Appliance Recycling Program Process Evaluation and Market Characterization Volume 2: Appendices

CALMAC Study ID SCE0337.02

September 18, 2013

Southern California Edison
and
Pacific Gas and Electric

The Cadmus Group, Inc.

An Employee-Owned Company • www.cadmusgroup.com

This page left blank.

CADMUS

Prepared by:
Ellen Rubinstein
Kate Bushman
Josh Keeling
Allen Lee, Ph.D.
Cadmus

This page left blank.

Table of Contents

A. DETAILED PARTICIPANT SURVEY FINDINGS

A.1 Introduction

In conducting the process evaluation of SCE's and PG&E's 2010–2012 ARP, Cadmus surveyed a sample of SCE and PG&E ARP participants. Table A-1 shows the number of targeted and completed surveys for each IOU.

Table A-1. Participant Summary of Interviews

IOU	Target Completes	Achieved Completes
SCE	200	203
PG&E	200	200
Total	400	403

The surveys explored the following topics related to participants' experiences with the program, including program satisfaction levels:

- Characteristics of participants' recycled appliances;
- Reason for recycling through the program;
- Likely alternative disposal methods in the program's absence;
- Marketing and outreach;
- Program experience, satisfaction, and areas for improvements;
- Awareness, knowledge, attitudes, and behavior (AKA-B) regarding the program; and
- Participant demographics and home characteristics.

This appendix summarizes the information Cadmus learned about SCE's and PG&E's ARPs from analysis of participant survey data. We compare results from the 2010–2012 participant survey to results from the *2004–2005 Statewide Residential Appliance Recycling Program* (RARP) evaluation study, and to the *2006–2008 Process and Market Evaluation* of Southern California Edison's ARP. This appendix notes differences between the utilities only where they are statistically significant with 90% confidence.

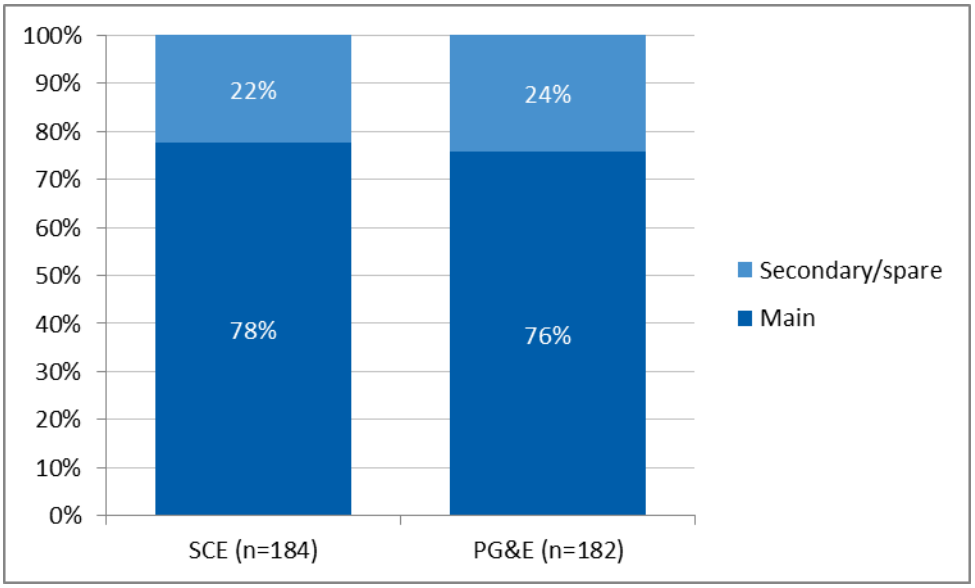
A.2 Characteristics of Recycled Appliances

The majority of survey respondents—89% of each IOU's program participants—recycled one refrigerator; 9% of each survey group recycled one standalone freezer; and 2% of each group recycled both a refrigerator and freezer.

As shown in Figure A-1, most SCE and PG&E participants (78% and 76%, respectively) disposed of their primary refrigerators rather than second units. This represents a statistically significant increase for both

utilities (with 90% confidence) from the 2006–2008 Residential Retrofit HIM Evaluation,[1] which estimated the proportion of primary units to be 69% and 62% for SCE and PG&E, respectively.

Figure A-1. Participant Refrigerator Use



Of respondents recycling a second unit, just over one-third (35%) reported using the unit as a second appliance for more than 10 years. The majority of second units (59%) moved from primary to second use at some point in their lifetimes.

The typical participating household in SCE territory owned its refrigerator for nearly 11 years, while the average PG&E household owned its refrigerator for almost 13 years (Table A-2). More than one-half of all participants reported owning their appliance for more than 10 years. Participants who had used their units as second units had done so for around 8.5 years.

Table A-2. Participant Average Years Refrigerator Was in Use

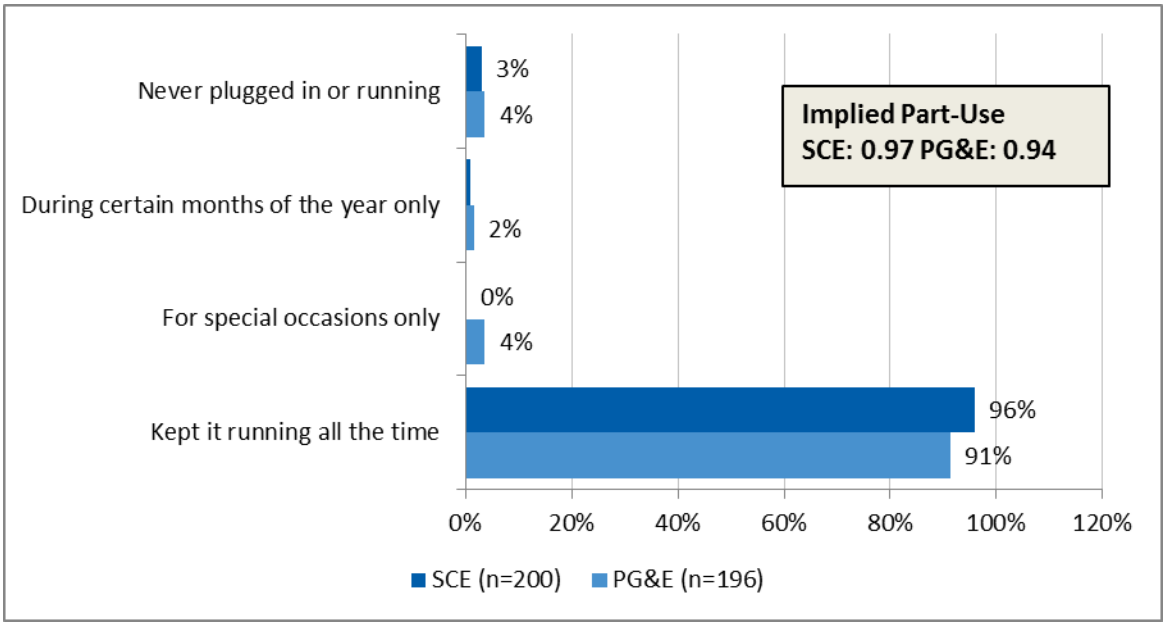
Refrigerator Category	SCE (n=173 overall, n=37 for second)	PG&E (n=162 overall, n=35 for second)
Total	10.5	12.8
As second	8.3	8.5

Figure A-2 shows usage rates (as a percentage of all respondents) for primary and second units collected from SCE and PG&E customers. Approximately nine out of 10 appliances ran year-round. Both utilities had relatively high total (i.e., combined primary and second unit) part-use rates: 0.97 for SCE

[1] http://www.calmac.org/publications/FinalResidentialRetroEvaluationReport_11.pdf

and 0.94 for PG&E.[2] This largely resulted from the high proportion of primary units recycled through the programs.

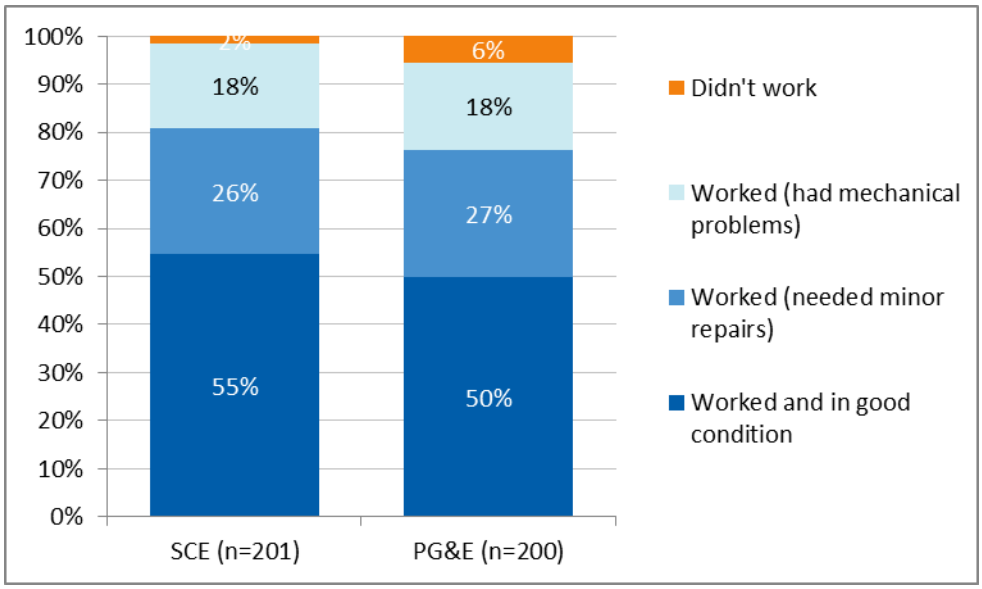
Figure A-2. Participant Part-Use Distributions



As shown in Figure A-3, about one-half of respondents reported they recycled units in good, working condition. These units likely had a resale value on the secondary market. Although JACO and ARCA confirmed at the point of pickup that units provided cooling, participants reported roughly one in five units picked up had mechanical problems. Units with mechanical problems probably did not have resale value on the secondary market. These units remained program eligible, however, as the programs only required the unit continued to provide cooling.

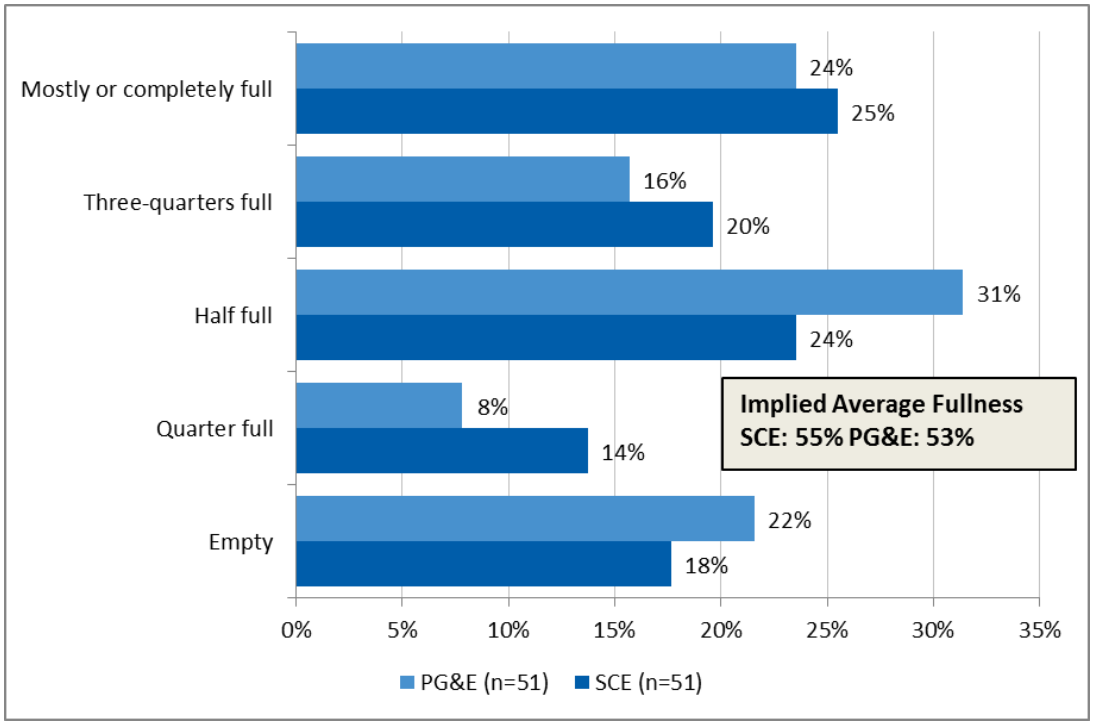
[2] Part-use is the average portion of the year that a unit runs. For instance, primary units plugged in continuously have a part-use of 1, and units left unplugged all year have a part-use of 0. Each respondent who reported using their appliance for only part of the year was asked for an average number of months per year that the unit remained in use. This allowed the unit's part-use value to computed as the number of months in operation, divided by 12.

Figure A-3. Participant Functionality of Recycled Appliances



Second appliance recyclers also reported underutilizing extra space provided by their second appliances. Of participants who said they kept their second appliance running for at least part of the year, the majority in SCE's and PG&E's service area (55% and 61%, respectively) also said they kept their units half-full or less than half-full (see Figure A-4).

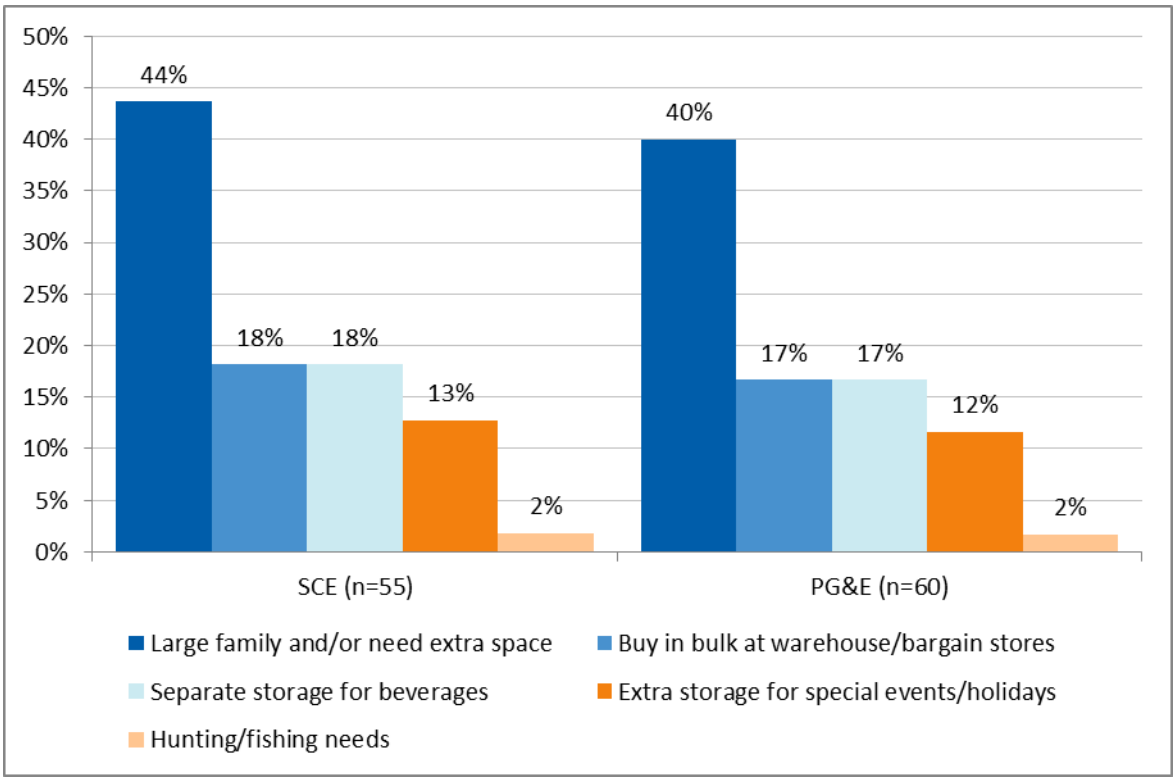
Figure A-4. Participant Second Appliance Fullness*



*Second units include refrigerators and freezers.

As shown in Figure A-5, survey respondents primarily used second appliances as they had a large family and/or needed extra space for storage. Two other commonly reported reasons for having a second appliance were: buying in bulk at warehouse or bargain stores; and wanting separate storage for beverages.

Figure A-5. Participant Reason for Using Second Appliance (Multiple Responses Allowed)*

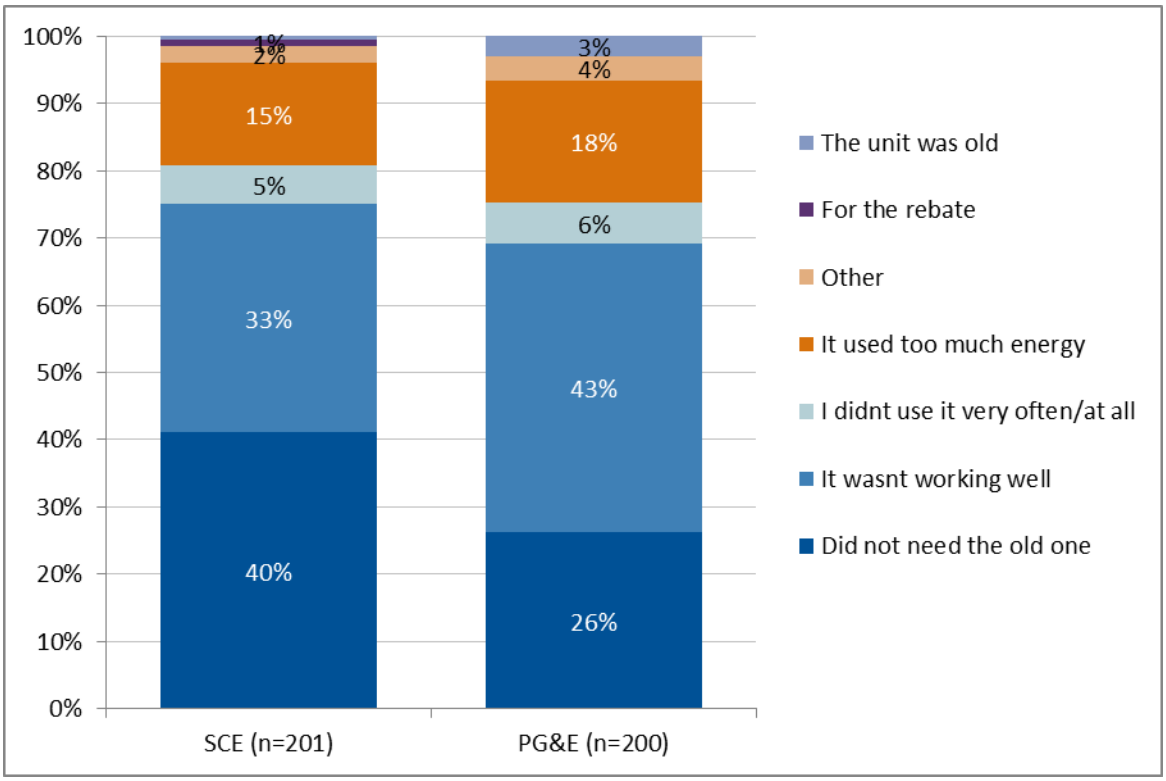


*Second units include refrigerators and freezers.

A.3 Reason for Participating

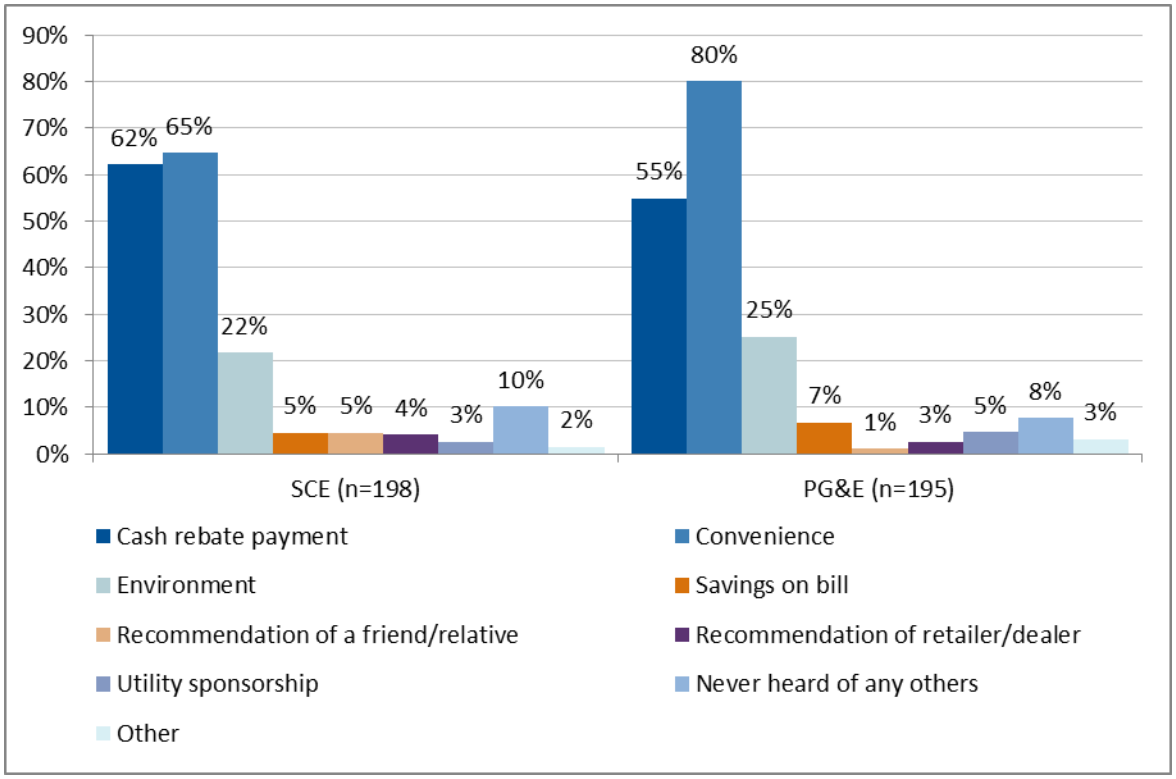
Figure A-6 illustrates participants' reasons for disposing of their appliances through the programs. SCE respondents most commonly reported recycling the unit when buying a new appliance and no longer needing the old unit. However, PG&E respondents' most commonly reported disposing of units that did not work well.

Figure A-6. Participant Reason for Disposing of Appliance



The majority of participants at both utilities cited convenience and the program incentive as the main factors motivating their participation (Figure A-7). Significantly more PG&E customers cited convenience, with four out of five participants citing it as one of the main factors in their decisions to participate. Data from the 2004–2005 RARP study showed similar results.

Figure A-7. Participant Reasons for Participation (Two Responses Allowed per Participant)

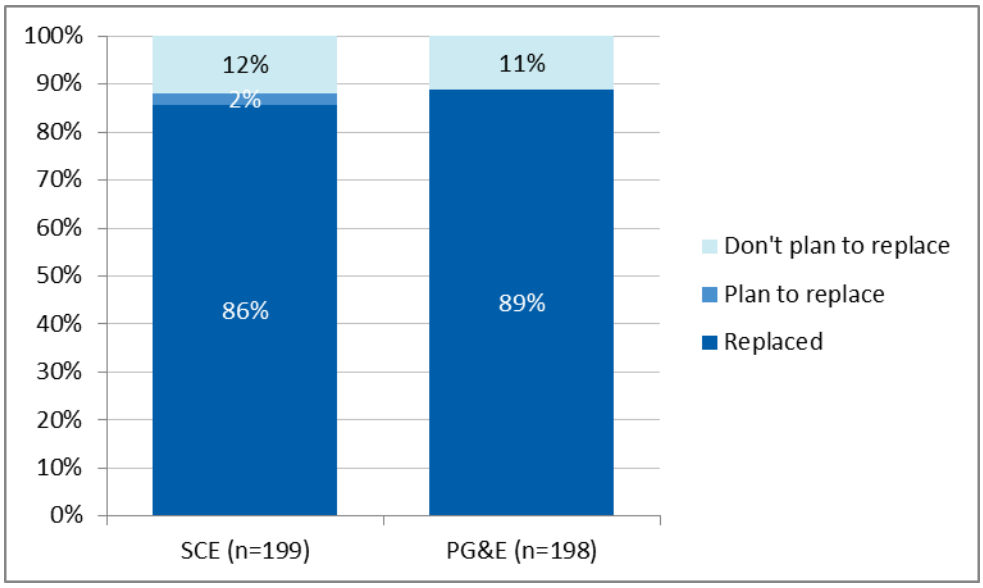


A.4 Replacement of Disposed Appliances

As shown in Figure A-8, a significant percentage of both IOUs' survey respondents replaced appliances recycled through the program. Approximately 16% of SCE participants who did not replace units said they planned to do so in the future. The proportion of participants replacing their units increased significantly (with 90% confidence) from the 2006–2008 Residential Retrofit HIM Evaluation,[3] where only 67% of SCE and PG&E participants reported recycling their refrigerators.

[3] http://www.calmac.org/publications/FinalResidentialRetroEvaluationReport_11.pdf

Figure A-8. Participant Appliance Replacement



Of SCE and PG&E respondents who reported replacing their disposed units, the majority purchased replacements from a dealer or retail store rather than from an individual. Nearly one in five participants in SCE's program reported purchasing a used appliance to replace the recycled appliance—nearly twice the proportion seen in PG&E's program. For both programs, these purchases supported the argument that an active secondary market exists in the utilities' service areas. As shown in Table A-3, participants purchased a large proportion of used units from individuals.

Table A-3. Participant Replacement Unit Vintage and Source

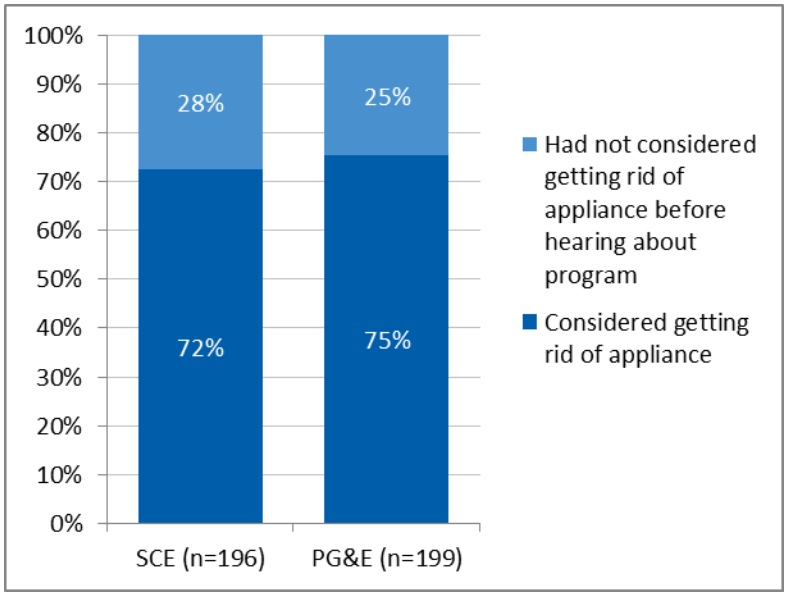
SCE (N=173)	Dealer/Retail Store	Individual/Private Party
New	75%	5%
Used	5%	15%
PG&E (N=177)	**Dealer/Retail Store**	**Individual/Private Party**
New	90%	1%
Used	1%	8%

A.5 Alternative Disposal Methods

Approximately one in four participants said they had not considered disposing of their appliance prior to learning of the program (as shown in Figure A-9), a result independent of whether the recycled unit was a primary or second: we found no statistically significant relationship (with 90% confidence) between recycling a primary unit and considering disposal before learning about the program. The roughly 25% of

customers who had not previously considered disposing their appliance represented the core segment the program seeks to target, and most would likely be characterized as non-freeriders.[4]

Figure A-9. Participant Consideration of Disposal



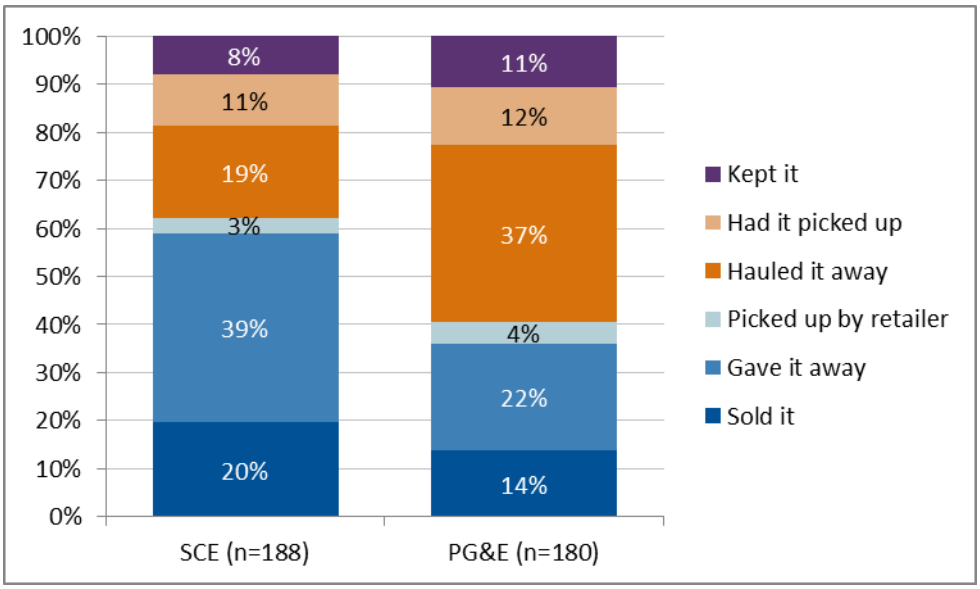
When asked how they would have disposed of their appliance in the ARPs' absence, SCE and PG&E customers responded somewhat differently, as shown in Figure A-10 (below).

SCE respondents more frequently reported alternative disposal methods that would reintroduce units to the used appliance market: nearly 60% of SCE participants claimed they would have sold or given away the unit, compared to about 36% of PG&E participants. This supports the hypothesis that the second appliance market remains more active in SCE's service area than in PG&E's.

PG&E participants reported a higher likelihood of sending appliances to a dump or recycling center. These participants would most likely be categorized as freeriders, as their actions in the program's absence would have led to the units' destruction.

[4] Statements in this document about freeridership and net savings should not be directly used in quantification of program impacts. The participant survey discussed here sought to inform the process evaluation. KEMA currently conducts the 2010–2012 ARP impact evaluation, and will provide estimates of the parameters used in net savings estimation as part of that study.

Figure A-10. Participant Alternative Disposal Methods

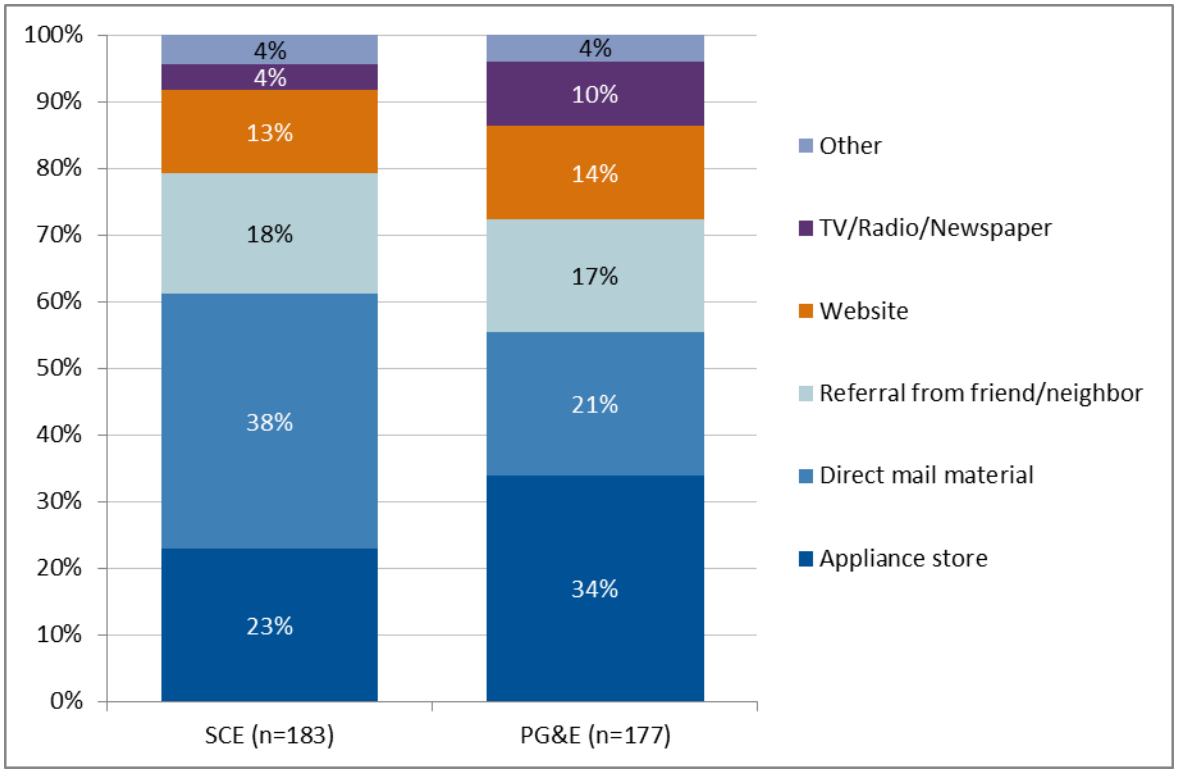


A.6 Participant Experience

A.6.1 Marketing and Outreach

Figure A-11 compares channels by which participants learned about the program, per IOU. SCE participants proved much more likely to learn about the ARP through direct mail (38%), while PG&E participants most commonly reported learning about the program at an appliance store (34%), producing results comparable to the 2004–2005 RARP study, where: 43% of SCE respondents reported direct mail, and 29% of PG&E respondents reported an appliance retailer as their primary program information sources. Nearly double the share of PG&E respondents cited paid mass media (such as newspapers, Pennysavers, radio, or television advertisements) as their awareness source than did SCE respondents (10% and 4%, respectively).

Figure A-11. Participant Sources of Program Awareness



A.6.2 Retailer Involvement

Of respondents buying replacement appliances from dealers or retailers, about one-half said they discussed disposal of their old appliances with the sales person (52% for SCE, and 59% for PG&E). As shown in Table A-4, all these SCE respondents reported the salesperson mentioned the SCE recycling service when they bought their replacement; slightly fewer PG&E respondents mentioned receiving an ARP referral at the time of purchase. A minority of retailers in both service areas offered their own disposal services. Of retailers offering their own appliance disposal services, those in PG&E's territory more likely charged for this service than stores in SCE's territory.

Table A-4. Participant Retailer Experience with Disposal

Question	Response	SCE	PG&E
Did the sales person tell you about the SCE/PG&E recycling service?* (SCE: n=66, PG&E: n=74)	Yes	100%	91%
	No	0%	9%
Did the store offer its own service to dispose of the old appliance for free? (SCE: n=46, PG&E: n=57)	Yes	39%	46%
	No	61%	54%
Did the store offer to dispose of the appliance for a charge?* (SCE: n=31, PG&E: n=33)	Yes	16%	39%
	No	84%	61%

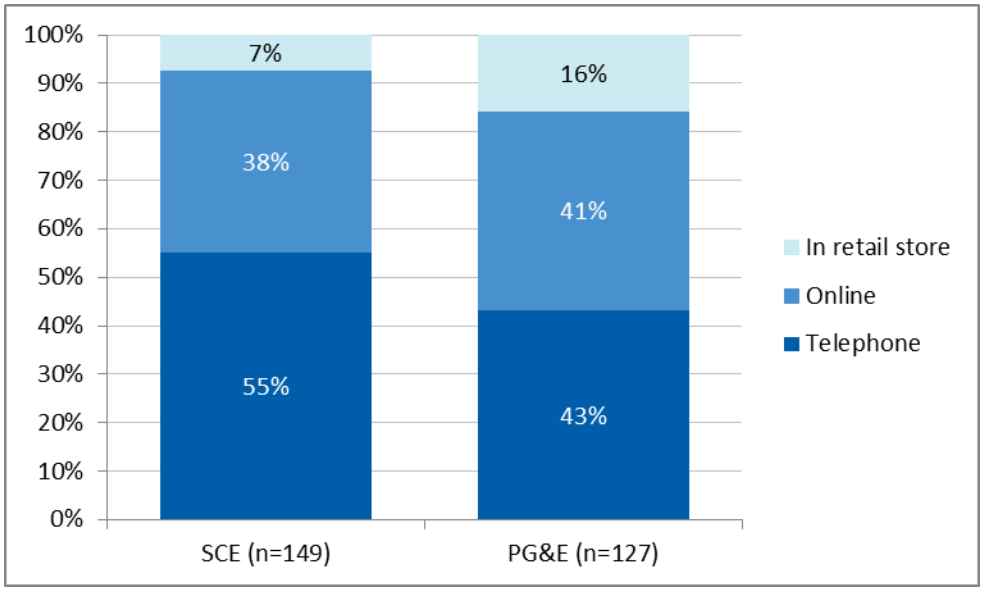
*Difference between utilities statistically significant with 90% confidence.

A.6.3 Program Delivery

Sign-Up Process

Participants used a variety of methods to sign up for the ARPs. As shown in Figure A-12, just over one-half of SCE respondents reported signing up by the telephone and close to 40% signed up online. Among PG&E respondents, roughly the same proportion reported signing-up by telephone as reported signing up online (about 40% each).

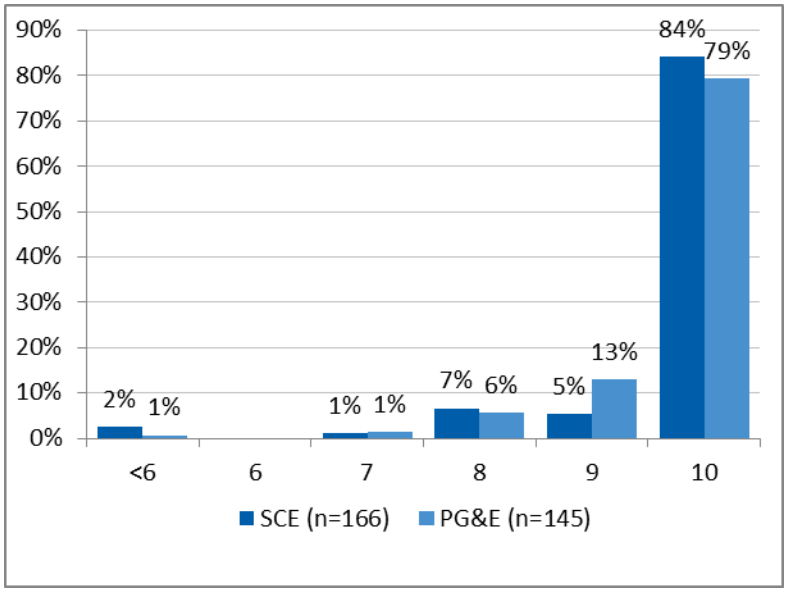
Figure A-12. Participant Sign-up Methods



As shown in Figure A-13, nearly all survey respondents from both utilities (95% overall) reported satisfaction with their sign-up experiences.[5] No significant differences occurred in satisfaction levels between sign-up methods.

[5] The evaluation gauged participant satisfaction for various program aspects using a 0 to 10 scale, with "10" meaning completely satisfied and "0" meaning not at all satisfied. A rating of four or less was considered less than satisfied; a rating between five and seven was considered a neutral response; and a rating of eight or higher was considered satisfied.

Figure A-13. Participant Satisfaction with Sign-up Process



Telephone Signup

Across the two service areas, survey respondents most commonly signed up for the program via telephone (43% overall). All respondents signing up for ARPs by phone found the representatives they spoke with polite and courteous, and answered all of their questions (shown in Table A-5). All but four respondents reported they could schedule a pick-up at convenient dates and times.

Table A-5. Participant Telephone Sign-up Experience

Question	Response	SCE	PG&E
Was the representative you spoke to on the telephone polite and courteous? (SCE: n=80, PG&E: n=51)	Yes	100%	100%
	No	0%	0%
Did the representative answer all your questions? (SCE: n=80, PG&E: n=54)	Yes	100%	100%
	No	0%	0%
Did you have to call more than once? (SCE: n=80, PG&E: n=55)	Yes	4%	5%
	No	96%	95%
Were you able to schedule a pickup appointment for a convenient date and time? (SCE: n=82, PG&E: n=55)	Yes	99%	95%
	No	1%	5%

Online Signup

About one-third of all respondents utilized the program Website to sign up for the ARP. The online sign-up option became much more common for SCE and PG&E customers over time: survey data collected for the 2004–2005 RARP study found only 8% of PG&E participants and 16% of SCE participants utilized online sign up.

As shown in Table A-6, nearly all 2010–2012 respondents signing up online found it easy to find the sign-up screen on the Website, and reported the Website answered all of their questions about the

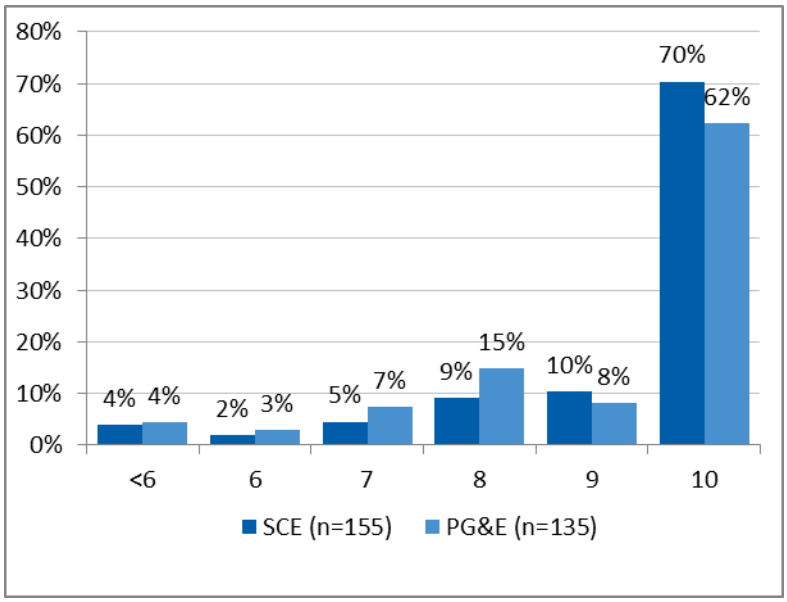
appliance recycling service. As with telephone enrollees, nearly all could schedule a pickup appointment for a convenient date and time.

Table A-6. Participant Online Signup Experience

Question	Response	SCE	PG&E
Was it easy to find the sign-up screen on the Website? (SCE: n=53, PG&E: n=49)	Yes	98%	96%
	No	2%	4%
Did the Website answer all your questions about the appliance recycling service? (SCE: n=55, PG&E: n=50)	Yes	98%	96%
	No	2%	4%
Were you able to schedule a pickup appointment for a convenient date and time? (SCE: n=56, PG&E: n=50)	Yes	98%	98%
	No	2%	2%
Did you receive confirmation that your signup had been successful? (SCE: n=52, PG&E: n=40)	Yes	96%	100%
	No	4%	0%

Respondents' satisfaction levels dropped somewhat when asked about the length of time between their sign-up and pickup dates, as shown in Figure A-14. Still, the vast majority rated their satisfaction with this process an 8 or higher on a 0 to 10 scale.

Figure A-14. Participant Satisfaction with Time Between Sign-Up and Pickup



Pickup Process

Ninety-nine percent of all survey respondents who reported being home during their appliance pickups expressed satisfaction with their pickup experiences (defined as an 8 or higher rating on a 0 to 10 scale).

Nearly all respondents present during appliance pickup reported receiving a call in advance to confirm the appointment and/or let them know the pickup representative was coming. Table A-7 lists reported

recall of participants' experience with the programs' pickup representatives. Overall, participants recalled positive experiences, with a large majority of respondents reporting representatives arriving on time, being polite and courteous, and appearing neat and professional.

Table A-7. Participant Pickup Experience

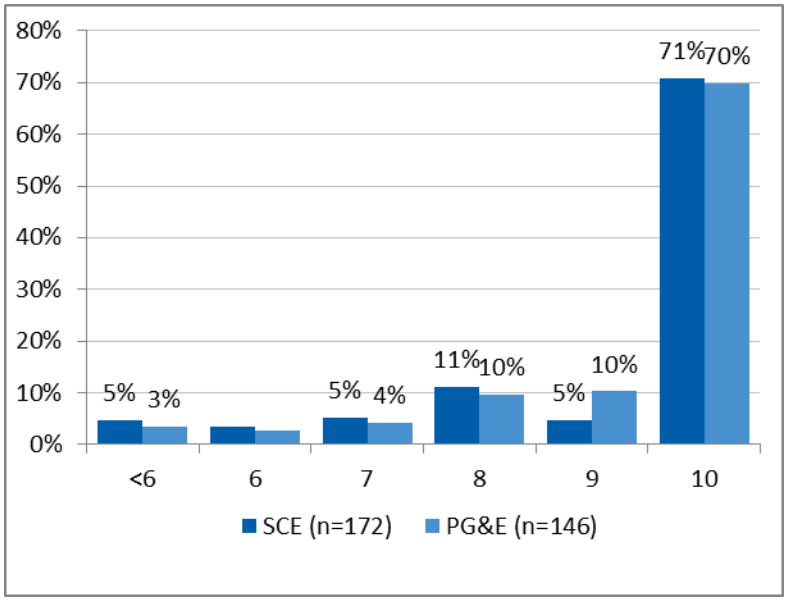
Question	Response	SCE	PG&E
Did someone call in advance to confirm the appointment or let you know they were coming? (SCE: n=147, PG&E: n=109)	Yes	99%	98%
	No	1%	2%
Did they arrive on time? (SCE: n=158, PG&E: n=139)	Yes	97%	99%
	No	3%	1%
Was the pickup representative polite and courteous? (SCE: n=160, PG&E: n=139)	Yes	98%	99%
	No	3%	1%
Did the representative appear neat and professional? (SCE: n=151, PG&E: n=132)	Yes	97%	98%
	No	3%	2%

Rebate Process and Amount

The majority of survey respondents (94% overall) had received a rebate check at the time of survey data collection. Many rebate recipients (37% for SCE, and 47% for PG&E) could not recall how long they waited to receive rebate checks after their appliance pickups. Of participants who could remember, 75% reported receiving the rebate check between two and four weeks after appliance pickup.

As shown in Figure A-15, for both utilities, the majority of participants expressed satisfaction with the time required for their rebate checks to arrive by mail.

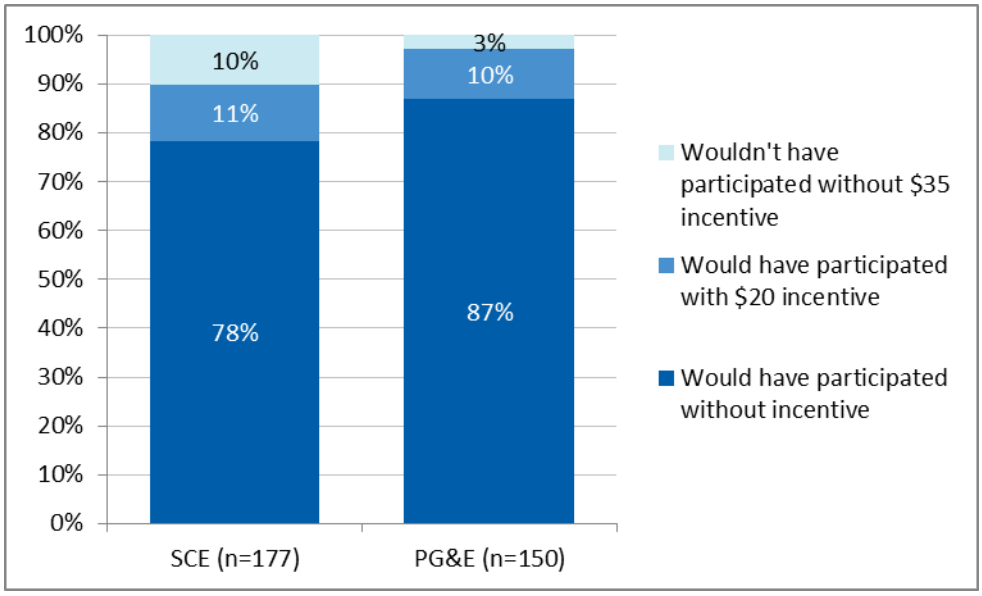
Figure A-15. Participant Satisfaction with Rebate Wait Times



The survey also asked participants whether they would have participated in the program, had the incentive amount been lower or absent. Under the current program designs, respondents received a $35 rebate for participation. The majority of survey respondents (78% for SCE, 87% for PG&E) claimed they would have participated in the program had there not been incentives to participate. A larger proportion of PG&E respondents than SCE respondents said they would have participated without the incentive, as shown in Figure A-16.

This is consistent with finding a greater percentage of PG&E than SCE participants rated convenience as a key factor in their participating in the program, and remains consistent with the finding that PG&E participants rated convenience as a more important factor than the incentive (as shown in Figure A-7). The 2006–2008 study presented similar results: when asked if the incentive proved essential to their participation, approximately 71% of SCE respondents said they would have participated in the ARP without the incentive. In the 2004–2005 study, 81% of SCE, PG&E, and San Diego Gas & Electric customers said they would have participated without an incentive.

Figure A-16. Participant Influence of Incentive Amounts



Among respondents who would not have participated in the program without the $35 incentive (10% for SCE and 3% for PG&E), most said they still would have participated for a $20 incentive.

Comparison to 2004–2005 Program Delivery

As noted, SCE and PG&E 2010–2012 ARP participants reported high satisfaction with all aspects of the program delivery process. The same proportion of participants reported satisfaction with their sign-up experiences in the 2004–2005 study as in the 2010–2012 survey. Satisfaction with pickup and removal also saw similar results between studies, with 96% of 2004–2005 participants and 97% of 2010–2012 participants satisfied with the process. As shown in Table A-8, other 2010–2012 program experience data remained consistent with past results.

Table A-8. Comparison of Current and Past Participants' Program Delivery Experience

	2004–2005 ARP Participants*		2010–2012 ARP Participants	
	Yes	No	Yes	No
Scheduling	(n=665)		(n=131)**	
Was the representative you spoke to on the telephone polite and courteous?	100%	0%	100%	0%
Did the representative answer all your questions? ***	99%	1%	100%	0%
Were you able to schedule a pickup appointment for a convenient date and time?	97%	3%	97%	3%
Did you have to call more than once? ***	11%	89%	4%	96%
Pickup	(n=717)		(n=256)	
Did the representative call in advance to confirm the appointment or let you know they were coming? ***	96%	4%	99%	1%
Did the representative arrive on time?	98%	2%	98%	2%
Did the representative appear neat and professional?	98%	2%	98%	2%
Rebate Process	(n=1,018)		(n=367)	
Did you receive an incentive check?	95%	5%	94%	6%
Would you have participated in the program without the incentive check?	(n=895)		(n=320)	
	84%	16%	82%	18%

*These frequencies include responses from San Diego Gas & Electric customers.

**This value only includes participants signing by telephone.

***Differences between evaluations were significant with 90% confidence.

Notable changes to reported program experiences since the 2004–2005 survey included:

- The percentage of participants having to call the ARP sign-up hotline more than once decreased by 7%.
- The percentage of participants reporting their pickup representative arrived on time increased by 3%.
- The percentage of participants indicating they would have participated in the program without the incentive decreased by 5%.

