complete the survey!

(This survey is being administered by Xcel Energy's third-party evaluator, Guidehouse. Your survey responses will be confidential.)

Please have the family member in your household who is **most familiar with AC Rewards** take this survey.

The survey will take approximately 10 minutes to complete. If you cannot complete the survey or you accidentally exit mid-course, you can resume where you left off by clicking on the link from this email or hitting the back button in your browser.

At the end of the survey, you will be asked to provide your name and email so that we can send you the Amazon eGift Card. Please respond by **[Date/time that is 48 hours from event]**.

Please click on the link below to take this short survey:

[SURVEY LINK, IN BUTTON FORM]

If you have any questions about the survey, please contact the Xcel Energy Customer Care Center at 800.895.4999.

Thank you in advance for completing the survey!

Sincerely,

Meagan Madden

Xcel Energy | Responsible By Nature
AC Rewards Manager

XCELENERGY.COM

*Amazon.com is not a sponsor of this promotion. Amazon, Amazon.com, the Amazon.com logo, the Amazon Gift Cards logo, and 1-Click are trademarks of Amazon.com, Inc. or its affiliates.

C.6.5 Online Survey Landing Page and Introduction

Thank you for sharing your experience with AC Rewards. Your feedback is important and will help us improve the program to better serve customers like you.

- We expect the survey to take no longer than 10 minutes to complete.
- Your responses will be kept confidential, shared only in aggregate with Xcel Energy.
- In reporting results, no comments will be attributed to specific individuals.

We appreciate your participation. Thank you again!

INTRO1. Our records indicate that you are participating in a smart thermostat program called AC Rewards. Is this correct?

1. Yes
2. No **[TERMINATE: We appreciate your willingness to complete the survey. However, unfortunately, you do not meet the qualifications to complete the survey. Thank you.]**

C.6.6 Control Events

AC Rewards helps you earn incentives from Xcel Energy during periods of high electricity demand, typically very hot summer days. During these periods, Xcel Energy may make small adjustments to your Wi-Fi thermostat setting; these are called “control events”. Control events reduce your central air conditioner’s cooling while still keeping you comfortable.

INTRO2. Has Xcel Energy initiated a control event since you enrolled in AC Rewards?

1. Yes
2. No
98. Don’t know

Comfort

C1. Did you or another member of your household notice a difference in the comfort level of your home any time on **[DAY OF WEEK], [DATE]** compared to a typical summer day with similar outdoor temperatures? **[RANDOMIZE RESPONSE OPTIONS]**

1. Yes, I or another household member felt a difference in comfort level
2. No, the temperature in our home stayed comfortable as usual **[SKIP TO AN1]**
3. No one was at home on this day **[SKIP TO AN1]**
98. Don’t know **[SKIP TO AN1]**

[ASK IF C1=1, ELSE SKIP TO AN1]

C1A. At approximately what time did you first notice a difference in the comfort level of your home on **[DAY OF WEEK], [DATE]**?

1. 10 AM
2. 11 Am
3. 12 PM
4. 1 PM
5. 2 PM
6. 3 PM
7. 4 PM
8. 5 PM
9. 6 PM
10. 7 PM
11. 8 PM
12. 9 PM
13. 10 PM
98. Don't know

C1B. How would you rate the comfort level of your home on **[DAY OF WEEK], [DATE]** using a scale of 1 to 10 where **1** is **no difference in comfort** (relative to days with similar outdoor temperatures) and **10** is **very uncomfortable**?

No difference										Very uncomfortable	Don't Know
1	2	3	4	5	6	7	8	9	10	98	

[ASK ONLY IFC1B=2-10. OTHERWISE SKIP TOAN1] [PROGRAMMING NOTE: CUSTOMERS WILL NOT BE ABLE TO SELECT BOTH TOO COLD AND TOO WARM]

C2. Which of the following best describes the reason for your discomfort on **[DAY OF WEEK], [DATE]**? Select all that apply.

1. Too cold
2. Too warm
3. Too humid
4. Other (Please specify)
98. Don't know

Event Awareness and Notification

AN1. As far as you are aware, did Xcel Energy initiate a control event on [DAY OF WEEK], [DATE]?

1. Yes
2. No
98. Don't know

[Ask if EVENT_TYPE=EVENT, otherwise skip to S3]

AN2. Xcel Energy initiated a control event on [DAY OF WEEK], [DATE], starting at [INSERT EVENT_STARTTIME] and ending at [INSERT EVENT_ENDTIME].

Which of the following characterizes *your* presence during this control event? (Select only one)

1. I was home during this entire period.
2. I was home for only part of this period.
3. I was not home during any of this period and was not remotely monitoring my home's temperature.
4. I was not home during any of this period, but I was remotely monitoring my home's temperature.
98. Don't know

[Ask if AN1=1, ELSE SKIP TO S3]

AN3. How did you become aware of the control event? Select all that apply {RANDOMIZE 1-4}

1. Notification from Xcel Energy
2. Notification from thermostat's mobile app
3. Notification on the thermostat itself
4. Change in indoor temperature
5. Other [OPEN-END]
98. Don't know

[Ask if AN3=4 or 5]

AN4. Did you receive notification about the control event on [DAY OF WEEK], [DATE]?

1. Yes
2. No
98. Don't know

[Ask if AN4=2]

AN5. Would you like to receive notifications about future controls events?

1. Yes
2. No
98. Don't know

Pre-Cooling

PC1. "Pre-cooling" sometimes occurs before a control event. During pre-cooling, your thermostat's temperature setting will automatically be lowered to keep you comfortable during the event. Did you notice pre-cooling prior to the event on **[DATE]**? (Pre-cooling does not include your own scheduled temperature changes or manual thermostat adjustments.)

1. Yes
2. No
98. Don't know

[IF PC1 = 1, CONTINUE. ELSE SKIP TO PC3]

PC2. Do you have any feedback about the "pre-cooling" that occurred prior to the control event?

1. Yes (Please specify) **[OPEN ENDED]**
2. No

PC3. Prior to the control event on **[DATE]**, did you take any actions to prepare for the control event?

1. Yes (Please specify) **[OPEN ENDED]**
2. No
98. Don't know

Opt Out Behavior

OO1. Did you or another member of your household override or "opt out" of the control event on **[DATE]**?

1. Yes
2. No
3. Don't know

[ASK IF OO1 = 1, ELSE SKIP TO OA1]

OO2. What action did you or another member of your household take to opt out of the control event? **[ALLOW MULTIPLE RESPONSES]**

1. Overrode the pre-cooling temperature setting before the event
2. Overrode the control event temperature setting during the event
3. Other **[OPEN-END]**
4. Don't know

[ASK IF OO1 = 1, ELSE SKIP TO OA1]

OO3. Which did you use to opt out of the control event?

1. Wi-Fi thermostat itself
2. Wi-Fi thermostat mobile app
3. Wi-Fi thermostat web app
4. Other **[OPEN-END]**
5. Don't know

[ASK IF OO1 = 1, ELSE SKIP TO OA1]

OO4. What caused you or another member of your household to opt out of the control event?
[OPEN-END]

[ASK IF OO1 = 1, ELSE SKIP TO OA1]

OO5. Did you encounter any challenges when you tried to opt out?

1. Yes (Please specify) **[OPEN-END]**
2. No
98. Don't know

Other Actions**[OO1 = 1, SKIP TO NA1, ELSE CONTINUE]****[Please put OA1 and OA2 on the same page.]**

OA1. Did you or other members of your household make changes to your typical daily routine to stay comfortable during the control event on **[DATE]**?

1. Yes
2. No
98. Don't know

[Ask only if OA1=1. Otherwise, skip to NA1]

[Please put OA1 and OA2 on the same page.] PROGRAMER NOTE: Randomize answer options, keep "Other" and "Don't know" static.

OA2. What changes to your routine did you make? Please select all that apply.

1. Continued normal activities/Didn't do anything different
2. Did not notice a difference in temperature **[MUTUALLY EXCLUSIVE]**
3. Turned on fans
4. Turned on room/window air conditioners
5. Closed blinds/shades
6. Moved to a cooler part of the home
7. Left the home and went somewhere cool

- 8. Wore less clothing
- 9. Drank more water/cool drinks
- 10. Opened windows
- 11. Avoided use of heat-generating appliances or devices
- 12. Cooled off with water (e.g. took a shower, went swimming in home pool, ran through sprinklers)
- 00. Other _____ **[OPEN END]**
- 98. Don't know

Needs for Assistance

NA1. Since enrolling in AC Rewards, do you recall if you or another member of your household contacted Xcel Energy with any questions or concerns related to the program?

- 1. Yes
- 2. No
- 98. Don't know

[Ask if NA1=1. Otherwise, skip to S1]

NA2. What have you contacted Xcel Energy about? **[OPEN-END]**

[Ask if NA1=1. Otherwise, skip to S1]

NA3. Did Xcel Energy provide the help you needed?

- 1. Yes
- 2. No
- 3. Only in part
- 98. Don't know

C.6.7 Satisfaction with the Control Events

S1. On a scale of 1-10, how satisfied are you with the following aspects of the control event on **[DAY OF WEEK], [DATE]**?

	Very Dissatisfied									Very Satisfied	Don't Know
a. Temperature during event	1	2	3	4	5	6	7	8	9	10	98
b. Timing of event	1	2	3	4	5	6	7	8	9	10	98
c. Length of event	1	2	3	4	5	6	7	8	9	10	98
d. [Skip if C5A=2]	1	2	3	4	5	6	7	8	9	10	98

	Very Dissatisfied									Very Satisfied	Don't Know
Event Notification											

[If S1a = 1-6, CONTINUE. ELSE SKIP TO S2b]

S2A. Why did you rate your satisfaction with event temperature that way?

1. Response:) **[OPEN ENDED]**

[If S1b = 1-6, CONTINUE. ELSE SKIP TO S2c]

S2B. Why did you rate your satisfaction with event timing that way?

1. Yes (Please specify) **[OPEN ENDED]**

2. No

98. Don't know

[If S1c = 1-6, CONTINUE. ELSE SKIP TO S2d]

S2C. Why did you rate your satisfaction with event length that way?

Response: **[OPEN ENDED]**

[If S1d = 1-6, CONTINUE. ELSE SKIP TO S3]

S2D. Why did you rate your satisfaction with event notification that way?

1. Yes (Please specify) **[OPEN ENDED]**

2. No

98. Don't know

C.6.8 Overall Satisfaction

S3. On a scale of 1-10, how satisfied are you overall with your AC Rewards program experience to-date?

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	98

[IF S3= 98 SKIP TO S4]

S3A. Why did you rate your satisfaction with AC Rewards that way?

_____ **(OPEN END)**

98. Don't know

S3B. Are there ways that your AC Rewards experience could be improved?

1. Yes _____ **(OPEN END)**

2. No

98. Don't know

S4. Now, thinking about Xcel Energy, your electricity provider, and not the AC Rewards program, on a scale of 1 to 10, how satisfied are you with Xcel Energy **in general**?

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	98

[IF S4= 98, SKIP TO S5]

S4A. Why did you rate your satisfaction with Xcel Energy that way?

_____ **(OPEN END)**

98. Don't know

S5. How has your participation in AC Rewards impacted your satisfaction with Xcel Energy overall? Has it...?

1. Increased your satisfaction
2. Decreased your satisfaction
3. Or, had no impact on your satisfaction
98. Don't know

C.6.9 Demographics

We're almost done! Please answer a few final questions for classification purposes.

D1. Our program records indicate the property at this **[STREET_ADDRESS]** is enrolled in AC Rewards. Is this correct?

1. Yes
2. A different address is enrolled in the program: [Open end response] (Don't require forced text entry in the box)

D2. Is this your primary home?

1. Yes
2. No

D3. Which of the following best describes the property type at **[STREET_ADDRESS]**?

1. Single family home
2. Multi-family home (2-4 units)
3. Multi-family home (5+ units)
4. Mobile home
5. Not a residence (business, workshop or other)
6. Other _____

D4. Which of the following best describes your ownership status of your property?

1. Own and live in
2. Own and don't live in

3. Rent

D5. How many people, including yourself, live in your home full-time (at least nine months of the year)?

_____ **[RECORD NUMBER OF OCCUPANTS]**

D6. Excluding short-term vacations (<3 weeks), how many people, including yourself, typically live in your home full-time during summer months (June through September)?

_____ **[RECORD NUMBER OF OCCUPANTS]**

D7. Compared to last summer, how has the amount of time you spend at home on weekdays during the summer changed?

1. More time at home
2. Less time at home
3. About the same

D8. Which of the following age categories do you fall into?

1. 18-24
2. 25-34
3. 35-44
4. 45-54
5. 55-64
6. 65 or over
99. Prefer not to provide

D9. What is the last grade of school you completed?

1. Grade school or less (1-8)
2. Some high school (9-11)
3. Graduated high school (12)
4. Vocational/technical school
5. Some college (1-3 years)
6. Graduated college (4 years)
7. Post graduate education
99. Prefer not to provide

D10. Which category best describes your gender?

1. Male
2. Female
3. Other
99. Prefer not to provide

D11. Please indicate which range best describes the annual income of your entire household (everyone living in your home).

1. Under \$15,000
2. \$15,000 to \$24,999
3. \$25,000 to 39,999
4. \$40,000 to 59,999
5. \$60,000 to \$74,999
6. \$75,000 to \$84,999
7. \$85,000 to \$99,999
8. \$100,000 to \$124,999
9. \$125,000 to \$149,999
10. \$150,00 to 199,999
11. \$200,000 or more
99. Prefer not to provide

C.6.10 Closing

C1. We have reached the end of the survey. Do you have any additional comments regarding AC Rewards?

1. Please enter any additional comments you have regarding the program. **[OPEN ENDED]**
2. None

C2. Thank you for taking the time to fill out this survey for the **AC Rewards Program!** Please provide the email address where you would like us to send your \$5 Amazon eGift Card.

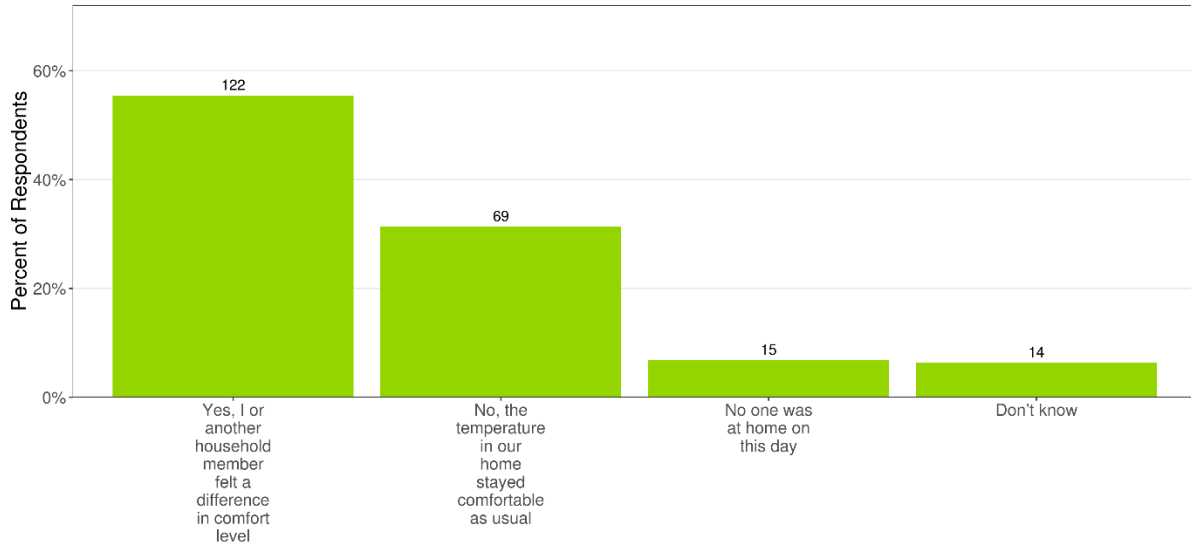
1. Email: **[OPEN ENDED]**
2. I prefer not to provide my email address

[SURVEY CLOSE] Thank you for completing the survey!
Thank you for your time. Xcel Energy appreciates your participation.

C.7 Appendix 2. Post-Event Survey Output

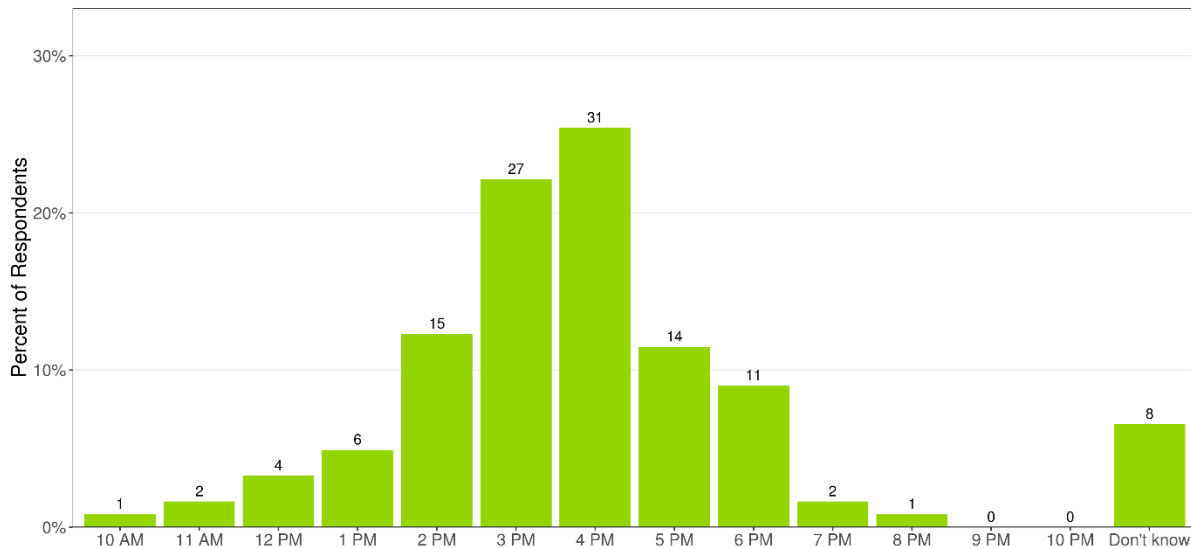
C.7.1 Comfort

Figure C-12. Did you or another member of your household notice a difference in the comfort level of your home any time on [DAY OF WEEK], [DATE] compared to a typical summer day with similar outdoor temperatures?



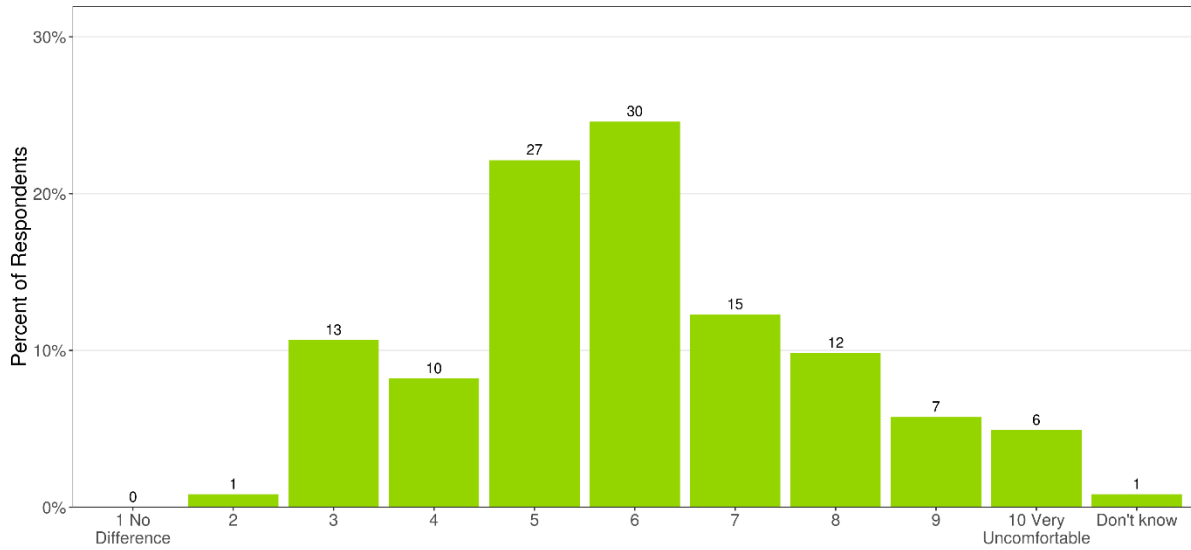
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-13. At approximately what time did you first notice a difference in the comfort level of your home on [Event Date]?



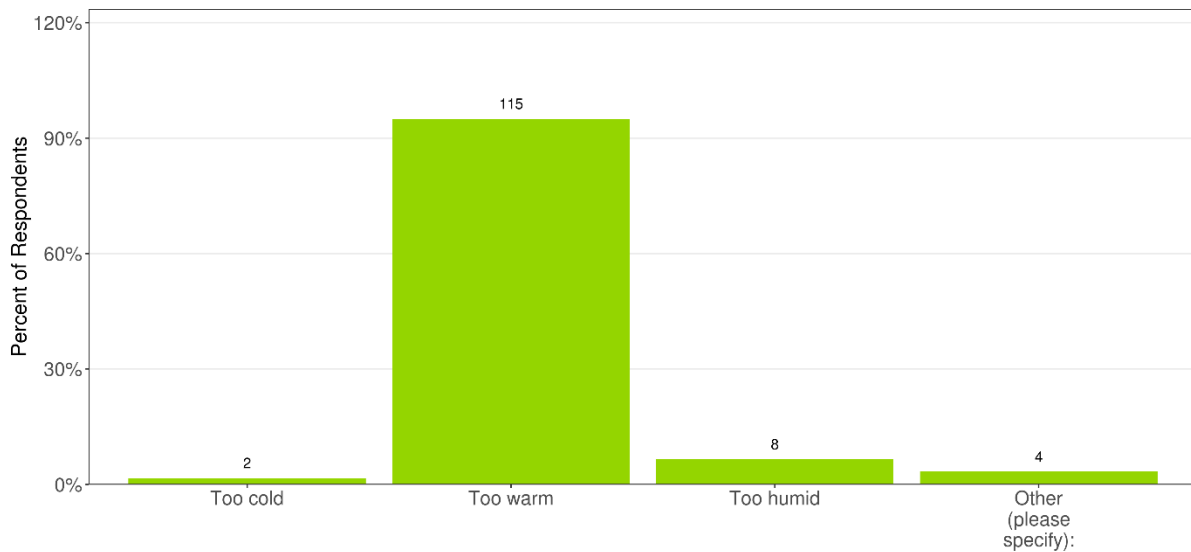
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-14. How would you rate the comfort level of your home on [EVENT DATE]?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

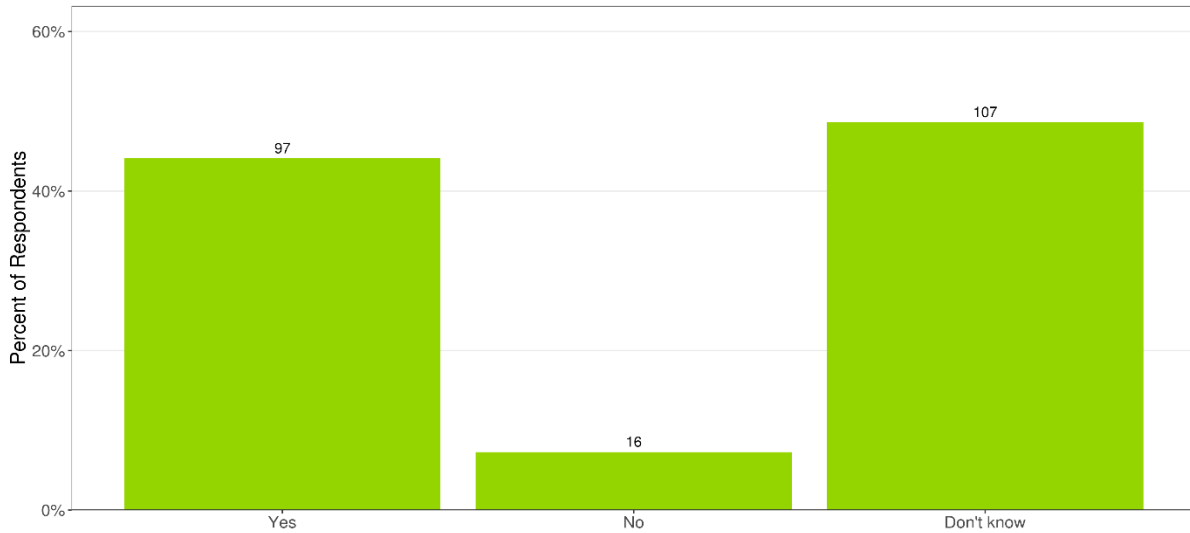
Figure C-15. Which of the following best describes the reason for your discomfort on [EVENT DATE]?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

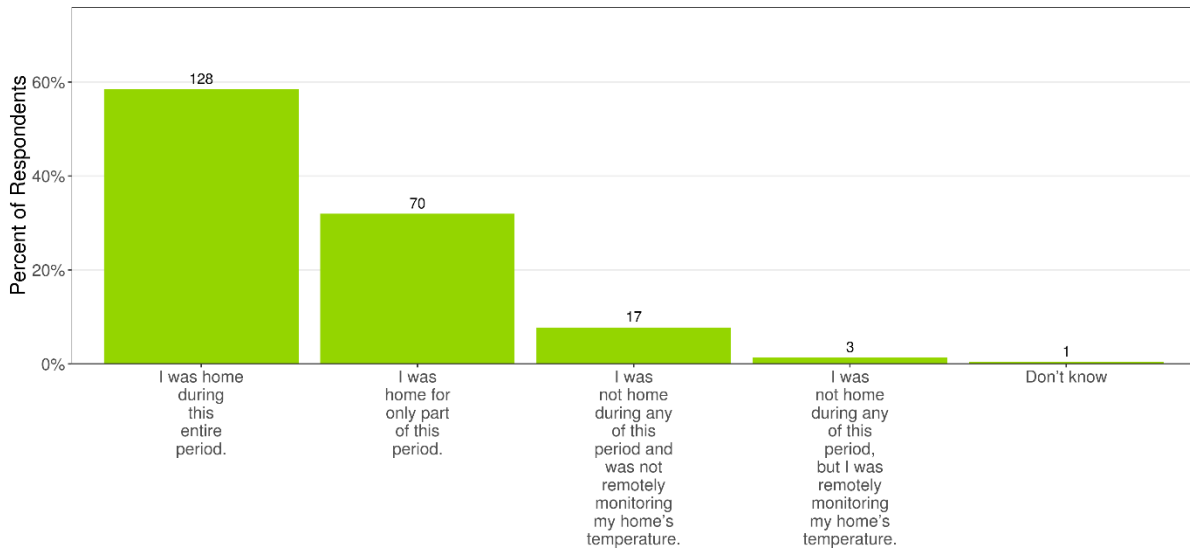
C.7.2 Event Awareness and Event Notification

Figure C-16. As far as you are aware, did Xcel Energy initiate a control event on [EVENT DATE]?



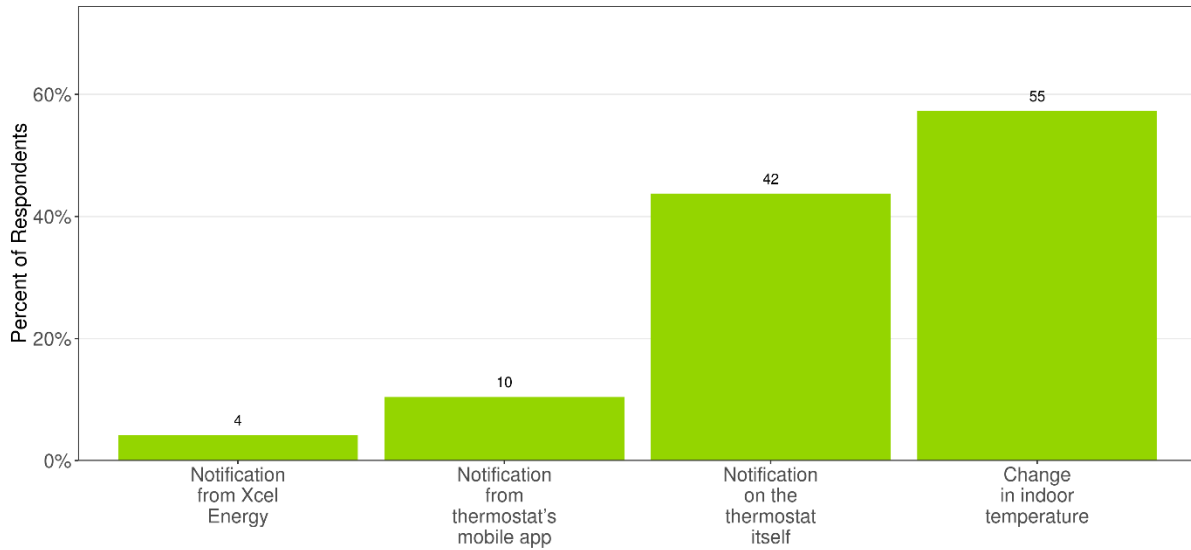
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-17. Xcel Energy initiated a control event on [EVENT DATE] starting at [START TIME] and ending at [END TIME]. Which of the following characterizes your presence during this control event?



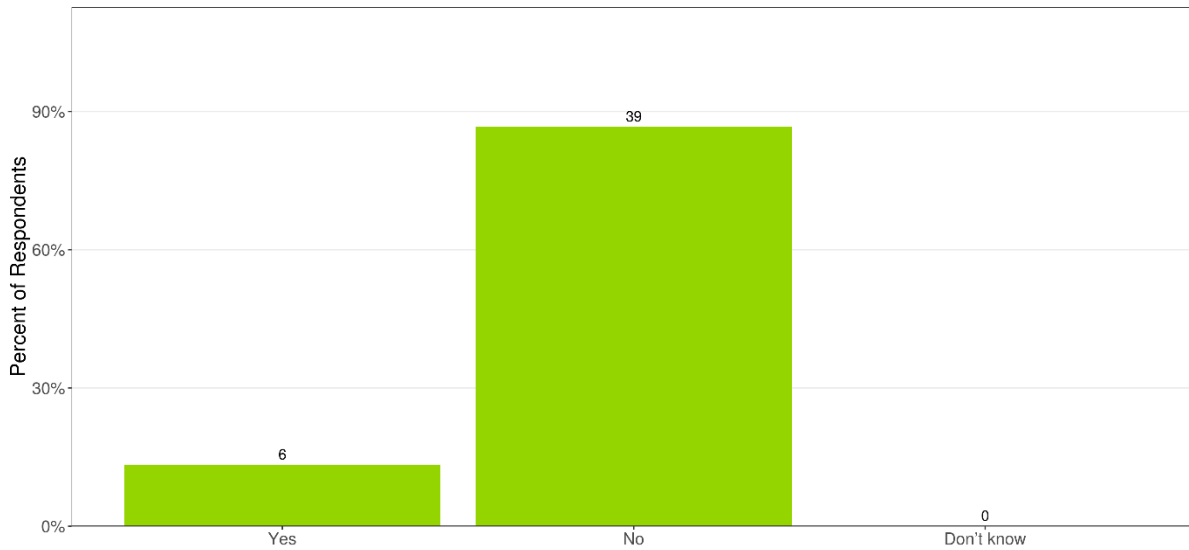
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-18. How did you become aware of the control event? Select all that apply.



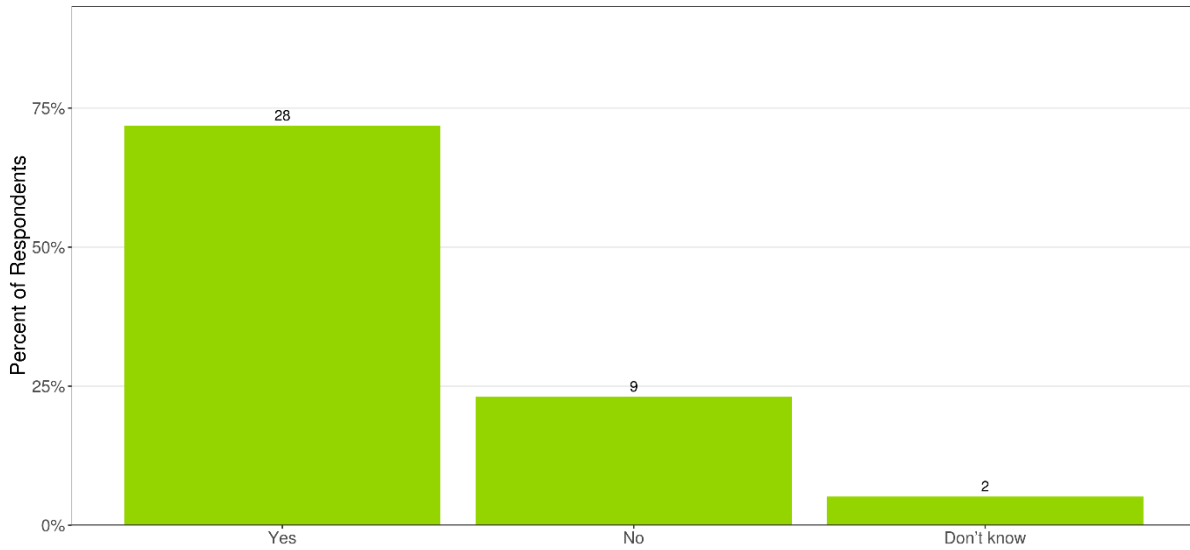
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-19. Did you receive notification about the control event on [EVENT DATE]?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

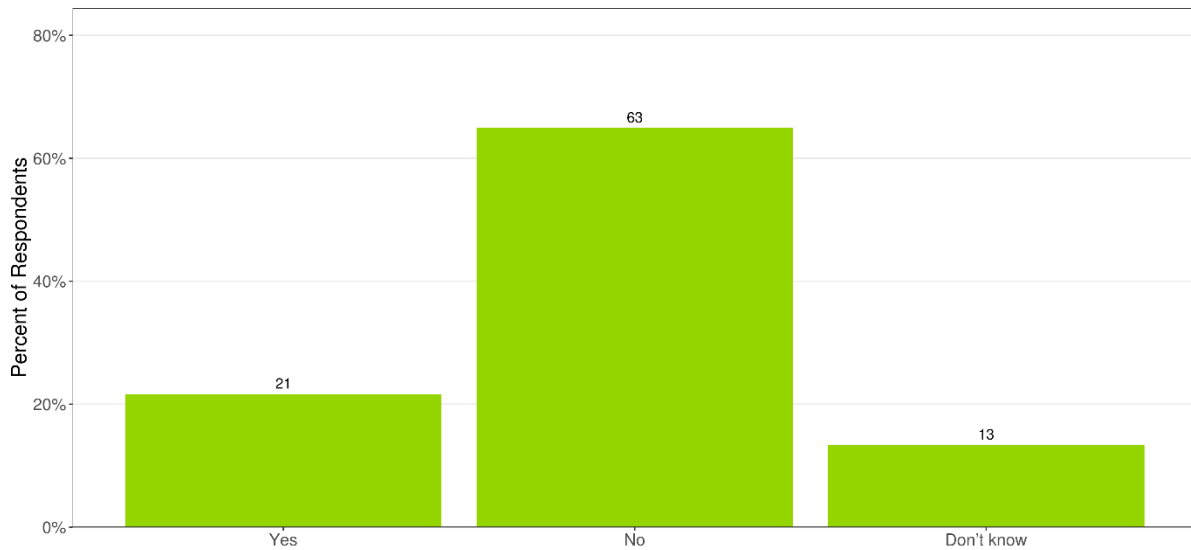
Figure C-20. Would you like to receive notifications about future controls events?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

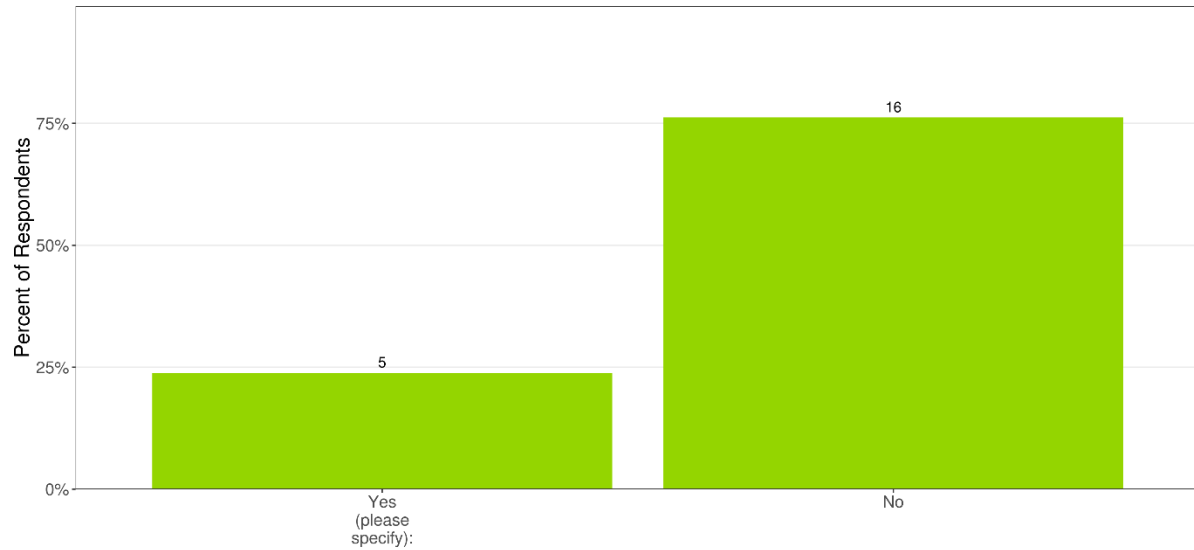
C.7.3 Pre-Cooling

Figure C-21. “Pre-cooling” sometimes occurs before a control event. During pre-cooling, your thermostat’s temperature setting will automatically be lowered to keep you comfortable during the event. Did you notice pre-cooling prior to the event on [EVENT DATE]?



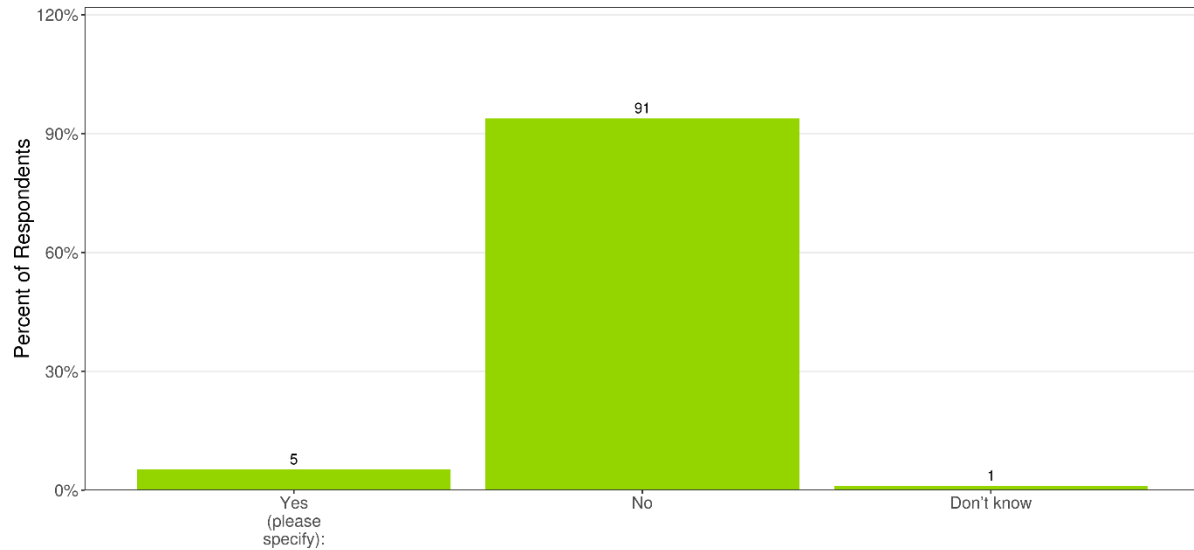
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-22. Do you have any feedback about the “pre-cooling” that occurred prior to the control event?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

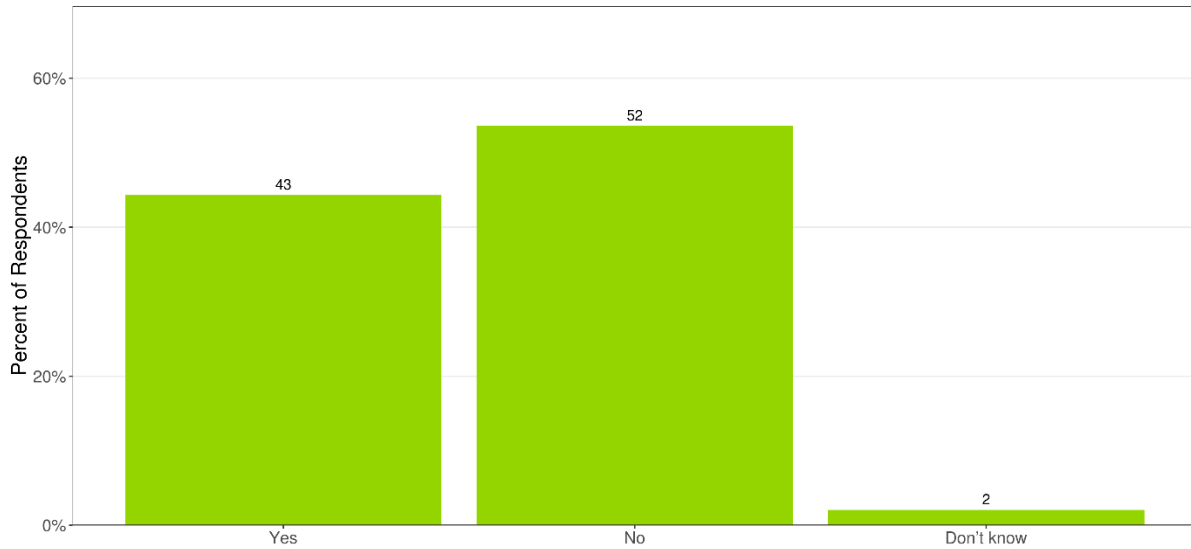
Figure C-23. Prior to the control event on [EVENT DATE], did you take any actions to prepare for the control event?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

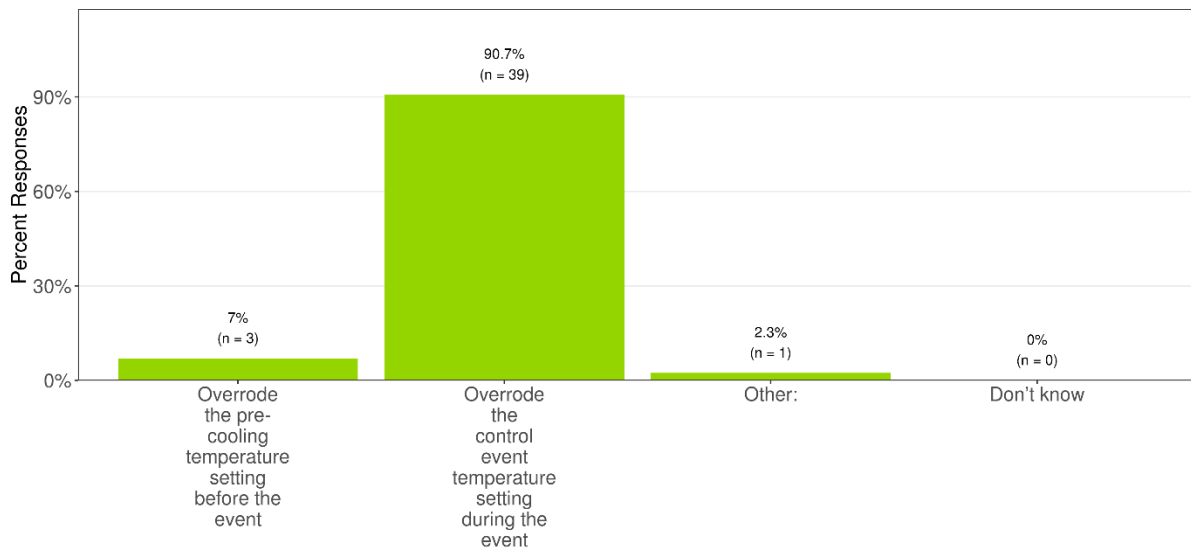
C.7.4 Opt-Out Behavior

Figure C-24. Did you or another household member override or “opt out” of the control event on [EVENT DATE]?



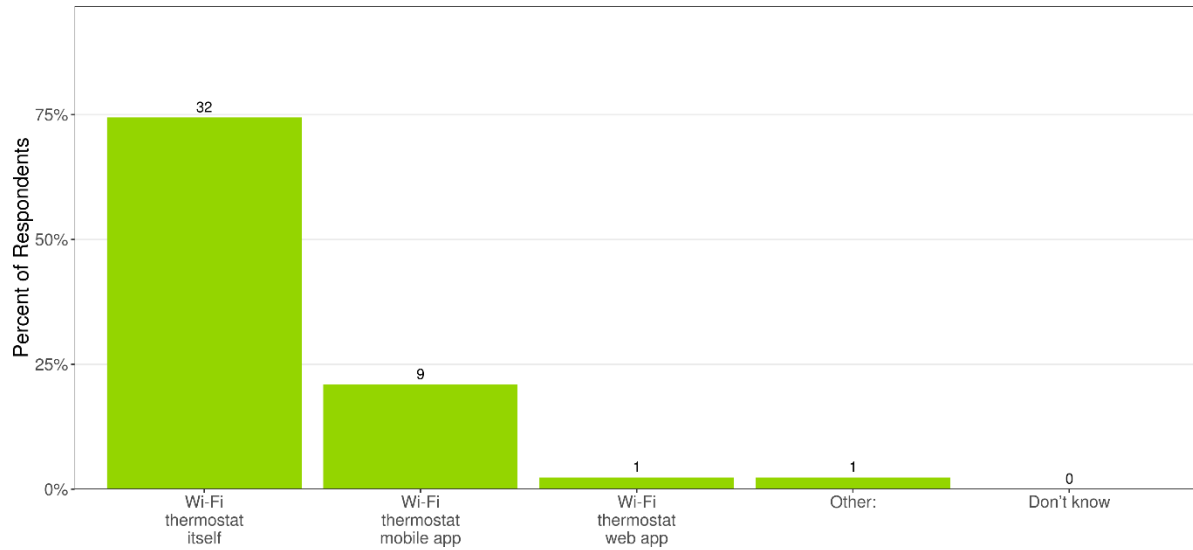
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-25. What action did you or another member of your household take to opt out of the control event?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

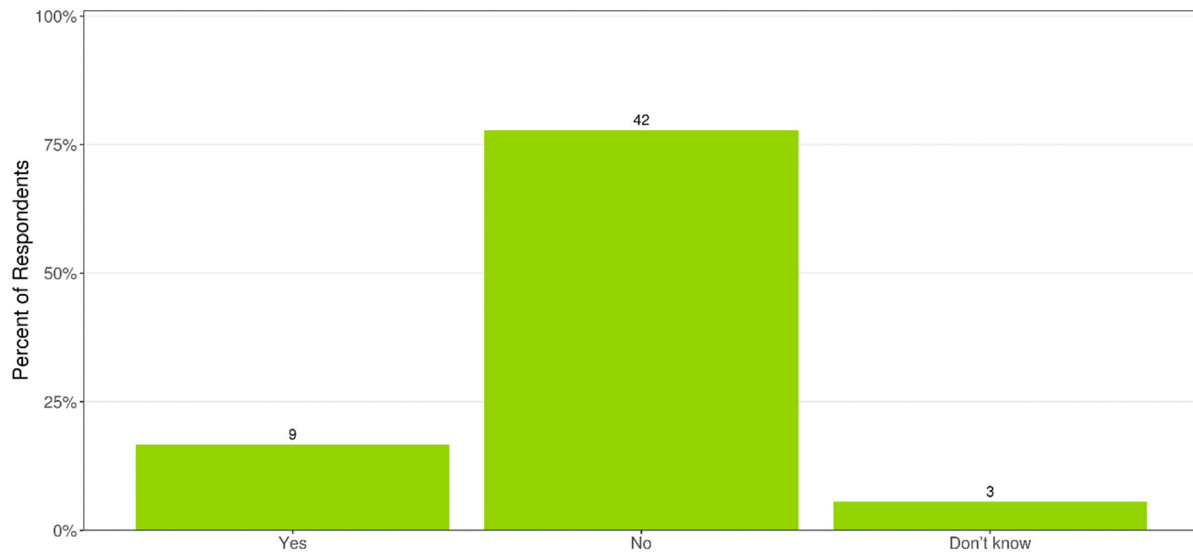
Figure C-26. Which did you use to opt out of the control event?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

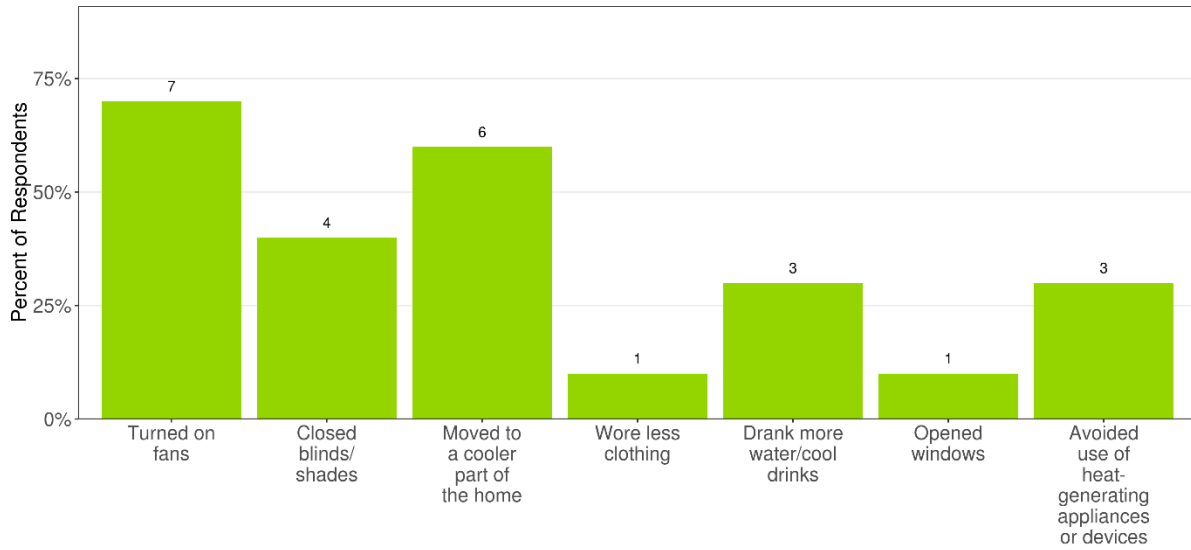
C.7.5 Other Actions

Figure C-27. Did you or other members of your household make changes to your typical daily routine to stay comfortable during the control event on [EVENT DATE]?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

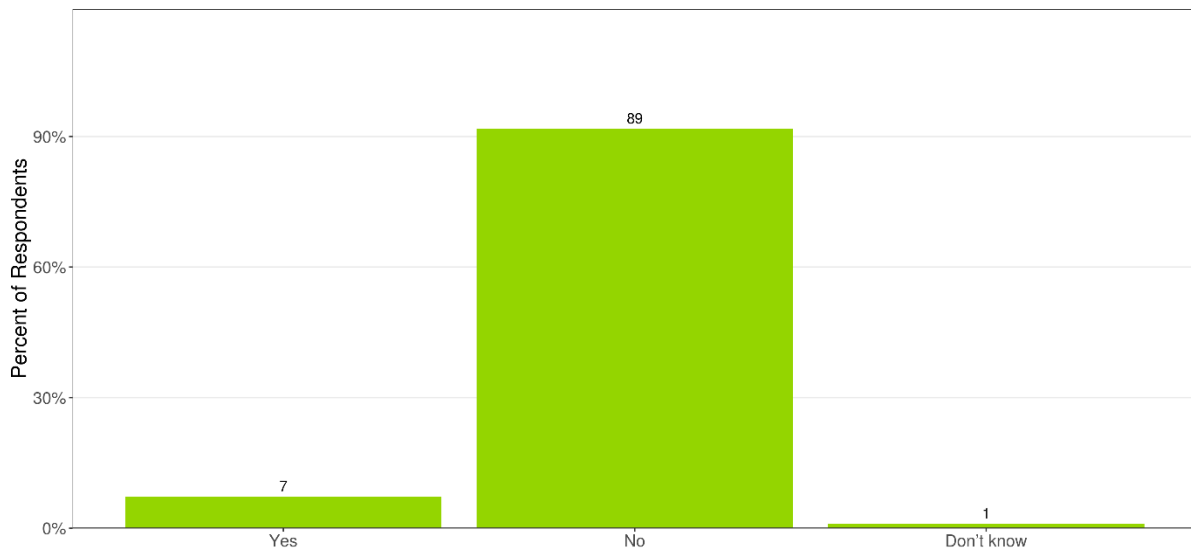
Figure C-28. What changes to your routine did you make? Please select all that apply.