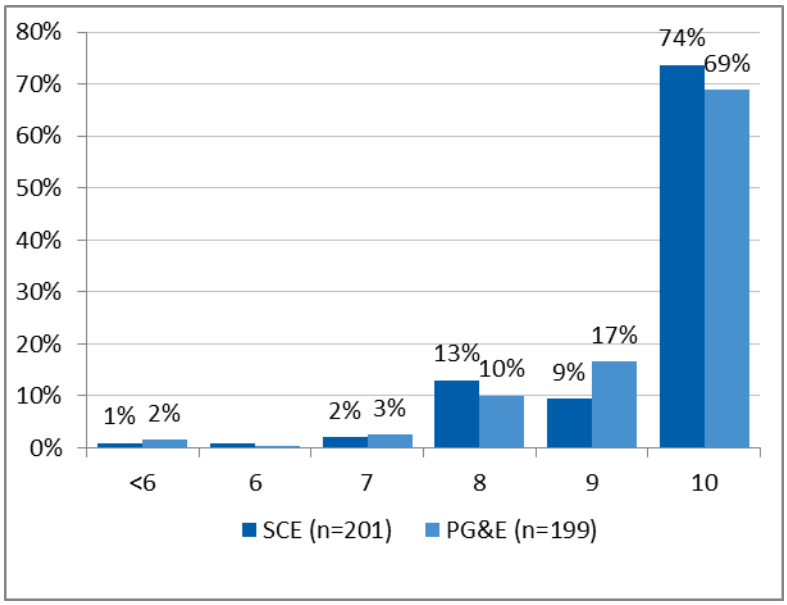
A.6.4 Satisfaction and Program Improvements

Overall, 95% of 2010–2012 survey respondents reported satisfaction with their program experiences. The 2004–2005 RARP study saw similar findings, with 96% of participants reporting they were somewhat or completely satisfied.[6]

[6] This frequency included customer data from San Diego Gas & Electric's service territory.

On a scale of 0 to 10, with 0 meaning not likely at all and 10 meaning extremely likely, 96% of both IOUs' respondents responded with an 8 or higher when asked how likely they would be to recommend the recycling service to a friend or family member.

Figure A-17. Participant Overall Satisfaction with the Program



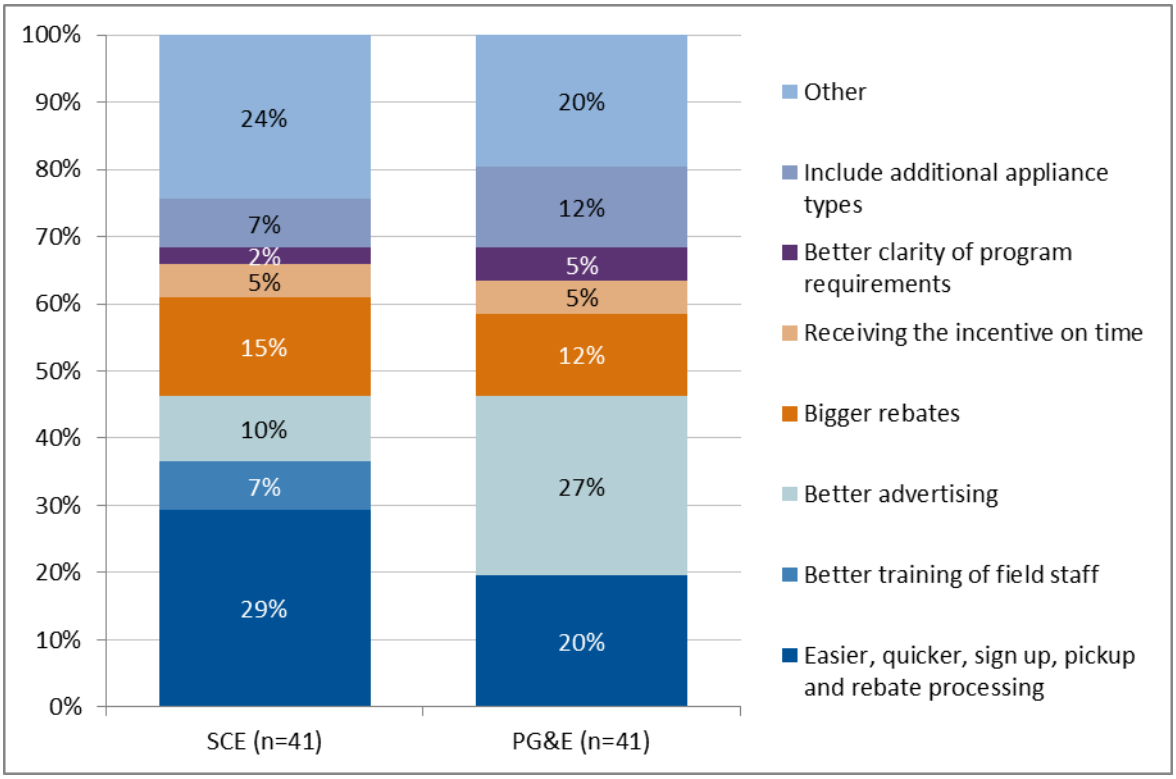
Twenty-six surveyed participants reported encountering problems during their ARP experiences.[7] Among this group, the most prevalent concern was not yet having received their rebates (cited by eight respondents). Other problems encountered included:

- Inconvenience with the pickup timing;
- Inconvenience with keeping the appliance plugged in to prove it functioned;
- Rude pickup staff; and
- Confusion regarding program requirements.

The survey also asked participants to provide suggestions for improvements to IOUs' recycling services. Four out of five respondents did not make any suggestions for improvements. As shown in Figure A-18, the majority of suggestions from SCE participants related to making the program process easier or quicker. Twenty-seven percent of PG&E respondents providing suggestions noted increasing awareness through improved marketing. In the 2004–2005 RARP study, PG&E customers also most commonly cited the need for more advertising.

[7] Roughly the same number of SCE and PG&E respondents reported problems with their ARP experiences. However, the sample remained too small to draw meaningful inferences about differences experienced by participants at each utility.

Figure A-18. Participant Suggested Program Improvements



A.7 Awareness, Knowledge, and Attitudes About ARP Benefits

The ARP participant surveys included questions designed to inform our understanding of participant awareness, knowledge, attitudes, and behaviors (AKA-B) about the program. Cadmus adopted the AKA-B/segmentation battery from the 2011 General Population Survey Instrument, adapting questions as necessary to collect information specific to ARPs.

As shown in Table A-9, approximately one-third of survey respondents reported not knowing a refrigerator or freezer could cost up to $180 a year in electricity to operate. A greater percentage of respondents knew of harmful materials (e.g., refrigerant, coolant, motor oil, and insulation) in appliances than knew of the programs' materials recycling and landfill reduction benefits. On average, PG&E customers expressed higher rates of environmental awareness than SCE customers.

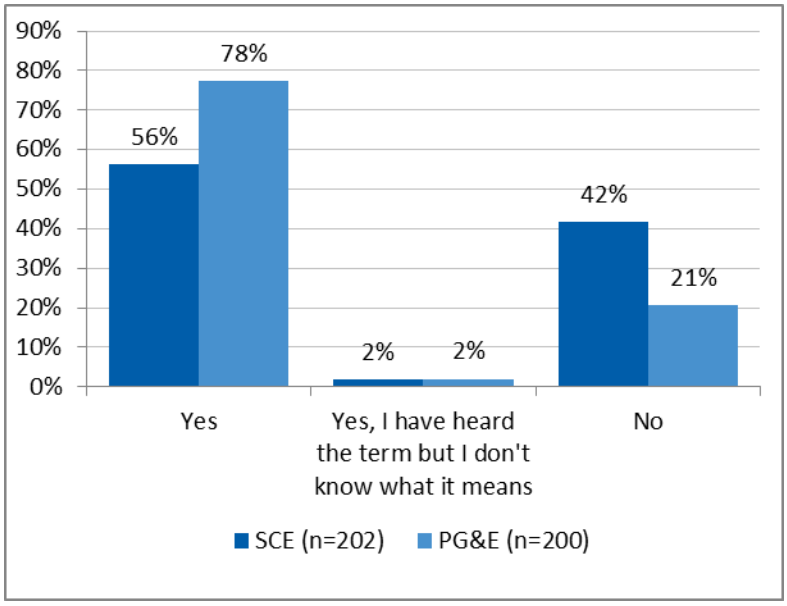
Table A-9. Participant Awareness of ARP Benefits*

Question	Response	SCE	PG&E
A refrigerator or freezer in your home can cost UP TO $180 a year for electricity? (SCE: n=203, PG&E: n=195)	Yes	61%	66%
	No	39%	34%
Refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of? **(SCE: n=203, PG&E: n=197)	Yes	81%	91%
	No	19%	9%
Would be completely taken apart and the metals and glass recycled? (SCE: n=202, PG&E: n=197)	Yes	44%	48%
	No	56%	52%
Coolant, motor oil, and insulation that might contain hazardous materials would be removed, and recycled or destroyed? **(SCE: n=203, PG&E: n=188)	Yes	52%	59%
	No	48%	41%
Almost none of the material from the units would go to a land fill? (SCE: n=202, PG&E: n=197)	Yes	28%	37%
	No	72%	63%

*The percentage of "no" responses includes "don't know" responses. "Refused" responses were removed.
** Differences between utilities were statistically significant with 90% confidence.

The survey also asked ARP participants questions regarding their general awareness of energy efficiency. As shown in Figure A-19, a significantly higher (with 90% confidence) proportion of PG&E participants than SCE participants recognized the term "carbon footprint" (78% and 56%, respectively).

Figure A-19. Participant Awareness of "Carbon Footprint"



To learn about participants' energy-saving behaviors, a few survey questions asked respondents about household actions they had taken to conserve energy. Table A-10 lists the percentage of each IOU's participants who adopted various energy-saving actions. A higher proportion of PG&E participants reported installing attic vents and motion detectors for lights, though this may be due to differences in building stocks between the two sets of respondents, as PG&E participants were more likely to live in single-family, detached housing.

Table A-10. Participant Adopted Energy-Saving Actions

Measure	Installed?	SCE	PG&E
Attic vent to keep the attic cooler* (SCE: n=194, PG&E: n=190)	Yes, installed it myself or had it installed	52%	70%
	No	32%	20%
	Came with the house	15%	14%
Programmable thermostats (SCE: n=194, PG&E: n=197)	Yes, installed it myself or had it installed	66%	60%
	No	27%	28%
	Came with the house	11%	13%
Ceiling fans (SCE: n=203, PG&E: n=200)	Yes, installed it myself or had it installed	63%	59%
	No	26%	28%
	Came with the house	11%	13%
Motion detectors for lights* (SCE: n=201, PG&E: n=198)	Yes, installed it myself or had it installed	29%	39%
	No	67%	60%
	Came with the house	3%	1%

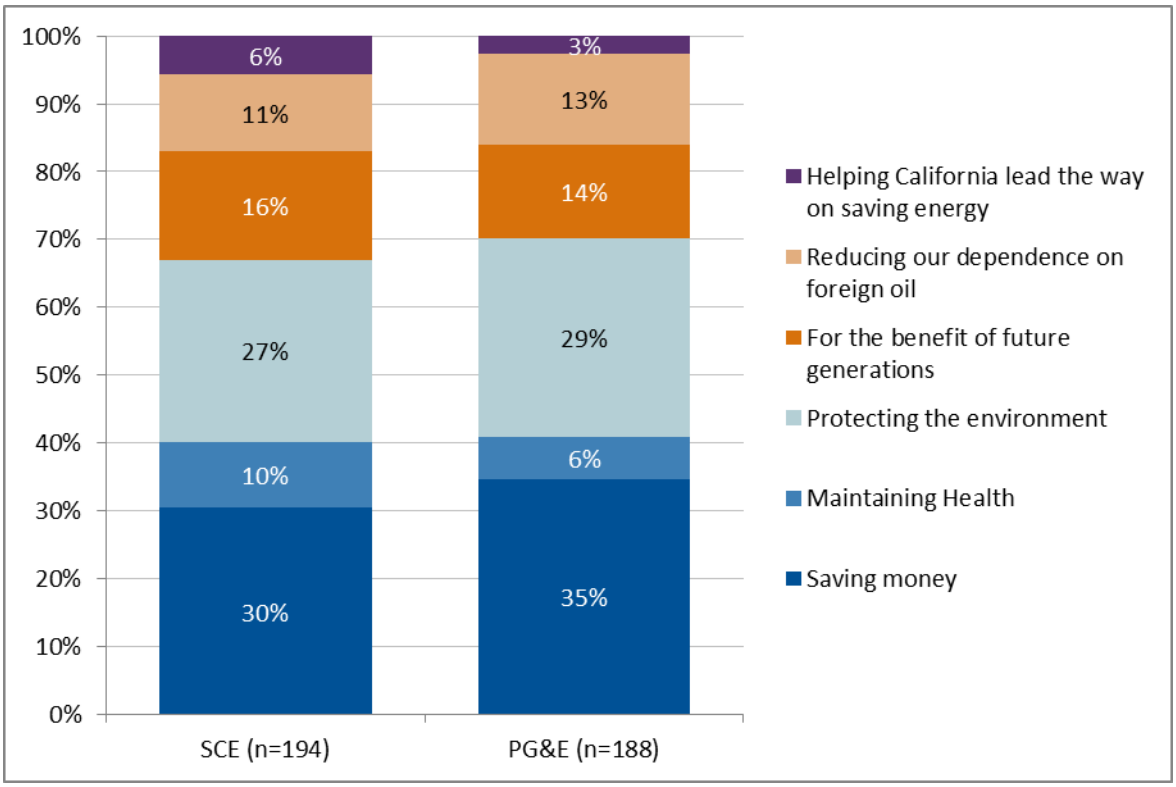
* Difference between utilities statistically significant with 90% confidence.

On a scale of 1 to 7, with 1 meaning strongly disagree and 7 meaning strongly agree, the survey asked respondents the degree to which they agreed or disagreed with two statements. SCE and PG&E participants responded similarly:

- ***I compare prices of at least a few brands before I choose:*** 88% of SCE and 90% of PG&E customers agreed, giving the statement a rating of six or higher.
- ***I do NOT feel responsible for conserving energy because my personal contribution is very small***: 10% of SCE and 8% of PG&E customers agreed, giving the statement a rating of six or higher.

The survey provided participants from each IOU a list of six reasons why people might change their daily actions to save energy. As shown in Figure A-20, when asked which of these actions would most motivate them to save energy, 32% of all respondents reported saving money, and 28% said saving the environment.

Figure A-20. Participant Motivations to Change Daily Actions to Save Energy

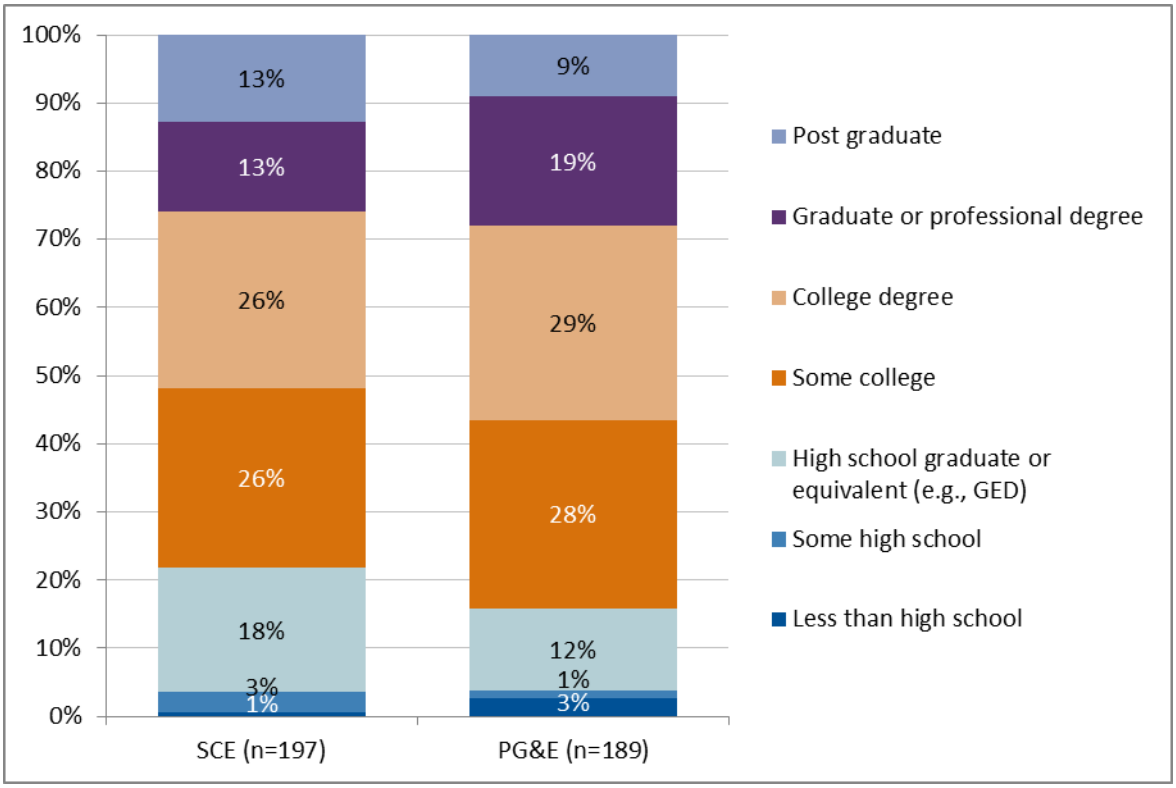


A.8 Customer Demographics

Surveyed participants primarily spoke English (90%), though this may partly result from the surveys being administered only in English. The majority of participants described their race as white: 69% for SCE; and a significant majority—85%—for PG&E. When asked about ethnicity, 22% of SCE and 6% of PG&E participants stated they were Spanish, Hispanic, or Latino.

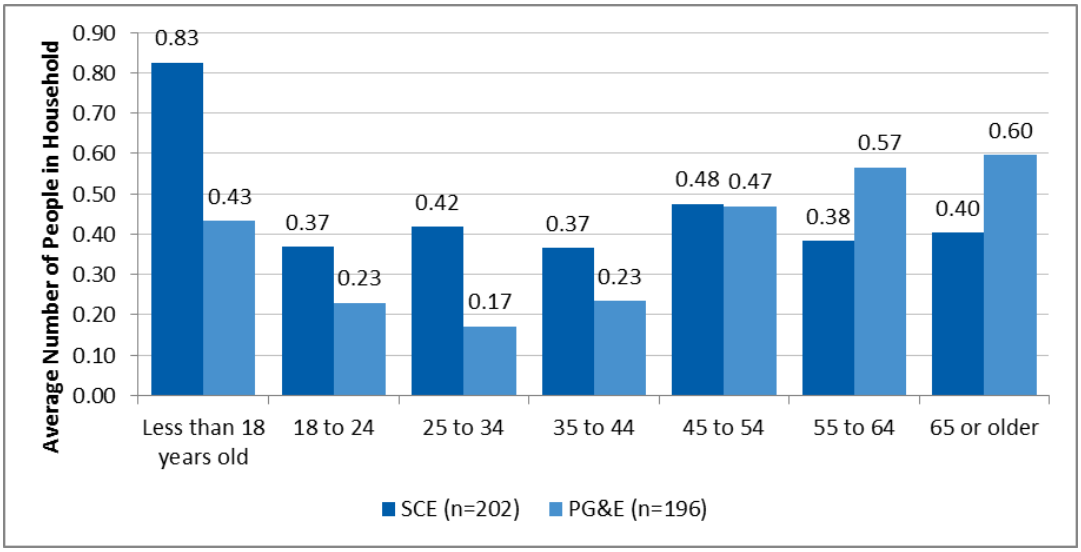
SCE and PG&E participants reported similar education and income levels. As shown in Figure A-21, over one-half of all surveyed participants (52% for SCE, and 57% for PG&E) reported earning a college degree.

Figure A-21. Participant Educational Attainment



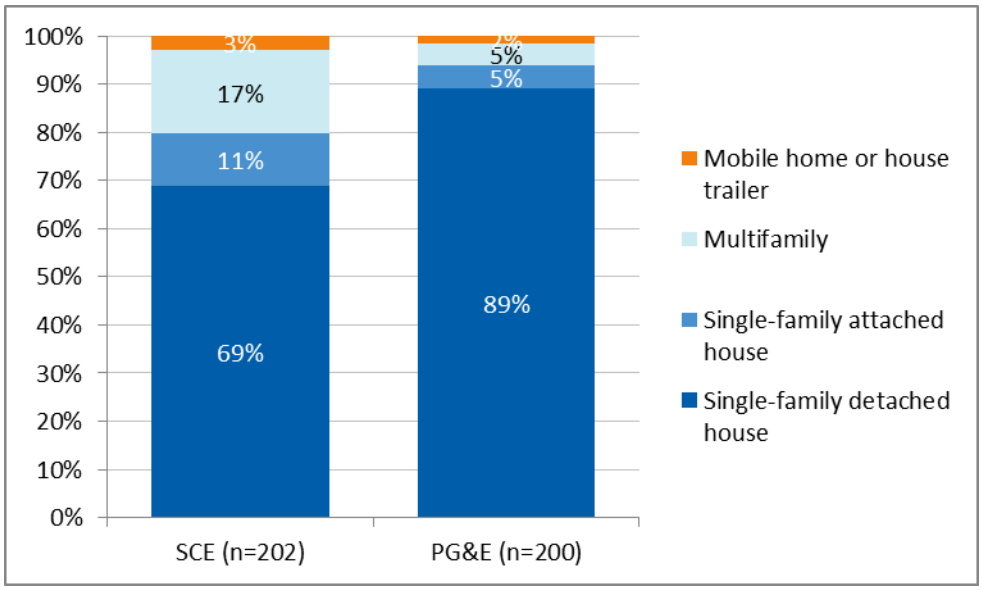
Nearly twice the number of SCE participants (40%) reported having children living in their homes than PG&E participants (22%). Figure A-22 shows the reported number of people living in participant households, by their respective age groups. Average households participating in SCE's program had 3.2 people, while average PG&E households had 2.7 people.

Figure A-22. Participant Number of Residents Living in Household, by Age Group



Fewer SCE participants reported living in single-family, detached housing, as shown in Figure A-23. SCE's program participants also were significantly less likely to own their homes than those participating in PG&E's program (77% for SCE versus 94% for PG&E).

Figure A-23. Participant Housing Type



As shown in Table A-11, the average participant home in both jurisdictions had approximately three bedrooms, and had been occupied for 15 to 20 years. More than one-third of participants (34% for SCE, and 41% for PG&E) had remodeled their home during the past five years.

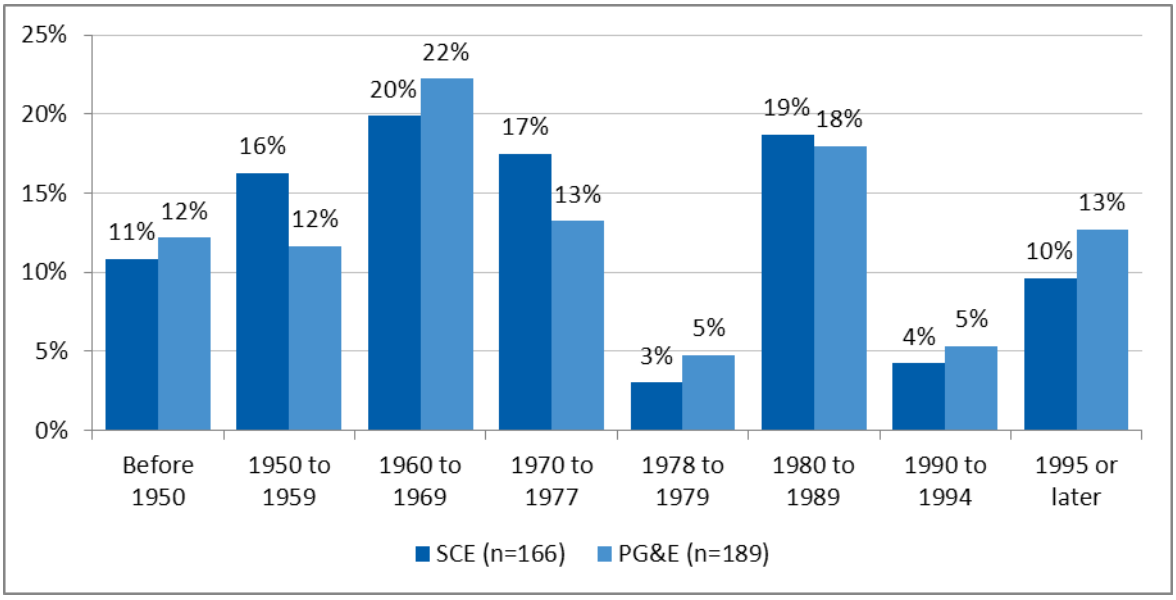
Table A-11. Participant Length of Residence in Their Current Location

Home Characteristic	SCE (n=202)	PG&E (n=196)
Number of bedrooms	3.1	3.4
Number of years in home*	15.4	21.2

*Difference between utilities was statistically significant with 90% confidence.

Figure A-24 shows vintage distributions of participant housing stock, indicating the percentage of homes built during each decade. According to respondents, more participant homes were built during the 1960s than in other decades.

Figure A-24. Participant Home Vintage



Second Appliances

The prevalence of second refrigerators in homes has increased for several decades. According to the U.S. Department of Energy's (US DOE) 2009 Refrigerator Market Profile,[8] the prevalence of second refrigerators significantly increased in U.S. households, rising from 12% in 1984 to 22% in 2005. The US DOE document also reported on-site inventory studies in California and the Pacific Northwest found second refrigerators in 19% and 34% of homes, respectively. In the Vermont Department of Public Service's Phase II (2003–2005) efficiency program evaluation, 12% of Vermont households had two refrigerators, and 1% of households had three refrigerators.[9]

Cadmus' participant surveys produced findings consistent with these data. A significant proportion of SCE and PG&E participants reported maintaining working second appliances in their home, even after participating in the ARPs. As shown in Table A-12, approximately one-third of the surveyed participant population reported having more than one working refrigerator in their home. A similar proportion of homes reported using a standalone freezer.

[8] U. S. Department of Energy. 2009. *Refrigerator Market Profile.* Accessed on November 29, 2012: http://apps1.eere.energy.gov/states/pdfs/ref_market_profile.pdf

[9] Vermont Department of Public Service. 2005. *Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs.*

Table A-12. Participant Second Refrigerator and Freezer Ownership

Variable	SCE (n=203)	PG&E (n=200)
Average number of working refrigerators in home	1.29	1.35
Saturation of second refrigerators	28%	34%
Average number of working freezers on home	0.31	0.36
Saturation of freezers	30%	35%

Comparison to RASS

Participant demographics differed from the general population across several characteristics. A comparison of a sample of these demographics to the 2009 California RASS (shown in Table A-13) shows ARP participants had household sizes similar to the general population. PG&E participants were more likely to live in single-family homes than the general population of PG&E residential customers. Notably, even after recycling their appliances, participants had much higher saturations of second refrigerators and freezers than the general population.

Table A-13. Comparison of Participant Respondents to 2009 RASS Respondents

Variable	SCE		p-value	PG&E		p-value
	Survey	RASS		Survey	RASS	
Household size*	3.22	3.09	0.24	2.69	2.78	0.34
Proportion in Single-Family	0.69	0.74	0.13	0.89	0.74	0.00
Second Refrigerator Saturation	0.29	0.18	0.00	0.34	0.25	0.01
Standalone Freezer Saturation	0.30	0.12	0.00	0.35	0.22	0.00

*Assumed a CV of 0.5 for RASS household sizes, as the report did not present standard deviations.
A p-value less than 0.10 indicates that, with 90% confidence, the two results differ.

B. DETAILED CANCELATION SURVEY FINDINGS

B.1 Introduction

As part of the process evaluation of SCE's and PG&E's 2010–2012 ARP, Cadmus surveyed a sample of SCE and PG&E ARP customers who cancelled their participation in the ARP. Table B-1 shows the number of targeted and completed surveys for each IOU.

Table B-1. Canceler Summary of Interviews

IOU	Target Completes	Achieved Completes
SCE	200	200
PG&E	200	200
Total	400	400

The surveys, which explored topics related to participants' experiences with the program, including program satisfaction levels, assessed the following key topics:

- Characteristics of the customers' appliances;
- Reason for cancelling their participation;
- Alternative disposal methods;
- Marketing and outreach;
- Awareness, knowledge, attitudes, and behavior (AKA-B) regarding the program; and
- Participant demographics and home characteristics.

This appendix summarizes the information Cadmus learned about SCE's and PG&E's ARPs from analysis of cancelation survey data, and notes differences between the utilities only when statistically significant with 90% confidence.

B.2 Characteristics of Cancelers' Appliances

As shown in Table B-2, the majority of survey respondents—91% of SCE and 86% of PG&E—intended to dispose of one refrigerator; 8% to 9% of each survey group intended to dispose of one standalone freezer; and the remainder intended to dispose of either of two refrigerators or one refrigerator and one freezer.

Table B-2. Canceler Appliance Type

Appliance Type/Quantity	SCE (n=200)	PG&E (n=200)
One Refrigerator	91%	86%
One Freezer	8%	9%
One Refrigerator and One Freezer	1%	4%
Two Refrigerators	1%	2%

Figure B-1 shows most customers—76% for SCE, 79% for PG&E—used the unit as their main refrigerator rather than as a second or spare unit.

Figure B-1. Canceler Refrigerator Use

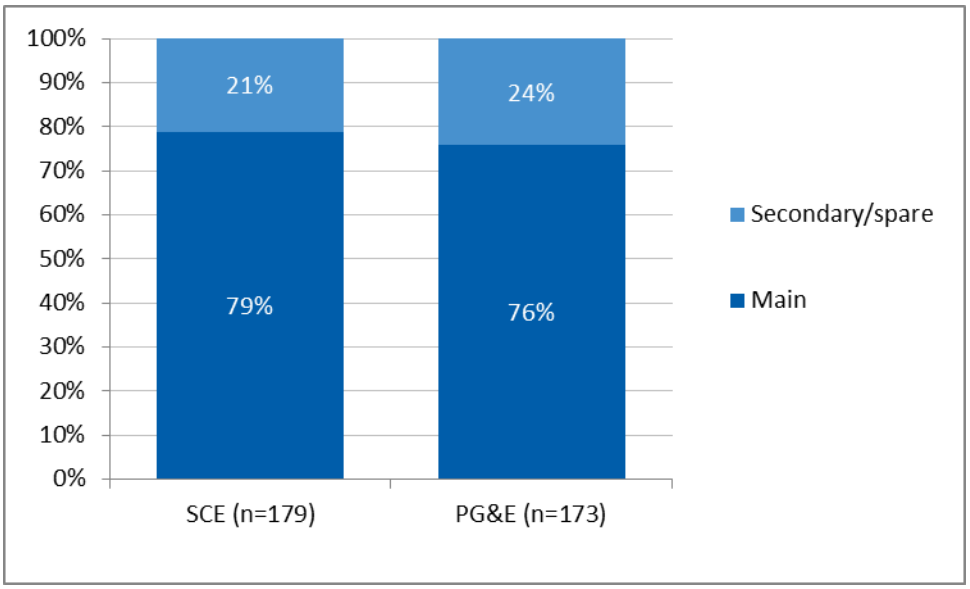


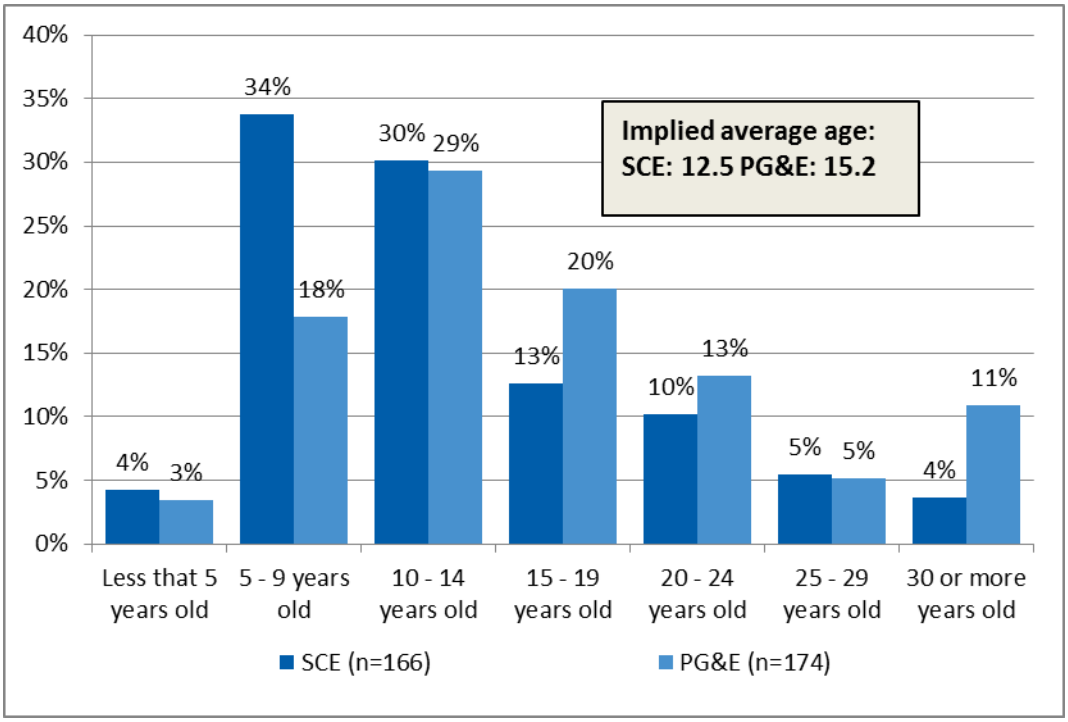
Table B-3 shows 80% or more of the surveyed customers disposed of their appliances. About one-half of those not disposing of their unit still used it.

Table B-3. Canceler Appliance Retention

Question	Response	SCE	PG&E
Do you still have the refrigerator or freezer? (SCE: n=193, PG&E: n=196)	Yes	20%	17%
	No	80%	83%
(If so) Are you still using it? (SCE: n=38, PG&E: n=33)	Yes	53%	39%
	No	47%	61%

Customers' appliances averaged between five and 20 years old. As shown in Figure B-2, disposed of appliances averaged 12.5 years for SCE and 15.2 years for PG&E.

Figure B-2. Canceler Appliance Age*

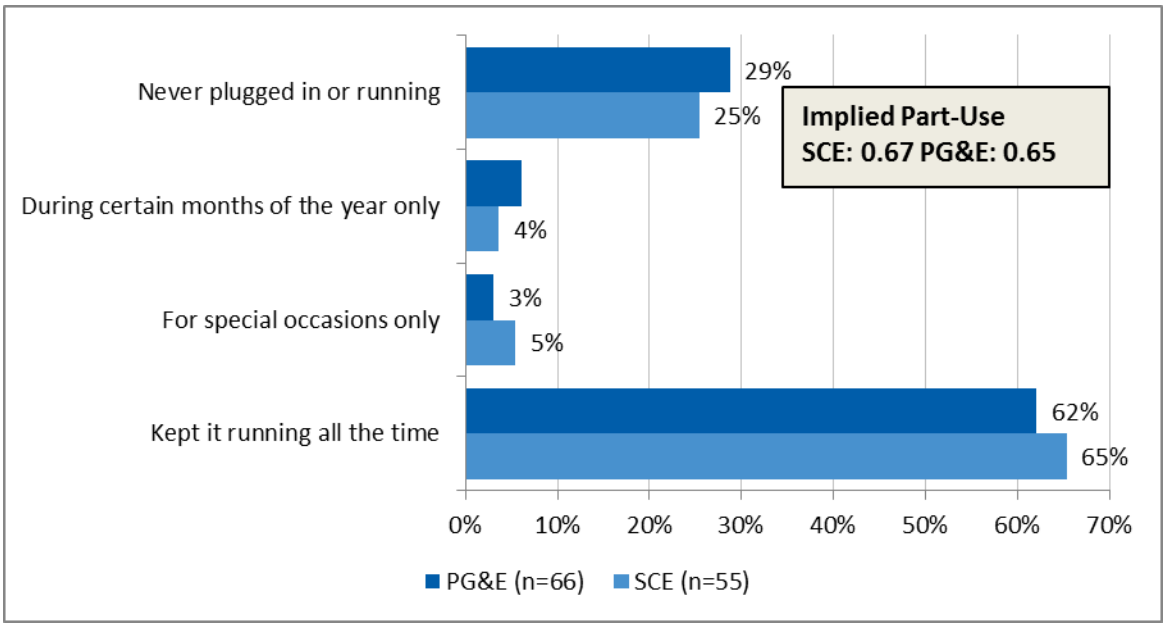


*Difference in the average age between utilities statistically significant with 90% confidence.

Figure B-3 shows usage rates (as a percentage of all respondents) for units planned for disposal by cancelled SCE and PG&E customers. Over 60% ran year-round. Both utilities had relatively low total (combined primary and second units) part-use rates: 0.67 for SCE, and 0.65 for PG&E.[10] This largely results from a high proportion of units no longer in use.

[10] Part-use is the average portion of the year a unit runs. For example, primary units plugged in continuously have a part-use of 1; and units left unplugged all year have a part-use of 0. Each respondent who reported using their appliance for only part of the year was asked the average number of months per year the unit remained in use. The unit's part-use value resulted from: the number of months in operation divided by 12.

Figure B-3. Canceler Part-Use Distributions



As seen in Figure B-4, most appliances remained in good or working condition. Approximately one in 10 units no longer functioned.

Figure B-4. Canceler Functionality of Appliances

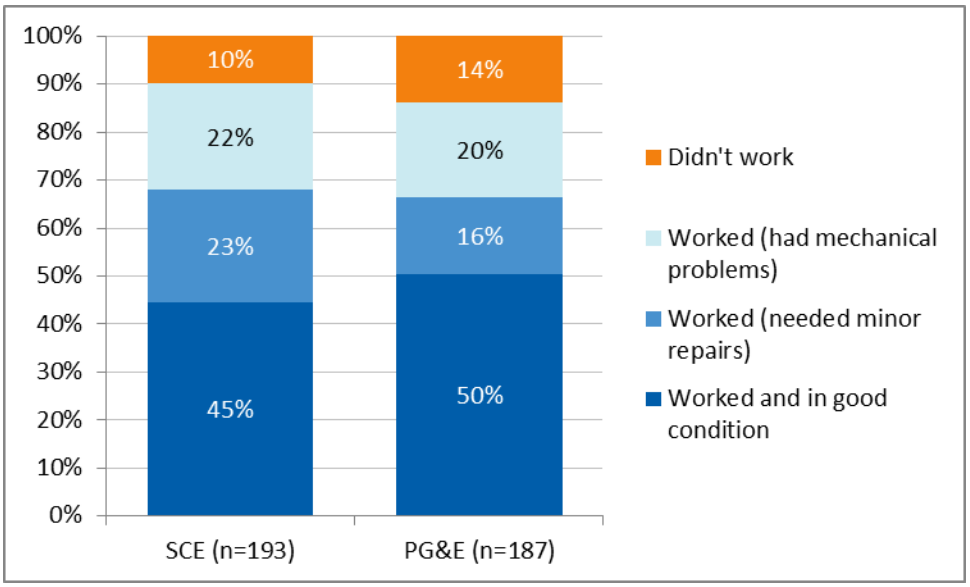
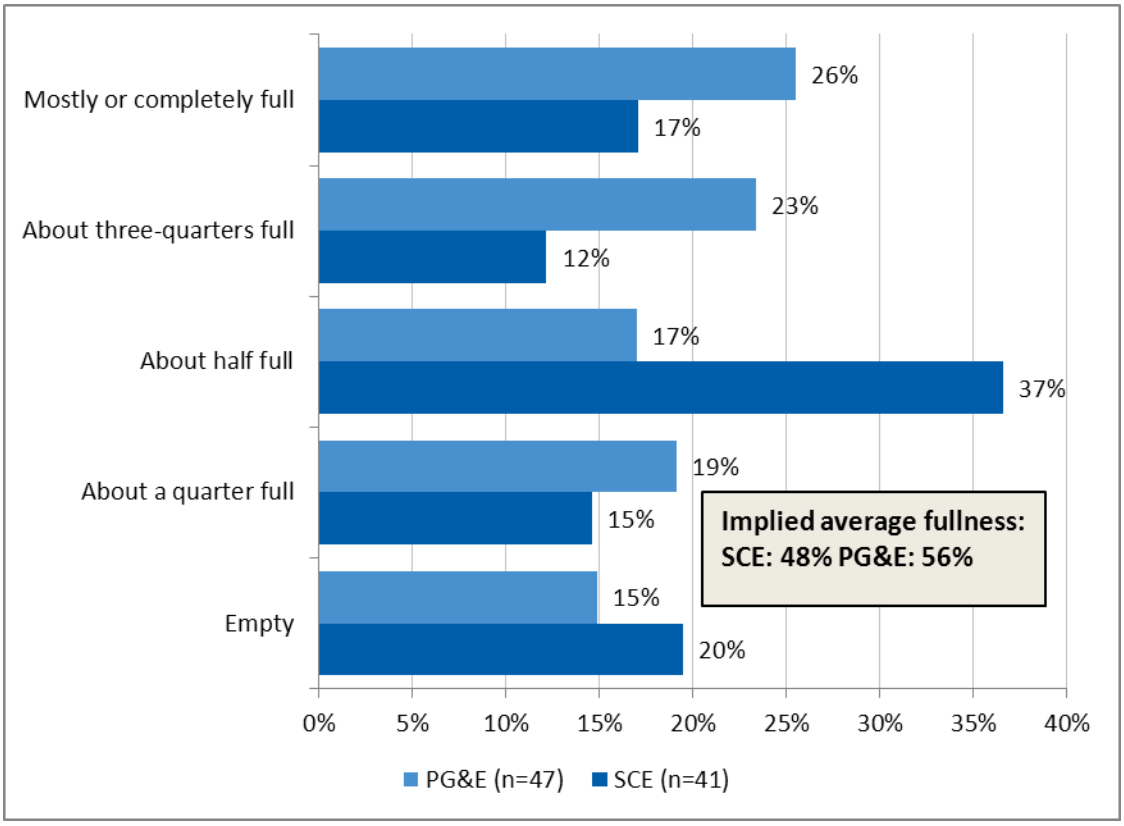


Figure B-5 shows appliances customers disposed of averaged about half-full, a finding similar to that found for program participants.

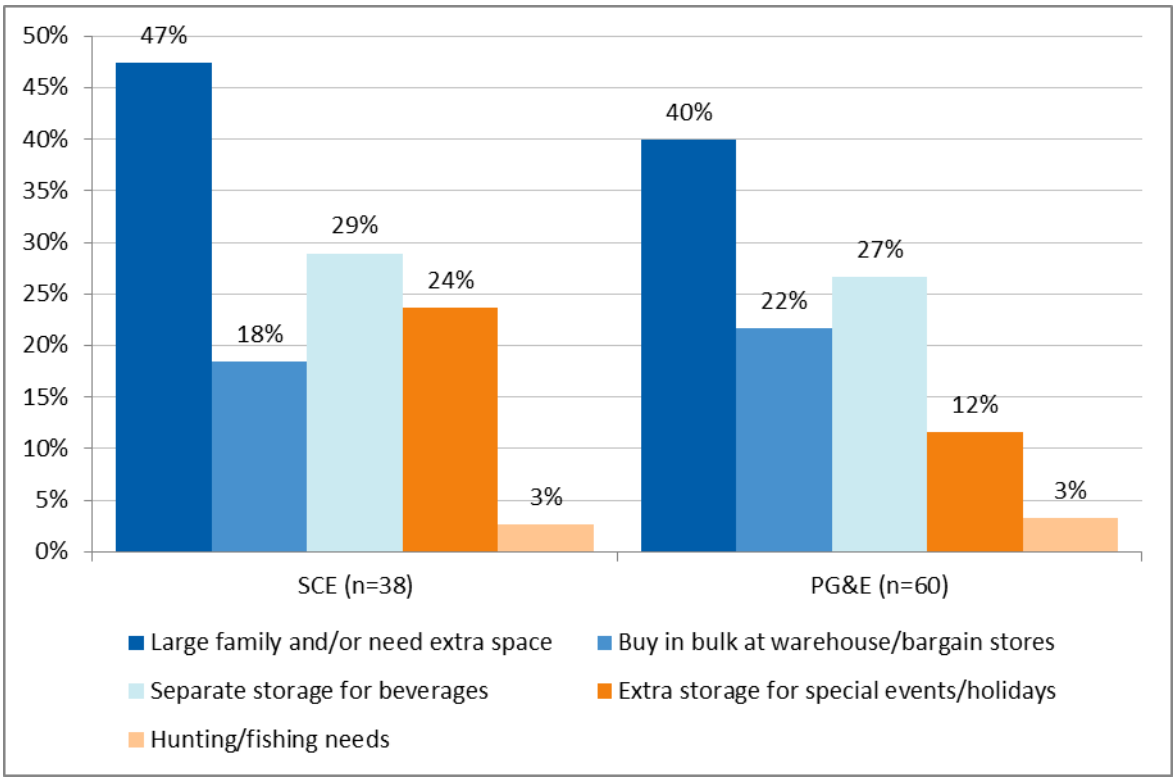
Figure B-5. Canceler Second Appliance Fullness*



*Second units include refrigerators and freezers.

As shown in Figure B-6, respondents primarily used second appliances due to having a large family and/or needing extra space for storage. Respondents also commonly kept a second appliance as separate storage for beverages.

Figure B-6. Canceler Reason for Using Second Appliance (Multiple Responses Allowed)*

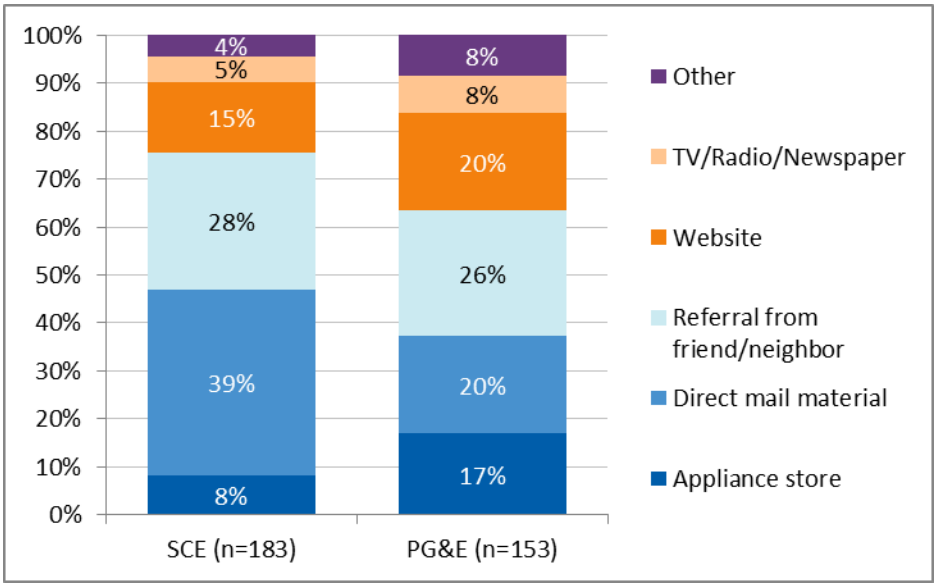


*Second units include refrigerators and freezers.

B.3 Program Awareness and Reasons for Cancelation

Customers primarily learned of the program through direct-mail materials and referrals from friends or neighbors. Respondents also cited program Websites, and 17% of PG&E customers learned of the program through appliance stores.

Figure B-7. Canceler Sources of Program Awareness



As shown in Table B-4, most customers knew of the program before deciding to dispose of units.

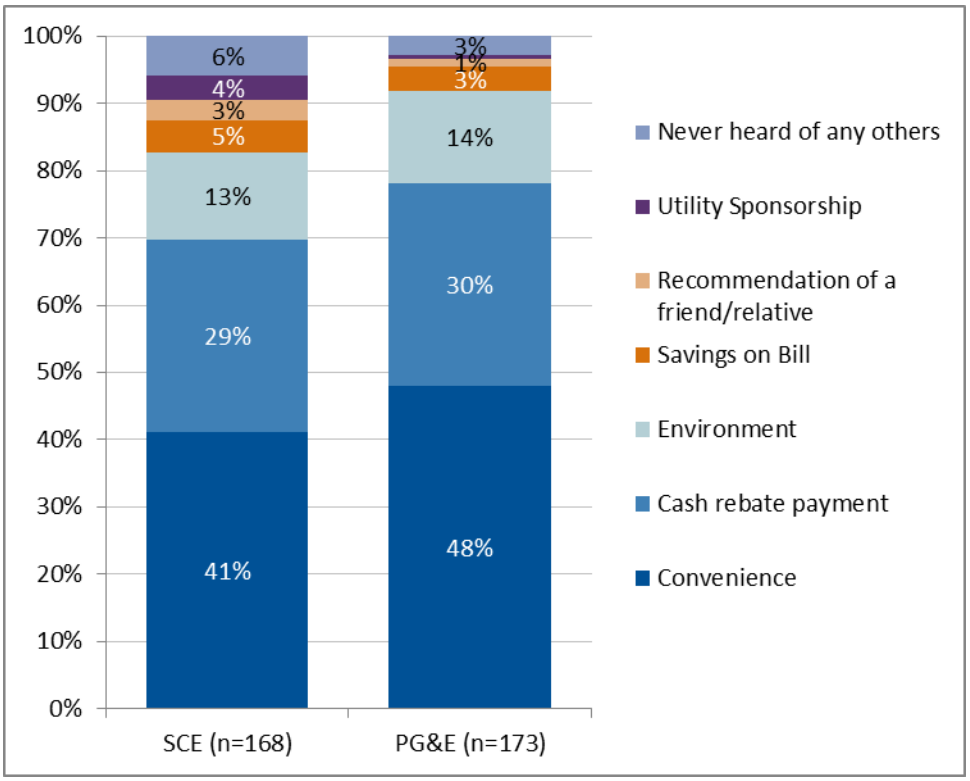
Table B-4. When Cancelers Learned of ARP*

Question	SCE (n=192)	PG&E (n=181)
While looking for a way to dispose of a unit.	31%	50%
Knew about the service prior to deciding to have the unit disposed of.	69%	50%

*Difference between utilities statistically significant with 90% confidence.

Respondents' initial interest in the program arose from perceiving it as a convenient way to dispose of their appliances, with the cash rebate accounting for most of the other responses (as shown in Figure B-8).

Figure B-8. Canceler Reasons for Interest in Participation



Respondents did not complete the program for the following primary reasons (see Figure B-9):

- The appliance did not qualify for the program;
- They decided somebody else could use the unit;
- They could not make the scheduled time;
- They ended up deciding to keep it; or
- They received a better offer.

Figure B-9 also shows some differences between customers for each utility. SCE had more respondents (33%) say the appliance did not qualify for the service than did PG&E (17%). PG&E respondents had more issues with scheduling (36%, SCE 18%). PG&E respondents were also more likely to want to remove their appliance sooner than it could be picked up (13%, SCE 2%). A small portion of participants in both IOU territories noted their appliance was stolen before it could be picked up.

Figure B-9. Canceler Reasons Why Appliance Pick Up Was Cancelled

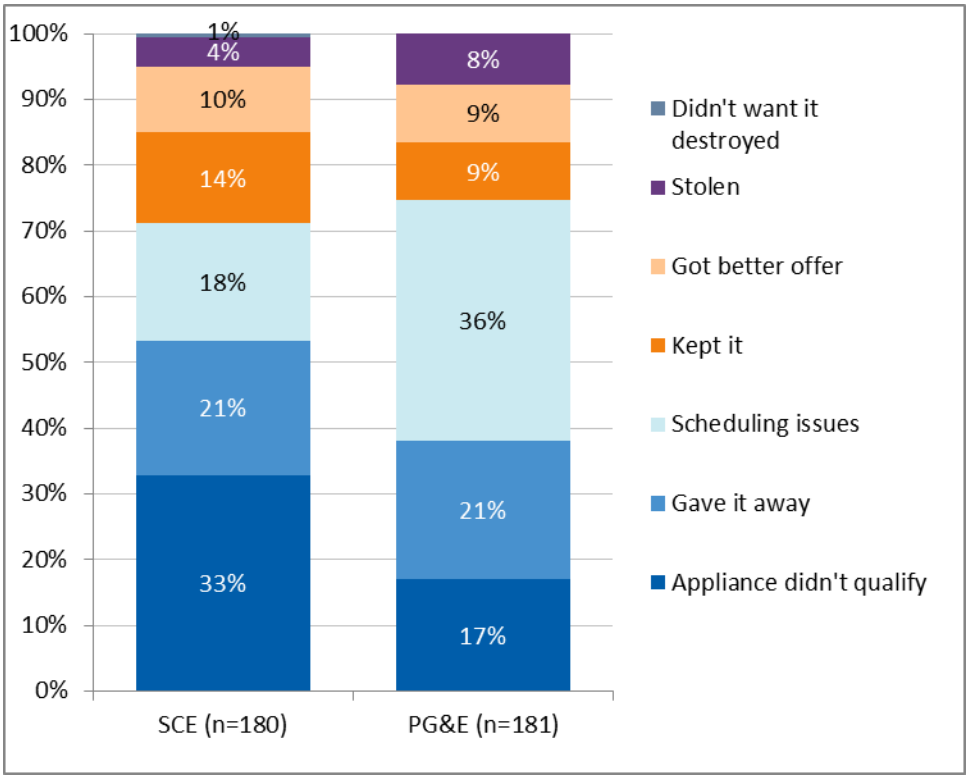
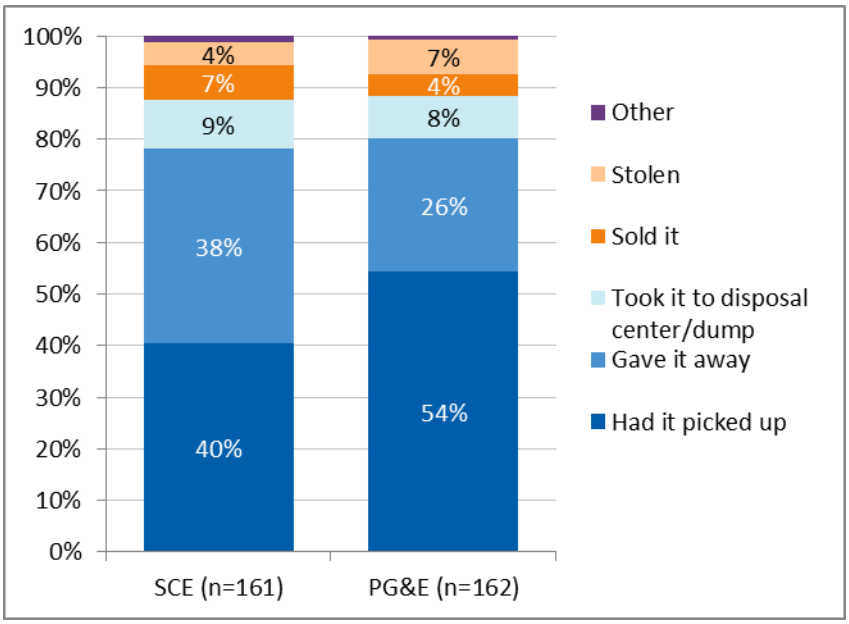


Figure B-10 shows a large majority of customers had the appliance picked up by someone else or gave it away. A small number (8% to 9%) took units to a disposal site themselves, and 4% to 7% sold the unit. Another small number (4% to 7%) had their appliance stolen, presumably after placing it outside their residence.

Figure B-10. Canceler Disposal Method



As shown in Table B-5, most respondents (78% SCE, 83% PG&E) replaced disposed of units, largely with new appliances. Of those going to an appliance dealer, one-half to two-thirds did not discuss how to dispose of their old appliance with the dealer, though the dealers informed one-half to three-quarters of respondents about the ARP. Salespersons told about one-half that the old appliance would be disposed of for free, and one-half were told there would be a fee.

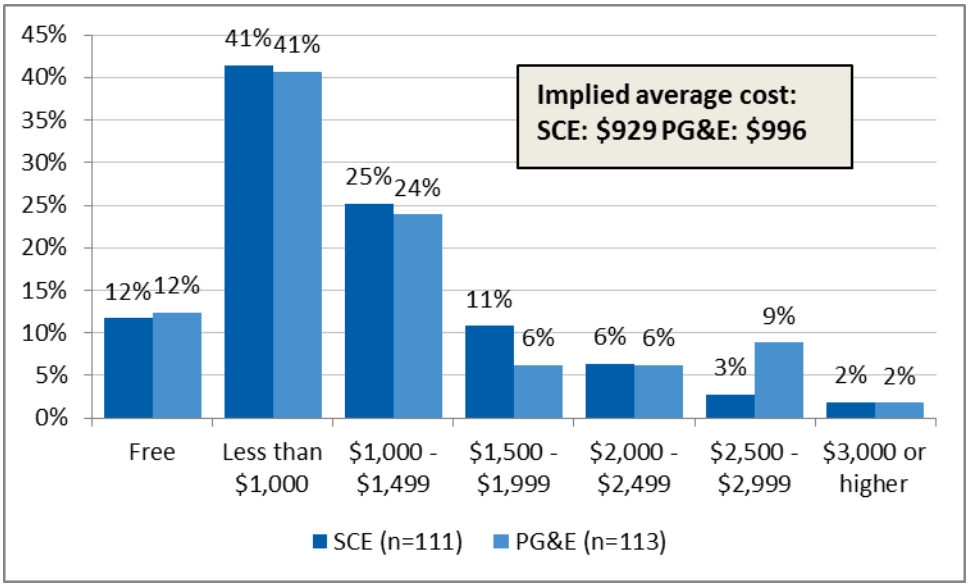
Table B-5. Canceler Appliance Replacement Experience

Question	Response	SCE	PG&E
Did you replace the refrigerator or freezer you disposed of with a different one? (SCE: n=162, PG&E: n=167)	Yes	78%	83%
	No	22%	17%
Was your replacement refrigerator or freezer brand new when you got it, or was it used?* (SCE: n=126, PG&E: n=137)	New	75%	87%
	Used	25%	13%
Did you get the replacement refrigerator or freezer from an appliance dealer? (SCE: n=123, PG&E: n=131)	Yes	74%	79%
	No	26%	21%
When you bought the replacement refrigerator or freezer, did you talk to the salesperson or dealer about how to dispose of your old one? (SCE: n=85, PG&E: n=94)	Yes	36%	48%
	No	64%	52%
Did the sales person tell you about SCE or PG&E's appliance recycling service?* (SCE: n=26, PG&E: n=39)	Yes	54%	77%
	No	46%	23%
Did the sales person offer to dispose of the old refrigerator or freezer for free? (SCE: n=27, PG&E: n=40	Yes	59%	55%
	No	41%	45%
Did the sales person tell you they would dispose of the appliance for a charge? (SCE: n=10, PG&E: n=16)	Yes	50%	56%
	No	50%	44%

*Difference between utilities statistically significant with 90% confidence.

Figure B-11 shows how much respondents reported paying for their new appliance, with the average around $1,000.

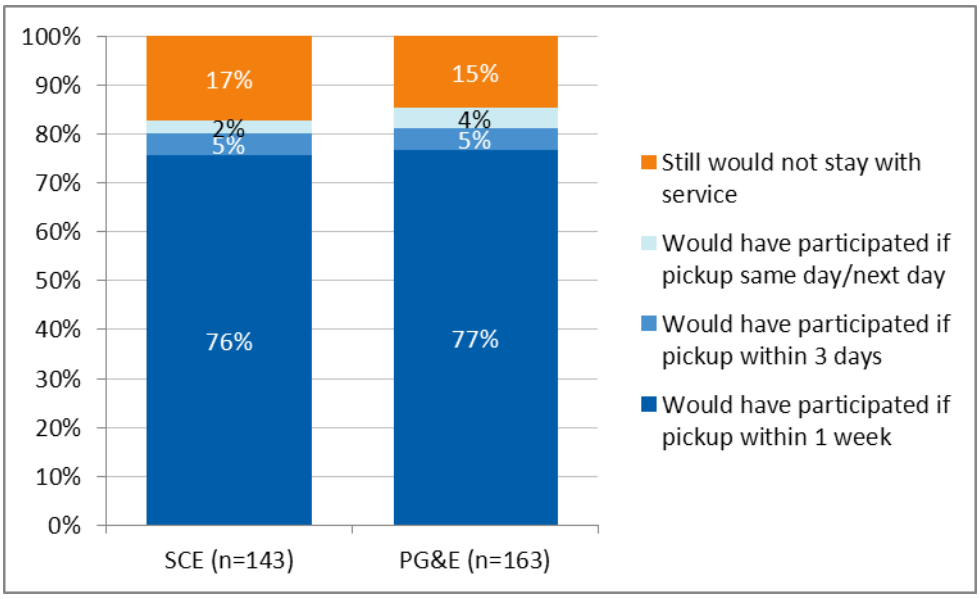
Figure B-11. Canceler Cost of Replacement Appliance



B.4 Awareness, Knowledge, and Attitudes of ARP Benefits

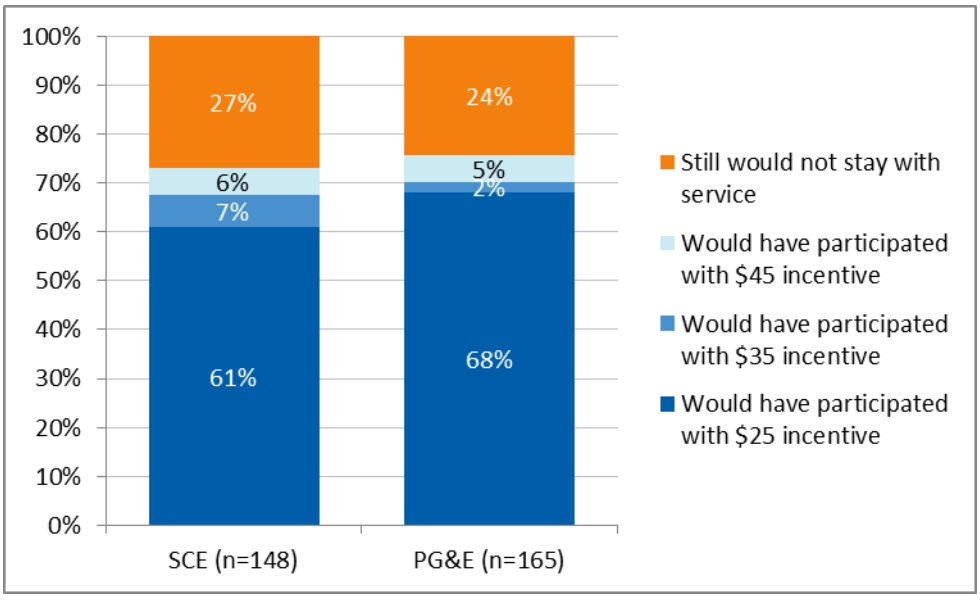
Cadmus asked several questions to determine how important various program characteristics were to customers who cancelled. While over three-quarters of customers reported they would have stayed with the program had the pick-up times been within a week, the rest did not seem persuaded by shorter timeframes. Among customers who said they would not have participated even if pick-up occurred within a week, 81% said they would have still cancelled if the appliance would have been picked up within three days.

Figure B-12. Canceler Pick-Up Timeframe Influence



Many customers who cancelled reported they would have considered participating even with a lower incentive amount. As shown in Figure B-13, around 60% would have stayed with the service (presumably if other factors had not prevented participation) at a $25 incentive level.

Figure B-13. Canceler Incentive Level Influence



Per the questions shown in Table B-6, respondents mostly seemed aware that old appliances could have high costs in terms of electric bills. Over 80% also reported knowing the appliances can be harmful to the environment if not properly disposed of, but only about one-half knew the recycling services took

care of those hazardous materials. A high number (73% to 80%) did not know the recycling program almost eliminated materials going to landfills.

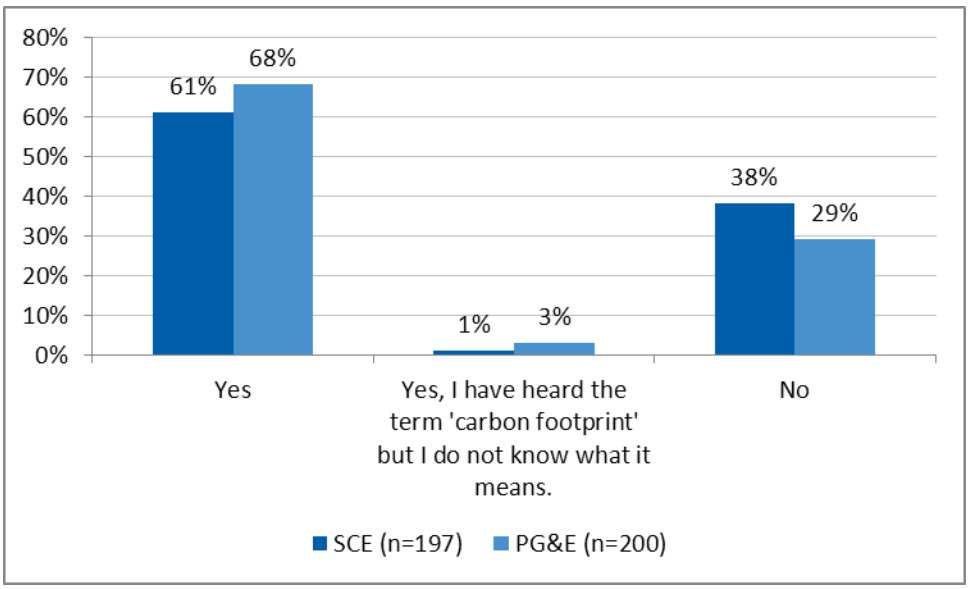
Table B-6. Canceler Awareness of ARP Benefits

Question	Response	SCE	PG&E
Before you decided to dispose of your appliance, were you aware that a refrigerator or freezer in your home can cost up to $180 or more a year for electricity? (SCE: n=196, PG&E: n=194)	Yes	69%	69%
	No	31%	31%
Were you aware that the refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of?* (SCE: n=199, PG&E: n=198)	Yes	83%	91%
	No	17%	9%
Did you know that SCE/PG&E's recycling service takes apart and recycles all of the metals and glass from the appliances it collects? (SCE: n=198, PG&E: n=198)	Yes	42%	39%
	No	58%	61%
Did you know that SCE/PG&E's recycling service removes, and recycles or destroys the coolant, motor oil, and insulation from the appliances it collects? (SCE: n=195, PG&E: n=197)	Yes	40%	42%
	No	60%	58%
Did you know that SCE/PG&E's recycling service makes it so almost none of the materials from the appliances they recycle go to a land fill? (SCE: n=196, PG&E: n=195)	Yes	20%	27%
	No	80%	73%

*Difference between utilities statistically significant with 90% confidence.

Figure B-14 shows over 60% of customers knew of the term Carbon Footprint and what it means. The rest mostly did not know, with a few (1% to 3%) knowing the term but not the meaning.

Figure B-14. Canceler Awareness of "Carbon Footprint"



According to questions shown in Table B-7, some households had or installed other energy-saving equipment in their households. The most popular pieces of equipment included ceiling fans, with around 75% of customers installing them or already having then installed in their house when they

bought it. About two-thirds of households had programmable thermostats, but about two-thirds of households did not have an attic vent or motion detectors for lights.

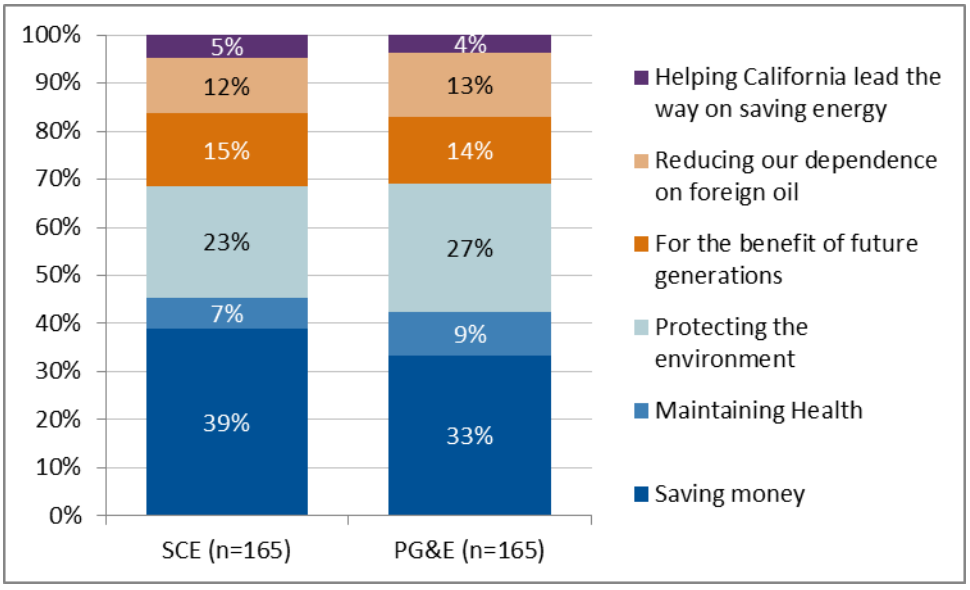
Table B-7. Canceler-Adopted Energy-Saving Actions

Measure	Installed?	SCE	PG&E
Attic vent to keep the attic cooler. (SCE: n=193, PG&E: n=200)	Yes, installed it myself or had it installed	26%	28%
	No	59%	65%
	Came with the house	15%	7%
Programmable thermostats.* (SCE: n=193, PG&E: n=191)	Yes, installed it myself or had it installed	47%	59%
	No	35%	23%
	Came with the house	19%	18%
Ceiling fans. (SCE: n=199, PG&E: n=198)	Yes, installed it myself or had it installed	55%	61%
	No	28%	25%
	Came with the house	17%	15%
Motion detectors for lights.* (SCE: n=197, PG&E: n=198)	Yes, installed it myself or had it installed	31%	40%
	No	65%	55%
	Came with the house	3%	5%

* Difference between utilities statistically significant with 90% confidence.

Figure B-15 shows the primary motivations of customers for saving energy, with saving money as the top answer, and protecting the environment as the next highest reason.

Figure B-15. Cancelers' Motivations to Change Daily Actions to Save Energy



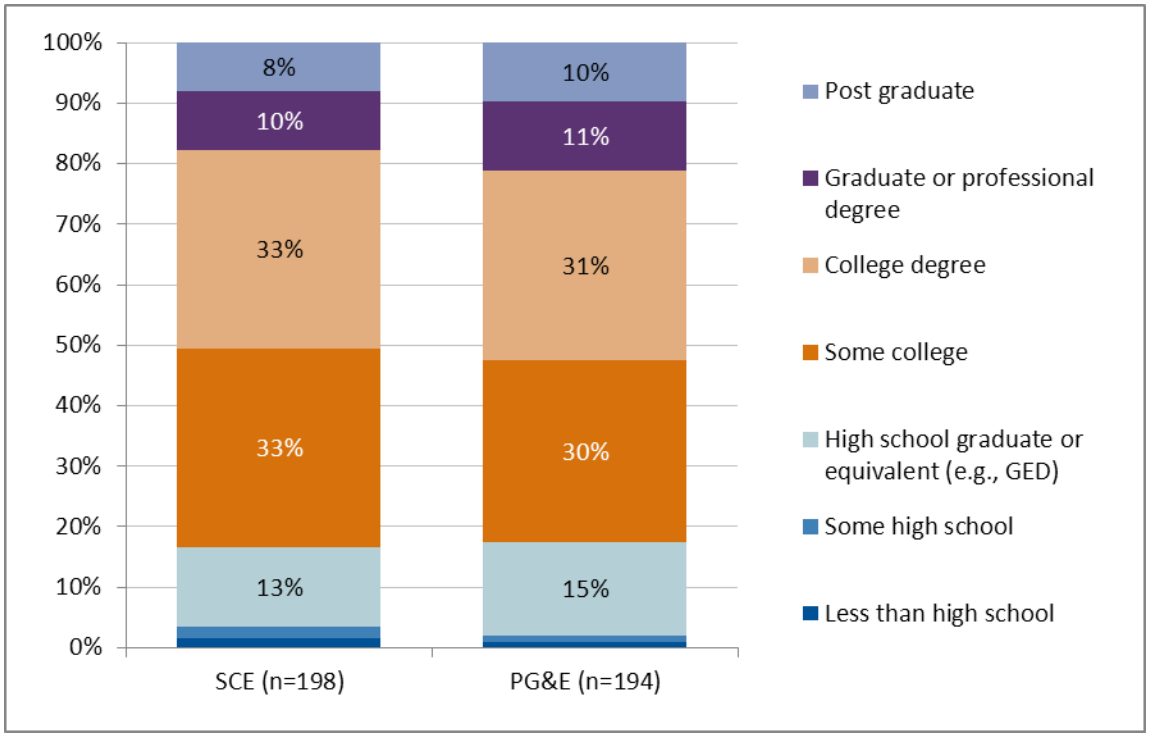
B.5 Customer Demographics

Surveyed respondents primarily spoke English (92% to 96%), though partly may be due to the administration of surveys only in English. The majority of participants described their race as white: 65%

for SCE, and a significant majority—76%—for PG&E. When asked about ethnicity, 26% of SCE and 16% of PG&E participants stated they were Spanish, Hispanic, or Latino.

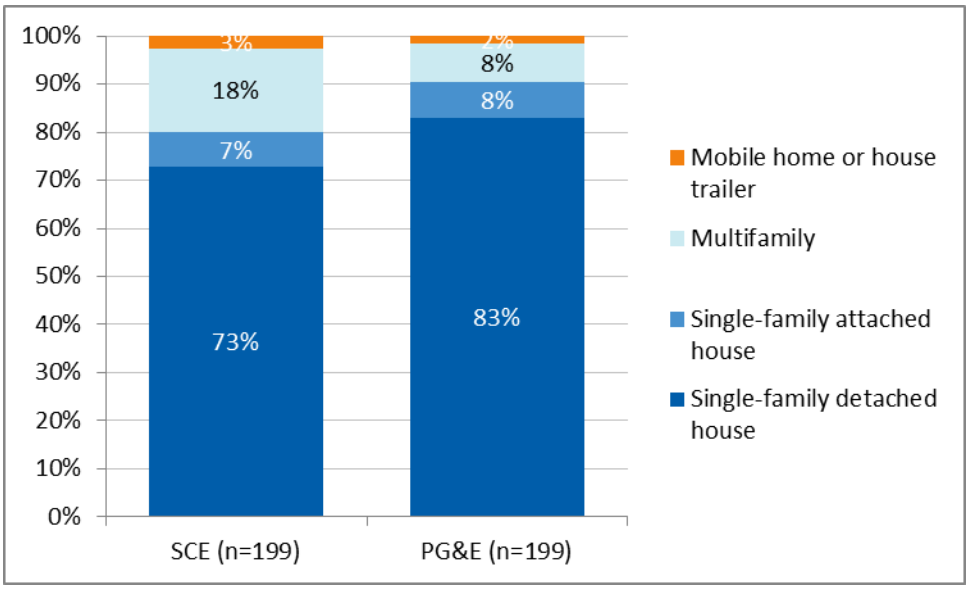
SCE and PG&E participants reported similar education and income levels. As shown in Figure B-16, over one-half of all surveyed participants (51% for SCE, and 53% for PG&E) reported earning a college degree or higher.

Figure B-16. Canceler Educational Attainment of Customers



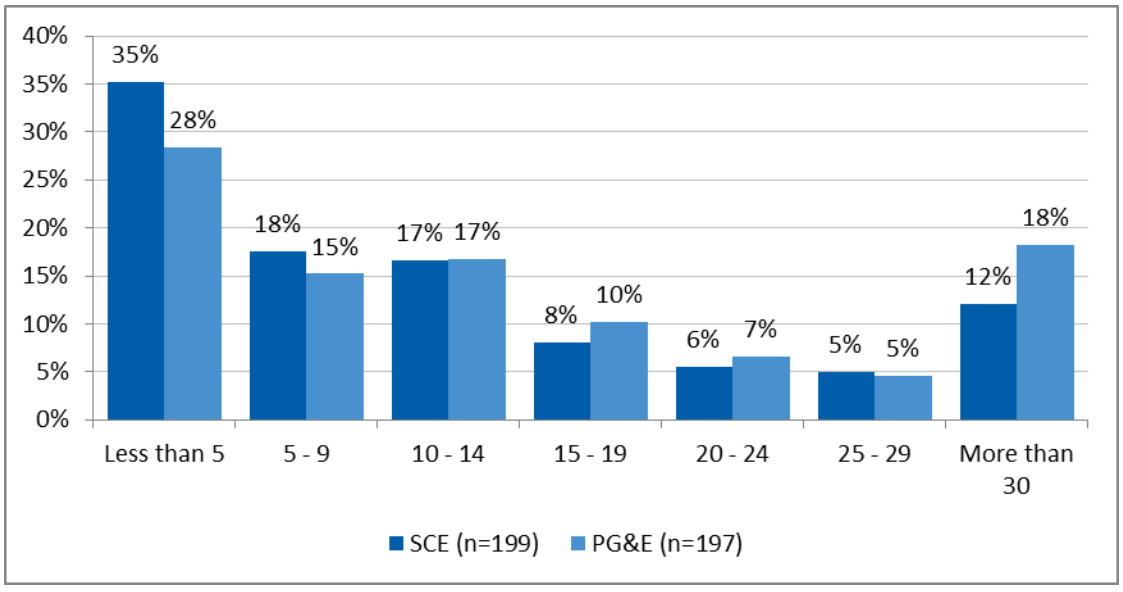
Respondents primarily lived in single-family households (80% for SCE, and 91% for PG&E). Figure B-17 shows the majority of the remaining customers lived in multifamily settings.

Figure B-17. Canceler Housing Type



As shown in Figure B-18, most customers lived in their homes for less than 20 years, and averaged 12 years for SCE and 15 years for PG&E respondents. About one-third of customers lived in their homes for five or less years.

Figure B-18. Canceler Length of Time Living In Household*



*Difference between utilities statistically significant with 90% confidence.

Figure B-19 shows vintage distributions of participant housing stock, indicating the percentage of homes built during each decade. Most respondents' homes had been built fairly recently (after 1995).

Figure B-19. Canceler Home Vintage

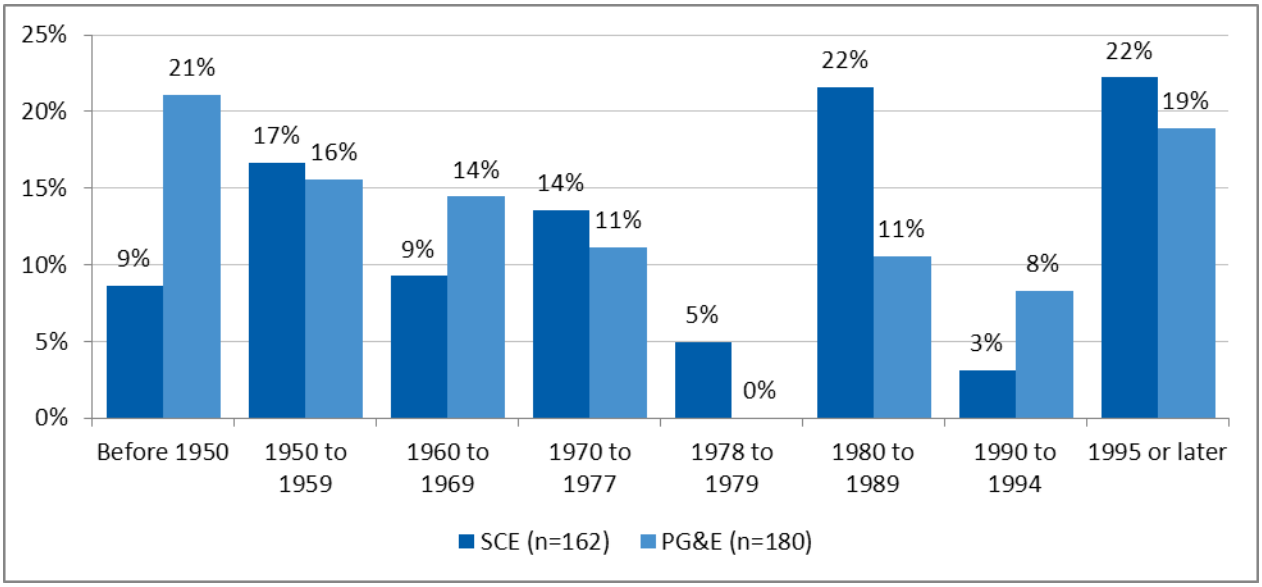
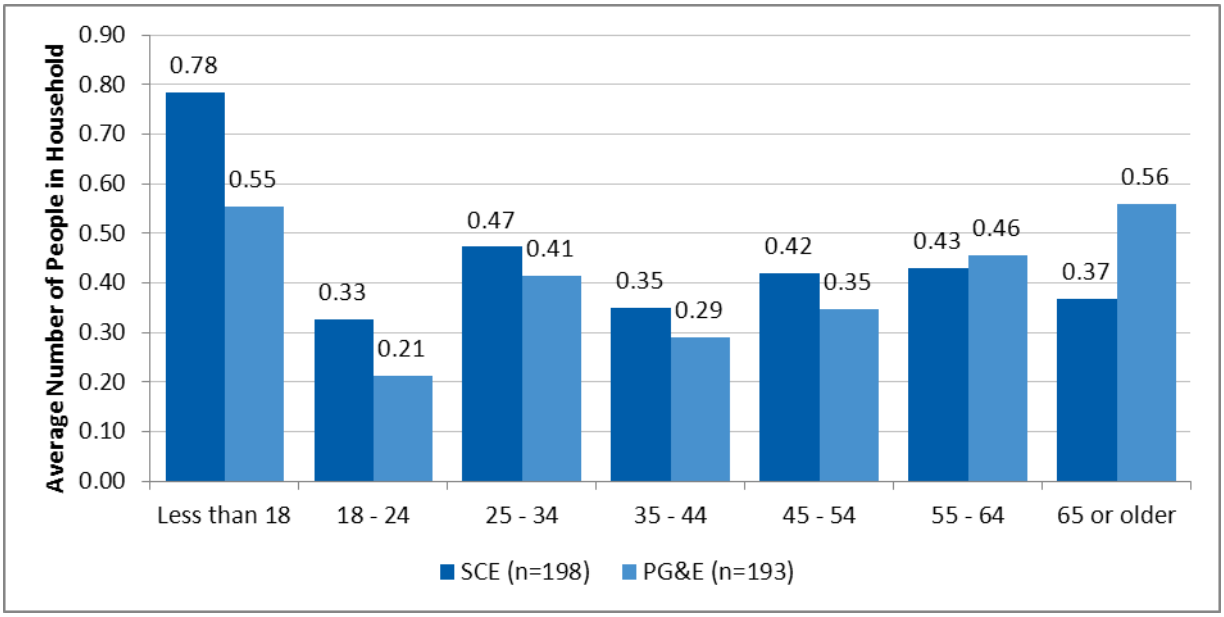


Figure B-20 shows the reported number of people living in respondent households, by their respective age groups. Average households cancelling from SCE's program had 3.2 people, while average PG&E households had 2.8 people.

Figure B-20. Canceler Number of Residents Living in Household, by Age Group



1.5 Comparison to RASS

Canceler demographics differed from the general population across several characteristics. Comparing a sample of these demographics to the 2009 California RASS (as shown in Table B-8) indicates cancellers

more likely lived in single-family homes than the general population of residential customers. Notably, even though many disposed of their appliances outside the program, cancellers still had much higher saturations of second refrigerators and freezers than the general population.

Table B-8. Canceler Comparison to 2009 RASS

Variable	SCE		p-value	PG&E		p-value
	Survey	RASS		Survey	RASS	
HH size	3.13	3.09	0.70	2.82	2.78	0.72
Proportion in Single-Family	0.80	0.74	0.04	0.90	0.74	0.00
Second Refrigerator Saturation	0.38	0.18	0.00	0.30	0.25	0.17
Standalone Freezer Saturation	0.25	0.12	0.00	0.28	0.22	0.06

*Assumed a CV of 0.5 for RASS household sizes, as the standard deviations were not presented in the report. A p-value less than 0.10 indicates that, with 90% confidence, the two results differ.

C. DETAILED NONPARTICIPANT DISPOSER SURVEY FINDINGS

C.1 Introduction

As part of the process evaluation of SCE's and PG&E's 2010–2012 ARP, Cadmus surveyed a sample of nonparticipating appliance disposers in SCE's and PG&E's territories to assess the actions and motivations of utility customers opting to dispose of their refrigerators and or freezers outside of the ARPs. Cadmus refers to these nonparticipating appliance disposers as "nonparticipants." Table C-1 shows the number of targeted and completed surveys for each investor-owned utility (IOU).

Table C-1. Summary of Surveys

IOU	Target Completes	Achieved Completes*
SCE	150	150
PG&E	150	152
Total	300	302

*Due to logistical reasons, Cadmus and the IOUs agreed to reduce the total target for this survey from the 400 originally planned to 300. However, the achieved completes for this survey still easily exceeded the 90/10 standard precision requirements.

Through these telephone survey interviews with residential customers, Cadmus collected data on the following metrics:

- Appliance characteristics;
- Appliance disposal methods;
- Criteria for successful resale (e.g., age, configuration);
- Resale market characteristics;
- Appliance replacement;
- Program awareness;
- Reasons for not participating in ARPs;
- Awareness of program benefits;
- Attitudes toward ARPs; and
- Customer demographics.

Cadmus also compared data between the two utilities to determine whether regional variations might be present. Our team reviewed findings relative to those determined through previous research.

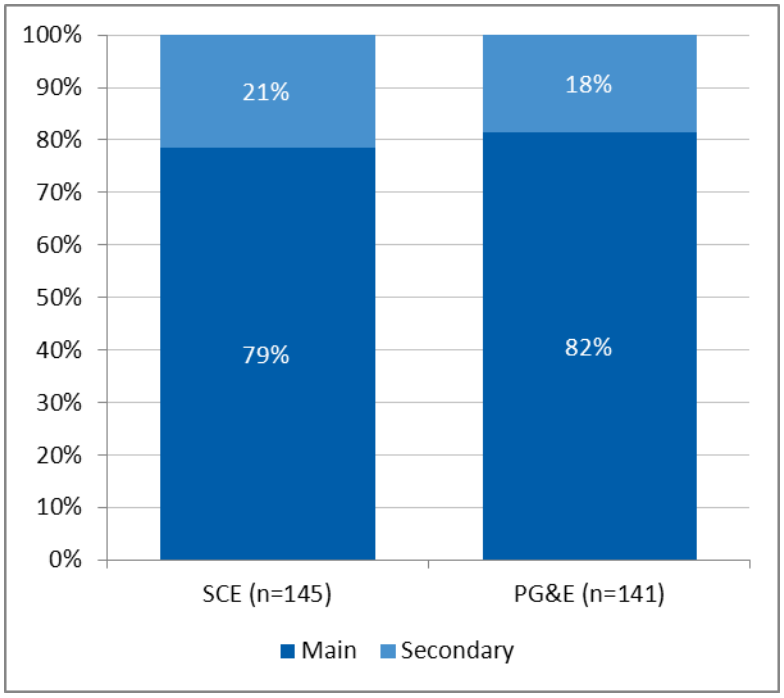
C.2 Characteristics of Disposed Appliances

The majority of nonparticipants—88% in SCE's territory and 80% in PG&E's territory—disposed of one refrigerator or freezer; 84% of each IOU's nonparticipants disposed of a unit (or multiple units) that worked at the time of disposal.

As shown in Figure C-1, most SCE and PG&E nonparticipants (79% and 82%, respectively) disposed of their primary refrigerator rather than a second unit. These results align with those from the participant

survey, which show 78% of SCE participants and 76% of PG&E participants disposed of a primary unit instead of a second unit.

Figure C-1. Nonparticipant Disposer Refrigerator Use



Of respondents recycling a second unit, just over one-fourth (28%) reported using the unit as a second appliance for 10 years or more.

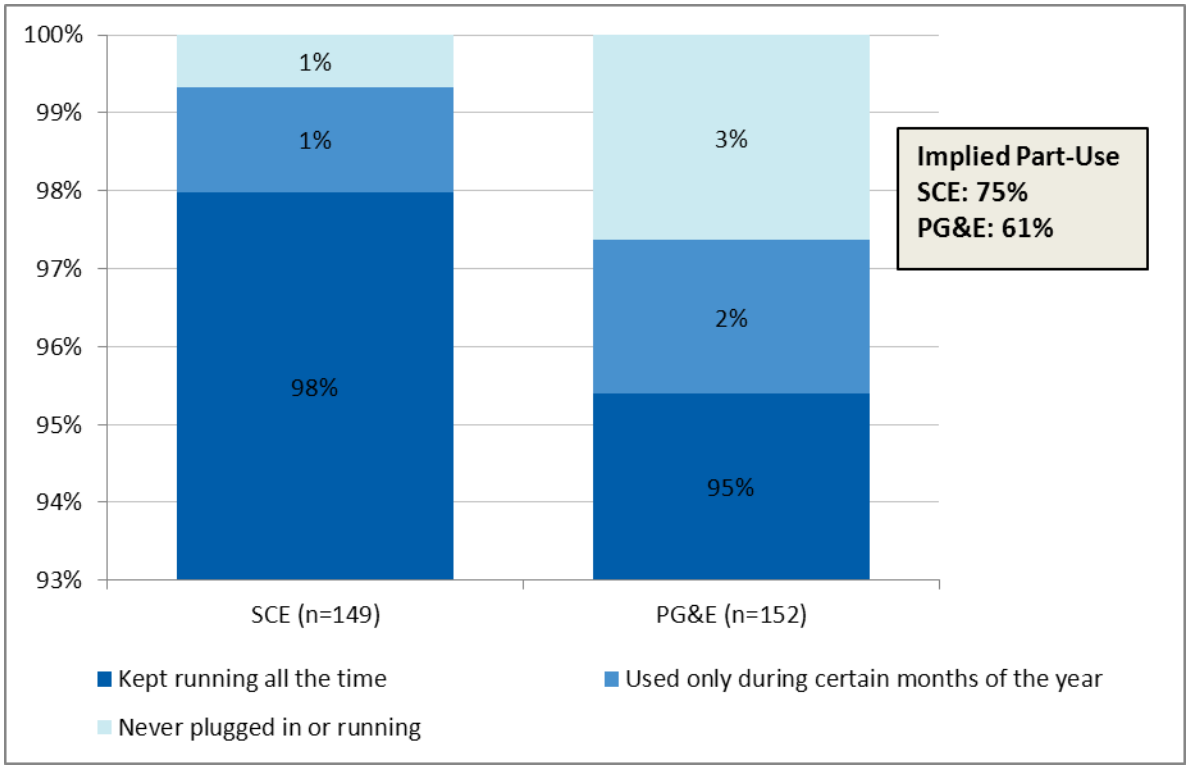
The typical nonparticipating household in SCE territory owned its refrigerator for about 11 years, while the average PG&E household owned its refrigerator for 12 years prior to disposal (as shown in Table C-2). Nonparticipants switching units to secondaries used them as such for just over one-half the time they owned it. The average ages of appliances at the time of disposal were over 13 years for SCE territory respondents and just under 15 years for PG&E territory respondents.

Table C-2. Nonparticipant Disposer Average Years Refrigerator Was in Use

Refrigerator Category	SCE (n=145 overall, n=31 for second)	PG&E (n=151 overall, n=27 for second)
Total	11	12
As second	6	8

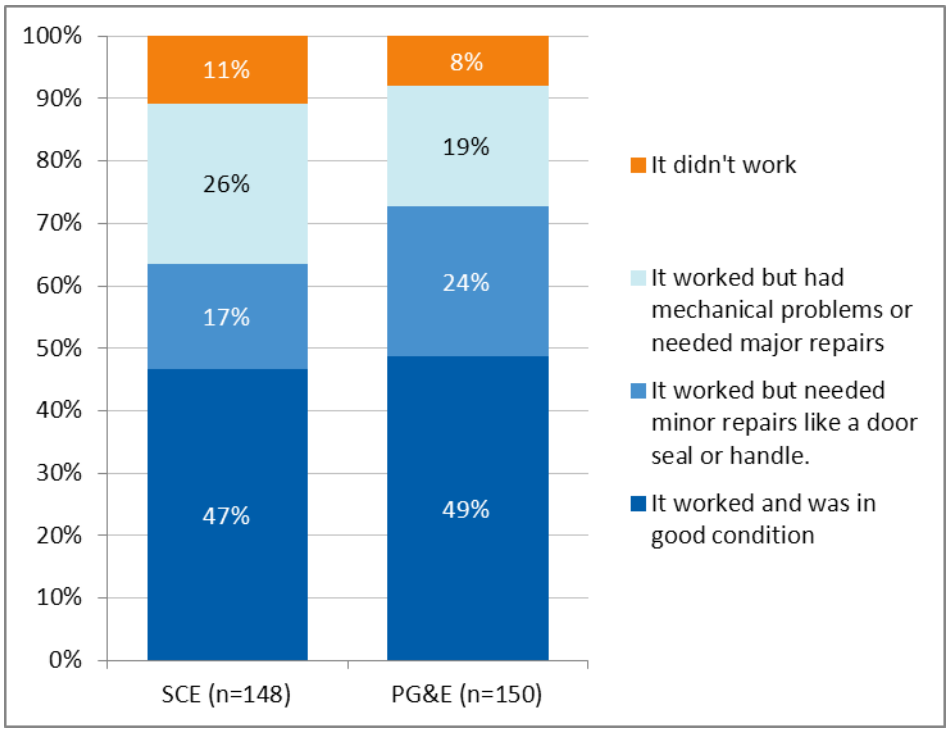
Figure C-2 shows usage patterns (as a percentage of all respondents) for primary and second units, collected from SCE and PG&E territory nonparticipants. Approximately nine out of 10 appliances ran year-round. These usage patterns were very similar to those of participants from the SCE and PG&E ARPs, where approximately nine out of 10 (91% PG&E and 96% SCE) appliances ran year-round.

Figure C-2. Nonparticipant Disposer Part-Use Distributions



As shown in Figure C-3, just under 50% of nonparticipants reported disposing of units in good, working condition. Nonparticipants reported roughly one in five units (26% for SCE, 19% for PG&E) picked up had mechanical problems or needed major repairs. Units with mechanical problems or in need of major repairs could be eligible for recycling through the ARP as long as units continued to provide cooling. According to our survey results, participant and nonparticipant recycled appliances had very similar functionality.

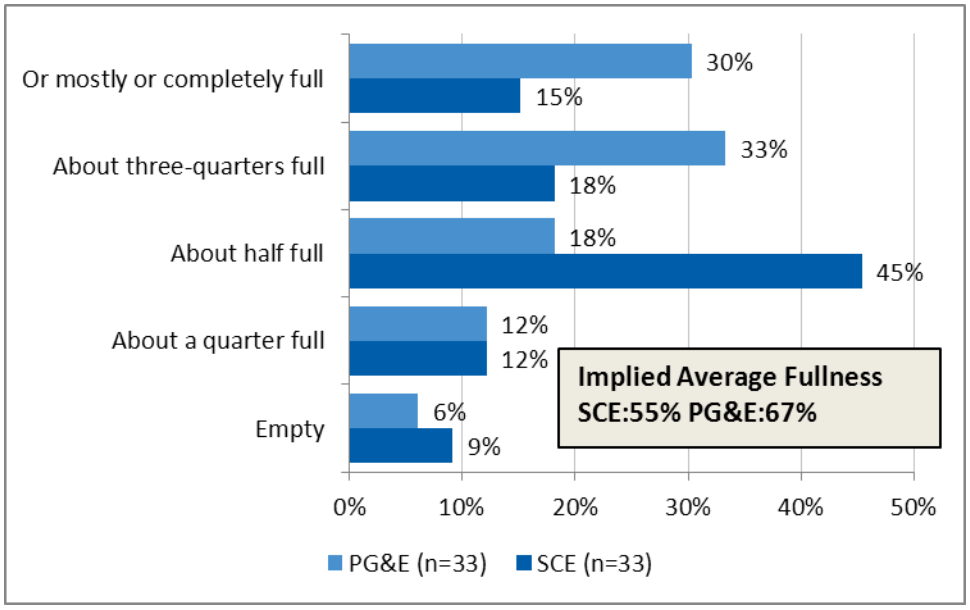
Figure C-3. Nonparticipant Disposer Functionality of Recycled Appliances



Of nonparticipants who said they ran their second appliances for at least part of the year, the majority in SCE's service area (67%) and almost one-third of respondents in PG&E's service area (36%) also said they kept their units half-full or less than half-full (see Figure C-4). Over one-half of SCE and PG&E program participants stated they kept their units half-full or less than half-full.[11]

[11] Cadmus noted a statistically significant difference when comparing the percentage of PG&E participants who kept their units half-full or less than half-full to PG&E territory nonparticipants who kept their units half-full or less than half-full.

Figure C-4. Nonparticipant Disposer How Full Participants Kept Their Disposed Appliance

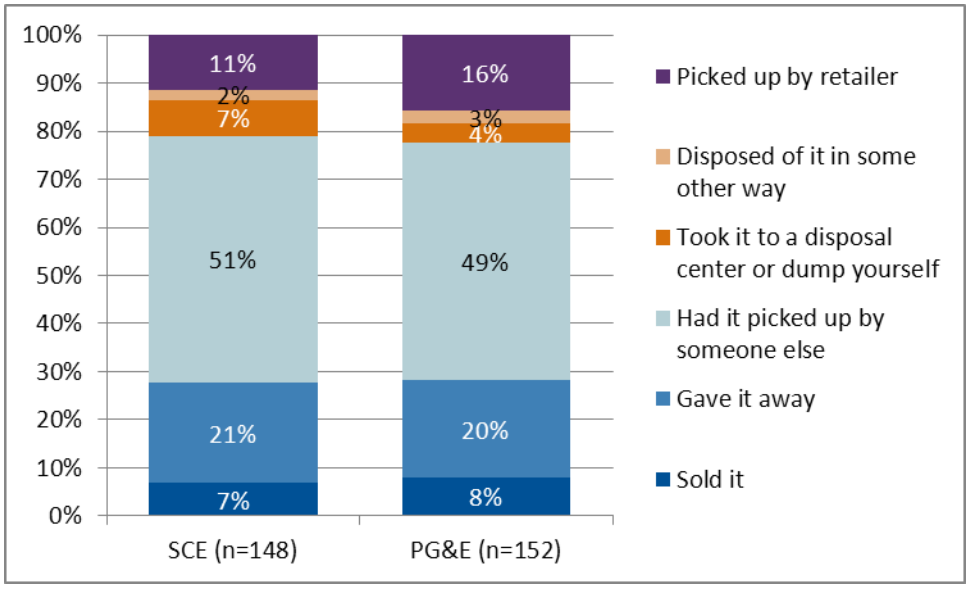


The average fullness of disposed appliances for nonparticipants (SCE: 55% and PG&E: 67%) was similar to the average fullness of second units owned by SCE and PG&E participants (SCE: 55%, PG&E: 53%). The difference in average fullness for participants and nonparticipants was not statistically significant.

C.3 Appliance Disposal Methods

When asked how they disposed of their appliance, SCE and PG&E nonparticipant disposers responded similarly, as shown in Figure C-5.

Figure C-5. Nonparticipant Disposer Disposal Methods

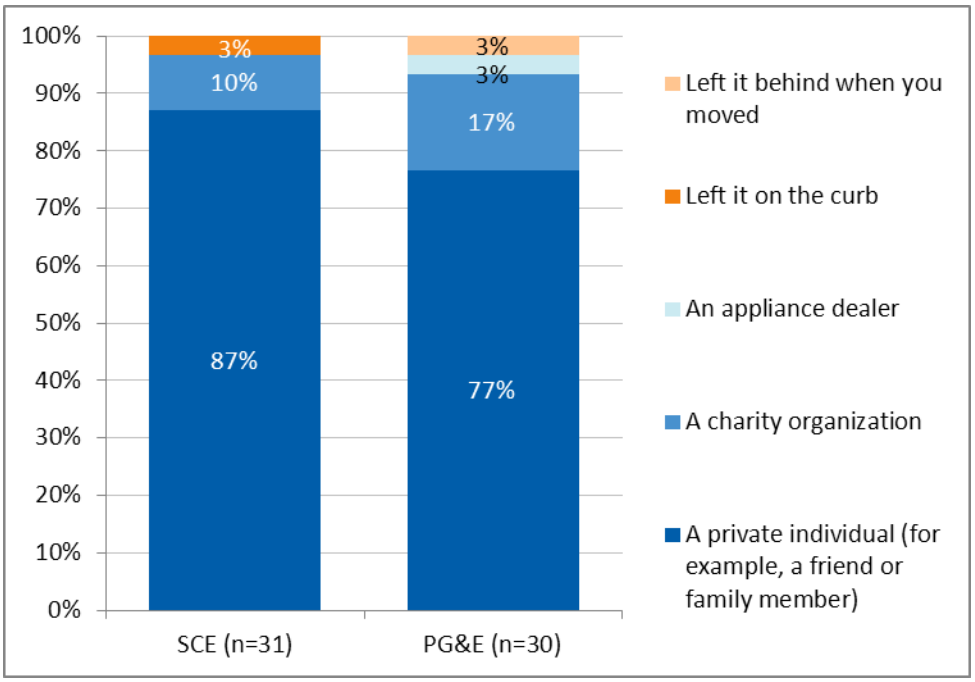


About one-half of SCE and PG&E nonparticipants disposed of their appliances by having someone else pick it up. Results differed from those of the participant survey, where only 11% of SCE participants and 12% of PG&E participants stated they would have had someone else pick up their appliance had they not participated in the program. Of nonparticipants who had their appliances picked up, the majority had their appliance picked up by a delivery service (74% for SCE and 87% for PG&E).

All customers who sold their units did so to a private individual (not a dealer). These respondents received, on average, around $135 for their unit. Around half of nonparticipants (51% for SCE and 43% for PG&E) actually paid to have their units disposed of, paying on average $5 ($4.08 for SCE and $6.15 for PG&E).

As noted in Figure C-6, most nonparticipants (87% for SCE and 77% for PG&E) who gave their appliances away did so by giving it to a friend or relative.