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

C.7.6 Needs Assistance

Figure C-29. Since enrolling in AC Rewards, do you recall if you or another member of your household contacted Xcel Energy with any questions or concerns related to the program?



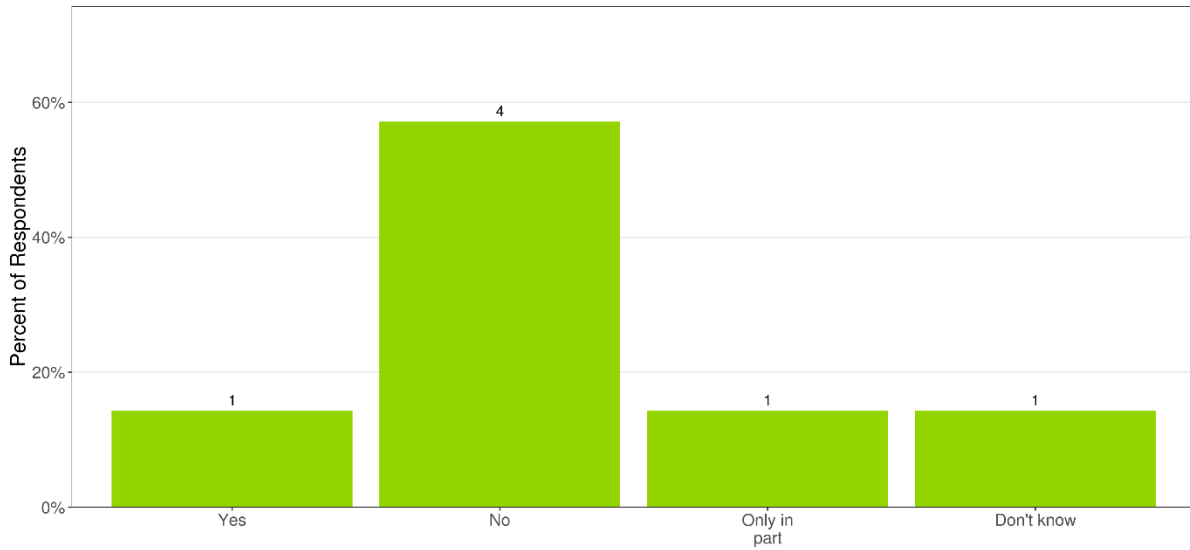
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

What have you contacted Xcel Energy about?

*Customer verbatims were summarized in the report, as appropriate

Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

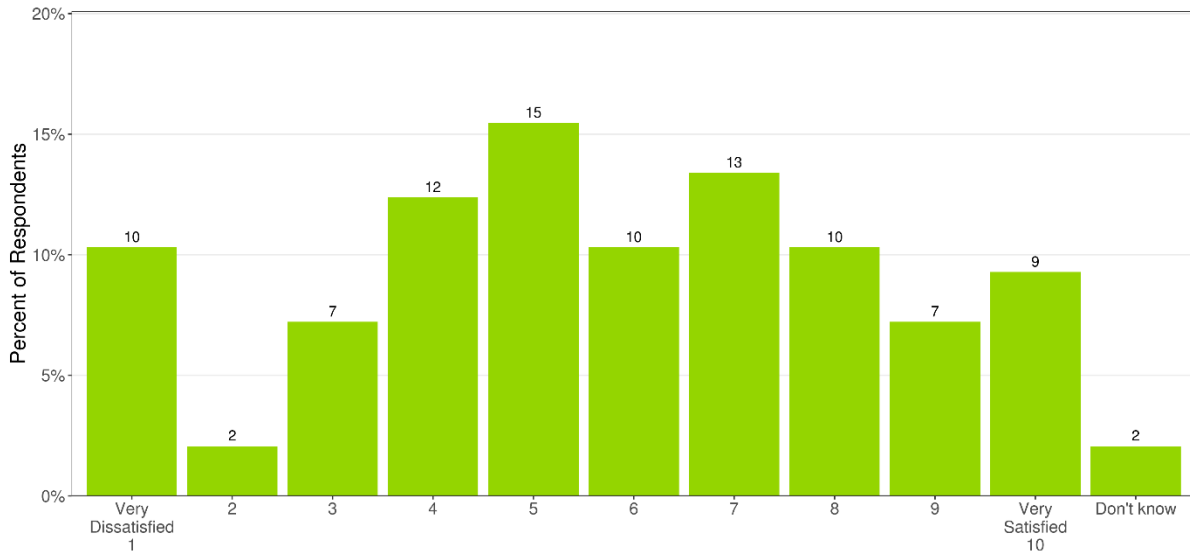
Figure C-30. Did Xcel Energy provide the help you needed?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

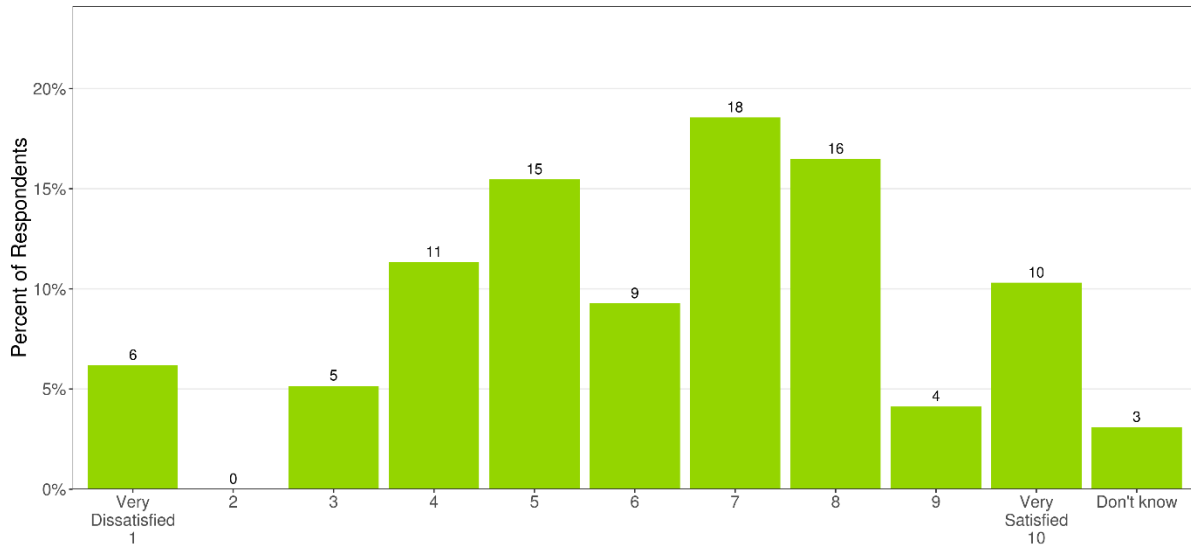
C.7.7 Satisfaction

Figure C-31. How satisfied are you with the temperature during the event?



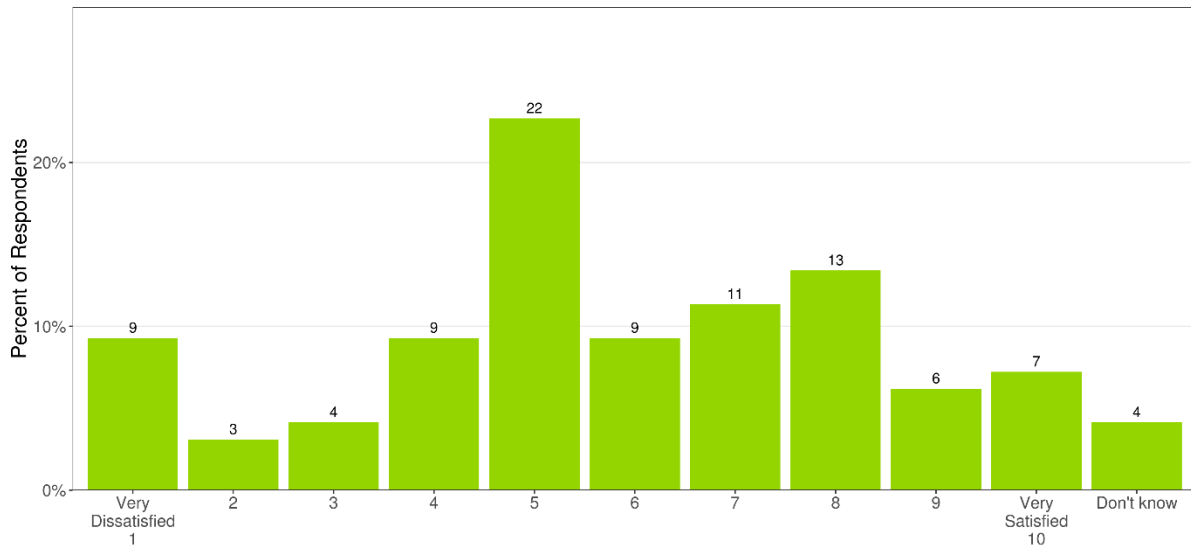
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-32. How satisfied are you with the timing of the event?



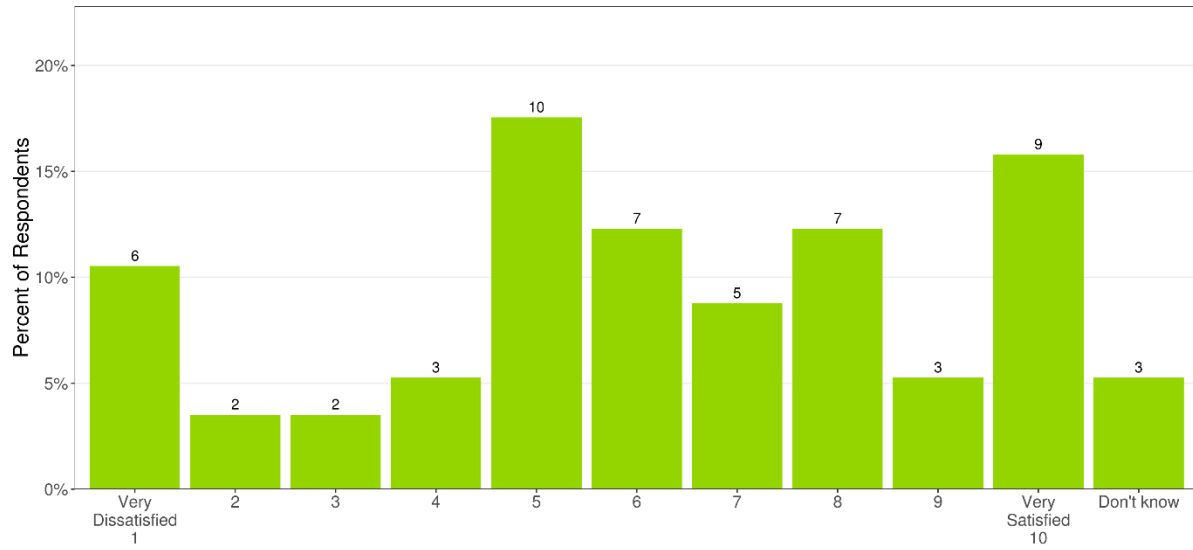
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-33. How satisfied are you with the length of the event?



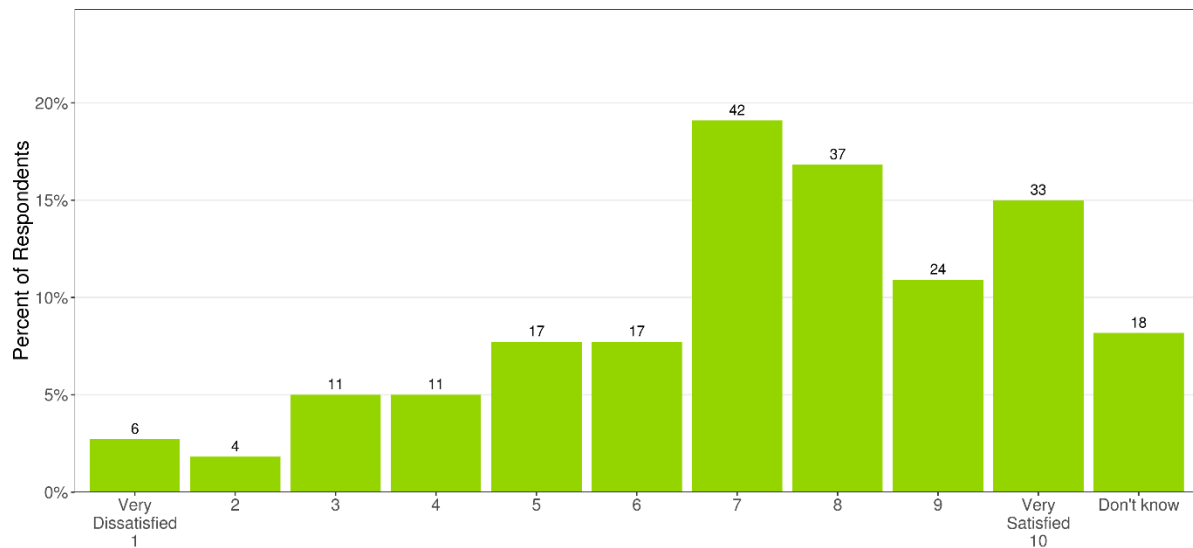
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-34. How satisfied are you with the event notification?



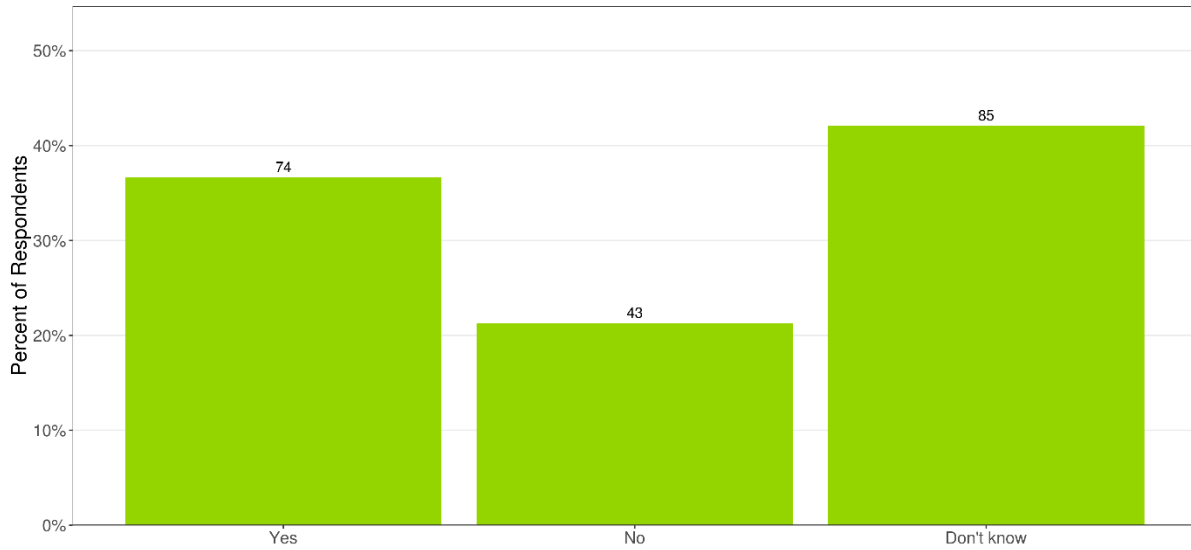
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-35. How satisfied are you overall with your AC Rewards program experience to-date?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

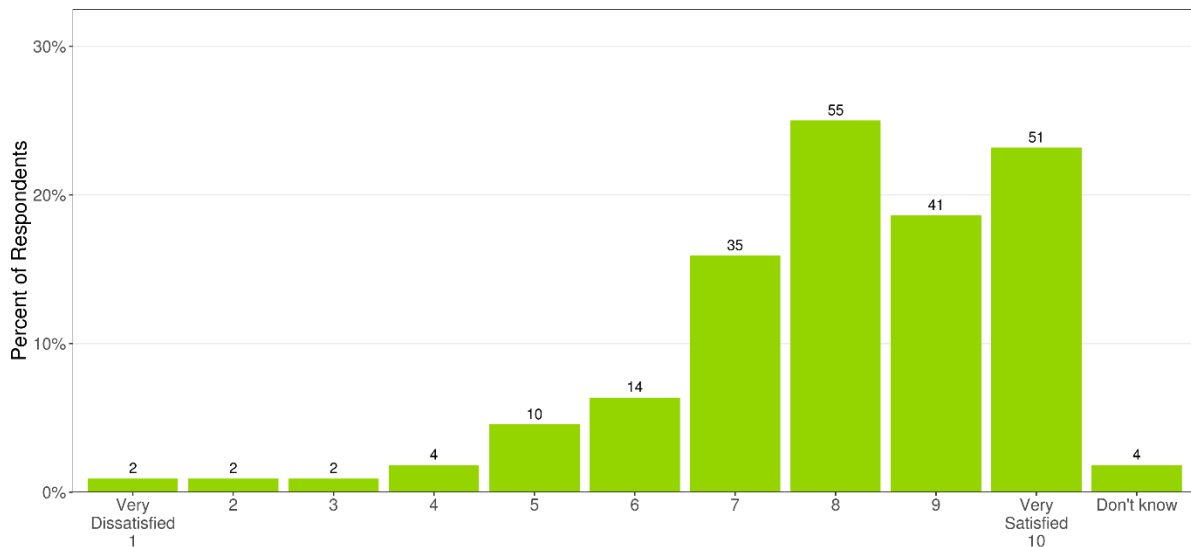
Figure C-36. Are there ways that your AC Rewards experience could be improved?



*Customer verbatims were summarized in the report, as appropriate

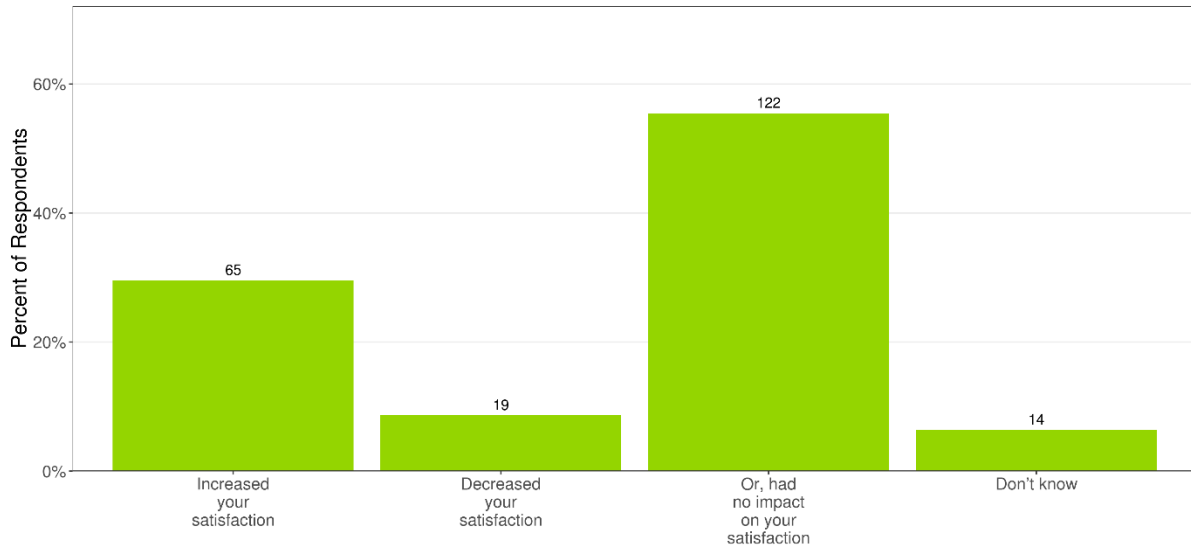
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

Figure C-37. Now, thinking about Xcel Energy, your electricity provider, and not the AC Rewards program, on a scale of 1 to 10, how satisfied are you with Xcel Energy in general?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

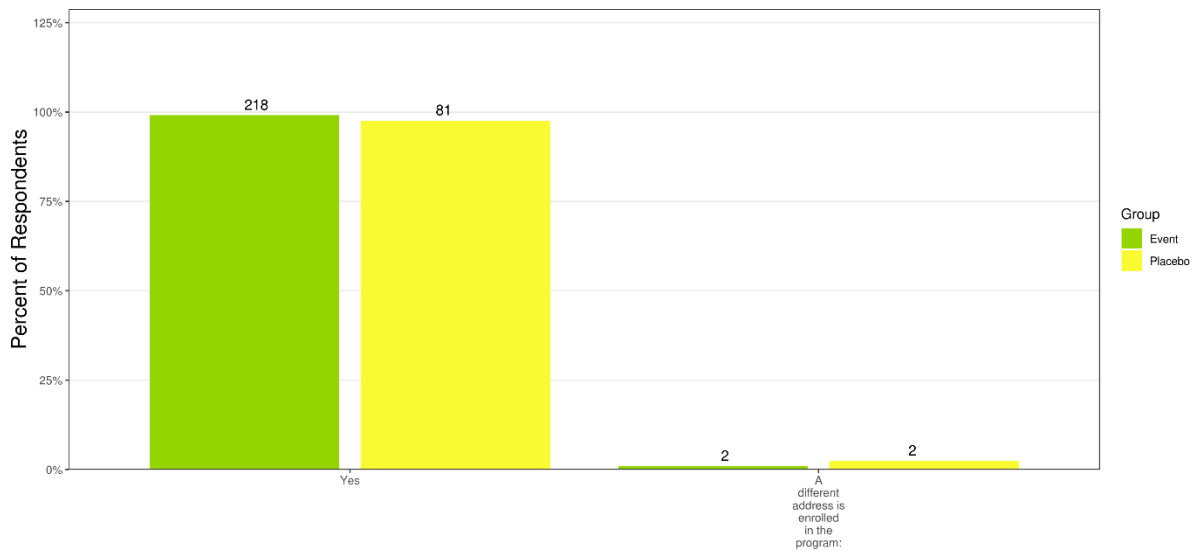
Figure C-38. How has your participation in AC Rewards impacted your satisfaction with Xcel Energy overall? Has it...?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020

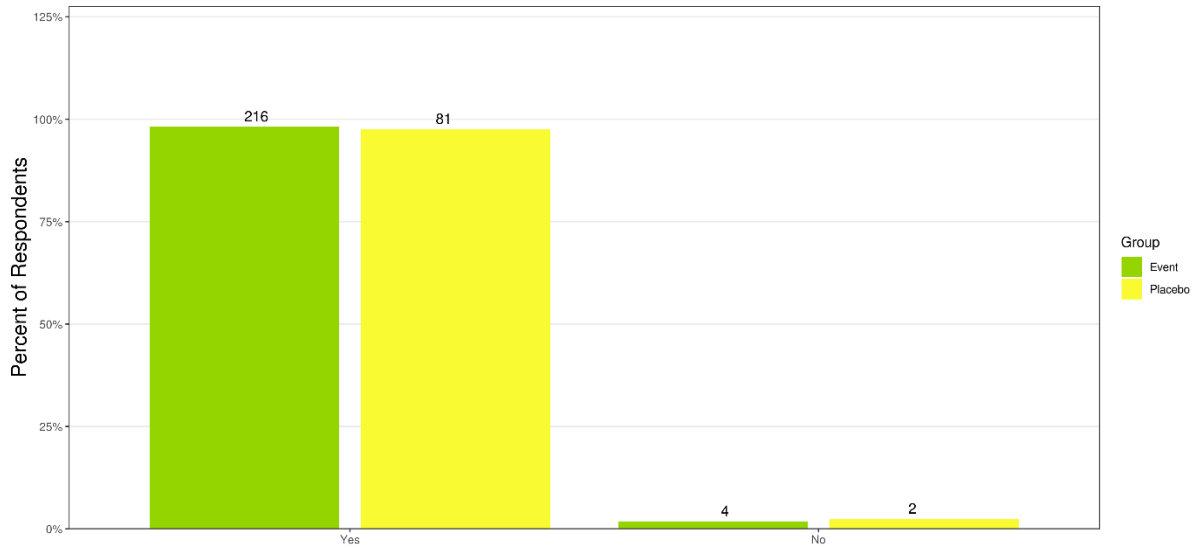
C.7.8 Demographics (Post-Event and Placebo)

Figure C-39. Our program records indicate the property at this [STREET_ADDRESS] is enrolled in AC Rewards. Is this correct?



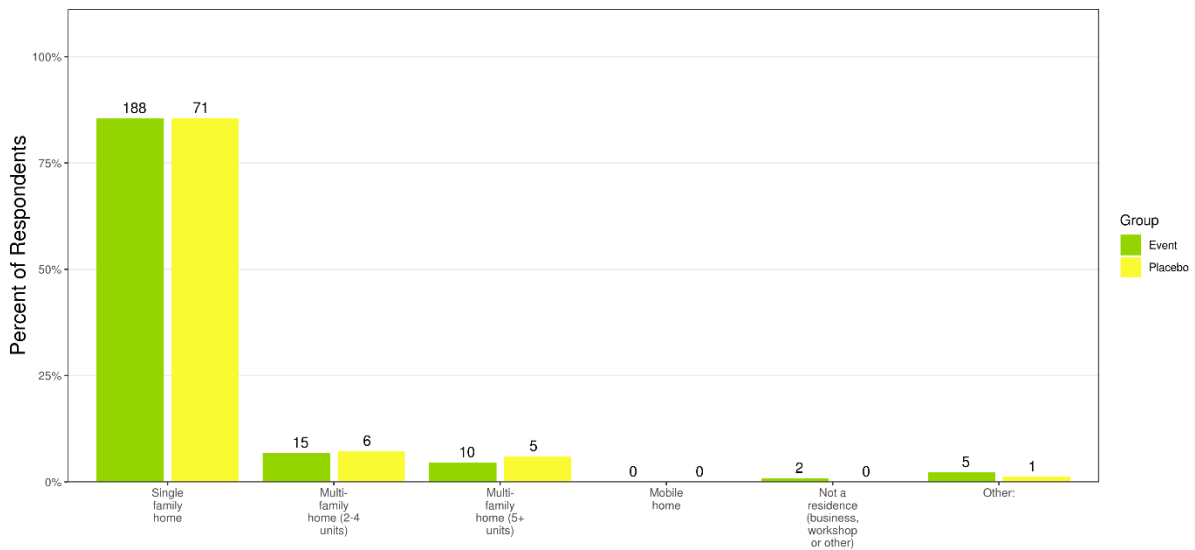
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-40. Is this your primary home?



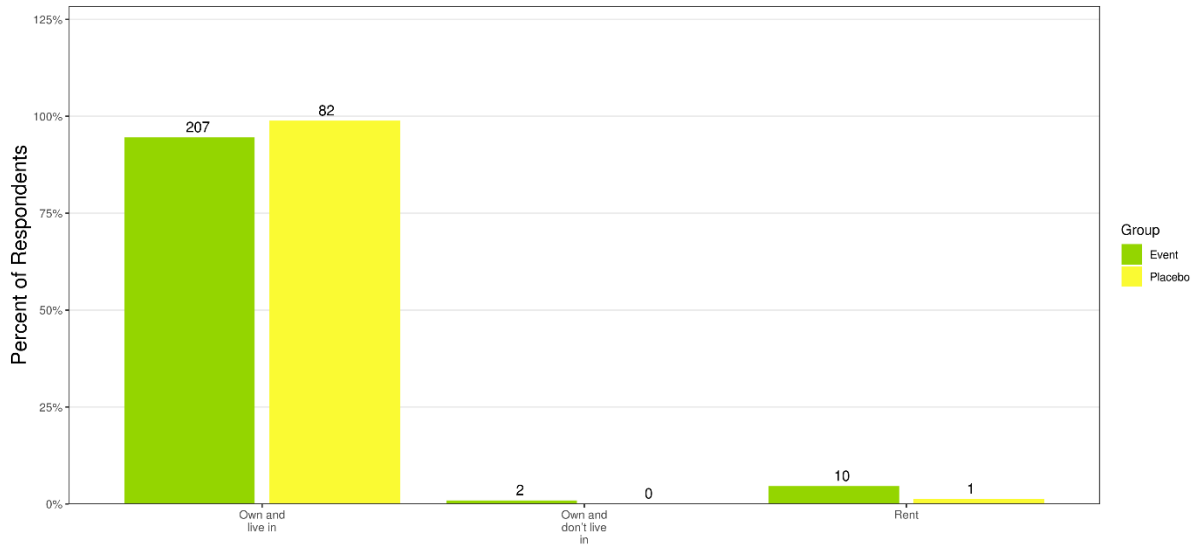
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-41. Which of the following best describes the property type at [Address]?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-42. Which of the following best describes your ownership status of your property?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-43. How many people, including yourself, live in your home full-time (at least nine months of the year)?

*Customer verbatims were summarized in the report, as appropriate

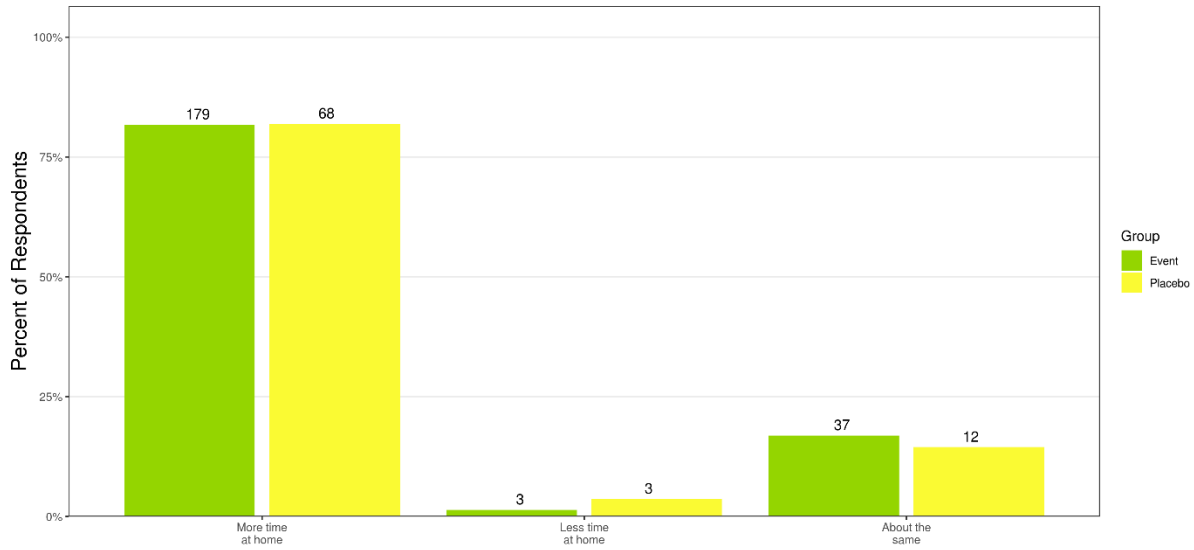
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-44. Excluding short-term vacations (<3 weeks), how many people, including yourself, typically live in your home full-time during summer months (June through September)?

*Customer verbatims were summarized in the report, as appropriate

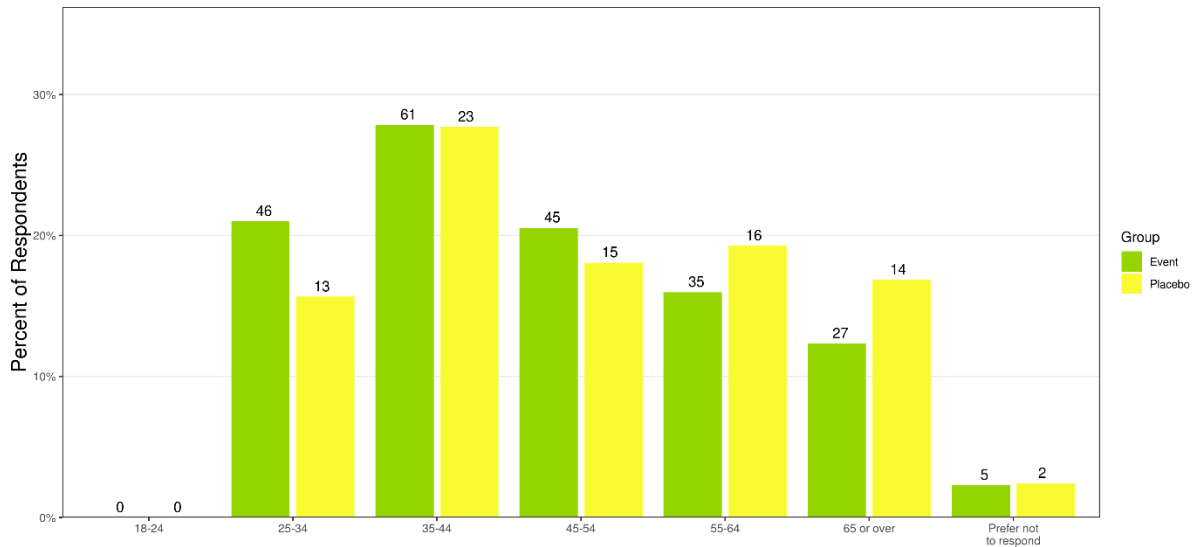
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-45. Compared to last summer, how has the amount of time you spend at home on weekdays during the summer changed?



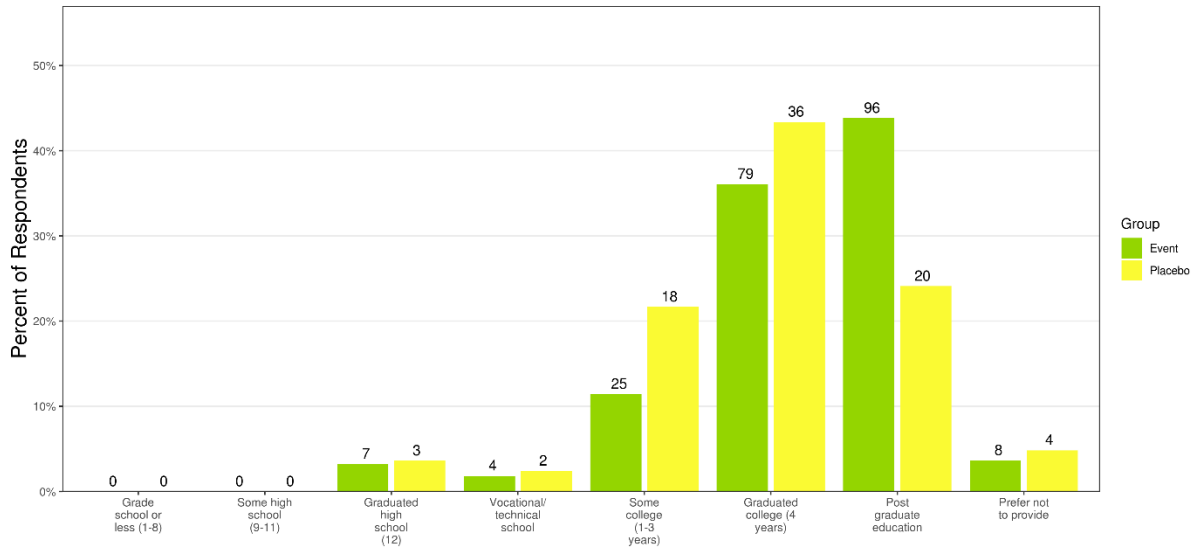
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-46. Which of the following age categories do you fall into?



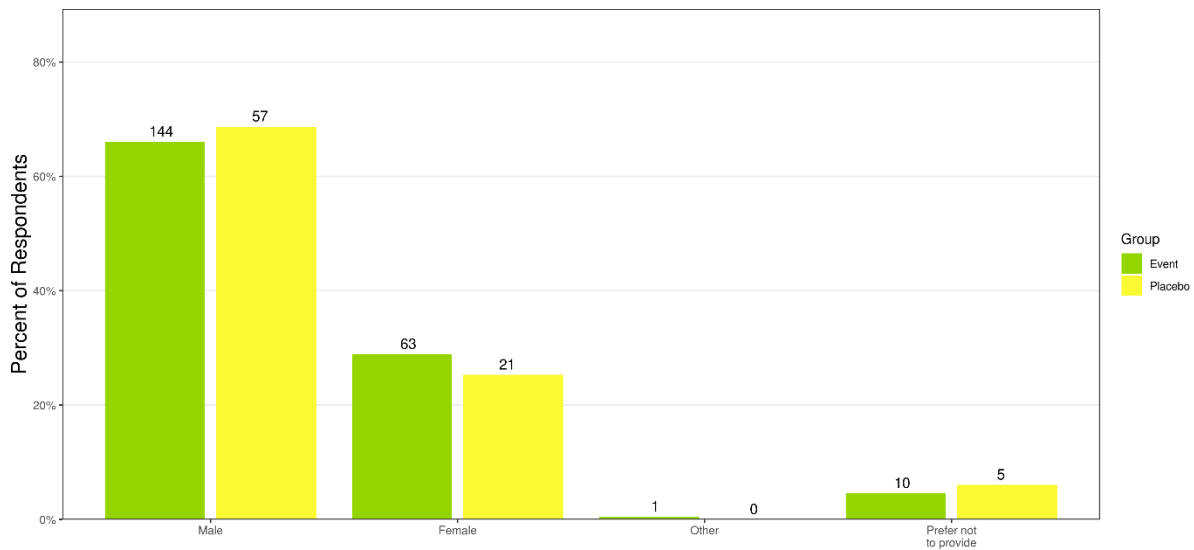
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-47. What is the last grade of school you completed?



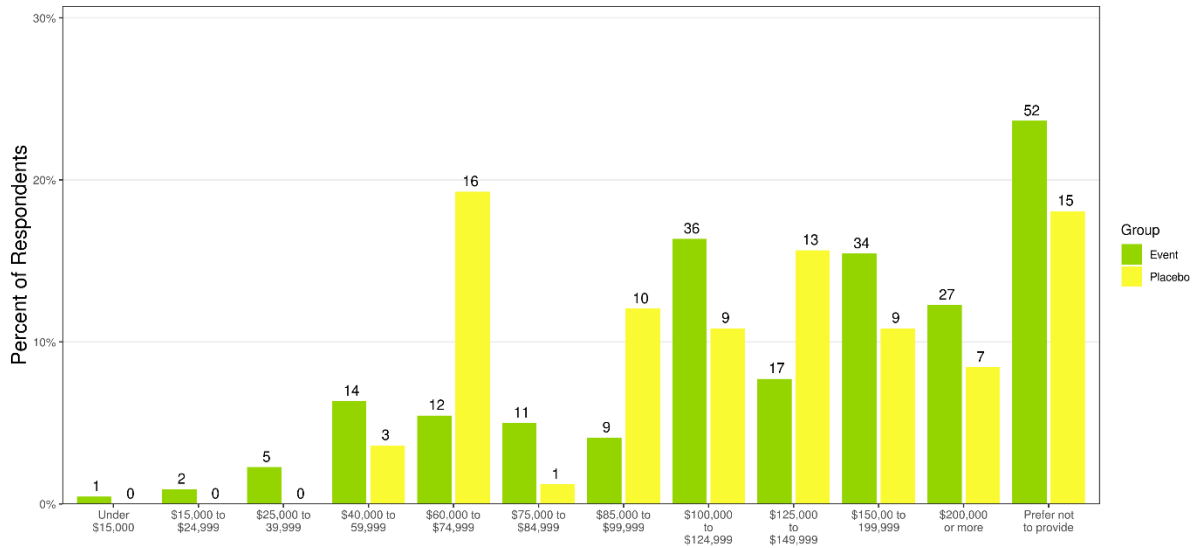
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-48. Which category best describes your gender?



Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

Figure C-49. Please indicate which range best describes the annual income of your entire household (everyone living in your home).



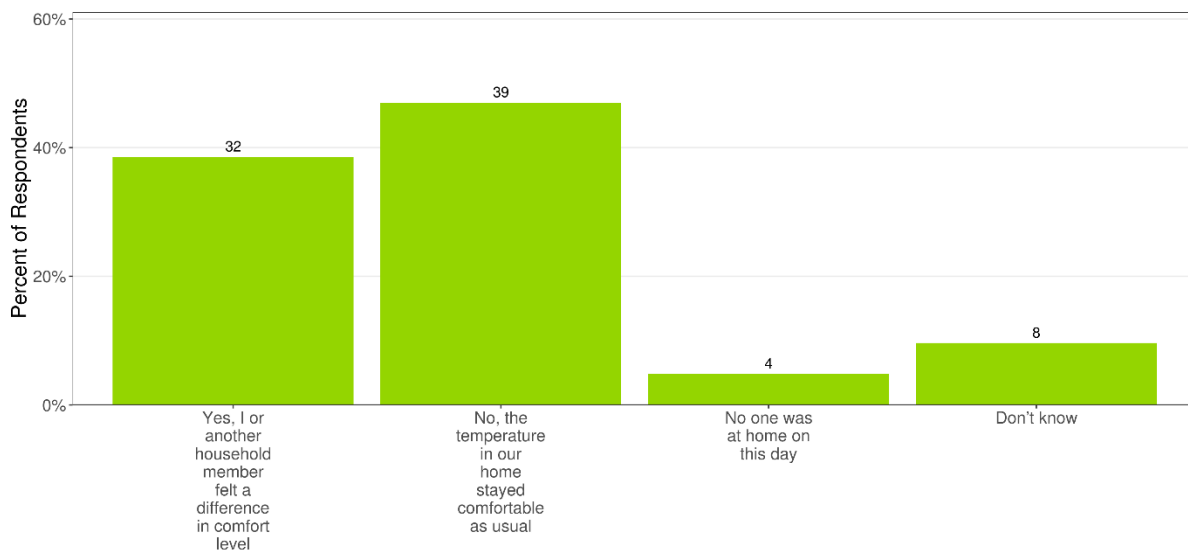
Source: Guidehouse analysis of responses to post-event surveys fielded on July 17, August 7, August 13, 2020, and the placebo survey fielded on July 29, 2020

C.8 Appendix 3. Placebo Survey Output

This section displays the specific questions placebo respondents received in the survey. Responses to demographic questions are shown in the previous section.

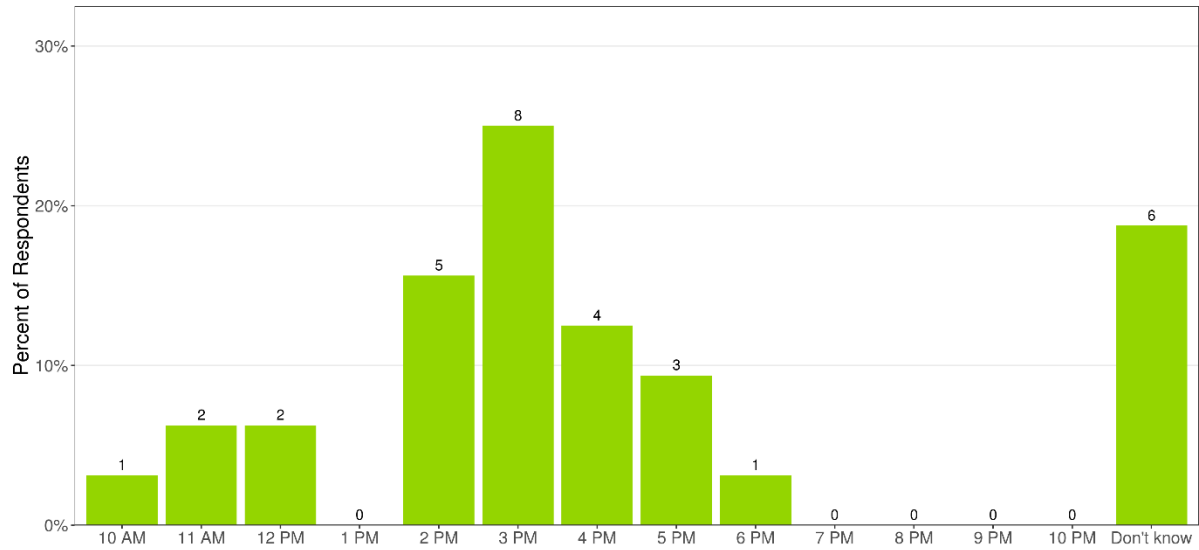
C.8.1 Comfort

Figure C-50. Did you or another member of your household notice a difference in the comfort level of your home any time on [DAY OF WEEK], [DATE] compared to a typical summer day with similar outdoor temperatures? n = 83



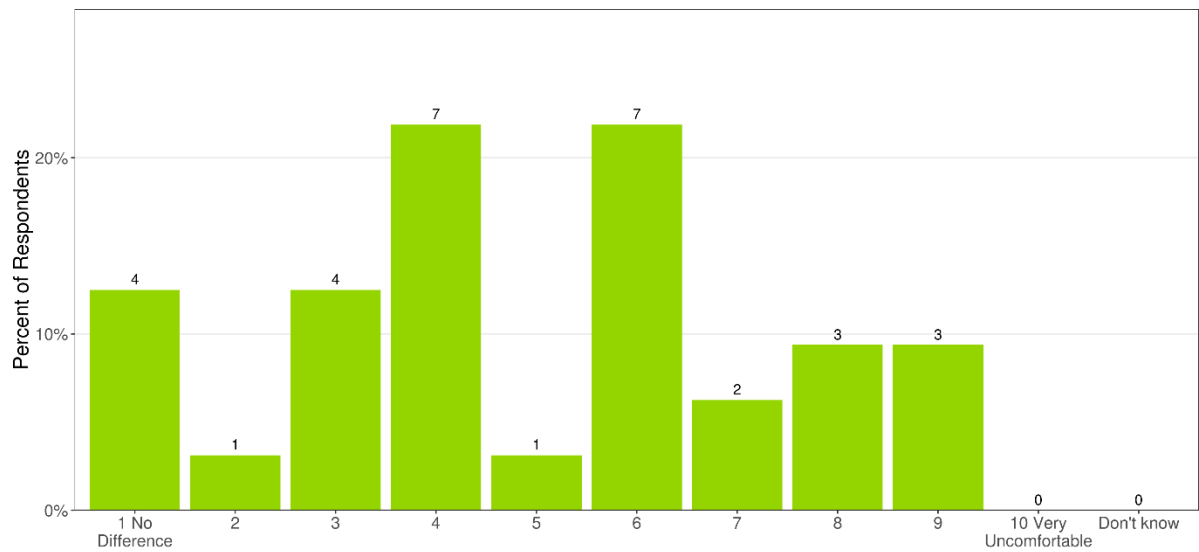
Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

Figure C-51. At approximately what time did you first notice a difference in the comfort level of your home on [EVENT DATE]?



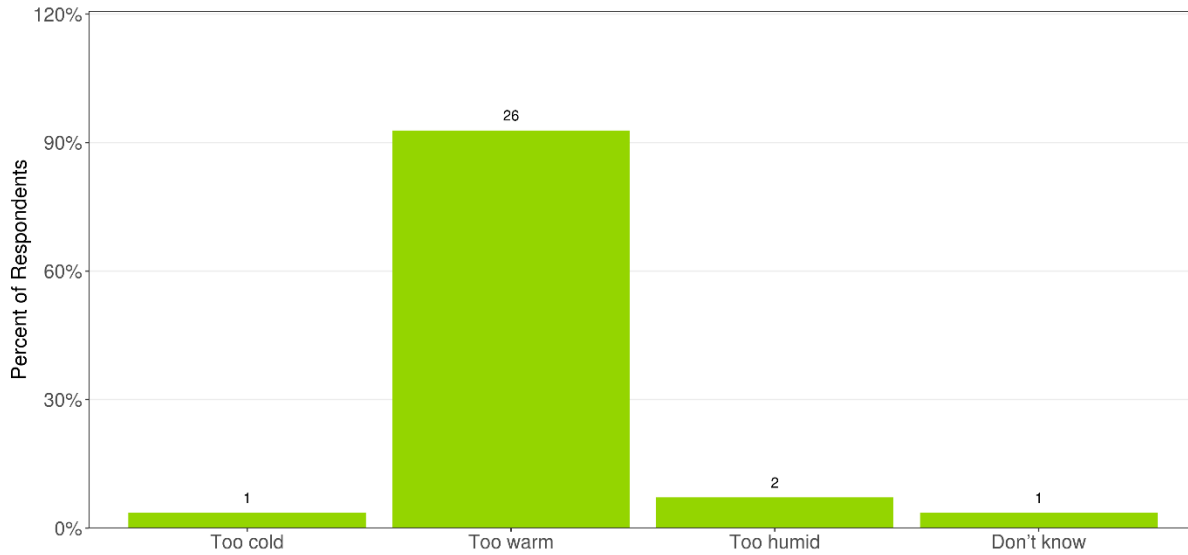
Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

Figure C-52. How would you rate the comfort level of your home on [EVENT DATE]?



Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

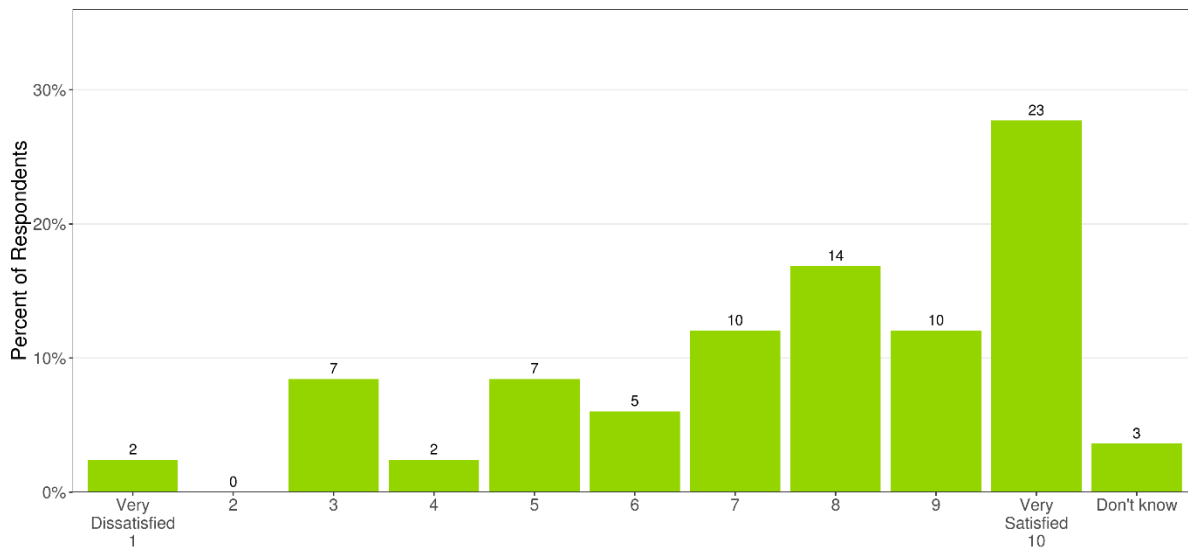
Figure C-53. Which of the following best describes the reason for your discomfort on [EVENT DATE]?



Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

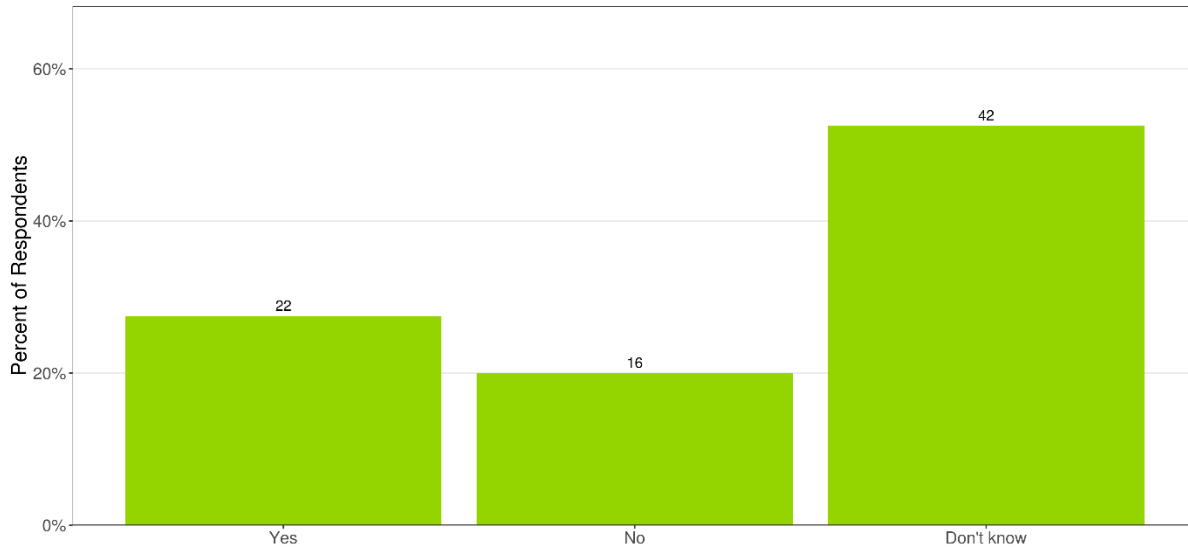
C.8.2 Satisfaction

Figure C-54. How satisfied are you overall with your AC Rewards program experience to-date?



Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

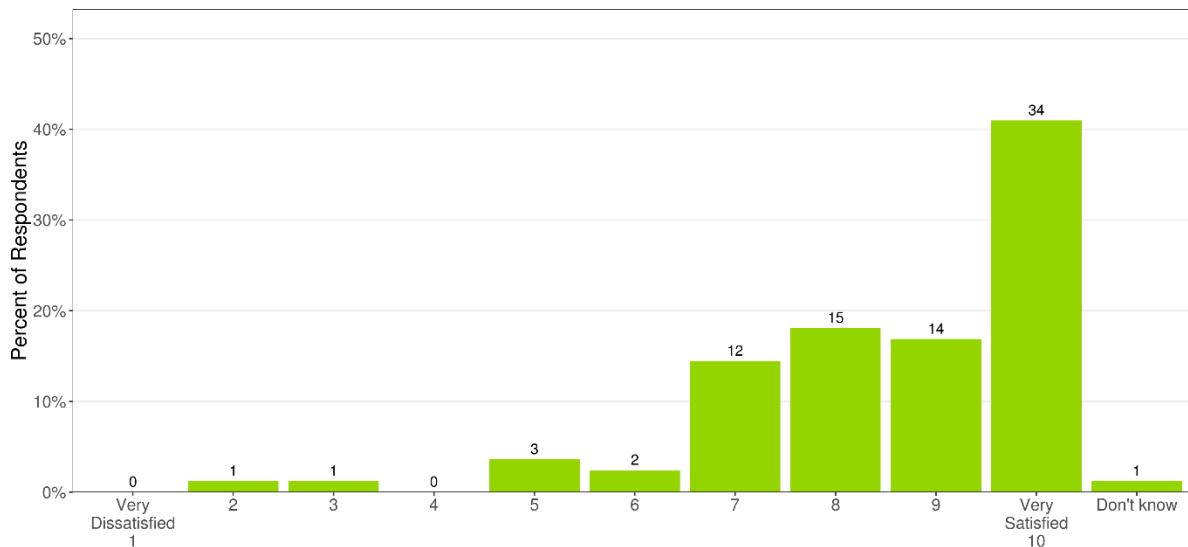
Figure C-55. Are there ways that your AC Rewards experience could be improved?



*Customer verbatims were summarized in the report, as appropriate.

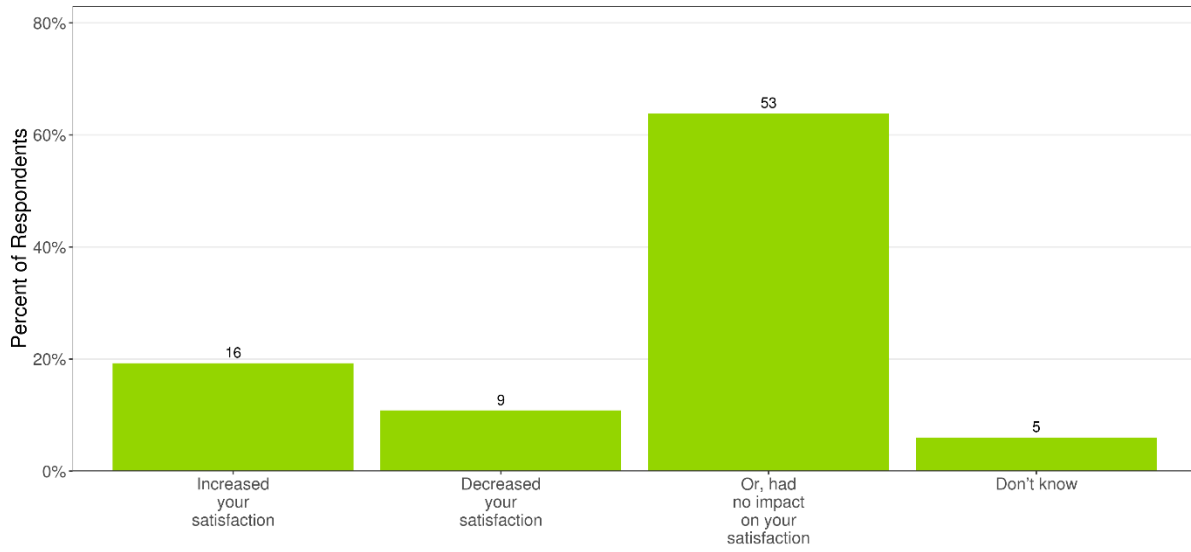
Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

Figure C-56. Now, thinking about Xcel Energy, your electricity provider, and not the AC Rewards program, on a scale of 1 to 10, how satisfied are you with Xcel Energy in general?



Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

Figure C-57. How has your participation in AC Rewards impacted your satisfaction with Xcel Energy overall? Has it...?



Source: Guidehouse analysis of responses to the placebo survey fielded on July 29, 2020

Appendix D. Interim Deliverable: Post-Season Survey Memo

To: Nick Minderman, Meagan Madden (Xcel Energy)
From: Nicole Buccitelli, Meg Campbell, Stuart Schare (Guidehouse)
 Lenore Zeuthen (Zeuthen Management Solutions)
Date: January 28, 2021
Re: AC Rewards Program Evaluation Post-Season Survey Findings – Colorado

D.1 Executive Overview

The AC Rewards program allows Xcel Energy’s residential customers in Colorado to earn an incentive by providing the company control of their smart thermostat during times of seasonal peak demand when demand response (DR) direct load control (DLC) events are called. Residio, the program’s demand response management system (DRMS) provider, plays a large role in program implementation. In November 2020, Guidehouse fielded a post-season survey to assess customer satisfaction with the AC Rewards season, which lasted from June 1 through September 30 in 2020. The survey closed on December 1, 2020.

This memo presents preliminary findings from the survey related to participation, awareness of events, the impact events have on customer comfort, participant opt-out behavior, and drivers for current levels of satisfaction. Table D-1 lists the key takeaways.

Table D-1. Post-Season Survey Key Findings

Topic	Key Finding
Marketing and Motivations	<ul style="list-style-type: none"> • Most respondents (84%) <i>first</i> learned about the program through Xcel Energy (rather than through their thermostat manufacturer). • Key sources of motivation to enroll were to lower their bills by reducing energy use (64%), receive bill credits (55%), and save energy (53%). • Many respondents also reported wanting to reduce pressure on the grid (47%) and support the community’s energy initiatives (38%).
Awareness and Notification	<ul style="list-style-type: none"> • 66% of respondents became aware of the event through a notification on the thermostat itself and 47% became aware by the change in indoor temperature. Only 21% reported becoming aware of events via notifications from their thermostat app. • Of the respondents who became aware of events only due to a change in indoor temperature, 57% indicated they did not receive any event notification, but most would like to via email or text. These respondents would like to be notified so they can prepare to use other methods to stay cool and so they can understand why the setpoint of their thermostat is being adjusted. • Of the respondents who received a notification, most participants were at least somewhat satisfied with the timing and method of the notification, providing mean satisfaction ratings of 7.1 and 7.4, respectively.** Less satisfied respondents requested that notification be sent in advance of the events.

Topic	Key Finding
Comfort and Behavior	<ul style="list-style-type: none"> 95% of respondents reported at least some change in comfort in their home (a score of 2 or higher).* Over half (64%) of respondents who were aware of events indicated they opted out of at least one event. Of the respondents who were aware of events, 48% did not take any actions to feel more comfortable, despite most of them having noticed a change in comfort.
Thermostat Performance and Usage Behavior	<ul style="list-style-type: none"> 88% of respondents indicated their thermostat performed well during events (provided a response of 7 or higher).*** Most respondents (66%) set a temperature schedule for their thermostat which they occasionally tweak. 19% of respondents indicated they only turn the AC on when it is uncomfortable in their home.
Smart Home Devices	<ul style="list-style-type: none"> 88% reported not using smart home devices besides their smart thermostats to control the temperature of their home. In terms of other smart home devices, respondents reported using home voice assistance such as Alexa (55%), smart garage door openers (53%), smoke/ carbon monoxide sensors (45%), smart lights (44%), and smart plugs (41%).
Satisfaction	<ul style="list-style-type: none"> Some respondents noted the AC Rewards bill credit is lower than the Saver's Switch program, which contributed to their lower bill credit satisfaction score. Respondents responded relatively positively to both the AC Rewards program and Xcel Energy, providing average satisfaction scores of 7.2 and 8.0, respectively.** Respondents are likely to continue participating the program and they are likely to recommend the program to others. Suggestions for program improvement from respondents included increasing the "reward", providing advance notification of event, and providing more detailed information about the program and performance during events.

* Where 1 is "no change in comfort" and 10 is "very uncomfortable."

** Where 1 is "very dissatisfied" and 10 is "very satisfied."

*** Where 1 is "not well" and 10 is "very well."

D.2 Post-Season Survey Methods

D.2.1 Sampling Method

Guidehouse leveraged an AC Rewards enrollment file dated October 21, 2020 to develop the post-season survey sample frame for Colorado. The team performed the following data cleaning on the dataset to prepare survey sample frames:

- Removed duplicate device IDs
- Checked for duplicate email addresses with different states
- Transformed device-level data to participant-level data (i.e., removed duplicate email addresses)
- Filtered for DR SubProgram = Xcel CO Residential
- Filtered for State = CO
- Filtered for Enrollment Status = Approved

- Removed emails containing “@none.com”

AC Rewards participants who had previously been invited to take a survey for evaluation (i.e., post-event/placebo survey) were excluded from the sample frame. This was done to minimize the number of communications any one individual received and maximize the number of unique individuals from which surveys efforts were able to obtain feedback. Additionally, participants enrolled after August 1, 2020 were excluded from the sample to ensure that respondents would have been enrolled for at least one event.

From the sample frame, a random sample of participants was selected and sent the survey invitation email.

D.2.2 Fielding Logistics and Survey Response Rates

Guidehouse designed the post-season surveys to assess participant motivation for enrolling in the program, comfort during events, awareness of events, event pre-cooling, opt-out behavior, actions taken during events, satisfaction, and general thermostat usage behavior and demographic information. The team fielded the post-season survey online through Qualtrics, a user-friendly survey platform. Table D-2 shows the distribution information. Participants were given one week to respond to the survey after receiving the survey invitation email.

To effectively plan, Guidehouse recorded the response rates and emails distributed to Xcel Energy participants to ensure the team collected a sufficient number of results (shown in Table D-2). After the survey closed, respondents who completed the survey received a \$5 incentive as a token of appreciation for their feedback.

Table D-2. Post-Season Survey Response Rate

Date(s) Initial Invites Sent	Emails Sent ¹⁸	Completes ¹⁹	Response Rate ²⁰
11/18 (Soft launch 1)	100		
11/19 (Soft launch 2)	399		
11/19 Full Launch	1496		
11/23 Additional Sample	1983		
11/25 Additional Sample	1494		
Total	5,472	402	7.3%

Source: Guidehouse

2020 Event Characteristics

In summer 2020, Colorado experienced warm temperatures. Compared to average summer conditions, temperatures were above average across the state, resulting in dry conditions that contributed to numerous wildfires. Xcel Energy called 15 events which lasted 4 or 6 hours. A temperature setback of 4 degrees was employed during events. Pre-cooling was employed for 2 hours prior to every event. Table D-3 summarizes characteristics of event days in 2020.

¹⁸ These values exclude invalid emails

¹⁹ This represent the total number of completes

²⁰ This represents and overall response rate.

Table D-3. Event Days in Summer 2020

Date	Start Time (MT)	End Time (MT)	Duration (Hours)	Pre-cool Duration	Temperature offset
June 16	3:00 PM	7:00 PM	4	2	4
June 24	2:00 PM	6:00 PM	4	2	4
June 29	2:00 PM	6:00 PM	4	2	4
July 6	2:00 PM	6:00 PM	4	2	4
July 8	2:00 PM	6:00 PM	4	2	4
July 10	2:00 PM	6:00 PM	4	2	4
July 13	2:00 PM	6:00 PM	4	2	4
July 17**	2:00 PM	6:00 PM	4	2	4
August 7**	2:00 PM	8:00 PM	6	2	4
August 12	3:00 PM	9:00 PM	6	2	4
August 13**	2:00 PM	8:00 PM	6	2	4
August 17	3:00 PM	7:00 PM	6	2	4
August 18	2:00 PM	8:00 PM	6	2	4
August 19	2:00 PM	8:00 PM	6	2	4
August 26	2:00 PM	8:00 PM	6	2	4

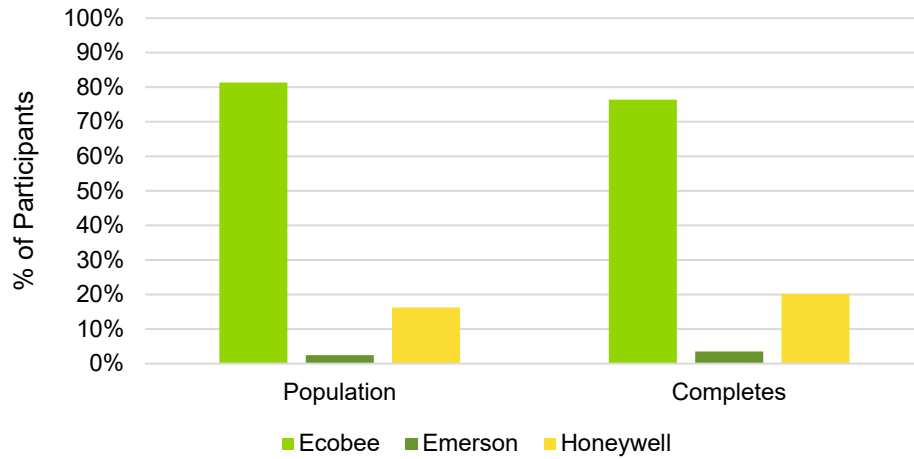
**These dates indicate the events in which Guidehouse fielded post-event surveys.

D.3 Representativeness of Survey Samples

To provide an indication of representativeness of the samples, the following charts show how the post-season survey sample compare to the AC Rewards population for Colorado as of August 1, 2020 (the cutoff date used for developing the survey sample frame).

The survey sample was roughly proportional to the AC Rewards population as of August 1, 2020 in terms of the distribution of thermostat types.

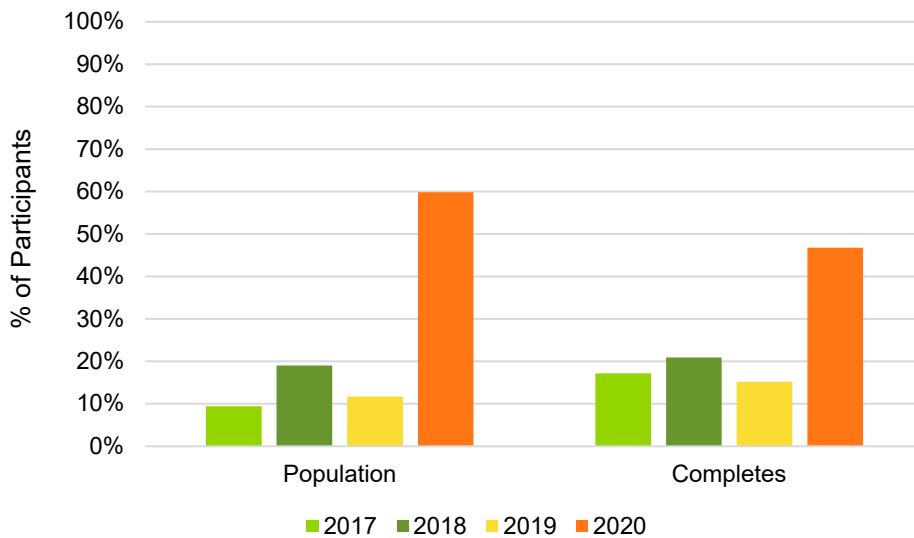
Figure D-1. Population (as of August 1) vs. Survey Completes – Thermostat Type



Source: Guidehouse analysis of sample frame based on enrollment data as of October 21, 2020, historical enrollment data as of February 19, 2020, post-season surveys fielded on November 18th to December 1st.

Relative to the AC Rewards population as of August 1, 2020, the survey sample was somewhat skewed toward participants who enrolled prior to 2020.

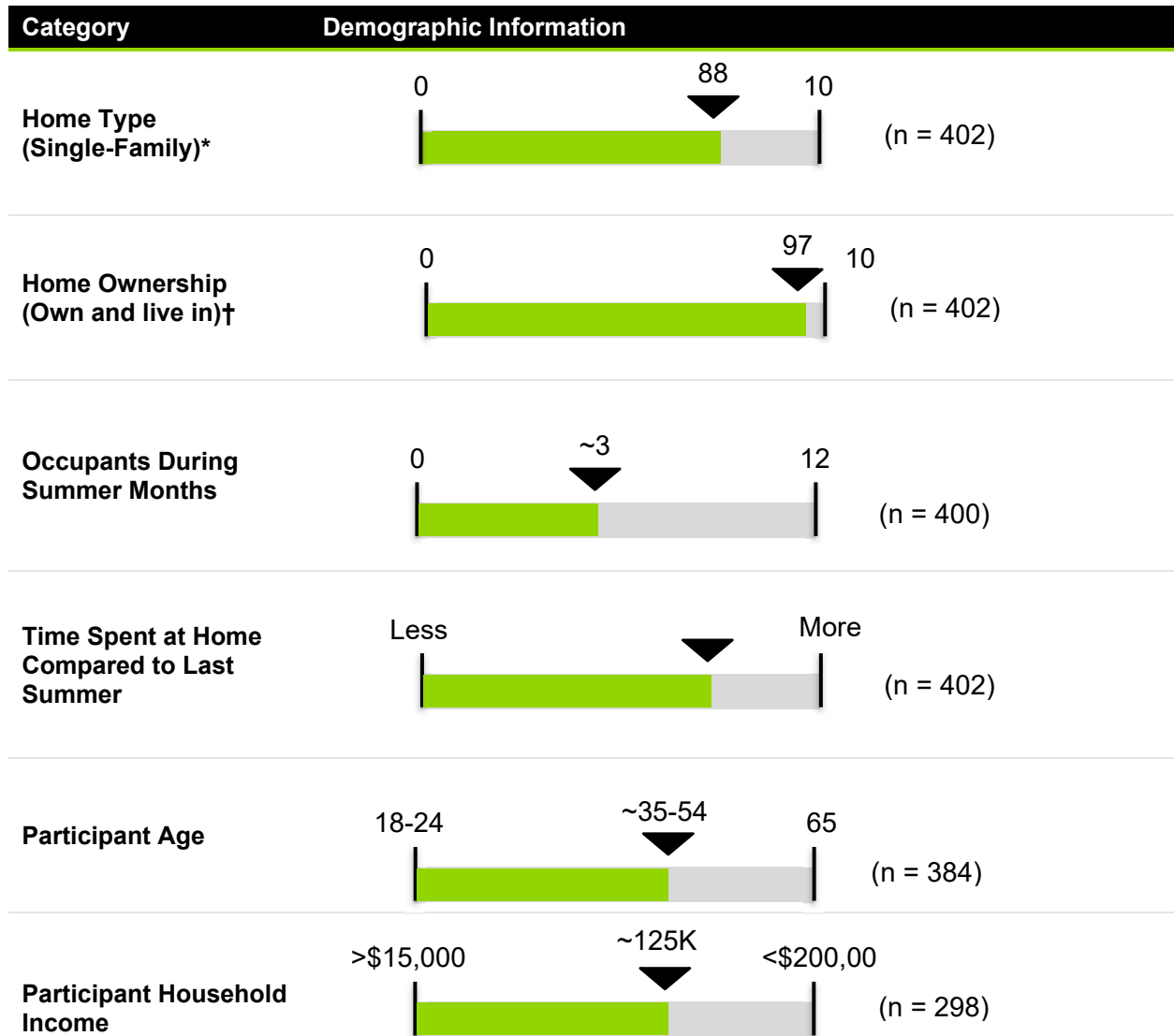
Figure D-2. Population (as of August 1) vs. Survey Completes – Enrollment Year



Source: Guidehouse analysis of sample frame based on enrollment data as of October 21, 2020, historical enrollment data as of February 19, 2020, post-season surveys fielded on November 18th to December 1st.

D.4 Demographics

The post-season survey solicited information on program participant demographics to learn about the types of customers that enroll in AC Rewards and to inform recruitment strategies. Most respondents were male (69%), with most having a college or post-graduate education. Table D-4 shows additional household and participant demographic information.

Table D-4. Key Participant Demographic Information


* These results display the percentages of reported single-family homes, which was the primary response. Full results for the question are displayed in the appendix.

† These results display the percentages of reported homes that are owned by respondents. Full results for the question are displayed in the appendix.

Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

D.5 Post-Season Survey Findings

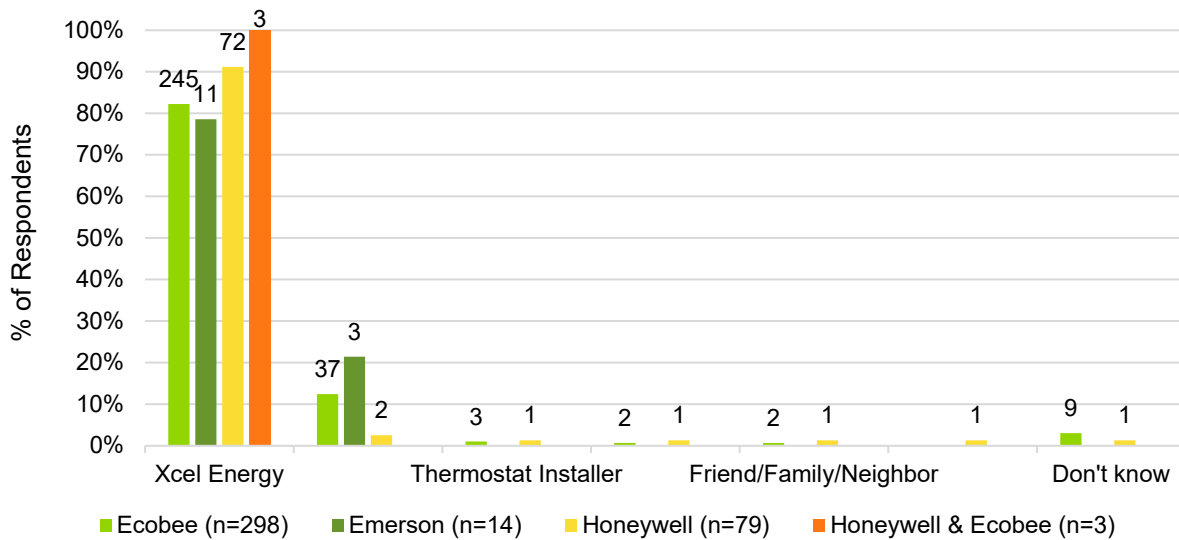
This section describes key findings from the post-season survey. Guidehouse designed the survey instrument to ask specific questions of certain respondents, dependent on their responses to previous questions and whether the respondent recalls AC Rewards events. Therefore, not every respondent received every question.

D.5.1 Marketing and Motivations

Participants may learn about the program through various means ranging from word of mouth to Xcel Energy advertising material or promotions through the manufacturer of their smart thermostat. Guidehouse assessed how respondents learned about the program and their primary reasons for participating. As shown in Figure D-3, **most respondents (84%) first learned about the program through Xcel Energy, while only 11% reported learning about the program through their thermostat manufacturer.**

Of those who learned about the program through Xcel Energy, over half (58%) learned about the program through an Xcel Energy email, while 40% learned about the program through the Xcel Energy website. This suggests marketing from **Xcel Energy (by email and through the website) is an important marketing vehicle for the AC Rewards program.**

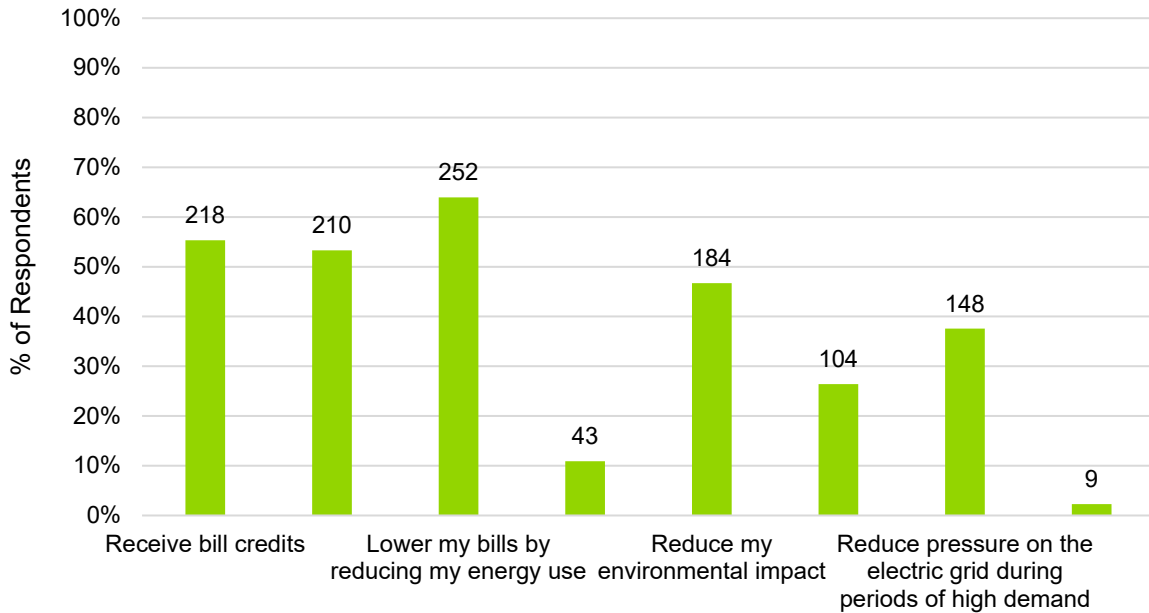
Figure D-3. How did you first learn about the AC Rewards Program? (n = 394)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Guidehouse also explored customer motivations for enrolling in the program, as shown in Figure D-4. Respondents indicated their **key enrollment drivers** were to **lower their bills by reducing energy use (64%), receive the bill credits (55%), and save energy (53%)**. Since any given individual participant may experience only minor bill and energy savings, if any, Xcel Energy should consider adjusting messaging away from emphasizing customer bill savings. Almost half (47%) of respondents also reported being motivated to help reduce pressure on the grid, and 38% enrolled to support their community’s energy initiatives. This finding suggests a good portion of AC Rewards participants are environmentally conscious.

Figure D-4. What are the primary reasons you decided to enroll in the program? (n = 394)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

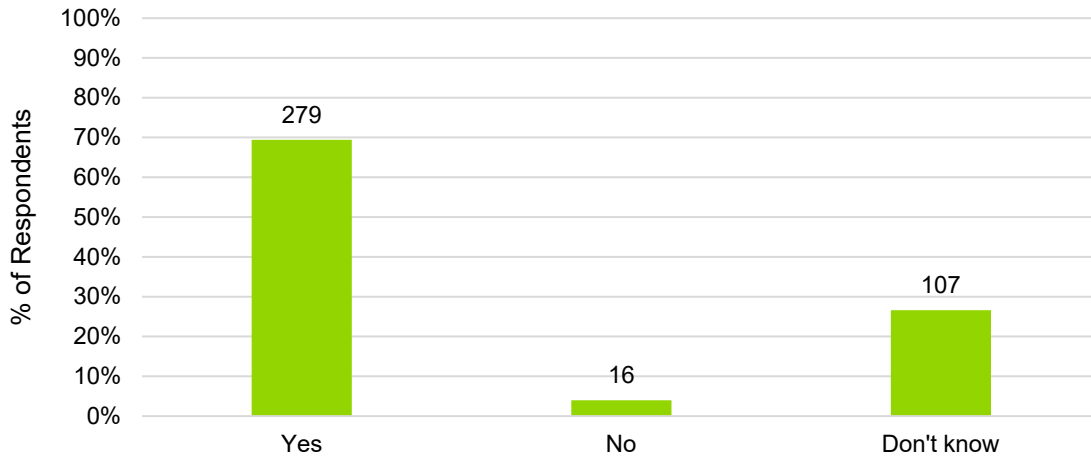
D.5.2 Event Awareness and Notification

In program years prior to 2020, participants were notified that an event was going to occur via an email from Xcel Energy, notifications on the thermostat itself, and through the thermostat’s mobile app. Starting in 2020, event notifications were no longer sent via email from Xcel Energy. In terms of the timing of notifications in 2020, notifications appearing on the thermostat itself were visible only once events were in-progress. In-app notifications were typically sent a few hours before events.

Post-season survey respondents were asked if they recall Xcel Energy initiating events in the summer of 2020. As indicated in Figure D-5, a **majority of respondents (69%) were aware that Xcel Energy initiated control events.**²¹

²¹ When asked to indicate how many events they recall, the median response among respondents was 7 events.

Figure D-5. Did Xcel Energy initiate any control events this past summer? (n = 402)

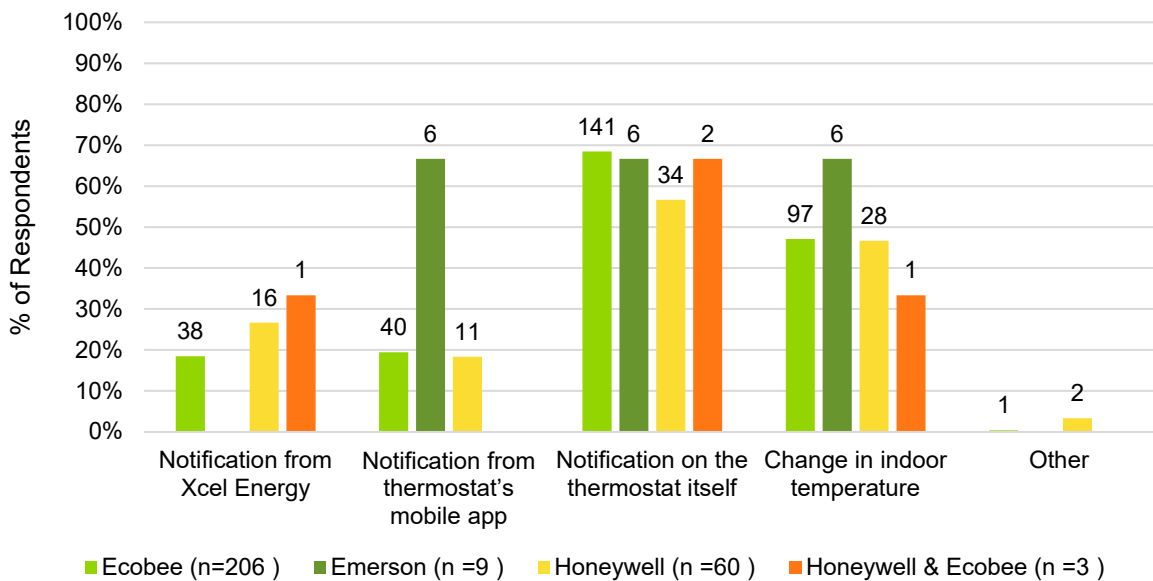


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

As context around event awareness, respondents were asked if they were home during the events; 86% of respondents who were aware of the events indicated they were home for all or most of the events. Only 14% of respondents reported only being home for some events.

Additionally, respondents were asked *how* they became aware of the event (Figure D-6). As shown, 66% indicated they became aware of the event through a notification on the thermostat itself (visible once the event has initiated) while 47% became aware by the change in indoor temperature. **A small minority of respondents indicated they became aware of events in advance through their thermostat’s app.**

Figure D-6. Which ways do you recall becoming aware of the control events? (Select all that apply) (n = 278)

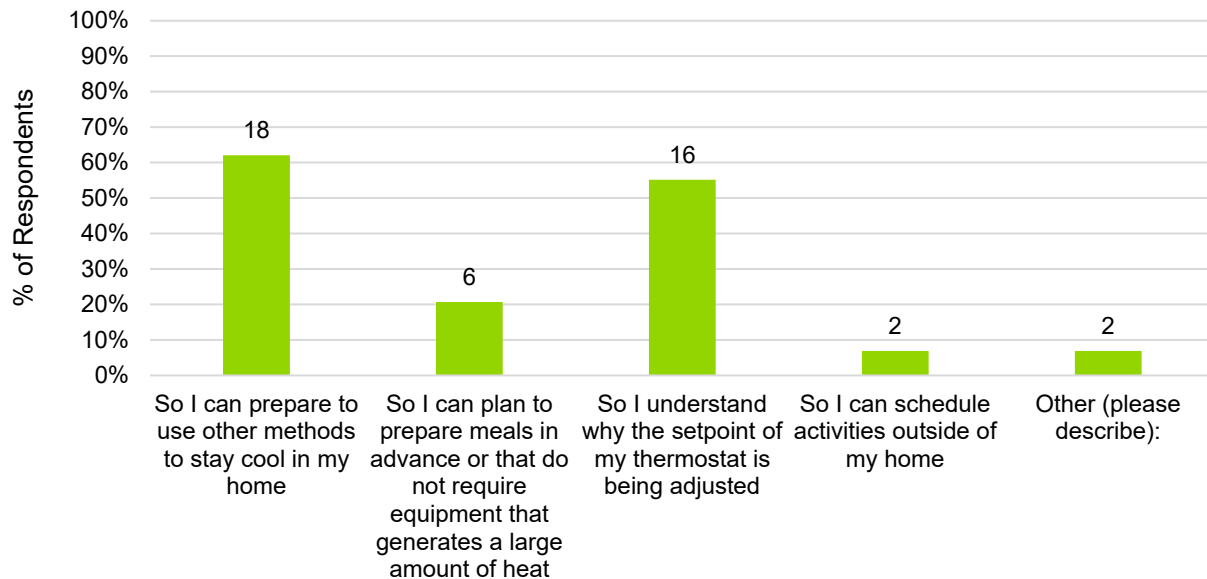


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Of the respondents who became aware of events only due to a change in indoor temperature, 57% indicated they did not receive any event notification, but most would like to. Of the 29 respondents who did not receive a notification but would like to, 26 (90%) indicated they would like to receive a message by email or text.

Guidehouse also assessed why customers who did not receive notifications would like to be notified of events, as shown in Figure D-7. A majority of those respondents would like to be notified so they can prepare to use other methods to stay cool (62%) and so they can understand why the setpoint of their thermostat is being adjusted (55%).

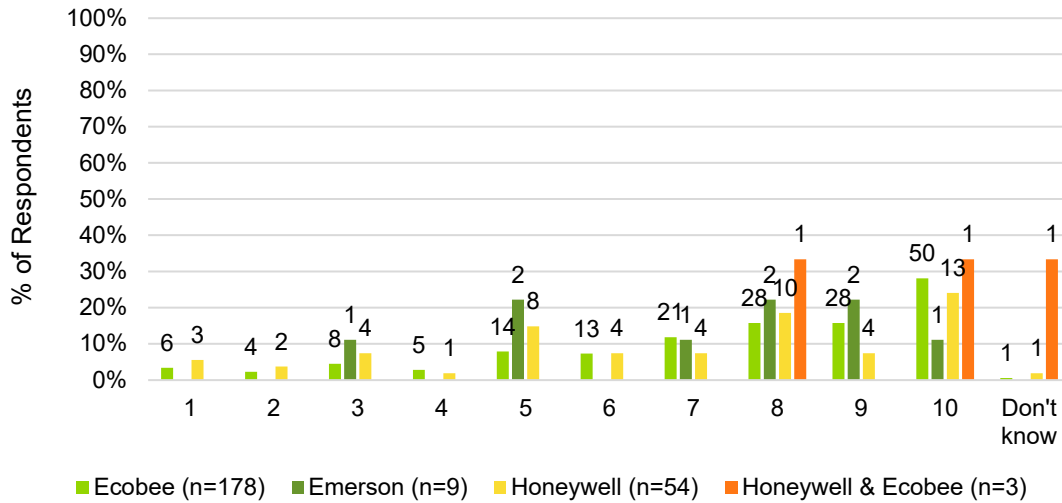
Figure D-7. Why would you like to receive notifications about control events? (Select all that apply) (n = 29)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Those who reported receiving some form of event notification were asked how satisfied they are with the method of the notification provided (Figure D-8). Most respondents (68%) were at least relatively satisfied with event notifications providing a rating between 7 to 10 on a 1 “very dissatisfied” to 10 “very satisfied” scale. **Just under one-third (31%) of those who reported receiving event notifications rated their satisfaction as a 6 or lower, indicating some opportunities for improvement with the form of the notification.**

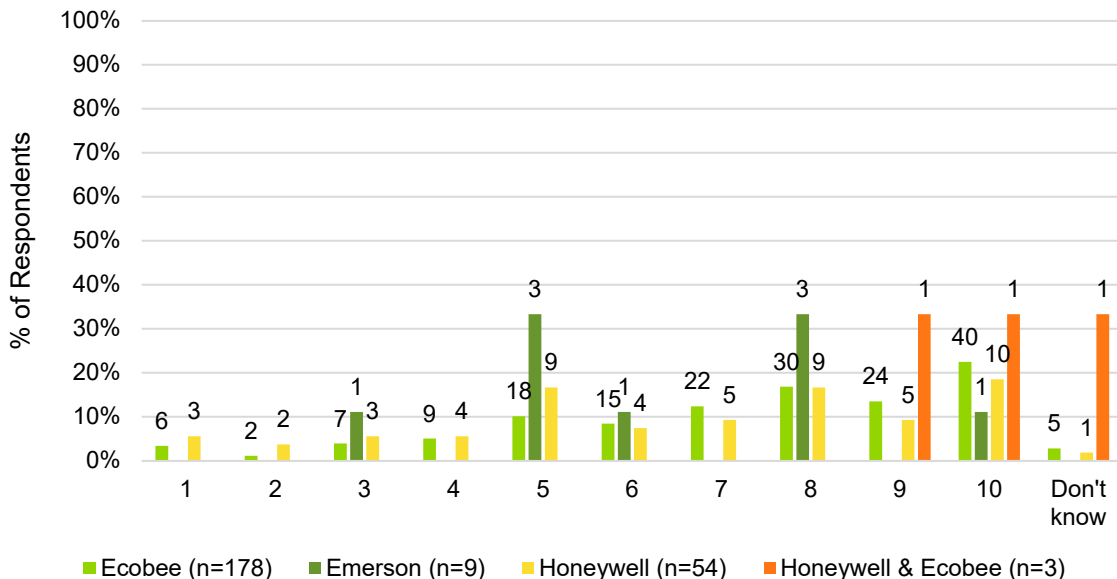
Figure D-8. How satisfied were you with the method of the notification? (n = 244)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Respondents were also asked to rate their satisfaction with the timing of the event notification (Figure D-9). Most respondents, 62%, were relatively satisfied with the timing of their notification (providing a score of 7 or above). **This suggests that many were satisfied with no advance notification** since the majority of these respondents reported seeing notification on the thermostat itself (visible once the event had commenced) and did not recall receiving notification via their thermostat’s app (which would have occurred in advance of events). **However, with 38% less than fully satisfied with notification timing, there is room for improvement.**

Figure D-9. How satisfied were you with the timing of the notification? (n=244)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

In an open-ended question, respondents who recalled receiving notification and were not fully satisfied indicated they only became aware of the event after it was underway. They provided the following feedback:

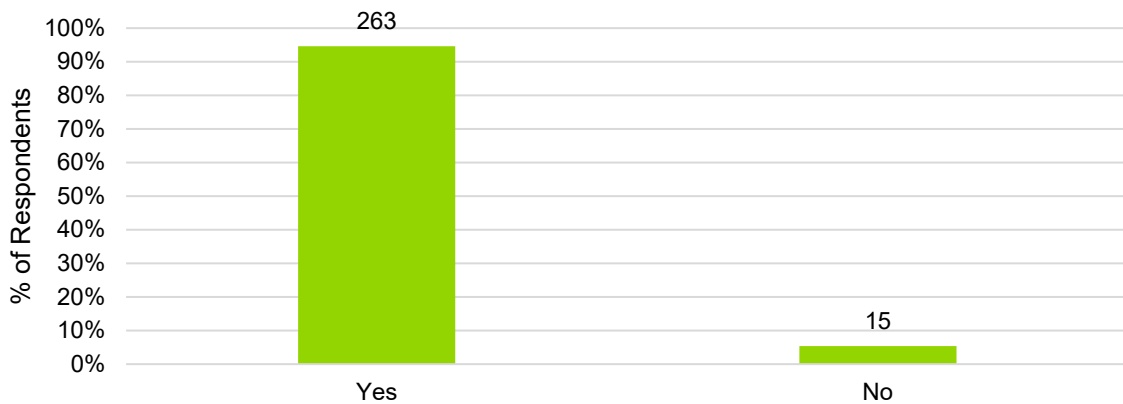
1. A majority of respondents would like notifications in the form of emails or texts.
2. Many respondents would like to have *advanced* notice of events. Many customers would like to know the day before so they can prepare for the event before it occurs.

In addition to assessing participant awareness of control events, the survey explored participant awareness of the *purpose of* control events. The survey provided the following description of the objectives of control events:

- Ease strain on the electrical grid at peak times
- Help keep costs low for communities by reducing the need to produce or purchase additional, expensive energy at peak times
- Prevent blackouts or brownouts
- Extend the lifetime of its infrastructure (avoiding additional investments)
- Over the long-term, develop a flexible grid that allows for more renewable sources of energy.

Only 5% of respondents (or 15) reported not being aware of the objectives for control events.

Figure D-10. Were you aware of some or all of Xcel Energy’s objectives for its AC Rewards’ control events? (n = 278)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

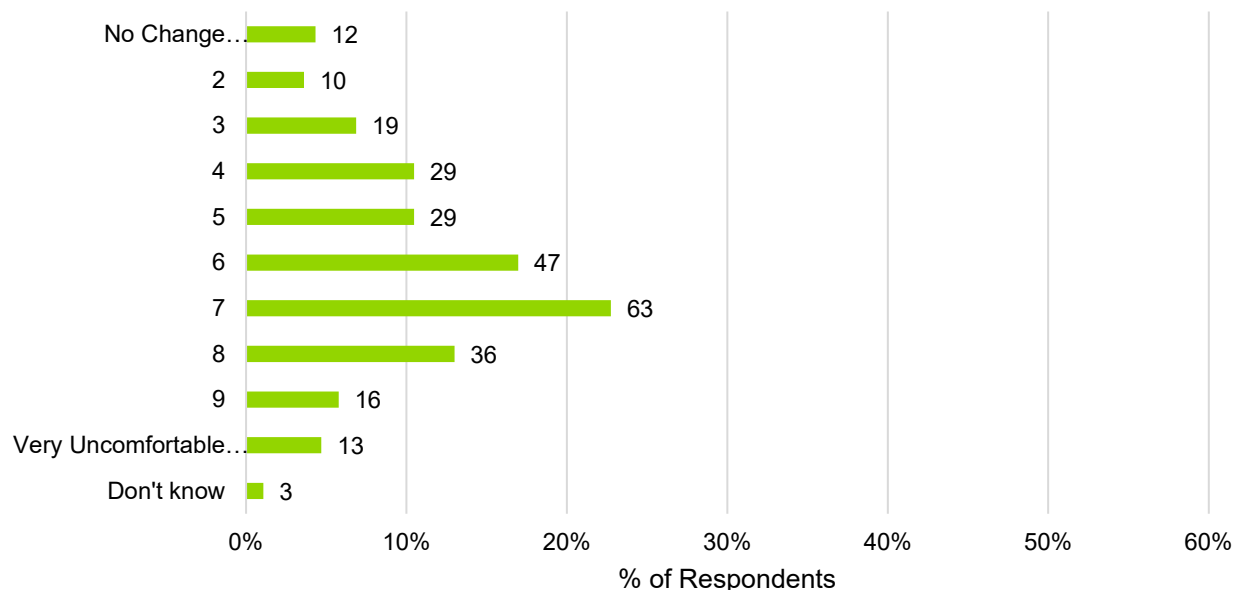
For those who were not aware of the program objectives, they were asked if they would have acted differently during control events and how their actions would have changed. Of the customers who indicated they would have acted differently, 83% percent (or 5 respondents) reported they would have changed the setting on their thermostat. One respondent indicated they would not have enrolled in the program because of the ability of an outside resource to control their thermostat.

D.5.3 Comfort and Behavior

During a control event, Xcel Energy sends a signal to adjust the setpoint of a participant's smart thermostat by a maximum of 4 degrees. An event can last up to 6 hours. As a result, the participant may experience a change in their comfort. The survey asked respondents to provide feedback on their level of comfort during event periods.

Respondents were asked whether they noticed a difference in the comfort level of their home during event periods relative to other summer days with similar outdoor temperatures. As Figure D-11 shows, Guidehouse assessed change in comfort ratings on a 1 (no change in comfort) to 10 (very uncomfortable) scale.

Figure D-11. Did you or another household member notice a difference in the comfort level of your home? How would you rate the comfort level of your home? (n = 277)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Among survey respondents, about 95% reported a change in comfort in their home (a score of 2 or higher). **Some respondents reported relatively high comfort impacts during events. A little over 60% of respondents who were home during at least some events reported a comfort change rating of 6 or higher.** These results were similar across thermostat types. It is important to keep in mind, however, as indicated in the post-event survey memo,²² survey responses may not fully reflect the reality of respondents' experiences or reports of discomfort may not be wholly attributable to the events themselves.