Figure C-6. Nonparticipant Disposer Disposal Methods for Units Given Away



C.4 Appliance Replacement

As shown in Table C-3, a substantial percentage of SCE and PG&E nonparticipants (91% SCE, and 90% PG&E) replaced the disposed appliance. These results do not differ significantly from the participant survey, which showed approximately 86% of SCE participants and 89% of PG&E participants replaced their appliances recycled through the program. Approximately 90% of SCE nonparticipants and 91% of PG&E nonparticipants who replaced their units said they replaced them with new units. Table C-3 also lists other survey responses related to unit replacements.

Table C-3. Nonparticipant Disposer Unit Replacement

Question	Response	SCE	PG&E
Did you replace the <refrigerator/freezer> you disposed of with a different one? (SCE: n=150, PG&E: n=152)	Yes	91%	90%
	No	9%	10%
Was your replacement <refrigerator/freezer> brand new when you got it, or was it used? (SCE: n=136, PG&E: n=137)	New	90%	91%
	Used	10%	9%
Did you get the replacement <refrigerator/freezer> from an appliance dealer (e.g. at either a retail store or on the internet)? (SCE: n=136, PG&E: n=135)	Yes	86%	87%
	No	14%	13%
When you bought the replacement <refrigerator/freezer>, did you talk to the salesperson or dealer about how to dispose of your old <refrigerator/freezer>)? (SCE: n=112, PG&E: n=109)	Yes	53%	53%
	No	47%	47%
Did the sales person tell you about <utility>'s appliance recycling service?* (SCE: n=53, PG&E: n=46)	Yes	17%	24%
	No	83%	76%

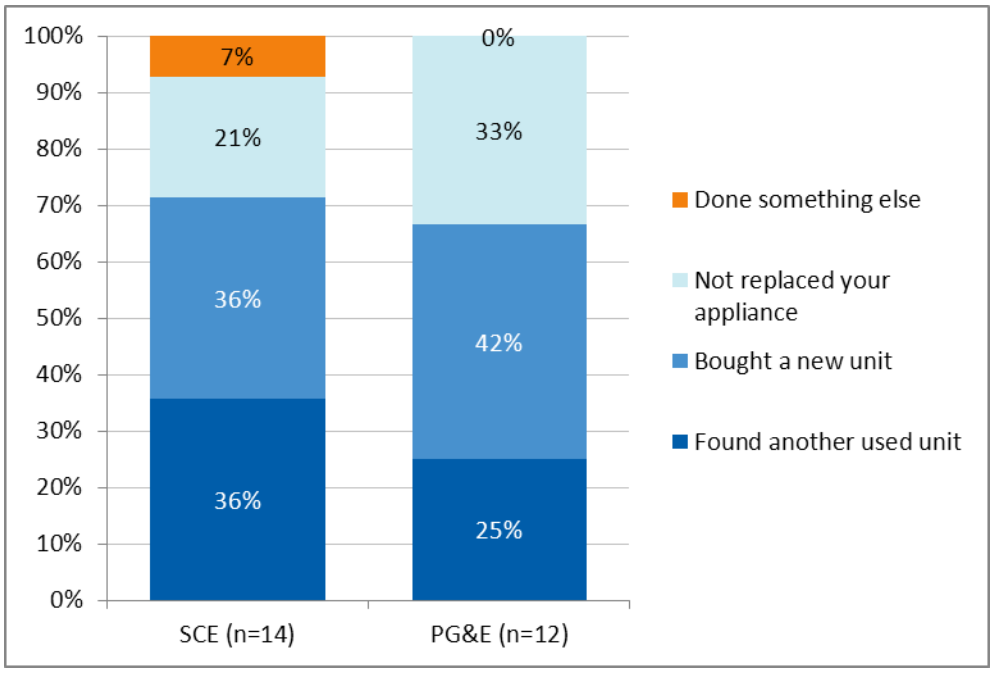
* Differences between utilities were statistically significant with 90% confidence.

Though nonparticipant survey responses for unit replacement largely mirrored responses provided by program participants, Cadmus noted the following, statistically significant differences among respondent groups:

- Among SCE nonparticipants replacing their units, 90% acquired a new (rather than used) unit, versus only 80% of SCE participants who did the same.
- One-hundred percent of SCE participants and 91% of PG&E participants stated a retail sales associate told them about SCE's ARP, while only 17% of SCE nonparticipants and 24% of PG&E nonparticipants stated the same.

Figure C-7 illustrates what nonparticipants (who replaced with a used unit) would have done had their replacement unit not been available. The majority (over two-thirds) of respondents would have still replaced their unit, either by finding another used unit or by buying a new unit. The sample of customers responding to this question is small, so additional research would be required to reliably draw any conclusions on this topic.

Figure C-7. Nonparticipant Disposer Potential Replacement if Used Replacement Unit Unavailable



C.5 Program Awareness

Figure C-8 illustrates the proportion of nonparticipants with knowledge of the ARP prior to the survey call. PG&E nonparticipants were significantly less likely to have heard about the ARP prior to the phone call than SCE nonparticipants.[12] Awareness did not show statistically significant changes from the results of the 2004–2006 CPUC process evaluation, which noted that 60% of SCE nonparticipants and 36% of PG&E nonparticipants had heard of the ARP prior to receiving the survey call.

[12] This difference is statistically significant with 90% confidence.

Figure C-8. Nonparticipant Disposer Percentage of Nonparticipants with Knowledge of IOU ARPs Prior to the Survey Call

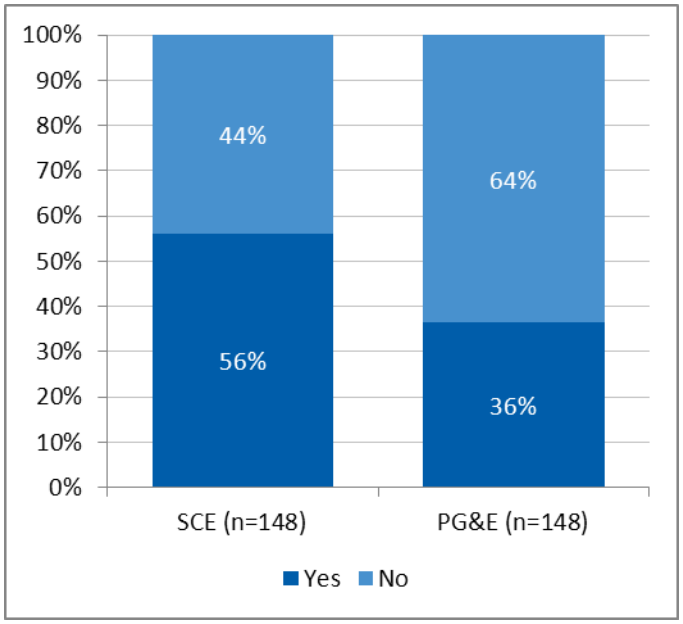


Figure C-9 compares the channels by which nonparticipants learned about the program, per IOU. SCE nonparticipants proved much more likely than PG&E nonparticipants to have learned about the ARP through a bill insert (43% vs. 29%). A greater portion of PG&E nonparticipants (21%) reported learning about the program at an appliance store.

Figure C-9. Nonparticipant Disposer How Nonparticipants First Heard about ARP

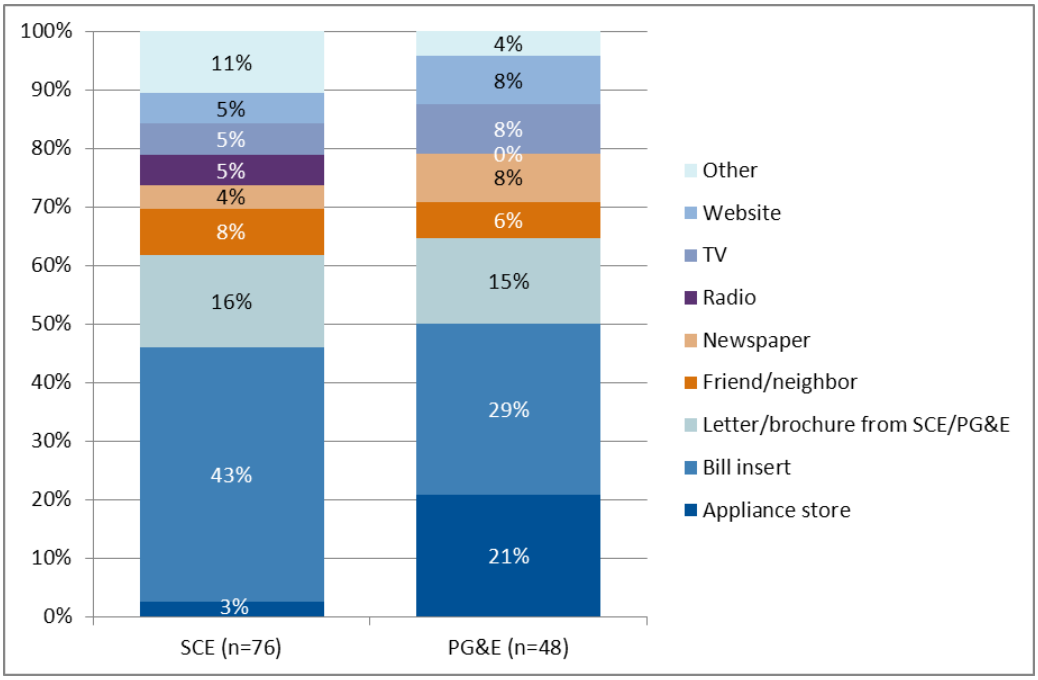
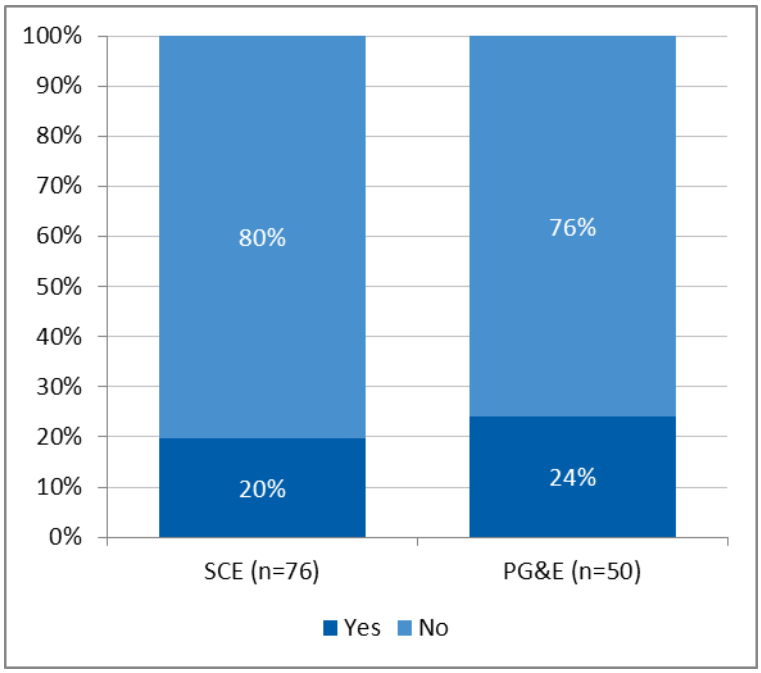


Figure C-10 notes that less than one-quarter of nonparticipants had previously participated in an ARP.

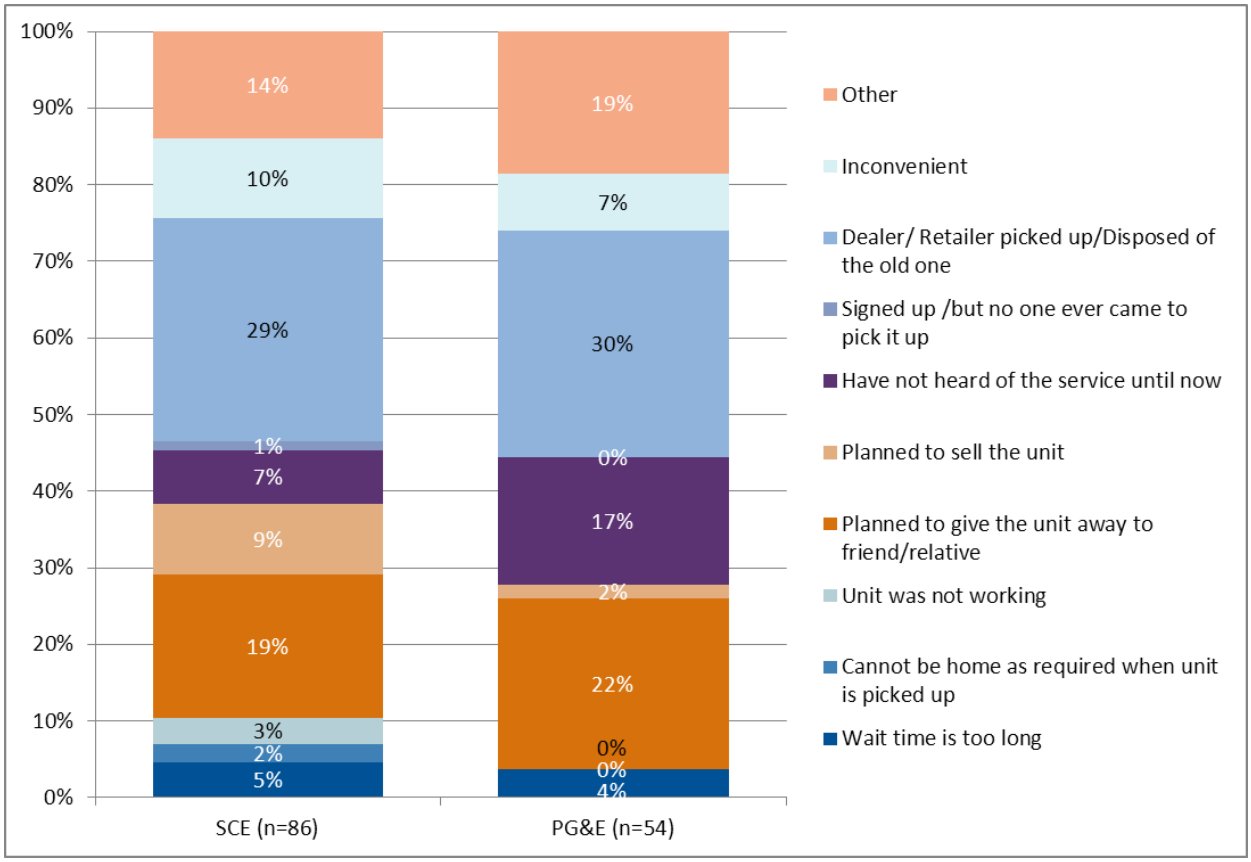
Figure C-10. Nonparticipant Disposer Previous ARP Participation



C.6 Reasons for Not Participating in ARP

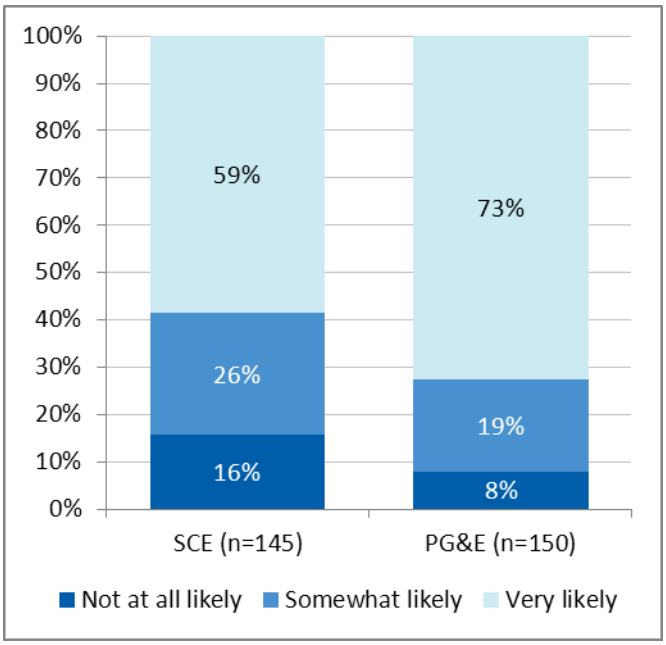
As noted in Figure C-11, around 30% of SCE and PG&E territory nonparticipants cited using a dealer or retailer pick-up service as the reason why they did not participate in the ARP.

Figure C-11. Nonparticipant Disposer Reason for Not Using ARP



A majority of surveyed nonparticipants would use the ARP the next time they disposed of a refrigerator or freezer. As noted in Figure C-12, 85% of SCE nonparticipants and 82% of PG&E nonparticipants would be somewhat likely or very likely to use ARP the next time they must dispose of an appliance.

Figure C-12. Nonparticipant Disposer Likelihood to Participate in ARP



As shown in Figure C-13, 74% of SCE nonparticipants and 66% of PG&E nonparticipants would be more inclined to use the ARP if they received a higher incentive for their appliance (among those who had heard of the program).

Figure C-13. Nonparticipant Disposer Likelihood to Participate with Incentive Higher than Current $35

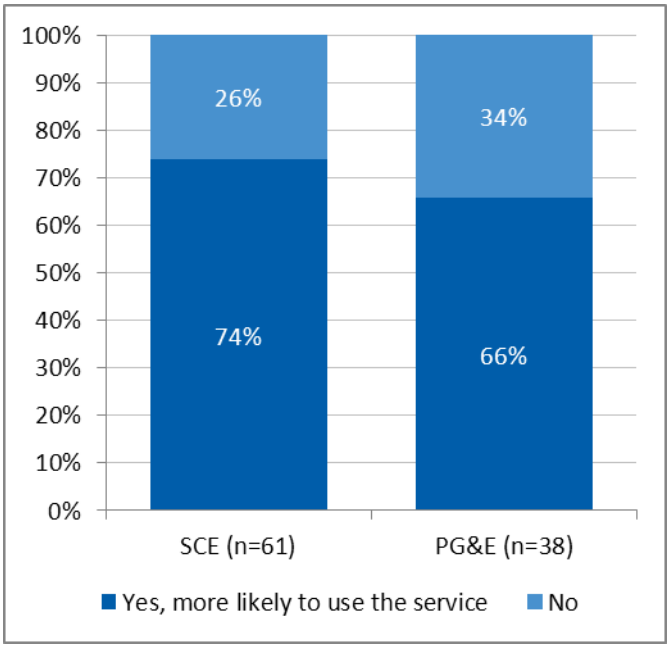
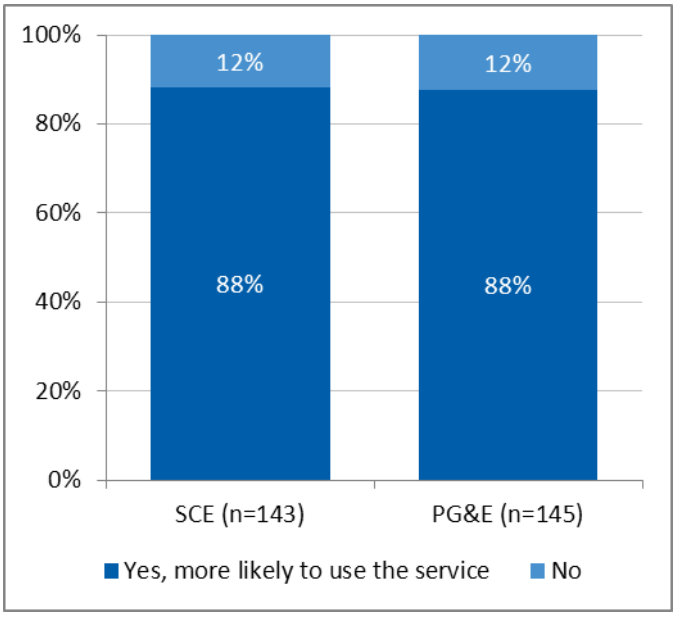


Figure C-14 shows 88% of SCE and PG&E nonparticipants would be more likely to participate in the program if their old unit was picked up at the same time their new unit was delivered.

Figure C-14. Nonparticipant Disposer Likelihood to Participate with Old Unit Picked Up at Time of New Unit Delivery



C.7 Awareness, Knowledge, Attitudes, and Behaviors

The ARP nonparticipant surveys included questions designed to inform our understanding of nonparticipant awareness, knowledge, attitudes, and behaviors (AKA-B) about the program. Cadmus adopted the AKA-B/segmentation battery from the 2011 General Population Survey Instrument, adapting questions as necessary to collect information specific to ARPs. Questions specifically referring to the ARPs were only asked of customers who were aware of the programs.

As shown in Table C-4, a majority of nonparticipants knew appliances could have a high cost in terms of electric consumption. A majority also reported knowing appliances could be harmful to the environment if not properly disposed of, but less than one-half knew the ARP recycling services took care of hazardous materials. Most (72% SCE, and 75% PG&E) did not know the recycling program almost eliminated materials going to landfills.

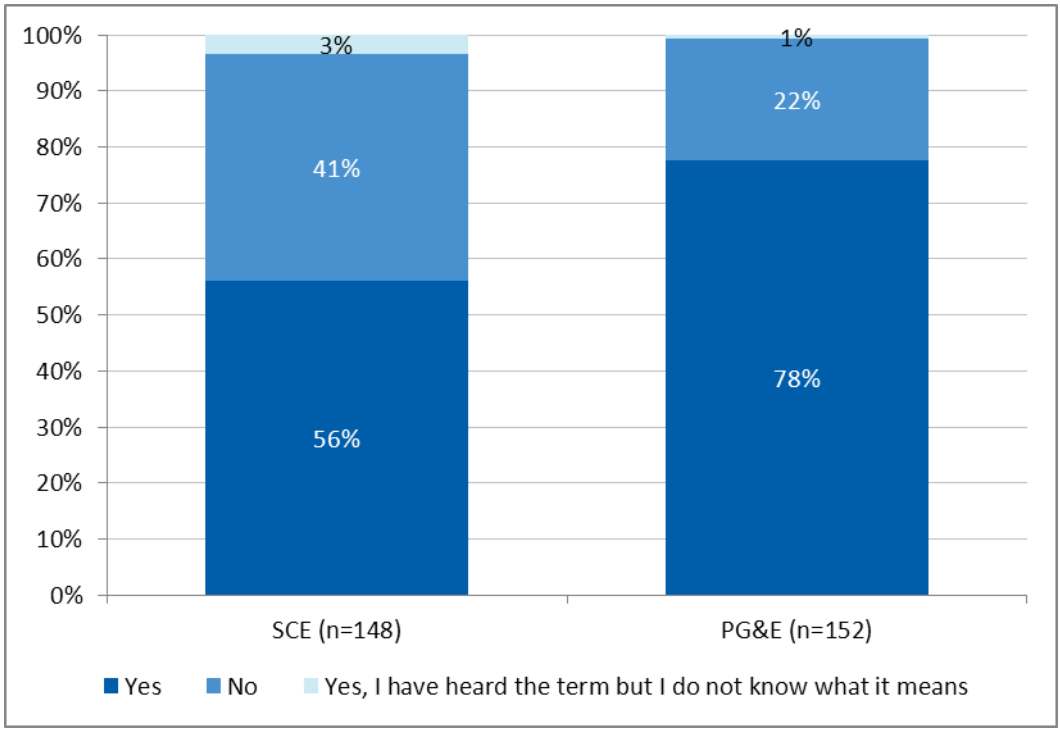
Table C-4. Nonparticipant Disposer Awareness of ARP Benefits*

Question	Response	SCE	PG&E
A refrigerator or freezer in your home can cost up to $180 a year for electricity? (SCE: n=145, PG&E: n=148)	Yes	71%	67%
	No	29%	33%
Refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of? (SCE: n=146, PG&E: n=151)	Yes	77%	81%
	No	23%	19%
Under the ARP, the units would be completely taken apart and the metals and glass recycled? (SCE: n=82, PG&E: n=53)	Yes	43%	34%
	No	57%	66%
Under the ARP, Coolant, motor oil, and insulation that might contain hazardous materials would be removed, and recycled or destroyed? **(SCE: n=82, PG&E: n=53)	Yes	44%	25%
	No	56%	75%
Under the ARP, almost none of the material from the units would go to a land fill? (SCE: n=81, PG&E: n=51)	Yes	28%	25%
	No	72%	75%

*The percentage of "no" responses includes "don't know" responses. "Refused" responses were removed.
** Differences between utilities were statistically significant with 90% confidence.

As shown in Figure C-15, a significantly higher (with 90% confidence) proportion of PG&E participants than SCE participants recognized the term "carbon footprint" (78% and 56%, respectively).

Figure C-15. Nonparticipant Disposer Awareness of "Carbon Footprint"



To learn about nonparticipants' energy-saving behaviors, survey questions asked respondents about household actions they had taken to conserve energy. Table C-5 presents the percentage of each IOU's nonparticipants who adopted various energy-saving measures. A significantly greater percentage of PG&E nonparticipants installed a programmable thermostat. A higher proportion of PG&E participants also reported installing motion detectors for lights. These differences may be due partly to differences in building stocks between the sets of nonparticipants, as PG&E nonparticipants were more likely to live in single-family, detached housing.

Table C-5. Nonparticipant Disposer Adopted Energy-Saving Actions

Measure	Installed?	SCE	PG&E
Programmable thermostats*(SCE: n=146, PG&E: n=150)	Yes, installed it myself or had it installed	45%	72%
	No	44%	19%
	Came with the house	12%	9%
Ceiling fans (SCE: n=149, PG&E: n=152)	Yes, installed it myself or had it installed	72%	65%
	No	21%	28%
	Came with the house	7%	7%
Motion detectors for lights* (SCE: n=149, PG&E: n=152)	Yes, installed it myself or had it installed	34%	45%
	No	62%	53%
	Came with the house	3%	1%

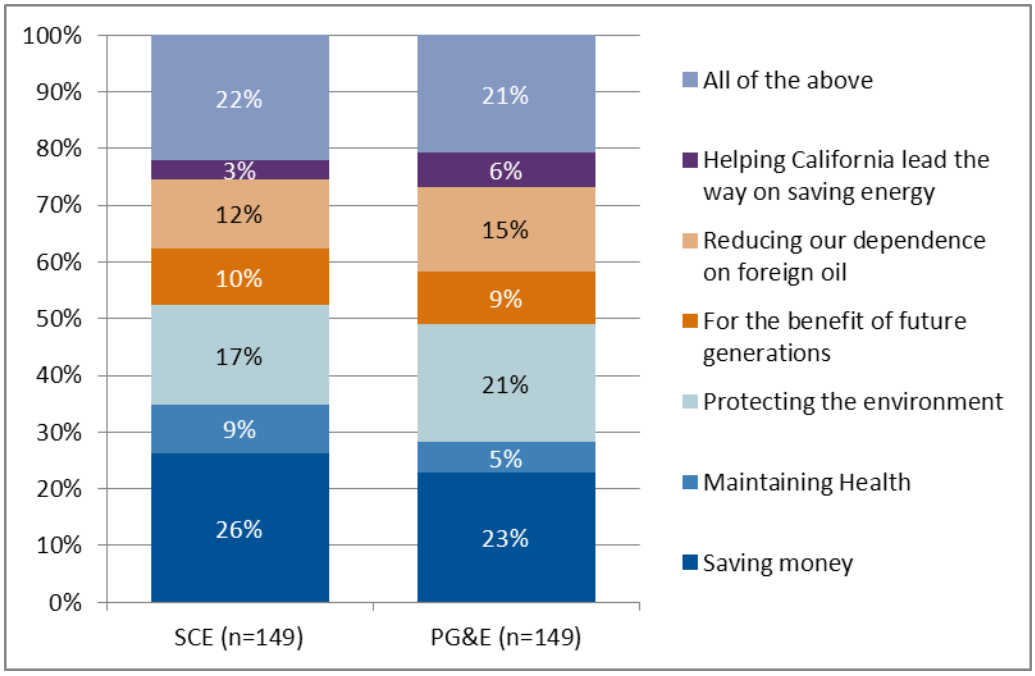
* Difference between utilities statistically significant with 90% confidence.

On a scale of 1 to 7, with 1 meaning strongly disagree and 7 meaning strongly agree, the survey asked respondents the degree that they agreed or disagreed with two statements. SCE and PG&E participants responded similarly:

- ***I compare prices of at least a few brands before I choose:*** 88% of SCE and PG&E customers agreed, rating the statement a six or higher.
- ***I do NOT feel responsible for conserving energy because my personal contribution is very small***: 15% of SCE and 6% of PG&E customers rated the statement a six or higher.

The survey provided participants from each IOU listed six reasons why people might change their daily actions to save energy. As shown in Figure C-16, when asked which of these actions would most motivate them to save energy, nonparticipants most frequently reported saving money (26% SCE and 23% PG&E) as their primary motivations to save energy.

Figure C-16. Nonparticipant Disposer Motivations to Change Daily Actions to Save Energy



C.8 Customer Demographics

Surveyed nonparticipants primarily spoke English (95%) in their home, though may be due partly to surveys being administered only in English. The majority of nonparticipants described their race as white: 70% for SCE, and 89% for PG&E. When asked about ethnicity, 21% of SCE and 9% of PG&E territory nonparticipants stated they were Spanish, Hispanic, or Latino.

SCE and PG&E nonparticipants reported similar education and income levels. As shown in Figure C-17, about one-half of all surveyed nonparticipants (48% for SCE, and 59% for PG&E) reported earning a college degree.

Figure C-17. Nonparticipant Disposer Educational Attainment of Participants

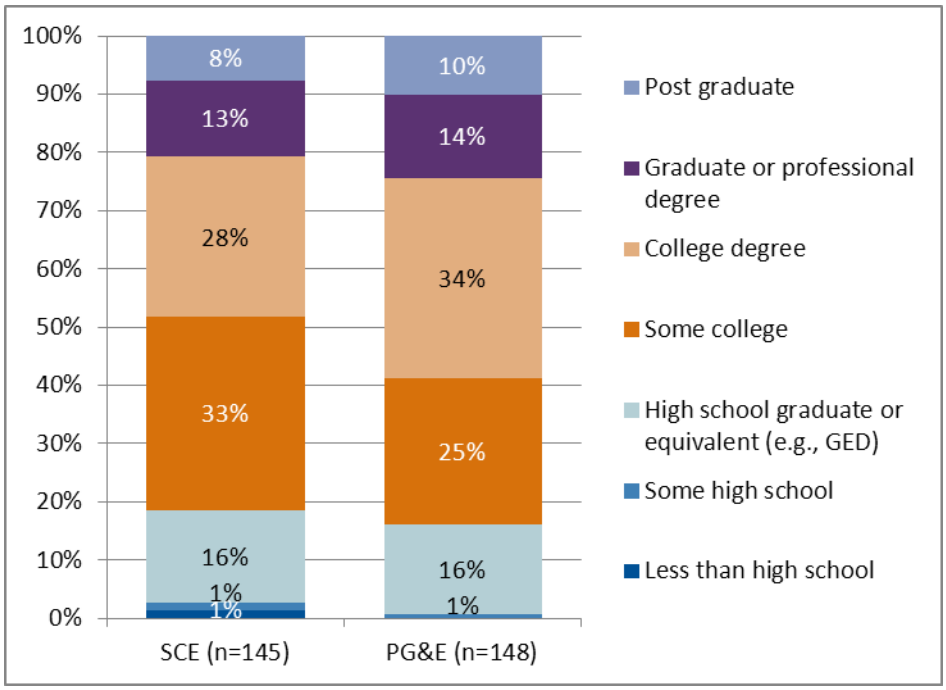
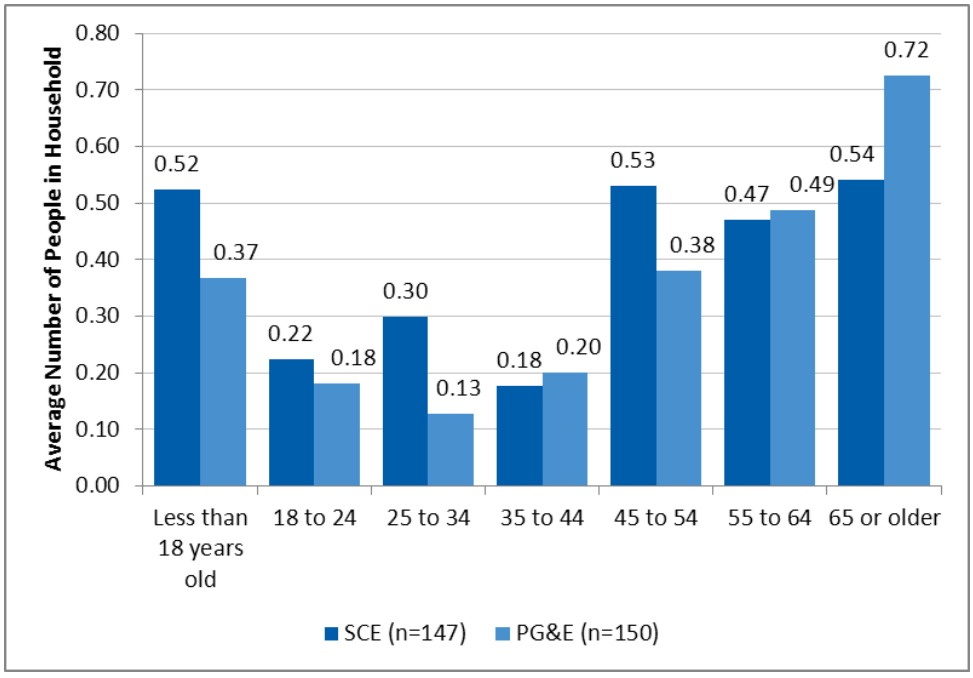


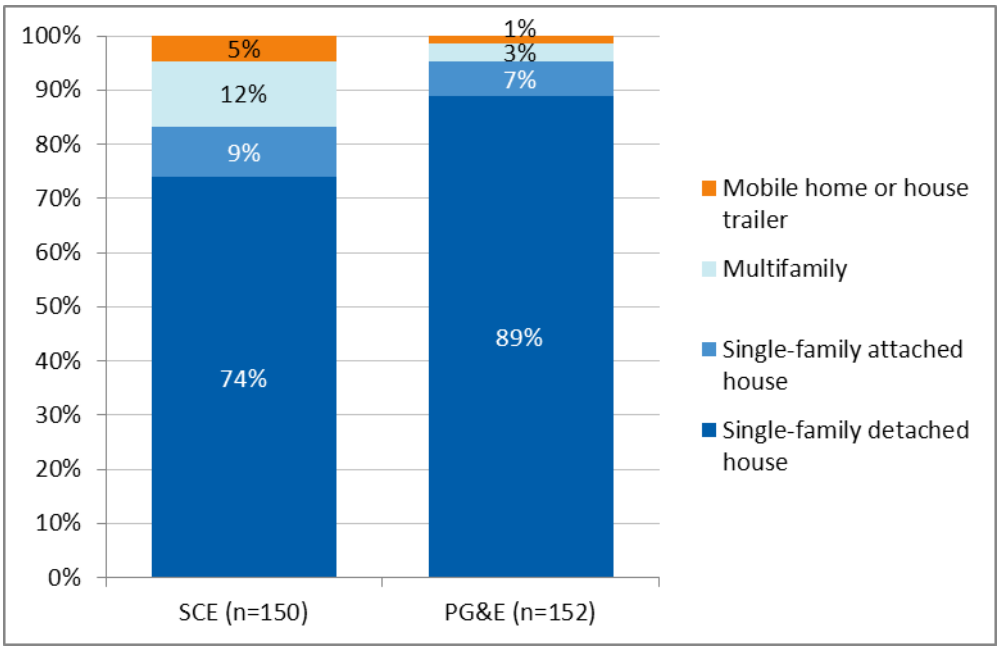
Figure C-18 shows the reported number of people living in nonparticipant households, by their respective age groups. Average nonparticipant households in SCE's program territory had 2.8 people, while average PG&E nonparticipant households had 2.7 people.

Figure C-18. Nonparticipant Disposer Number Residents Living in Nonparticipant Households, by Age Group



Fewer SCE than PG&E territory nonparticipants reported living in single-family, detached housing, as shown in Figure C-19. SCE's program nonparticipants also were significantly less likely to own their homes than nonparticipants in PG&E's program (74% for SCE versus 89% for PG&E).

Figure C-19. Nonparticipant Disposer Housing Type



As shown in Table C-6, the average nonparticipant home in both jurisdictions had approximately three bedrooms, and had been occupied for 18 to 20 years. More than two-fifths of nonparticipants (45% for SCE, and 43% for PG&E) had remodeled their home during the past five years.

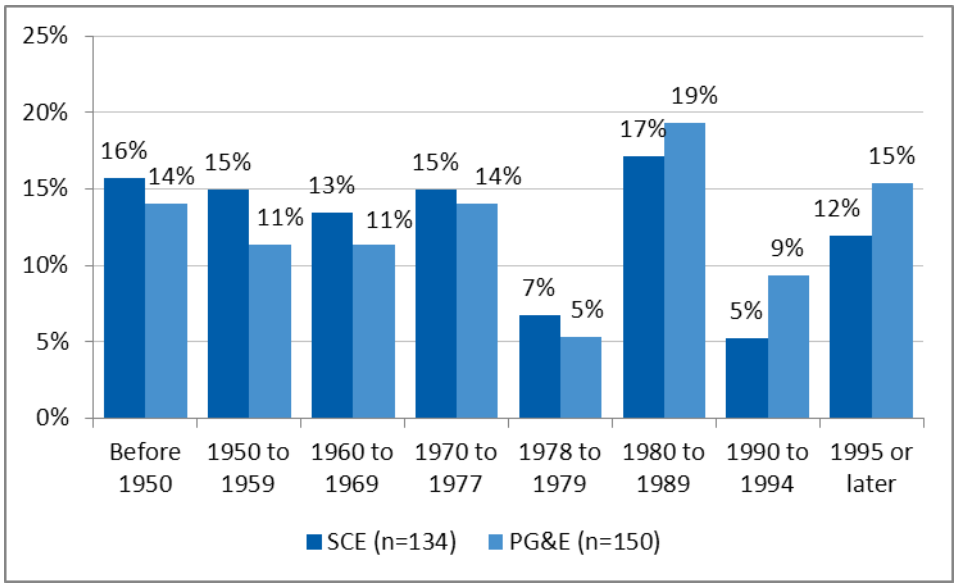
Table C-6. Nonparticipant Disposers' Length of Residence in Their Current Location

Home Characteristic	SCE (n=150)	PG&E (n=151)
Number of bedrooms*	3.21	3.24
Number of years in home	18.15	19.79

* n=149 for PG&E territory responses

Figure C-20 shows vintage distributions of nonparticipant housing stock, indicating the percentage of homes built during each decade. According to respondents, more nonparticipant homes were built during the 1980s than in other decades.

Figure C-20. Nonparticipant Disposer Home Vintage



C.9 Comparison to RASS

Nonparticipant disposer demographics differed from the general population across several characteristics. Comparing these demographics to the 2009 California RASS (shown in Table C-7) shows nonparticipants often had smaller households. Surveyed PG&E nonparticipants were more likely to live in single-family homes than the general population of PG&E residential customers. Notably, even after disposing of their appliances, surveyed nonparticipants had higher saturations of second refrigerators and freezers than the general population.

Table C-7. Nonparticipant Disposer Comparison to 2009 RASS*

Variable	SCE		p-value	PG&E		p-value
	Survey	RASS		Survey	RASS	
HH size	2.79	3.09	0.01	2.51	2.78	0.00
Proportion in Single-Family	0.74	0.74	0.48	0.89	0.74	0.00
Second Refrigerator Saturation	0.31	0.18	0.00	0.34	0.25	0.01
Standalone Freezer Saturation	0.29	0.12	0.00	0.38	0.22	0.00

*Assuming a CV of 0.5 for RASS household sizes, as the report did not present standard deviations.
A p-value less than 0.10 indicates that, with 90% confidence, the two results differ.

D. DETAILED SECOND APPLIANCE OWNER SURVEY FINDINGS

D.1 Introduction

As part of the process evaluation of SCE's and PG&E's 2010–2012 ARP, Cadmus surveyed a sample of SCE and PG&E ARP customers who own a second refrigerator or freezer. Table D-1 shows the number of targeted and completed surveys for each IOU.

Table D-1. Second Appliance Owner Summary of Interviews

IOU	Target Completes	Achieved Completes
SCE	200	200
PG&E	200	200
Total	400	400

The surveys explored the following key topics:

- Characteristics of customers' second appliances;
- Consideration of and experience with disposal;
- Program awareness;
- Motivation for possible future participation;
- Attitudes, knowledge, and awareness of program benefits and energy-efficiency in general;
- Motivations to save energy; and
- Participant demographics and home characteristics.

This appendix summarizes the information Cadmus learned about SCE's and PG&E's ARPs through our analysis of second appliance owner survey data. We note differences between the utilities only when they prove statistically significant with 90% confidence.

D.2 Characteristics of Second Appliances

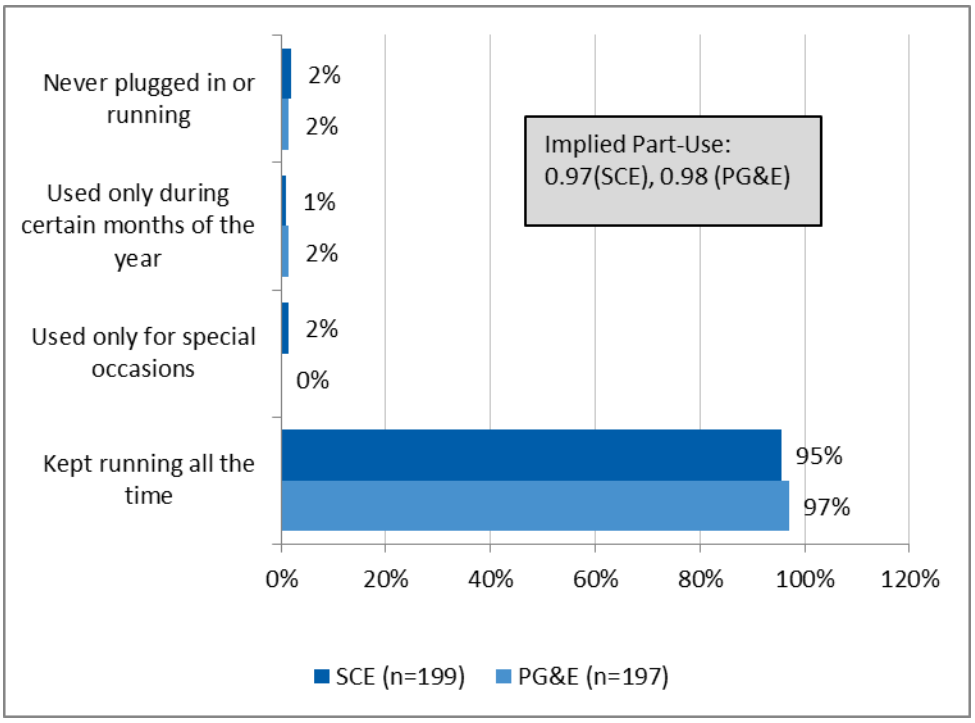
As shown in Table D-2, nearly all survey respondents (99.5%) owned a second refrigerator, and roughly one-half had a standalone freezer. The survey asked respondents to discuss only one appliance; 80% and 75% elected to discuss refrigerators for SCE and PG&E respectively, while the remainder discussed their freezers.

Table D-2. Second Appliance Owner Appliance Saturations

Appliance Type	SCE (n=200)	PG&E (n=200)
Refrigerator	99.5%	99.5%
Freezer	45.5%	60.0%

When asked how often their appliance remained plugged in, nearly all respondents said they plugged it in all the time (see Figure D-1). Along with Figure D-5, this demonstrates many second appliance owners may operate their older second appliances year-round, representing substantial energy consumption.

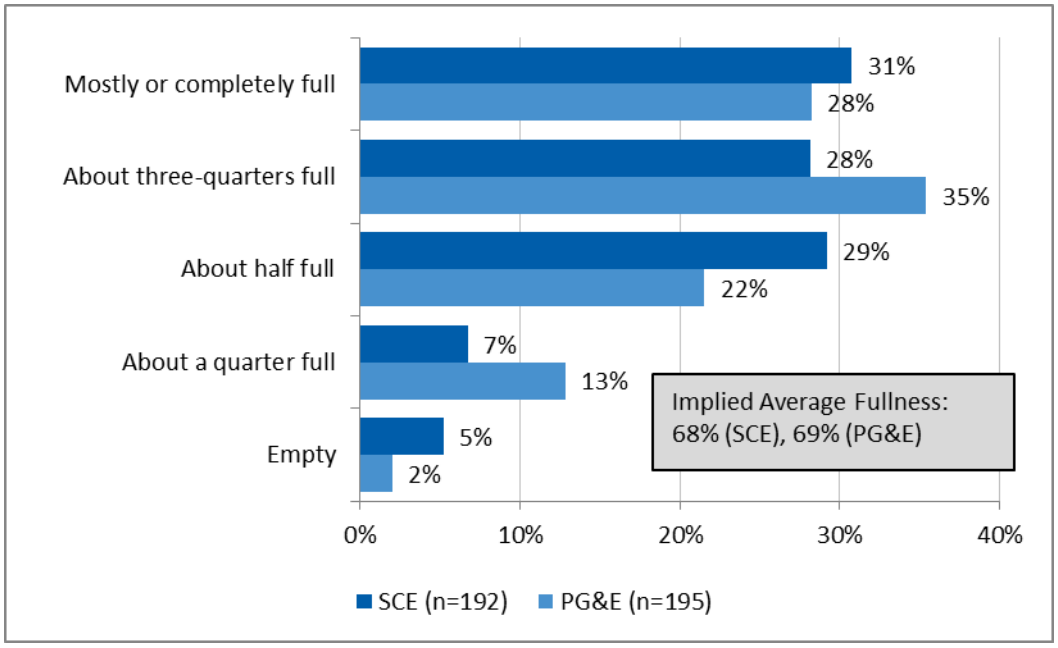
Figure D-1. Second Appliance Owner Part-Use Distributions*



*Data were missing on the average number of months customer used units only for certain months or special occasions. Therefore, Cadmus used the average from the participant surveys for this category of respondents to calculate part-use. As only a small portion of respondents used their units only part of the time, this substitution has a minimal effect on the estimate's accuracy.

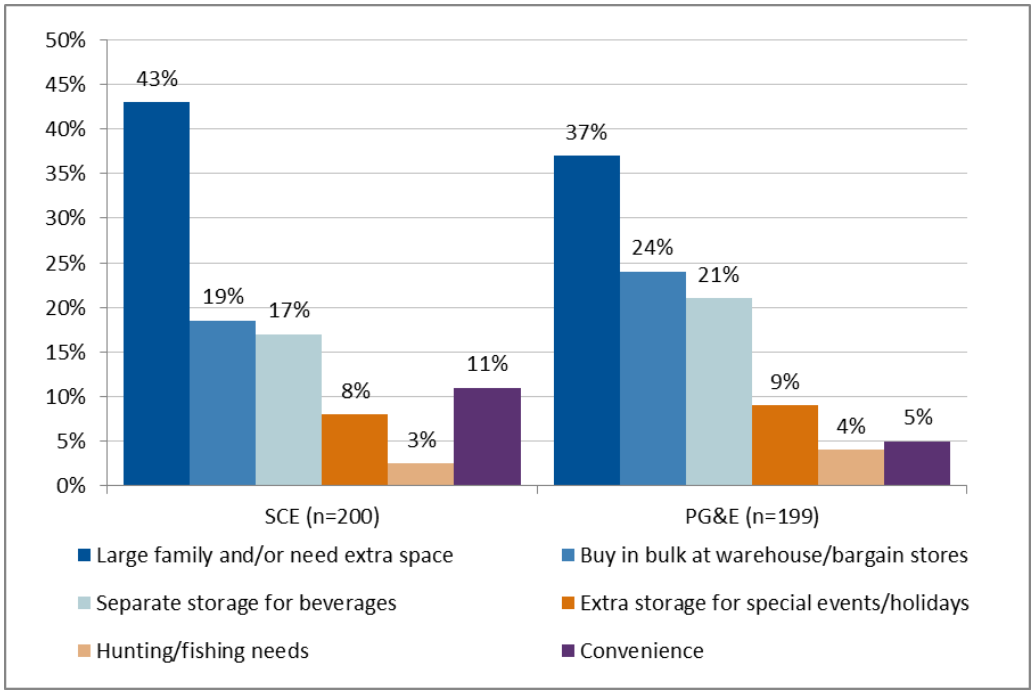
Surveyed customers reported their second refrigerators and freezers as almost 70% full, on average. Figure D-2 shows few of both utilities' customers reported their second appliances as empty, which stands in contrast to participants' usage, with the average fullness closer to 50% for both utilities.

Figure D-2. Second Appliance Owner Appliance Fullness



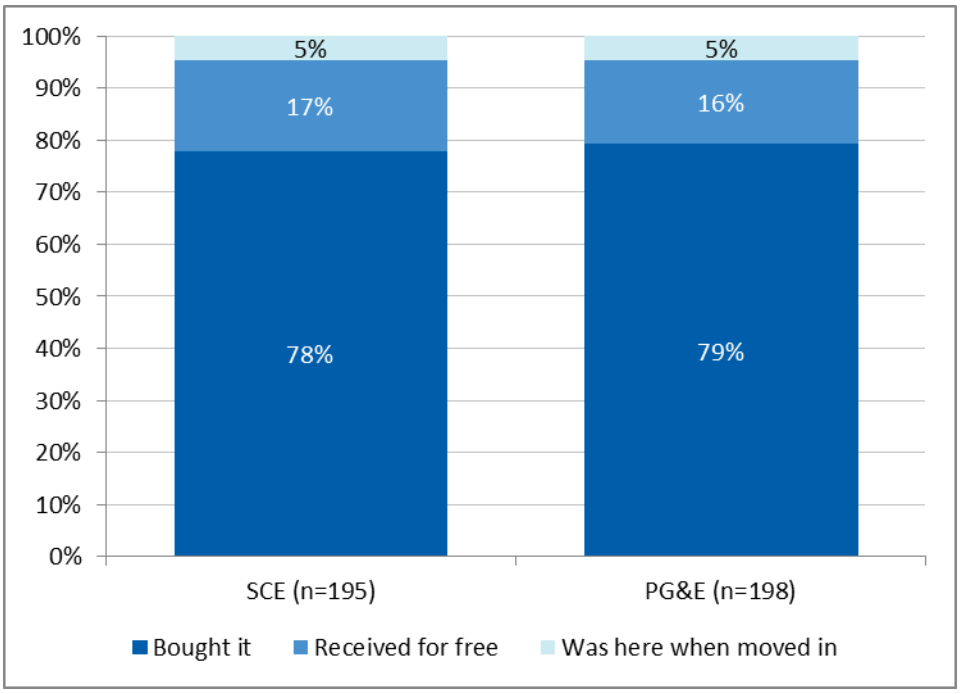
As shown in Figure D-3, customers said they used their second appliances because: they required more storage for a large family (43% SCE, 37% PG&E); they bought in bulk (19% SCE, 17%); or they preferred having separate storage for beverages.

Figure D-3. Second Appliance Owner Reason for Using Second Appliance (Multiple Responses Allowed)



When asked how they procured their second appliance, almost 80% of each utility's customers said they bought it, and the rest received it for free or already had the appliance in their home when they moved in.

Figure D-4. Second Appliance Owner Method of Acquiring Appliance



Of the majority of survey respondents saying they bought their second appliance, 88% of SCE and 91% of PG&E customers purchased it from a retail store. This indicates a majority of second appliance buyers could be reached through contacts at appliance retail stores.

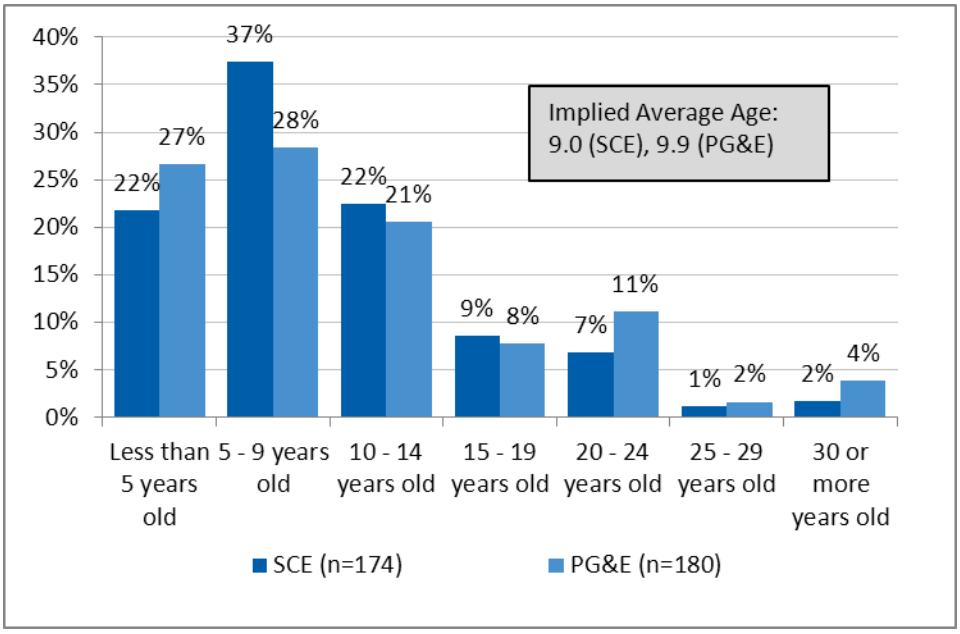
Table D-3 shows where respondents obtained their appliances, and whether they purchased a new or used appliance. Most (86% SCE, 89% PG&E) respondents bought their appliances new, with almost all purchased at a retail store; less than one-quarter of respondents purchased used appliances from retail stores.

Table D-3. Second Appliance Owner Unit Vintage on Purchase and Source

SCE (N=173)	Dealer/Retail Store	Individual/Private Party	Total
New	84%	2%	86%
Used	3%	10%	14%
PG&E (N=177)	**Dealer/Retail Store**	**Individual/Private Party**	**Total**
New	88%	1%	90%
Used	3%	7%	10%

Figure D-5 shows most second appliances in both utility territories at less than 14 years old, with the average age between nine (for SCE) and 10 (for PG&E) years old. For SCE, respondents reported 19% of units to be 15 years old or more, while 25% of PG&E appliances did so.

Figure D-5. Second Appliance Owner Reported Appliance Age



Program Awareness and Previous Disposal Service Experience

Regarding program awareness, 75% of SCE respondents reported knowing of the utility's ARP, and 53% of PG&E customers knew of it.

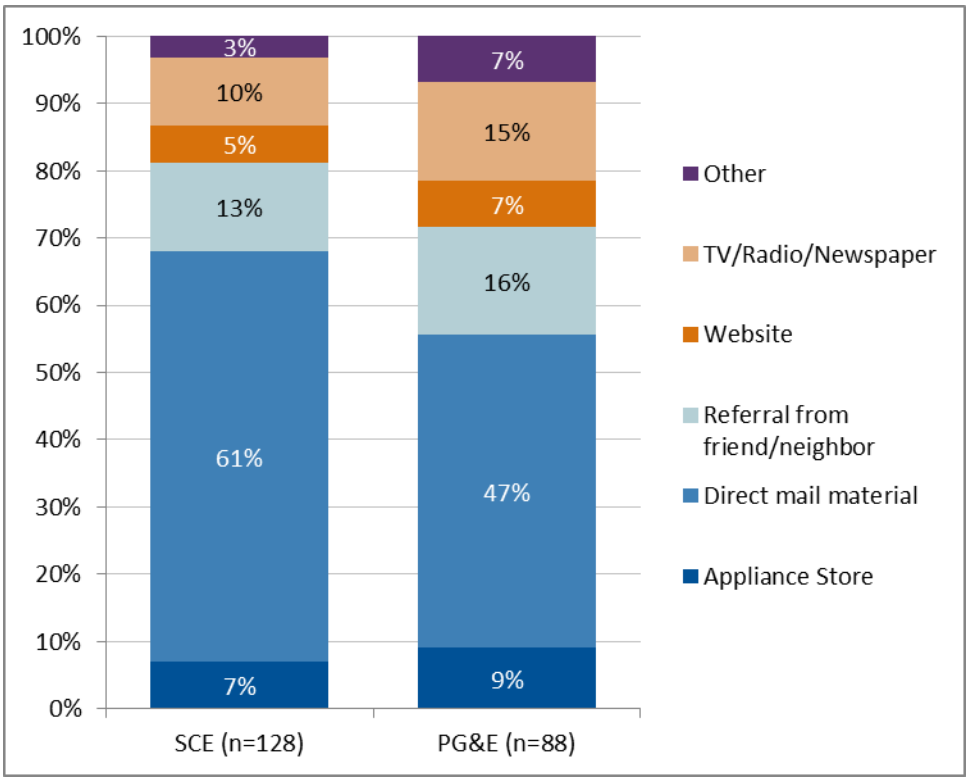
Table D-4. Second Appliance Owner Awareness of ARP Removal Service

Question	Response	SCE	PG&E
(SCE/PG&E)'s service helps save energy by removing and recycling unwanted or out of date appliances. Do you recall hearing about this service before today?*	Yes	75%	53%
(SCE: n=195, PG&E: n=197)	No	25%	47%

* Difference between utilities statistically significant with 90% confidence.

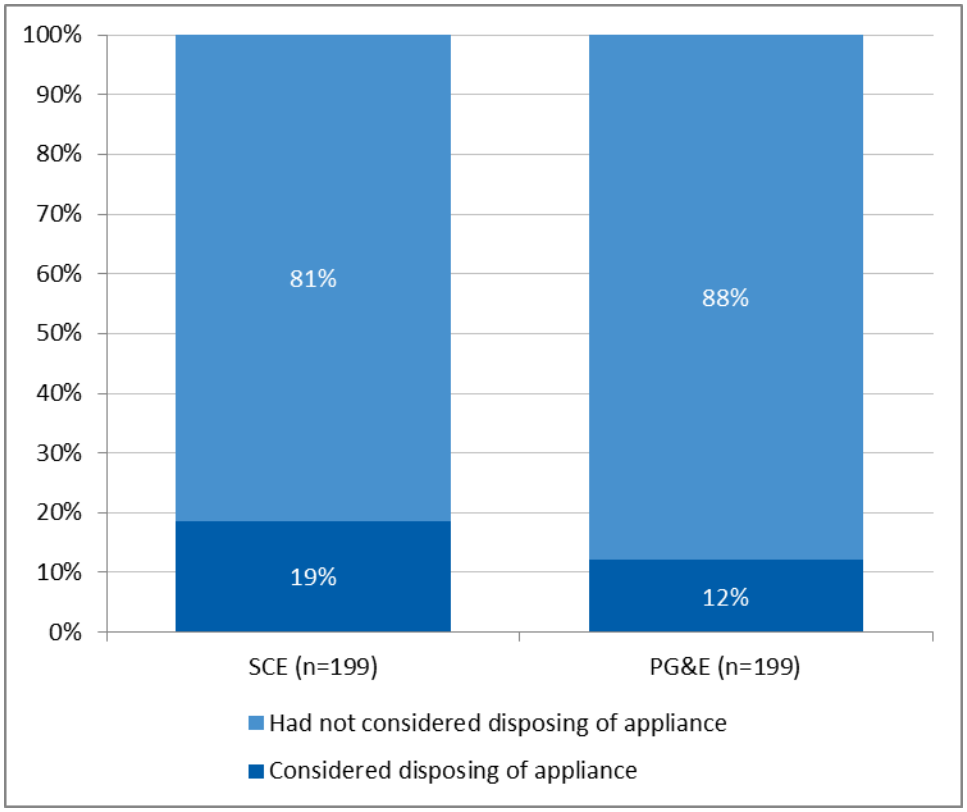
Of those reporting awareness of the program, most (61% SCE, 47% PG&E) learned of it through direct-mail material sent by the utility. Figure D-6 shows the complete breakdown of responses.

Figure D-6. Second Appliance Owner Sources of Program Awareness



As shown in Figure D-7, most respondents had not considered disposing of their second appliance. This segment most likely would be the intended target population for a subprogram aimed at removing second appliances from use.

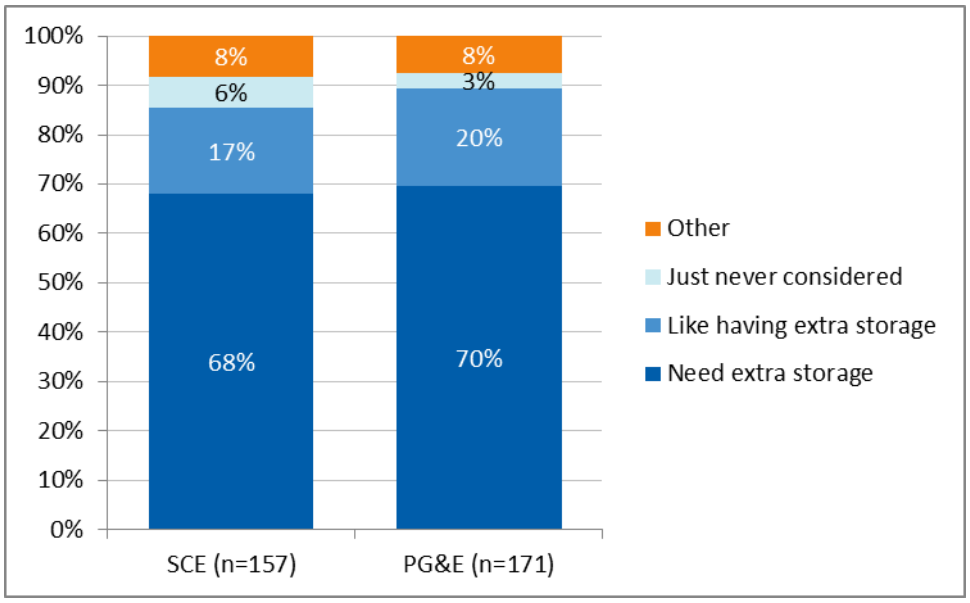
Figure D-7. Second Appliance Owner Consideration of Appliance Disposal*



* Difference between utilities statistically significant with 90% confidence.

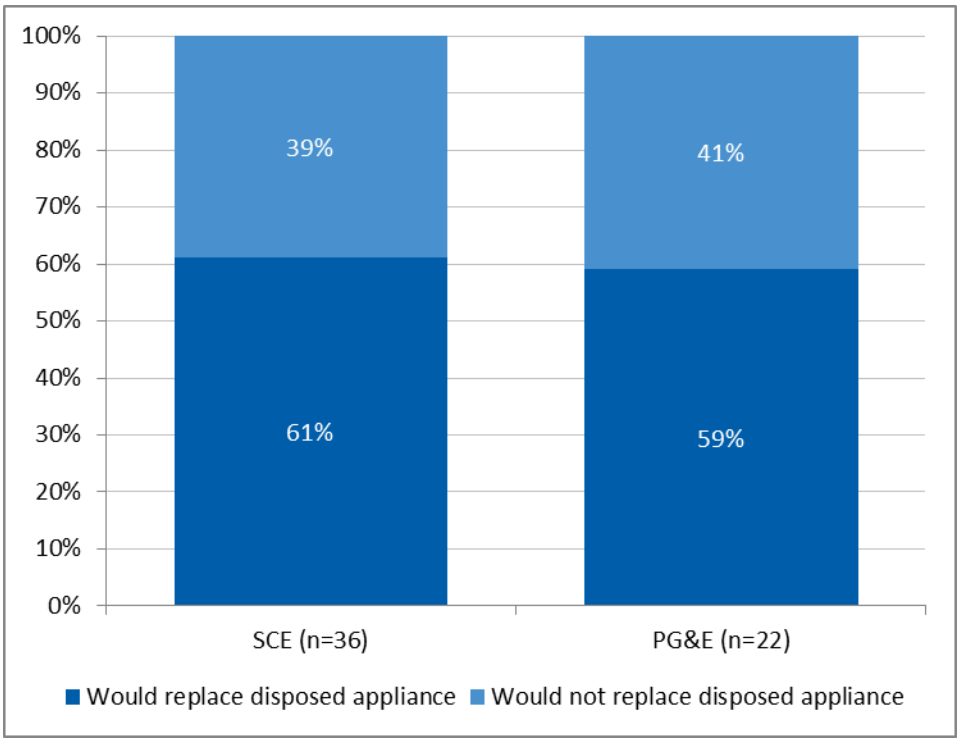
As shown in the Figure D-8, of the respondents who had not considered disposing of their appliance approximately 70% reported needing additional storage. Another 20% respondents stated they simply liked having additional storage.

Figure D-8. Second Appliance Owner Reason for Not Considering Disposal



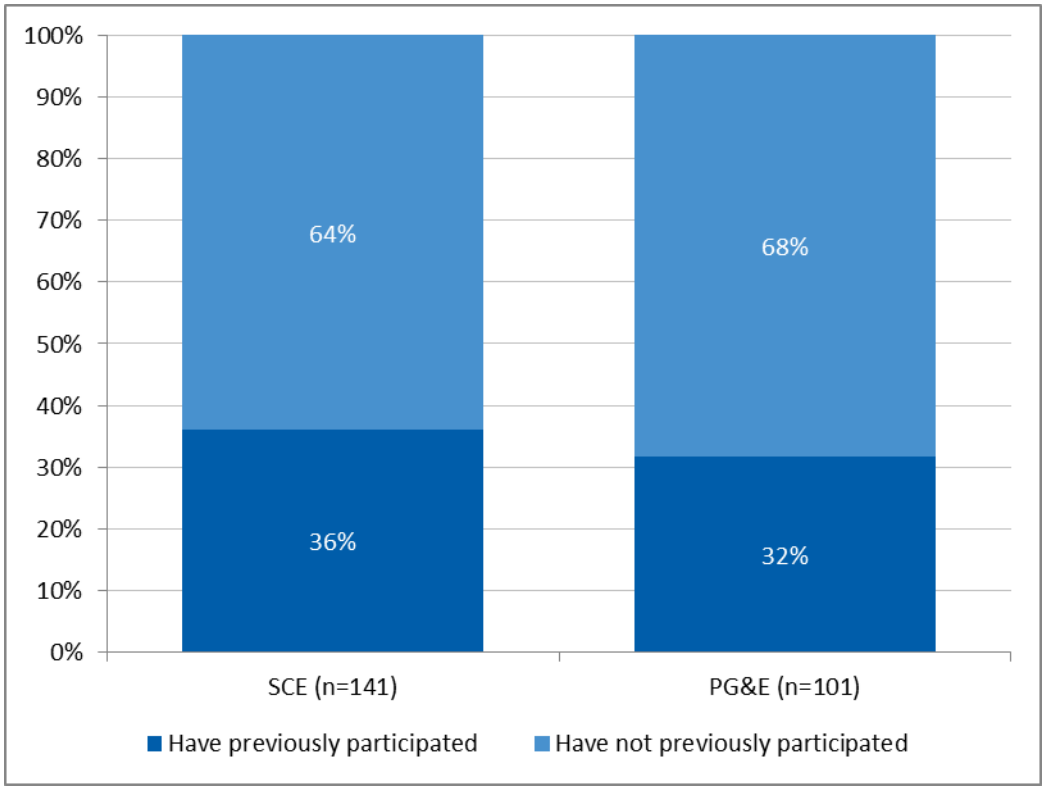
About 60% of those reporting they considered disposing of their appliance said they would consider procuring another second appliance upon disposing of their original one (as shown in Figure D-9). The remaining 40% that would not replace their second appliance represent possible future participants in standard ARP offerings.

Figure D-9. Second Appliance Owner Consideration of Replacement in Case of Disposal



Of respondents who knew of ARP, about one-third said they had participated in the ARP program previously, while the remaining customers had not done so (as shown in Figure D-10).

Figure D-10. Second Appliance Owner Previous ARP Participation



Of those saying they had used the ARP previously, over 80% of the SCE customers said they had participated more than two years ago, while just over one-half of PG&E customers said they had participated more than two years ago.

Figure D-11. Second Appliance Owner Time of Last Participation

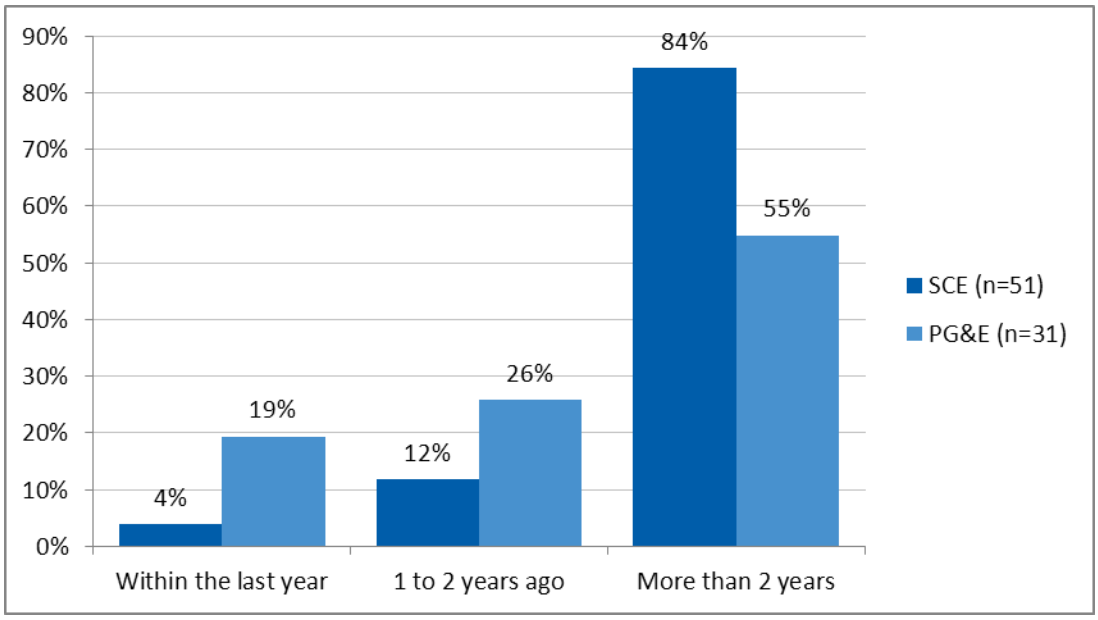
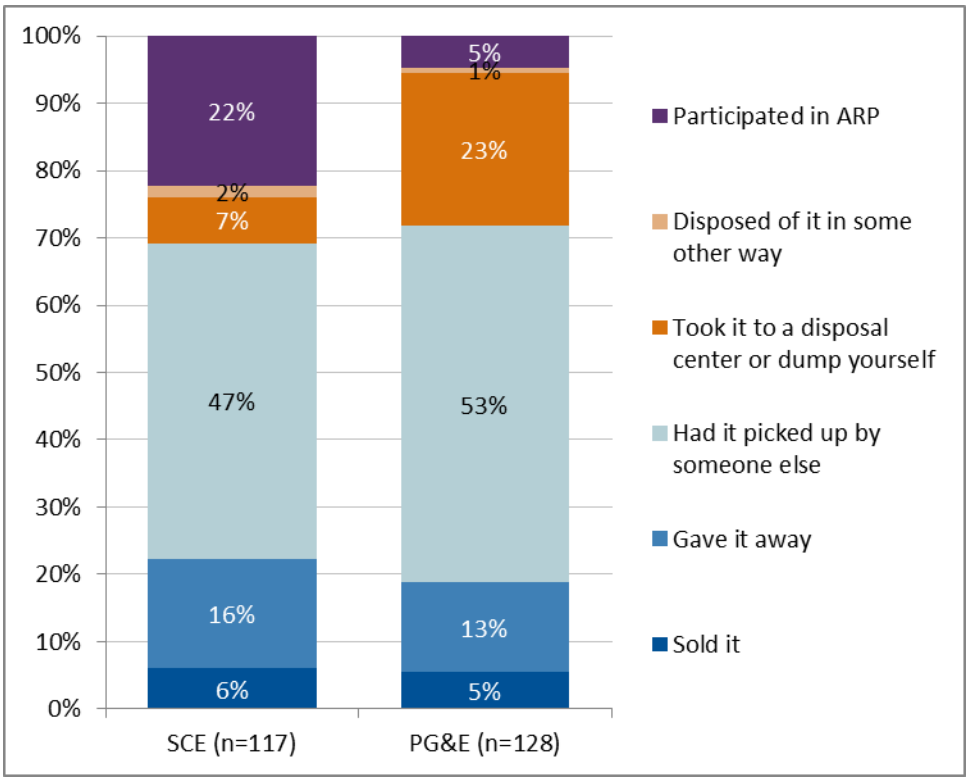


Figure D-12 shows previous methods used to dispose of appliances, as reported by the respondents. About one-half of each utility's customers said they had it picked up by someone else. SCE respondents more likely had their last unit recycled by the ARP than PG&E customers, while PG&E customers more often took units to a dump or disposal center.

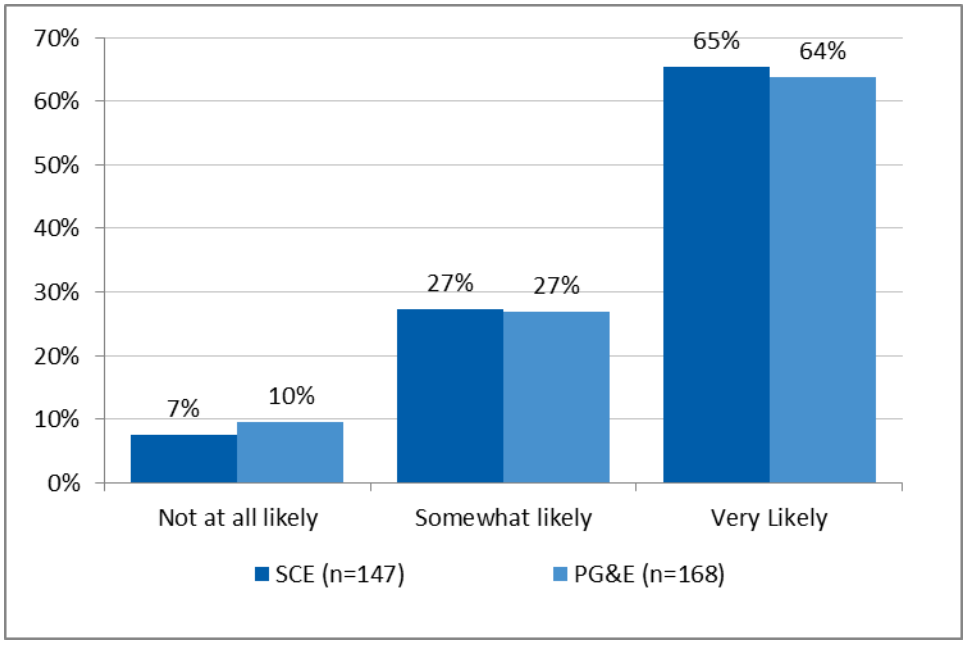
Figure D-12. Second Appliance Owner Previous Disposal Methods



D.3 Motivation for Possible Future ARP Participation

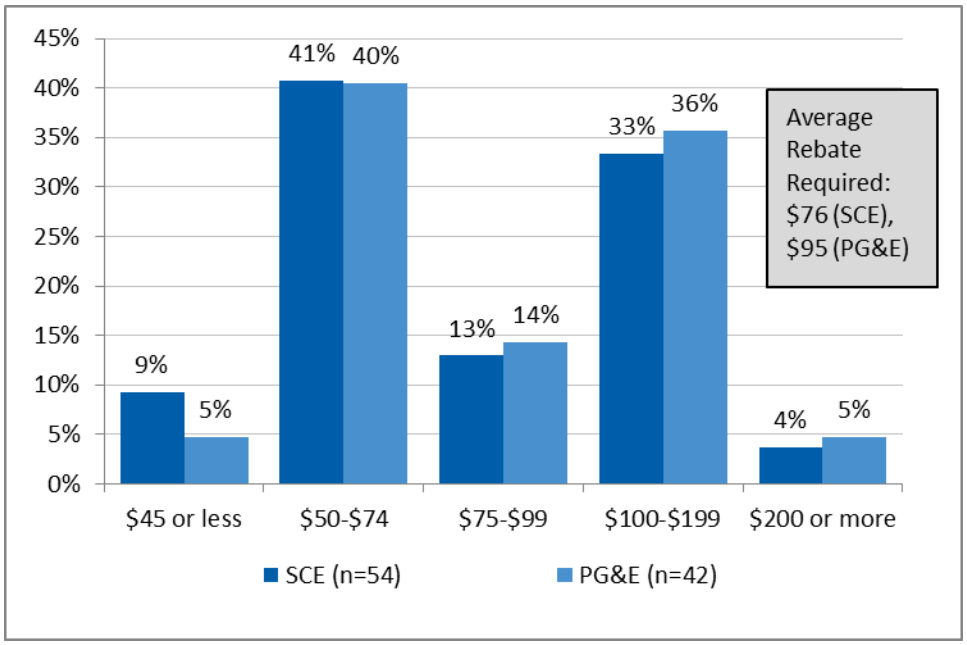
Many respondents reported they would be likely to participate when disposing of an appliance (see Figure D-13). This did not mean they would dispose of their second appliance without replacing it; rather, they would consider participating when disposing of an appliance.

Figure D-13. Second Appliance Owner Likelihood to Participate in ARP



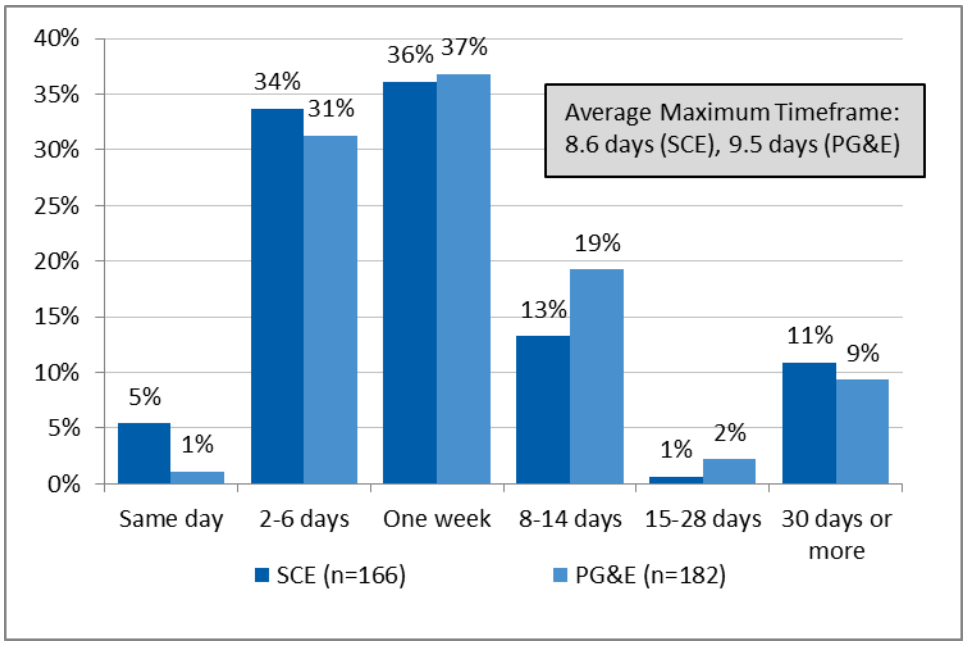
A series of questions asked second appliance owners what would be required for them to participate in the ARPs immediately (i.e., remove their current second appliance). Figure D-14 shows rebate amounts respondents reported requiring to dispose of their appliances. The average rebate required far exceeded the $35 the ARPs currently offer, with more than half requiring at least twice the current rebate amount.

Figure D-14. Second Appliance Owner Rebate Required to Dispose of Second Appliance



Required timeframes more closely aligned with typical ARP timeframes. As shown in Figure D-15, most respondents expected to have their units picked up within a week.

Figure D-15. Second Appliance Owner Reported Maximum Pickup Timeframe



D.4 Awareness, Knowledge, and Attitudes About Energy Efficiency

As the questions in Table D-5 show, over 75% of second appliance owners knew appliances could have high costs in terms of electric consumption. Over 90% also reported knowing appliances could be

harmful to the environment if not properly disposed of, but less than one-half knew the recycling services took care of those hazardous materials. Most (73%) did not know the recycling program almost eliminated materials going to the landfill.

Table D-5. Second Appliance Owner Awareness of ARP Benefits

Question	Response	SCE	PG&E
Were you aware that a refrigerator or freezer in your home can cost up to $180 or more a year for electricity?	Yes	78%	76%
(SCE: n=196, PG&E: n=194)	No	22%	24%
Were you aware that the refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of?*	Yes	90%	92%
(SCE: n=200, PG&E: n=200)	No	10%	8%
Did you know that SCE/PG&E's recycling service takes apart and recycles all of the metals and glass from the appliances it collects	Yes	40%	41%
(SCE: n=144, PG&E: n=103)	No	60%	59%
Did you know that SCE/PG&E's recycling service removes, and recycles or destroys the coolant, motor oil, and insulation from the appliances it collects	Yes	42%	42%
(SCE: n=146, PG&E: n=102)	No	58%	58%
Did you know that SCE/PG&E's recycling service makes it so almost none of the materials from the appliances they recycle go to a land fill?	Yes	27%	27%
(SCE: n=143, PG&E: n=103)	No	73%	73%

Figure D-16 shows most (64% SCE, 84% PG&E) customers knew of the term Carbon Footprint and understood what it means. The rest mostly did not know, with only a very small portion (2%) knowing the term but not the meaning.

Figure D-16. Second Appliance Owner Awareness of "Carbon Footprint"

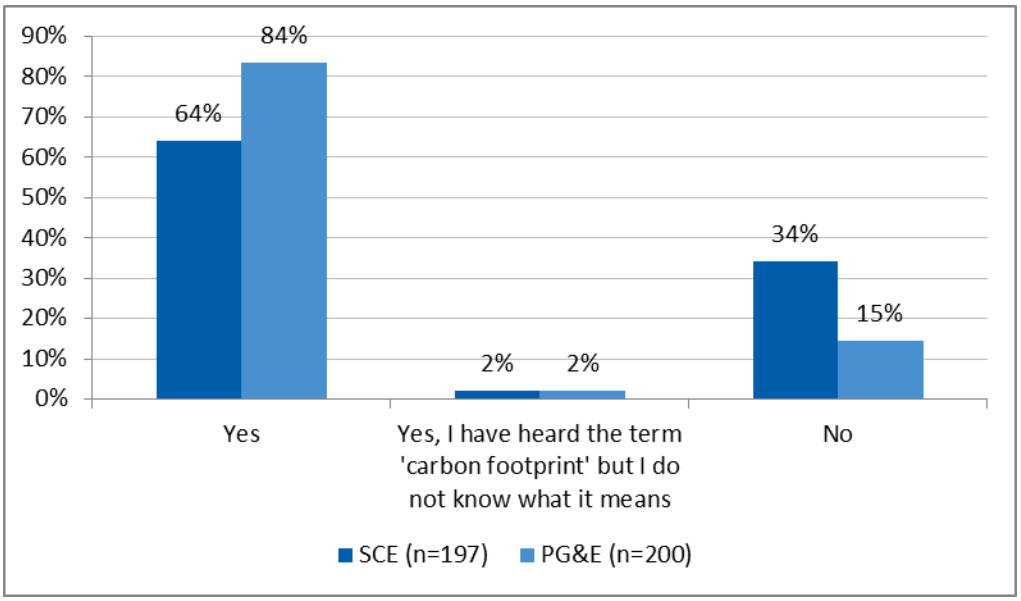
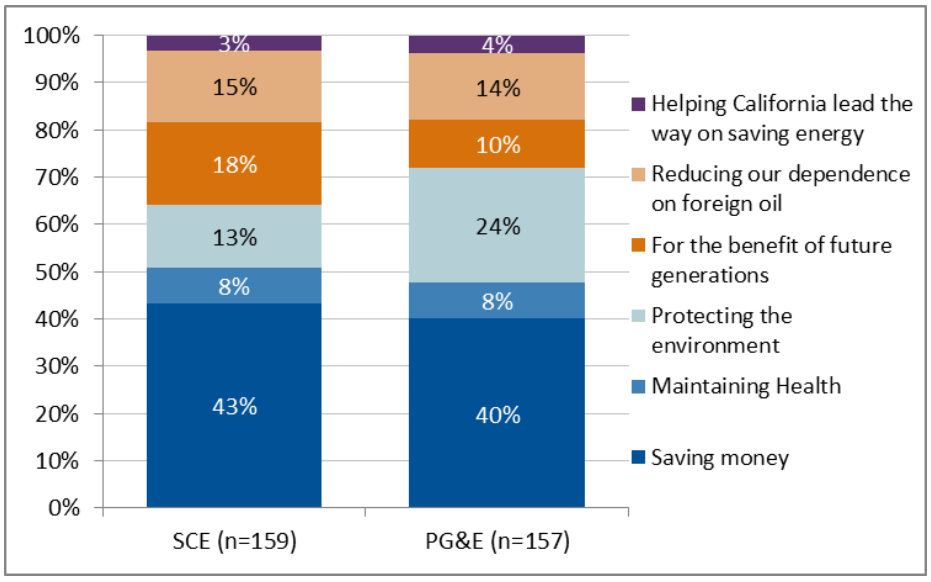


Figure D-17 shows customers' primary motivations for saving energy, with saving money the top answer. Respondents next mostly commonly cited the benefit of future generations and protecting the environment (for SCE and PG&E, respectively).

Figure D-17. Second Appliance Owner Motivations to Change Daily Actions to Save Energy

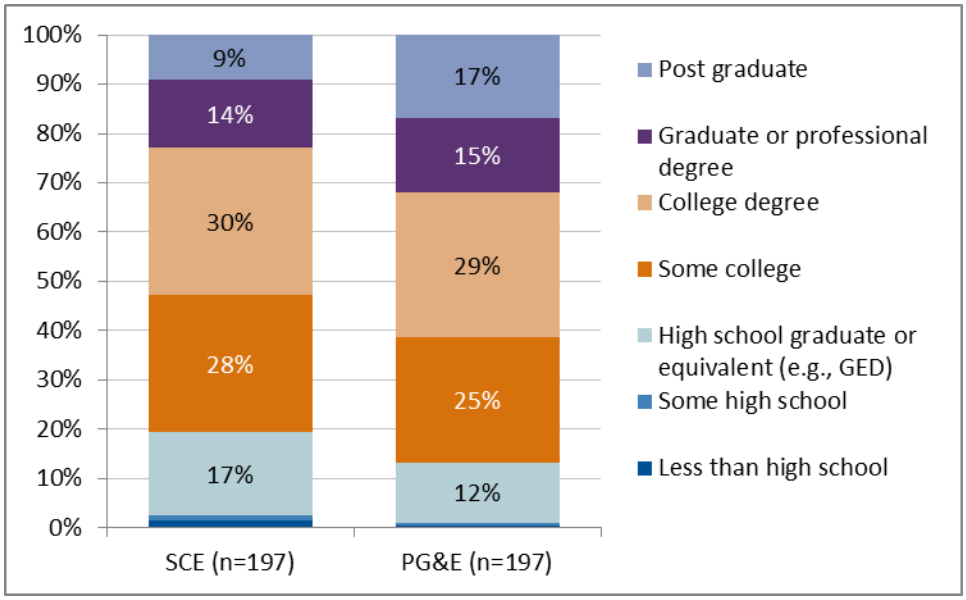


D.5 Customer Demographics

Surveyed second appliance owners primarily spoke English (92% to 97%), though this high percentage is likely due in part to administering the surveys only in English. The majority of respondents described their race as white: 72% for SCE and 89% for PG&E.

SCE and PG&E respondents reported similar education and income levels. As shown in Figure D-18, over one-half of all surveyed second appliance owners (53% for SCE, and 61% for PG&E) reported earning a college degree or higher.

Figure D-18. Second Appliance Owner Educational Attainment



Respondents primarily lived in single-family homes, at 95% for SCE and 96% for PG&E. Figure D-19 shows the majority of remaining customers lived in multifamily buildings.

Figure D-19. Second Appliance Owner Housing Type

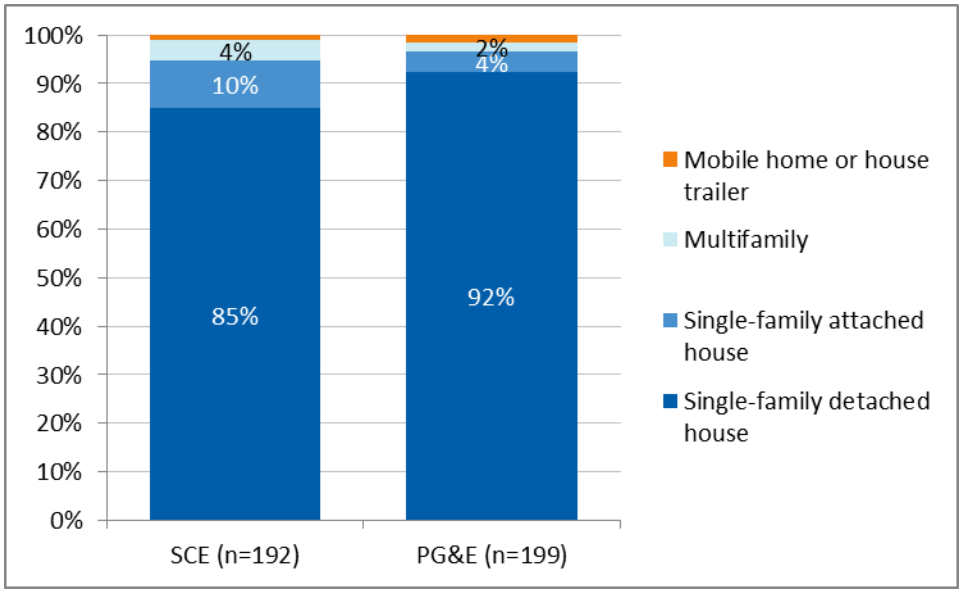


Figure D-20 shows vintage distributions of second appliance owner housing stock, indicating the percentage of homes built during each decade. Per respondents, second appliance owner home vintages were distributed fairly equally over the past six decades.

Figure D-20. Second Appliance Owner Home Vintages

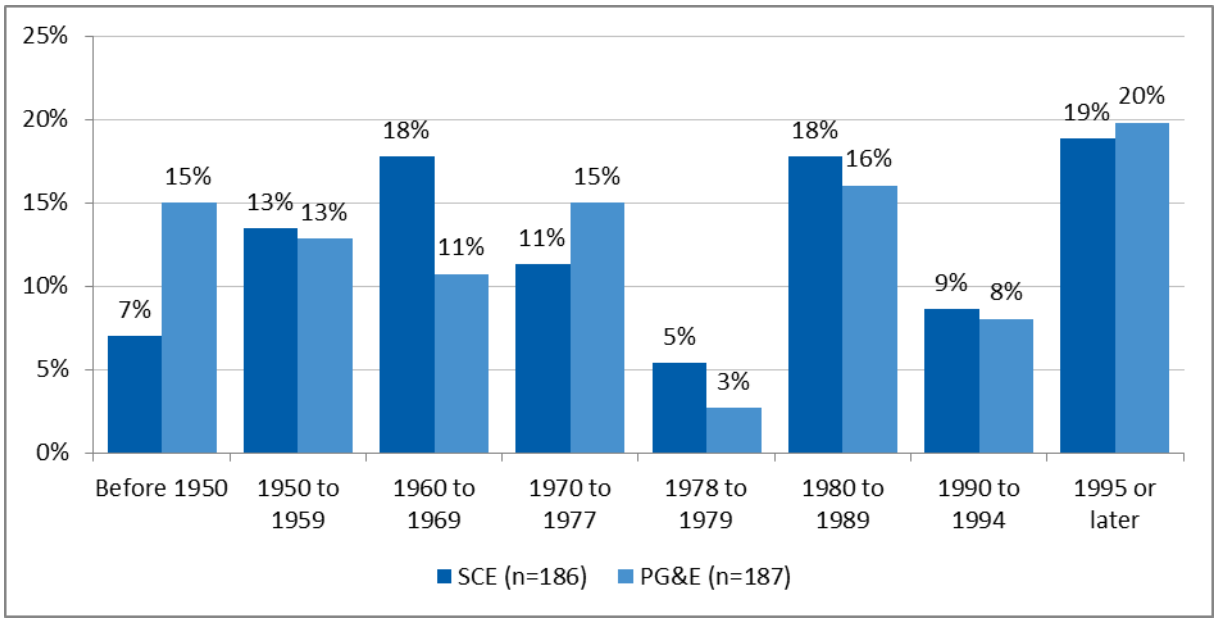
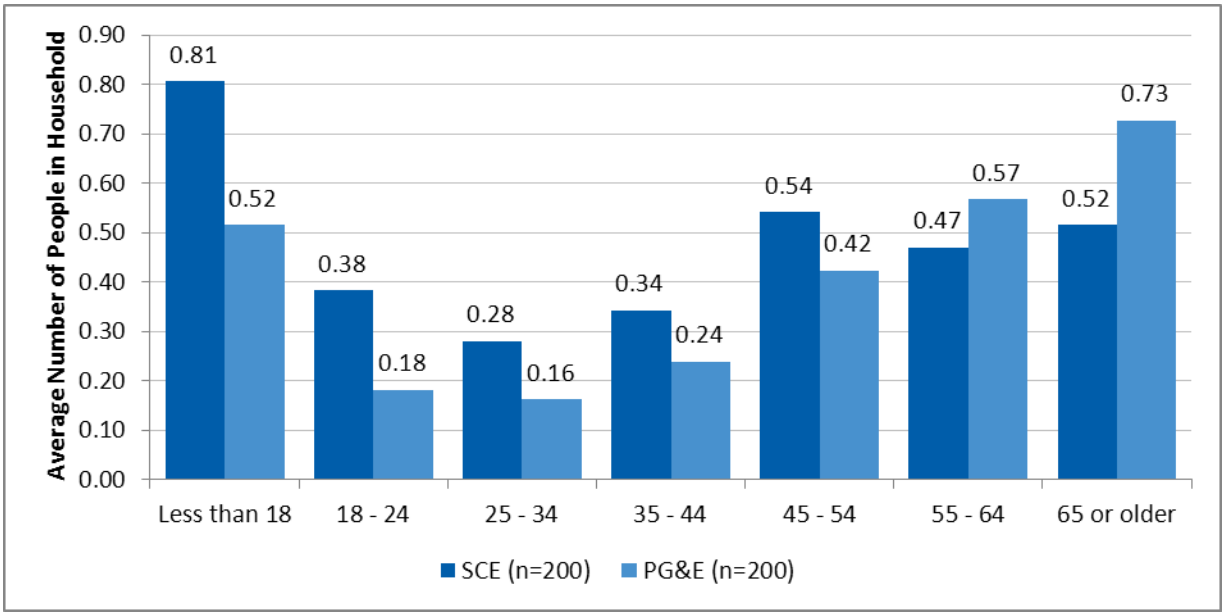


Figure D-21 shows the reported number of people living in second appliance owners' households, by their respective age groups. SCE households had 3.3 people on average, while the average for PG&E households was 2.8 people.

Figure D-21. Second Appliance Owner Number of Residents Living in Household, by Age Group



D.6 Comparison to RASS

Second appliance owner demographics differed from the general population across several characteristics. A comparison of several of these demographics to the 2009 California RASS (as shown in Table D-6) indicates larger households within this segment, and respondents more likely to live in single-family homes. Given that these respondents were self-identified as second appliance owners, they also had much higher saturations of second appliances.

Table D-6. Second Appliance Owner Comparison to 2009 RASS*

Variable	SCE		p-value	PG&E		p-value
	Survey	RASS		Survey	RASS	
Household size	3.35	3.09	0.03	2.82	2.78	0.36
Proportion in Single-Family	0.95	0.74	0.00	0.96	0.74	0.00
Second Refrigerator Saturation	1.00	0.18	0.00	1.00	0.25	0.00
Standalone Freezer Saturation	0.46	0.12	0.00	0.60	0.22	0.00

*Assumed a CV of 0.5 for RASS household sizes, as the report did not present standard deviations. A p-value less than 0.10 indicates that, with 90% confidence, the two results differ.

E. MARKET ACTOR INTERVIEW FINDINGS

E.1 New Appliance Retailers

E.1.1 About the Interviewees

Cadmus interviewed two major appliance retailers for the purposes of this market actor study. The interviewees' responsibilities included overseeing the companies' non-utility appliance recycling and haul-away programs and overseeing the utility programs with which they are partnered. One of the two retailers started engaging with utilities approximately three years ago and built strategic agreements with various utilities across the country, SCE and PG&E being among the first. That retailer's ultimate goal was mutual collaboration and support as the retailer promotes the utilities' rebates and incentives.

E.1.2 Appliance Recycling Overview

Both interviewees said their companies' standard practice is to haul away an old appliance after delivering a new appliance. One of the two retailers confirmed that they never directly resell haul-always at an outlet store (though they may be resold through other indirect means), while the other refurbishes about 25%-30% of old appliances nationally and resells them unless it is mandated that the appliance be demanufactured (e.g., through a utility program). For one of the retailers, appliance recycling supports corporate goals of providing energy-efficient products for customers, and the utility programs help sales associates become educated about the greater environmental impacts. The customer receives an attractive net markdown, so appliance recycling becomes an effective marketing tool for promoting energy efficiency.

One interviewee said their company transfers haul-away units to recyclers who meet stringent federal and state requirements for proper disposal of any hazardous materials. Materials broken down from appliances are sold to commodity markets. Haul-aways are conducted through the interviewee's network of contractors and old appliances are sent to warehouses in the United States for processing. The main benefits seen by one major U.S. retailer is that appliance recycling is viewed by customers as something of value that is not offered by many other retailers; therefore, ARPs help the retailer attract more customers and thus sales.

One retailer said there is a lot of dialogue about retailers not needing utility programs because retailers recycle appliances of their own accord. This interviewee suggested that some commissions are ill-informed and the utility-sponsored appliance recycling programs are critical to retailers' ability to continue their own recycling programs. They said there is no physical way to conduct RAD-compliant recycling in about 20 states because no infrastructure exists locally or through the state. As an example, in Montana no local plants exist where foam can be removed from appliances. Utility programs have been a key player in bringing such plants to various locations.

E.1.3 Interviewee Role and Perception of Used Appliances Market

One of the two retailers interviewed does not resell used appliances. The other retailer interviewed uses JACO as a third-party haul-away provider. JACO takes the old appliances and either sells them as used units or recycles the raw materials. They said old appliances use a tremendous amount of energy so the most beneficial approach is to recycle them, and it is a good model for the country.

The interviewee said that in the past five to seven years, with the advent of new technologies, new product cycles are becoming shorter, meaning the life of products is becoming shorter. The retailer is starting to see some very good products coming in the market, as consumer electronics companies enter the appliance market (such as Samsung and LG) with great innovation, technology, colors, materials, construction, and user-interface. These new products are driving faster turnover of appliances on the market. The retailer reported it is hard to say whether the demand for used appliances is growing or shrinking. At the time of the interview (late 2012), however, the interviewee is seeing an uptick in sales at outlets, where prices are more attractive.

E.1.4 Interviewees' Appliance Recycling and Replacement Services

Both of the interviewees offer pick-up, recycling, or replacement services for appliances such as refrigerators and freezers. One said the removal fee is $10 per product for a standard (non-utility) haul-away. Both retailers interviewed said all products are eligible for removal and recycling. One of the retailers commented that safety and handling and/or compliance are major considerations for appliances taken into facilities. For example, food-related appliances involve animal-attraction risks, and mattress recycling is never done because of bedbug potential.

One interviewee believes adding other appliances such as clothes washers, room air conditioners, set-top boxes, or other electronics to utility program offerings could be a good opportunity. The interviewee is noticing an upward trend in residences purchasing energy-efficient air purifiers, air conditioners, and microwave ovens. Most new products are energy efficient, but if there is a program to help get older energy-inefficient products out of use, it would be greatly beneficial, the interviewee said.

E.1.5 Participation in Federal and State Government Programs

At one of the interviewed retailers, approximately 70% to 75% (based on number of units) of appliances are recycled and reported to the RAD program each year. According to the interviewee, the EPA estimates that nationally about 60% of disposed appliances are demanufactured, and 40% are resold. The retailer estimated that in California through JACO and the utility ARPs, 80% are demanufactured and 20% are resold, but the interviewee stressed this was simply a rough estimate. The other interviewee's company has participated in the RAD program for roughly the past two years but is not sure of the percent of appliances recycled and reported to the RAD program each year. They had thus far focused on refrigerators and freezers but were looking to expand their RAD scope to include air conditioners.

E.1.6 Utility ARPs

One of the retailers said that the utility-sponsored ARPs positively affect the business model of that retailer, creating more jobs and providing a platform for green leadership. The retailer is also dedicated to creating positive relationships with utilities and positive customer relations, with energy efficiency as an area of focus and major selling point. The interviewee said utility-sponsored recycling programs are changing the refrigerator and freezer market by supporting the introduction of more efficient appliances. Much of this depends on the customer coming in to purchase a new appliance, but the utility-sponsored program helps push customers to take the old appliance out of use. These programs are helping to protect the environment; they promote safe demanufacturing and energy savings.

The second retailer also reported a strongly belief that the utility-sponsored ARPs have a positive impact on their company.

E.2 Appliance Disposal Companies

E.2.1 About the Interviewees

Cadmus interviewed six disposal companies. Three of the six said they send their scrap metal to companies that purchase scrap metal in bulk. One is a subcontractor for JACO. The disposal companies mostly do haul-aways in the residential sector, though some also work in the commercial sector. One interviewee said they focus on disposing HVAC equipment, air conditioners, and hot water appliances.

E.2.2 Appliance Recycling Overview

The general process in appliance disposal is pick-up of the old appliance and transfer to a facility yard where the metal (both ferrous and non-ferrous) is scrapped for profit. Most companies that purchase scrap metal in bulk only accept appliances that have been "processed," meaning that prior to selling the appliances, the companies we interviewed remove and properly handle refrigerant, remove mercury switches from some appliances, and remove compressors and capacitors and drain oil. One of the disposal companies specified that they must check the oil from older appliances to see if it is "hot oil," i.e., oil containing refrigerant, because disposal of this material costs $285 per barrel. Mercury disposal is even more costly: the interviewee estimated the cost at $385 per five-gallon bucket.

All of the companies are focused on proper disposal of potentially environmentally harmful waste (for example, oil, refrigerant, and mercury). One interviewee said their company does not recycle blowing agent CFC-11 (which is one of the materials JACO removes during their recycling process for the IOU programs).

Interestingly, one of the interviewees sees the Certified Appliance Recycler (CAR) program as a nuisance. Since they joined the program, business has slowed. This interviewee said recycling copper and aluminum is how the business survives, because the CAR program does not monitor non-ferrous metal. This company notes that there are many haul-away companies that conduct business illegally and make greater profit by disposing of hazardous materials improperly, because their disposal is not scrutinized and regulated, whereas the interviewee states that they ship about 2,000 pounds of refrigerant every

month legally, and the costs associated with properly handling refrigerant reduce profit when compared to the illegal model of simply dumping refrigerant into the environment or in a landfill.