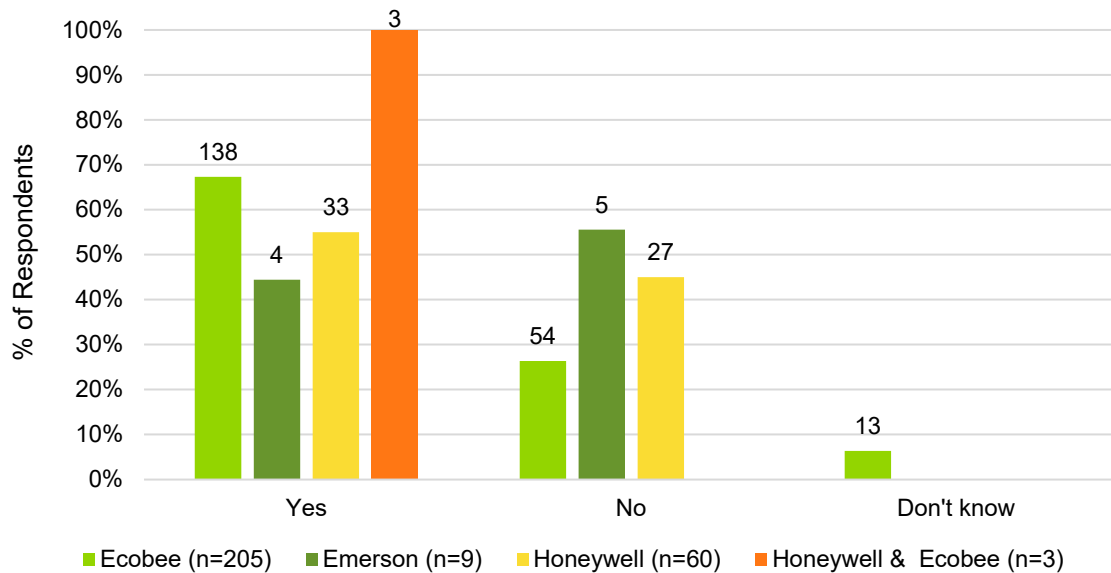
²² Many "placebo" event survey respondents reported a change in comfort when asked about their comfort level on a specific day (when no event was called).

Opt-Out Behavior

Participants have the option to opt out of an event at any time; they can do so simply by overriding the event temperature setpoint. The survey included questions focused on understanding participants’ opt-out behavior.

When respondents who were aware of events were asked if they ever opted out, **over half (64%) indicated they opted out** at least one time (Figure D-12). 66% of those who reported a change in comfort level during control events opted out at least once.

Figure D-12. Did you or another member of your household ever override your smart thermostat setting or “opt out” of a control event? (n=277)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

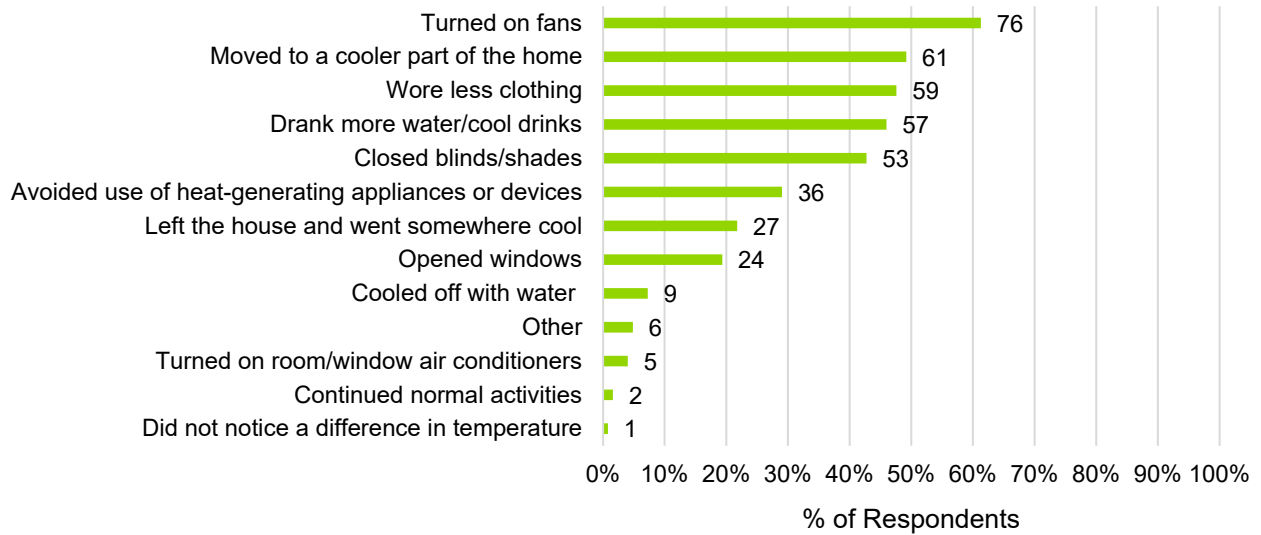
Of the respondents who opted out, a majority overrode the event by adjusting the temperature setting on their Wi-Fi thermostat itself (81%) as opposed to through their Wi-Fi thermostat’s mobile app or web app. This override method was consistent across thermostat types.

Other Actions

During an event, participants may take steps to stay cool and increase their comfort level. The survey asked respondents about the actions they may have taken to avoid discomfort during the event. **Of the respondents who were aware of events, 48% did not take any actions to feel more comfortable, despite the majority of them having noticed a change in comfort.** This finding suggests an opportunity for customer engagement whereby Xcel Energy could provide information and communications to participants with tips about ways to stay comfortable during control events.

Those who took action during an event (47%) indicated they turned on fans, moved to a cooler part of the home, wore less clothing, drank more water/cool drinks, closed blinds, and avoided the use of heat generating appliances (Figure D-13).

Figure D-13. What changes to your routine did you make? (n=124)



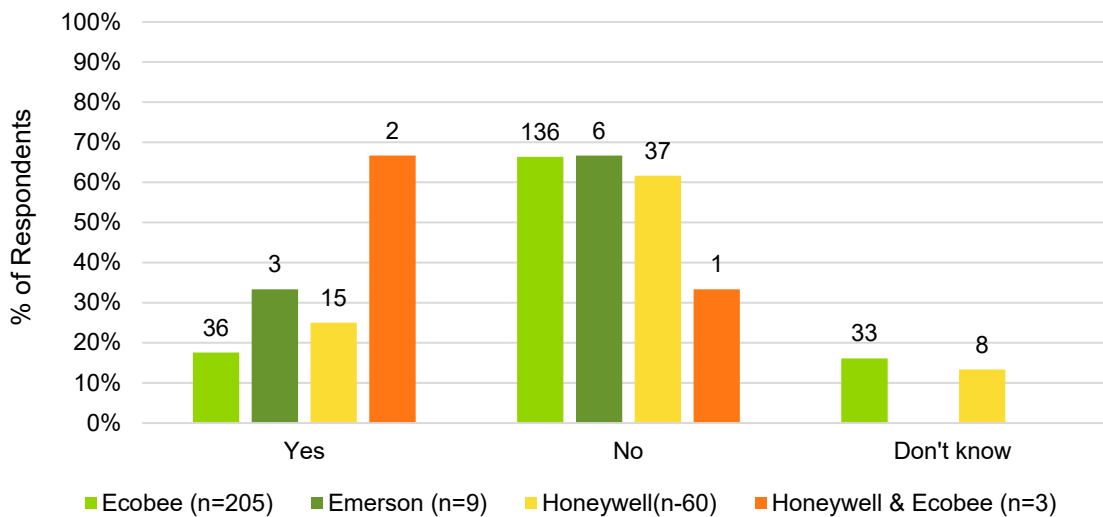
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

D.5.4 Pre-Cooling

In preparation for an event being called, the program may pre-cool the home to limit potential discomfort during the time of an event. During a pre-cooling phase, for Honeywell and Emerson devices, Xcel Energy decreases thermostat setpoints by 2 degrees. ecobee employs its own pre-cooling algorithm.

Less than one-quarter of post-season survey respondents (20%) noticed that their home was automatically pre-cooled before an event (Figure D-14).

Figure D-14. Do you recall the program “pre-cooling” your home? (n = 277)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Respondents were given the opportunity to provide open-ended feedback on pre-cooling. Of the respondents who were less than satisfied with pre-cooling, just over one-third reported it caused their home to become too cold, while about 19% indicated pre-cooling did not help their home stay cool during the event.

When asked if respondents took any actions on their own to prepare for the event, a vast majority (85%) indicated they did not take any action to prepare for the event. This is not surprising given the vast majority of respondents reported that they did not receive advance notification²³ and, therefore, would not have known an event was going to take place.

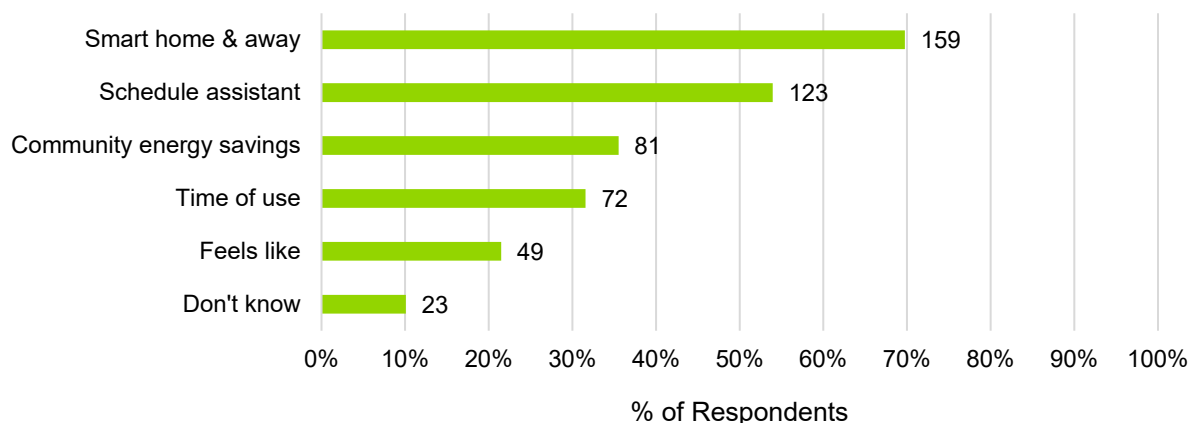
D.5.5 Thermostat Performance and Usage Behavior

In the survey, Guidehouse assessed thermostat performance in addition to determining how customers use and interact with their smart thermostat.

ecobee customers who enrolled in AC Rewards in 2020 were required to be using eco+ (a software update launched in 2020)²⁴, while previously enrolled ecobee users were not required to adopt the update. Guidehouse assessed how many ecobee respondents have eco+ activated and asked about their use of eco+ features.

74% of ecobee respondents reported having eco+ activated. When asked about the features respondents utilize, a majority of respondents (70%) use “Smart home & away” and more than half use “Schedule assistant” (Figure D-15).

Figure D-15. What eco+ features do you use? (n = 227)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

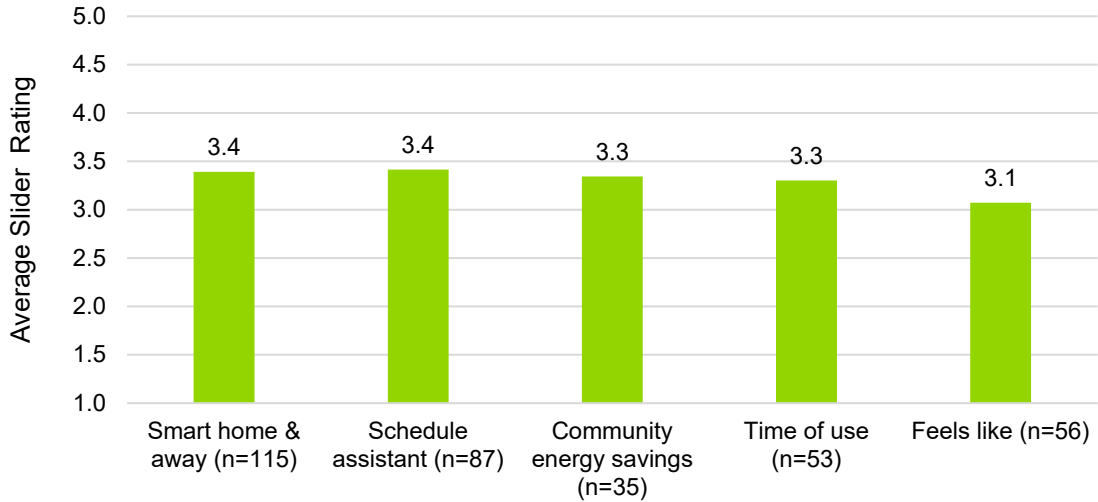
Additionally, respondents were asked which slider setting (1-5) they employ for the eco+ features they use. To be eligible for AC Rewards, the program requires participants to set

²³ Most respondents became aware of the event either by noticing a change in temperature or seeing a notification on the thermostat itself that an event was in-progress.

²⁴ Eco+ is a “a suite of new smart features that helps you save on energy by improving your home’s energy efficiency, while enhancing your comfort. It supercharges your ecobee thermostat and delivers personalized energy recommendations by looking at things like local weather, home occupancy, and variable electricity rates to shift your home’s energy usage accordingly.” Source: <https://support.ecobee.com/hc/en-us/articles/360035246672-eco-Frequently-Asked-Questions>

features at a minimum of 2. Average slider settings ranged from 3.1 to 3.4, depending on the feature (Figure D-16). **9% of respondents reported a slider score of 1 for at least one feature.**

Figure D-16. Which slider setting (1-5) do you typically use?*



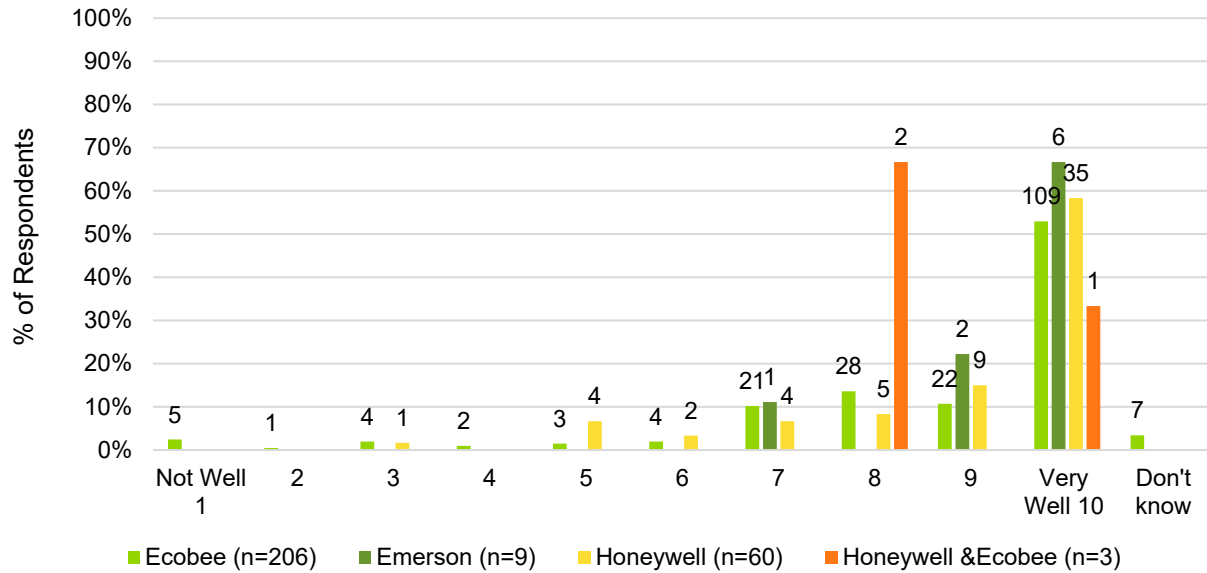
* The n values differed by the eco+ feature.

Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

To gain an understanding of respondent’s satisfaction with their thermostat, respondents were asked how well their thermostat performed on a scale of 1 “not well” to 10 “very well”. As shown in Figure D-17, 88% of respondents indicated their thermostat performed well (provided a response of 7 or higher).²⁵ Of those who reported a satisfaction score of 6 or below, most indicated their thermostat did not indicate a control event was occurring or it was difficult to override an event.

²⁵ The question as seen in the survey provided the following examples: “For example, did the thermostat clearly indicate when a control event was in-progress? Was it easy to makes changes the temperature setting to override events? Did your thermostat stay connected to Wi-Fi?”

Figure D-17. How well did your thermostat work during the control events?

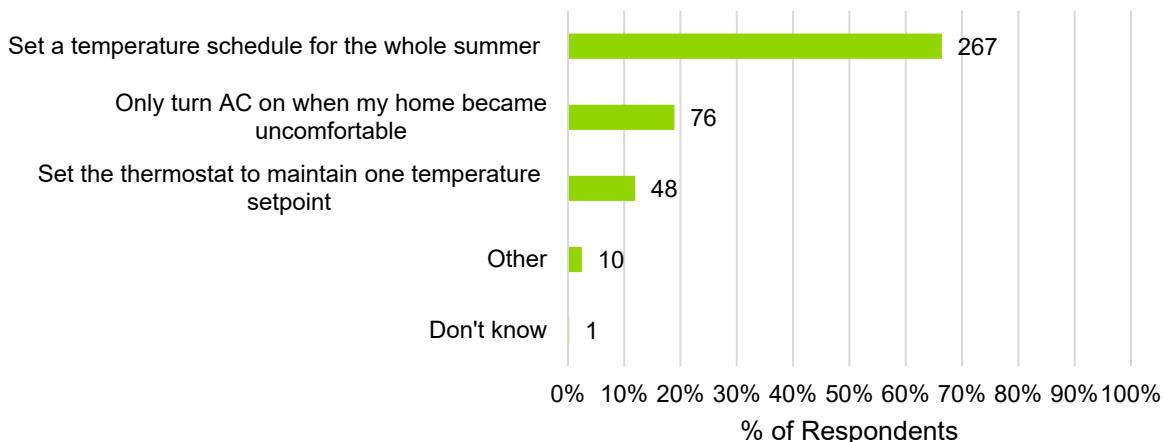


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

In addition to learning about the respondent’s satisfaction with how their thermostat performed during control events, the survey probed to understand how respondents use their smart thermostats in general during summer months. **Most (66%) set a temperature schedule while 19% of respondents indicated they only turn the AC on when it is uncomfortable in their home** (Figure D-18).

Of those who only turn on the AC when their home becomes uncomfortable, they reported turning on the AC when the indoor temperature exceeds 77 degrees, on average. Overall responses ranged from 68 degrees to 95 degrees as the threshold in which they become too uncomfortable and need to use AC.

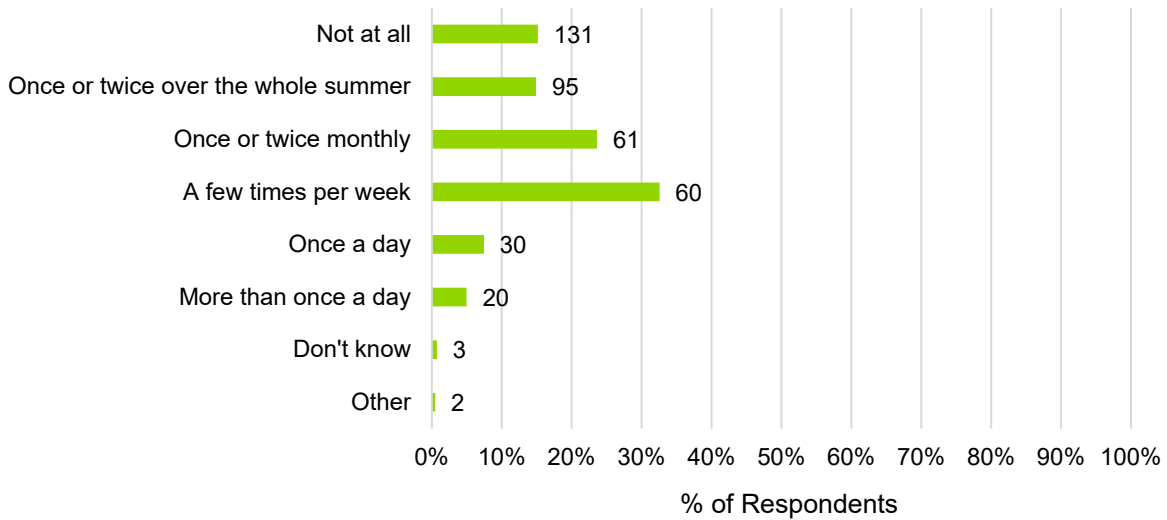
Figure D-18. How did you typically use your thermostat throughout the summer? (n = 402)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

To get a sense of how often customers interact with their thermostats by adjusting or tweaking their settings, the survey asked how frequently participants adjusted their smart thermostat setting during the summer. A third of respondents adjust settings a few times a week, while a quarter do so once or twice monthly (Figure D-19).

Figure D-19. How frequently did you adjust your Wi-Fi thermostat’s setting or schedule (either up or down) during the summer during non-event days? (n=402)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

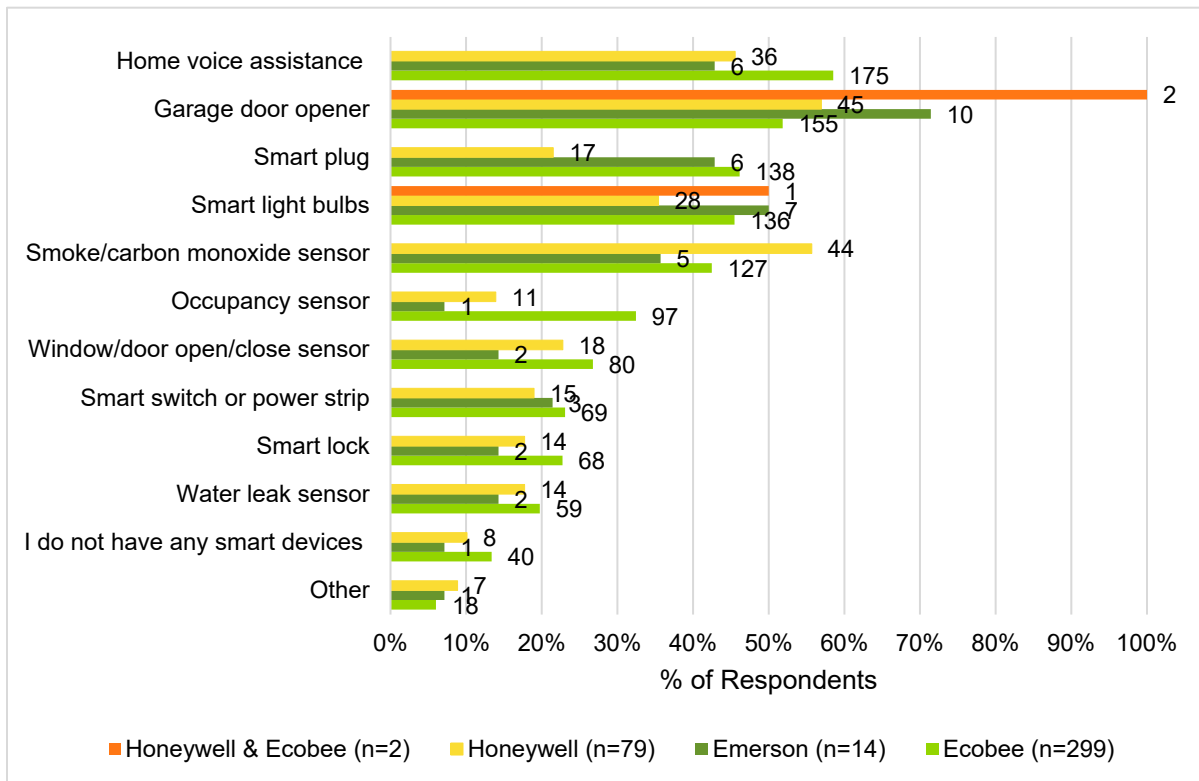
D.5.6 Smart Home Devices

Consumers continue to integrate smart devices into their lifestyle as a way to increase convenience and comfort. When asked if respondents use other smart home devices besides their smart thermostats to control the temperature of their home, 88% reported not using other smart home devices. Of the respondents who do utilize other smart home devices to control household temperature, the most popular responses included:

- Alexa or Echo
- Sensors such as ecobee Smart Sensors, SmartThings temperature sensors, and remote temperature sensors.

Other smart home devices (those not used to control temperature) are prevalent in respondents’ homes. When asked about other smart devices, over a majority (55%) reported using home voice assistance such as Alexa (Figure D-20). Many respondents also reported using smart garage door openers (53%), smoke/ carbon monoxide sensors (45%), smart lights (44%), and smart plugs (41%).

Figure D-20. What other type of smart home device(s) do you have at home? (n=394)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

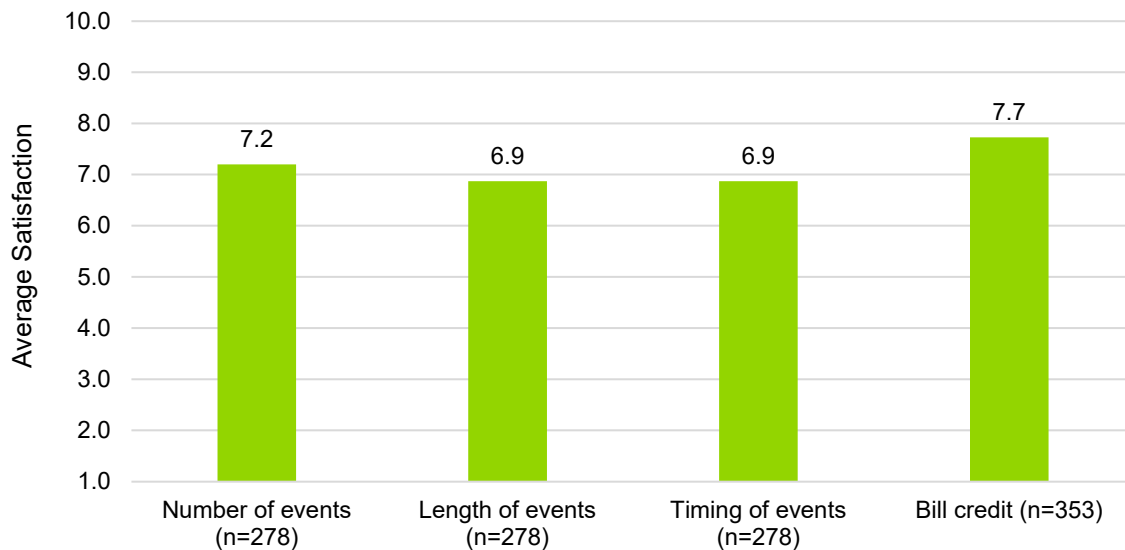
D.5.7 Satisfaction

As part of the post-season survey effort, Guidehouse assessed customer satisfaction with Xcel Energy overall, the AC Rewards program, and aspects of the program.

Satisfaction with Events

Xcel Energy would like to better understand current levels of participant satisfaction with different aspects of the AC Rewards program including the annual bill credit, number of events, length of events, and timing of events in summer 2020 to identify areas of improvement. Guidehouse assessed satisfaction of these topics by asking respondents to rate their satisfaction on a 1 “very dissatisfied” to 10 “very satisfied” scale.

Across all event attributes, satisfaction ratings ranged from an average of 6.9 to 7.7 (Figure D-21).

Figure D-21. How would you rate your satisfaction with the following program aspects?


Note: Only respondents who recall events received satisfaction questions for the number of events, length of events, and timing of events. All participants received the satisfaction question regarding the annual bill credit. Don't know responses were removed from analysis.

Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Respondents were somewhat satisfied with the bill credit and number of events, providing an average satisfaction rating of 7.7 and 7.2, respectively. Several respondents who reported lower satisfaction for the number of events indicated there were too many or noted there were more events in 2020 compared to past seasons due to the hot temperatures in Colorado. Of respondents who reported lower satisfaction scores for the bill credit, most respondents indicated the credit was either not worth the amount of discomfort they experienced during events or they did not recognize the credit on their bill. One respondent noted that it, “seems like a substantial benefit to utility company, but limited credit to consumer.” Some respondents also noted the AC Rewards bill credit is lower than the Saver’s Switch program, which contributed to their lower satisfaction score.

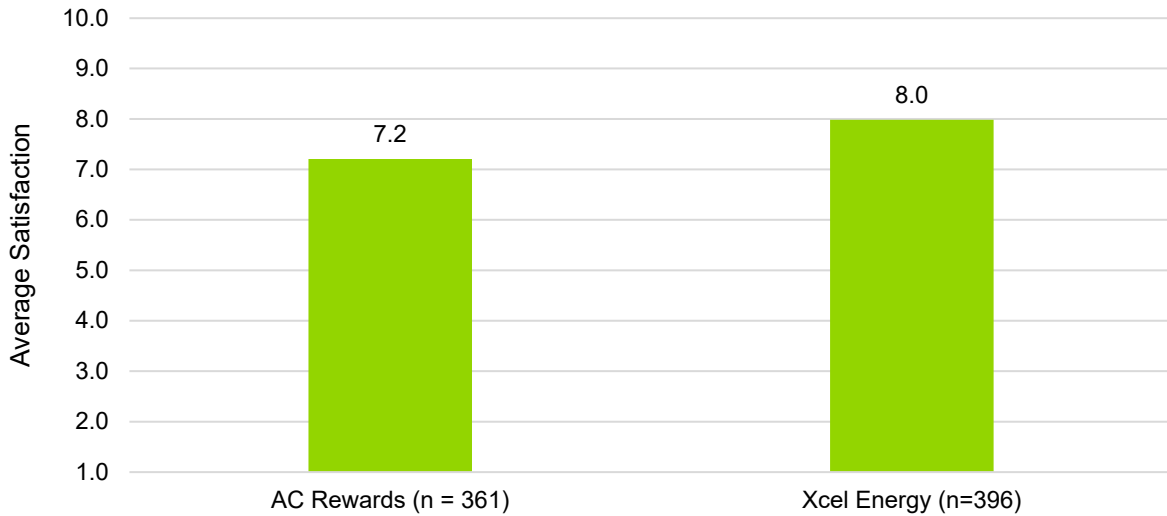
Respondents were somewhat less satisfied with the length of events and timing of events. When asked to provide a reasoning for their satisfaction rating, a majority of respondents indicated the events were too long and the temperatures in their home were too warm because the events occur at the warmest period of the day and at a time of meal preparation.

Overall Satisfaction

In addition to questions related to participant satisfaction with event attributes, the survey solicited feedback on respondents’ satisfaction with the AC Rewards program overall and Xcel Energy in general.

As Figure D-22 shows, **respondents responded positively to both the AC Rewards program and Xcel Energy, providing average satisfaction scores of 7.2 and 8.0, respectively.**

Figure D-22. How satisfied are you with AC Rewards and Xcel Energy?

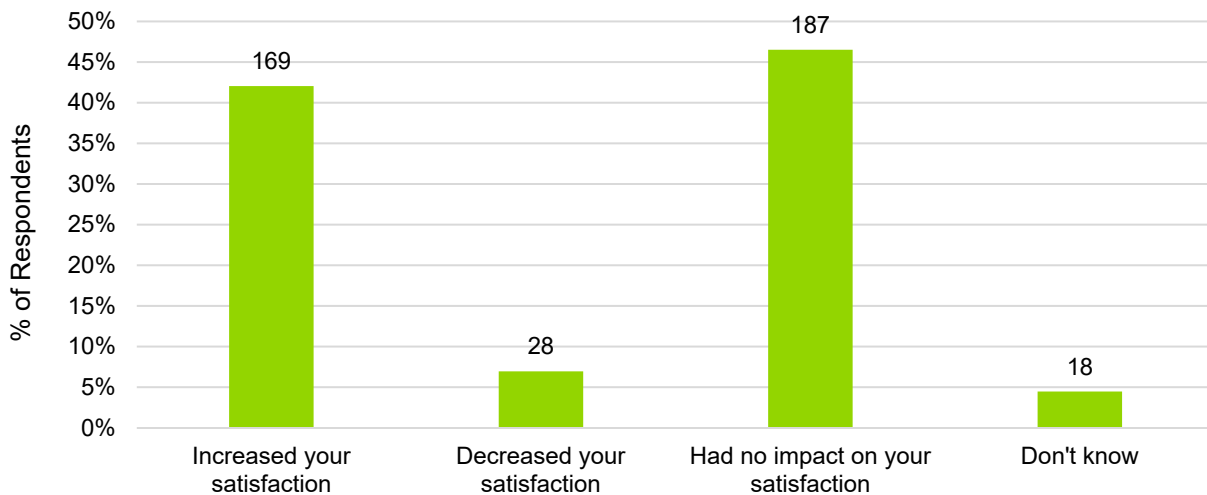


Note: Don't know responses were excluded from analysis.

Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Additionally, as Figure D-23 shows, few respondents indicated their AC Rewards experience has negatively impacted their satisfaction with Xcel Energy. In fact, almost half of respondents (42%) indicated the AC Rewards program increased their satisfaction with Xcel Energy.

Figure D-23. How has AC Rewards impacted your satisfaction with Xcel Energy overall? (n=402)



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

When asked if respondents were likely to continue participating in the program in the future on a 1 “very unlikely” to 10 “very likely” scale, **the average likelihood score was 8.6, indicating they are very likely to continue participating.** Respondents were also asked if they would recommend the program to others, providing an average likelihood score of 8.1, meaning they are likely to encourage others to participate.

Although high satisfaction scores were provided and respondents would recommend that others participate in the program, respondents offered suggestions for improvement. The following three common themes arose from customer feedback:

1. Increase the incentive or include more “rewards”.
2. Provide additional forms of event notifications (emails and texts) and provide notification in advance of events.
3. Provide more information to the customer. Not only would customers like more details about how the programs works, they would also like to know how they performed during events. Although it was mentioned by others as well, one customer phrased this well by mentioning, “It’s nice to hear measurable results from my and other participating customers on how much energy was saved.”

Many respondents also left positive remarks about the program and indicated they enjoy participating.

D.5.8 Considerations

Guidehouse summarizes key findings and considerations in Table D-5.

Table D-5. Key Findings and Considerations

Topic	Key Finding	Considerations
Marketing and Motivations	<ul style="list-style-type: none"> • Most respondents (84%) <i>first</i> learned about the program through Xcel Energy (rather than through their thermostat manufacturer). • Key sources of motivation to enroll were to lower their bills by reducing energy use (64%), receive bill credits (55%), and save energy (53%). • Many respondents also reported wanting to reduce pressure on the grid (47%) and support the community’s energy initiatives (38%). 	<ul style="list-style-type: none"> • Since any given individual participant may experience only minor bill and energy savings, if any, Xcel Energy should adjust messaging away from emphasizing energy savings and focus on customer bill credits in addition to the contributions of the program towards sustainability and grid stability.

Topic	Key Finding	Considerations
Awareness and Notification	<ul style="list-style-type: none"> • 66% of respondents became aware of the event through a notification on the thermostat itself and 47% became aware by the change in indoor temperature. Only 21% reported becoming aware of events via notifications from their thermostat app. • Of the respondents who became aware of events only due to a change in indoor temperature, 57% indicated they did not receive any event notification, but most would like to via email or text. These respondents would like to be notified so they can prepare to use other methods to stay cool and so they can understand why the setpoint of their thermostat is being adjusted. • Of the respondents who received a notification, most participants were at least somewhat satisfied with the timing and method of the notification, providing mean satisfaction ratings of 7.1 and 7.4, respectively.** Less satisfied respondents requested that notification be sent in advance of the events. 	<ul style="list-style-type: none"> • Provide more information about how and when participants receive event notifications. Be sure to clearly instruct and remind participants to enable push notifications from their thermostat app to receive advance notifications. • Consider offering additional methods of event notifications (email or text) in advance of events.
Comfort and Behavior	<ul style="list-style-type: none"> • 95% of respondents reported at least some change in comfort in their home (a score of 2 or higher).* • Over half (64%) of respondents who were aware of events indicated they opted out of at least one event. • Of the respondents who were aware of events, 48% did not take any actions to feel more comfortable, despite most of them having noticed a change in comfort. 	<ul style="list-style-type: none"> • Create and distribute material providing helpful tips about how to prepare for events and ways to stay cool during events. •
Thermostat Performance and Usage Behavior	<ul style="list-style-type: none"> • 88% of respondents indicated their thermostat performed well during events (provided a response of 7 or higher).*** • Most respondents (66%) set a temperature schedule for their thermostat which they occasionally tweak. • 19% of respondents indicated they only turn the AC on when it is uncomfortable in their home. 	<ul style="list-style-type: none"> • Take advantage of customer’s “set it and leave it behavior” and promote the ease of participating in AC Rewards. Indicate Xcel Energy does all the work. • Review event participation statistics to assess how many participants, if any, had their thermostats in off mode or in a non-cooling mode, and how this varies with event temperature and by region.

Topic	Key Finding	Considerations
Satisfaction	<ul style="list-style-type: none"> • Some respondents noted the AC Rewards bill credit is lower than the Saver's Switch program, which contributed to their lower bill credit satisfaction score. • Respondents responded relatively positively to both the AC Rewards program and Xcel Energy, providing average satisfaction scores of 7.2 and 8.0, respectively.** • Respondents are likely to continue participating the program and they are likely to recommend the program to others. • Suggestions for program improvement from respondents included increasing the "reward", providing advance notification of event, and providing more detailed information about the program and performance during events. 	<ul style="list-style-type: none"> • Consider providing customers with a referral bonus for referring other Xcel Energy customers to enroll in AC rewards. • Create a comparison of the AC Rewards and Saver's Switch program to help customers decide which program is best for them. • Consider sending customers an email after each event or a couple times over the course of the summer letting them know how they performed or how the collective program performed, and how they helped the grid, environment and community by participating.

* Where 1 is "no change in comfort" and 10 is "very uncomfortable."

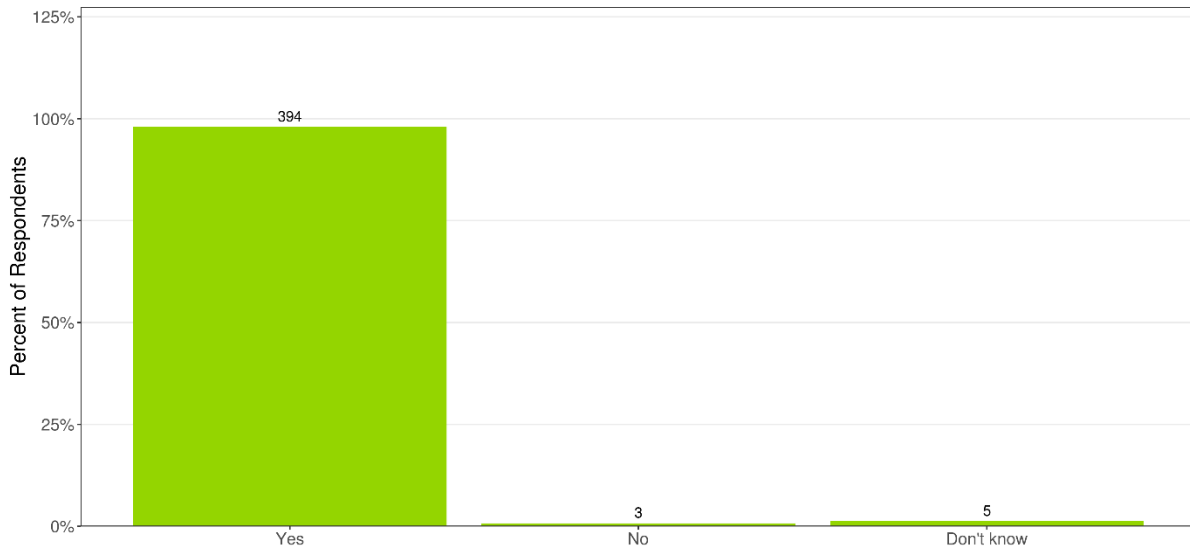
** Where 1 is "very dissatisfied" and 10 is "very satisfied."

*** Where 1 is "not well" and 10 is "very well."

D.6 Appendix 1. Post-Season Survey Output

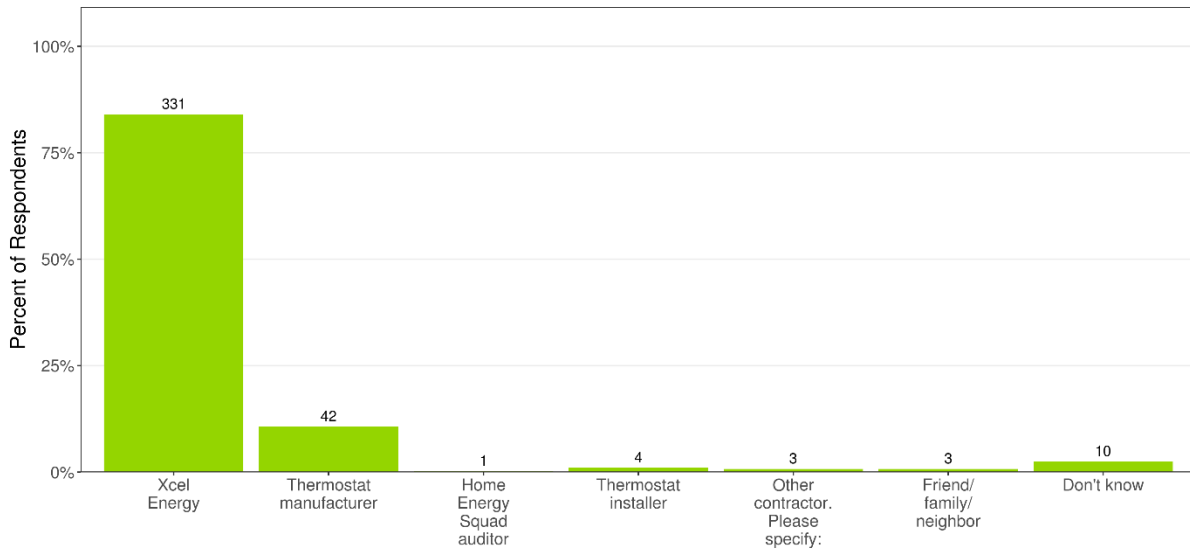
D.6.1 Motivation

Figure D-24. Were you the person responsible for signing up for the AC Rewards program?



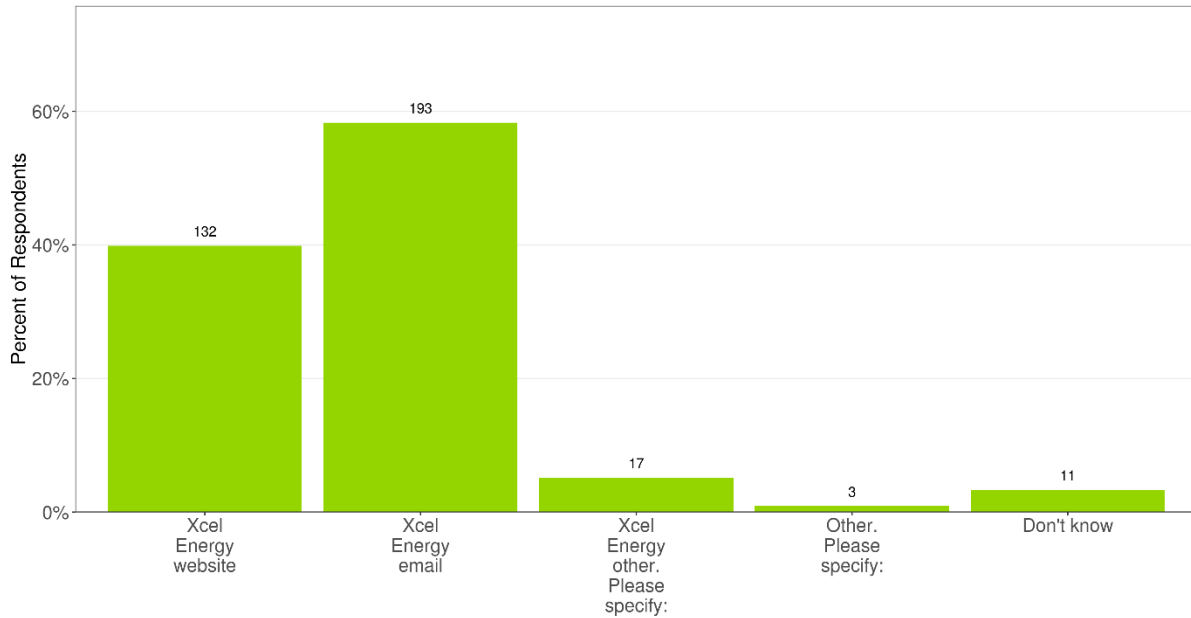
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-25. How did you first learn about Xcel Energy's AC Rewards Program?



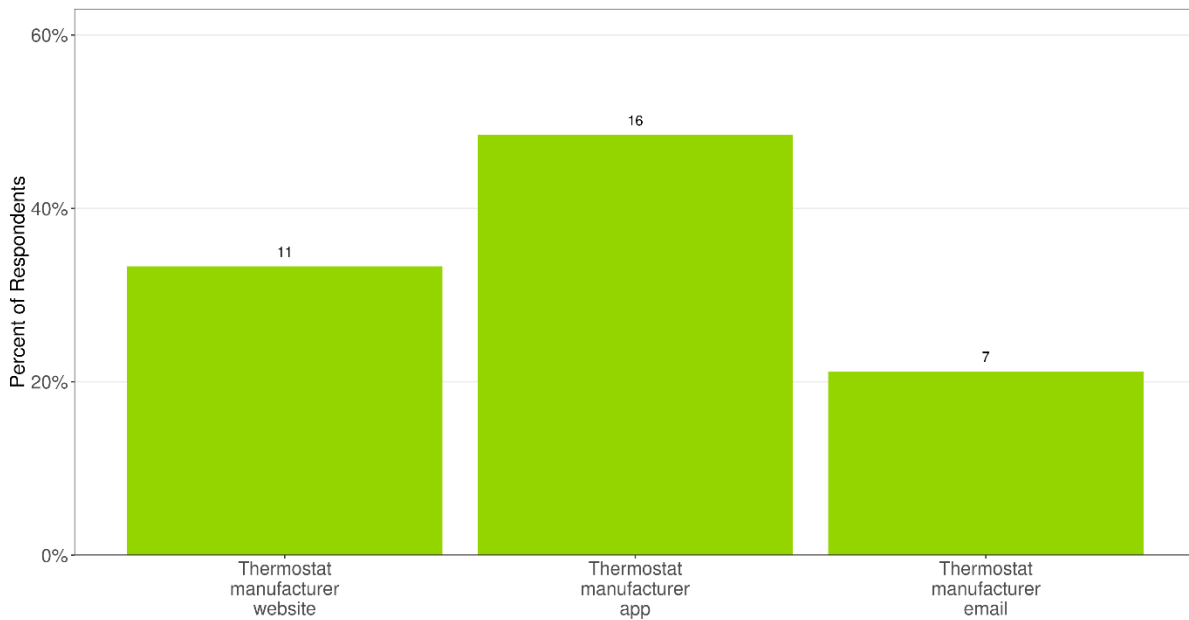
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-26. How did you learn about AC Rewards through Xcel Energy? (Select all that apply).



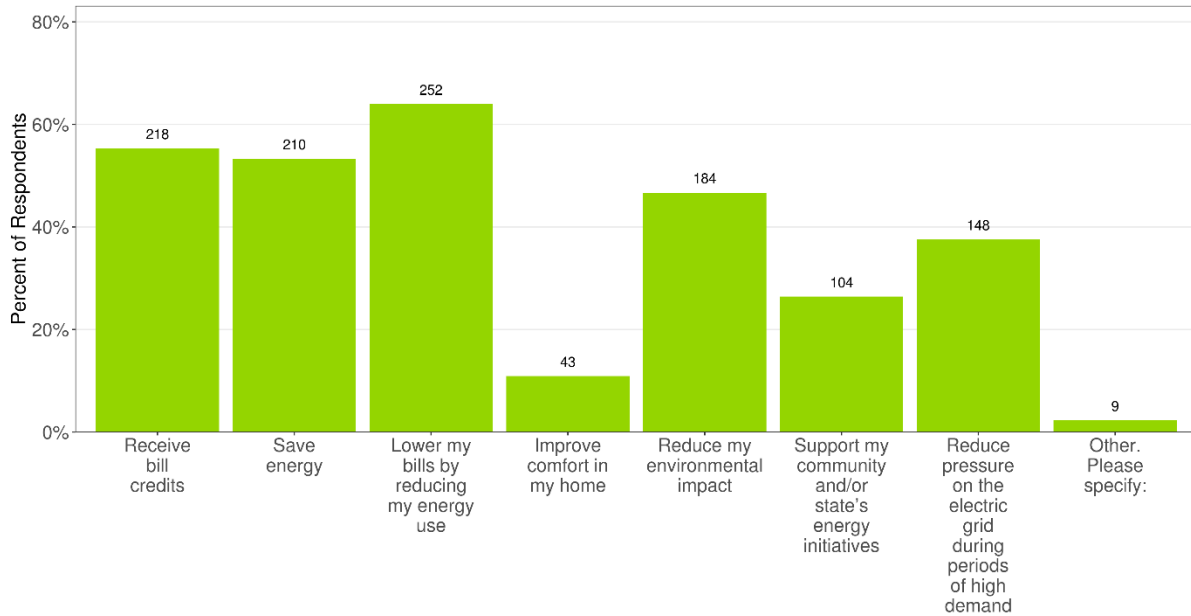
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-27. How did you learn about AC Rewards through your thermostat manufacturer? (Select all that apply).



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

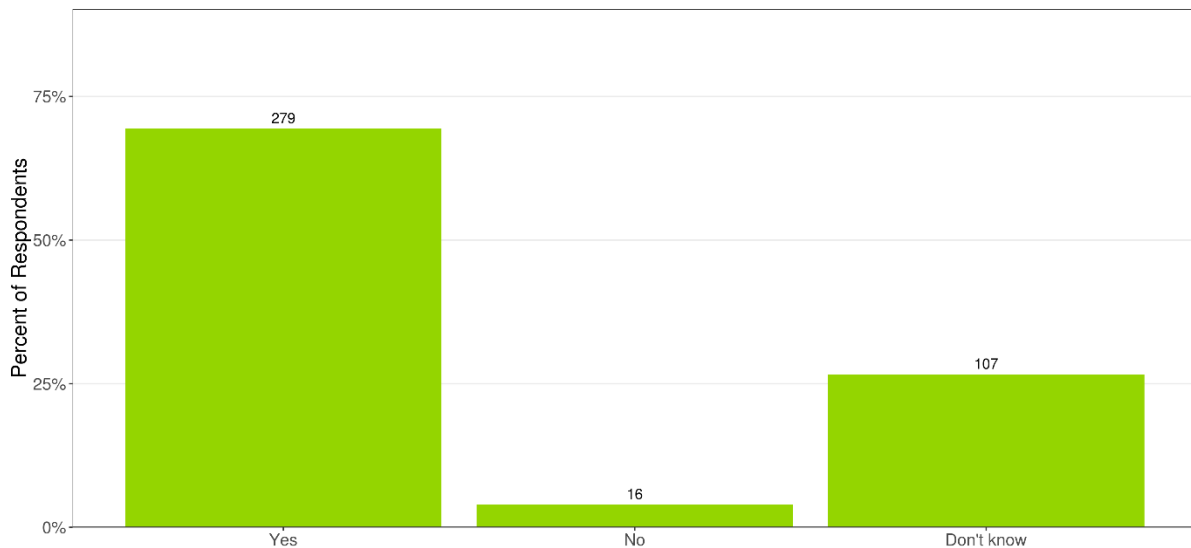
Figure D-28. What are the primary reasons you decided to enroll in the program? (Please select all that apply).



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

D.6.2 Awareness and Event Notification

Figure D-29. Did Xcel Energy initiate any control events this past summer?

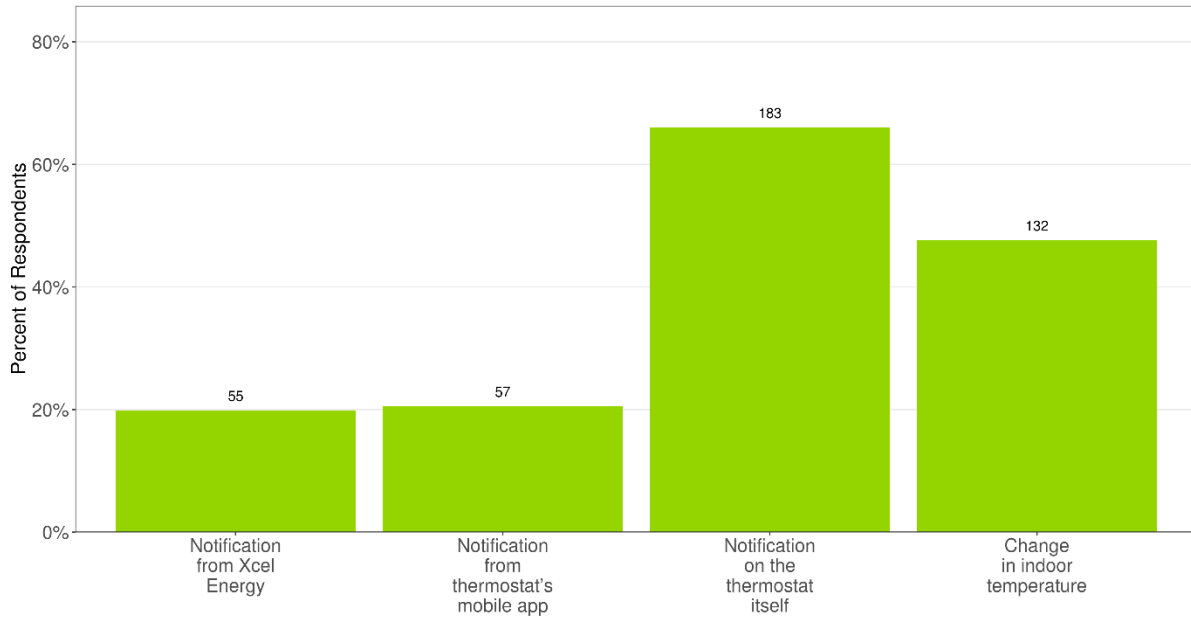


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-30. Approximately how many control events do you remember occurring over the summer? (Please give your best estimate).

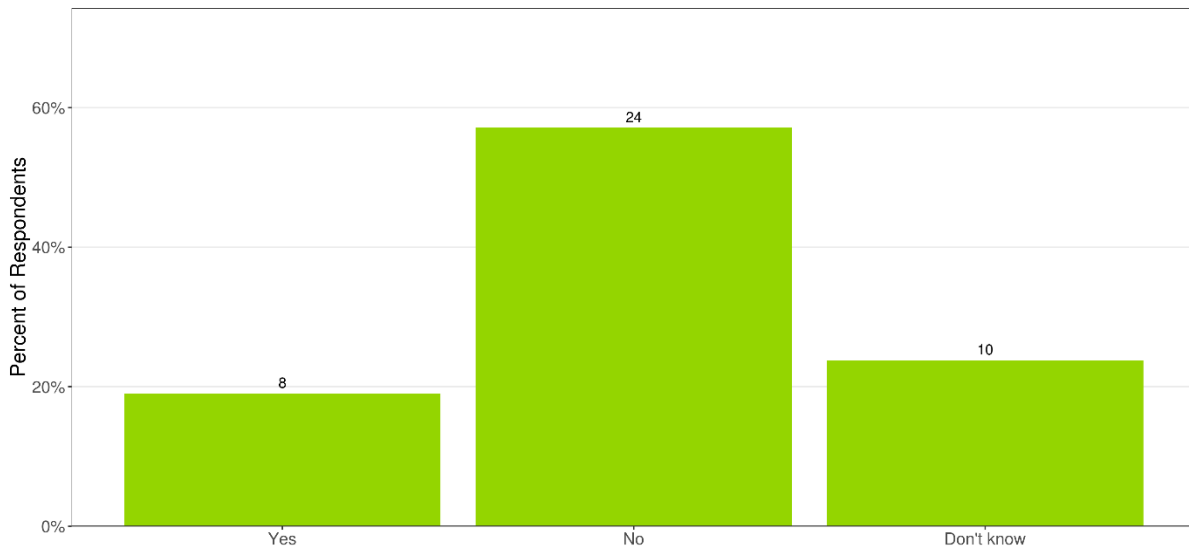
*Customer verbatims were summarized in the report, as appropriate

Figure D-31. Which ways do you recall becoming aware of the control events? (Please select all that apply).



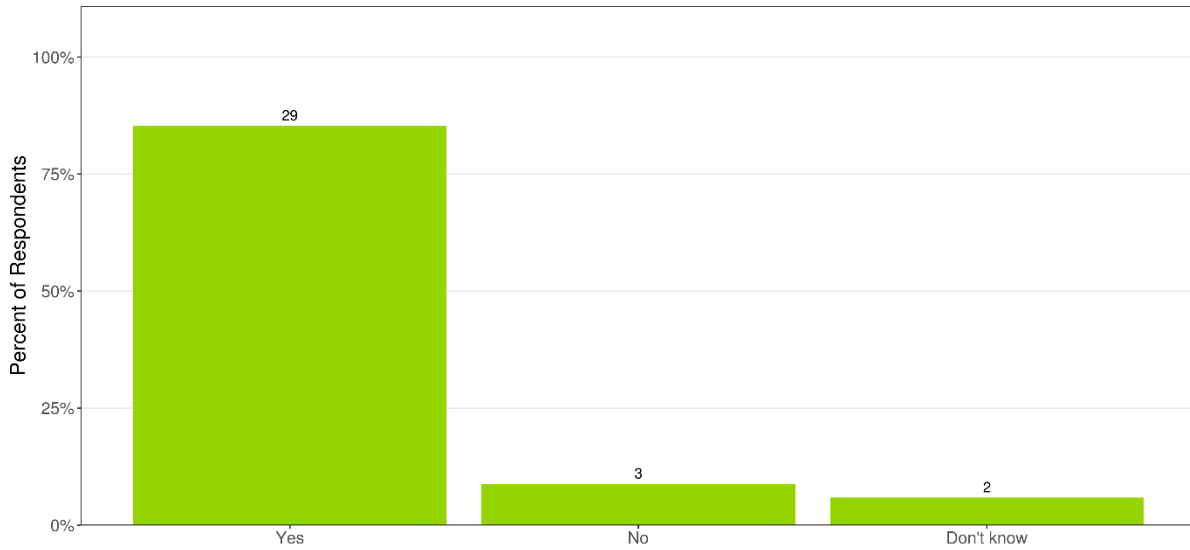
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-32. Did you receive notification about the control events?



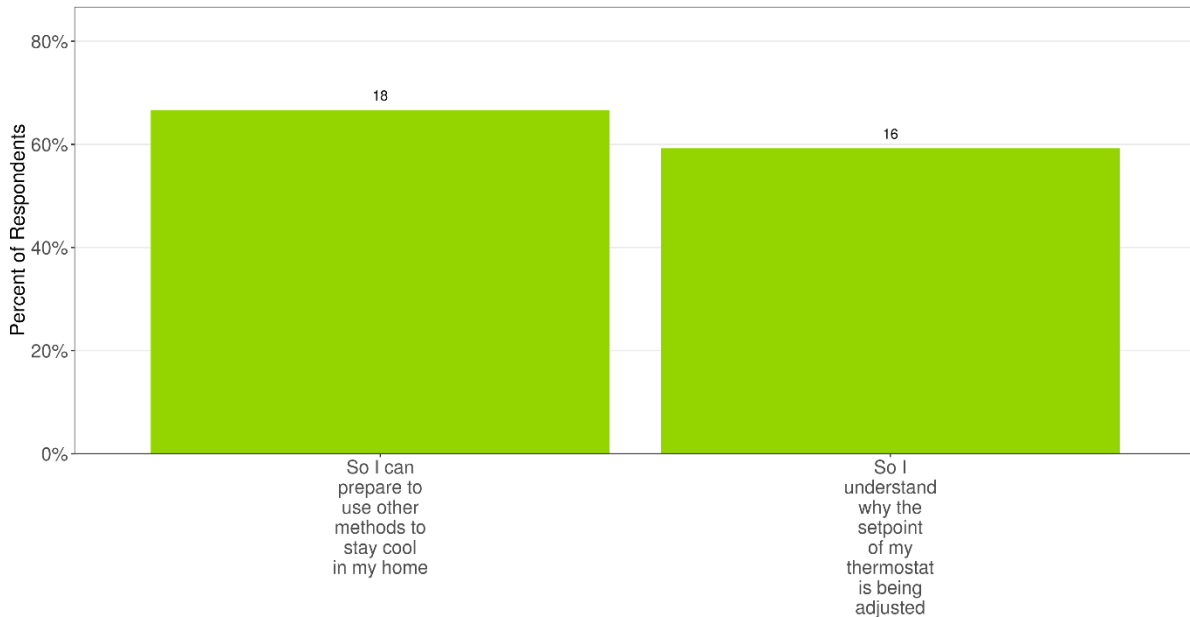
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-33. Would you like to receive notifications about future controls events?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-34. Why would you like to receive notifications about control events?

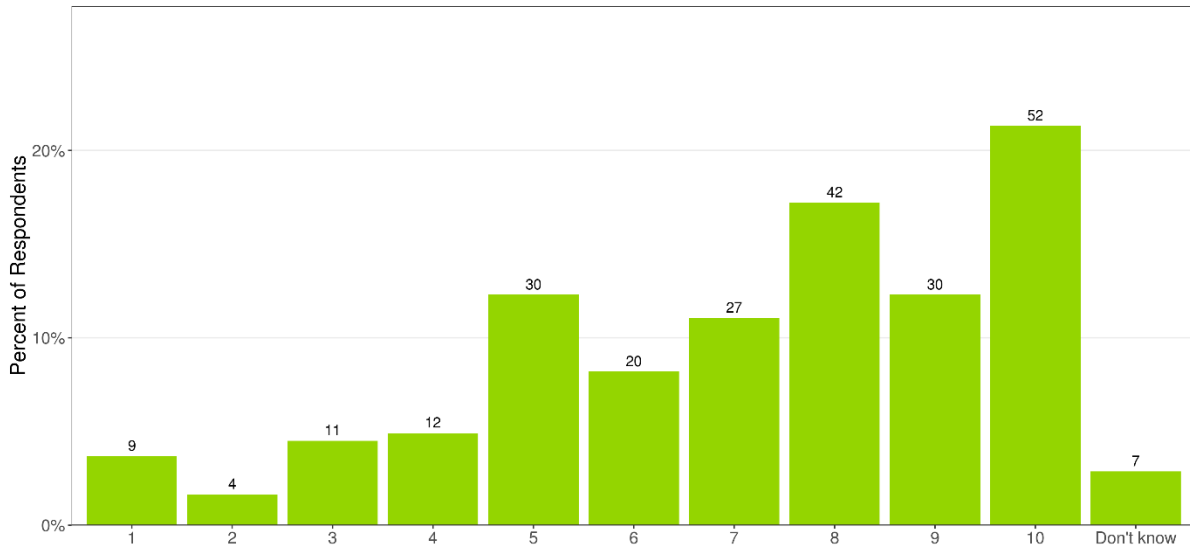


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-35. How would you like to receive notification about control events?

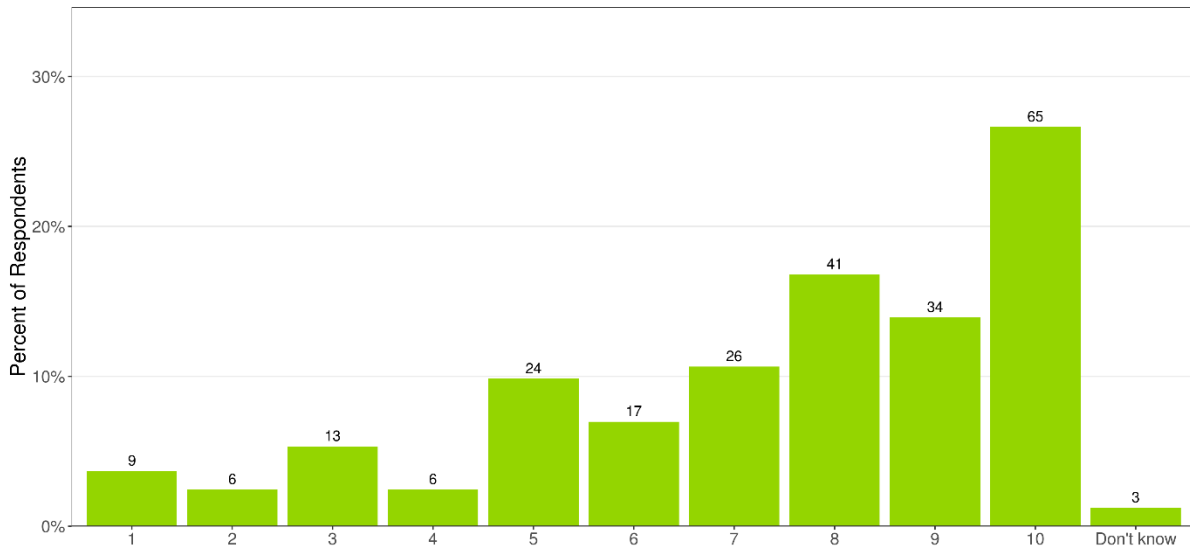
*Customer verbatims were summarized in the report, as appropriate

Figure D-36. How satisfied were you with the timing of the notification?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-37. How satisfied were you with the method of the notification?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-38. Why did you rate your satisfaction with the timing of event notifications that way?

*Customer verbatims were summarized in the report, as appropriate

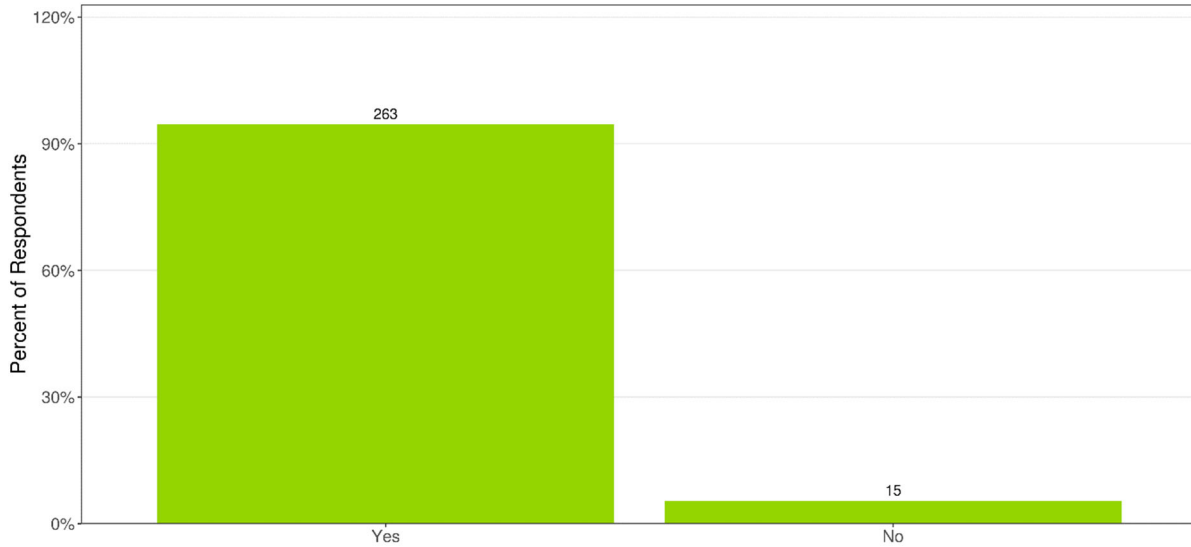
Figure D-39. Why did you rate your satisfaction with the method of event notifications that way?

*Customer verbatims were summarized in the report, as appropriate

Figure D-40. How could the notification of the control events have been improved?

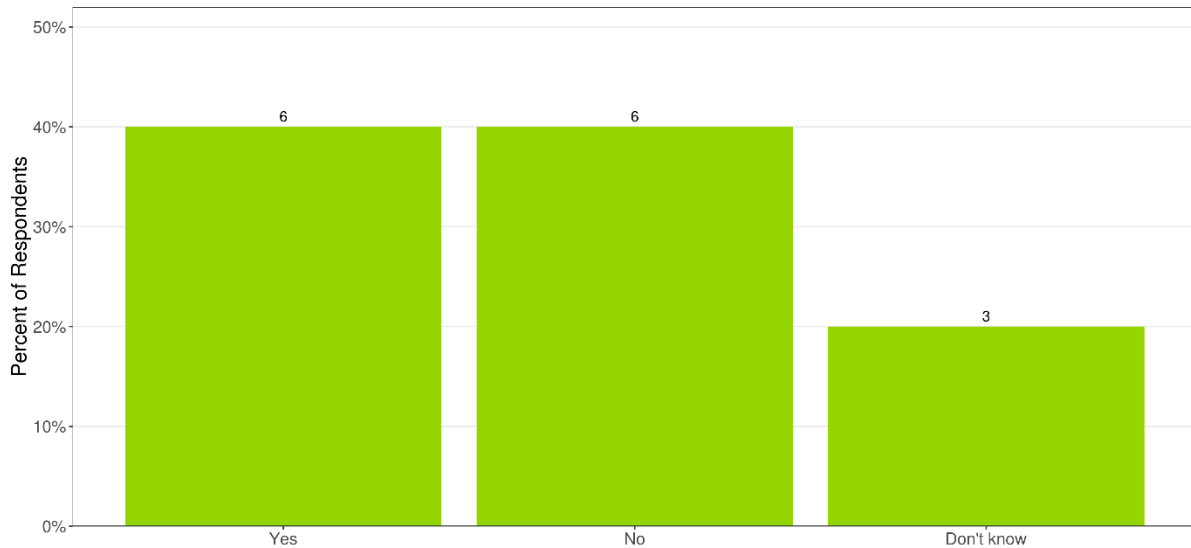
*Customer verbatims were summarized in the report, as appropriate

Figure D-41. Were you aware of some or all of Xcel Energy’s objectives for its AC Rewards’ control events?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-42. If you had been aware of the objectives of control events, do you think you would you have acted differently during control events this past summer?



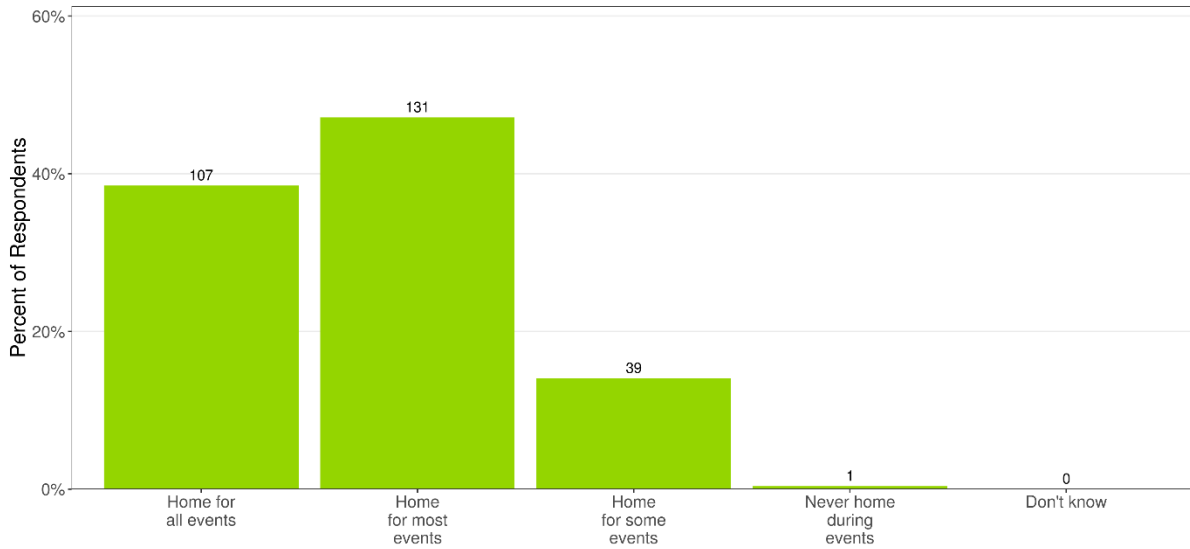
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-43. How do you expect your actions would change?

*Customer verbatims were summarized in the report, as appropriate

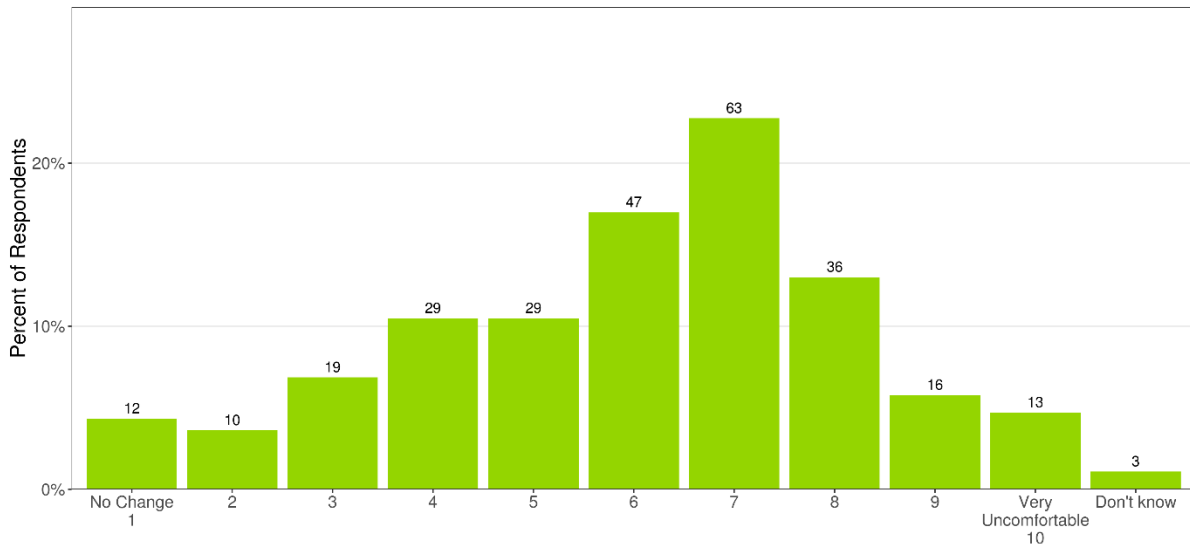
D.6.3 Comfort and Opt-Out Behavior

Figure D-44. This summer, for the control events you can recall, how often were you or another family member at home during any part of the event?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-45. On average, how would you rate your comfort level during control events using a scale of 1 to 10 where 1 is “No change” in comfort and 10 is “Very uncomfortable”?

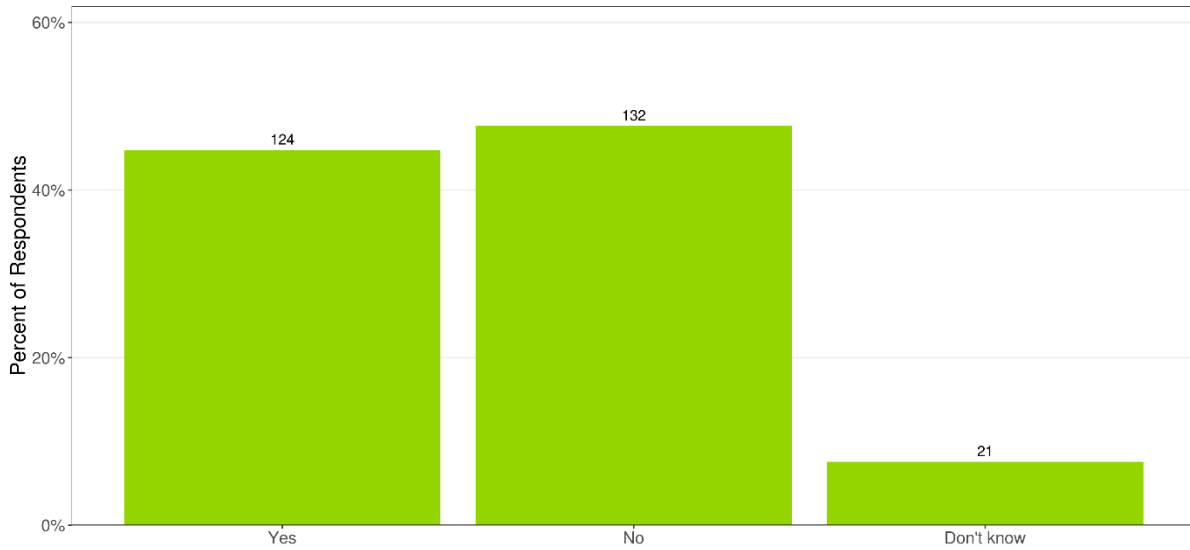


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-46. Why did you rate your satisfaction with your comfort level during control events that way?

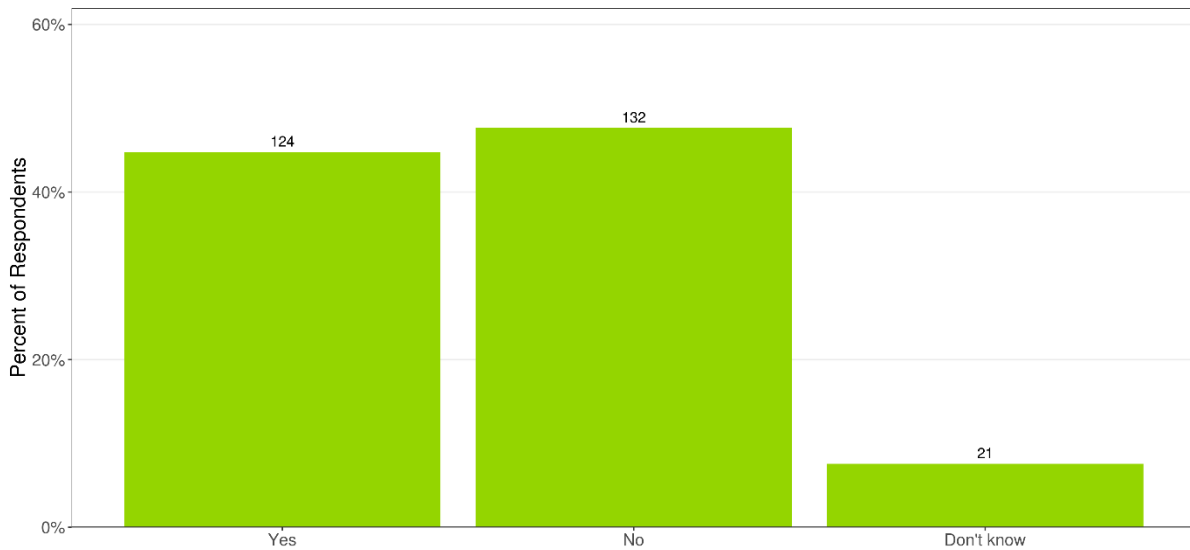
*Customer verbatims were summarized in the report, as appropriate

Figure D-47. During control events, did you or other occupants of your household make changes to your typical daily routine to keep cool?



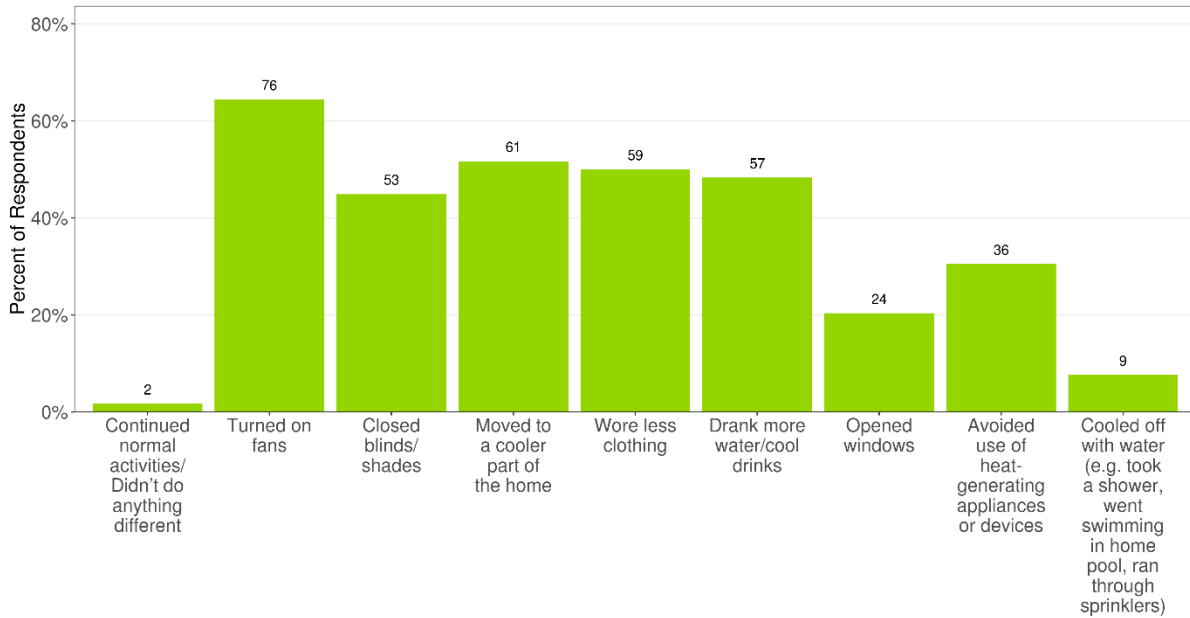
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-48. During control events, did you or other occupants of your household make changes to your typical daily routine to keep cool?



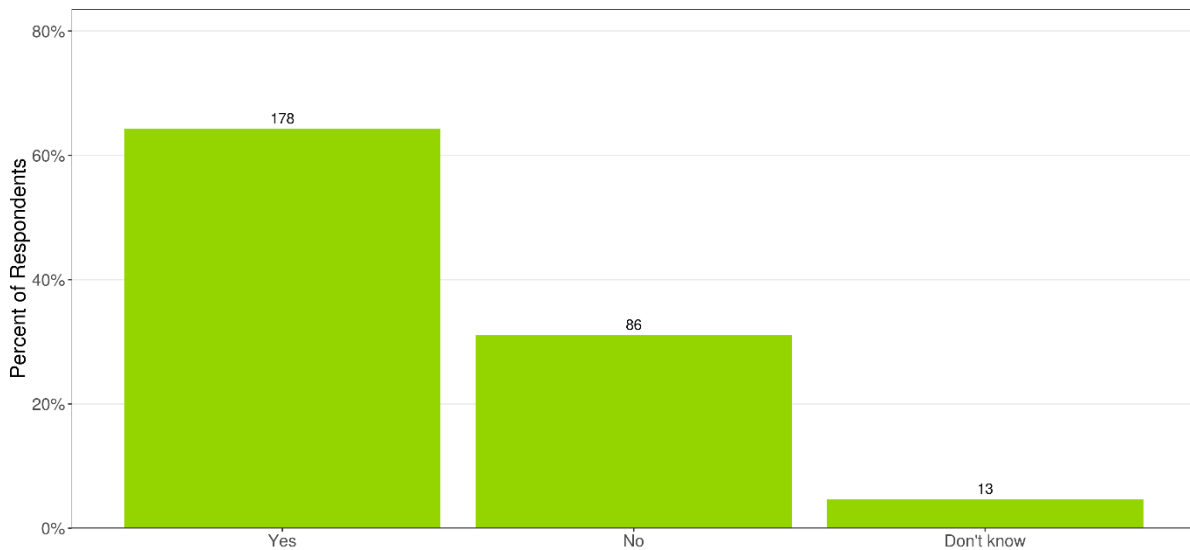
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-49. During control events, what changes to your routine did you make most often? Please select all that apply.



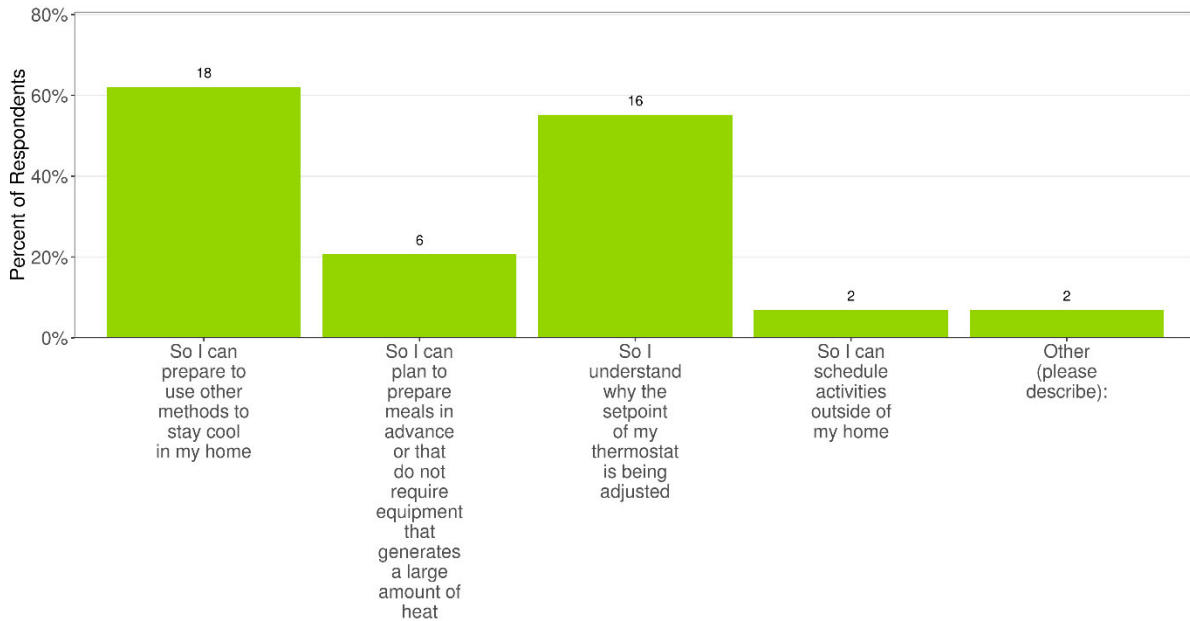
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-50. As part of the AC Rewards program, you have the ability to opt out of a control event. Did you or another member of your household ever override your smart thermostat setting or “opt out” of a control event?



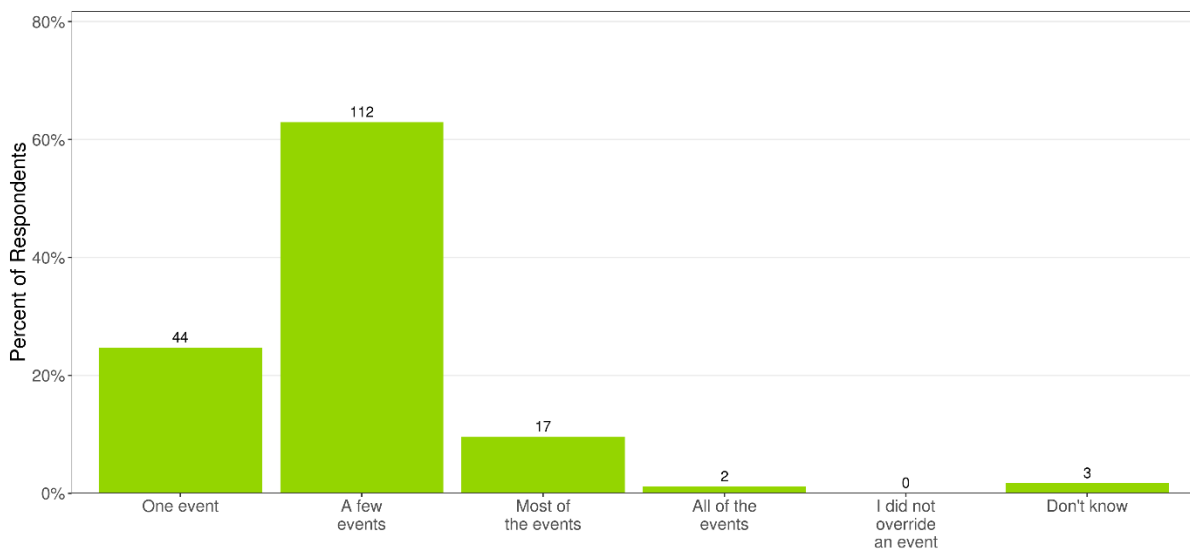
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-51. Which did you use to opt out of the control event(s)? (Select all that apply).



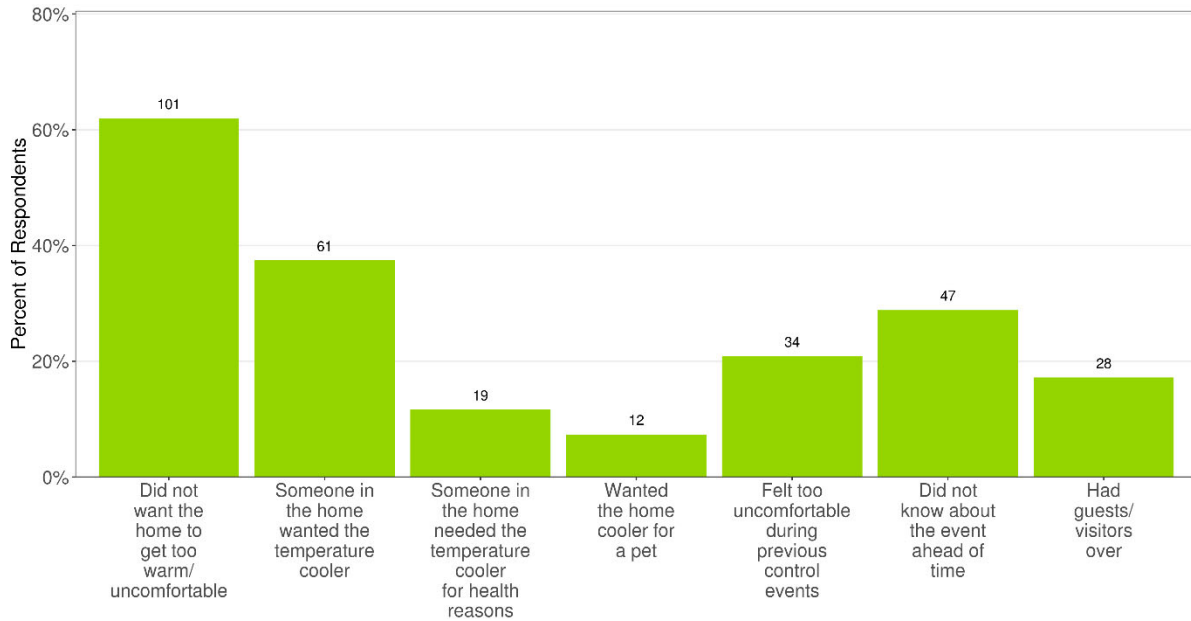
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-52. How often did you override your thermostat’s temperature setting during the control event(s)?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

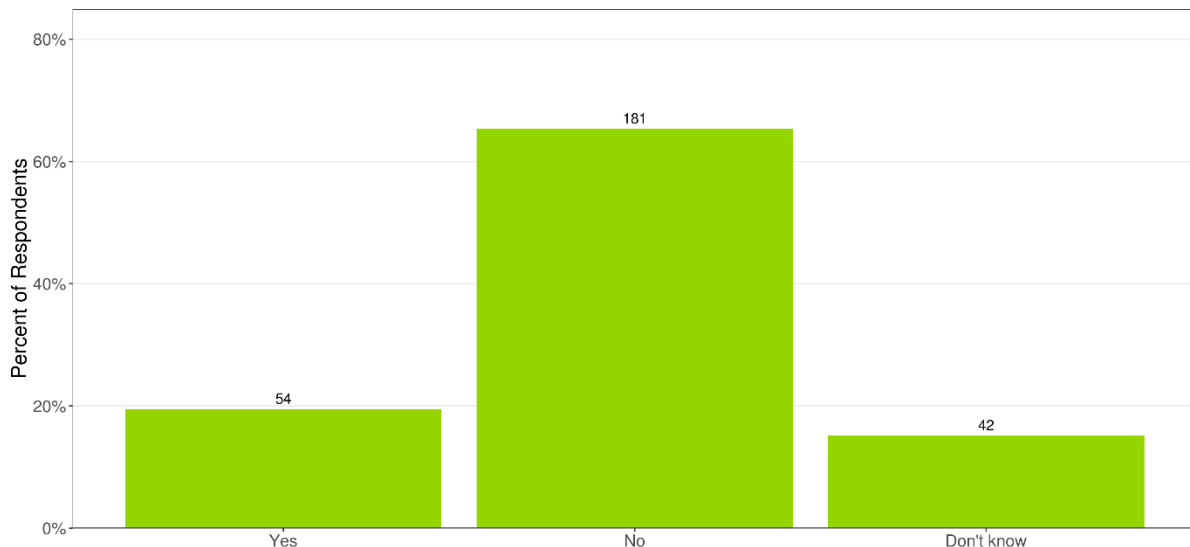
Figure D-53. Why did you typically override the thermostat temperature setting? (Select all that apply).



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

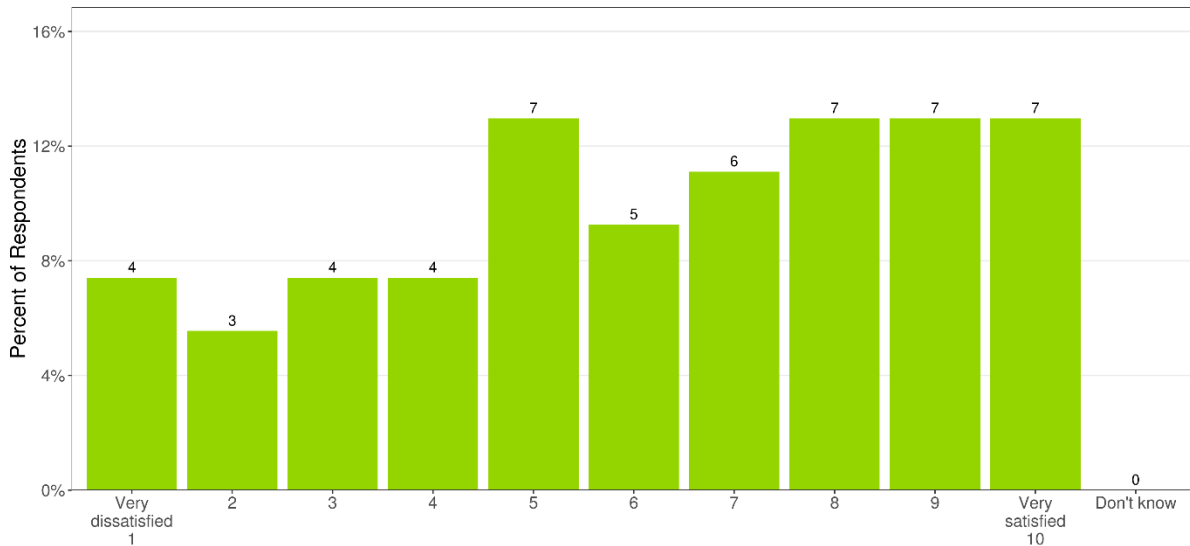
D.6.4 Pre-Cooling

Figure D-54. “Pre-cooling” sometimes occurs before a control event. During pre-cooling, your thermostat’s temperature setting will automatically be lowered to keep you comfortable during the event. Prior to a control event, do you recall the program “pre-cooling” your home (i.e., providing your home extra cooling prior to the control event)?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-55. How would you rate your satisfaction with your comfort level during the pre-cooling period? Please rate your satisfaction on a scale of 1-10 with 1 being “Very Dissatisfied” and 10 being “Very Satisfied”.



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

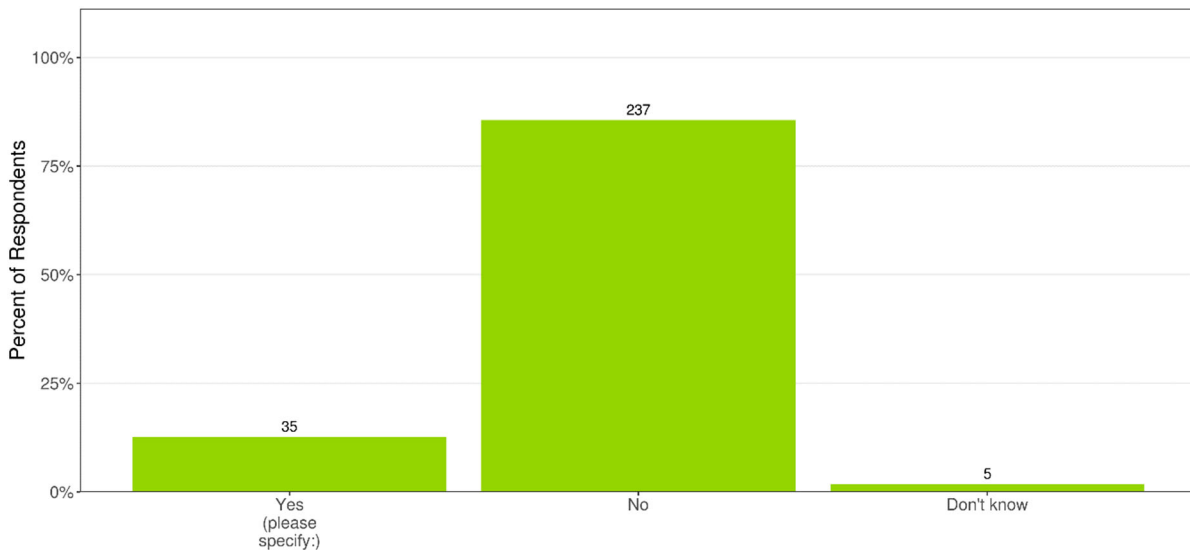
Figure D-56. Why did you rate your satisfaction with the program’s pre-cooling that way?

*Customer verbatims were summarized in the report, as appropriate

Figure D-57. Do you have any feedback about the “pre-cooling” that occurred prior to the control event?

*Customer verbatims were summarized in the report, as appropriate

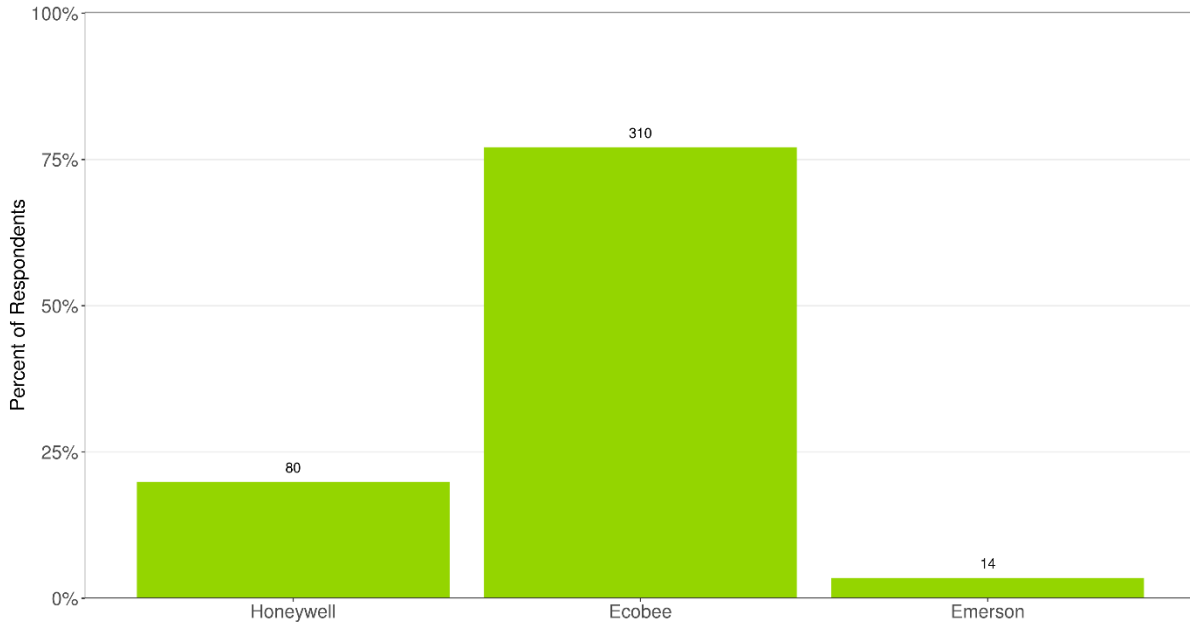
Figure D-58. Prior to the control event, did you ever take any actions to prepare for the event?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st

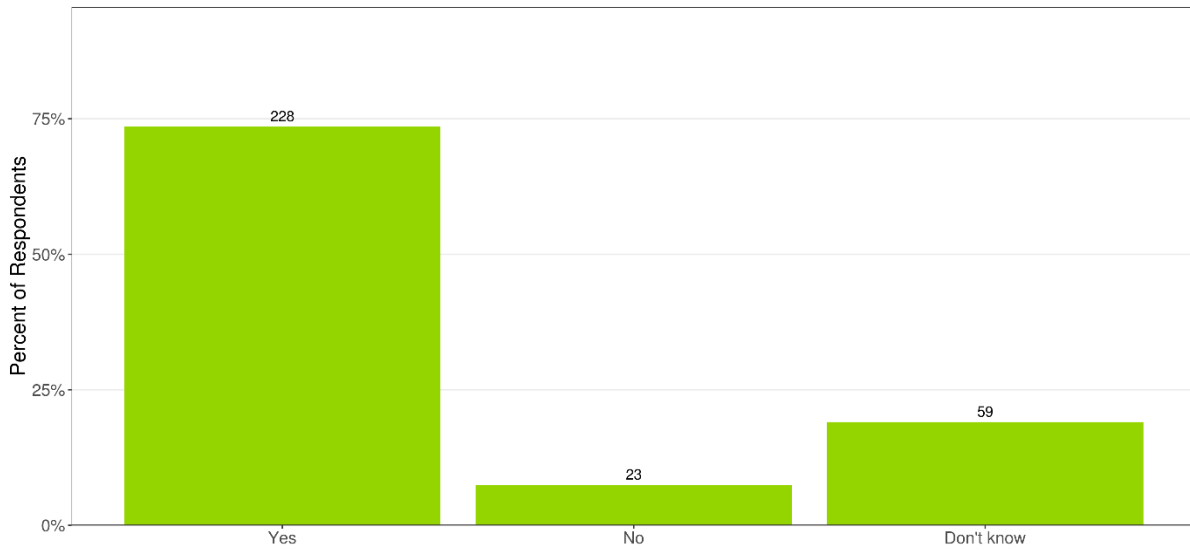
D.6.5 Thermostat Performance and Usage Behavior

Figure D-59. What brand of Wi-Fi thermostat(s) do you have? (Select all that apply).