One disposal company believes both the RAD program and the CAR program have failed. This interviewee stated that state and federal environmental agencies should focus their energies on people who are disposing of old appliances illegally, instead of "over-regulating" companies participating in CAR. They noted that due to the burden of regulation, their company is beginning to think disposing of hazardous waste is too expensive and diminishes company profit.

E.2.3 Interviewee Role and Perception of Used Appliances Market

All six of the interviewed disposal companies do not resell used refrigerators and freezers or any other household appliances to retail stores or individuals. One disposal company said the main change in the used appliance market they had noticed since 2010 was that there seemed to be an increase in people clearing out old, used appliances. Another observation was that more landfills have been recycling.

E.2.4 Interviewees' Appliance Recycling and Replacement Services

Most of the interviewees offer pick-up services for old appliances from residential and commercial buildings. One interviewee said his or her company receives shipments of bulk quantities of old appliances from contractors. Some charge $10 per appliance for pickup; others charge $35 per appliance, with each additional pick-up at $20. A third company has a removal fee of $75-$100 per appliance. Most of the disposal companies said that they take every type of appliance and that expansion of appliance types in utility programs would increase business. One company does not believe there is potential for adding program offerings because other appliances are an insignificant portion of the market.

E.2.5 Participation in Federal and State Government Programs

While some of the disposal companies are not sure if they are part of RAD, others are active participants. All companies interviewed were California Certified Appliance Recyclers (CAR). Companies that are part of CAR voluntarily report units recycled to CAR. One of the disposal companies that is not a RAD member is a contractor for JACO and said JACO is part of the RAD program.

E.2.6 Disposal Business Models

Only a few of the companies interviewed said that extracting and selling ferrous metals is a highly profitable endeavor, though all companies interviewed do this. One large company interviewed nets 40,000 to 45,000 tons of ferrous metals per month. The target markets include a mix of commercial and residential customers. One of the disposal companies is a franchise hauler for the city and only takes care of the city's appliance pick-up and recycling needs. Another disposal company explained that 85% of their business is from three HVAC contractors.

E.2.7 Utility ARPs

A few of the interviewees were not familiar with the utility ARPs. One of the companies partners with JACO in Arizona, Utah, Illinois, Michigan, Ohio, and Indiana, and these programs have a positive effect on their organization. The interviewee noted that the utility-sponsored recycling programs are changing the refrigerator and freezer market because it provides a service that assists in getting rid of old units faster.

The interviewee said marketing is encouraging people to buy new ENERGY STAR® refrigerators and that these programs bring environmental benefits. The main differences between utilities are marketing activities. As an example, PG&E had a total of 30,000 units recycled per year, but with more aggressive marketing the interviewee estimated the number could be 80,000 units per year. In general, utility-sponsored programs affect the interviewees' businesses in a positive way.

E.3 Appliance Manufacturer

E.3.1 About the Interviewee

We interviewed one major appliance manufacturing company. One individual interviewed was a government relations professional for the manufacturing company whose responsibilities include working with the government and utilities. The interviewee has worked to expand recycling through partnerships, outlet stores, retail relationships, and an employee purchase program. Units are said to be very valuable particularly because of the value of metal. The interviewee viewed the company as a vehicle of partnership among stakeholders.

E.3.2 Appliance Recycling Overview

This particular major appliance manufacturing company defines "appliance recycling" as appliances that are destroyed or removed (with certification of destruction) including removal and proper handling of all harmful substances. The interviewee's contractual obligations require all subcontracted recyclers working directly for this company to be certified with relevant state and local governments. The interviewee does a lot of work with retailers to push for energy efficiency and recycling.

E.3.3 Interviewee Role and Perception of Used Appliances Market

The interviewee had little insight into the used appliances market. This major manufacturing company takes factory-dented, used, or damaged refrigerators and freezers or other major household appliances and donates them to Habitat for Humanity or ReStore. The interviewee was also aware of "ding and dent" retailers but this manufacturer does not sell to them.

E.3.4 Interviewee's Appliance Recycling and Replacement Services

The manufacturer does not directly offer pick-up, recycling, or replacement services for appliances such as refrigerators and freezers. The manufacturer also does not partner with the EPA's RAD program. In order to align better with the manufacturer's goals, the interviewee reported they wanted the program to encompass tracking the environmental benefits of using high-efficiency appliances. However,

according to this interview, the EPA decided not to add that component to the RAD program, and so this manufacturer made the decision not to partner with EPA's RAD program at that time.

E.3.5 Design Process Impacts

The company is very focused on sustainability in manufacturing, with waste being reduced. The main environmental concerns that this major manufacturing company considers when designing a new residential refrigerator or freezer include energy and water efficiency. Materials and chemistry are also important, though, and considerations are made for using sustainable materials and materials that will not cause environmental harm at end-of-life. Adding "smart" capabilities and shifting load to off-peak hours are also major considerations.

The company's activity in direct-to-customer sales must take into consideration what happens to the appliance when it stops working. The direct-to-customer sales are leading to a greater focus on end-of-life, and customer messaging is important.

E.3.6 Utility ARPs

The manufacturer was familiar with utility-sponsored appliance recycling programs. They work with many of the programs because it boosts sales of high-efficiency appliances. There is economic value to recycling (selling of materials, etc.) and the programs start a broader conversation about energy efficiency in the environment and appliance purchasing. When consumers visit stores to shop for a new home appliance, there is an education component that has changed the market. The utility can help with customer education by providing information about energy-efficient appliances and recycling.

The interviewee does not see a change in the number of refrigerators and freezers being purchased with the utility-sponsored recycling programs in effect. The only change the interviewee observed is the increase in innovation which may lead to faster turnover in households.

E.4 Other Utilities

E.4.1 About the Interviewees

Cadmus interviewed representatives of two other California utilities for the purposes of this study. One was a manager of marketing and the other was a key accounts manager who handles public benefit programs (including an ARP).

E.4.2 Life of Nonparticipating Appliances

One of the utilities defines appliance recycling as "taking a working, used appliance and recycling component parts in an environmentally sustainable manner." The benefits of this process include removing inefficient appliances from use so energy is saved, and disposal of component parts to avoid CFC emissions and reduce landfilling.

Both utilities interviewed recycle refrigerators and freezers and offer customers a $35 rebate. The second utility includes air conditioner recycling for a rebate of $25. Both utilities pay a fee to JACO for handling and logistics.

One utility is not directly partnered with EPA's RAD program (though JACO is a RAD partner). The other is a RAD partner and reports all recycled appliances to RAD.

Both interviewees said utility-sponsored recycling programs are beneficial in that they help get rid of old working appliances that might otherwise be sold in the secondary market, often to low-income consumers would be operating inefficient appliances and paying more for energy. Without the program, more people would pay to have refrigerators hauled away and possibly added to the secondary market, or the used appliances would be gifted to family members which would keep older, inefficient appliances in use.

A problem is that JACO is only in each utility area a few times a month, whereas an independent retailer haul-away service is more convenient because they will pick up a unit at any time. Another issue is that, when retailers conduct their own haul-aways, the utilities are uncertain what happens to the appliances. They know that some go to the secondary market. In Southern California, there are companies that pick up old appliances, refurbish them, and take them into Mexico. One of the utilities commented that ARPs are one way to prevent that from happening.

E.4.3 Alternative Sub-Program Design

Currently, most utility-sponsored appliance recycling programs focus on the removal of refrigerators and freezers from the appliance market. The utilities believe there could be potential in a different climate for RACs, but not in most parts of California. The utilities are not sure about promoting electronics recycling programs, but know that there are many community organizations that focus on recycling electronics. Utilities might have interest in piloting a program to obtain data. Utilities historically have not focused on electronics, as household appliances such as refrigerators are bigger energy users on a per-unit basis.

A utility must be able to verify savings before adding other appliances to a recycling program. Although the interviewee believes in the environmental benefit from a funding standpoint, it must fall into the areas for which Public Benefit Fund was created – i.e., to cost-effectively save energy.

E.5 Government Agencies

E.5.1 About the Interviewees

Interviewed government agencies include the Responsible Appliance Disposal program at U.S. EPA, and the California Department of Toxic Substances Control, which oversees e-waste, the California Certified Appliance Recycler program, and various other programs. RAD is concerned with promoting the proper disposal of household appliances that are refrigerant-containing, such as refrigerators, freezers, RAC, and dehumidifiers. According to the interviewee, utilities are the foundations of the RAD program; only

recently have retailers and GE, the first manufacturer member, joined. Based on the volume of participating organizations, utility partners account for half the participation in RAD nationally. Volume has increased steadily over the life of the program.

RAD partners report removal of ozone-depleting substances (for example, refrigerant and foam-blowing agents), and landfill reduction. The calculation of benefits is based on displaced emissions from releasing refrigerant, displaced emissions that would have occurred from crushing the foam, and the climate benefit associated with recycling of durable goods. All emissions benefits are calculated using EPA's calculators.

E.5.2 Appliance Recycling Overview (For All Appliances Recycled)

To participate in the CAR program, appliance recyclers must submit an application whose purpose is to convince DTSC that the recyclers know how to remove and responsibly manage materials requiring special handling (MRSH). The interviewee did not believe that compliance with federal and state regulations regarding MRSH was well-understood. Anecdotally, DTSC is aware of some large scrap yards in California that say they are recyclers, but do not appear to follow any regulations. In the past, these scrap yards would have been neglected because there was not adequate enforcement of regulations. In recent years DTSC's inspectors have begun to check both e-waste sites and CAR sites. However, these inspections do not cover companies operating without CAR certification.

E.5.3 Appliance Recycling Regulations and Government-Sponsored Programs

DTSC noted the CAR program has increased compliance with regulations regarding appliance disposal. The program stipulates that all hazardous materials and MRSH must be removed prior to disposal or recycling. Increased enforcement of appliance disposal and recycling regulations would be helpful, but there is not adequate staff to perform more enforcement – it is a resource issue at the state level. The interviewee thought landfills should be policed, and DTSC should pay more attention to the program and be more proactive to follow up on recyclers who do not renew their certifications with the ARPs.

E.5.4 Utility ARPs

According to DTSC, there was a period during which some California utilities were asking people to take their appliances to a CAR for recycling. During that time, DTSC saw an increase in recyclers renewing their applications or submitting new applications.

Both DTSC and EPA interviewees noted that communication between all parties involved in enforcing regulations and promoting appliance recycling is the key variable that will help programs run more efficiently.

E.5.5 Other Appliances

DTSC believes there is potential for including other kinds of appliances in utility program offerings. DTSC does not foresee challenges arising from a utility's adding other appliances to its appliance recycling program.

F. SUB-PROGRAM DESIGN ANALYSIS INPUTS AND ASSUMPTIONS

F.1 User Profiles

While conducting this evaluation, Cadmus surveyed program participants and second appliance owners. We used the survey results as the primary inputs to the user profiles analysis. Cadmus' sampling and data collection methodology for these surveys is outlined in Volume 1 of this report, Chapter 3: Process Evaluation and Market Characterization Methodology.

F.2 Secondary Research

Cadmus conducted secondary research from two main sources: 1) ARP evaluations, which were part of the literature review, and 2) stakeholder interviews with program implementation staff. The documents we reviewed are listed in Volume 1 of this report, Chapter 2: Literature Review. We also determined program design features using two of our papers from the 2011 International Energy Program Evaluation Conference:

1. Bushman, K. and J. Keeling. *A Meta-Analysis of Drivers of Freeridership in Appliance Recycling Programs*. Paper presented at the International Energy Program Evaluation Conference, Boston, Massachusetts, August 16-18, 2011.
2. Bushman, K., Kansfield, K., and J. Keeling. *Primary Refrigerators: An Examination of Appliance Recycling Program Design*. Paper presented at the International Energy Program Evaluation Conference, Boston, Massachusetts, August 16-18, 2011.

F.3 Diffusion Modeling

F.3.1 Model Specification

For diffusion modeling, Cadmus relied on our literature review, and considered many of the complexities of ARPs that lead to divergence from the classic Bass Model. We considered two main issues for modeling ARP diffusion:

1. The possibility for re-participation; and
2. The changing size and composition of the population over time.

Our approach to account for these issues was informed by the following sources:

- Islam, T. and N. Meade. *Modeling Diffusion and Replacement.* European Journal of Operations Research (125: 551–570). 2000.
- Kamakura, W. A. and S. K. Balasubramanian. *Long-Term View of the Diffusion of Durables*. International Journal of Research in Marketing (5: 1–13). 1988.
- Mahajan, V. and R. A. Peterson. *Innovation Diffusion in a Dynamic Potential Adapter Population.* Management Science (24: 1,589–1,597). 1978.

- Bass, F. M. *The Relationship Between Diffusion Rates, Experience Curves, and Demand Elasticities for Consumer Durable Technological Innovations*. Journal of Business (53: 51–67). 1980.
- Kalish, S. *A New Product Adoption Model with Price, Advertising and Uncertainty.* Management Science (31: 1,569–1,585. 1985.

Cadmus originally considered addressing the two ARP diffusion modeling issues separately, thinking we would first estimate the likely rate of disposing the replacement appliance by accounting for re-participation using a model of appliance aging, and then we would estimate the M parameters as a function of population growth. However, it proved too difficult to recover coefficients from these models that were consistently within expected bounds (i.e., between zero and one for the coefficient on re-participants, and non-negative for the coefficient on the population). We solved this by effectively aggregating the two issues, using the cumulative potential for recycling from the market characterization.

We conducted our final estimation of the diffusion curves using the nonlinear least-squares estimation of the Bass Model found in:

- Srinivasan, V. and C. Mason. *Nonlinear Least Squares Estimation of New Product Diffusion Models.* Marketing Science (Vol 5. No.2: 169-178). 1986.

We then combined the results with the dynamic M parameters, as found in Mahajan and Peterson (1978).

F.3.2 Model Estimation

Cadmus completed the final estimation models in R, using robust, nonlinear, iterated weighted least-squares estimators. We used a Gauss-Newton algorithm to determine convergence.

The final outputs for each model are provided in Figure F-1 through Figure F-4. Note that Cadmus estimated these models on a monthly level; therefore, we annualized the *p* and *q* parameters.

Figure F-1. SCE Refrigerator Model Output

```
------
Call:
nlrob(formula = lil_n ~ (potential * k1) * ((p + q)^2/p) * (exp(-(p +
    q) * t))/(((q/p) * exp(-(p + q) * t) + 1)^2) * (m1 + b2 *
    m2 + b3 * m3 + b4 * m4 + b5 * m5 + b6 * m6 + b7 * m7 + b8 *
    m8 + b9 * m9 + b10 * m10 + b11 * m11 + b12 * m12), data = sce.REF.raw,
    start = coef(sce.REF.estimates), maxit = 100)


Parameters:
     Estimate Std. Error t value Pr(>|t|)
p    0.0087912  0.0009825   8.948 3.53e-15 ***
q    0.0084474  0.0034889   2.421   0.0169 *
k1   0.2678070  0.0300732   8.905 4.46e-15 ***
b2   0.9009319  0.1296026   6.951 1.65e-10 ***
b3   1.0426124  0.1404629   7.423 1.42e-11 ***
b4   1.1459428  0.1489772   7.692 3.38e-12 ***
b5   1.2014099  0.1513055   7.940 8.91e-13 ***
b6   1.3657322  0.1626811   8.395 7.49e-14 ***
b7   1.5833913  0.1799489   8.799 8.05e-15 ***
b8   1.7612274  0.2010946   8.758 1.01e-14 ***
b9   1.6565883  0.1924307   8.609 2.31e-14 ***
b10 1.4272896  0.1700314   8.394 7.52e-14 ***
b11 1.1387751  0.1449894   7.854 1.42e-12 ***
b12 1.0691907  0.1401398   7.629 4.72e-12 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Robust residual standard error: 968.1
Convergence in 11 IRWLS iterations

Robustness weights:
 112 weights are ~= 1. The remaining 30 ones are summarized as
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.2972  0.5524  0.7072  0.6888  0.9007  0.9648
------
Residual sum of squares: 2.08e+08
```

Figure F-2. SCE Freezer Model Output

```
------
Call:
nlrob(formula = lil_n ~ (potential * k1) * ((p + q)^2/p) * (exp(-(p +
    q) * t))/(((q/p) * exp(-(p + q) * t) + 1)^2) * (m1 + b2 *
    m2 + b3 * m3 + b4 * m4 + b5 * m5 + b6 * m6 + b7 * m7 + b8 *
    m8 + b9 * m9 + b10 * m10 + b11 * m11 + b12 * m12), data = sce.FRZ.raw,
    start = coef(sce.FRZ.estimates), maxit = 100)


Parameters:
     Estimate Std. Error t value Pr(>|t|)
p    0.0048736  0.0005299   9.197 8.76e-16 ***
q    0.0296788  0.0021909  13.547  < 2e-16 ***
k1   0.1331611  0.0132987  10.013  < 2e-16 ***
b2   0.9009120  0.1308962   6.883 2.35e-10 ***
b3   1.1021060  0.1459485   7.551 7.16e-12 ***
b4   1.3288281  0.1623346   8.186 2.35e-13 ***
b5   1.3093453  0.1603864   8.164 2.65e-13 ***
b6   1.5859307  0.1840149   8.618 2.19e-14 ***
b7   1.7651244  0.1963300   8.991 2.77e-15 ***
b8   2.1959601  0.2380541   9.225 7.50e-16 ***
b9   2.1482235  0.2337445   9.190 9.08e-16 ***
b10 1.6822243  0.1904123   8.835 6.61e-15 ***
b11 1.2642648  0.1569130   8.057 4.74e-13 ***
b12 1.0284504  0.1400083   7.346 2.12e-11 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Robust residual standard error: 96.89
Convergence in 12 IRWLS iterations

Robustness weights:
 102 weights are ~= 1. The remaining 40 ones are summarized as
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.2208  0.5319  0.6837  0.6625  0.8113  0.9597
------
Residual sum of squares: 2830000
```

Figure F-3. PG&E Refrigerator Model Output

```
------
Call:
nlrob(formula = lil_n ~ (potential * k1) * ((p + q)^2/p) * (exp(-(p +
    q) * t))/(((q/p) * exp(-(p + q) * t) + 1)^2) * (m1 + b2 *
    m2 + b3 * m3 + b4 * m4 + b5 * m5 + b6 * m6 + b7 * m7 + b8 *
    m8 + b9 * m9 + b10 * m10 + b11 * m11 + b12 * m12), data = pge.REF.raw,
    start = coef(pge.REF.estimates), maxit = 100)


Parameters:
    Estimate Std. Error t value Pr(>|t|)
p    0.007555   0.001281   5.896 5.68e-08 ***
q    0.038346   0.004551   8.426 3.79e-13 ***
k1   0.112430   0.016951   6.632 2.01e-09 ***
b2   0.962231   0.197661   4.868 4.48e-06 ***
b3   1.156892   0.217968   5.308 7.26e-07 ***
b4   1.326674   0.237065   5.596 2.11e-07 ***
b5   1.519166   0.263487   5.766 1.01e-07 ***
b6   1.587849   0.272347   5.830 7.59e-08 ***
b7   1.677084   0.281788   5.952 4.43e-08 ***
b8   1.669844   0.284039   5.879 6.12e-08 ***
b9   1.513888   0.263950   5.736 1.15e-07 ***
b10  1.562395   0.273866   5.705 1.31e-07 ***
b11  1.411926   0.255876   5.518 2.96e-07 ***
b12  1.225532   0.227630   5.384 5.25e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Robust residual standard error: 480.1
Convergence in 17 IRWLS iterations

Robustness weights:
 80 weights are ~= 1. The remaining 29 ones are summarized as
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.3627  0.5181  0.7065  0.7152  0.9015  0.9911
------
Residual sum of squares: 40200000
```

Figure F-4. PG&E Freezer Model Output

```
------
Call:
nlrob(formula = lil_n ~ (potential * k1) * ((p + q)^2/p) * (exp(-(p +
    q) * t))/(((q/p) * exp(-(p + q) * t) + 1)^2) * (m1 + b2 *
    m2 + b3 * m3 + b4 * m4 + b5 * m5 + b6 * m6 + b7 * m7 + b8 *
    m8 + b9 * m9 + b10 * m10 + b11 * m11 + b12 * m12), data = pge.FRZ.raw,
    start = coef(pge.FRZ.estimates), maxit = 100)


Parameters:
     Estimate Std. Error t value Pr(>|t|)
p    0.0064728  0.0009236   7.008 3.47e-10 ***
q    0.0490919  0.0038063  12.898  < 2e-16 ***
k1   0.0919588  0.0133645   6.881 6.32e-10 ***
b2   1.0764628  0.2065769   5.211 1.09e-06 ***
b3   1.2468375  0.2319982   5.374 5.47e-07 ***
b4   1.6309159  0.2720246   5.995 3.64e-08 ***
b5   1.9315728  0.3105539   6.220 1.33e-08 ***
b6   1.7706439  0.2941343   6.020 3.27e-08 ***
b7   1.8502696  0.2974556   6.220 1.33e-08 ***
b8   1.9543145  0.3128998   6.246 1.18e-08 ***
b9   1.8074711  0.2906683   6.218 1.34e-08 ***
b10 1.7574026  0.2928335   6.001 3.55e-08 ***
b11 1.7134217  0.2866558   5.977 3.95e-08 ***
b12 1.1762003  0.2167899   5.426 4.40e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Robust residual standard error: 73.14
Convergence in 17 IRWLS iterations

Robustness weights:
 89 weights are ~= 1. The remaining 20 ones are summarized as
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.3167  0.5640  0.7195  0.6947  0.8286  0.9976
------
Residual sum of squares: 777000
```

F.4 Forecast Participation

Cadmus forecasted technical potential from the market characterization study using an eight-year, moving linear trend. We then forecasted program participation by program type using the diffusion models and, for the subprograms, using *a* parameters from the user profiles. The final outputs are shown in Table F-1 and Table F-2.

Table F-1. Forecast of SCE Programs, 2013-2015

Month-Year	Standard Offering			Sub-Program								
				Low Case			Medium Case			High Case		
	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total
1-2013	3,490	187	3,677	22	31	53	41	56	96	80	110	191
2-2013	3,115	164	3,279	21	28	49	38	52	89	74	102	177
3-2013	3,572	195	3,767	26	36	62	47	65	112	93	129	222
4-2013	3,889	229	4,118	32	44	76	58	81	139	116	160	275
5-2013	4,039	219	4,258	32	45	77	59	82	141	117	162	279
6-2013	4,548	259	4,806	40	56	96	74	102	175	145	201	347
7-2013	5,222	280	5,502	46	64	110	84	116	200	166	230	396
8-2013	5,753	339	6,092	59	82	141	107	149	256	211	294	505
9-2013	5,359	322	5,681	59	82	141	107	149	257	212	295	507
10-2013	4,572	246	4,818	47	66	113	86	120	206	170	237	407
11-2013	3,612	179	3,791	37	51	87	66	93	159	131	182	313
12-2013	3,358	142	3,500	30	42	73	55	77	133	109	152	261
1-2014	3,108	134	3,242	31	44	75	57	81	137	111	159	270
2-2014	2,770	117	2,888	29	41	70	52	75	127	103	147	250
3-2014	3,172	140	3,312	36	52	88	66	94	159	129	185	314
4-2014	3,449	163	3,613	45	64	109	81	116	197	160	229	388
5-2014	3,578	156	3,734	45	65	110	82	118	199	161	231	392
6-2014	4,023	184	4,207	56	80	136	101	146	248	199	287	487
7-2014	4,614	199	4,813	64	92	155	115	167	282	227	328	555
8-2014	5,077	240	5,317	81	117	198	147	213	360	289	418	707
9-2014	4,723	228	4,951	81	117	198	147	213	360	288	419	707
10-2014	4,025	174	4,198	65	94	159	118	171	288	231	335	566
11-2014	3,176	127	3,303	50	72	122	90	131	222	177	258	435
12-2014	2,949	100	3,049	41	60	102	75	109	184	147	214	361
1-2015	2,725	94	2,820	42	62	103	76	112	187	148	219	367
2-2015	2,426	83	2,509	38	57	95	70	103	173	136	202	339
3-2015	2,774	98	2,872	48	71	119	87	129	216	170	253	423
4-2015	3,013	115	3,127	59	88	147	107	159	266	209	312	521
5-2015	3,121	109	3,230	59	89	148	108	160	268	210	314	524
6-2015	3,505	129	3,634	73	110	183	133	199	331	260	389	648
7-2015	4,015	139	4,153	83	125	208	150	226	376	294	441	735
8-2015	4,411	167	4,579	105	158	263	190	286	477	372	560	932
9-2015	4,099	159	4,258	105	158	263	189	286	475	370	558	927

Month-Year	Standard Offering			Sub-Program								
				Low Case			Medium Case			High Case		
	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total
10-2015	3,489	121	3,609	83	126	209	151	228	379	294	445	739
11-2015	2,749	88	2,837	64	96	160	115	174	290	224	340	564
12-2015	2,550	69	2,619	53	80	132	95	144	240	185	282	467

Table F-2. Forecast of PG&E Programs, 2013-2015

Month-Year	Standard Offering			Sub-Program								
				Low Case			Medium Case			High Case		
	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total
1-2013	678	62	740	17	24	41	33	46	79	59	81	140
2-2013	628	64	692	20	52	71	37	52	89	67	92	158
3-2013	727	70	798	24	63	87	45	63	108	81	112	193
4-2013	803	87	891	33	86	119	62	86	149	111	153	264
5-2013	886	99	984	40	107	148	77	107	184	137	190	327
6-2013	892	86	978	39	103	142	74	103	177	131	183	314
7-2013	907	86	992	42	113	155	81	113	193	143	200	343
8-2013	869	86	955	46	124	171	89	124	213	157	221	378
9-2013	758	76	834	45	120	165	85	120	206	151	213	364
10-2013	753	70	823	45	122	167	86	122	208	153	216	369
11-2013	655	65	720	46	124	170	88	124	212	155	220	375
12-2013	547	42	589	33	89	121	62	89	151	111	157	267
1-2014	429	34	463	29	78	107	55	78	134	97	139	236
2-2014	397	35	432	32	88	120	62	88	150	109	156	264
3-2014	459	39	497	39	106	145	74	106	180	131	187	318
4-2014	506	48	554	53	144	197	100	144	245	177	255	432
5-2014	557	54	611	65	177	242	123	177	300	217	313	530
6-2014	559	47	606	61	169	230	117	168	285	206	297	503
7-2014	568	47	614	66	182	248	126	182	308	222	322	543
8-2014	543	47	590	72	199	271	137	199	336	241	351	592
9-2014	473	41	514	69	190	259	130	190	320	229	335	564
10-2014	469	38	507	69	190	259	130	190	321	229	335	564
11-2014	407	35	443	69	191	260	130	191	321	229	336	565
12-2014	340	23	363	48	135	183	92	135	227	161	237	398
1-2015	266	19	285	42	118	160	80	118	197	140	207	347
2-2015	246	19	265	46	130	176	88	130	218	154	228	382

Month-Year	Standard Offering			Sub-Program								
				Low Case			Medium Case			High Case		
	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total	REF	FRZ	Total
3-2015	284	21	**304**	55	154	**209**	104	154	**258**	182	271	**453**
4-2015	312	26	**338**	73	206	**279**	138	206	**344**	243	362	**605**
5-2015	343	29	**372**	88	249	**337**	167	249	**416**	293	437	**730**
6-2015	344	25	**369**	82	233	**315**	155	233	**388**	272	408	**680**
7-2015	349	25	**374**	87	247	**334**	165	247	**412**	289	433	**722**
8-2015	333	25	**358**	93	265	**358**	176	265	**441**	308	464	**773**
9-2015	290	22	**312**	87	249	**336**	165	249	**413**	288	435	**723**
10-2015	287	21	**307**	86	245	**330**	162	245	**406**	283	428	**710**
11-2015	249	19	**268**	84	241	**325**	159	241	**400**	278	421	**699**
12-2015	207	12	**219**	58	167	**225**	110	167	**277**	192	291	**483**

F.5 Forecast Unit Savings

Cadmus took all the gross and net savings values from DEER's READI tool for 2013-2014 planning. We last accessed the tool on June 19, 2013.

F.6 Estimated Program Cost

Cadmus determined program costs using SCE and PG&E ARP expenditures from the utilities' 2012 fourth quarter Fund Shifting reports. These reports are available on the Energy Efficiency Groupware Application website (http://eega.cpuc.ca.gov/).

G. NON-ENERGY BENEFITS INPUTS AND ASSUMPTIONS

G.1 Environmental Benefits Estimation Inputs

The following tables outline the inputs to the environmental benefits model.

Table G-1. SCE Average Material Weights

Toxic Substance		2010	2011	2012	Total
		Proportion Containing			
CFC-12		0.575	0.639	0.557	0.596
HFC-134a		0.436	0.367	0.440	0.410
HCFC-22		0.000	0.000	0.000	0.000
CFC-11		0.540	0.590	0.510	0.552
HCFC-141b		0.436	0.364	0.448	0.411
Mercury-Containing Components		0.004	0.007	0.006	0.006
PCB-Containing Capacitors		0.016	0.013	0.013	0.014
Fiberglass		0.058	0.050	0.051	0.053
Material	**Units**	**Average Value**			
Used Oil	lbs.	0.075	0.073	0.073	0.074
Refrigerant	Count	0.382	0.296	0.330	0.336
Ferrous Metal	lbs.	135.938	137.346	136.442	136.608
Non-Ferrous Metal	lbs.	6.323	6.570	6.491	6.460
Plastic	lbs.	16.435	14.397	14.737	15.233
Glass	lbs.	3.465	3.542	3.511	3.506
Capacitors	lbs.	1.029	1.022	1.021	1.024
Rubber	lbs.	0.000	0.000	0.000	0.000
Foam	lbs.	8.383	6.802	7.581	7.574
Foam-Blowing Agent	lbs.	0.931	0.756	0.842	0.842
Fiberglass	lbs.	0.331	0.284	0.293	0.304
CFC-12	Count	0.219	0.193	0.181	0.200
HFC-134a	Count	0.156	0.100	0.141	0.131
HCFC-22	Count	0.000	0.000	0.000	0.000

Table G-2. PG&E Average Material Weights

Toxic Substance		2010	2011	2012	Total
		Proportion Containing			
CFC-12		0.802	0.787	0.685	0.747
HFC-134a		0.198	0.213	0.291	0.242
HCFC-22		0.001	0.000	0.000	0.000
CFC-11		0.719	0.607	0.527	0.619
HCFC-141b		0.198	0.198	0.321	0.254
Mercury-Containing Components		0.000	0.000	0.000	0.000
PCB-Containing Capacitors		0.042	0.054	0.050	0.047
Fiberglass		0.097	0.116	0.106	0.103
Material	**Units**	**Average Value**			
Used Oil	lbs.	0.082	0.083	0.083	0.083
Refrigerant	Count	0.411	0.438	0.401	0.409
Ferrous Metal	lbs.	125.000	125.000	125.000	125.000
Non-Ferrous Metal	lbs.	5.000	5.000	5.000	5.000
Plastic	lbs.	25.000	25.000	25.000	25.000
Glass	lbs.	3.000	3.000	3.000	3.000
Capacitors	lbs.	1.000	1.000	1.000	1.000
Rubber	lbs.	0.000	0.000	0.000	0.000
Foam	lbs.	8.131	8.131	8.131	8.131
Foam-Blowing Agent	lbs.	0.903	0.903	0.903	0.903
Fiberglass	lbs.	0.552	0.661	0.606	0.589
CFC-12	Count	0.330	0.344	0.275	0.306
HFC-134a	Count	0.081	0.093	0.117	0.099
HCFC-22	Count	0.000	0.000	0.000	0.000

Table G-3. Monetary Conversions

Benefit	Units	Valuation Scenario	Monetary Value per Unit	Source	Assumption
GHG Emissions	MTCO2eq	Low	$7.000	https://www.wci-auction.org/	50% of Medium
GHG Emissions	MTCO2eq	Medium	$14.000	https://www.wci-auction.org/	Current ARB auction reserve price
GHG Emissions	MTCO2eq	High	$21.000	https://www.wci-auction.org/	150% of Medium
NOX	lbs.	Low	$0.025	http://www.evomarkets.com/environment/emissions_markets/nox_seasonal_allowances	50% of Medium
NOX	lbs.	Medium	$0.050	http://www.evomarkets.co	Called exchange to

Benefit	Units	Valuation Scenario	Monetary Value per Unit	Source	Assumption
				m/environment/emissions_markets/nox_seasonal_allowances	confirm values
NOX	lbs.	High	$0.250	http://www.evomarkets.com/environment/emissions_markets/nox_seasonal_allowances	150% of Medium
Reclaimed ferrous metal	lbs.	Low	$0.062	http://www.americanrecyclinginc.com/pricing.htm - Find out where these scrap prices come from: (817) 625-4366	50% of Medium
Reclaimed ferrous metal	lbs.	Medium	$0.125	http://www.americanrecyclinginc.com/pricing.htm - Find out where these scrap prices come from: (817) 625-4366	
Reclaimed ferrous metal	lbs.	High	$0.187	http://www.americanrecyclinginc.com/pricing.htm - Find out where these scrap prices come from: (817) 625-4366	150% of Medium
Reclaimed fiberglass	lbs.	Low	$0.063	http://www.recycle.net/Glass/fiber/xv095500.html	50% of Medium
Reclaimed fiberglass	lbs.	Medium	$0.125	http://www.recycle.net/Glass/fiber/xv095500.html	Value derived from Recycler's exchange market. Specific post from 12/04/2012
Reclaimed fiberglass	lbs.	High	$0.188	http://www.recycle.net/Glass/fiber/xv095500.html	150% of Medium
Reclaimed foam	lbs.	Low	$0.098	http://www.recycle.net/Textile/foam/xv140500.html	50% of Medium
Reclaimed foam	lbs.	Medium	$0.195	http://www.recycle.net/Textile/foam/xv140500.html	take average of buy/sell values for PU Foam Scrap. Ads posted on 12/21/2012
Reclaimed foam	lbs.	High	$0.293	http://www.recycle.net/Textile/foam/xv140500.html	150% of Medium
Reclaimed glass	lbs.	Low	$0.001	http://www.calrecycle.ca.gov/BevContainer/Notices/2013/SVMonthly.pdf	50% of Medium
Reclaimed glass	lbs.	Medium	$0.001	http://www.calrecycle.ca.gov/BevContainer/Notices/2013/SVMonthly.pdf	Scrap glass rate

Benefit	Units	Valuation Scenario	Monetary Value per Unit	Source	Assumption
Reclaimed glass	lbs.	High	$0.002	http://www.calrecycle.ca.gov/BevContainer/Notices/2013/SVMonthly.pdf	150% of Medium
Reclaimed oil	lbs.	Low	$0.926	http://www.americanrecycler.com/0110/used002.shtml www.epa.gov/p2/pubs/resources/GallonsPoundsConversion.xls	50% of Medium
Reclaimed oil	lbs.	Medium	$1.853	http://www.americanrecycler.com/0110/used002.shtml www.epa.gov/p2/pubs/resources/GallonsPoundsConversion.xls	convert cost/gallon to cost/lbs by multiplying density factor from EPA conversion chart
Reclaimed oil	lbs.	High	$2.779	http://www.americanrecycler.com/0110/used002.shtml www.epa.gov/p2/pubs/resources/GallonsPoundsConversion.xls	150% of Medium
Reclaimed plastic	lbs.	Low	$0.146	http://www.recycle.net/Plastic/other/xv100700.html http://www.ehow.com/info_12193939_type-plastic-used-refrigerator.html	50% of Medium
Reclaimed plastic	lbs.	Medium	$0.291	http://www.recycle.net/Plastic/other/xv100700.html http://www.ehow.com/info_12193939_type-plastic-used-refrigerator.html	Average of ABS and Polycarbonate Values
Reclaimed plastic	lbs.	High	$0.437	http://www.recycle.net/Plastic/other/xv100700.html http://www.ehow.com/info_12193939_type-plastic-used-refrigerator.html	150% of Medium
Reclaimed aluminum	lbs.	Low	$0.387	http://www.calrecycle.ca.gov/BevContainer/Notices/2012/2012ComRates.pdf	50% of Medium
Reclaimed aluminum	lbs.	Medium	$0.774	http://www.calrecycle.ca.gov/BevContainer/Notices/2013/SVMonthly.pdf	
Reclaimed aluminum	lbs.	High	$1.161	http://www.calrecycle.ca.gov/BevContainer/Notices/2012/2012ComRates.pdf	150% of Medium
Reclaimed rubber	lbs.	Low	$48.058	http://rubberboard.org.in/weeklyrubberprice.asp	50% of Medium

Benefit	Units	Valuation Scenario	Monetary Value per Unit	Source	Assumption
Reclaimed rubber	lbs.	Medium	$96.116	http://rubberboard.org.in/weeklyrubberprice.asp	
Reclaimed rubber	lbs.	High	$144.175	http://rubberboard.org.in/weeklyrubberprice.asp	150% of Medium
Reclaimed rubber	lbs.	All	$96.120	http://rubberboard.org.in/weeklyrubberprice.asp	
SOX	lbs.	All	$0.001	http://www.evomarkets.com/environment/emissions_markets/so2_allowances	Called exchange to confirm values (1.914.323.0255) 2009 and later vales half ton 2009 & later values per half ton
Avoided Mercury Contamination	lbs.	Low	$145,454.545	http://www.sustainablehospitals.org/PDF/IP_spills_cost.pdf	50% of Medium
Avoided Mercury Contamination	lbs.	Medium	$250,000.000	http://www.sustainablehospitals.org/PDF/IP_spills_cost.pdf	The $$ value for one LBS of mercury (med)
Avoided Mercury Contamination	lbs.	High	$888,888.889	http://www.sustainablehospitals.org/PDF/IP_spills_cost.pdf	150% of Medium
Reclaimed Copper	lbs.	All	$2.625	http://www.americanrecyclinginc.com/pricing.htm	Took average values of copper 1 and copper 2
Avoided Oil Contamination	gal.	Low	$22.000	http://www.epa.gov/oswercoe1/docs/oil/fss/fss09/denning.pdf_	50% of Medium
Avoided Oil Contamination	gal.	Medium	$244.000	http://www.epa.gov/oswercoe1/docs/oil/fss/fss09/denning.pdf_	Clean-up costs for oil spill: $218 per gallon (average value)- This is not a linear value (i.e. <5 gallon spill = $19,631 per gallon etc.)
Avoided Oil Contamination	gal.	High	$723.000	http://www.epa.gov/oswercoe1/docs/oil/fss/fss09/denning.pdf_	150% of Medium

Table G-4. SCE Disposal Scenarios

Appliance Component	Raw Material	Disposal Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Refrigerant	CFC-12	Reclaimed	0%	5%	45%	50%	50%
Refrigerant	CFC-12	Destroyed	0%	5%	45%	50%	50%
Refrigerant	HFC-134a	Reclaimed	0%	5%	45%	50%	50%
Refrigerant	HFC-134a	Destroyed	0%	5%	45%	50%	50%
Refrigerant	HCFC-22	Reclaimed	0%	5%	45%	50%	0%
Refrigerant	HCFC-22	Destroyed	0%	5%	45%	50%	100%
Foam-Blowing Agent	CFC-11	Reclaimed	0%	0%	0%	0%	0%
Foam-Blowing Agent	CFC-11	Destroyed	0%	0%	0%	0%	100%
Foam-Blowing Agent	HCFC-141b	Reclaimed	0%	0%	0%	0%	0%
Foam-Blowing Agent	HCFC-141b	Destroyed	0%	0%	0%	0%	100%
Foam-Blowing Agent	HFC-134a	Reclaimed	0%	0%	0%	0%	0%
Foam-Blowing Agent	HFC-134a	Destroyed	0%	0%	0%	0%	100%
Internal Components	Used Oil	Recycled	0%	10%	90%	100%	100%
Internal Components	Used Oil	Disposed	0%	0%	0%	0%	0%
Shell	Ferrous Metal	Recycled	25%	100%	100%	100%	100%
Internal Components	Non-Ferrous Metal	Recycled	25%	100%	100%	100%	100%
Internal Components	Rubber	Recycled	0%	0%	0%	0%	0%
Shelving/Internal Components	Plastic	Recycled	0%	0%	25%	100%	100%
Shelving	Glass	Recycled	0%	0%	25%	100%	100%
Internal Components	Mercury-Containing Components	Recycled	0%	0%	0%	0%	100%
Internal Components	Mercury-Containing Components	Disposed	0%	0%	50%	100%	0%
Internal Components	PCB-Containing Capacitors	Recycled	0%	0%	0%	0%	0%
Internal Components	PCB-Containing Capacitors	Disposed	0%	0%	50%	100%	100%
Internal Components	Non PCB-Containing Capacitors	Recycled	0%	0%	0%	0%	100%

Appliance Component	Raw Material	Disposal Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Internal Components	Non PCB-Containing Capacitors	Disposed	0%	0%	0%	0%	0%
Insulation	Foam	Recycled	0%	0%	0%	0%	100%
Insulation	Fiberglass	Recycled	0%	0%	0%	0%	0%

Table G-5. PG&E Disposal Scenarios

Appliance Component	Raw Material	Disposal Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Refrigerant	CFC-12	Reclaimed	0%	5%	45%	50%	50%
Refrigerant	CFC-12	Destroyed	0%	5%	45%	50%	50%
Refrigerant	HFC-134a	Reclaimed	0%	5%	45%	50%	50%
Refrigerant	HFC-134a	Destroyed	0%	5%	45%	50%	50%
Refrigerant	HCFC-22	Reclaimed	0%	5%	45%	50%	0%
Refrigerant	HCFC-22	Destroyed	0%	5%	45%	50%	100%
Foam-Blowing Agent	CFC-11	Reclaimed	0%	0%	0%	0%	0%
Foam-Blowing Agent	CFC-11	Destroyed	0%	0%	0%	0%	100%
Foam-Blowing Agent	HCFC-141b	Reclaimed	0%	0%	0%	0%	0%
Foam-Blowing Agent	HCFC-141b	Destroyed	0%	0%	0%	0%	100%
Foam-Blowing Agent	HFC-134a	Reclaimed	0%	0%	0%	0%	0%
Foam-Blowing Agent	HFC-134a	Destroyed	0%	0%	0%	0%	100%
Internal Components	Used Oil	Recycled	0%	10%	90%	100%	100%
Internal Components	Used Oil	Disposed	0%	0%	0%	0%	0%
Shell	Ferrous Metal	Recycled	25%	100%	100%	100%	100%
Internal Components	Non-Ferrous Metal	Recycled	25%	100%	100%	100%	100%
Internal Components	Rubber	Recycled	0%	0%	0%	0%	0%
Shelving/Internal Components	Plastic	Recycled	0%	0%	25%	100%	100%
Shelving	Glass	Recycled	0%	0%	25%	100%	100%

Appliance Component	Raw Material	Disposal Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Internal Components	Mercury-Containing Components	Recycled	0%	0%	0%	0%	100%
Internal Components	Mercury-Containing Components	Disposed	0%	0%	50%	100%	0%
Internal Components	PCB-Containing Capacitors	Recycled	0%	0%	0%	0%	0%
Internal Components	PCB-Containing Capacitors	Disposed	0%	0%	50%	100%	100%
Internal Components	Non PCB-Containing Capacitors	Recycled	0%	0%	0%	0%	100%
Internal Components	Non PCB-Containing Capacitors	Disposed	0%	0%	0%	0%	0%
Insulation	Foam	Recycled	0%	0%	0%	0%	100%
Insulation	Fiberglass	Recycled	0%	0%	0%	0%	0%

G.2 Profiles of Materials Buyers

To augment our ARCA and JACO recycling facility visits, we researched, and contacted, several of the prominent material buyers that have contracts to purchase metals, glass, oils, and toxic substances from ARCA and JACO. The buyers we researched are listed in Table G-6, and our findings are described in detail below.

Table G-6. Material Buyers

Company	Researched Online	Spoke with via Telephone
Asbury Environmental	Yes	No
Clean Harbors	Yes	No
Ecology Auto	Yes	Yes
Multi-Link International	Yes	Yes
SA Recycling	Yes	No
Sims Metal Management	Yes	Yes

G.2.1 Asbury Environmental

Asbury Environmental is the waste oil and antifreeze collection service for DeMenno/Kerdoon (DK). Asbury Environmental is a California company with locations in Compton, Spring Valley, Fontana, and

Dixon. The firm's primary functions include picking up bulk or drums of waste oil, drums of used oil filters, and antifreeze, and transporting these substances to DK for processing. DK processes the waste oil into lubricant quality oil, fuel oil, and asphalt extender. DK processes the waste antifreeze into reusable antifreeze and sells it as Trinity antifreeze.

G.2.2 Clean Harbors

Clean Harbors is an international company, with locations in California, Texas, the northeastern US, Canada, and Puerto Rico. Clean Harbors provides a variety of environmental, energy, and industrial services including refrigerant recycling, waste oil and antifreeze recycling, and PCB and non-PCB capacitor disposal.

Clean Harbors processes the refrigerant it drains from appliances for reuse, and remanufactures antifreeze for reuse. The company processes waste oil into products that can be used as a boiler fuel supplement or burned in approved industrial furnaces. It also recycles working Non-PCB capacitors, and incinerates PCB waste in accordance with applicable regulations.

G.2.3 Ecology Auto

Ecology Auto is a California company with several locations in the southern portion of the state, as well as in Nevada and Arizona. Though primarily a car parts yard, Ecology Auto also purchases scrap metal for processing. The firm does not accept hazardous, contaminated, or radioactive materials, and its DTSC CAR certification appears to have expired at the beginning of 2012.

Ecology Auto takes ferrous and non-ferrous metals, as well as aluminum cans for processing. The metals received are shredded, sorted by type, and then baled together for resale to steel, aluminum, or other metal product manufacturers.

G.2.4 Multi-Link International

Multi-Link International is a California company, located near the Port of Long Beach. The company accepts a variety of plastics and foams—plastic types 1 to 7, ABS, HDPE, Nylon, PP, Acrylic, LDPE, PC, PS/HIPS, Acetal MDPE, PE_PET, and PVC—for processing and recycling.

Multi-Link International processes these materials by grinding them, and then either baling them for resale, or processing them further into materials like films, rolls, or pellets before sale. Being one hour from the Port of Long Beach allows Multi-Link International to sell its processed materials in bulk to companies that use them in manufacturing new plastic products.

G.2.5 SA Recycling

SA Recycling is a full service recycler, based primarily in California, with additional locations in Las Vegas, Phoenix, and Tucson. In addition to accepting a variety of materials (e.g., aluminum cans, plastic and glass bottles, small and large appliances, cars, metal and plastic items, and manufacturing scraps) for recycling, the firm is Department of Toxic Substances Certified Appliance Recycling (CAR)-certified, and

therefore able to process appliances containing hazardous materials. Upon receipt of an appliance, SA Recycling removes, crushes, shreds, and/or shears the hazardous materials.

SA Recycling separates the metals they receive by type, and then bales them with like metals. The company sells recovered materials to stamping companies, wheel manufacturers, steel furniture or bracket manufacturers, tooling companies, rebar cutters or fabricators, machinery manufacturers, and pipe manufacturers.

G.2.6 Sims Metal Management

Sims Metal Management originated in Australia, but now has locations in North America—including California and elsewhere in the US—Asia, and Europe..

Sims Metal Management accepts refrigerators as well as a wide variety of other metal items for processing, including cars, cans, steel beams, electronics and IT equipment, planes, and trains. It operates curbside material programs in New York City and Chicago.

The company first It separates and resells intact items like copper cables, batteries, car and marine engines, trains, copper piping, and alloy wheels. It then sorts the remaining ferrous from the non-ferrous metals, shreds them, and then organizes them by specific metal type for baling. The processed scrap metals are reused in a wide variety of ways: as fragmented furnace feed, clean cut grades of ferrous scrap for steel and foundry markets, high grade non-ferrous metals, and high quality/low chemical residual chemical bales for steel manufacturers needing specific quality levels.

G.3 Emissions from Energy Use

Cadmus conducted a review of E3's emissions factors GHG reductions due to reduced energy consumption. This review is outlined in detail below.

G.3.1 Introduction

To determine the amount of greenhouse gas (GHG) emissions displaced by the SCE and PG&E programs through energy savings, Cadmus compiled the most relevant GHG emissions factors. To determine these factors Cadmus reviewed the following sources:

- The World Resource Institute's (WRI) Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects; and GHG Protocol Corporate Standard;
- WRI GHG Protocol calculations;
- The Climate Registry;
- EPA's State Inventory Tool (SIT);
- Utility-specific emissions factors used for reporting emissions;
- Emissions factor requirements under the Mandatory Reporting requirement of AB 32;
- California Public Utilities Commission (CPUC) reporting requirements; and
- Interviews with technical staff at the California Air Resources Board (ARB).

There is currently no single mandated federal or California-specific GHG evaluation method for assessing displaced emissions from energy-efficiency programs. Therefore, Cadmus compiled the most up-to-date California electricity-based emissions factors found through our literature review. The derivation of each emissions factor is dependent on its own set of assumptions (e.g., climate zone, boundary, fuel type, granularity of data, and methods). The most relevant emissions factors are listed in Table G-7.

Table G-7. Potential Emissions Factors for SCE and PG&E ARP Programs*

Emissions Factor (lbs CO_2/MWh)**	Year/ Region	Source	Link
445	2009, PG&E	Self-reported for 2012 Carbon Disclosure Project (CDP) Response	https://www.cdproject.net/en-US/Results/Pages/responses.aspx
463	2012 forecast, PG&E	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
529	2008, PG&E	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
559	2010/2011, PG&E	Average of PG&E's 2005 to 2009 GHG emissions factors provided for current use	http://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf
595	2012 forecast, SCE	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
610	2002, CA	EIA 2002 - For CA	http://www.eia.gov
631	2008, SCE	2008 Utility-Specific Emissions Factors; Power/Utility Reporting Protocol (PUP) Metrics June 2009	http://www.climateregistry.org/tools/member-resources/power-utility-reporters.html
636	2008, PG&E	2008 Utility-Specific Emissions Factors; PUP Metrics June 2009	http://www.climateregistry.org/tools/member-resources/power-utility-reporters.html
681	2007, CA	CA eGrid subregion 2007 emissions factors	http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html
683	2008, SCE	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
710	Current, US	EPA default emissions factor (40 CFR Part 98)	http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/ghg_fuelthreshold.pdf
943	2010, CA	Mandatory Reporting Regulation from AB 32, Section 95111 for unspecified electricity	http://www.arb.ca.gov/regact/2010/ghg2010/mrrfro.pdf

* This table does not provide an exhaustive list: additional PG&E specific factors that could be added can be found at: http://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf

**Emissions factors have been converted to lbs CO_2/MWh.

G.3.2 Potential Emissions Factors

In our review of emissions factors, Cadmus referred to the best practice[13] sources initially listed in this memo to develop a range of applicable emissions factors for each utility.

Cadmus considered the regulatory environment, program type and client reporting (previous GHG inventories and protocols used for their development) when identifying the range of emissions factors to use in our analysis.

Two relevant sources for this analysis are California ARB and The Climate Registry. The ARB requires either a set emissions factor for electricity from an unspecified source[14] or a supplier-specific emissions factor. The Climate Registry specifies using either an eGrid subregion emissions factor or supplier-specific verified emissions factors. We therefore selected both eGrid and supplier/utility-specific emissions factors for use in our analysis. We are uncertain whether these values have been third-party verified. As a note, Cadmus conducted an interview with ARB staff who stated that for utilities in California reporting their own emissions, the ARB regulations take precedence for GHG reporting.