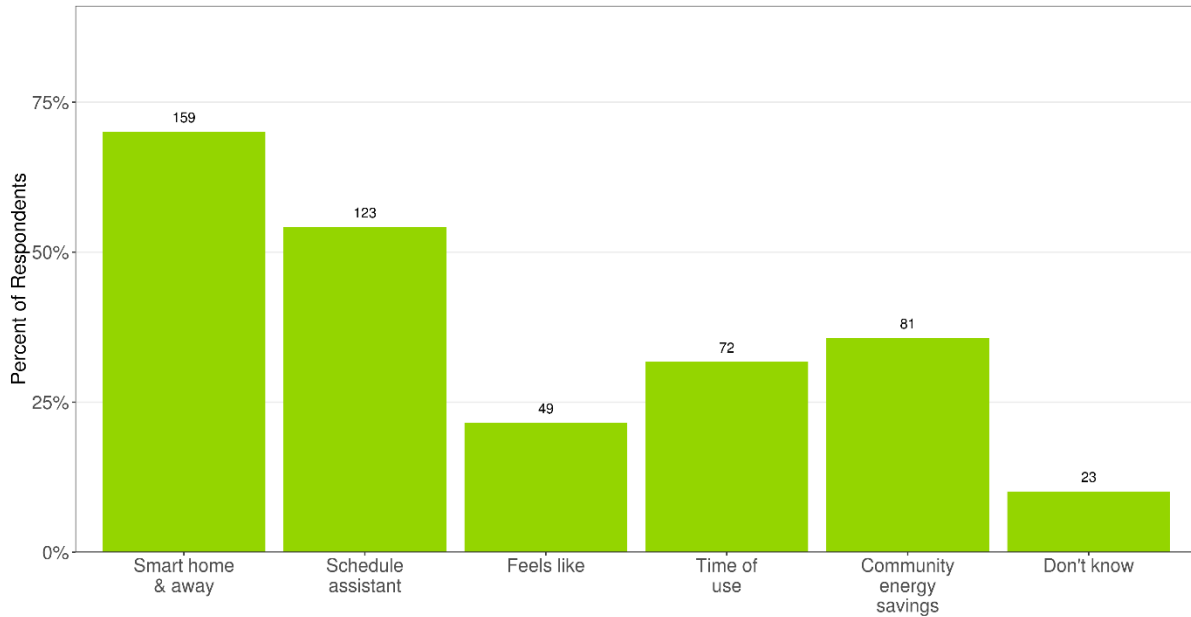
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-60. Have you activated eco +?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-61. What eco+ features do you use? (Select all that apply)

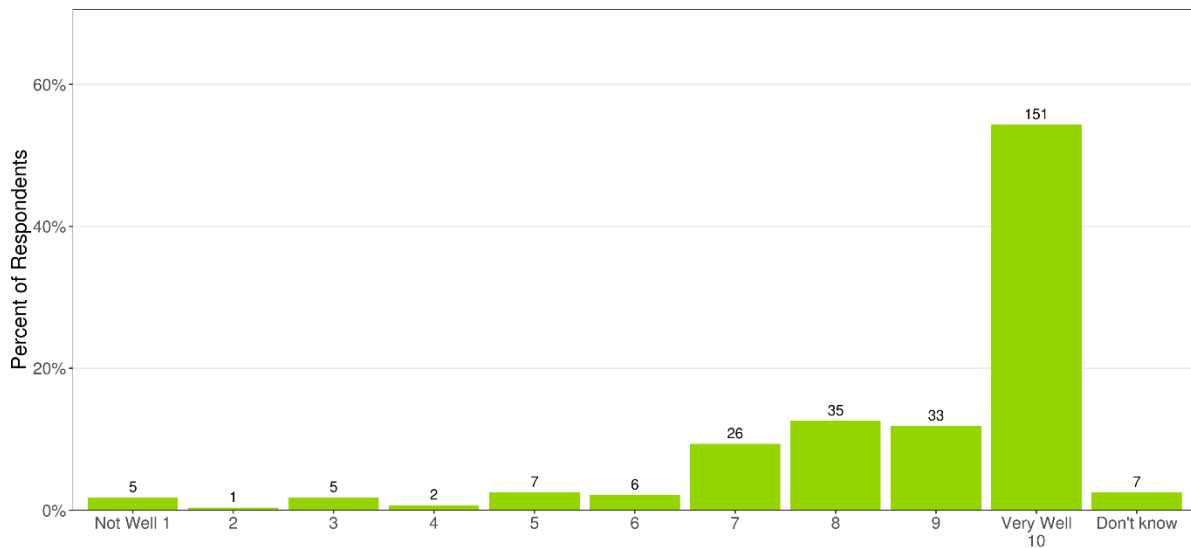


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st

Figure D-62. Which slider setting (1-5) do you typically use?

*Customer responses were summarized in the report, as appropriate

Figure D-63. On a scale of 1 to 10 with 1 meaning “Not Well” and 10 meaning “Very Well”, how well did your thermostat work during the control events? For example, did the thermostat clearly indicate when a control event was in-progress? Was it easy to makes changes the temperature setting to override events? Did your thermostat stay connected to Wi-Fi?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

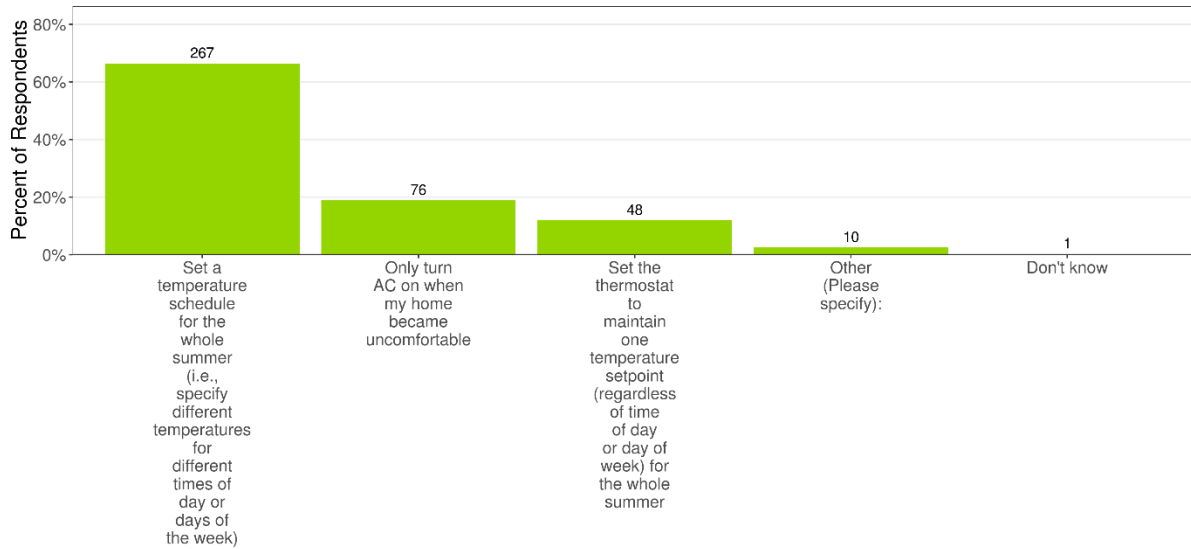
Figure D-64. What issues did your thermostat have during the control events?

*Customer verbatims were summarized in the report, as appropriate

Figure D-65. Do you have any additional comments on the performance of your thermostat in general?

*Customer verbatims were summarized in the report, as appropriate

Figure D-66. How did you typically use your thermostat throughout the summer?

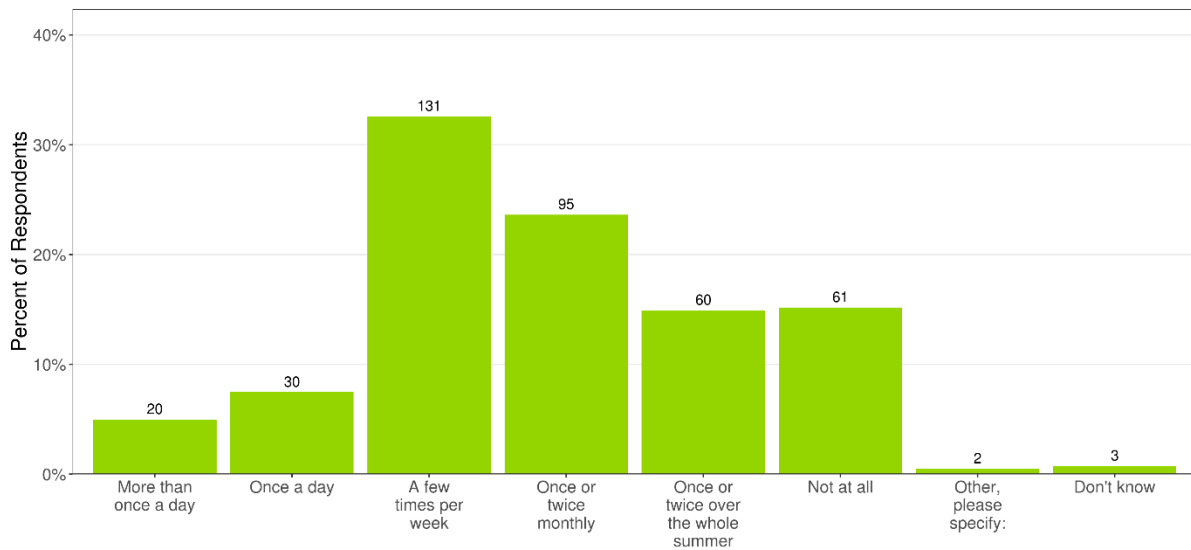


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-67. Above what indoor temperature do you typically turn your air conditioning on? Please enter a temperature in degrees F.

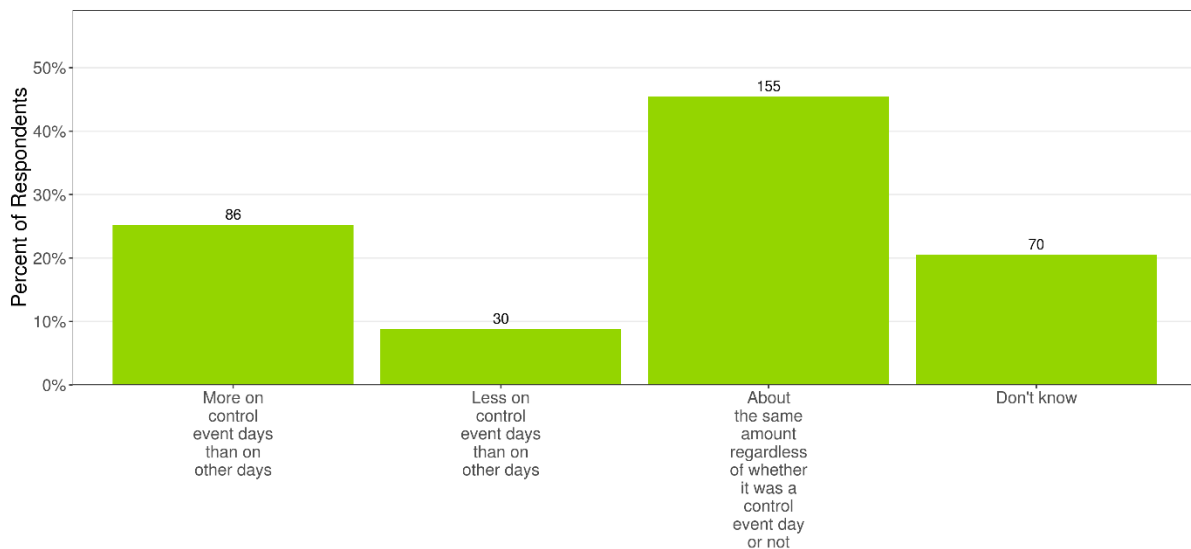
*Customer verbatims were summarized in the report, as appropriate

Figure D-68. Now we'd like to understand the frequency with which you adjusted your Wi-Fi thermostat's setting or schedule (either up or down) on days when there was no control event this summer. Would you say it was...



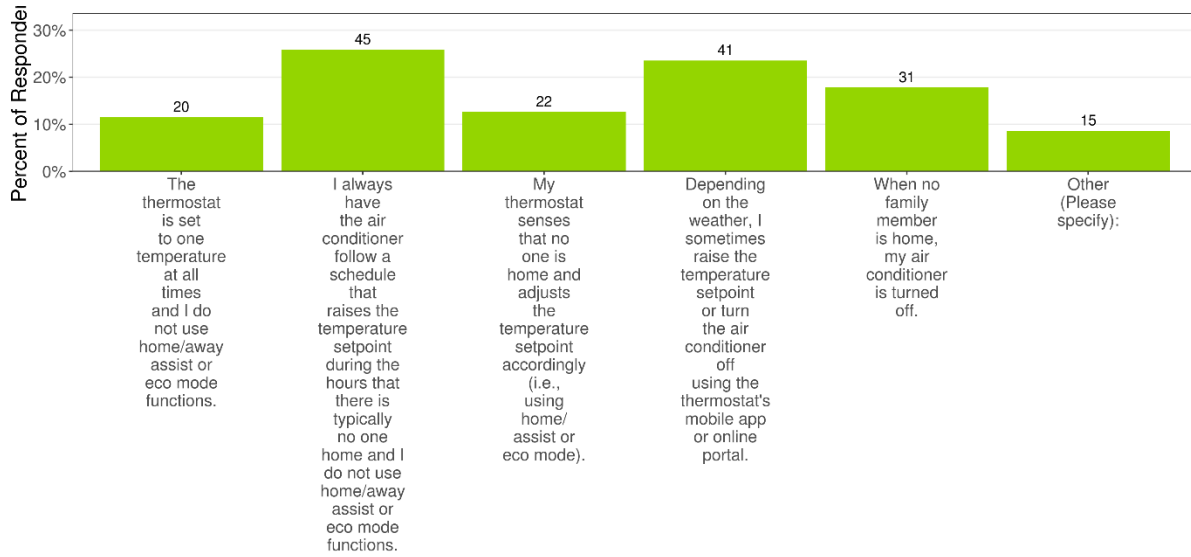
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-69. We'd also like to understand whether the frequency with which you adjusted your Wi-Fi thermostat's setting or schedule was different on control event days compared to other days. Would you say you adjusted your home's temperature...



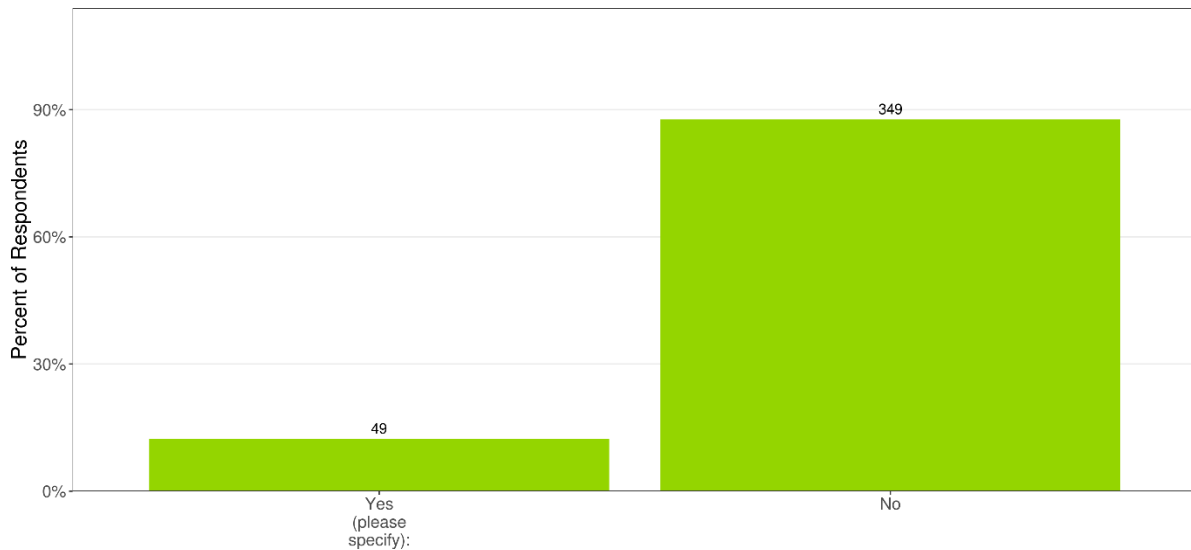
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-70. When no family member is at home during the summer, which of the following best describes the way you use your air conditioner?



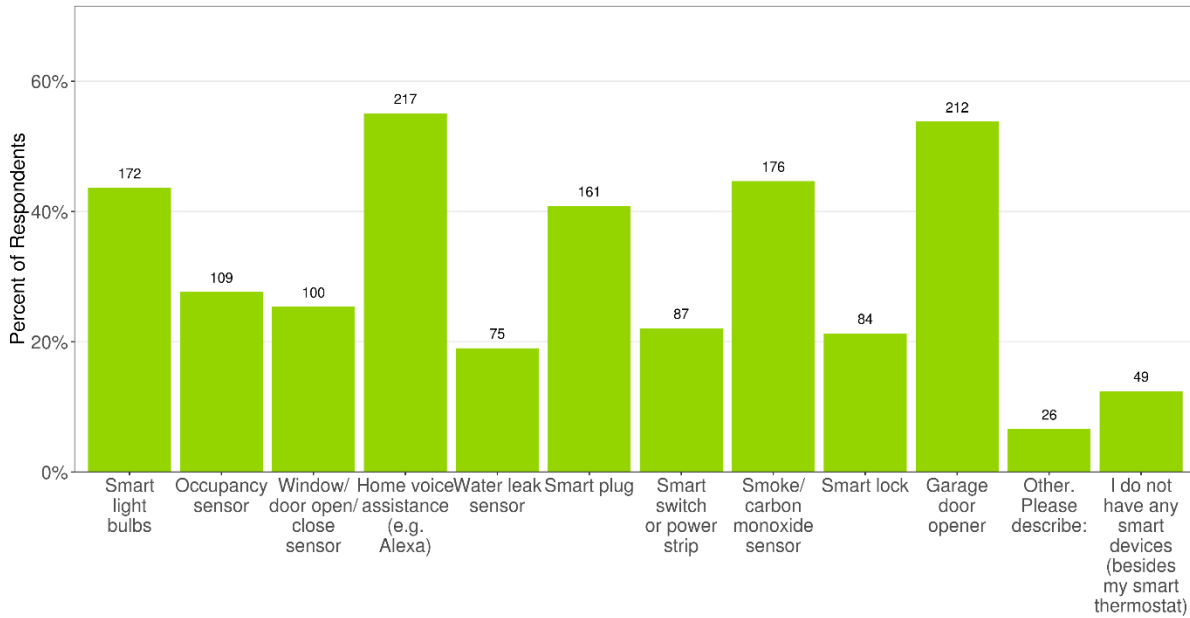
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-71. Besides your smart thermostat app or smart thermostat itself, do you use other smart home devices to monitor and/or control the temperature or comfort of your home?



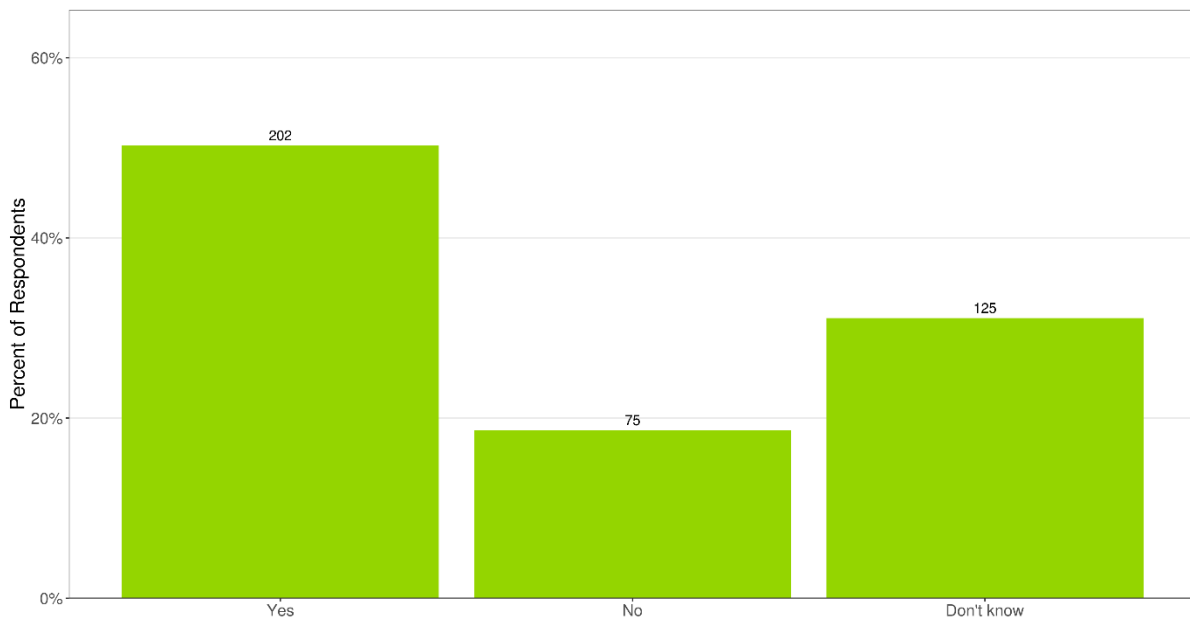
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-72. What other type of smart home device(s) do you have at home? Select all that apply.



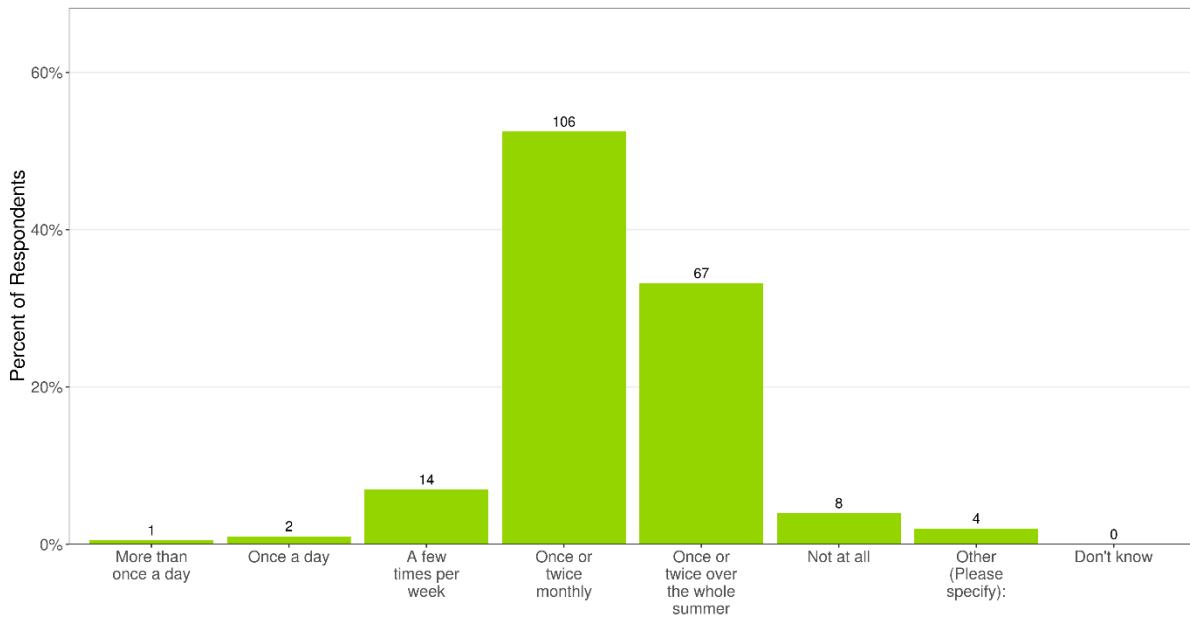
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-73. Does your Wi-Fi thermostat app provide you with information about your household's AC usage?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

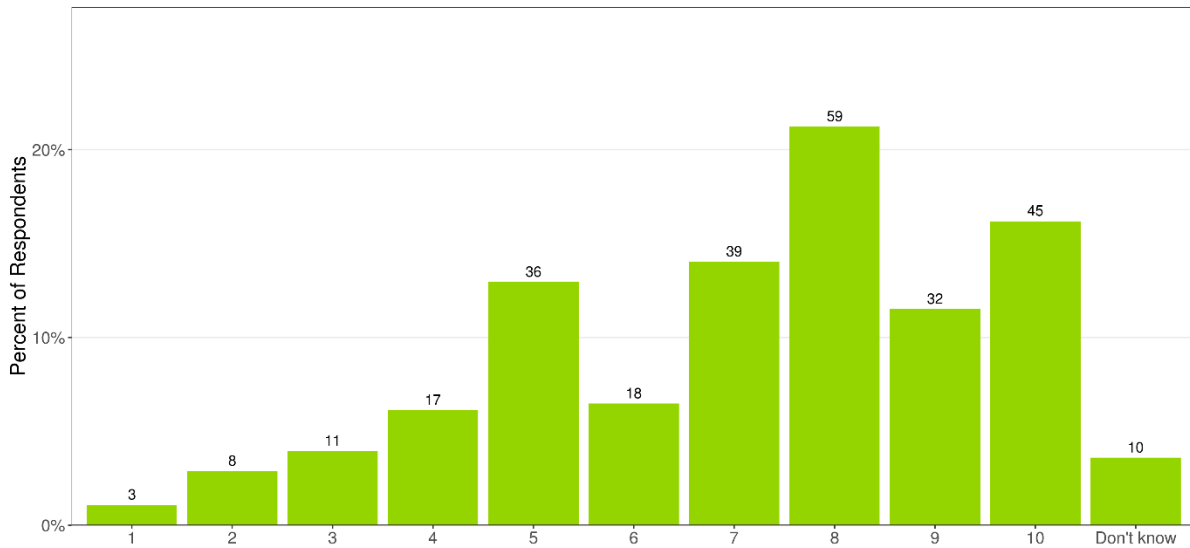
Figure D-74. How regularly do you review this information?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

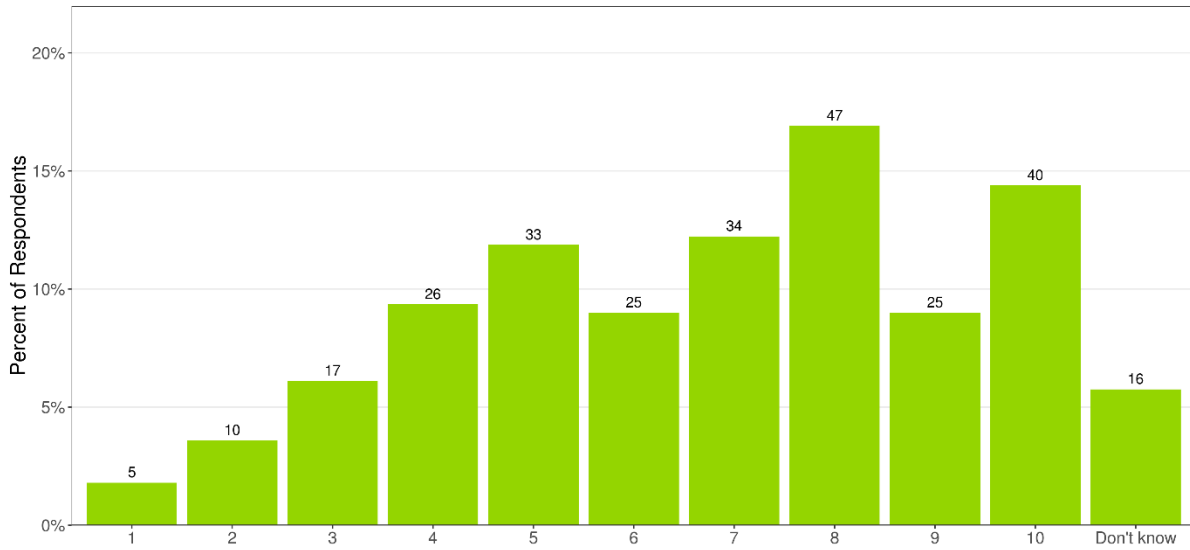
D.6.6 Satisfaction

Figure D-75. How would you rate your satisfaction with the number of events in summer 2020?



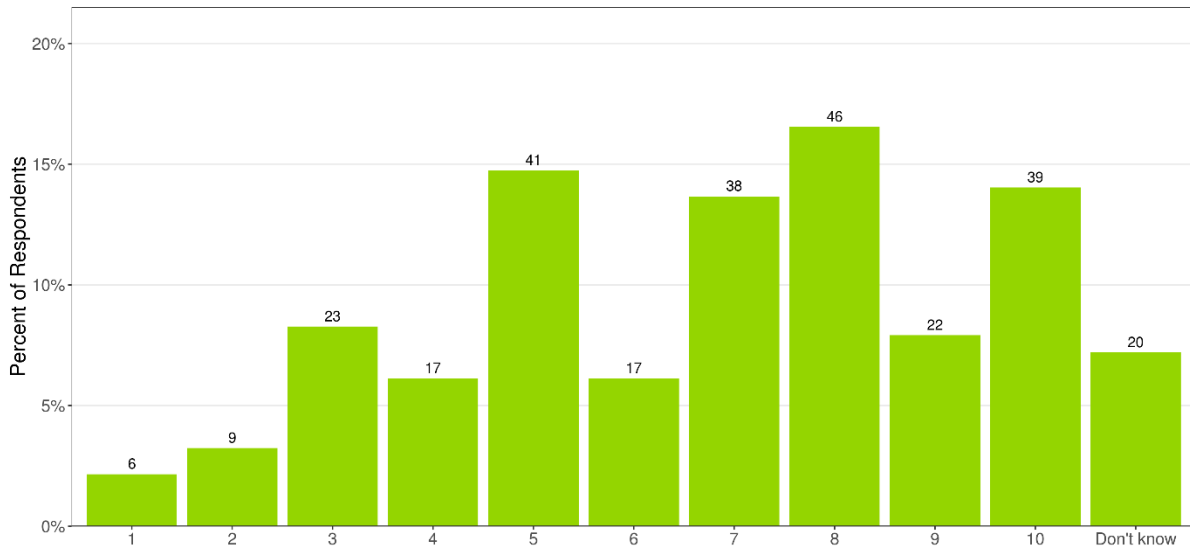
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-76. How would you rate your satisfaction with the length of events in summer 2020?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-77. How would you rate your satisfaction with the timing of events in summer 2020?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-78. Why did you rate your satisfaction with the number of events that way?

*Customer verbatims were summarized in the report, as appropriate

Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st

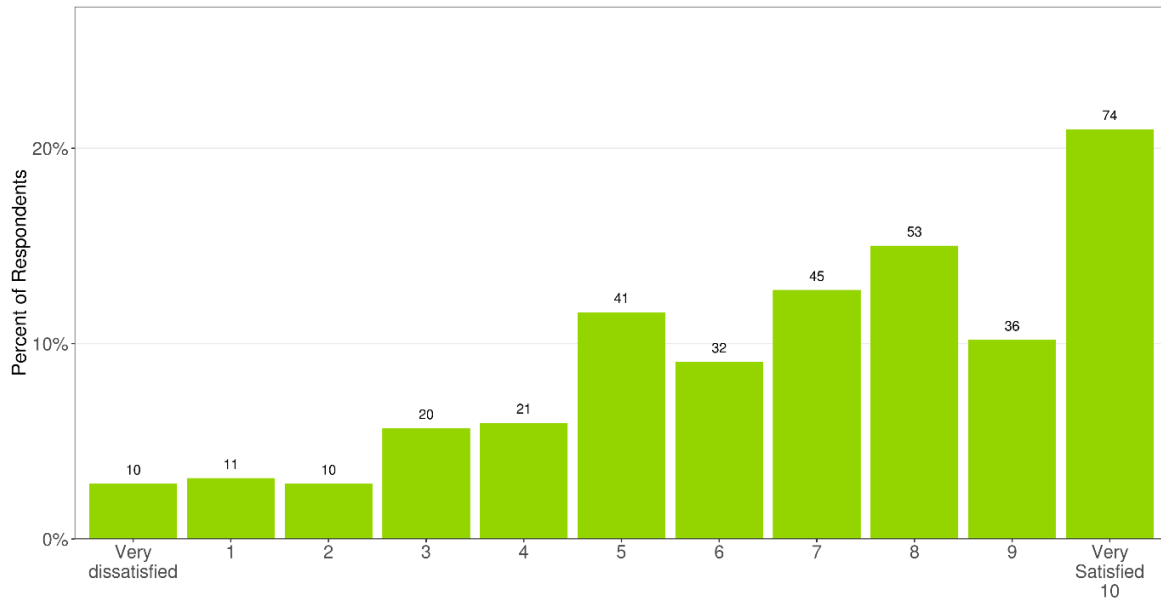
Figure D-79. Why did you rate your satisfaction with the length of events that way?

*Customer verbatims were summarized in the report, as appropriate

Figure D-80. Why did you rate your satisfaction with the timing of events that way?

*Customer verbatims were summarized in the report, as appropriate

Figure D-81. On a scale of 1-10, how satisfied are you overall with the annual bill credit for participating in program?

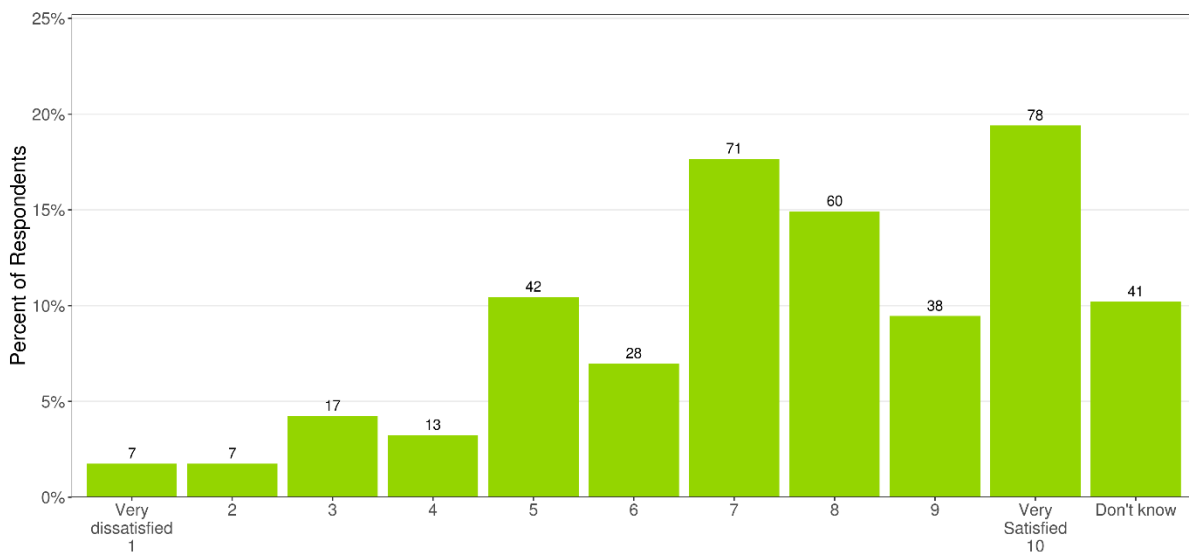


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-82. Why did you rate your satisfaction with the annual bill credit for participating in the program that way?

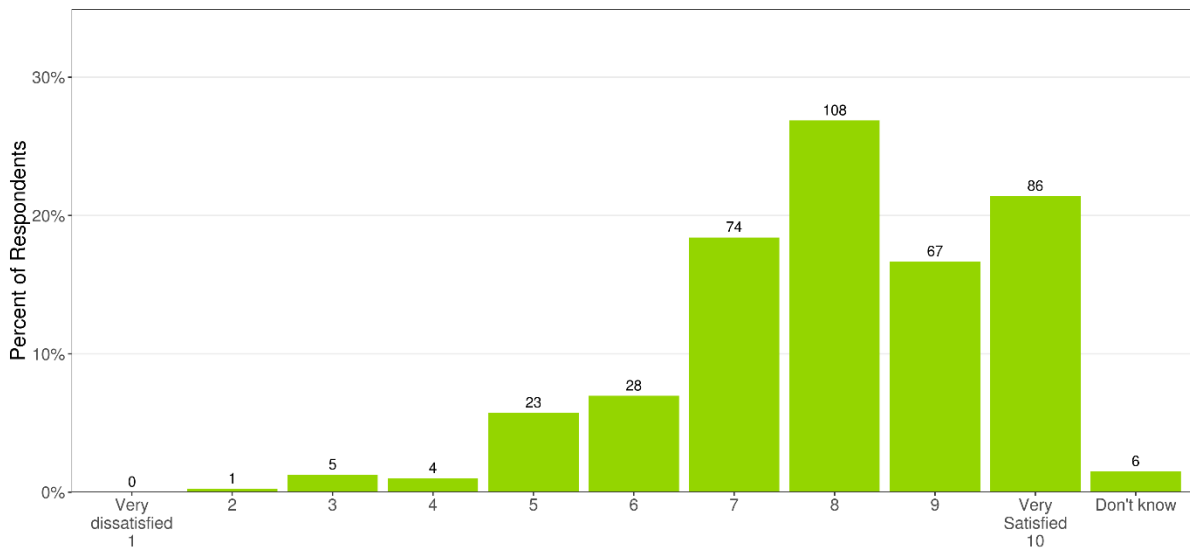
*Customer verbatims were summarized in the report, as appropriate

Figure D-83. On a scale of 1-10, how satisfied are you overall with the AC Rewards program?



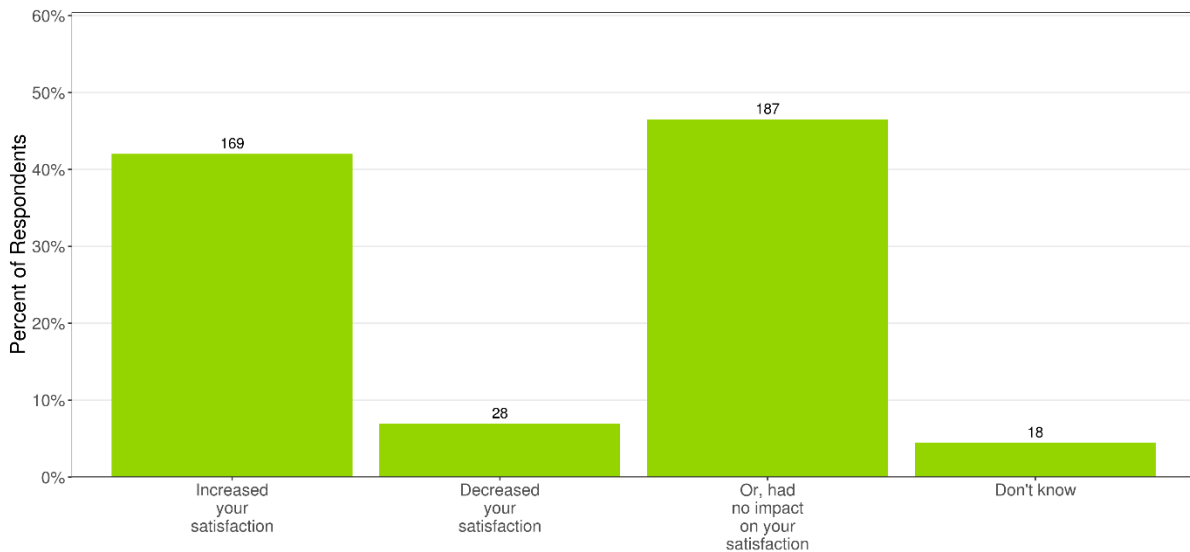
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-84. Now, thinking about Xcel Energy the utility, not just the program you participated in, on a scale of 1 to 10, with 1 meaning “Very Dissatisfied” and 10 meaning “Very Satisfied,” how satisfied are you with Xcel Energy in general?



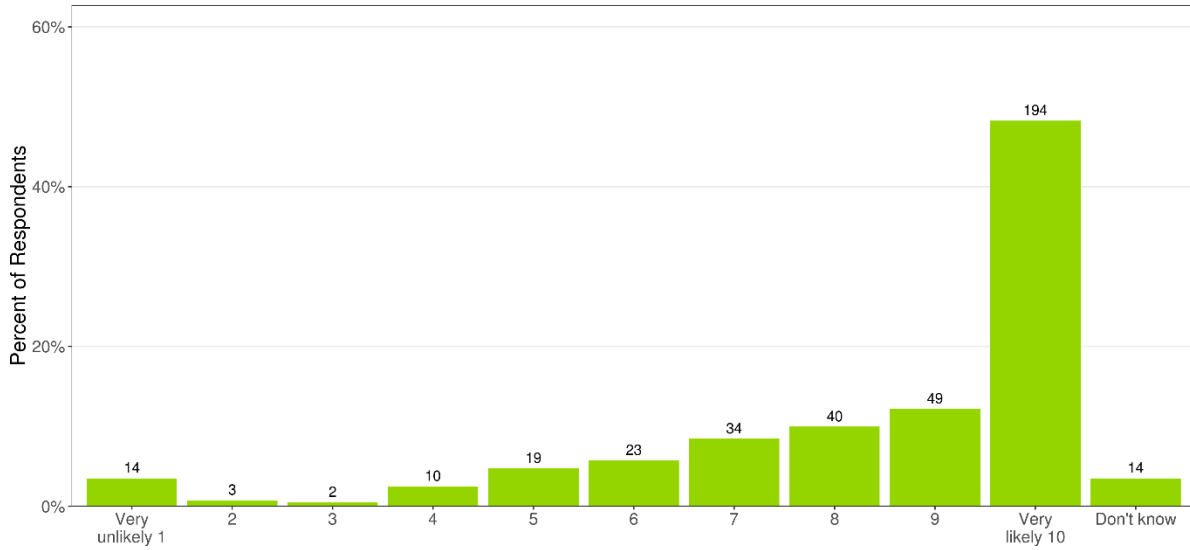
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-85. How has your participation in the AC Rewards Program impacted your satisfaction with Xcel Energy overall? Has it...?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-86. How likely are you to continue to participate in the AC Rewards program in the future?

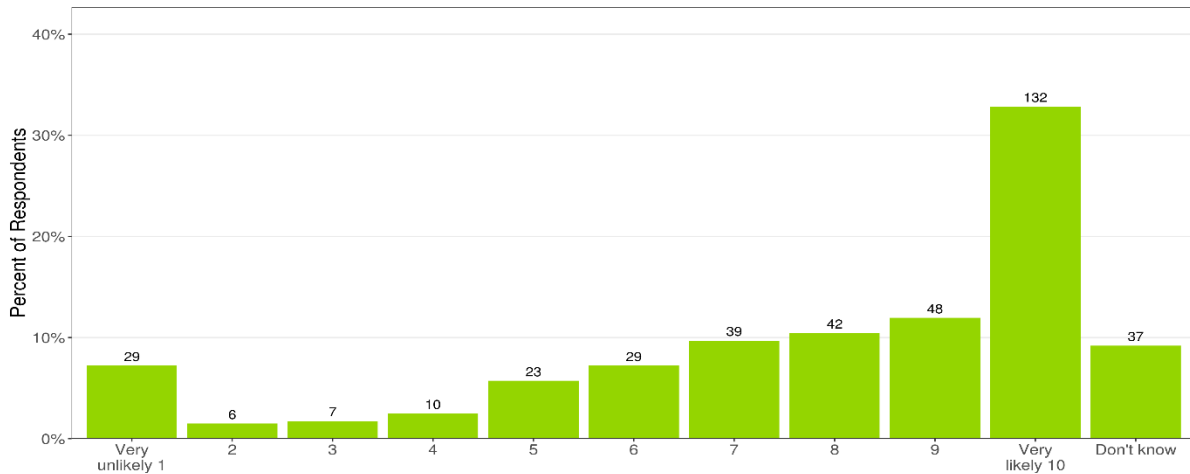


Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-87. What change(s) to the program would encourage you to continue participating?

*Customer verbatims were summarized in the report, as appropriate

Figure D-88. How likely are you to recommend the AC Rewards program to a friend or relative?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

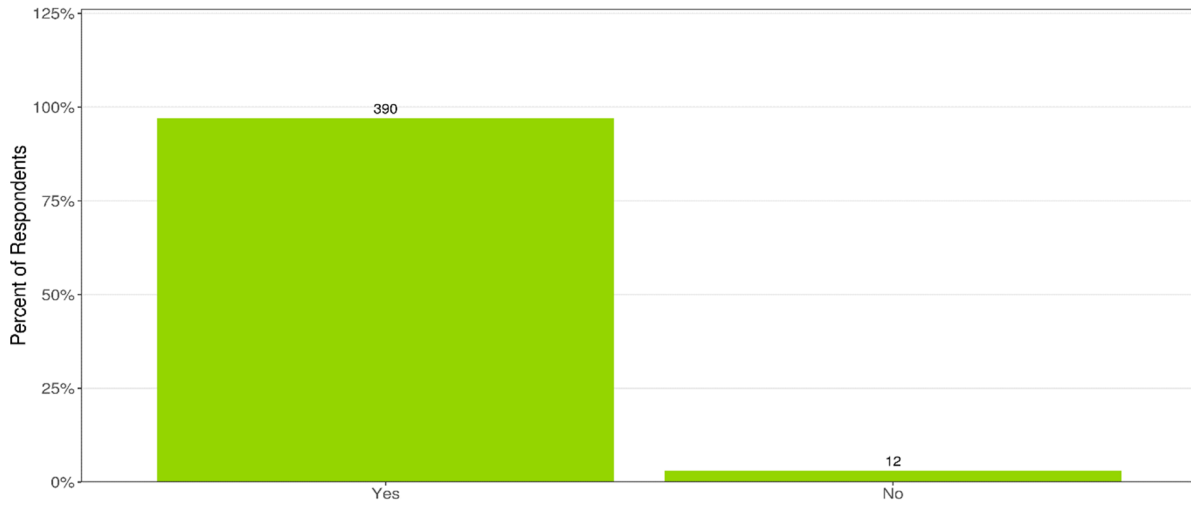
Figure D-89. What suggestions do you have for how to improve the AC Rewards Program?

*Customer verbatims were summarized in the report, as appropriate

Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st

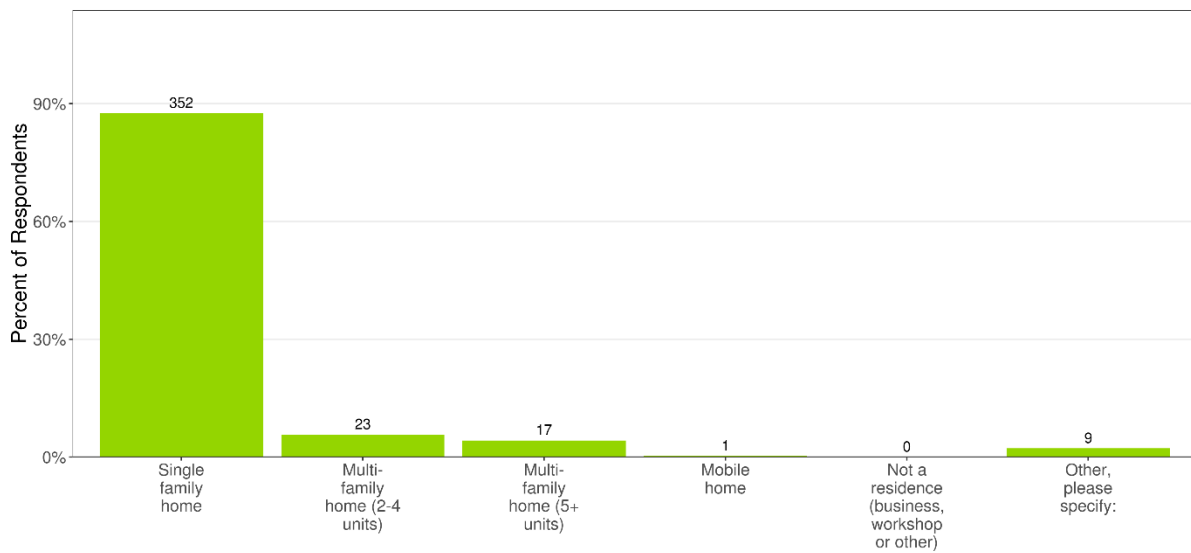
D.6.7 Demographics

Figure D-90. Is this your primary home?



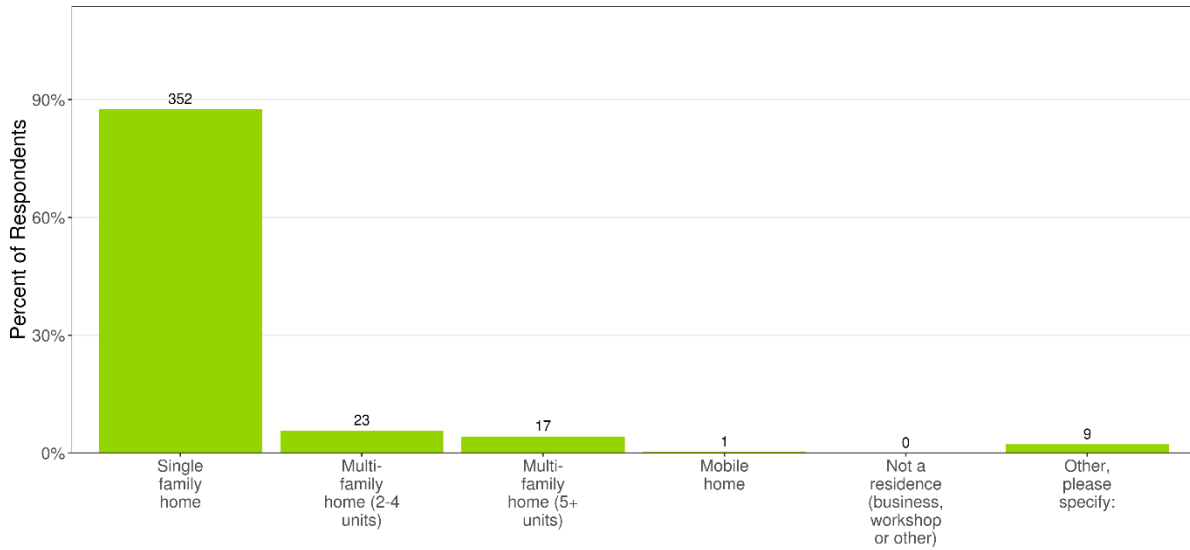
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-91. Which of the following best describes the type of home?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-92. Which of the following best describes your ownership of the home?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

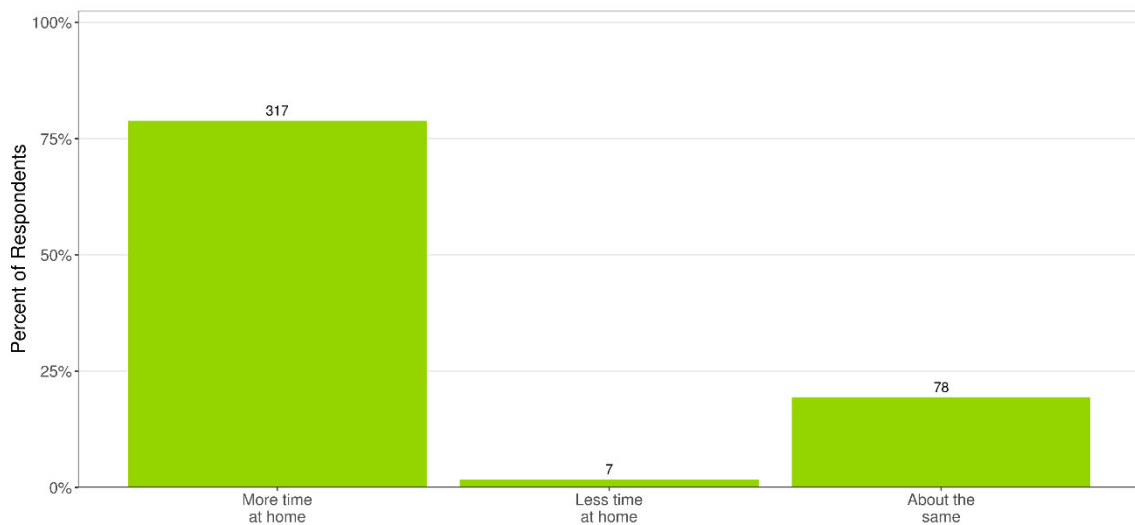
Figure D-93. How many people, including yourself, live in your home full-time (at least nine months of the year)?

*Customer verbatims were summarized in the report, as appropriate

Figure D-94. Excluding short-term vacations (<3 weeks), how many people, including yourself, typically live in your home full-time during summer months (June through September)?

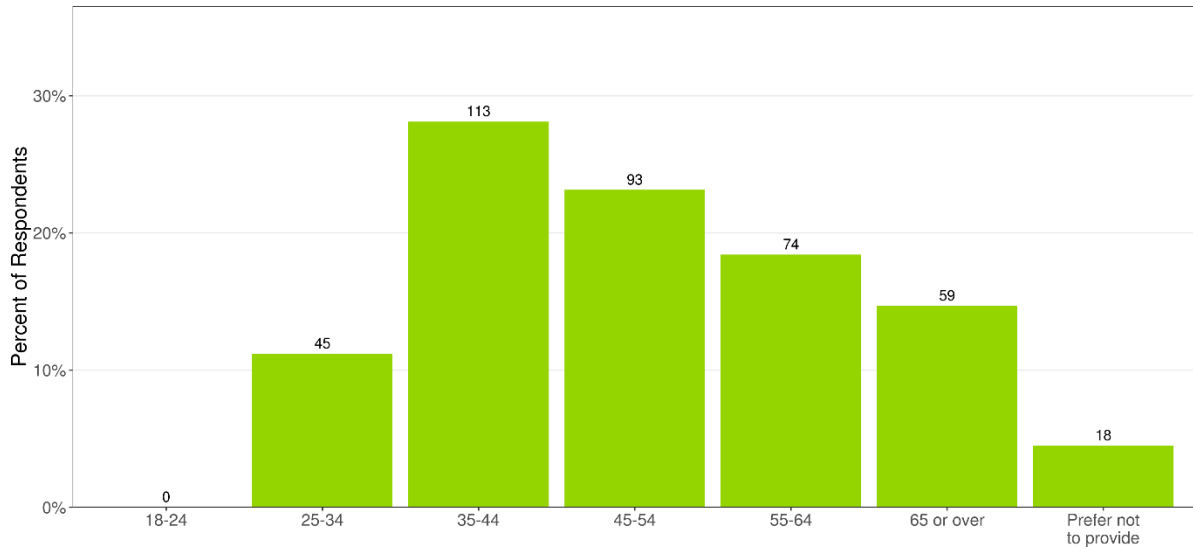
*Customer verbatims were summarized in the report, as appropriate

Figure D-95. Compared to last summer, how did the amount of time you spend at home on weekdays during the summer changed?



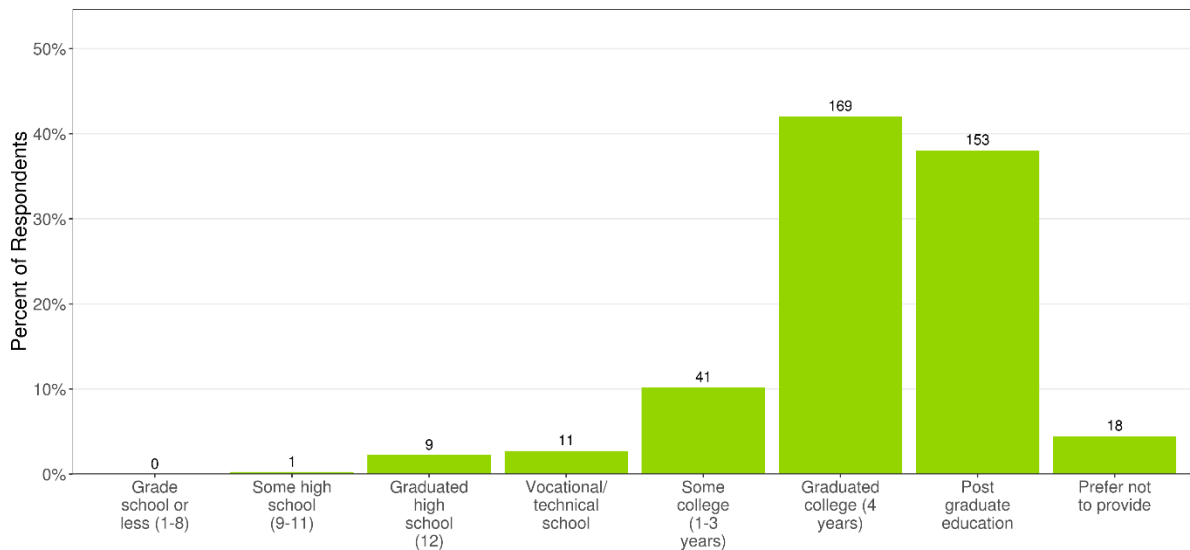
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-96. Which of the following age categories do you fall into?



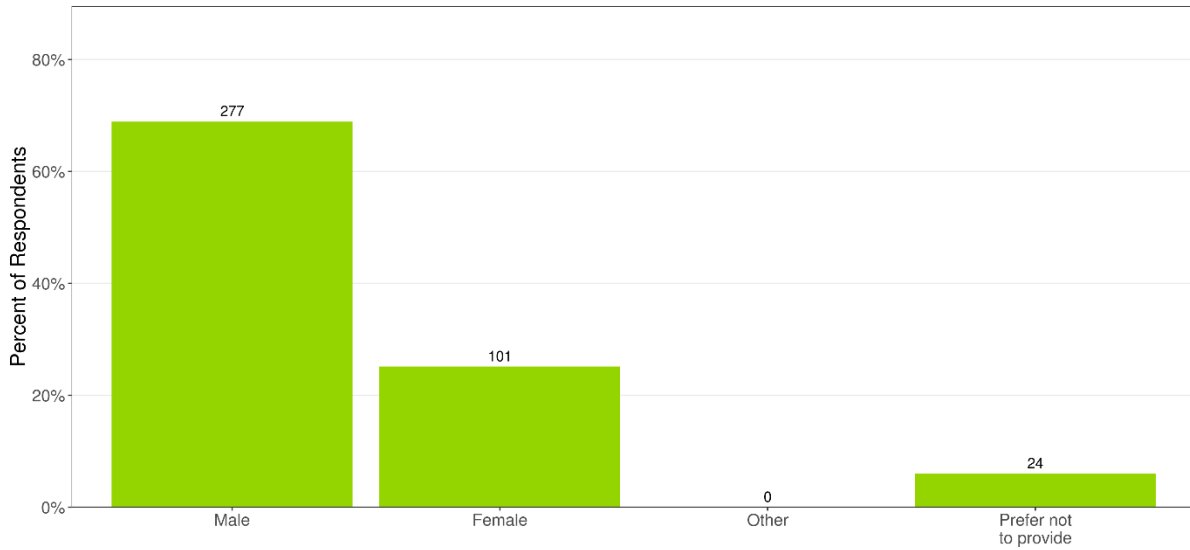
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-97. What is the last grade of school you completed?



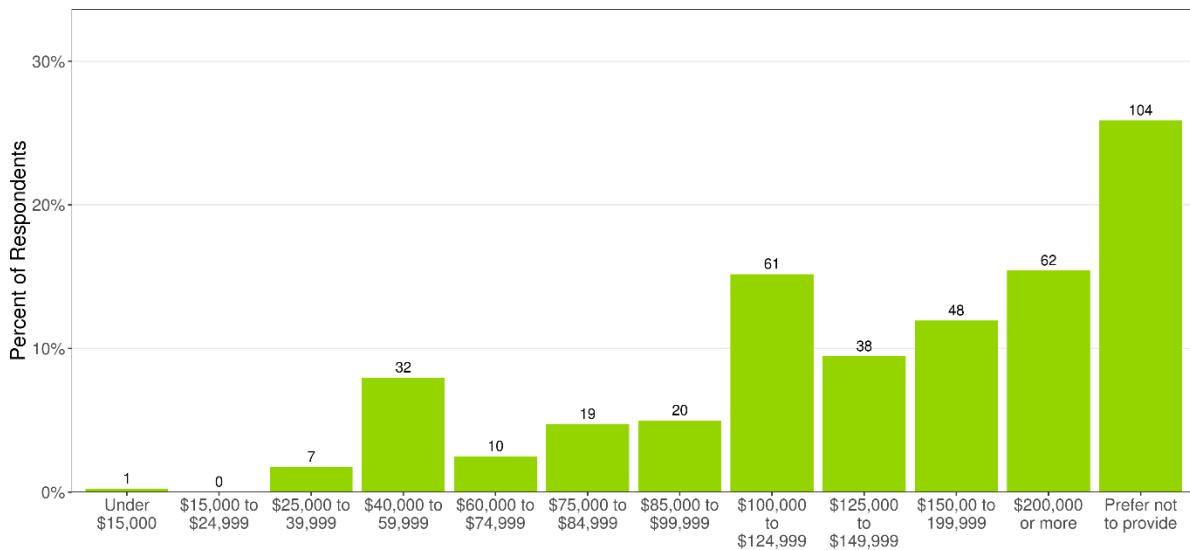
Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-98. Which category best describes your gender?



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

Figure D-99. Please indicate which range best describes the annual income of your entire household (everyone living in your home).



Source: Guidehouse analysis of responses to post-season surveys fielded on November 18th to December 1st.

D.7 Appendix 2. Post-Season Survey Instrument

Xcel Energy AC Rewards Program Participant Post-Season Survey Instrument

D.7.1 Program Overview

The AC Rewards (ACR) program provides Xcel Energy’s residential customers in Colorado and Minnesota the opportunity to earn incentives by allowing Xcel Energy to remotely control their A/C usage via their Wi-Fi thermostat(s) in the summer months during periods of peak demand (“control events”). Guidehouse will conduct surveys with newly enrolled participants (i.e.,

enrolled since August 1, 2020) in order to glean insights into customers' ACR experience. The tables below describe the survey attributes and objectives.

Table D-6. ACR Post-Season Survey Summary

Section	Description
Statement of purpose	The key evaluation research objectives addressed through this survey will include assessing participants' experiences with the AC Rewards during summer 2020, including awareness of and comfort during events, as well as event opt-out behavior. The survey also assesses participants' general thermostat and air conditioner usage behavior.
Qualified respondent	ACR participants who enrolled before August 1, 2020
Estimated survey length	10-15 minutes
Survey timeline	Survey will be fielded in October 2020 (after summer 2020 is complete).
Survey Protocols	<ul style="list-style-type: none"> Any data collection must subscribe to Do Not Contact regulations, should not exceed more than 5 attempts, and supply the Company with final dispositions for any sample provided. Any customer/participant complaint issues related to the programs, the evaluation process or any other Company issues must be forwarded immediately to the Company's evaluation lead.

Table D-7. ACR Post-Season Survey Variables

Survey Variables	Description	Source
CUSTOMER NAME	Customer name	Xcel Energy Tracking Data
STATE	State of residence (COLORADO or MINNESOTA)	Xcel Energy Tracking Data
STREET_ADDRESS	Street address of enrolled residence	Xcel Energy Tracking Data
OEM	ecobee, Honeywell, Emerson	Xcel Energy Tracking Data
POST-EVENT RESPONDENT	Customer responded to post-event survey	Post-event survey data
DI	Customer who received a direct install	Xcel Energy Tracking Data
REBATE	Customer who received a rebate	Xcel Energy Tracking Data

D.7.2 Sample

This table outlines Guidehouse's sampling techniques.

Table D-8. ACR Post-Season Sample Plan

Topic	Description	Population
Sample size	How many completes will you need to reach a precision level of $\pm 10\%$ at the 90% confidence level?	<ul style="list-style-type: none"> • Guidehouse will target 400 completes per state, for a total of ~800 completes. • Guidehouse expects to contact ~8,000 ACR participants for the survey (assumes a 10% response rate).
Stratification	How complex is the sample? Do you need to stratify?	<ul style="list-style-type: none"> • The survey sample will be stratified by state (CO and MN). Random samples will be pulled for each state. • Survey data may ultimately be analyzed by thermostat type, new v returning, and BYOT v DI, depending on the question.
Unique attributes	What is the ability level of the population? Are there language barriers? Do you need to consider literacy rates? Do you need to specialize the training of your surveyors?	No special training or unique attributes are expected.
Incentives	Any incentives or persuasion techniques?	\$5 per complete

D.7.3 Survey Overview

Table D-9. ACR Post-Season Survey Sections

Research Objective	Survey Questions
Intro	INTRO1 – INTRO2
Motivations for Participation	M1 – M5
Awareness & Event Notification	A1 – N6
Comfort and Opt-Out Behavior	CE1 – CE7A
Pre-Cooling	PC1 – PC3
Thermostat Performance and Usage Behavior	TP1 – TP3, GT1 – GT8
Satisfaction and Suggestions for Improvement	S1 – S9
Demographics	D1 – D11
Closing	C1-C2

D.7.4 Online Survey Email Recruitment Script

Subject Line: Get \$5 for Telling Us What You Think - Xcel Energy's AC Rewards Program
Sender: Xcel Energy

Dear Valued Customer,

Thank you for participating in Xcel Energy's AC Rewards Program!

Xcel Energy would like to hear about your experience with the AC Rewards program. As a thank you for your time, we are offering you a **\$5 eGift Card** redeemable at a number of retailers including including Amazon.com and Visa (to see your options visit <https://www.rewardsgenius.com/reward-catalog>)!

(This survey is being administered by Xcel Energy's third-party evaluator, Guidehouse. Your survey responses will be confidential.)

Please have the family member in your household who is **most familiar with the AC Rewards program** take this survey.

The survey will take approximately 10 minutes to complete.

If you cannot complete the survey or you accidentally exit mid-course, **you can resume** where you left off by clicking on the link from this email or hitting the back button in your browser.

At the end of the survey, you will be asked to provide your name and email so that we can send you the eGift Card. Please respond by **[Date that is one week later than when invite is sent]**.

Please click on the link below to take this short survey:

[SURVEY LINK, IN BUTTON FORM]

If you have any questions about the survey, please contact the Xcel Energy Customer Care Center at 800.895.4999.

Thank you in advance for completing the survey!

Sincerely,

Meagan Madden
Xcel Energy | Responsible By Nature
AC Rewards Manager

XCELENERGY.COM

Click here to opt out of future AC Rewards survey emails. We hope you won't. Xcel Energy values your opinion.

D.7.5 Online Survey Landing Page and Introduction

Thank you for sharing your experience with AC Rewards. Your feedback is important and will help us improve the program to better serve customers like you.

- We expect the survey to take no longer than 10 minutes to complete.
- Your responses will be kept confidential, shared only in aggregate with Xcel Energy.
- In reporting results, no comments will be attributed to specific individuals.

If you cannot complete the survey or you accidentally exit mid-course, **you can resume** where you left off by clicking on the link from this email or hitting the back button in your browser.

We appreciate your participation. Thank you again!

INTRO1. Are you, or is anyone in your household, a current employee of Xcel Energy or of a market research firm?

1. Yes
2. No **[TERMINATE: We appreciate your willingness to complete the survey. However, unfortunately, you do not meet its qualifications. Thank you.]**

INTRO2. Our program records indicate the property at this street address is enrolled in AC Rewards.

[STREET_ADDRESS]

Is this correct?

3. Yes
4. A different address is enrolled in the program: **[Open end response]** (Don't require forced text entry in the box)

INTRO3: Are you the person in your household who is most familiar with the AC Rewards Program?

1. Yes **[Continue to M1]**
2. No **[TERMINATE: We appreciate your willingness to complete the survey. However, unfortunately, you do not meet its qualifications. Thank you.]**

D.7.6 Motivations for Participation

M1. Were you the person responsible for signing up for the AC Rewards program?

1. Yes
2. No
98. Don't know

[IF M1 = 1, ELSE SKIP TO A1]

M2. How did you first learn about Xcel Energy's AC Rewards Program?

1. Xcel Energy
2. Thermostat manufacturer
3. Home Energy Squad auditor
4. Thermostat installer

5. Other contractor. Please Specify _____.
6. Friend/family/neighbor
98. Don't Know

[IF M2 = 1, ASK. ELSE SKIP TO M4]

M3. How did you learn about AC Rewards through Xcel Energy? (Select all that apply).

1. Xcel Energy website
2. Xcel Energy email
3. Xcel Energy other. Specify _____.
4. Social media. Specify _____.
5. Radio ads
6. Other. Specify _____.
7. Don't Know **[Mutually exclusive]**

[IF M2 = 2, ASK. ELSE SKIP TO M5]

M4. How did you learn about AC Rewards through your thermostat manufacturer? (Select all that apply).

1. Thermostat manufacturer website
2. Thermostat manufacturer app
3. Thermostat manufacturer email
4. On the thermostat itself
5. Other. Specify _____.
6. Don't Know **[Mutually exclusive]**

M5. What are the primary reasons you decided to enroll in the program? (Please select all that apply). **[Allow multiple responses]. {RANDOMIZE}**

1. Receive bill credits
2. Save energy
3. Lower my bills by reducing my energy use
4. Improve comfort in my home
5. Reduce my environmental impact
6. Support my community and/or state's energy initiatives
7. Reduce pressure on the electric grid during periods of high demand
8. Other. Specify _____.

D.7.7 Awareness and Event Notifications

AC Rewards helps you earn incentives from Xcel Energy during periods of high electricity demand, typically very hot summer days. During these periods, Xcel Energy may make small adjustments to your Wi-Fi thermostat setting; these are called "control events". Control events reduce your central air conditioner's cooling while still keeping you comfortable.

A1. Did Xcel Energy initiate any control events this past summer?

1. Yes
2. No **[SKIP TO TP1]**
98. Don't know **[SKIP TO TP1]**

[Ask only if A1=1. Otherwise, skip to TP1.]

A2. Approximately how many control events do you remember occurring over the summer? (Please give your best estimate).

1. Enter number: _____ **[PROGRAMMING TO ACCEPT NUMERIC INPUT. IF 0, SKIP TO TP1]**

N1. Which ways do you recall becoming aware of the control events? (Please select all that apply).

1. Notification from Xcel Energy
2. Notification from thermostat's mobile app
3. Notification on the thermostat itself
4. Change in indoor temperature
5. I did not notice any events **[Mutually Exclusive] [SKIP TO TP1]**
6. Other: _____

[Ask if N1 <> 1-3, else skip to N3]

N1a. Did you receive notification about the control events?

3. Yes
4. No
99. Don't know

[Ask if N1a = 2 or 98]

N1b. Would you like to receive notifications about future controls events?

3. Yes
4. No
99. Don't know

[Ask if N1b = 1]

N1c. Why would you like to receive notifications about control events?

1. So I can prepare to use other methods to stay cool in my home
2. So I can plan to prepare meals in advance or that do not require equipment that generates a large amount of heat
3. So I understand why the setpoint of my thermostat is being adjusted
4. So I can schedule activities outside of my home
5. Other (please describe) :
98. Don't know

[Ask if N1b = 1]

N2. How would you like to receive notification about control events?

1. Response: **[OPEN ENDED]**

[ASK IF N1 = 1-3 or N1a = 1, ELSE SKIP to N5]

N3. How satisfied were you with the notification? Please rate your satisfaction on a scale of 1-10 with 1 being “Very Dissatisfied” and 10 being “Very Satisfied”.

[SCALE 1-10; 98=Don't know]

Timing of notification	1	2	3	4	5	6	7	8	9	10	Don't know
Method of notification	1	2	3	4	5	6	7	8	9	10	Don't know

[ASK IF N3a= 1-6]

N3_a. Why did you rate your satisfaction with the timing of event notifications that way?

1. Response: **[OPEN ENDED]**

[ASK IF N3a= 1-6]

N3_b. Why did you rate your satisfaction with the method of event notifications that way?

1. Response: **[OPEN ENDED]**

N4. How could the notification of the control events have been improved? **[OPTIONAL]**

1. Response: **[OPEN ENDED]**

N5. Control events are important for many reasons. Xcel Energy calls control events to reduce demand for electricity at peak times, meaning when most customers are using a great deal of energy. It does so in cooperation with the [STATE] regulatory commission, in order to:

- Ease strain on the electrical grid at peak times
- Help keep costs low for communities by reducing the need to produce or purchase additional, expensive energy at peak times
- Prevent blackouts or brownouts
- Extend the lifetime of its infrastructure (avoiding additional investments)
- Over the long-term, develop a flexible grid that allows for more renewable sources of energy.

Were you aware of some or all of Xcel Energy’s objectives for its AC Rewards’ control events? [Programmer note: use STATE variable to display CO or MN in the text]

1. Yes
2. No

[Ask if N5=2]

N5a. If you had been aware of the objectives of control events, do you think you would you have acted differently during control events this past summer?

1. Yes
2. No
98. Don't know

[Ask if N5a=1]

N6. How do you expect your actions would change? **[OPTIONAL]**

1. Response: **[OPEN ENDED]**

D.7.8 Comfort and Opt-Out Behavior

Next, we ask a few questions about your comfort during the control events.

[Ask if A1=1, Else Skip to TP1]

CE1. This summer, for the control events you can recall, how often were you or another family member at home during any part of the event?

1. Home for all events
2. Home for most events
3. Home for some events
4. Never home during events
98. Don't know

[Ask if CE1=1,2, or 3. Else Skip to TP1]

CE3. On average, how would you rate your comfort level during control events using a scale of 1 to 10 where 1 is "No change" in comfort and 10 is "Very uncomfortable"?

[SCALE 1-10; 98=Don't know]

No change									Very uncomfortable	Don't know
1	2	3	4	5	6	7	8	9	10	98

[ASK IF CE3 = 2-10]

CE3_a. Why did you rate your satisfaction with your comfort level during control events that way?

1. Response: **[OPEN ENDED]**

CE4. During control events, did you or other occupants of your household make changes to your typical daily routine to keep cool?

1. Yes
2. No
98. Don't know

[Ask only if CE4=1. Otherwise, skip to CE5.]

CE4A. During control events, what changes to your routine did you make most often?

Please select all that apply.

1. Continued normal activities/Didn't do anything different **[MUTUALLY EXCLUSIVE]**
2. Did not notice a difference in temperature **[MUTUALLY EXCLUSIVE]**
3. Turned on fans
4. Turned on room/window air conditioners
5. Closed blinds/shades
6. Moved to a cooler part of the home
7. Left the house and went somewhere cool
8. Wore less clothing
9. Drank more water/cool drinks
10. Opened windows
11. Avoided use of heat-generating appliances or devices
12. Cooled off with water (e.g. took a shower, went swimming in home pool, ran through sprinklers)
13. Other _____ **[OPEN END]**
14. Don't know **[MUTUALLY EXCLUSIVE]**

CE5. As part of the AC Rewards program, you have the ability to opt out of a control event. Did you or another member of your household ever override your smart thermostat setting or "opt out" of a control event?

4. Yes
5. No
6. Don't know

[ASK IF CE5 = 1, ELSE SKIP TO PC1]

CE6. Which did you use to opt out of the control event(s)? (Select all that apply).

6. Wi-Fi thermostat itself
7. Wi-Fi thermostat mobile app
8. Wi-Fi thermostat web app
9. Other **[OPEN-END]**
10. Don't know

CE7. How often did you override your thermostat's temperature setting during the control event(s)?

1. One event
2. A few events
3. Most of the events

4. All of the events
5. I did not override an event
98. Don't know

[Ask only if CE7=1-4. Otherwise, skip to PC1.]

CE7A. Why did you typically override the thermostat temperature setting? (Select all that apply).

1. Did not want the home to get too warm/uncomfortable
2. Someone in the home wanted the temperature cooler
3. Someone in the home needed the temperature cooler for health reasons
4. Wanted the home cooler for a pet
5. Felt too uncomfortable during previous control events
6. Wanted the home cooler for a toddler/baby
7. Had guests/visitors over
8. Did not have sufficient time to prepare
9. Did not know about the event ahead of time
97. Other. Please specify: _____
98. Don't know **[Mutually Exclusive]**

D.7.9 Pre-Cooling

PC1. "Pre-cooling" sometimes occurs before a control event. During pre-cooling, your thermostat's temperature setting will automatically be lowered to keep you comfortable during the event. Prior to a control event, do you recall the program "pre-cooling" your home (i.e., providing your home extra cooling prior to the control event)?

1. Yes
2. No
3. Don't know

[IF PC1 = a, CONTINUE. ELSE SKIP TO PC3]

PC1_a. How would you rate your satisfaction with your comfort level during the pre-cooling period? Please rate your satisfaction on a scale of 1-10 with 1 being "Very Dissatisfied" and 10 being "Very Satisfied".

Very dissatisfied									Very satisfied	Don't know
1	2	3	4	5	6	7	8	9	10	98

[ASK IF PC1_a = 1-6]

PC1_b. Why did you rate your satisfaction with the program's pre-cooling that way?

1. Response: **[OPEN ENDED]**

[IF PC1 = a, CONTINUE. ELSE SKIP TO PC3]

PC2. Do you have any feedback about the “pre-cooling” that occurred prior to the control event? **[OPTIONAL]**

1. Response: **[OPEN ENDED]**

PC3. Prior to the control event, did you ever take any actions to prepare for the event?

1. Yes (please specify): _____
2. No
3. Don't know

D.7.10 Thermostat Performance and Usage Behavior

TP1. What brand of Wi-Fi thermostat(s) do you have? (Select all that apply).

1. Honeywell
2. ecobee
3. Emerson

[Ask if TP1=2]

TP1_a. Have you activated eco +?

1. Yes
2. No
3. Don't know

[Ask if TP1_a=1]

TP1_b. What eco+ features do you use? (Select all that apply)

1. Smart home & away
2. Schedule assistant
3. Feels like
4. Time of use
5. Community energy savings
6. Don't know [Mutually Exclusive]

[Ask if TP1_a=1 and TP1_b <> 6]

TP1_c. Which slider setting (1-5) do you typically use? To move the red dot, please click on the part of the slider bar below that aligns with the setting you use. **[Programmer Note: Include 1-5 slider].**

1. **[slider]**
2. Not applicable to the feature I use
3. Don't know [Mutually Exclusive]

[IF A1 = 2-3 or N1 = 5, SKIP TO TP3. ELSE CONTINUE]

TP2. On a scale of 1 to 10 with 1 meaning “Not Well” and 10 meaning “Very Well”, how well did your thermostat work during the control events? For example, did the thermostat clearly indicate when a control event was in-progress? Was it easy to make changes to the temperature setting to override events? Did your thermostat stay connected to Wi-Fi?

[SCALE 1-10; 98=Don't know]

Not Well									Very Well	Don't Know
1	2	3	4	5	6	7	8	9	10	98

[Ask if TP2=1-6]

TP2. What issues did your thermostat have during the control events?

- Response: **[OPEN ENDED]**

TP3. Do you have any additional comments on the performance of your thermostat in general?

- Response: **[OPEN ENDED] [OPTIONAL]**

GT1. How did you typically use your thermostat throughout the summer?

- Set a temperature schedule for the whole summer (i.e., specify different temperatures for different times of day or days of the week)
- Only turn AC on when my home became uncomfortable
- Set the thermostat to maintain one temperature setpoint (regardless of time of day or day of week) for the whole summer
- Other (Please specify): _____
- Don't know

[If GT1 = 2, CONTINUE. ELSE SKIP TO GT3]

GT2. Above what *indoor* temperature do you typically turn your air conditioning on? Please enter a temperature in degrees F.

- Response: **[ENTER NUMERIC]**

GT3. Now we'd like to understand the frequency with which you adjusted your Wi-Fi thermostat's setting or schedule (either up or down) on days when there was no control event this summer. Would you say it was...

1. More than once a day
2. Once a day
3. A few times per week
4. Once or twice monthly
5. Once or twice over the whole summer
6. Not at all
7. Other (Please specify) **[OPEN ENDED]**
8. Don't know

[IF GT3 = 6, SKIP TO GT5. ELSE CONTINUE]

GT4. We'd also like to understand whether the frequency with which you adjusted your Wi-Fi thermostat's setting or schedule was different on control event days compared to other days. Would you say you adjusted your home's temperature...

1. More on control event days than on other days
2. Less on control event days than on other days
3. About the same amount regardless of whether it was a control event day or not
4. Don't know

[Ask if TP1_a <> 1]

GT5. When no family member is at home during the summer, which of the following best describes the way you use your air conditioner?

1. The thermostat is set to one temperature at all times and I do not use home/away assist or eco mode functions.
2. I always have the air conditioner follow a schedule that raises the temperature setpoint during the hours that there is typically no one home and I do not use home/away assist or eco mode functions.
3. My thermostat senses that no one is home and adjusts the temperature setpoint accordingly (i.e., using home/assist or eco mode).
4. Depending on the weather, I sometimes raise the temperature setpoint or turn the air conditioner off using the thermostat's mobile app or online portal.
5. When no family member is home, my air conditioner is turned off.
6. Other (Please specify): _____

GT6. Besides your smart thermostat app or smart thermostat itself, do you use other smart home devices to monitor and/or control the temperature or comfort of your home?

1. Yes (Please specify)
2. No

GT8. What other type of smart home device(s) do you have at home? Select all that apply:

1. Smart light bulbs
2. Occupancy sensor
3. Window/door open/close sensor

4. Home voice assistance (e.g. Alexa)
5. Water leak sensor
6. Smart plug
7. Smart switch or power strip
8. Smoke/carbon monoxide sensor
8. Smart lock
8. Garage door opener
97. Other. Please describe _____
98. I do not have any smart devices (besides my smart thermostat) **[Mutually exclusive]**

GT2_a. Does your Wi-Fi thermostat app provide you with information about your household's AC usage?

1. Yes
2. No
3. Don't Know

[IF GT2_a = 1, Ask]

GT2_b. How regularly do you review this information?

1. More than once a day
2. Once a day
3. A few times per week
4. Once or twice monthly
5. Once or twice over the whole summer
6. Not at all
7. Other (Please specify) **[OPEN ENDED]**
8. Don't know

D.7.11 Satisfaction

[IF A1 = 2-3 or N1 = 5, SKIP TO S3. ELSE CONTINUE]

S1. How would you rate your satisfaction with the following program aspects? Please rate your satisfaction on a scale of 1-10 with 1 being "Very Dissatisfied" and 10 being "Very Satisfied".

	1	2	3	4	5	6	7	8	9	10	Don't Know
a. The number of events in summer 2020											
b. Length of events in summer 2020											
c. Timing of events in summer 2020											

[If S1a = 1-6, CONTINUE. ELSE SKIP TO S2B]

S2A. Why did you rate your satisfaction with the number of events that way?

2. Response: **[OPEN ENDED]**

[If S1b = 1-6, CONTINUE. ELSE SKIP TO S2C]

S2B. Why did you rate your satisfaction with the length of events that way?

1. Response: **[OPEN ENDED]**

[If S1c = 1-6, CONTINUE. ELSE SKIP TO S2D]

S2C. Why did you rate your satisfaction with the timing of events that way?

1. Response: **[OPEN ENDED]**

S2d. On a scale of 1-10, how satisfied are you overall with the annual bill credit for participating in program?

[SCALE 1-10; 98=Don't know]

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	98

S2e. **[If S1d = 1-6, CONTINUE. ELSE SKIP TO S3]** Why did you rate your satisfaction with the annual bill credit for participating in the program that way?

1. Response: **[OPEN ENDED]**

S3. On a scale of 1-10, how satisfied are you overall with the AC Rewards program?

[SCALE 1-10; 98=Don't know]

Very Dissatisfied									Very Satisfied	Don't Know
1	2	3	4	5	6	7	8	9	10	98

[SKIP TO S4 IF S3= 98]

S3A. Why did you rate your satisfaction with the AC Rewards program that way?

1. Response: **[OPEN ENDED]**

S4. Now, thinking about Xcel Energy the utility, not just the program you participated in, on a scale of 1 to 10, with 1 meaning "Very Dissatisfied" and 10 meaning "Very Satisfied," how satisfied are you with Xcel Energy in general?

[SCALE 1-10; 98=Don't know]

Very Dissatisfied									Very Satisfied	Don't know
1	2	3	4	5	6	7	8	9	10	98

[SKIP TO S5 IF S4= 98]

S4A. Why did you rate your satisfaction with Xcel Energy that way?

1. Response: **[OPEN ENDED]**

S5. How has your participation in the AC Rewards Program impacted your satisfaction with Xcel Energy overall? Has it...?

1. Increased your satisfaction
2. Decreased your satisfaction
3. Or, had no impact on your satisfaction
98. Don't know

S6. How likely are you to continue to participate in the AC Rewards program in the future?

[SCALE 1-10; 98=Don't know]

Very Unlikely									Very Likely	Don't Know
1	2	3	4	5	6	7	8	9	10	98

If S6 = 1-6 CONTINUE. ELSE SKIP TO S8]

S7. What change(s) to the program would encourage you to continue participating?

1. Response: **[OPEN ENDED]**

S8. How likely are you to recommend the AC Rewards program to a friend or relative?

[SCALE 1-10; 98=Don't know]

Very Unlikely									Very Likely	Don't know
1	2	3	4	5	6	7	8	9	10	98

S9. What suggestions do you have for how to improve the AC Rewards Program?

1. Response: **[OPEN ENDED]**
2. No suggestions

D.7.12 Demographics

We're almost done! Please answer a few final questions to help Xcel Energy better understand the perspectives of different types of customers.

D2. Is this your primary home?

Address: [STREET_ADDRESS]

- 3. Yes
- 4. No

D3. Which of the following best describes the type of home?

- 7. Single family home
- 8. Multi-family home (2-4 units)
- 9. Multi-family home (5+ units)
- 10. Mobile home
- 11. Not a residence (business, workshop or other)
- 12. Other _____

D4. Which of the following best describes your ownership of the home?

- 4. I own and live there
- 5. I own and don't live there
- 6. I rent

D5. How many people, including yourself, live in the home full-time (at least nine months of the year)?

_____ [RECORD NUMBER OF OCCUPANTS]

D6. Excluding short-term vacations (<3 weeks), how many people, including yourself, typically live in the home full-time during summer months (June through September)?

_____ [RECORD NUMBER OF OCCUPANTS]

D7. Compared to last summer, how did the amount of time you spend at home on weekdays during the summer changed?

- 4. More time at home
- 5. Less time at home
- 6. About the same

D8. Which of the following age categories do you fall into?

1. 18-24
 2. 25-34
 3. 35-44
 4. 45-54
 5. 55-64
 6. 65 or over
99. Prefer not to provide

D9. What is the last grade of school you completed?

1. Grade school or less (1-8)
 2. Some high school (9-11)
 3. Graduated high school (12)
 4. Vocational/technical school
 5. Some college (1-3 years)
 6. Graduated college (4 years)
 7. Post graduate education
99. Prefer not to provide

D10. Which category best describes your gender?

1. Male
 2. Female
 3. Other
99. Prefer not to provide

D11. Please indicate which range best describes the annual income of your entire household (everyone living in your home).

1. Under \$15,000
 2. \$15,000 to \$24,999
 3. \$25,000 to 39,999
 4. \$40,000 to 59,999
 5. \$60,000 to \$74,999
 6. \$75,000 to \$84,999
 7. \$85,000 to \$99,999
 8. \$100,000 to \$124,999
 9. \$125,000 to \$149,999
 10. \$150,00 to 199,999
 11. \$200,000 or more
99. Prefer not to provide

D.7.13 Closing

C1. We have reached the end of the survey. Do you have any additional comments regarding AC Rewards?

1. Please enter any additional comments you have regarding the program. **[OPEN ENDED]**
2. None

C2. Thank you for taking the time to fill out this survey for the **AC Rewards Program!** Please provide the email address where you would like us to send your \$5 Amazon eGift Card.

3. Email: **[OPEN ENDED]**
4. I prefer not to provide my email address

[SURVEY CLOSE] Thank you for completing the survey! Xcel Energy appreciates your participation.

Appendix E. Interim Deliverable: Nonparticipant Focus Group Memo

To: Nick Minderman, Meagan Madden (Xcel Energy)

From: Lenore Zeuthen (Zeuthen Management Solutions)
Nicole Buccitelli, Meg Campbell, Stuart Schare (Guidehouse)

Date: February 16, 2021

Re: AC Rewards Program Focus Group Findings

E.1 Executive Overview

Guidehouse and Zeuthen Management Solutions (collectively, the “Guidehouse team”) conducted focus groups to better understand Xcel Energy customers who have Wi-Fi thermostats but are not enrolled in the AC Rewards program. This memorandum provides a summary of the objectives of the focus groups, key findings and areas of opportunity.

The focus groups supported the evaluation by:

- Establishing a **clear understanding** of customer motivation for acquiring their Wi-Fi thermostats, and how their satisfaction to date creates opportunities and challenges for AC Rewards enrollment
- Providing the evaluation team with **real-time customer feedback** regarding familiarity with AC Rewards, reaction to AC Rewards marketing materials and AC Rewards value proposition
- Identifying barriers to program enrollment, including **pain points and confusion**
- Eliciting anecdotes from customers’ **own experiences with Xcel Energy**, both positive and negative, which can inform future marketing messages

Key takeaways include:

- **Hesitancy to give up control and comfort, prized features of Wi-Fi thermostats.** Focus group respondents were motivated to acquire Wi-Fi thermostats because they deliver enhanced control and increased comfort. The perspective of these customers is that the very premise of the AC Rewards program compromises their reasons for getting a Wi-Fi thermostat to begin with.
- **Skepticism about program marketing that lacks detail.** Focus group respondents require detailed program information up front. Respondents wanted more information regarding the number of degrees the temperature of their home would change during control events, the frequency and length of events, their own ability to regain control or opt out, and Xcel Energy’s motivation for the events themselves. The lack of details in marketing materials creates a barrier to enrollment.
- **Confusion with AC Rewards in comparison to Saver’s Switch.** Some focus group respondents confused AC Rewards with Saver’s Switch, while others believed Saver’s

Switch offered a better incentive. A few respondents were wary of AC Rewards because of their prior experience with Saver's Switch control events. This confusion and negative comparison were noticeable pain points and barriers to enrollment.

- **Confusion between AC Rewards and eco+.** Focus group respondents were distracted by E=eco+ content in marketing emails that also promoted AC Rewards and were not sure how the two differed. Four respondents believed they were enrolled in both AC Rewards and three in Saver's Switch. Several respondents thought they were also using eco+ and were unable to distinguish between control events and energy efficiency changes, leading them to feel frustrated. Respondents want to know "who is controlling their thermostat and when." This confusion is not only a pain point, but also undermines participation in control events.
- **Need for Xcel Energy's ownership of AC Rewards to be clear.** Respondents questioned why their thermostat's manufacturer would email them about an Xcel Energy program. This distracts from AC Reward's value proposition and may create hesitancy among customers.
- **Focus group respondents lacked socioeconomic diversity.** Focus group respondents were a mix of men and women, age groups 18-24 through 65+. While the Guidehouse team attempted to recruit an ethnically diverse mix, nearly all identified as white (four declined to disclose their race or ethnicity) and all were high skill working professionals (with the exception of two retirees).

Key opportunities for the program include:

- **Revise marketing collateral for greater transparency.** Clearly describe why Xcel Energy initiates control events, when and how often they occur, and for how long. Describe what customers can expect: event notifications, pre-cooling, thermostat set point increase vs. actual home temperature change.
- **Fine tune marketing messaging to better communicate the value proposition.** Respondents require a clear understanding of bill credit amounts, when they will be paid, and for what behavior (i.e. thermostat purchase, AC Rewards enrollment, control event participation). Consider informing customers that they can opt out of control events, while emphasizing the need for their participation. Leverage behavioral messaging to explain why it is beneficial to participate, but limit opt-out messaging to maintain a steady event participation.
- **Create new program materials** that enable customers to access more granular information at their discretion. For example, provide an enhanced FAQs page, details program page (or individual landing pages) with videos, text and infographics. Provide greater explanation of specific topics such as control events, demand response, home thermal dynamics.
- **Message on Xcel Energy's rationale for control events**, particularly as it relates to sustainability and grid stability. Nearly all respondents spoke of environmental conservation; many expressed a desire to be responsible and an interest in Xcel Energy's use of renewables.
- **Distinguish between AC Rewards, Saver's Switch and eco+.** Promote these in separate marketing communications. Ensure AC Rewards marketing emails from thermostat vendors are focused on AC Rewards rather than combining topics such as eco+. Supplement marketing emails from thermostat vendors with emails directly from

Xcel Energy. On Xcel Energy’s website, offer a side-by-side comparison of AC Rewards and other programs and offers. Provide information about the differences between AC Rewards and thermostat features.

- Conduct additional customer segment research.** Focus group respondents were entirely white-collar or highly skilled and resided in single family homes (both detached and townhome). It likely is the case that Wi-Fi thermostat owners tend to be white-collar, single-family homeowners. However, it also may be that other customer types were less inclined or able to participate in a focus group. Further examination of under-represented customer segments is warranted to more fully understand what Xcel can do to increase Wi-Fi thermostat penetration and AC Rewards program participation among these segments. To this end, consider conducting interviews with lower income homeowners and renters (those who do and do not have a Wi-Fi thermostat) to assess views on and engagement with smart home devices.

E.2 Focus Group Methods

The Guidehouse team conducted four online focus groups for Xcel Energy using Focus Vision software, an interactive web-based platform utilized to facilitate focus groups, provided by The Blackstone Group (Blackstone). The groups consisted of current Xcel Energy residential customers who had received a rebate from Xcel Energy for the purchase of an AC Rewards-eligible Wi-Fi thermostat either purchased through the Xcel Energy online store or another retailer. The Guidehouse team removed current and past AC Rewards participants from the sample frames used for recruitment. However, ultimately, 4 of the 23 focus group participants were active AC Rewards participants (these 4 were all in group 1).²⁶ A summary of the focus group dates, times, and number of participants is displayed in Table E-1.

Table E-1. Focus Group Summary

Group	Service Territory	Purchase Channel	Date of Focus Group	Number of Participants
1	Minnesota	Xcel Energy online store	Oct 8 th 7-9 p.m. CT	8 ²⁷
2	Minnesota	Other retailer	Oct 13 th 7-9 p.m. CT	5
3	Colorado	Xcel Energy online store	Oct 14 th 7-9 p.m. MT	6
4	Colorado	Other retailer	Oct 15 th 7-9 p.m. MT	4

Source: Guidehouse team

Information about the focus group recruitment process is included in the Recruitment Process Appendix section.

²⁶ Initially, screening conducted during focus group recruitment did not include a question about whether the customer was a current or past AC Rewards participant. To prepare for recruitment efforts, the Guidehouse team developed samples by removing current and past AC Rewards participants from customer data (customers who had received a rebate from Xcel Energy for a Wi-Fi thermostat either through the online marketplace or application). However, since the AC Rewards enrollment data used for this cross-check was outdated by the time the focus groups were conducted, four customers in focus group 1 were actually AC Rewards participants. For subsequent focus groups, the Guidehouse team added an additional screener for AC Rewards participants to ensure groups were composed only of non-participants.

²⁷ Focus group 1 contained 4 active AC Rewards participants.

Focus group respondents were a mix of men and women, age groups 18-24 through 65+. While the Guidehouse team attempted to recruit an ethnically diverse mix, nearly all identified as white (four declined to disclose their race or ethnicity). Additionally, all except for two retirees were working professionals – a third retiree had recently returned to work as a church pastor. Table E-2 provides an overview of focus group respondent characteristics.

Table E-2. Focus Group Respondent Demographic Information

Group	Participant	Brand of Thermostat	Age	Gender	Race	Occupation
1	1*	ecobee	45-54	Male	White	Sales engineering manager
1	2	Honeywell	25-34	Male	White	Senior systems engineer
1	3*	Honeywell	25-34	Male	White	Research Scientist
1	4	ecobee	18-24	Male	White	Engineer
1	5*	ecobee	25-34	Male	White	Information Security Analyst
1	6	ecobee	55-64	Male	White	Rep
1	7	ecobee	55-64	Male	White	Web Developer
1	8*	ecobee	45-54	Male	Prefer not to say	Manufacturing Leader
2	9	ecobee	25-34	Female	White	Site supervisor of a childcare program
2	10	ecobee	45-54	Male	White	Systems Administrator
2	11	ecobee	55-64	Female	White	Mortgage Underwriter
2	12	Honeywell	35-44	Prefer not to say	Prefer not to say	Graphic designer
2	13	ecobee	55-64	Female	Prefer not to say	Retired
3	14	Honeywell	35-44	Male	White	Teacher
3	15	ecobee	65+	Male	White	Retired clergy
3	16	Honeywell	45-54	Male	Hispanic	Communications Consultant
3	17	ecobee	35-44	Male	White	Program Manager
3	18	Honeywell	55-64	Female	White	Retired
3	19	ecobee	35-44	Male	Prefer Not to Say	System administrator
4	20	Honeywell	25-34	Female	White	Insurance manager
4	21	ecobee	45-54	Female	White	Operations
4	22	ecobee	45-54	Male	White	CRE
4	23	ecobee	55-64	Male	White	Home theater consultant

Source: Guidehouse team

As a whole, the best way to describe the respondents is *busy*. Prior to each session, the Guidehouse team invited respondents to create an optional collage that depicted *a typical day at home this past summer*. 15 out of 23 respondents completed the assignment, shared it during introductions and described their lives. In addition to serving as a warm-up exercise, this gave

the team a window into their individual lives, so we could better understand Xcel Energy customers.

These customers were busy with work – both inside and outside of the home, in spite of the pandemic – and also highly active. They described home improvement or renovation projects, gardening, outdoor recreation, family time, cooking, baking, pets. Group 1 in particular were enthusiastic “gadget geeks” who loved technology and were each invested in smart home tech as well as home improvement projects. Additionally, during the discussions, nearly all respondents talked about environmental conservation and responsibility. In fact, several respondents were primarily motivated to save energy for environmental purposes alone; most felt saving energy and saving money should go hand-in-hand. We polled respondents in Groups 2, 3 and 4 regarding how important it was for them to save energy on a scale of 1 -10 (low to high importance). All respondents provided a score of 5 or higher (Table E-3).

Table E-3. How important is saving energy to you, personally?

Group	Rating 1-10									
	1	2	3	4	5	6	7	8	9	10
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2								2	3	
3					1		1	1	2	1
4							1	1	1	1

Source: Guidehouse team

Furthermore, participants were lively and chatted among themselves as well as with the moderator, compared experiences, shared information and were keen on communicating their opinions directly to Xcel Energy. The remainder of this memo addresses respondent feedback in detail and program opportunities based on key learnings from the focus groups.

E.3 Respondent Feedback

This section describes focus group respondents’ opinions, reactions, perceptions, and experiences to date with both their Wi-Fi thermostats and AC Rewards program materials. Their input is highly pertinent to both AC Rewards enrollment and future participation in control events. Respondent feedback related to the following four topics:

1. Customer motivation for purchasing Wi-Fi thermostats
2. Reaction to AC Rewards marketing materials
3. Barriers to enroll in AC Rewards
4. Attitudes towards Xcel Energy

E.3.1 Customer Motivation for Purchasing Wi-Fi Thermostats

Xcel Energy’s rebate was a primary trigger to purchase a Wi-Fi thermostat. Not surprisingly, several respondents had recently upgraded their homes’ HVACs and thus required updated thermostats.