Table G-8 gives a potential overall California emissions factor from eGrid.

Table G-8. Overall Potential Emissions Factor

Emissions Factor (lbs CO2/MWh)	Year/Region	Source	Link
681	2007, CA	CA eGrid subregion 2007 emissions factors	http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html

Note: As The Climate Registry includes eGrid as best practice, this emissions factor could be appropriate for both utilities.

Table G-9 shows utility-specific factors for SCE. These include the most recent actual emissions factors as well as factors forecasted for 2012.

[13] For best practice guidance, Cadmus used the World Resource Institute's *Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects*, The Climate Registry's *General Reporting Protocol* and default emission factor updates, WRI's *GHG Protocol Corporate Standard* as well as WRI's GHG calculation tools, and EPA's calculation tools such as the State Inventory Tool (SIT). These are the most widely recognized protocols and tools for GHG emissions calculation.

[14] Per ARB (http://www.arb.ca.gov/regact/2010/ghg2010/mrrfro.pdf), an unspecified source is defined as "electricity procured and delivered without limitation at the time of transaction to a specific facility's or unit's generation." These sources "contribute to the bulk system power pool and are typically dispatchable, marginal resources that do not serve baseload."

Table G-9. SCE Potential Emissions Factors

Emissions Factor (lbs CO_2/MWh)	Year/Region	Source	Link
595	2012 forecast, SCE	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
683	2008, SCE	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
631	2008, SCE	2008 Utility-Specific Emissions Factors; PUP Metrics June 2009	http://www.climateregistry.org/tools/member-resources/power-utility-reporters.html

Table G-10 shows the utility-specific factors for PG&E. These include the most recent actual emissions factors as well as factors forecasted for 2012.

Table G-10. PG&E Potential Emissions Factors

Emissions Factor (lbs CO_2/MWh)	Year/Region	Source	Link
463	2012 forecast, PG&E	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
529	2008, PG&E	CPUC E3 GHG Calculator, Version 3c, 10/2010	http://www.ethree.com/public_projects/cpuc2.php
636	2008, PG&E	2008 Utility-Specific Emissions Factors; PUP Metrics June 2009	http://www.climateregistry.org/tools/member-resources/power-utility-reporters.html

Updates to the emissions factors we used will depend on legislation and the progression of study in this area. When the emissions factors are updated, the estimates of GHG emissions displaced over the lifetime of each program are subject to change accordingly.

H. REFERENCES

ADM Associates, Inc. *Evaluation Study of the 2004-05 Statewide Residential Appliance Recycling Program*. Written on behalf of the California Public Utilities Commission. 2008.

ADM Associates, Inc. *Measure and Verify Savings of Refrigerator Recycling Program*. Prepared for Sacramento Municipal Utility District. 2007. Available online: http://www.cee1.org/eval/db_pdf/907.pdf.

Ameren Illinois. 2012. "Fridge and Freezer Recycling." Accessed November 29, 2012. http://www.actonenergy.com/for-my-home/explore-incentives/refrigerator-freezer-recycling.

Bushman, Kate and J. Keeling. "A Meta-Analysis of Drivers of Freeridership in Appliance Recycling Programs." Paper presented at The International Energy Program Evaluation Conference, Boston, Massachusetts, August 16, 2011 through August 18, 2011.

Bushman, Kate, K. Kansfield, and J. Keeling. "Primary Refrigerators: An Examination of Appliance Recycling Program Design." Paper presented at The International Energy Program Evaluation Conference, Boston, Massachusetts, August 16, 2011 through August 18, 2011.

The Cadmus Group, Inc. *Ameren Illinois Appliance Recycling Program Evaluation – PY2.* 2011.

The Cadmus Group, Inc. *Consumers Energy 2010 Evaluation Activity and Summary Report Prepared for Consumers Energy.* 2011.

The Cadmus Group, Inc. *Rocky Mountain Power 2009-2010 Utah Cool Cash Program Evaluation.* 2011.

The Cadmus Group, Inc. *Rocky Mountain Power Wyoming Evaluation 2009–2010 Report.* 2011.

The Cadmus Group, Inc. *2008 and 2009 Great Refrigerator Roundup Program—Impact Evaluation Prepared for Ontario Power Authority.* 2010.

The Cadmus Group, Inc. *Appliance Recycling Program Evaluation—PY1 Prepared for: Ameren Illinois Utilities.* 2010.

The Cadmus Group, Inc. *Idaho Refrigerator and Freezer Recycling Program 2006-2008 Prepared for: Rocky Mountain Power.* 2010.

The Cadmus Group, Inc. et al. *Residential Retrofit High Impact Measure Evaluation Report Prepared for the California Public Utilities Commission Energy Division.* 2010.

The Cadmus Group, Inc. *Utah Refrigerator and Freezer Recycling Program 2006-2008 Prepared for Rocky Mountain Power.* 2010.

The Cadmus Group, Inc. *Washington Refrigerator and Freezer Recycling Program 2006-2008 Prepared for Pacific Power.* 2010.

The Cadmus Group, Inc. *PowerWise Appliance Recycling Program, FY 2009 Evaluation*. Prepared for Salt River Project. September 2009.

The Cadmus Group, Inc. *Impact and Evaluation of Ontario Power Authority's Great Refrigerator Roundup Program Prepared for Ontario Power Authority.* 2008.

California Public Utilities Commission. "2008 Database for Energy-Efficient Resources, Version 2008.2.04 October 30, 2008. For Use in the California IOU 2006-2007 Energy Efficiency Claims Ex Ante Update." Accessed December 28, 2012. http://www.deeresources.com/index.php?option=com_content&view=category&layout=blog&id=40&Itemid=55.

California Public Utilities Commission. "2008 Database for Energy-Efficient Resources, Version 2008.2.05 December 16, 2008. For Use in California IOU 2009-2011 Energy Efficiency Planning and Reporting." Accessed December 28, 2012. http://www.deeresources.com/index.php?option=com_content&view=article&id=65&Itemid=57.

California Public Utilities Commission. *2010-2011 Energy Efficiency Annual Progress Evaluation Report*. 2012.

Commonwealth Edison. "Save money by recycling your old fridge or freezer." Accessed November 29, 2012. https://www.comed.com/home-savings/rebates-incentives/pages/refrigerator-recycling.aspx.

Consumers Energy. "How appliance recycling works for you and your budget." Accessed November 29, 2012. http://www.consumersenergy.com/eeprograms/RHome.aspx?id=4117.

Dohrmann, D., J. Peterson, J. Reed, S. Samiullah, and S. Westberg. "Net Savings Estimation in Appliance Recycling Programs: A Review and Empirical Analysis with Recent California Data." Paper presented at The International Energy Program Evaluation Conference, Chicago, Illinois, August 14, 2007 through August 16, 2007.

Energy Efficiency Groupware Application (EEGA). PG&E and SCE Q1 2006 through Q4 2009 Quarterly Reports. http://eega2006.cpuc.ca.gov/DisplayQuarterlyReport.aspx?ID=7.

Energy Information Administration. "Table 6. Class of ownership, number of consumers, sales, revenue, and average retail price by State and utility: residential sector." 2004, 2005, 2006, 2007, 2008, 2009, 2010, and 2011. http://www.eia.gov/electricity/sales_revenue_price/pdf/table6.pdf.

Heschong Mahone Group, Inc. *Measurement and Verification of SB5X Energy Efficiency Programs for the Sacramento Municipal Utility District.* 2003.

Itron, Inc. *DEER Database: 2011 Update Documentation.* November 8, 2011.

Itron, Inc. *Database for Energy Efficient Resources: 2011 Update. Appendix A-1, last updated November 19, 2011.* 2011.

KEMA, Inc. *2009 California Residential Appliances Saturation Study.* CEC-200-2010-004. Prepared for California Energy Commission. October 2010.

KEMA, Inc. *Evaluation Measurement and Verification of Public Service Company of New Mexico's Electric Energy Efficiency Programs October 2007 – December 2008 Program Year.* 2009.

KEMA-Xenergy, Inc. *Measurement and Evaluation Study of 2002 Statewide Residential Appliance Recycling Program Prepared for Southern California Edison.* 2004.

Lawrence Berkley National Laboratory. "Energy Efficiency Standards: Refrigerators." Accessed November 29, 2012. http://ees.ead.lbl.gov/projects/past_projects/refrigerators.

MassSave. "Offers: Receive $50 when you recycle your second refrigerator or freezer." Accessed November 29, 2012. http://www.masssave.com/residential/offers/refrigerator-and-freezer-recycling-rebates.

Navigant Consulting. *Energy Efficiency / Demand Response Plan: Plan Year 2 (6/1/2009 – 5/31/2010). Evaluation Report: Residential Appliance Recycling Presented to Commonwealth Edison Company*. 2010.

Nexus Market Research Group, Inc. *Massachusetts Appliance Turn-In Program Impact Evaluation FINAL 6/15/2011.* 2011.

Nexus Market Research Group, Inc. *Impact, Process, and Market Study of the Connecticut Appliance Retirement Program: Overall Report.* 2005.

NMR Group, Inc. and Cadmus Group, Inc. *The Massachusetts Appliance Turn-in Program Impact Evaluation. FINAL.* Prepared for National Grid, NSTAR Electric, Cape Light Compact, Western Massachusetts Electric Company. June 15, 2011.

Ontario Power Authority. "Fridge & Freezer Pickup." Accessed November 29, 2012. https://saveonenergy.ca/Consumer/Programs/Appliance-Retirement.aspx.

Pacific Power. "Refrigerator Recycling." Accessed November 29, 2012. http://www.pacificpower.net/res/sem/epi/washington/roa.html.

PNM. "PNM Refrigerator Recycling Rebate." Accessed November 29, 2012. http://www.pnm.com/rebates/fridge.htm.

Robert Mowris & Associates. *Measurement and Verification Report for NCPA SB5X Refrigerator Recycling.* Final Report to Northern California Power Agency. 2003.

Rocky Mountain Power. "Refrigerator Recycling." Accessed November 29, 2012. http://www.rockymountainpower.net/res/sem/epi/idaho/roa.html.

Salt River Project. "Clean up your patio or garage and save." Accessed November 29, 2012. http://www.srpnet.com/energy/powerwise/savewithsrp/ApplianceRecycling.aspx.

Skumatz, Lisa A. and John Gardner. *Revised/Updated EULs Based on Retention and Persistence Studies Results, Revised Report.* 2005.

Snohomish Public Utility District. "Appliance Recycling." Accessed November 29, 2012. http://www.snopud.com/?p=1289.

Snohomish Public Utility District. *2006 Refrigerator/Freezer Recycling Program Evaluation Prepared for Sacramento Municipal Utility District.* 2007.

Summit Blue Consulting. *Commonwealth Edison Company Energy Efficiency/Demand Response Plan Year 1 (6/1/2008-5/31/2009).* 2009.

U.S. Department of Energy. *Refrigerator Market Profile.* December 2009. Available online: http://apps1.eere.energy.gov/states/pdfs/ref_market_profile.pdf.

I. RECYCLING FACILITY PROCESS REVIEW

I.1 Methodology

To assess the decommissioning processes reported by SCE's and PG&E's Appliance Recycling Program (ARP) implementation contractors—ARCA Incorporated (ARCA) and JACO Environmental (JACO)—Cadmus toured ARCA's recycling facility in Compton, California, and JACO's recycling facilities in Fullerton and Hayward, California.

While on site, we interviewed the facility manager for each warehouse and spoke with other staff and consultants as appropriate. Table I-1 lists those interviewed.

Table I-1. Implementation Contractors Interviewed

Company	Interviewee	Title	Location
ARCA	Jeffrey Woloz	Vice President and General Manager	Compton, CA
JACO	Michael Dunham	Director, Energy & Environmental Programs	Fullerton, CA
	Dave Bray	Facility Manager	Hayward, CA
	Theresa Rodriguez	Retail Coordinator for PG&E ARP	Hayward, CA
	Phil Sisson	Consultant for JACO Environmental	Hayward, CA

The interviews sought to develop insights into the technical aspects of the decommissioning process, and to better understand how recycling facilities coordinate with their organizations' corporate headquarters, call centers, and client utilities. Interview questions addressed organizations' structures, program management, and program delivery. Our interview-driven site visits focused on gathering information specifically about the following appliance recycling processes:

- Call-center operations and appliance pick-ups;
- Unit intake and deconstruction;
- Handling and documentation of appliance components and materials; and

Transfer of materials and containment of toxic substances.

The information gathered through the interviews enabled us to document the implementers' procedures for: signing up participants; collecting and decommissioning appliances; handling materials and components; and transporting materials to other organizations.

To trace the components of recycled appliances to their ultimate end points, we also spoke with several materials buyers maintaining contracts with ARCA and JACO to dispose of metals, glass, oils, and toxic substances. Overviews of ARCA and JACO's materials buyers are provided in Appendix F.

Our interviews of both implementer staff and their material vendors covered the following topics:

- What are the steps of the intake and decommissioning process?

- What verification processes are in place to ensure adequate data collection?
- Which appliance components do and do not get recycled/reclaimed/disposed of in an environmentally sound manner and otherwise?
- What are the implementers' roles in and perceptions of the used appliances market?
- How are the implementers' involved in voluntary government recycling programs?

I.2 Findings

This section describes the following, major steps ARCA and JACO undertake in appliance recycling:

- Pick-up scheduling and appliance collection;
- Unit intake and deconstruction;
- Handling and documentation of appliance component materials; and
- Transfer of materials and containment of toxic substances.

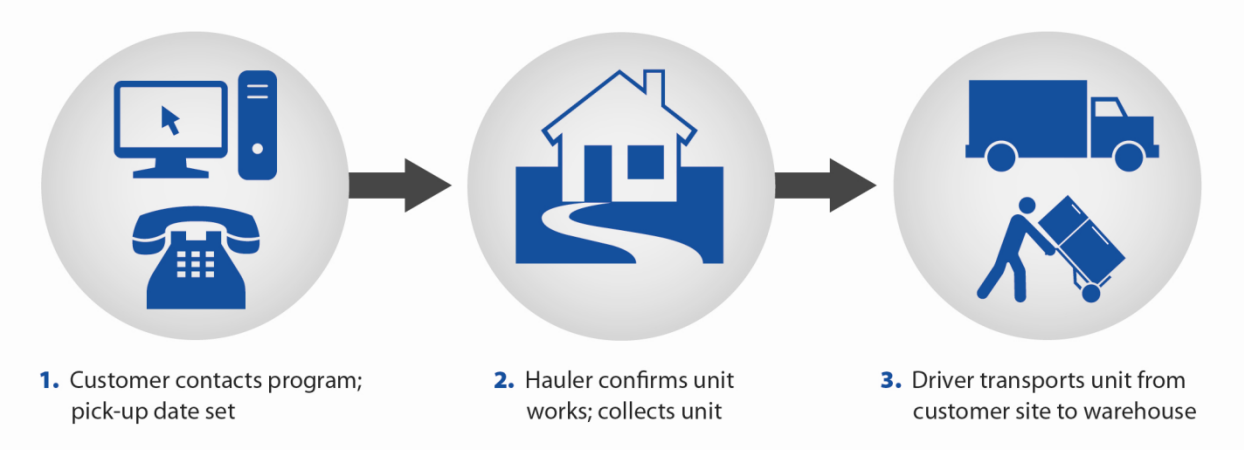
Understanding of appliance recycling processes proves crucial in not only understanding what happens to materials when recycled through the ARPs, but also to understanding what likely happens to materials from discarded refrigerators and freezers in absence of ARPs.

In Section **Error! Reference source not found.**, we apply findings from the facility site visits to quantification of environmental benefits.

I.2.1 Pick-Up Scheduling and Appliance Collection

ARCA and JACO use relatively similar sign-up and appliance collection procedures. Both implementers follow the basic procedures shown in Figure I-1.

Figure I-1. Appliance Pick-Up Scheduling and Collection



1. A customer initiates a pick-up by phoning the implementer's call center directly or by signing up on the program Website. ARCA's flagship call center, which handles appliance recycling requests from customers throughout the United States, is based in Southern California. JACO also uses a

central call center, based in Washington State, to handle appliance scheduling from around the United States.

The call center representative or Website asks the customer to describe the basic characteristics of appliances they wish to recycle (e.g., age, brand, size, type, configuration, and whether the unit is operable). As customers often supply inaccurate descriptions of their appliances, the appliance hauler will check and, if necessary, update this information when picking up the unit.

The phone representative or Website records the order in the company's software system, and assigns the customer a pick-up date. All SCE customer orders and associated appliance information, whether placed by an ARCA or JACO representative, are entered into the Enerpath software.

The call center's dispatcher informs the appliance haulers of their pick-up routes a few days in advance. The haulers, in turn, call customers 48 hours prior to their scheduled pick-up dates to provide them with a four-hour pick-up window and to remind them their units must be in working order to qualify for the program.

ARCA Details (SCE): ARCA's Southern California call center maintains 22 operators on duty. The center handles initial orders from program participants across the United States, not just from California participants. The call system identifies the area code of each incoming call, and ARCA's computer system determines the applicable recycling program, based on the caller's area code. ARCA places orders and schedules pick-ups based on scheduling procedures established for each jurisdiction.

2. Upon arriving at a customer's building, the hauler verifies the appliance works by plugging it in, and, in the case of refrigerators or freezers, confirming it has the ability to cool. The hauler then enters information about the unit into a personal digital assistant (PDA), applies a sticker with a unique bar code to identify the appliance, scans the bar code, and records the customer's signature in the PDA. All information recorded in the PDA uploads to ARCA's or JACO's main data tracking system. In addition to recording appliance characteristics on their PDAs, the haulers use the PDAs to photograph the collected appliances.

   JACO Fullerton and ARCA Details (SCE): JACO's Fullerton facility uses the EnerPath PDA system to record incoming order requests and to schedule appliance pick-ups.

   JACO Hayward Details (PG&E): As with the haulers for its Fullerton facility, haulers for JACO's Hayward facility also employ PDAs to record appliance characteristics and photographs. However, they use JACO's internal data entry system (rather than EnerPath's). Although JACO's Fullerton and Hayward facilities use different intake and sign-up systems, JACO staff reported little difference between data collected by the two systems.

3. The hauler transports the unit to the warehouse or recycling facility.

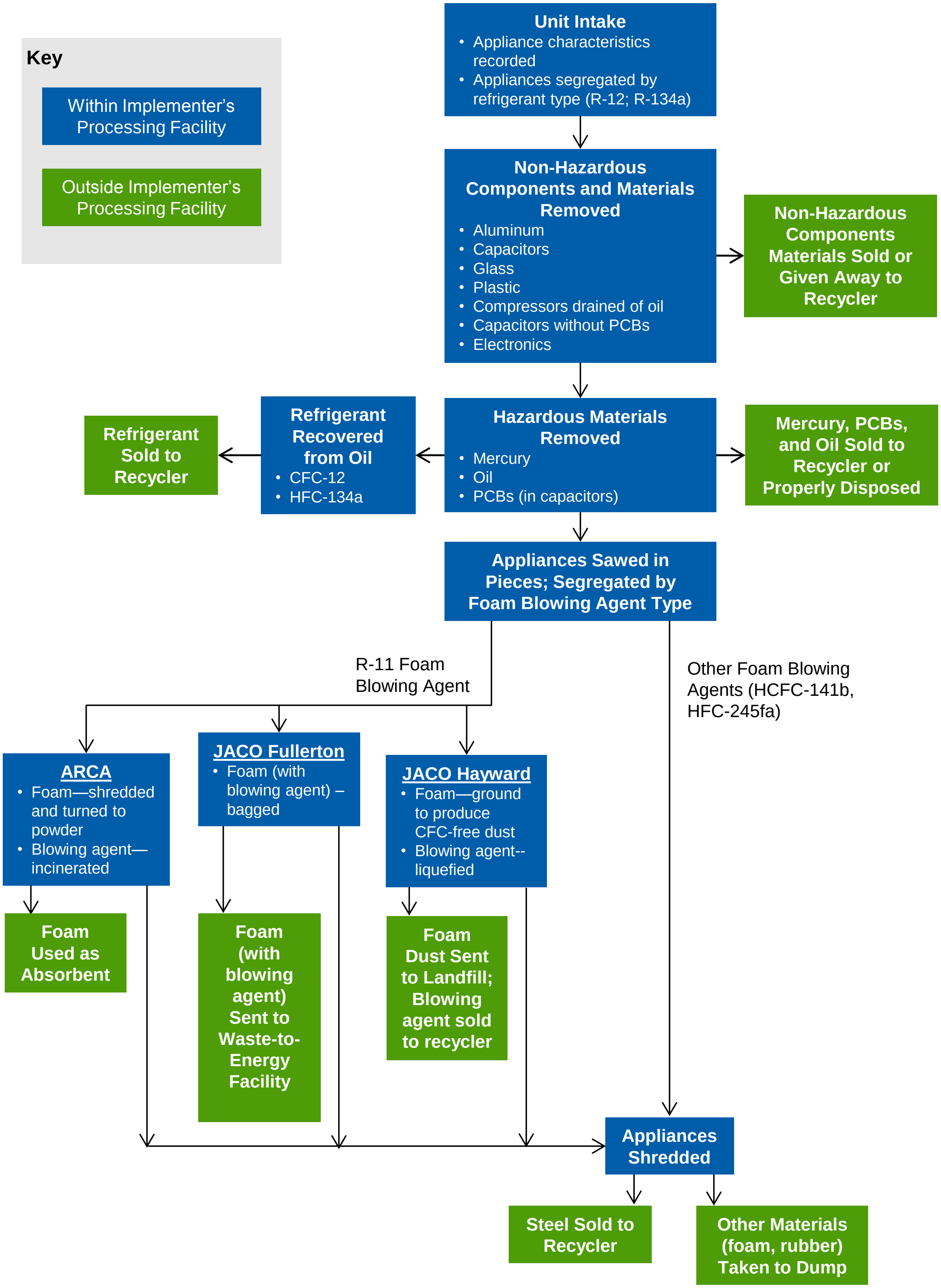
   ARCA Details (SCE): ARCA handles most of its own *in situ* appliance eligibility verification and appliance hauling. Occasionally, the company supplements its internal staff by contracting verification and hauling functions to Herrera Trucking.

JACO Details (Fullerton and Hayward): JACO contracts with Appliance Distribution, Inc., to verify appliance eligibility and to haul the appliances from customer sites.

I.2.2 Unit Intake and Deconstruction

ARCA and JACO follow similar processes for the intake and deconstruction of collected ARP appliances, with an overview of these processes depicted in Figure I-2.

Figure I-2. Appliance Intake and Deconstruction Process



Though generally similar, ARCA's and JACO's unit intake and deconstruction processes differ, most notably in the methods they employ to determine a unit's age. Detailed descriptions of ARCA's and JACO's distinctive intake and deconstruction processes follow.

ARCA

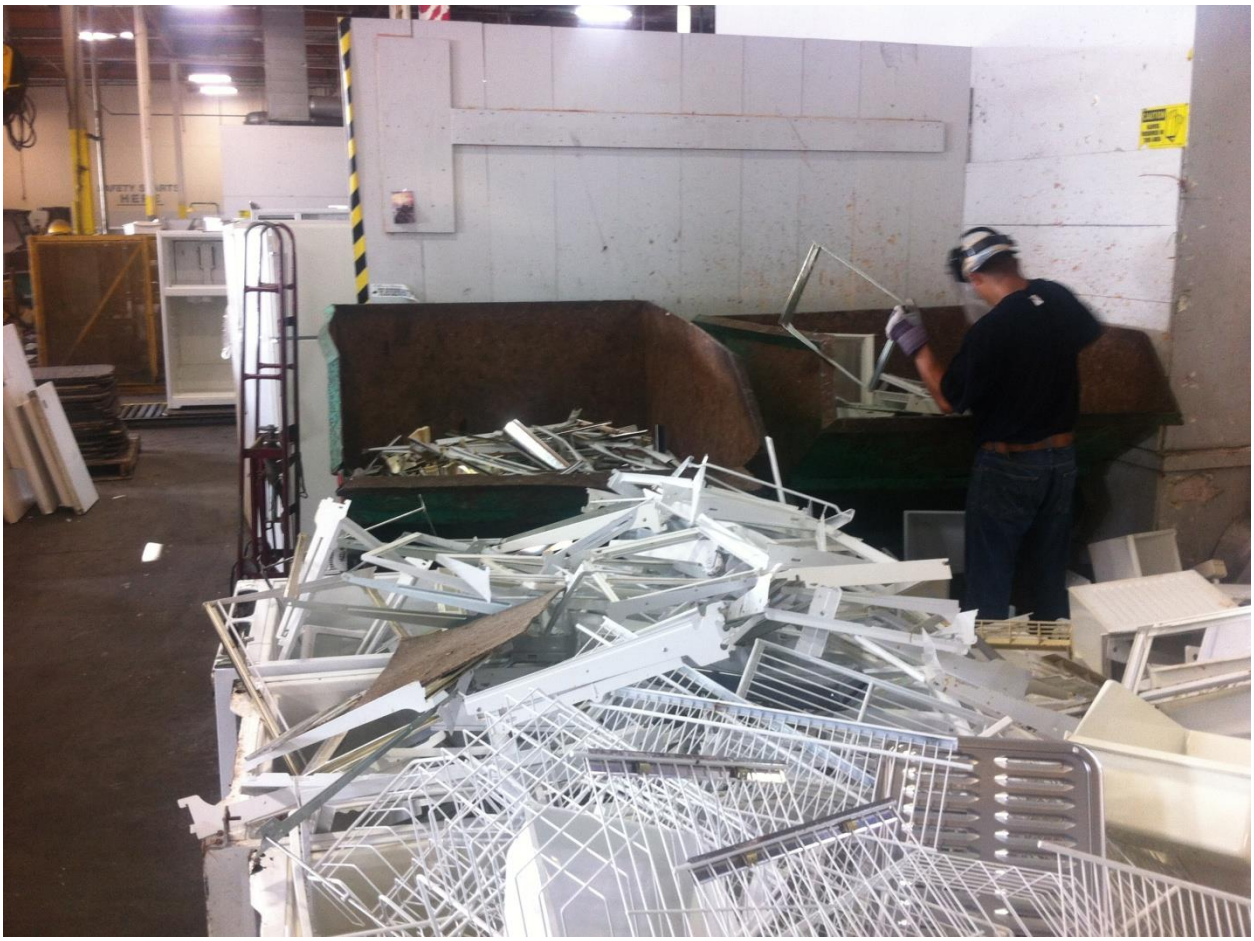
After unloading an appliance at their warehouse, ARCA staff scan the bar code from the applied sticker. Staff also rechecks the age, size, and configuration of the unit. When possible, ARCA staff determine the unit's age based on its serial number. However, ARCA successfully determines an appliance's age from its serial number only about one-half of the time. Where the manufacturing date cannot be established from the serial number, ARCA staff estimates the unit's age based on its color, handle type, and other features. ARCA determines a unit's size based on its model number. If the model number cannot be seen on the unit, staff often determines the unit's size visually, but does not physically measure the unit. Staff determine the appliance's configuration by visual inspection.

Figure I-3 shows units ready for deconstruction at ARCA's Compton facility.

Figure I-3. Site Interior (ARCA Compton Facility)

ARCA staff then bring the appliance to an unloading area, where they classify it as containing CFC-12[15] or HFC-134a[16] refrigerant. They strip the unit of its parts and components, manually removing plastic and glass shelves, aluminum coils, capacitors, and other electric components. Staff sort the plastic into three separate piles: clear, white, and dark. Figure I-4 illustrates this step in ARCA's deconstruction process.

Figure I-4. Binning of Components (ARCA Compton Facility)

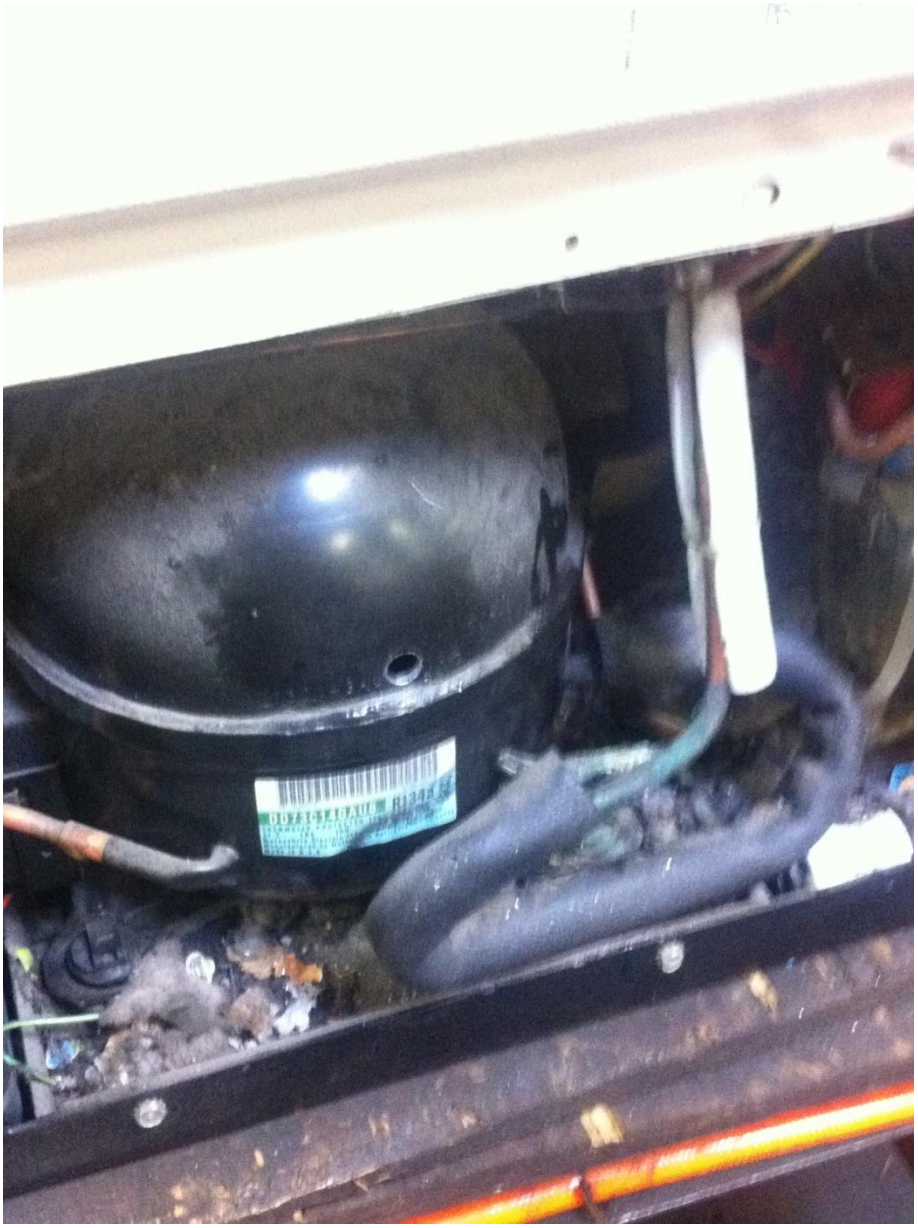


[15] CFC-12, also known as dichlorodifluoromethane or CFC-12, was the most commonly used refrigerant in residential refrigerators prior to 1994. (Freon-12, another common name for CFC-12, is DuPont's trade name for this refrigerant). As it is a chlorofluorocarbon halomethane (CFC) that causes damage to the ozone layer, manufacture of CFC-12 was banned in the United States and other countries in 1996 (under the Montreal Protocol).

[16] HFC-134a, also known as 1,1,1,2-Tetrafluoroethane or HFC-134a, has properties similar to CFC-12, and has become the new industry standard refrigerant following CFC-12's banning. Unlike CFC-12, HFC-134a's has an ozone depletion potential of zero. Recently, however, HFC-134a has been identified as a greenhouse gas that contributes to global climate change.

ARCA confirms the unit's refrigerant type (CFC-12 or HFC-134a), notes mercury leaks, and cleans out mercury in older units. Staff then drill holes into the appliance's compressor to collect the oil contained inside the unit. Staff collects the oil using a drip pan, and treats it to remove refrigerant. Staff also extract the appliance's motor compressor and lay it on its side; so oil can properly drain. The facility treats all separated oil by burning, degassing, and then disposal in compliance with EPA regulations, or sells it as fuel. Figure I-5 shows a drained compressor at ARCA's Compton recycling facility.

Figure I-5. Drained Compressor (ARCA Compton Facility)



At this stage, a unit can be considered "decommissioned," and is marked and scanned into the PDA, indicating its new status.

Once deemed decommissioned, ARCA uses industrial saws to break the units into two to three pieces. They then separate units containing R-11 foam blowing agent from those that do not. If the unit contains foam,[17] ARCA applies pressure to the appliance foam with a plunger. Figure I-6 shows the appliance segmentation process. Staff shreds the foam, and incinerates the blowing agent using a machine that turns solid product into a polyurethane powder that can be used as an absorbent for spills or other purposes.

Figure I-6. Segmenting of Unit for Foam Removal (ARCA Compton Facility)

[17] Some very old refrigerators and freezers contain fiberglass in lieu of foam. These units are grouped with non-R-11 units.

If the unit does not contain R-11 foam blowing agent, staff shreds the unit, and sends the remaining materials to materials vendors for recycling or disposal, as described below.

JACO (Fullerton and Hayward)

After unloading appliances from delivery trucks appliances at its warehouse, JACO staff tracks collected appliances by rescanning them. Figure I-7 shows an entrance at JACO's Hayward warehouse.

Figure I-7. Site Interior (JACO Hayward Facility)

JACO staff then rechecks and records the units' size, configuration, and age. They determine a unit's size by examining its name plate, and determine the unit's configuration visually or, when needed, with the aid of a reference manual. About one-half of the time, staff can determine an appliance's age by inspecting its name plate. In other instances, staff estimate the age by entering the unit's make and

model into Kouba-Cavallo Associates' database,[18] or, for units manufactured before 1975, by consulting a vintage refrigerator manual.

JACO staff strip the unit of its parts and components, manually removing plastic and glass shelves, aluminum coils, capacitors, and other electric components. They then code each unit according to its refrigerant type: CFC-12 or HFC-134a. Staff places appliances on the appropriate (CFC-12 or HFC-134a) conveyor, and hooks each unit up to machinery that removes refrigerant and oil. During this process, oil from the compressor is cleaned; so it no longer can be deemed a hazardous material.[19] Figure I-8 shows JACO's refrigerant removal equipment. JACO staff records the weight (in ounces) of oil and refrigerant reclaimed from each unit.

[18] See: http://www.kouba-cavallo.com/refmods.htm.

[19] Oil with refrigerant content above 1,000 ppm is considered a hazardous material. JACO's oil extraction process results in oil containing a maximum of 250 ppm of refrigerant.

Figure I-8. Refrigerant Removal Equipment (JACO Fullerton Facility)

Staff then removes the unit's compressor, which they stack until a group of compressors can be sold.

If the refrigerator or freezer contains R-11 foam blowing agent, staff send it through a foam extraction process, where staff break units into roughly four pieces using a saws-all, and then use chippers to break out foam by hand. JACO's Fullerton facility sends foam to JACO's polyurethane grinder, which converts the foam into a 99.9% CFC-free dust, acceptable for disposal in landfills. Figure I-9 shows a refrigerator ready for chipping at JACO's Fullerton recycling center. At JACO's Hayward facility, staff bags the foam, and sends it to a waste-to-energy facility (which generates approximately 20 kWh per recycled unit).

Figure I-9. Unit Prepared for Chipping (JACO Fullerton Facility)

Units from which the foam has been extracted and units not containing R-11 foam blowing agents are shredded and shipped to a scrap yard, which recycles metal. Materials vendors receive the remaining materials for recycling or disposal (as described below). Profiles of some such vendors are included in Appendix F.

I.2.3 Transfer of Materials and Containment of Toxic Substances

During interviews with ARCA and JACO facility staff, Cadmus inquired about ARCA's and JACO's procedures for disposing of glass, plastic, oil, and hazardous materials that remain once appliances have been deconstructed. Table I-2 provides a list of major deconstructed appliance materials and organizations that buy or accept them for free. Cadmus was not able to obtain all information for all materials.

Table I-2. Appliance Materials' Dispositions by Recycling Facility

Material	Facility					
	ARCA		JACO-Fullerton		JACO-Hayward	
	Disposition	Recipient	Disposition	Recipient	Disposition	Recipient
Capacitors					Given	Clean Harbors—incinerate PCBs; recycle non-PCB capacitors
Compressors	Sold	Future Products—ships to Indian and Pakistani buyers			Sold	Indian and Pakistani buyers
Electrical cords, wires, and other scraps					Sold	Sims Metal Management*
Refrigerants CFC-12 and HFC-134a	Shipped and destroyed for carbon credits	Clean Harbors*	Sold	EOS Consulting	Sold	EOS Consulting
Glass (tempered)	Given	Strategic Materials—for use as ground cover and asphalt applications	Given	Western Strategies—grinds for use as aggregate in concrete, countertop, soil aerator, dust inhibitor		
Metals: steel, aluminum, and copper	Sold	Ecology Auto;* SA Recycling*	Sold	SA Recycling (most metals);* Ecology Auto* (some aluminum)	Sold	Sims Metal Management*
Mercury					Given	Clean Harbors*

Material	Facility					
	ARCA		JACO-Fullerton		JACO-Hayward	
	Disposition	Recipient	Disposition	Recipient	Disposition	Recipient
Capacitors					Given	Clean Harbors—incinerate PCBs; recycle non-PCB capacitors
switches						
Oil	Sold	Asbury*	Cleaned during evacuation process at JACO facility, Sold	Clean Harbors*	Sold**	Clean Harbors*
Plastic	Sold	Future Products Multi-Link International*	Sold	So-Cal Plastics—for use in cell phones, computers, and other electronics		
Polyurethane foam (from refrigerator walls)	Converted to powder	Reused by ARCA as an absorbent for spills	Bagged and sold	Commerce Waste to Energy***		
Incinerators			Sold	Ecology Auto*		

* A profile of this company is provided in Appendix F.

** JACO pays Clean Harbors $100 to dispose of an unlimited amount of used oil.

*** One refrigerator contains about 10 pounds of foam and 1 pound of CFC-11 gas; each bag creates 20kWh of electricity.

I.2.4 Handling and Documentation of Appliance Component Materials

ARCA and JACO follow the EPA's Responsible Appliance Disposal (RAD) protocol for appliances recycled through SCE's and PG&E's Appliance Recycling Programs. As EPA RAD partners, both program implementers must annually submit the following program information:[20]

- The number of appliances collected.
- The type and quantity of refrigerant reclaimed or destroyed.
- The type and quantity of foam blowing agent reclaimed or destroyed.
- The weight of metals, plastics, and glass recycled.
- The quantity of hazardous waste products and used oil recovered or destroyed.

The implementers' environmentally sound recycling and disposal practices often go beyond those required by the RAD program. For example, ARCA and JACO completely destroy appliances' blowing foam in the recycling process, while RAD only requires the implementers report the type and quantity of blowing agent destroyed.

[20] http://www.epa.gov/rad/reportingforms.html

J. DATA COLLECTION INSTRUMENTS

In order to preserve original formatting, Cadmus has included PDF versions of all data collection instruments in this document. The instruments that follow are:

- Participant Survey Instrument
- Cancelation Survey Instrument
- Nonparticipant Disposer Survey Instrument
- Second Appliance Owner Survey Instrument
- IOU Staff Interview Guide
- Implementer Staff Interview Guide
- Market Actor Interview Guide
- Other Utility Interview Guide
- State Agency Interview Guide
- EPA RAD Staff Interview Guide

THE CADMUS GROUP, INC.

SCE / PG&E Appliance Recycling Program Participant Survey

Research Topic	Participant Survey Question
Number and description (type, primary/secondary, condition, frequency of use, working/not) of refrigerator(s)/freezer(s) disposed of; length of ownership	B1 to B3, B5 to B9, F1 to F4
Reasons for disposal	B4
Replacement equipment	B10 to B12, B16 to B18
Program awareness	C1 to C3
Reasons for participation	C4, C5
Disposal methods	B13 to B15, D1
Program satisfaction, improvement opportunities	D2 to D22, D25 to D28
Incentive/Rebate preferences (types and levels)	D23, D24
Attitudes, knowledge, and awareness of *program benefits* and energy-efficiency in general; motivations to save energy	E1 to E4
Segmentation	**Error! Reference source not found.** to E9, F11
Customer characteristics and demographics	F5 to F10, F12 to F18

A. Introduction

May I please speak with **[CONTACT NAME]**?

Good **[MORNING/AFTERNOON]**. I'm _____ calling on behalf of **[Southern California Edison/ Pacific Gas & Electric]**. We are talking to customers who had refrigerators or freezers disposed of through **[SCE/PG&E]**'s recycling service.

[IF NEEDED: The survey takes about 15 to 20 minutes.]

[IF NEEDED: I'm calling from Gilmore Research Group, an independent research firm.]

A1. Our records show that on **[Prefill Date]** you disposed of a **[ApplianceVar]** through the **[SCE/PG&E]** recycling service. Are you the person in your household who is most familiar with this disposal?

1. Yes, I remember **[SKIP TO A5]**
2. Someone better to talk to **[SKIP TO A4]**
3. Yes, but on a different date **[BETWEEN JAN 01, 2010 AND DEC 31, 2012] [SKIP TO A5] [SPECIFY AND RECORD MONTH AND YEAR]**

-98. REFUSED
-99. DON'T KNOW ABOUT THE APPLIANCE DISPOSAL OR DISPOSED OF APPLIANCE BEFORE JAN 01, 2010

A2. You or someone in your house may have called **[SCE/PG&E]** or signed up on the Internet. You may have been disposing of a refrigerator or freezer because you had an extra one or because you bought a new one. Do you remember signing up for this service?

1. Yes **[SKIP TO A5]**
2. No/Don't Know

A3. Is there someone else in your household who might know?

1. Yes
2. No **[THANK AND TERMINATE]**

A4. May I speak to that person?

1. Yes **[Transfer to new contact or Record Name- if not available establish a good time for a call back]**
2. No **[THANK AND TERMINATE]**

A5. Let me just verify, when you participated in the Recycling Program you disposed of …

a) **[READ IF ApplianceVar1 = Refrigerator]** A refrigerator through the service
b) **[READ IF ApplianceVar1 = Freezer]** A freezer through the service **[IF CORRECT SKIP TO B4]**
c) **[READ IF ApplianceVar1 = First Refrigerator; ApplianceVar2 =Second Refrigerator]** Two refrigerators through the service
d) **[READ IF ApplianceVar1 = Refrigerator; ApplianceVar2= Freezer]** A refrigerator and a freezer through the service
e) **[READ IF ApplianceVar1 = First Freezer; ApplianceVar2 =Second Freezer]**Two freezers through the service **[IF CORRECT SKIP TO B4]**

Is that correct?

1. Yes, that is correct **[SKIP TO B1]**
2. No, not correct

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW

A6. So what type of appliance did you dispose of? **[ALLOW RESPONDENT TO ANSWER IN HIS/HER OWN WORDS, THEN SELECT THE APPROPRIATE RESPONSE BELOW. IF RESPONDENT IS UNSURE, PROMPT WITH: Was there one refrigerator? What about the other one?]**

1. A refrigerator
2. A freezer **[SKIP TO B4]**
3. Two refrigerators
4. A refrigerator and a freezer
5. Two freezers **[SKIP TO B4]**

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW **[THANK AND TERMINATE]**

B. Refrigerator/Freezer

Now I am going to ask you some questions about the **[ApplianceVar1]** that you disposed of.

B1. During the time just before you decided to dispose of it, was the **[ApplianceVar1]** being used as your main unit, or had it been a secondary or spare? **[IF NEEDED: A main refrigerator is typically in the kitchen, a secondary or spare is usually kept someplace else and might or might not be running or plugged in all the time]**

1. Main
2. Secondary/spare

-98. REFUSED
-99. DON'T KNOW

B2. How long had you owned it?

1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**

-98. REFUSED
-99. DON'T KNOW

B3. **[SKIP IF B1=1]** How long had it been a secondary or spare? **[IF RESPONDENT IS CONFUSED, ASK: How long had it been a spare when you decided to dispose of it?]**

1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**

-98. REFUSED
-99. DON'T KNOW

B4. Why did you dispose of the **[ApplianceVar1]?**

1. I got a new appliance and did not need the old one
2. It wasn't working well
3. I didn't use it very often/at all
4. It used too much energy
5. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

B5. **[SKIP IF B1=1]** In the last year, how much was the **[ApplianceVar1]** used?
1. Kept it running all the time **[SKIP TO B7]**
2. For special occasions only
3. During certain months of the year only
4. Never plugged in or running **[SKIP TO B7]**
5. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW **[SKIP TO B7]**

B6. **[ASK IF B5=2, 3, 5, OR -98]** During the last 12 months you had the appliance, how many months do you think it was plugged in and running?
1. **[RECORD MONTHS; RANGE: 1-12; HALF A MONTH=0.5]**

-98. REFUSED
-99. DON'T KNOW

B7. What was the condition of this appliance? Would you say **[READ LIST; ENTER ONLY ONE RESPONSE]**
1. It worked and was in good condition
2. It worked but needed minor repairs like a door seal or handle.
3. It worked but had mechanical problems or needed major repairs
4. Or, it didn't work
5. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW **[DO NOT READ]**

B8. **[ASK IF B5= 1, 2, 3, OR 5]** Would you say that the **[ApplianceVar1]** you disposed of was typically…[**READ LIST]**
1. Empty
2. About a quarter full
3. About half full
4. About three-quarters full
5. Mostly or completely full

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

B9. **[ASK IF ApplianceVar1=Freezer or FirstFreezer OR B1=2]** Why did you use the spare **[ApplianceVar1]**? **[READ LIST ONLY IF NEEDED; RECORD MULTIPLE]**

1. I have a large family and/or need extra space for storage
2. I buy in bulk at warehouse/bargain stores (Costco, Sam's Club, B.Js, etc.)
3. I need/like separate storage for beverages
4. I need extra storage for special events/holidays
5. Hunting/fishing needs
6. Medical storage
7. Other **[SPECIFY]**

-98. REFUSED
-99. DONT KNOW

B10. Did you replace the **[ApplianceVar1]** you recycled with a different refrigerator or freezer?

1. Yes
2. No **[SKIP TO B18]**

-98. REFUSED **[SKIP TO B18]**
-99. DON'T KNOW **[SKIP TO B18]**

B11. Was your replacement brand new when you got it, or was it used?

1. New
2. Used

-98. REFUSED
-99. DON'T KNOW

B12. Did you buy the replacement from a retail store, or did you get it from an individual?

1. Dealer/retail store
2. Individual/private party **[SKIP TO INTRODUCTION BEFORE C1]**

-98. REFUSED
-99. DON'T KNOW

B13. When you bought the replacement, did you talk to the salesperson or dealer about how to dispose of your old **[ApplianceVar1]**?

1. Yes
2. No **[SKIP TO INTRODUCTION BEFORE C1]**

-98. REFUSED **[SKIP TO INTRODUCTION BEFORE C1]**
-99. DON'T KNOW **[SKIP TO INTRODUCTION BEFORE C1]**

B14. **[READ LIST. RECORD FOR EACH: 1=YES; 2=NO; -98=REFUSED; -99=DON'T KNOW]**

a) Did the sales person tell you about the **[SCE/PGE]** recycling service?
b) Did the store offer its own service to dispose of the old appliance for free?
c) **[SKIP IF B14b)=Yes]** Did the store offer to dispose of the appliance for a charge?

B15. **[IF B14c)=Yes]** How much did the sales person or dealer charge for the appliance disposal? **[RECORD AMOUNT; SPECIFY VALUE TO NEAREST DOLLAR]**

-98. REFUSED
-99. DON'T KNOW

B16.

a)

B17.

B18. **[IF B10=2]** Do you plan to get a replacement appliance in the near future?

1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

C. Recycling Program

Now I would like to ask you a few questions specifically about **[SCE/PG&E]**'s recycling service.

C1. As best as you can recall, how did you first learn about the recycling service? **[DO NOT READ. RECORD MOST APPROPRIATE RESPONSE. IF RESPONDENT JUST SAYS, "utility" OR SAYS, "a mailing from SCE/PG&E," PROBE FOR A MORE DETAILED RESPONSE. FOR EXAMPLE, IF RESPONDENT HEARD ABOUT THE SERVICE FROM THE UTILITY, ASK WHETHER THEY HEARD ABOUT IT ON THEIR BILL OR ON A SEPARATE LETTER.]**

1. Appliance store
2. Information that came with a **[SCE/PG&E]** bill
3. Information that came in a letter or brochure from **[SCE/PG&E]**
4. Email from **[SCE/PG&E]**
5. Utility representative
6. Other utility resource **[SPECIFY]**
7. Referral from friend/neighbor
8. Movie Theater
9. Newspaper/Pennysaver
10. Radio
11. TV
12. Truck ad
13. Website
14. News story
15. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

C2. **[IF C1=1, OTHERWISE SKIP TO C3]** Can you tell me the name of the store? **[RECORD STORE NAME]**

-98. REFUSED
-99. DON'T KNOW

C3. Had you already considered getting rid of this appliance before hearing about **[SCE/PG&E]**'s recycling service?

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

C4. What is the MAIN reason you chose this service over other methods of disposing of your appliance? [**DO NOT READ. ACCEPT ONLY ONE RESPONSE. IF MULTIPLE RESPONSES ARE MENTIONED, ASK: Of those, which is the main reason? IF RESPONDENT SAYS SOMETHING LIKE: "I didn't need or want the refrigerator," ASK THE QUESTION AGAIN.]**

1. Cash rebate payment
2. Free pick-up service/Others don't pick up/Don't have to take it myself
3. Environmentally safe disposal/Recycled/Good for Environment
4. Savings on electric bill
5. Recommendation of a friend/relative
6. Recommendation of retailer/dealer
7. Utility sponsorship of the service
8. Easy way/convenient
9. Never heard of any others/only one I know of
10. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

C5. What is the SECOND MOST IMPORTANT reason you chose this service over other methods of disposing of your appliance? [**DO NOT READ. ACCEPT ONLY ONE RESPONSE. IF MULTIPLE RESPONSES ARE MENTIONED, ASK: Of those, which is the main reason? IF RESPONDENT SAYS SOMETHING LIKE: "I didn't need or want the refrigerator," ASK THE QUESTION AGAIN.]**

1. Cash rebate payment
2. Free pick-up service/Others don't pick up/Don't have to take it myself
3. Environmentally safe disposal/Recycled/Good for Environment
4. Savings on electric bill
5. Recommendation of a friend/relative
6. Recommendation of retailer/dealer
7. Utility sponsorship of the service
8. Easy way/convenient
9. Never heard of any others/only one I know of
10. Other **[SPECIFY]**
11. **No other Reason**

-98. REFUSED
-99. DON'T KNOW

D. Other Disposal Options

Now I have a few questions about the different options you might have considered before recycling your refrigerator or freezer.

D1. If you had not had your appliance picked up by the recycling service, what do you think you would have most likely done with it? **[READ LIST ONLY IF NEEDED; RECORD ONLY ONE RESPONSE]**

1. Sold it to a private individual (for example, a family member/neighbor/friend/co-worker, or a stranger)
2. Gave it away for free to a private individual (including if you left it behind when you moved, or if you installed it in a rental house or second home)
3. Sold it to an appliance dealer
4. Given it away to a charity organization
5. Gave it away for free to an appliance dealer
6. Picked up as part of the delivery service with the purchase of a new or replacement appliance
7. Hauled it to the landfill/dump or threw it away yourself, or had a community waste service dispose of it
8. Hauled it to a waste management or recycling center yourself
9. Had someone else pick it up for junking or dumping
10. Left it on the curb for someone to take for free
11. Disposed of it in some other way **[SPECIFY]**
12. Kept it

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D2. Once you decided to use this service to dispose of your **[ApplianceVar1]**, the first step was signing up and pre-qualifying. Are you the one who took care of this, or did someone else in your household?