That said, two key themes arose around customer motivation for choosing a Wi-Fi thermostat:

- Smart home integration
- Control, comfort, convenience

Smart Home Integration

A quarter of respondents purchased their Wi-Fi thermostats to **integrate it with their smart home** systems. The Guidehouse team polled Groups 2, 3 and 4 regarding their smart home devices (Appendix, Table E-8). Among the 15 respondents, most had other smart home devices, with a median of 5 devices per respondent (Appendix, Table E-9). They appreciated the savings gained from increased efficiency and mentioned home automation features such as activity monitors (i.e. room sensors), which turn off the AC when a room is vacant. Some like using Alexa to change their homes' temperature.

Respondents also enjoy the added convenience of controlling their thermostats from their phones; one participant chose her thermostat for its compatibility with Apple HomeKit, which allows users to control their home technology on one app.

On the other hand, two respondents expressed wariness of smart home technology due to privacy and control concerns. Home automation was de facto for most: "I've always been that person that likes to have technology embedded in my life, and [smart home automation] is a perfect way of doing it...with all the devices that we have at our fingertips now" (Group 3 respondent).

Control, Comfort, and Convenience

Many participants also purchased the thermostat because they wanted the ability to **control their thermostat while away**. They recalled forgetting to adjust the thermostat before leaving home for several days; being able to do so from a phone saves energy that would otherwise be wasted. "It just eats at you for three days knowing that the AC is cranking away when you're not there" (Group 1 respondent).

Others mentioned they wanted to adjust their homes' temperature **prior to returning**, to either warm or cool their home. Convenience is bundled into "comfort" as participants are using their phones to adjust the thermostat while at home – whether waking up on a cold morning or simply watching TV on the couch. Two respondents told us their primary motivation for getting a Wi-Fi thermostat was simply being able to control it from their phones.

Other

All respondents in Group 1 said they acquired a Wi-Fi thermostat in part because they enjoy the gadgetry aspect of owning one. One selected the ecobee specifically for its graphing and reporting features. Another respondent (Group 3) wanted to control his home's humidity.

E.3.2 Reaction to AC Rewards Marketing Materials

The Guidehouse team presented three marketing items to the focus group members to collect their feedback and initial thoughts. These materials included:

1. A promotional commercial for smart thermostats which highlighted the Xcel Energy rebate and the AC Rewards program

2. An AC Rewards marketing email sent by Honeywell (Figure E-1)
3. An AC Rewards marketing email sent by ecobee (Figure E-2)

After playing the commercial, we polled respondents on their familiarity with AC Rewards (see Table E-4).

Table E-4. Number of Respondents Familiar with AC Rewards

Group	Familiar with AC Rewards	Not familiar with AC Rewards
1	7	1
2	3	2
3	5	1
4	2	2

Source: Guidehouse team

Seventeen (17) respondents out of twenty-three (23) were already familiar with AC Rewards. Five customers from Group 1 had considered enrolling or thought they were currently enrolled in the program (4 were). This cohort was generally uncertain about their actual enrollment and/or participation in control events.

After showing the video, we asked respondents to review each email and mark it up to show areas of interest (circle, star) and confusion (question mark).

In reviewing the marketing materials, respondents commented on certain words, phrases and concepts in the marketing materials they reviewed. Three key categories were discussed in depth – key words, the lack of detailed program information and the source of the marketing content.

Key Words

The following is a discussion of some of the key words that emerged as focal points as focus group respondents reviewed marketing materials.

Savings promise

At first pass, participants liked the promise of saving money on their power bills. Terms like “cheaper” and “less expensive” stood out. However, in discussion some noted that these words can mean different things to different people; respondents wanted to know exactly what that would mean for them.

Incentive

Once details of AC Rewards were discussed, **many stated the \$25 annual incentive was not enough** to cede control of their thermostats. Those willing to try the program were clear that \$25 would ultimately not be sufficient if the temperature change caused them significant discomfort.

Regarding the \$75 enrollment incentive, we heard mixed reviews of how it is presented in the marketing emails:

- Respondents told us the offer should be featured prominently – above the fold – in marketing emails. One suggested Xcel Energy should combine the enrollment and participation payments (i.e. \$100) to attract her attention. Another respondent liked that the incentive was parsed out otherwise she would have been confused.
- Overall, while customers liked the amount of the \$75 enrollment incentive, they emphasized that **the marketing emails should clearly explain how much was being paid, when, and for what kind of obligation.**

Temperature adjustment

Multiple participants reacted to the term “**slight temperature adjustment.**” They wanted to know what “slight” meant and questioned if Xcel Energy’s definition would be the same as theirs. One respondent objected to the promise that “it’s without AC Rewards sacrificing your comfort,” because he doubts Xcel Energy knows what his comfort level is. “It almost sounds dismissive” (Group 3 respondent).

All of the respondents expressed **strong hesitation to enroll in the program without knowing what temperature adjustment to expect.** They all wanted Xcel Energy to provide a precise figure. We asked customers what they considered to be “slight,” and most told us two (2) degrees.

Rewards

The word “rewards” also elicited a visceral reaction from participants. They noticed the term was used interchangeably with the actual dollar-amount incentives (i.e. \$75 enrollment and \$25 participation) and found that confusing.

Respondents associated the term “rewards” with the following:

- Something to earn, after additional action from the customer
- Points, or something “bigger” that would be awarded after an accumulation of points
- Refund
- Rebate
- Miles
- A coupon or gift certificate

“Rewards” was among the most circled or emphasized with question marks; one respondent wrote “skeptical” next to it.

Lack of Detailed Program Information

Overall, respondents were emphatic in their desire for a clear explanation of the program. A majority of focus group participants reacted negatively to language perceived as vague and expected more details about program aspects. After reviewing AC Rewards marketing emails, their questions included:

- How many degrees change would they be subjected to?

- How hot would their homes become? Can they establish an upper threshold?
- How long will the change last? How quickly does the new temperature occur?
- Can you, or how do you exit the control event or the program? How does the former affect the annual incentive payment?
- How soon do they regain control of their thermostats?
- When are they paid the incentive? What is it based on? How many events are required?

Customers were bothered by the fact that they could not find precise answers to these questions in the marketing materials presented to them during the focus groups. They were noticeably critical of language they found uninformative. For example, one respondent took issue with a portion of marketing collateral: “Saying your smart thermostat can be even smarter, that says nothing. That doesn’t actually give me any information” (Group 4 respondent). A resounding theme in all four focus groups was the customers’ desire for **more detail and transparency**. One respondent stated, “over-communicating is never a bad thing” (Group 1 respondent).

With many questions in their mind, respondents asked *why* Xcel Energy offers AC Rewards. We engaged each group in a discussion to understand their perceptions and waited until the end to provide an official answer.²⁸

We heard multiple respondents ask **why Xcel Energy needs customers to use less energy** at times of peak demand. They surmised it was to prevent black outs. Notably, several respondents were interested in supporting efforts to minimize strain on the grid. Some respondents expressed a greater willingness to withstand discomfort if they knew Xcel Energy was working to avoid a black out. Other reasons for calling control events, such as Xcel Energy extending the life of its infrastructure, did not resonate as strongly with respondents.

Brand Messaging in Emails

Marketing materials for AC Rewards are distributed by both Xcel Energy and the manufacturer of a customer’s smart thermostat. When customers were shown marketing materials from thermostat manufacturers, respondents questioned **why a thermostat company would be the one inviting them to enroll** in a program offered by Xcel Energy. At least one participant mistook the button “Enroll with Xcel Energy” for a call-to-action to actually sign up for electricity service from Xcel Energy.

Respondents were also befuddled by AC Rewards and eco+ being mentioned in the same marketing email that targets ecobee owners. They questioned their relation, were confused as to how they differed, and were distracted by eco+ being prominently featured at the top of the email.

²⁸ With approval from Xcel Energy, the Guidehouse team provided a description of Xcel Energy’s rationale for DR programs/control events to focus group participants at the end of each discussion:

“Xcel Energy offers programs like AC Rewards to its customers to reduce demand for electricity at peak times, meaning when most customers are using a great deal of energy. It does so in cooperation with Minnesota’s [or Colorado’s] regulatory commission, in order to extend the lifetime of its infrastructure, achieve cost savings and, over the long term, develop a more flexible grid that allows for more renewable sources of energy.”

E.3.3 Barriers to Enroll in AC Rewards

As previously mentioned, respondents reacted negatively to the lack of clarity in the marketing collateral they reviewed. This is a significant obstacle for Xcel Energy. Customers *anticipate* acute discomfort during control events. They are thus reluctant to cede control of their thermostats because they do not know what to expect from the program. This section highlights the primary barriers to AC Rewards enrollment that focus group participants expressed.

Control and Comfort

Relinquishing control is also a considerable barrier to enrollment in AC Rewards. “We all want to save money, but we don’t want to give up full control over how we do that” (Group 2 respondent).

We heard from many respondents that they were not comfortable with this; some even expressed **fear and distrust of Xcel Energy controlling their home’s temperature**. “When I read ‘light temperature adjustment,’ I tuned out right away” (Group 2 respondent). Many respondents said they were reluctant to allow Xcel Energy to reduce their air conditioning on hot days – **the very days they need cooling**. Working from home exacerbated this sentiment. One participant told us if she were away from home it would be fine, but “if I’m here all day and I’m sweating and uncomfortable, then that’s not going to be okay” (Group 4 respondent).

Importantly, customers perceive the “slight temperature adjustment” to be an automatic change in their *home’s temperature*, whereas Xcel Energy is actually adjusting their *thermostat’s set point*. The respondents did not understand that their homes’ temperatures would rise based on their respective thermal dynamics (i.e. insulation) and might never reach the 4-degree increase in set point. The distinction between set point temperature and home temperature is a key message to communicate to customers in marketing materials.

Several participants expressed greater interest in AC Rewards after learning about the ability to override or opt out of an event. However, they still wanted to know how many events to expect.

Incentive

Some respondents felt that **\$25 paid annually was not sufficient** to allow Xcel Energy to control their thermostat. Ultimately, they were not willing to trade their comfort for a modest savings: “I’m not Scrooge McDuck. I don’t have money coming out of my ears, but the amount of savings doesn’t add up to what I could eke out in comfort” (Group 3 respondent).

Previous Customer Service Issues or Enrollment Challenges

Even when participants were interested in AC Rewards, some were hesitant due to poor prior customer service experiences, namely having difficulty receiving thermostat rebates or trying to enroll in AC Rewards. One customer reported making multiple attempts to track down his thermostat rebate, which he received a year after purchase. Because of this (and other reasons), he was reluctant to enroll in AC Rewards.

Another customer recalled trying to enroll and finding the experience inconvenient, possibly having to go “to two or three websites” or “apply using another username and another password” (Group 2 Respondent). This confirms reporting from Xcel Energy staff on former Demand Response Management System enrollment issues (pre-Resideo).

Both points of friction – **rebate payment and program sign-up difficulty** – are primary barriers to enrollment.

Saver's Switch and eco+ Confusion/Comparison

There was notable confusion among respondents concerning AC Rewards, Saver's Switch and Eco+, which creates additional barriers to entry.

Some respondents were confused between Saver's Switch and AC Rewards; others who were familiar with Saver's Switch were dissuaded from enrolling in AC Rewards. Their points of comparison were:

- Saver's Switch control events made them uncomfortable
- During Saver's Switch control events, they were unable to use their air conditioning at all
- Saver's Switch incentives were of greater dollar value

Not only did respondents struggle to differentiate AC Rewards from Saver's Switch, they were also confused by eco+, the energy efficiency feature offered by ecobee. This confusion was particularly acute among Group 1 participants (which included AC Rewards participants). Each respondent believed they were enrolled in *at least one* of the three programs or options (AC Rewards, Saver's Switch, and eco+). These respondents did not know what the differences were, what was expected of them, or what they were supposed to receive.

Moreover, **they did not know when they were experiencing a control event (AC Rewards) or an energy efficiency adjustment (eco+)** and conflated the two. "I don't really know who's doing what to my thermostat anymore" (Group 1 respondent). These participants explicitly stated they wanted to know who is controlling their thermostats, when, and for what purpose.

One participant recommended Xcel Energy provide a side-by-side comparison of Xcel Energy's various programs and offer to help customers differentiate among them and make better choices.

E.4 Attitudes Toward Xcel Energy

During the focus groups, we assessed the customers perception of Xcel Energy. We probed to understand aspects they like about their utility and opportunities for improvement through a "letter writing exercise". Respondents shared what they wished for ("Dear Santa"), disliked ("Poison Pen") and appreciated ("Love Letter") from Xcel Energy. They imagined themselves writing a letter to Xcel Energy, and volunteered their main points, which are displayed in Table E-5. During the discussion, respondents spoke favorably of service reliability and communication during outages. Regarding their wishes, respondents want greater detail on their energy usage and more information on Xcel Energy's use of renewables and sustainability initiatives.

Overall, focus group participants wanted to hear more from Xcel Energy – not less:

- Granular detail regarding power outages and restoration, including countdowns to power coming back on
- Information about Xcel Energy's use of renewables
- Local options for solar, including installation and bill impact

This enforces what respondents told us throughout each session: **transparency and greater access to details are valuable** to them.

Table E-5. Information Customers Want Xcel Energy to Know

Letter	Topic	Comments
Dear Santa	Detailed household information	<ul style="list-style-type: none"> • More usage information; more detail (which appliance, times of day) (5) • More information and advice on how to save energy that is <i>particular to household</i>
	Outages/service	<ul style="list-style-type: none"> • More timely updates re: power restoration (would like a “countdown” with detail) (2)
	Solar and other renewables	<ul style="list-style-type: none"> • More information on how Xcel Energy is using alternative fuel sources (3) • How adding solar will reflect on bill • More initiatives to make solar panels affordable • Opinion/reaction to solar installers/vendors – what is Xcel Energy’s stance or recommendations?
	Other	<ul style="list-style-type: none"> • More communication regarding city of Boulder and potential muni (CO)
Poison Pen	Detailed household information	<ul style="list-style-type: none"> • Fees on bills – should identify, explain
	Outages/service	<ul style="list-style-type: none"> • Long hold times (not outage related)
	Solar and other renewables	<ul style="list-style-type: none"> • Reduced/took away solar incentives
Love Letter	Detailed household information	<ul style="list-style-type: none"> • Usage updates via email • Likes quarterly usage breakdown with advice on how to save • Year-to-date usage comparison, temperature data
	Outages/service	<ul style="list-style-type: none"> • Accurate, reassuring outage communications (4) • Reliable (2+) • Removed branches from lines immediately after snowstorm • Call center customer service
	Solar and other renewables	<ul style="list-style-type: none"> • Using renewables (CO) (2) • Doing a lot with solar (MN) • Installed solar panels, felt Xcel Energy was cooperative (CO)
	Other	<ul style="list-style-type: none"> • Rebates

Source: Guidehouse team

E.5 Program Opportunities

This section summarizes opportunities for improved program marketing, retention and participation. These recommendations were informed by customer feedback, particularly around concepts of comfort and control; a desire for greater communication (detail and frequency); and, a value placed on environmental responsibility.

Findings are organized into the following categories:

1. Marketing Messaging
2. Development of additional marketing collateral
3. Use of marcom creative design for subtle targeting

E.5.1 Enhance Marketing Messaging

Overall focus group respondents told us they want greater transparency and details from Xcel Energy – not just about AC Rewards, but also about their power company’s operations.

The AC Rewards team can leverage this into program messaging. Key findings and considerations for messaging are described in Table E-6.

Table E-6. AC Rewards Marketing Considerations

Messaging Aspect	Key Finding	Considerations
Clear, detailed information	Customers also told us they want clear, detailed information about AC Rewards	<ul style="list-style-type: none"> • Consider sending marketing emails from Xcel Energy (in addition to leveraging thermostat manufacturers for marketing) • Clarify emails sent from thermostat manufacturers: “We want to tell you about a money-saving program call AC Rewards, offered by your utility Xcel Energy.” • Rather than bundling AC Rewards with co+ in marketing emails, dedicate standalone emails to each • Avoid “selling” the program with marketing language; instead, provide the basic facts up front.²⁹
Reliability	Respondents appreciate Xcel Energy’s reliable delivery of power to their homes, and fast turnaround times during outages.	<ul style="list-style-type: none"> • Include “reliability” in program marketing: “We take pride in delivering reliable service to you. Help us continue that service by reducing your energy use at peak times.”

²⁹ For example:

- “Xcel Energy needs your help to reduce electricity use on hot days, during peak times.
- To say, “thank you,” Xcel Energy will give you a \$75 bill credit for enrolling in AC Rewards, then an additional \$25 annually for reducing your energy use during control events.
- During control events, Xcel Energy sends a signal to your Wi-Fi thermostat, adjusting its set point up to 4 degrees, for 4 hours.
- Your home’s temperature will change based on how well it is insulated; AC Rewards includes a “pre-cooling” feature to keep you comfortable.
- You can adjust your thermostat’s set point at any time; this may affect your annual participation credit.”

Messaging Aspect	Key Finding	Considerations
Environment	Respondents wanted to hear more about what Xcel Energy is doing for the environment; we also heard them say they <i>like</i> what Xcel Energy is doing.	<ul style="list-style-type: none"> Message on renewables portfolio and how DR helps limit reliance on fossil fuels at peak times.³⁰

Source: Guidehouse team

E.5.2 Develop Additional Marketing Collateral

It would be challenging to provide all the details customers want in just one email – and ill-advised. We recommend creating complementary marketing pieces that allow customers to access more information as they wish:

- Add hyperlinks to marketing emails that bring customers to specific sections of either the AC Rewards program information page or FAQs section
 - For example, answer questions about home thermodynamics (i.e., how quickly a home’s temperature may change, how warm it may become), pre-cooling, event notification, control event dispatch (i.e. Wi-Fi thermostat signaling) *et cetera*
 - Be sure to add “Enroll today” and “Sign up now” call-to-action buttons on any supporting materials
- Create content using more than one medium:
 - Consumers like to parse information in a variety of ways. Explain “control events” using website text, videos, and infographics
 - Make resources available to enrolled customers as well
 - Use a variety of media for the same information, at the same time
 - For example: imbed marketing emails with a video explaining the program. Some customers will read the email, some will prefer the video – and some will consume both.
- Provide a side-by-side comparison with other programs and offers, such as Saver’s Switch
- Acknowledge, thank and remind participants of their program enrollment in a variety of media, such as bills, MyAccount, and their thermostat portal
- Create retention communications. The latter includes providing demand response education and thanking customers for participating in control events, confirming program enrollment on monthly bills.

³⁰ For example, “On very hot days, it is vital that we have enough electricity for everyone. To do so, we rely on fuel sources that are available in predictable quantities. Help us avoid using fossil fuels and keep everyone cool by using a little less power in your homes.”

E.5.3 Use Creative Design for Subtle Targeting

Xcel Energy can use creative design in AC Rewards marketing collateral to appeal to customers best suited for this program. Use a variety of images and copy that speak to different “types” of customers (Table E-7). Xcel Energy can leverage any existing segmentation data or simply send out a series of different emails and conduct A/B tests with smaller portions of the customer database (those with AC Rewards-eligible thermostats).

Table E-7. Customer Types

Customer Type	Pitch	Approach
Customers who are not home during control events; this means people who work outside of the home.	“Put your thermostat to work while you’re at work”	Test images of individuals engaged in a variety of jobs, i.e. outdoors or essential workers as well as office professionals (taking into account any Covid-19 stay-at-home orders)
Home improvement types	“Make your home even better with more energy savings”	Test images of different types of homes; people working on their homes, gardening, shopping at the hardware store; graphics showing heating/cooling systems
Smart home gadget-geeks	“Are you getting the most out of your Wi-Fi thermostat?” “Unlock more savings from your Wi-Fi thermostat”	<ul style="list-style-type: none"> Visually highlight the tech aspects of the Wi-Fi thermostats, i.e. screenshots, infographics, diagrams Use a screenshot showing control event notification: “Leverage your technology to save more.”
Environmentally and socially responsible	“Help take a load off the grid”	<ul style="list-style-type: none"> Include an infographic – elephants on a trapeze net – that is eye-catching and instantly understandable. <p>“When you use less power on very hot days, you help us keep everyone cool with less reliance on fossil fuels.”</p>

Source: Guidehouse team

E.5.4 Conduct Additional Customer Segment Research

Focus group respondents were entirely white-collar or highly skilled and resided in single family homes (both detached and townhome). It likely is the case that Wi-Fi thermostat owners tend to be white-collar, single-family homeowners. However, it also may be that other customer types were less inclined or able to participate in a focus group. Further examination of under-represented customer segments is warranted to more fully understand what Xcel can do to increase Wi-Fi thermostat penetration and AC Rewards program participation among these segments. To this end, consider conducting interviews with lower income homeowners and renters (those who do and do not have a Wi-Fi thermostat) to assess views on and engagement with smart home devices.

E.6 Appendix

E.6.1 Recruitment Process

After the Guidehouse team design the samples to use for recruitment, Blackstone executed the recruitment process. An initial online survey (screener) was sent to potential focus group recruits by email explaining the study and offering them an incentive of up to \$125 for their participation in a 2-hour group discussion.³¹ Then, the Guidehouse team reviewed the online responses, including information on profession, gender, age, and ethnic background, with the aim of selecting a diverse set of Xcel Energy customers as participants. When recruiting participants, respondents were screened in part for having generally positive attitudes towards Xcel Energy. Using a 10-point scale (1-10), we excluded recruits who gave Xcel Energy scores of 3 or less, or 9 or higher. We wanted to hear from customers who would offer candid insights.

After high-priority customers were selected, Blackstone called each customer to conduct a follow-up screening to verify they have a Wi-Fi thermostat, use their thermostat for cooling, and are not enrolled in AC Rewards. They also verified that customers had video chat capabilities for the focus group.

Finally, the day before each focus group, Blackstone called customers to remind them of the study.

³¹ Customers were offered \$100 incentive for participating in the Focus Group. An additional \$25 incentive was offered to participants who completed an assignment before the group. The assignment was for participants to create a collage that illustrates a typical summer day for them.

E.6.2 In-Home Smart Technology Devices

Table E-8. Smart Home Technology

Device	Group 1*	Group 2	Group 3	Group 4
Smart light bulbs	N/A	4	2	2
Occupancy sensor	N/A	2	3	2
Window/door open/close sensor	N/A	2	3	2
Home voice assistant (e.g. Alexa)	N/A	3	4	3
Water leak sensor	N/A	1	1	0
Smart plug	N/A	2	2	2
Smart switch or power strip	N/A	3	2	2
Smoke/carbon monoxide sensor	N/A	3	2	0
Smart lock	N/A	2	1	2
Home security (e.g. Ring)	N/A	3	4	2
Other	N/A	1	0	3
I do not have any smart devices (besides my smart thermostat)	0	0	1	1

* Not polled but this group was highly tech-engaged

Source: Guidehouse team

E.6.3 Smart Home Devices

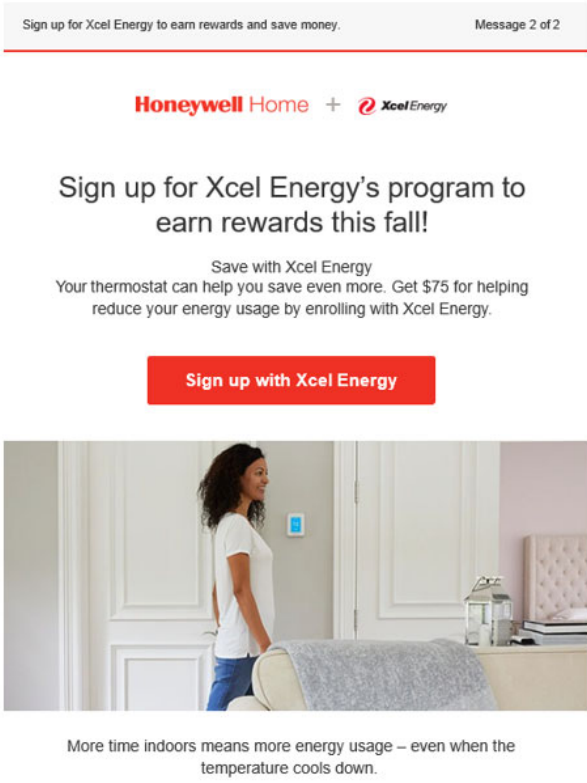
Table E-9. Number of In-Home Smart Devices

Count of Respondents	Number of Smart Devices (besides thermostats)
2	0
2	1
1	2
1	4
4	5
1	7
2	8
1	9
1	10

Source: Guidehouse team

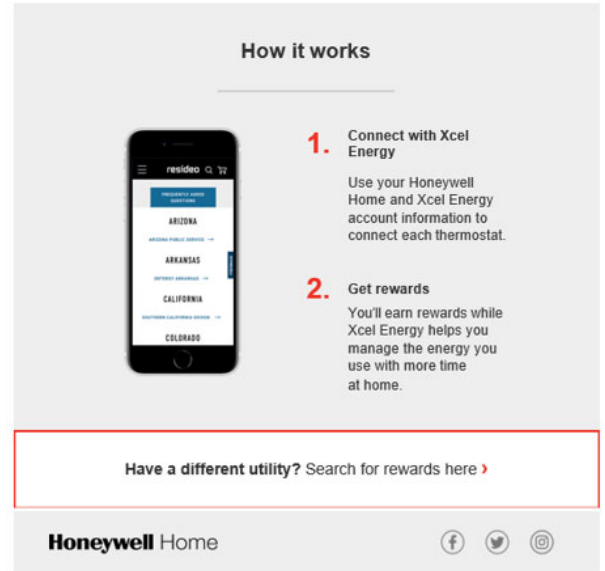
E.6.4 Honeywell Marketing Email

Figure E-1. Honeywell Marketing Email



Source: Xcel Energy

But, when you sign up for Xcel Energy’s program, your thermostat can help save energy in your neighborhood by making automatic adjustments. Plus, you’ll earn rewards!

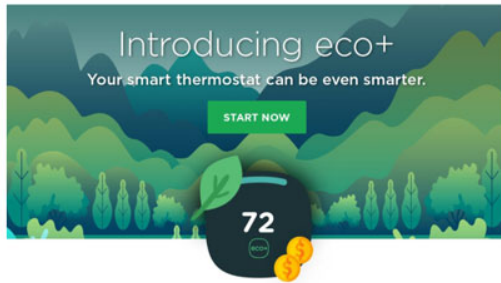


† Honeywell Home by Resideo thermostats and apps work in both Fahrenheit and Celsius temperature scales.

This email was sent by www.honeywellhome.com, and was intended for: rideme@yahoo.com. To avoid important emails being routed to your Junk folder instead of your Inbox, please add our email address to your contacts and trusted mail sources as specified by your email client or ISP.

E.6.5 ecobee Marketing Email

Figure E-2. ecobee Marketing Email



Supercharge your thermostat for maximum efficiency with minimal effort

Congrats Kenneth! You've been given exclusive access to **eco+**, a free software upgrade for all ecobee smart thermostats. **eco+** works in the background to unlock extra energy savings and enhance your comfort. Get started with **eco+** by opening the ecobee app.

Why **eco+**?

Think of **eco+** as your personal home energy assistant. When it's enabled, your ecobee smart thermostat will optimize household energy use by automatically adjusting for:

Sign up for **eco+** and get rewarded by your utility provider

As part of **eco+**, you may choose to participate in AC Rewards, Xcel Energy's energy savings program. If you participate, Xcel Energy will make slight temperature adjustments to your thermostat when electricity demand in your community peaks to help reduce strain on the energy grid without compromising your comfort.

As a thank you for participating, Xcel Energy will reward you with an \$75 for each eligible thermostat when you enroll in our AC Rewards program as well as a recurring \$25 annual bill credit for remaining enrolled in the program.



[View this email online](#) | [Opt out to unsubscribe](#)

Source: Xcel Energy

Appendix F. Interim Deliverable: Peer Benchmarking Summary



Peer Program Benchmarking Summary

2020 AC Rewards Evaluation

March 10, 2021



Benchmarking Objectives

1 Program Uses

- What are the primary drivers of other utilities' programs currently?
- How are utilities thinking about the value of the program in the future?

2 Program Design and Delivery

- What program design elements and delivery strategies do peer utilities employ?
- What has worked not worked?

3 Interaction with EE Programs

- How have other utilities approached the integration of EE and DR?
- What EE channels do other utilities leverage to increase Wi-Fi thermostat adoption and DR program participation?

Peer Programs

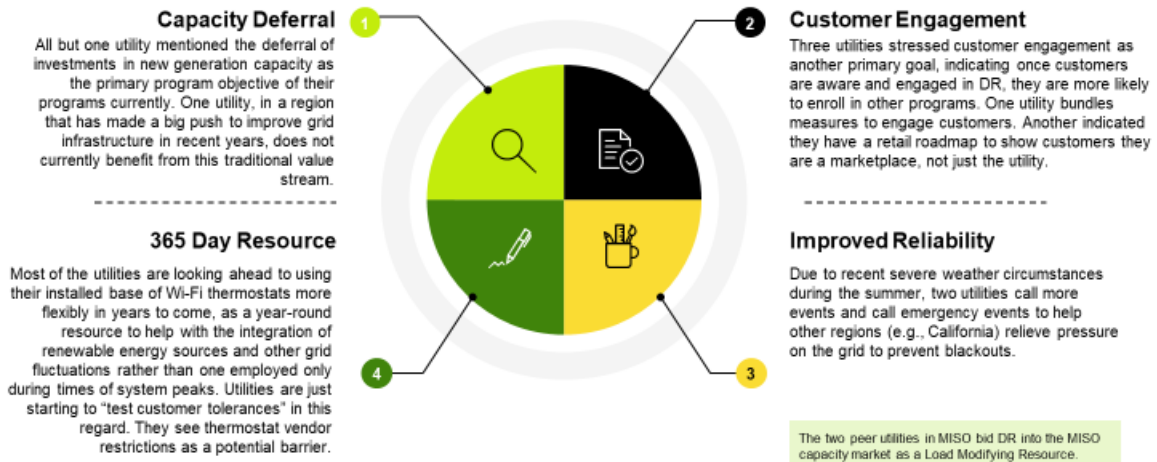
Summary of peer programs benchmarked

Utility	State	Eligible Sectors	Program Type	Inception Year	Current Program Size (devices)
1	AZ	Res	BYOT	2018	29,000
2	MD	Res	BYOT	2020	13,800
		Res	Direct Install	Unknown	193,000
3	IL	Res	Switches	Unknown	70,000
			BYOT (discontinued in 2021 ²)	2014	0
4	MI	Res	BYOT	2019	27,000
		Res SF, Res MF	BYOT	2015	42,000
5	TX	Res SF, Res MF	Direct Install	2003	SF: 57,000 MF: 41,000
6	MI	Res	BYOT	2017	28,000
7	NV	Res	Direct Install (launching BYOT soon)	2013	32,000
8	NM	Res and SB	Direct Install	2014	Unknown
		Res SF, Res MF	BYOT	2019	Unknown

1. The utility is looking to transition customers currently enrolled in DI to BYOT; transition will be gradual.
 2. The utility requested permission to cancel the program because of changes to their thermostat vendor partner's platform.

Primary Program Drivers

Avoided generation capacity costs remain the primary value stream. Most utilities are not currently focused on leveraging DR on a locational basis but are preparing to do this in the future (e.g., to support EV adoption). Only two peers indicated they use their program as a non-wires alternative (NWA).



Program Incentives

Utility	State	Eligible Sectors	Program Type	Sign up Incentive	Ongoing Incentive	Incentive Form
1	AZ	Res	BYOT	\$50	\$25 per year	Bill credit
		Res	BYOT	\$50 off purchase of thermostat on marketplace	\$50 per year	Visa e-gift card
2	MD	Res	Direct Install	N/A	\$1.25 for every kWh reduced, up to \$100 per year (allowed to override 2 events)	Bill credit
		Res	Switches	None	\$10 per month (up to \$40 per year for 100% cycling, half the incentive for 50% cycling), per household (June-September)	Bill credit
3	IL	Res	BYOT (discontinued in 2021)	\$75	\$10 per month (up to \$40 per year), per household (June-September)	Bill credit
			BYOT	\$75	\$25 after each season	Pre-paid Mastercard
4	MI	Res SF, Res MF	BYOT	\$85 (excl. DI)	\$30 per year	Bill credit
		Res SF, Res MF	Direct Install	Unknown	\$30 per year	Bill credit
6	MI	Res	BYOT	Free Google Nest mini (limited time offer)	\$20 per year. Customers are also entered into a sweepstakes (2018-2020 only).	Gift card
7	NV	Res	Direct Install including switches and programmable t-stats (launching BYOT soon)	N/A (unknown for BYOT)	Calculated based on performance (energy saved x real-time rate = energy rebate)	Bill credit
8	NM	Res and SB	Direct Install	N/A	\$25 per year	Check
		Res SF, Res MF	BYOT	\$25	\$25 per year	Check

Program Partners

Utility	State	DRMS Vendor Partner	Thermostat Vendor Partners					Other
			ecobee	Nest	Honeywell	Emerson		
1	AZ	EnergyHub	X	X	X	X	Sensi, Lux, Radio, Vivint, Alarm	
2	MD	EnergyHub	X*	X	X	X	Honeywell Utility Pro (1-way)*, Alarm, Lux, Radio, Vivint	
3	IL	N/A		X (discontinued)				
4	MI	Uplight	X	X		X		
5	TX	EnergyHub and Resideo	X	X	X	X	Vivint, Alarm, Lux, Radio, Building36	
6	MI	EnergyHub	X	X	X	X	Alarm, Lux, Radio, Vivint	
7	NV	None	X*		X*		Ecofactor/Bidgely*	
8	NM	Itron			X		Itron*	

*Direct Install Thermostat Partner

Event Design

Utility	State	DR Season	Event Criteria	Curtailement Strategy	Pre-Cooling
1	AZ	Summer: Jun-Sep	No specific criteria developed yet	Use firm-load dispatch (staggered dispatch) for more even impacts over event period	For weekday events, two thermostat vendors will not pre-cool (due to TOU settings). Other devices pre-cool for 2 hours outside of TOU hours.
2	MD	Summer: May-Oct	Can call system wide or local events as needed. To-date, events have been tests.	Up to 4-degree temperature setback	Pre-cool up to 90 minutes (tested 30 and 90-minute pre-cooling) ¹
3	IL	Summer: Jun-Sep	Typically, cycling would occur during very hot weather (switches)	50%/100% cycling (switches)	None (switches)
4	MI	Summer: Jun-Sep Winter: Nov-Mar (pilot)	Calling economic events (if energy prices are high enough)	All t-stats at once, stagger customers returning to normal after event	Pre-cool algorithm with temperature setback
5	TX	Summer: May-Sep	Call system wide events to align with ERCOT peak period Tries to call different groups (Res vs. C&I) to prevent customer fatigue	3–4-degree setback, all t-stats at once at start of event	Pre-cool up to 1 hours
6	MI	Summer: Jun-Sep	Call events on hot summer days	Up to 4-degree temperature setback, all t-stats at once at start of event	Pre-cool 3 degrees prior to the event
7	NV	Summer: Jun-Sep	Call economic events on hot summer days and emergency events, as needed	Emergency: System-wide up to 4 degrees Non-emergency: "Phased approach", only call 12.5% at a time up to 4 degrees to flatten load curve and keep participants happy	Pre-cool a few degrees before an event
8	NM	Summer: Jun-Sep	Call events on hot summer days	Systemwide setbacks	Unknown

¹ The utility learned some customers did not like pre-cooling, indicating they thought it compromised energy savings even though the utility tried to communicate very clearly that this is not an energy savings program. The utility hopes to make pre-cooling optional.

Event Design (continued)

Utility	State	Max Events Per Season	Max Duration of Events	Potential Event Window	Potential Event Days
1	AZ	20 (Usually 10 events)	2 hours ¹	3 PM - 8 PM	Weekdays and weekends (typically not holidays)
2	MD	15	6 hours	Event window not identified	Non-holiday weekdays
3	IL	Average has been 1 event per summer	10 hours	9 AM - 9 PM	Any day of the week
4	MI	Summer: 14 Winter: 10	4 hours	Summer: 1 PM - 7 PM Winter: 6 AM - 10 AM	Non-holiday weekdays
5	TX	Usually 20-25	4 hours	3 PM - 7 PM	Weekdays
6	MI	10	4 hours	3 PM - 7 PM	Non-holidays
7	NV	Minimum of 4, typically 40 events	Non-emergency: Although the max event period is 4 hours (most are 3 hours), they use a "phased" approach, calling 12.5% of t-stats at a time Emergency: 2 hours	1 PM - 7 PM	Unknown
8	NM	No limit Usually less than 10	4 hours	1 PM - 8 PM	Weekdays

¹ The utility received approval to call 3-hour long events in 2021.

Interaction with EE

Utility	State	EE Thermostat Rebate \$	Rebated Thermostats	EE Channels for Marketing Thermostats and DR	Required to enroll in DR?
1	AZ	\$30; with additional during promotions	Nest, ecobee, Honeywell, Emerson, Lux, Radio, Vivint, Alarm	Online marketplace; other retailers	No
2	MD	\$75	Nest, ecobee, Honeywell, Emerson	Online marketplace; other retailers (some have instant discounts)	No
3	IL	\$100	Nest, ecobee, Honeywell, Emerson	<ul style="list-style-type: none"> Online marketplace, select retailers (with instant in-store coupon), other retailers EE DI program Online marketplace EE DI program HER program Home energy audit program Wx program 	N/A
4	MI	\$50-100	Nest, ecobee, Emerson	<ul style="list-style-type: none"> EE DI program HER program Home energy audit program Wx program 	No
5	TX	No separate EE rebate		<ul style="list-style-type: none"> Home energy audit program Wx program 	Yes
6	MI	\$50	ecobee, Emerson	Online marketplace	No
7	NV	No separate EE rebate (coming soon)		<ul style="list-style-type: none"> Home energy audit program EE DI program Home energy audit program Wx (low income) program Residential comprehensive program 	Yes
8	NM	\$100 customer copay	Unknown	<ul style="list-style-type: none"> Home energy audit program Wx (low income) program Residential comprehensive program 	No (DR enrollment only required to get thermostat for free)

Interaction with EE (continued)



Cross-Promotion

- Six of the peer utilities already leverage EE pathways to cross-promote DR. One of these utilities "bundles everything because you never know what will resonate with people - smart thermostats, home energy assessment and EE DI measures – these are rarely mentioned on their own."
- DR is marketed with Wi-Fi thermostats through the utility's online marketplace (four utilities) and during home energy assessments (three utilities), and through EE direct install (three utilities), weatherization (two utilities), and home energy report (one utility) programs.
- Two utilities do not have stand alone EE rebates for Wi-Fi thermostats and require customers to enroll in DR to receive an incentive for getting a Wi-Fi thermostat (i.e., the DR program sign-up incentive).



Accounting

- Seven of the peer utilities have separate EE and DR portfolios whereby shared costs and benefits must be allocated between the two.
- Of those who provided information about how costs and benefits are allocated across portfolios, two indicated that, if the thermostat is enrolled in DR, the DR program carries the costs and receives the benefits. Another utility noted that, for thermostats purchased through the online marketplace, the EE portfolio gets the kWh benefit, and the DR portfolio gets the kW benefit.
- For one peer utility, DR is considered part of the EE portfolio and associated costs and benefits are not separated out.

Other Programs Offered By Peers

Utility	State	AC Switch	Other Direct Load Control	Behavioral/Pricing	TOU
1	AZ	Yes	None	None	Yes, optional
2	MD	Yes (part of Peak Rewards)	Retiring current water heater switch program soon, but open to a program with 2-way switches. Got approval to open BYO program up to more devices (thinking about ductless mini-splits and solar + battery, EV chargers).	PTR EV pilot (w/ TOU)	Some BYOT program participants are on TOU (pilot phase)
3	IL	Yes Not taking new enrollments	None	PTR	Yes, optional. TOU Pricing; Hourly Pricing.
4	MI	Yes No longer marketing but still allow enrollment	Programmable t-stat (DI)	Behavioral/pricing	Yes. TOU will be mandatory soon.
5	TX	No	None	None	No
6	MI	Yes Still allowing enrollment	None	DPP App with add-on feature	Yes, optional
7	NV	Discontinued	None	None	Yes, optional
8	NM	Yes	None	None	Yes, optional

*PTR = peak time rebate; DPP = dynamic peak pricing

Marketing and Recruitment



Overview

- All but one of the peer utilities with a BYOT program uses thermostat vendors for program marketing.
- All utilities conduct their own marketing of the program. This includes general awareness campaigns and cross-promotions with the utility's online marketplace or other demand management solutions. Additionally, most utilities leverage EE program onsite opportunities as DR recruitment pathways.
- Marketing modes employed include email blasts, 15- and 30-second videos, Facebook ads, Instagram posts, TV commercials, bill inserts, newsletters, and printed articles.
- Peer utility research on messaging indicates saving money, saving energy, reliability benefits, and environmental benefits all resonate as reasons to participate in DR. Loss of control is the biggest barrier preventing people from enrolling.



Strategies

- **Establishing a rapport:** One utility sends emails to customers to help them understand their utility bill, how to save energy, how to find information on the website, and also to educate customers about DR offerings.
- **Messaging seasonally:** One utility conducts marketing and promotions during times when customers are transitioning from heating to cooling and from cooling to heating. Relatedly, Earth Day and Black Friday are a good opportunity for special promotions.
- **Promotions:** Several utilities routinely offer promotions of thermostats, particularly around the holidays, which help to boost DR enrollment. One utility conducted a promotion with a specific thermostat vendor on their online marketplace, which resulted in DR enrollment skyrocketing.
- **Marketing similar programs together:** Multiple utilities market similar programs (e.g., BYOT and behavioral or pricing-based DR) together, rather than separately, to reduce confusion. Utilities employ messaging such as "choose your own path" and describe the differences between the offerings in a clear and succinct way.
- **Using AMI data when available:** One utility uses AMI data to target customers with the highest peak load contribution.
- **Targeting customers who moved:** Peer utilities acknowledged the challenge of attrition due to moving. Some are focused on targeting recent movers for program marketing, including when customers connect with the call center for support.

Enrollment



Overview

- Only two peer utilities require customers to provide their account number during enrollment. One utility requires account numbers if not enrolling via the online marketplace. Those that elect to pre-enroll on the online marketplace do not have to provide their account numbers.
- Those that do not ask for account numbers conduct verification of customers mostly by using name and service address.



Strategies

- **Making it easy to enroll at time of purchase:** Some utilities provide a seamless pre-enrollment experience for customers purchasing Wi-Fi thermostats through the online marketplace. Effective website features reported include opting customers in, by default, to DR program enrollment (requiring them to uncheck the option to opt out) and, similarly, listing any EE rebate, the DR enrollment incentive, and any special promotions as separate line items that get deducted from the price of the thermostat at check out.
- **Maximizing install rate:** One utility worked with a vendor to explore virtual installation assistance for other programs and believe it could be beneficial for BYO programs. They learned their customers are willing to pay \$25-\$50 for virtual assistance. Another utility started enforcing a charge-back if the customer does not end up installing the thermostat. In advance of charge-back, they communicate heavily with the customer and offer to direct install. Through this approach, they have increased the install rate to almost 80% (from 62%).

Participation Experience



Event Notification

- Five utilities provide notification of events, while two elect not to send notifications for thermostat types that do not require it. One utility does not send notifications except for emergency events.
- For BYOT programs, notification method and timing varies by manufacturer. Only one utility sends its own email notifications to BYOT participants prior to events.
- Of the utilities that do not provide participants with event notification, one in PJM territory indicated that it is difficult to bid DR into the wholesale market during an emergency if they cannot control opt-outs. For this reason, to reduce the potential for opt-outs and call center volume, the utility does not send out event notifications unless the thermostat provider requires a notification.
- Similarly, another utility does not send notifications in advance because they want the flexibility of calling shorter, more precise events. Additionally, they do not want customers to notice the events.
- In terms of timing, one utility piloted 8:00 a.m. notifications the day of an event and then switched to 8:00 p.m. the night before based on customer feedback. All other utilities try to provide at least 1-2 hours advance notification.



Strategies

- **Minimizing opt-outs:** Although none of the peers currently employ a pay-for-performance (P4P) incentive design for BYOT programs, one utility currently employs P4P incentive for its direct install program and another utility is considering using a P4P design for its BYOT program to reduce potential for opt outs.
- **Communicating as a courtesy:** One utility sends a follow-up email after each event to say, "thank you for participating, here's how you did." The open rates are high, customers are pleased with these emails, which has contributed to high customer satisfaction scores. Another utility engages program participants three times: 1) after the summer DR season ends, 2) right before incentive is paid, and 3) at the end of the year when they provide a message about switching thermostats to heating. Communications thank customers for their participation and include information about the credits earned and the impact of their participation.
- **Communicating about pre-cooling:** One utility noted that they have tried to be very clear from the start that BYOT is not an energy savings program. Even so, some participants do not want pre-cooling, believing it to be contrary to program goals. This utility is currently looking into whether its possible to make pre-cooling optional and offer different incentive levels depending on whether you get pre-cooling.

Lessons Learned



Lack of Control

- All utilities operating BYOT programs noted a lack of control over their programs resulting from the rules and procedures of the various thermostat vendors. Utilities are two steps removed from managing relationships with thermostat vendors when aggregators are involved. Also, there is a lack of ownership of the customer. As one utility noted, this is the tradeoff for a relatively low-cost program. This lack of control presents a barrier to using Wi-Fi thermostats as a flexible, year-round resource.



Participant Confusion

- Some participants have trouble differentiating between certain thermostat vendors' TOU settings and the utility's DR program. The utility sometimes gets blamed. One utility has found that participants who are also enrolled in an optimization program through their thermostat vendor drop out of the DR program at a higher rate than other participants.
- Some utilities indicated that some customers are confused about the program and that this can lead to participants dropping out. In the case of one utility, there is some confusion around the difference between the utility's programs. To help with this, they are exploring building a DR-specific website that talks about all the different programs and really focuses on customer education.








Scalability

- BYOT does not scale very fast. There is a big push at the beginning when thermostat vendors email everyone, but then it dies off. That is why periodic promotions have been helpful. One utility noted that to really move devices, they must be free or near to free.
- Retention is just as much an issue as building a program; transience is always a challenge. Dealing with brand new customers and customers who moved needs to be a focus of customer service.

Appendix

Appendix: Peer Benchmark - Criteria

Xcel Energy and Guidehouse selected eight utilities as primary peer benchmarks based on five key criteria categories.

1  Xcel Energy Peer Utility	2  Program Type	3  Region	4  Customer Segments	5  Program Design
<ul style="list-style-type: none"> • Large investor – owned utilities similar to Xcel Energy 	<ul style="list-style-type: none"> • Has a BYOT program or both BYOT and DI • BYOT program is established/mature • Also offers a switch program (comparable to Saver's Switch) 	<ul style="list-style-type: none"> • Peer programs offered in similar regions as Xcel Energy 	<ul style="list-style-type: none"> • BYOT for residential • BYOT also offered to other customer segments of interest (e.g., small business and multifamily) 	<ul style="list-style-type: none"> • Different incentive schemes • Includes winter season • Resideo is DRMS provider

AC Rewards Evaluation

2021 Program Evaluation: Recommendations and Responses

The Xcel Energy AC Rewards offering in Colorado seeks to reduce system load by curtailing central air conditioners via control of a smart thermostat generally during hot summer days when the system load is expected to reach near-peak capacity.

Xcel Energy (“the Company”) engaged a team of researchers led by Guidehouse to conduct a process and modified impact evaluation of the AC Rewards offering. The principal evaluation objective was to identify strengths and areas of improvement related to current AC Rewards offering design and delivery. Through discussion with Xcel Energy staff, the evaluation team identified five priority research areas:

- Marketing and recruitment
- Enrollment
- Event awareness
- Satisfaction and attrition
- Event experience

Based on the results of this research, the evaluation team developed key findings and recommendations for Xcel Energy.

Recommendation	Response
1) Continue to send Xcel Energy-branded program marketing emails while also leveraging thermostat vendors for marketing.	The Company will continue to utilize our internal marketing channels for customer outreach and will look for new and innovative ways to enhance marketing. The Company will also continue to supplement vendor marketing campaigns with emails directly from Xcel Energy as resources allow.
2) Adjust messaging from emphasizing easing strain on the grid to emphasizing customer bill credits and the contributions of the program toward sustainability, grid stability, and resilience.	The Company will work internally to craft and adjust marketing language that focuses on highlighting benefits to the customer and community in response to customer preferences and motivations uncovered during the evaluation.
3) Fine-tune marketing messaging to communicate the value proposition. Revise marketing collateral for greater transparency. Create new program materials that enable customers to access more granular information at their discretion.	The Company will work internally to develop more transparent and concise offering collateral and marketing materials to limit confusion for potential and existing participants.
4) Distinguish between AC Rewards, Saver’s Switch, and thermostat vendor algorithms.	The Company will continue to work with vendors to ensure clear and consistent messaging in marketing materials. The Company will supplement vendor marketing campaigns with emails directly from Xcel Energy as resources allow.
5) Conduct additional customer segment research.	The Company will continue to analyze possible customer segment research studies as they come up

	and will participate in these studies if there is a clear value-add to the offering and if they make financial sense.
6) Distribute an automatic confirmation email to customers once they successfully enroll in the program.	The Company has implemented the recommendation since the completion of the evaluation. The Company will continue to look for improvements to this added functionality.
7) Provide more information about how and when participants receive event notifications. Consider offering additional forms of advance notification. Consider sending customers an email after each event or a couple times over the course of the summer.	The Company will develop pre- and post-event season messaging as well as pre-event notifications to provide better event awareness for participants that wish to receive additional notifications. The Company will work internally and with vendors to brainstorm how event performance data could be provided to the customer; however, there is not currently a feasible option in place to provide these metrics to the individual customer after each event.
8) Provide tips on ways to stay cool during events.	The Company will investigate adding tips and collateral to its website to enhance customer event experience.
9) Analyze setpoint and indoor temperature changes during events to confirm events are operating as expected.	This analysis has already been conducted and temperature thresholds have been implemented. API signals are operating as expected and the Company will continue to monitor this going forward.
10) Consider giving customers a referral bonus for referring other Xcel Energy customers to enroll in AC Rewards.	The Company will investigate adding this into future marketing plans and strategy. However, due to limitations of current systems in place, implementing and tracking referral bonuses would be difficult at this time.
11) If possible, to keep customers satisfied, avoid calling consecutive day events and limit event length to 4 hours or less.	The Company will keep an eye on the number of events as well as the duration of the events to ensure customers are not being overwhelmed. The Company will explore options such as event staggering to mitigate these conditions.
12) Consistently capture and monitor customer reasons for unenrollment.	The Company currently has a solution in place to capture unenrollment reasons when a customer leaves the offering. The Company will continue to analyze these reasons and make changes to the offering to try to address the top reasons that customers unenroll.