1. Yes, I did it
2. No, someone else **[SKIP TO D13]**

-98. REFUSED **[SKIP TO D13]**
-99. DON'T KNOW **[SKIP TO D13]**

D3. How did you sign up? **[READ LIST]**

1. Telephone
2. Online
3. In retail store
4. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D4. How satisfied were you with this signup experience? Please use a scale where "10" means "completely satisfied" and "0" means "not at all satisfied."
[RECORD RATING]

-98. REFUSED
-99. DON'T KNOW

[IF D3= 2 THEN ASK D5; OTHERWISE SKIP TO D9]

D5. Was it easy to find the sign-up screen on the website?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D6. Did the website answer all your questions about the appliance recycling service?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D7. Were you able to schedule a pickup appointment for a convenient date and time?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D8. Did you receive confirmation that your signup had been successful?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

[IF (D3= 1 THEN ASK D9; OTHERWISE SKIP TO D13]

D9. Was the representative you spoke to on the telephone polite and courteous?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D10. Did the representative answer all your questions?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D11. Did you have to call more than once?
1. Yes
2. No
3. Not Applicable
-98. REFUSED
-99. DON'T KNOW

D12. Were you able to schedule a pickup appointment for a convenient date and time?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D13. The next step in the service is the pickup appointment. Were you present at the time of the pickup or are you familiar enough with the pickup to answer some questions about it?
1. Yes
2. No **[SKIP TO D20]**
-98. REFUSED **[SKIP TO D20]**
-99. DON'T KNOW **[SKIP TO D20]**

D14. How satisfied were you with the actual pickup experience? Please use a scale where "10" means "completely satisfied" and "0" means "not satisfied at all." **[RECORD RATING]**
-98. REFUSED
-99. DON'T KNOW

D15. Using the same scale, how satisfied were you with the amount of time you had to wait between signing up and the pickup? **[IF NEEDED: Use a 0 to 10 scale where "10" means "completely satisfied" and "0" means "not satisfied at all."]** **[RECORD RATING]**
-98. REFUSED
-99. DON'T KNOW

D16. Did someone call in advance to confirm the appointment or let you know they were coming?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D17. Did they arrive on time?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D18. Was the pickup representative polite and courteous?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D19. Did the representative appear neat and professional?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D20. Did you receive a rebate check?
1. Yes
2. No **[SKIP TO D25]**
-98. REFUSED **[SKIP TO D25]**
-99. DON'T KNOW **[SKIP TO D25]**

D21. How long did it take to get the check after your appliance was picked up?
1. **[IF LESS THAN ONE WEEK, RECORD NUMBER OF DAYS]**
2. 1 week
3. 2 weeks
4. 3 weeks
5. 4 weeks
6. 5 weeks
7. 6 weeks
8. 7 weeks
9. 8 weeks or more
-98. REFUSED
-99. DON'T KNOW

D22. Using the same 0 to 10 scale, how satisfied were you with the amount of time you waited to receive the rebate check? **[IF NEEDED: Use a 0 to 10 scale where "10" means "completely satisfied" and "0" means "not satisfied at all."] [RECORD RATING]**
-98. REFUSED
-99. DON'T KNOW

D23. Would you have used the service if no rebate were offered?
1. Yes **[SKIP TO D25]**
2. No
-98. REFUSED
-99. DON'T KNOW

D24. If the rebate had been $20, would you have used the service?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D25. Thinking about your experiences throughout the whole process, how satisfied were you with the service OVERALL, using the 0 to 10 scale? **[IF NEEDED: Use a 0 to 10 scale where "10" means "completely satisfied" and "0" means "not satisfied at all."]**
[RECORD RATING]
-98. REFUSED
-99. DON'T KNOW

D26. Did you encounter any problems with the service that you have not mentioned yet? **[OPEN END. IF RESPONDENT MENTIONED OTHER PROBLEMS EARLIER, RECORD THEM HERE. PROBE FOR CLARITY ONLY.]**

D27. Is there anything you can think of that would improve **[SCE/PG&E]**'s recycling service?
1. **[OPEN END]**
2. Nothing/Can't think of anything
-98. REFUSED
-99. DON'T KNOW

D28. On a scale of 0 to 10, where 10=Extremely Likely and 0=Not Likely at All, How likely are you to recommend the **[SCE/PG&E]** recycling service to a friend or family member?
[RECORD RATING]

-98. REFUSED
-99. DON'T KNOW

E. Awareness, Knowledge, and Attitudes of ARP Benefits

Now I have some general questions for you about refrigerators and freezers.

E1. Before you decided to dispose of your appliance, were you aware that a refrigerator or freezer in your home can cost UP TO $180 a year for electricity?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

E2. Before using the **[SCE/PG&E]** recycling service, were you aware that the refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

E3. Did you know that the **[ApplianceVar1]** that was removed through **[SCE/PG&E]**'s service…
[READ LIST. RECORD FOR EACH: 1=YES; 2=NO; -98=REFUSED; -99=DON'T KNOW]

a. Would be completely taken apart and the metals and glass recycled?
b. Did you know that the coolant, motor oil, and insulation that might contain hazardous materials would be removed, and recycled or destroyed?
c. Did you know that almost none of the material from the units would go to a land fill?

E4. **[IF E3a="YES" OR E3b="YES" OR E3c=YES]** How much did knowing that your **[ApplianceVar1]** would be disposed of in an environmentally safe way influence your decision to dispose of it through **[SCE/PG&E]**'s service? Did it…

1. Influence your decision a lot
2. Somewhat influence your decision
3. Not influence your decision at all
-98. REFUSED
-99. DON'T KNOW

E5.
a.

We're almost finished with the survey. I have just few general questions for you, and then a few final questions about your household.

E6. Have you heard of a carbon footprint? **[IF NECESSARY: A carbon footprint is the amount of gases containing carbon that are produced when you burn fuels and use electricity. This includes but is not limited to the energy consumption in your home, your transportation, your diet, and your purchases.] [DO *NOT* READ RESPONSES]**

1. Yes
2. No
3. Yes, I have heard the term "carbon footprint" but I do not know what it means
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E7. Next, I'm going to read a list of energy-saving actions. For each action please tell me if your household has already taken the action. Did you… **[RANDOMIZE ACTIONS]** **[READ EACH ACTION. RECORD FOR EACH: 1=YES; 2=NO; 3=CAME WITH THE HOUSE; -98=REFUSED; -99=DON'T KNOW. DISTINGUISH BETWEEN, "1=YES, INSTALLED IT MY/OUR SELVES" AND "3=CAME WITH THE HOUSE"]**

a. …install an attic vent to keep the attic cooler?
b. …install programmable thermostats?
c. …install ceiling fans?
d. …install motion detectors for lights?

E8. On a scale of 1 to 7, where 7 is Strongly Agree, and 1 is Strongly Disagree, please tell me how much you agree or disagree with the following two statements.

a. I compare prices of at least a few brands before I choose one.

[RECORD NUMBER 1-7]
-98. REFUSED
-99. DON'T KNOW

b. I do NOT feel responsible for conserving energy because my personal contribution is very small.

[RECORD NUMBER 1-7]
-98. REFUSED
-99. DON'T KNOW

E9. I'm going to read you a list of 6 reasons why people might change their daily actions to save energy. Please tell me which of these would motivate you the MOST to save energy? **[READ CHOICES]** **[IF RESPONDENT SAYS "DON'T KNOW," PROBE: "if you had to choose from the following reasons which one would motivate you the most"]** **[RANDOMIZE]**

1. Saving money
2. Maintaining Health
3. Protecting the environment
4. For the benefit of future generations
5. Reducing our dependence on foreign oil
6. Helping California lead the way on saving energy

-98. REFUSED
-99. DON'T KNOW

F. Customer Characteristics and Demographics

F1. How many refrigerators do you currently have in your home?
[RECORD NUMBER]
-98. REFUSED
-99. DON'T KNOW

F2. **[IF F1>0]** How many of those refrigerators work?
[RECORD NUMBER; MAKE SURE NUMBER IS LESS THAN OR EQUAL TO NUMBER IN F1]
-98. REFUSED
-99. DON'T KNOW

F3. How many stand-alone freezers do you currently have in your home?
[RECORD NUMBER]
-98. REFUSED
-99. DON'T KNOW

F4. **[IF F3>0]** How many of your stand-alone freezers work?
[RECORD NUMBER; MAKE SURE NUMBER IS LESS THAN OR EQUAL TO NUMBER IN F3]
-98. REFUSED
-99. DON'T KNOW

F5. Which of the following types of housing units would you say best describes your home? Is it a… **[READ CHOICES]**
1. Single-family detached house
2. Single-family attached house
3. Duplex
4. Building with 2-4 units
5. Building with 5 or more units
6. Mobile home or house trailer
7. Other (specify)
-98. REFUSED
-99. DON'T KNOW

F6. How many bedrooms do you have in your home? **[IF EFFICIENCY OR STUDIO APARTMENT, BEDROOMS=0]**
[RECORD]
-98. REFUSED
-99. DON'T KNOW

F7. How many years have you lived in your home? **[ROUND TO THE NEAREST HALF YEAR; USE 0.5 FOR 6 MONTHS OR ½ YEAR]**
[RECORD]
-98. REFUSED
-99. DON'T KNOW

F8. About when was your home first built?
1. Before 1950
2. 1950 to 1959
3. 1960 to 1969
4. 1970 to 1977
5. 1978 to 1979
6. 1980 to 1989
7. 1990 to 1994
8. 1995 or later
-98. REFUSED
-99. DON'T KNOW

F9. Including yourself, how many people currently live in your home year-round? **[RECORD]**
-98. REFUSED
-99. DON'T KNOW

F10. **[IF F9>0]** Including yourself, how many of the people currently living in your home year-round are in the following age groups? **[TOTAL SHOULD EQUAL RESPONSE FROM F9; RECORD -98 FOR REFUSED OR -99 FOR DON'T KNOW]**

a.	Less than 18 years old	**[RECORD NUMBER]**
b.	18 to 24	**[RECORD NUMBER]**
c.	25 to 34	**[RECORD NUMBER]**
d.	35 to 44	**[RECORD NUMBER]**
e.	45 to 54	**[RECORD NUMBER]**
f.	55 to 64	**[RECORD NUMBER]**
g.	65 or older	**[RECORD NUMBER]**

F11. Do you or members of your household own your home, or do you rent it?
1. Own/ Buying
2. Rent/ Lease
3. Occupy rent-free
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F12. Have you remodeled your home in the past 5 years?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

F13. What is the highest level of education you have completed? **[DO NOT READ]**
1. No schooling
2. Less than high school
3. Some high school
4. High school graduate or equivalent (e.g., GED)
5. Some college
6. College degree
7. Graduate or professional degree
8. Post graduate
-98. REFUSED
-99. DON'T KNOW

F14. How would you describe your race? **[DO NOT READ; RECORD UP TO 5 RESPONSES]**
1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Pacific Islander
6. Other **[SPECIFY]**
-98. REFUSED
-99. DON'T KNOW

F15. Are you Spanish, Hispanic or Latino?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

F16. What was your household income from all sources in 2011, before taxes? Please stop me when I reach the category that best describes your household's income. **[READ LIST; IF NECESSARY, SAY: "This information is confidential and will only be used for the purpose of characterizing study respondents."]**

1. Less than $20,000
2. 20 to less than $30,000
3. 30 to less than $40,000
4. 40 to less than $50,000
5. 50 to less than $60,000
6. 60 to less than $75,000
7. 75 to less than $100,000
8. 100 to less than $150,000
9. 150 to less than $200,000
10. More than $200,000

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F17. What is the primary language spoken in your home? **[DO NOT READ LIST]**

1. English
2. Spanish
3. Mandarin
4. Cantonese
5. Tagalog
6. Korean
7. Vietnamese
8. Russian
9. Japanese
10. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F18. **[RECORD GENDER, DO NOT ASK]**

1. Female
2. Male

Those are all the questions I have for you. Thank you for participating in our survey. This will help [Southern California Edison/ Pacific Gas & Electric] to better serve their customers.

[READ IF NECESSARY] If you have any questions about this survey please call [FOR SCE: Caroline Chen at 619-423-1512/ FOR PG&E: Andy Fessel 415-973-6236]

Project Name: SCE/PG&E Appliance Recycling Program Participant Survey

Report executed on: 8/25/2012

	TYPE		
	Total cases	SCE	PG & E
Total cases	2346	1165	1181
01 Completed Interview	403	203	200
02 ARRANGE CALL-BACK - OUT OF HOME	17	8	9
03 RESPONDENT NOT AVAILABLE/TOO BUSY	45	24	21
04 NO ANSWER	75	22	53
05 ANSWERING MACHINE	750	351	399
06 BUSY	7	5	2
07 INCOMPLETE SURVEY/SCHEDULE CALLBACK	14	8	6
10 INITIAL REFUSAL - SOFT	175	81	94
12 INITIAL REFUSAL - HARD - MENTIONED DO NOT CALL LIST	15	9	6
13 INITIAL REFUSAL - HARD	137	63	74
14 Final refusal	1	1	0
15 BLOCKED NUMBER	4	4	0
17 DUPLICATED NUMBER	6	5	1
19 WRONG NUMBER/NO HERE BY THAT NAME AT THIS NUMBER	43	30	13
20 DISCONNECT	214	97	117
21 BUSINESS	53	30	23
22 FAX MODEM LINE	23	8	15
23 LANGUAGE BARRIER (NON-SPANISH)	30	18	12
24 HEARING PROBLEM/OTHER PROBLEM WITH RESPONDENT	26	9	17
25 RESPONDENT GONE FOR REMAINDER OF SURVEY	22	10	12
26 TERMINATED SURVEY	106	56	50
30 SPANISH LANGUAGE	91	78	13
41 NQ - MISCELLANEOUS	33	18	15
60 - NO ONE IN HOUSEHOLD SIGNED UP FOR PROGRAM	52	26	26
62 - Don't know/Refused appliance	2	0	2
70 - DISPOSED OF APPLIANCE OUTSIDE OF DATE RANGE	2	1	1

Average Time	14.60
Incidence	75%
Completion Rate	22%
Refusal Rate	40%

SCE / PG&E Appliance Recycling Cancellation Survey

A. Introduction

May I please speak with **[CONTACT]**?

Good **[MORNING/AFTERNOON/EVENING]**. I'm _____ calling on behalf of **[Southern California Edison/ Pacific Gas & Electric]**.

[If needed: The survey takes about 15 to 20 minutes.]

[If needed: I'm calling from Gilmore Research Group, an independent research firm.]

A1. Our records show that in **[Month and Year]** you or someone in your household signed up to have the **[SCE/PG&E]** appliance recycling service remove a refrigerator or freezer. According to our records the appliance was not removed. Do you recall signing up for this service?

1. Yes, I do **[SKIP TO B1]**
2. Yes, but they offer someone more knowledgeable **[SKIP TO A4]**
3. No

-98. REFUSED
-99. DON'T KNOW

A2. You or someone in your house may have signed up by phone or on the Internet. You may have been disposing of a refrigerator or freezer because you had an extra one or because you bought a new one. Do you remember signing up for the service?

1. Yes **[SKIP TO B1]**
2. No

-98. REFUSED
-99. DON'T KNOW **[Thank and Terminate]**

A3. Is there someone else in your household who might know?

1. Yes
2. No **[Thank and Terminate]**

-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

A4. May I speak to that person?
1. Yes **[Transfer to new contact or Record Name- if not available establish a good time for a call back]**
2. No **[Thank and Terminate]**
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B. Verification

B1. When you signed up for the service, did you sign up to have one or two appliances removed?
1. One **[SKIP TO B3]**
2. Two **[SKIP TO B5]**
-98. REFUSED
-99. DON'T KNOW **[Thank and Terminate]**

B2. Just let me check, you did sign up to have an appliance removed, correct?
1. Yes
2. No **[Thank and Terminate]**
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B3. Was it a refrigerator or a freezer?
1. Refrigerator
2. Freezer
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B3a. Was the appliance less than 10 cubic feet in size?

1. Yes **[Thank and Terminate]**
2. No
-98. REFUSED
-99. DON'T KNOW

B4. Did you end up having the appliance removed by the **[SCE/PG&E]** service?
1. No, kept it or disposed some other way **[SKIP TO C1]**
2. Yes, disposed through the service **[Thank and Terminate]**
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B5. Was it… **[READ LIST]**
1. A refrigerator and a freezer
2. Two refrigerators
3. Two freezers
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B6. Did you end up having any of these appliances removed by the **[SCE/PG&E]** service?
1. Yes
2. No **[SKIP TO C1]**
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B7. Just one or both?
1. One
2. Both **[Thank and Terminate]**
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

B8. **[B5=1 and B7=1]** Was the one removed by **[SCE/PG&E]** a refrigerator or a freezer?
1. Refrigerator
2. Freezer
-98. REFUSED **[Thank and Terminate]**
-99. DON'T KNOW **[Thank and Terminate]**

C. ARP Awareness

[IF B6=2 go to C1 **and say: From now on I want you to think about just one of the appliances and answer the questions while just thinking about that one appliance.]**

[IF B7=1 go to C1 **and say: From now on let's just talk about the appliance that was not disposed of through the [SCE/PG&E] service.]**

C1. How did you first learn about **[SCE/PG&E]**'s appliance recycling service? **[Do not read. Check most appropriate response. If respondent just says "utility" or "a mailing from SCE/PG&E," probe to get a more specific response. For example, if respondent heard about the service from the utility, ask whether they heard about it through information in a bill or as a letter separate from a billing])**

1. Appliance store
2. Information that came with a **[SCE/PG&E]** bill
3. Information that came in a letter or brochure from **[SCE/PG&E]**
4. Email from **[SCE/PG&E]**
5. Utility representative
6. Other utility source **[SPECIFY]**
7. Referral from friend/neighbor
8. Movie Theater
9. Newspaper/Pennysaver
10. Radio
11. TV
12. Truck ad
13. Website
14. News story
15. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

C2. **[IF C1=1, OTHERWISE SKIP TO C3]** Can you tell me the name of the store?

1. **[RECORD STORE NAME]**

-98. REFUSED
-99. DON'T KNOW

C3. Did you first learn of the service while looking for a way to dispose of a unit or did you know about the service prior to deciding to have the unit removed?

1. While looking for a way to dispose of a unit
2. Knew about the service prior to deciding to have the unit removed

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C4. Why did you initially sign up with the appliance recycling service to have your appliance removed? **[DO NOT READ, RECORD ONLY ONE RESPONSE]**

1. Cash rebate payment
2. Free pick-up service/Others don't pick up/Don't have to take it myself.
3. Environmentally safe disposal/Recycled/Good for Environment
4. Savings on electric bill
5. Recommendation of a friend/relative
6. Recommendation of retailer/dealer
7. Utility sponsorship of the service
8. Easy way/convenient
9. Never heard of any others/only one I know of
10. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D. Reasons for Cancellation

D1. Why wasn't the appliance picked-up as scheduled? **[LET THE RESPONDENT EXPLAIN IN THEIR OWN WORDS. RECORD THE CLOSEST RESPONSE. PROBE TO BE SURE OF RESPONSE; USE "OTHER" IF NOT SURE.]**

1. Appliance didn't qualify for the service
2. Decided to keep it
3. Couldn't meet the scheduled pick-up time
4. Recycling company (ARCA/JACO) didn't show up as scheduled
5. Wanted to get rid of it sooner than it could be picked up
6. Received a better offer for disposing of it **[SKIP TO D4]**
7. Decided somebody else could use the unit
8. Didn't want it destroyed
9. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D2. Do you still have the refrigerator or freezer?

1. Yes
2. No **[SKIP TO D4]**

-98. REFUSED
-99. DON'T KNOW

D3. Are you still using it?
1. Yes **[SKIP TO E1]**
2. No **[SKIP TO E1]**
-98. REFUSED **[SKIP TO E1]**
-99. DON'T KNOW **[SKIP TO E1]**

D4. How did you dispose of this **[ApplianceVar]**? Did you…
1. Sell it
2. Give it away **[SKIP TO D6]**
3. Have it picked up by someone else **[SKIP TO D7]**
4. Take it to a dump or disposal center yourself **[SKIP TO D8]**
5. Dispose of it in some other way **[SPECIFY; RECORD RESPONSE VERBATIM]** **[SKIP TO D13]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO D13]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO D13]**

D5. Who did you sell it to? **[READ LIST; IF RESPONDENT SAYS, "Someone on Craigslist," ASK THEM TO SPECIFY WHETHER THE BUYER WAS A DEALER]**
1. A private individual (for example, a friend or family member) **[SKIP TO D9]**
2. An appliance dealer **[SKIP TO D9]**
3. Other **[DO NOT READ, SPECIFY]** **[SKIP TO D9]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO D9]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO D9]**

D6. Who did you give it to?
1. A private individual (for example, a friend or family member) **[SKIP TO D13]**
2. A charity organization **[SKIP TO D13]**
3. An appliance dealer **[SKIP TO D13]**
4. Left it on the curb **[SKIP TO D13]**
5. Left it behind when you moved **[SKIP TO D13]**
6. Other **[DO NOT READ, SPECIFY]** **[SKIP TO D13]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO D13]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO D13]**

D7. Was it picked it up through the delivery service with the purchase of a new appliance, or did someone else pick it up for disposal?
7. Delivery service **[SKIP TO D12]**
8. Someone else **[SKIP TO D12]**
9. Other **[DO NOT READ, SPECIFY]** **[SKIP TO D12]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO D12]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO D12]**

D8. Did you haul it to…
1. A landfill or dump **[SKIP TO D12]**
2. A community waste disposal service **[SKIP TO D12]**
3. A waste management or recycling center **[SKIP TO D12]**
4. Other **[DO NOT READ, SPECIFY]** **[SKIP TO D12]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO D12]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO D12]**

D9. When you tried to sell the unit, did you advertise?
1. Yes
2. No **[SKIP TO D11]**

-98. REFUSED **[SKIP TO D11]**
-99. DON'T KNOW **[SKIP TO D11]**

D10. Where did you advertise?
1. Craigslist
2. Pennysaver
3. Local newspaper
4. Local bulletin board
5. Other internet site **[SPECIFY]**
6. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D11. How much money did you get for it?
[RECORD DOLLARS; ENTER $0 IF RESPONDENT SAYS "NOTHING"] **[SKIP TO D13]**

-98. REFUSED **[SKIP TO D13]**
-99. DON'T KNOW **[SKIP TO D13]**

D12. How much did you pay to dispose of it?
[RECORD DOLLARS; ENTER $0 IF RESPONDENT SAYS "NOTHING"]

-98. REFUSED
-99. DON'T KNOW

D13. Did you replace the **[ApplianceVar]** you disposed of with a different one?
1. Yes
2. No **[SKIP TO D22]**

-98. REFUSED **[SKIP TO D22]**
-99. DON'T KNOW **[SKIP TO D22]**

D14. Was your replacement **[ApplianceVar]** brand new when you got it, or was it used?
1. New
2. Used
-98. REFUSED
-99. DON'T KNOW

D15. Did you get the replacement **[ApplianceVar]** from an appliance dealer at either a retail store or on the internet? **[NOTE TO INTERVIEWER: IF RESPONDENT SAYS "Craigslist," ASK THEM TO SPECIFY WHETHER THE SELLER WAS A DEALER]**
1. Yes, got it from a dealer
2. No, did not get it from a dealer **[SKIP TO D21]**
-98. REFUSED **[SKIP TO D21]**
-99. DON'T KNOW **[SKIP TO D21]**

D16. When you bought the replacement **[ApplianceVar]**, did you talk to the salesperson or dealer about how to dispose of your old **[ApplianceVar]**?
1. Yes
2. No **[SKIP TO D21]**
-98. REFUSED **[SKIP TO D21]**
-99. DON'T KNOW **[SKIP TO D21]**

D17. Did the sales person tell you about **[SCE/PGE]'s** appliance recycling service?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

D18. Did the sales person offer to dispose of the old appliance for free?
1. Yes **[SKIP TO D21]**
2. No
-98. REFUSED
-99. DON'T KNOW

D19. Did the sales person tell you they would dispose of the appliance for a charge?
1. Yes
2. No **[SKIP TO D21]**
-98. REFUSED **[SKIP TO D21]**
-99. DON'T KNOW **[SKIP TO D21]**

D20. How much did you spend for the replacement **[ApplianceVar]**?Was it…
1. Free
2. Less than $100
3. More than $100
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D21. **[IF D14 = 2]**What would you have done if the specific replacement **[ApplianceVar]** had not been available? Would you have…
1. Found another used unit
2. Bought a new unit
3. Not replaced your appliance
4. Other **[SPECIFY]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D22. **[IF D13= 2, -98, OR -99]** Do you plan to get a replacement appliance in the near future?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

E. Appliance Characteristics

E1. Approximately how old was the appliance when you decided to discard it? **[RECORD NUMBER OF YEARS OLD, 0 TO 75]**
~~1. Less than 6 years~~
~~2. 6-10~~
~~3. 11-15~~
~~4. 16-20~~
~~5.~~3.~~Greater than 20 **[SPECIFY]**~~
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E2. What type of unit was it?
[IF APPLIANCE= REFRIGERATOR READ CATEGORIES 1-3 and 6]
1. Side-by-side
2. Top freezer
3. Bottom freezer
[IF APPLIANCE=FREEZER READ CATEGORIES 4- 6]

4. Upright freezer
5. Chest freezer
6. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

[IF APPLIANCE=REFRIGERATOR]

E3. Approximately what size was it in cubic feet? **[READ LIST IF NECESSARY]**

1. Mini (10 to less than 13 cu. ft.)
~~1.~~2. Small (~~under~~ 1~~0~~3 ~~-~~to less than ~~14~~ 17 cu. ft.)
~~2.~~3. Medium (1~~5~~7 to less than 20 ~~– 18~~ cu. ft.)
~~3.~~4. Large (~~19~~20~~-~~ to less than 2~~2~~3 cu. ft.)
~~4.~~5. Extra Large (23 cu. ft.~~ and above~~ or larger)

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

[IF APPLIANCE=FREEZER]

E3a. Approximately what size was it in cubic feet? **[READ LIST IF NECESSARY]**

1. Small (10 to less than 13 cu. ft.)
2. Medium (13 to less than 16 cu. ft.)
3. Large (greater than 16 cu. ft.)

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E4. During the time just before you contacted the recycling service, was the refrigerator/freezer being used as your main refrigerator/freezer, or had it been a secondary or spare?
[IF NEEDED: A main refrigerator is typically in the kitchen, a secondary or spare is usually kept someplace else and might or might not be running or plugged in all the time.]

1. Main **[SKIP TO E7]**
2. Secondary/Spare

-98. REFUSED
-99. DON'T KNOW

E5. How long had you owned it?

1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**

-98. REFUSED
-99. DON'T KNOW

E6. **[SKIP IF E4=1]** How long had it been a secondary or spare? [IF RESPONDENT IS CONFUSED, ASK: How long had it been a spare when you decided to dispose of it?]
1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**

-98. REFUSED
-99. DON'T KNOW

E7. Why did you dispose of the **[ApplianceVar1]?**
1. I got a new appliance and did not need the old one
2. It wasn't working well
3. I didn't use it very often/at all
4. It used too much energy
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E8. **[SKIP IF E4=1]** In the last year, how much was the **[ApplianceVar1]** used?
1. Kept it running all the time **[SKIP TO E10]**
2. For special occasions only
3. During certain months of the year only
4. Never plugged in or running **[SKIP TO E10]**
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO E10]**

E9. **[ASK IF E8=2, 3, 4, OR -98]** During the last 12 months you had the appliance, how many months do you think it was plugged in and running?
1. **[RECORD MONTHS; RANGE: 1-12; HALF A MONTH=0.5]**

-98. REFUSED
-99. DON'T KNOW

E10. What was the condition of this appliance? Would you say **[READ LIST; ENTER ONLY ONE RESPONSE]**
1. It worked and was in good condition
2. It worked but needed minor repairs like a door seal or handle.
3. It worked but had mechanical problems or needed major repairs
4. Or, it didn't work
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E11. **[ASK IF E8= 1, 2, 3, OR 5]** Would you say that the **[ApplianceVar1]** you disposed of was typically…[**READ LIST]**

1. Empty
2. About a quarter full
3. About half full
4. About three-quarters full
1. Mostly or completely full

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E12. **[ASK IF ApplianceVar1=Freezer or FirstFreezer OR E4=2]** Why did you have the spare **[ApplianceVar1]**? **[READ LIST ONLY IF NEEDED; RECORD MULTIPLE]**

1. I have a large family and/or need extra space for storage
2. I buy in bulk at warehouse/bargain stores (Costco, Sam's Club, B.Js, etc.)
3. I need/like separate storage for beverages
4. I need extra storage for special events/holidays
5. Hunting/fishing needs
6. Medical storage
7. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DONT KNOW **[DO NOT READ]**

F. Disposer Preferences

F1. If you knew the appliance would have been picked up within a week, would you have stayed with the **[SCE/PG&E]** appliance recycling service?

1. Yes **[SKIP TO F4]**
2. No

-98. REFUSED **[SKIP TO F4]**
-99. DON'T KNOW **[SKIP TO F4]**

F2. If the appliance could have been picked up within 3 days, would you have stayed with the **[SCE/PG&E]** service?

1. Yes **[SKIP TO F4]**
2. No

-98. REFUSED **[SKIP TO F4]**
-99. DON'T KNOW **[SKIP TO F4]**

F3. What if the appliance could have been picked up the same day or the next day after you signed up?

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

F4. What is most important to you when choosing a way to dispose of an old refrigerator or freezer? **[RANDOMIZE AND READ LIST; RECORD ONLY ONE ANSWER]**

1. Getting a rebate
2. Selling the appliance for cash
3. Someone else getting to use it
4. Convenient pick-up
5. Environmentally safe disposal
6. Someone else removing the appliance for you
7. Saving time and money
8. Other **[DO NOT READ; SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F5. What is the next most important reason when choosing a way to dispose of an old refrigerator or freezer? **[READ LIST IF NECESSARY; RECORD ONLY ONE ANSWER]**

1. Cash rebate payment
2. Getting money from selling the unit
3. Have someone else be able to use it and get good from it
4. Convenient and/or fast pick-up
5. Making sure it is disposed of in an environmentally safe manner
6. Having someone else remove it
7. Not having to spend much time getting rid of it
8. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F6. If the **[SCE/PG&E]** incentive had been $25, would you have stayed with the service?

1. Yes **[SKIP TO F9]**
2. No

-98. REFUSED
-99. DON'T KNOW

F7. How about $35, would you have stayed with the service?

1. Yes **[SKIP TO F9]**
2. No

-98. REFUSED
-99. DON'T KNOW

F8. How about $45, would you have stayed with the service?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

F9. If there were no cash incentives but everything else remained the same, would you consider using **[SCE/PG&E]**'s Appliance Recycling service in the future?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

F10. In the future, if you were to purchase a new refrigerator or freezer and the appliance dealer could remove the old unit for free, would you consider that option?
1. Yes **[SKIP TO G1]**
2. No
-98. REFUSED
-99. DON'T KNOW

F11. In the future, if you were to purchase a new refrigerator or freezer and the appliance dealer could remove the old unit and you received a $35 incentive would you consider that?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

G. AKA-B/ Segmentation Questions

Now I have some general questions for you about refrigerators and freezers.

G1. Before you decided to dispose of your appliance, were you aware that a refrigerator or freezer in your home can cost UP TO $180 a year for electricity?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

G2. Were you aware that the refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

G3. Did you know that **[SCE/PG&E]**'s recycling service…
[READ LIST. RECORD FOR EACH: 1=YES; 2=NO; -98=REFUSED; -99=DON'T KNOW]
a. …Takes apart and recycles all of the metals and glass from the appliances it collects?
b. …Removes, and recycles or destroys the coolant, motor oil, and insulation from the appliances it collects?
c. …Almost none of the materials from the appliances **[SCE/PG&E]** recycles go to a land fill?

G4. **[SCE/PG&E]**'s recycling service DOES dispose of all the appliance parts in an environmentally safe manner. Knowing that, how much more likely would you be to participate in **[SCE/PG&E]**'s appliance recycling service in the future? Would you be…
1. Much more likely
2. Somewhat more likely
3. Not at all more likely
-98. REFUSED
-99. DON'T KNOW

We're almost finished with the survey. I have just few general questions for you, and then a few final questions about your household.

G5. Have you heard of a carbon footprint? **[IF NECESSARY: A carbon footprint is the amount of gases containing carbon that are produced when you burn fuels and use electricity. This includes but is not limited to the energy consumption in your home, your transportation, your diet, and your purchases.] [DO *NOT* READ RESPONSES]**
1. Yes
2. No
3. Yes, I have heard the term "carbon footprint" but I do not know what it means
-98. REFUSED
-99. DON'T KNOW

G6. Next, I'm going to read a list of energy-saving actions. For each action please tell me if your household has already taken the action. Did you… **[RANDOMIZE ACTIONS]** **[READ EACH ACTION. RECORD FOR EACH: 1=YES; 2=NO; 3=CAME WITH THE HOUSE; -98=REFUSED; -99=DON'T KNOW. DISTINGUISH BETWEEN, "1=YES, INSTALLED IT MY/OUR SELVES" AND "3=CAME WITH THE HOUSE"]**

a. …install an attic vent to keep the attic cooler?
b. …install programmable thermostats?
c. …install ceiling fans?
d. …install motion detectors for lights?

G7. On a scale of 1 to 7, where 7 is Strongly Agree, 1 is Strongly Disagree , please tell me how much you agree or disagree with the following two statements.

a. I compare prices of at least a few brands before I choose one.

[RECORD NUMBER 1-7]

-98. REFUSED
-99. DON'T KNOW

b. I do NOT feel responsible for conserving energy because my personal contribution is very small.

[RECORD NUMBER 1-7]

-98. REFUSED
-99. DON'T KNOW

G8. I'm going to read you a list of 6 reasons why people might change their daily actions to save energy. Please tell me which of these would motivate you the MOST to save energy? **[READ CHOICES]** **[IF RESPONDENT SAYS "DON'T KNOW," PROBE: "if you had to choose from the following reasons which one would motivate you the most"]** **[RANDOMIZE]**

1. Saving money
2. Maintaining Health
3. Protecting the environment
4. For the benefit of future generations
5. Reducing our dependence on foreign oil
6. Helping California lead the way on saving energy

-98. REFUSED
-99. DON'T KNOW

G9. Do you or members of your household own your home, or do you rent it?

1. Own/ Buying
2. Rent/ Lease
3. Occupy rent-free

-98. REFUSED **(DO NOT READ)**

-99. DON'T KNOW **(DO NOT READ)**

H. Customer Characteristics

H1. How many refrigerators do you currently have in your home?
[RECORD NUMBER]
-98. REFUSED
-99. DON'T KNOW

H2. **[IF H1>0]** How many of those refrigerators work?
[RECORD NUMBER; MAKE SURE NUMBER IS LESS THAN OR EQUAL TO NUMBER IN H1]
-98. REFUSED
-99. DON'T KNOW

H3. How many stand-alone freezers do you currently have in your home?
[RECORD NUMBER]
-98. REFUSED
-99. DON'T KNOW

H4. **[IF H3>0]** How many of those stand-alone freezers work?
[RECORD NUMBER; MAKE SURE NUMBER IS LESS THAN OR EQUAL TO NUMBER IN H3]
-98. REFUSED
-99. DON'T KNOW

H5. Which of the following types of housing units would you say best describes your home? Is it a… **[READ CHOICES]**
1. Single-family detached house
2. Single-family attached house
3. Duplex
4. Building with 2-4 units
5. Building with 5 or more units
6. Mobile home or house trailer
7. Other (specify)

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H6. How many bedrooms do you have in your home? **[IF EFFICIENCY OR STUDIO APARTMENT, BEDROOMS=0]**
[RECORD]
-98. REFUSED
-99. DON'T KNOW

H7. How many years have you lived in your home? **[ROUND TO THE NEAREST HALF YEAR; USE 0.5 FOR 6 MONTHS OR ½ YEAR]**
[RECORD YEARS]

H8. About when was your home first built?
1. Before 1950
2. 1950 to 1959
3. 1960 to 1969
4. 1970 to 1977
5. 1978 to 1979
6. 1980 to 1989
7. 1990 to 1994
8. 1995 or later

-98. REFUSED
-99. DON'T KNOW

H9. Including yourself, how many people currently live in your home year-round?
[RECORD NUMBER]

-98. REFUSED
-99. DON'T KNOW

H10. **[IF H9>0]** Including yourself, how many of the people currently living in your home year-round are in the following age groups? **[TOTAL SHOULD EQUAL RESPONSE FROM H9; RECORD -98 FOR REFUSED OR -99 FOR DON'T KNOW]**

a. Less than 18 years old **[RECORD NUMBER]**
b. 18 to 24 **[RECORD NUMBER]**
c. 25 to 34 **[RECORD NUMBER]**
d. 35 to 44 **[RECORD NUMBER]**
e. 45 to 54 **[RECORD NUMBER]**
f. 55 to 64 **[RECORD NUMBER]**
g. 65 or older **[RECORD NUMBER]**

H11. Do you or members of your household own your home, or do you rent it?
1. Own/ Buying
2. Rent/ Lease
3. Occupy rent-free

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H12. Have you remodeled your home in the past 5 years?
1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

H13. What is the highest level of education you have completed? **[DO NOT READ]**

1. No schooling
2. Less than high school
3. Some high school
4. High school graduate or equivalent (e.g., GED)
5. Some college
6. College degree
7. Graduate or professional degree
8. Post graduate

-98. REFUSED
-99. DON'T KNOW

H14. How would you describe your race? **[DO NOT READ; RECORD UP TO 5 RESPONSES]**

1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Pacific Islander
6. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

H15. Are you Spanish, Hispanic or Latino?

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

H16. What was your household income from all sources in 2011, before taxes? Please stop me when I reach the category that best describes your household's income. **[READ LIST; IF NECESSARY, SAY: "This information is confidential and will only be used for the purpose of characterizing study respondents."]**

1. Less than $20,000
2. 20 to less than $30,000
3. 30 to less than $40,000
4. 40 to less than $50,000
5. 50 to less than $60,000
6. 60 to less than $75,000
7. 75 to less than $100,000
8. 100 to less than $150,000
9. 150 to less than $200,000
10. More than $200,000

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H17. What is the primary language spoken in your home? **[DO NOT READ LIST]**

1. English
2. Spanish
3. Mandarin
4. Cantonese
5. Tagalog
6. Korean
7. Vietnamese
8. Russian
9. Japanese
10. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H18. **[RECORD GENDER, DO NOT ASK]**

1. Female
2. Male

Those are all the questions I have for you. Thank you for participating in our survey. This will help [Southern California Edison/ Pacific Gas & Electric] to better serve their customers.

[IF NECESSARY: If you have any questions about this survey please call [FOR SCE: Caroline Chen at 619-423-1512/ FOR PG&E: Andy Fessel 415-973-6236]

Appliance Recycling Cancellation Study Sample Disposition 10-17-12

Average time = 15 minutes

	Total cases	SCE	PG& E
Total cases	***7999***	***4000***	***3999***
01 Completed Interview	***400***	200	200
02 ARRANGE CALL-BACK - OUT OF HOME	***41***	19	22
03 RESPONDENT NOT AVAILABLE/TOO BUSY	***134***	87	47
04 NO ANSWER	***408***	245	163
05 ANSWERING MACHINE	***2513***	1406	1107
06 BUSY	***52***	27	25
07 INCOMPLETE SURVEY/SCHEDULE CALLBACK	***9***	2	7
08 REFER TO NEW PHONE NUMBER	***1***	0	1
10 INITIAL REFUSAL - SOFT	***296***	128	168
12 INITIAL REFUSAL - HARD - MENTIONED DO NOT CALL LIST	***29***	9	20
13 INITIAL REFUSAL - HARD	***156***	68	88
15 BLOCKED NUMBER	***19***	16	3
17 DUPLICATED NUMBER	***1***	0	1
19 WRONG NUMBER/NO HERE BY THAT NAME AT THIS NUMBER	***610***	332	278
20 DISCONNECT	***823***	407	416
21 BUSINESS	***193***	77	116
22 FAX MODEM LINE	***37***	17	20
23 LANGUAGE BARRIER (NON-SPANISH)	***53***	29	24
24 HEARING PROBLEM/OTHER PROBLEM WITH RESPONDENT	***52***	15	37
25 RESPONDENT GONE FOR REMAINDER OF SURVEY	***25***	10	15
26 TERMINATED SURVEY	***177***	79	98
27 CELL PHONE	***12***	6	6
30 SPANISH LANGUAGE	***213***	161	52
41 NQ - MISCELLANEOUS	***68***	33	35
(INTRO) 60 - N0/NO ONE IN HOUSEHOLD SIGNED UP FOR SERVICE	***445***	173	272
(INTRO) 61 - DK - NO ONE ELSE IN HOUSEHOLD KNOW	***295***	103	192
(INT02) 62 - NO, DID NOT SIGN UP	***19***	6	13
(INT02) DK/REFUSED TYPE OF APPLIANCE	***5***	0	5
(INT03) 64 - DK/REFUSED TYPE OF APPLIANCE	***1***	0	1
(INT04) 65 - Disposed through service	***642***	248	394
(INT04) 66 - DK/REFUSED how disposed	***103***	42	61
(INT07) 67 - Dk/Refused how disposed	***7***	2	5
(INT08) 68 - All disposed through service	***20***	3	17
(INT08) 69 - DK/REFUSED how disposed	***1***	0	1
(INT11) 72 - DK/REF - Appliances	***99***	29	70
(INT12) 73 - Under-counter appliance	***40***	21	19

THE CADMUS GROUP, INC.

SCE / PG&E Appliance Recycling Program
Nonparticipant Disposer Survey

Research Topic	Nonparticipant Survey Question
Number and description (type, primary/secondary, condition, frequency of use, working/not) of refrigerator(s)/ freezer(s) disposed of; length of ownership	B1 to B4, C1, C3, C4, C5, C7 to C13, G1 to G4
Reasons for disposal, use of secondary unit	C2, C6
Replacement equipment	C21 to C23, C28 to C30
Program awareness	C25, D1 to D3
Disposal methods; price paid/received for disposal	C14 to C20, C24 to C27
Resale market characteristics	C9 to C13
Reasons for not participating in ARP	D4, D5
Program improvement opportunities (rebates/incentives, scheduling, etc.)	E1 to E6
Attitudes, knowledge, and awareness of *program benefits,* energy-efficiency	F1 to F9
Customer characteristics	G5 to G18

A. Introduction

Hello, my name is _____. I am calling on behalf of **[Southern California Edison/ Pacific Gas & Electric]**. We are conducting a survey about refrigerators and freezers.

[IF NEEDED: The survey takes about 15 to 20 minutes.]

[IF NEEDED: I'm calling from Gilmore Research Group, an independent research firm.]

A1. Has your household disposed of a refrigerator or stand-alone freezer that you owned in the past 4 years?
[IF NEEDED: By "disposed of," I mean sell it, give it away, or have it hauled away. Going back four years is since June, 2008.]
1. Yes
2. No **[THANK AND TERMINATE]**

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW **[SKIP TO A6]**

A2. Were you involved in or familiar with the disposal of the appliance?
1. Yes
2. No **[SKIP TO A6]**

-98. REFUSED
-99. DON'T KNOW

A3. Did you have the appliance(s) picked up through your electric company's appliance recycling service?
1. Yes **[THANK AND TERMINATE]**
2. No

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW/DON'T REMEMBER

A4. **[IF A3=2 OR -99]** Your electric company offers a rebate to pick up and recycle old working refrigerators and freezers. A contractor would have picked the appliance up at your home and you would have been paid a rebate later in the mail. Are you sure your appliance wasn't picked up by the utility's service?
1. Yes, I'm sure it wasn't picked up by the service or I received no rebate
2. No, I did get the rebate check **[THANK AND TERMINATE]**

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW/DON'T REMEMBER **[THANK AND TERMINATE]**

A5. Who is your electric company? **[READ LIST IF NECESSARY]**
1. Southern California Edison/ SCE **[SKIP TO B1]**
2. Pacific Gas & Electric/ PG&E **[SKIP TO B1]**
3. Other **[THANK AND TERMINATE]**

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW **[THANK AND TERMINATE]**

A6. Is there someone else in your household who might know appliances your household has disposed of?
1. Yes
2. No **[THANK AND TERMINATE]**

A7. May I speak to that person or have his/her name?
1. Yes **[TRANSFER TO NEW CONTACT OR RECORD NAME AND GO BACK TO INTRODUCTION; IF NOT AVAILABLE, ESTABLISH A GOOD TIME TO CALL BACK]**
2. No **[THANK AND TERMINATE]**

B. Disposal Information

B1. How many refrigerators or freezers have you disposed of since June 2008 including units you replaced?
1. None **[THANK AND TERMINATE]**
2. One
3. More than one **[RECORD NUMBER, 2-20]**

-98. REFUSED
-99. DON'T KNOW

B2. How many were *refrigerators* that *worked* at the time of disposal?
1. None
2. One
3. More than one [**RECORD NUMBER, 2-20]**

-98. REFUSED
-99. DON'T KNOW

B3. **[IF B1=2 AND B2=2 SKIP TO C1]** How many were *freezers* that *worked* at the time of disposal?
1. None
2. One
3. More than one **[RECORD NUMBER, 2-9]**

-98. REFUSED
-99. DON'T KNOW

B4. **[IF B1=3 AND B2 =2 OR 3 AND B3=2 OR 3)]** The next few questions will focus on the appliance you disposed of most recently. Was that appliance a refrigerator or freezer? **[IF CUSTOMER SAYS "BOTH," ASK: Which would you rather discuss for the remainder of the survey?]**
1. Refrigerator **[SET ApplianceVar = "Refrigerator"]**
2. Freezer **[SET ApplianceVar = "Freezer"]**

-98. REFUSED **[SKIP TO D1]**
-99. DON'T KNOW **[SKIP TO D1]**

C. Working Refrigerators

C1. Do you recall the year when you disposed of this **[ApplianceVar]?**

1. 2008
2. 2009
3. 2010
4. 2011
5. 2012
6. Other **[DO NOT READ; RECORD YEAR]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW/ CAN'T REMEMBER **[DO NOT READ]**

C2. Why did you dispose of the **[ApplianceVar]?**

1. I got a new appliance and did not need the old one
2. It wasn't working well
3. I didn't use it very often/at all
4. It used too much energy
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C3. How long had you owned it?

1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**

-98. REFUSED
-99. DON'T KNOW

C4. **[IF ApplianceVar= "Refrigerator"]** During the time just before you decided to dispose of it, was the refrigerator you disposed of being used as your main unit, or had it been a secondary or spare?

[IF NEEDED: A main refrigerator is typically in the kitchen, a secondary or spare is usually kept someplace else and might or might not be running or plugged in all the time. If the person recently bought a new main refrigerator and was just waiting for the old one to be picked up, it should be classified as "main.")]

1. Main **[SKIP TO C9]**
2. Secondary/Spare

-98. REFUSED
-99. DON'T KNOW

C5. **[IF ApplianceVar= "Refrigerator"]** How long had it been a secondary or spare?

[IF NEEDED: If respondent is confused, reinforce that "how long had it been a spare when you decided to dispose of it."]

1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**

-98. REFUSED
-99. DON'T KNOW

C6. **[ASK IF ApplianceVar=Freezer OR C4=2]** Why did you have the spare **[ApplianceVar]**? **[READ LIST ONLY IF NEEDED; RECORD MULTIPLE]**

1. I have a large family and/or need extra space for storage
2. I buy in bulk at warehouse/bargain stores (Costco, Sam's Club, B.Js, etc.)
3. I need/like separate storage for beverages
4. I need extra storage for special events/holidays
5. Hunting/fishing needs
6. Medical storage
7. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DONT KNOW **[DO NOT READ]**

C7. In the last year before you disposed of it, how much was the **[ApplianceVar]** used? Was it…

1. Kept it running all the time
2. Used only for special occasions
3. Used only during certain months of the year
4. Never plugged in or running
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C8. Would you say that the **[ApplianceVar]** you disposed of was typically… **[READ LIST]**

6. Empty
7. About a quarter full
8. About half full
9. About three-quarters full
1. Mostly or completely full

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C9. What was the condition of this appliance just before you disposed of it? Would you say: **[READ LIST]**

1. It worked and was in good condition
2. It worked but needed minor repairs like a door seal or handle.
3. It worked but had mechanical problems or needed major repairs
4. Or, it didn't work
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C10. Approximately how old was the appliance when you disposed of it?
1. Less than 6 years
2. 6-10
3. 11-15
4. 16-20
5. Greater than 20 **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C11. **[IF ApplianceVar= "Refrigerator"]** What type of unit was it? **[READ LIST]**
1. Side-by-side
2. Top freezer
3. Bottom freezer
4. Single door
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C12. **[IF ApplianceVar= "Freezer"]** What type of unit was it? **[READ LIST]**
1. Upright freezer
2. Chest freezer
3. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C13. Would you consider the unit... **[READ LIST]**
1. Small
2. Medium
3. Large
4. Extra Large

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C14. How did you dispose of this **[ApplianceVar]**? **[DO NOT READ; IF NEEDED, CLARIFY TO FIT LIST BELOW.]**
1. Sell it
2. Give it away **[SKIP TO C16]**
3. Have it picked up by someone else **[SKIP TO C17]**
4. Take it to a disposal center or dump yourself **[SKIP TO C18]**
5. Dispose of it in some other way **[SPECIFY; RECORD RESPONSE VERBATIM]** **[SKIP TO C21]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO C21]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO C21]**

C15. Who did you sell it to? **[READ LIST; IF RESPONDENT SAYS, "Someone on Craigslist," ASK THEM TO SPECIFY WHETHER THE BUYER WAS A DEALER]**
1. A private individual (for example, a friend or family member) **[SKIP TO C19]**
2. An appliance dealer **[SKIP TO C19]**
3. Other **[DO NOT READ; SPECIFY]** **[SKIP TO C19]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO C19]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO C19]**

C16. Who did you give it to?
1. A private individual (for example, a friend or family member) **[SKIP TO C21]**
2. A charity organization **[SKIP TO C21]**
3. An appliance dealer **[SKIP TO C21]**
4. Left it on the curb **[SKIP TO C21]**
5. Left it behind when you moved **[SKIP TO C21]**
6. Other **[DO NOT READ, SPECIFY]** **[SKIP TO C21]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO C21]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO C21]**

C17. Was it picked it up through the delivery service with the purchase of a new appliance, or did someone else pick it up for disposal?
1. Delivery service **[SKIP TO C20]**
2. Someone else **[SKIP TO C20]**
3. Other **[DO NOT READ, SPECIFY]** **[SKIP TO C20]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO C20]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO C20]**

C18. Did you haul it to…
1. A landfill or dump **[SKIP TO C20]**
2. A community waste disposal service **[SKIP TO C20]**
3. A waste management or recycling center **[SKIP TO C20]**
4. Other **[DO NOT READ, SPECIFY]** **[SKIP TO C20]**

-98. REFUSED **[DO NOT READ]** **[SKIP TO C20]**
-99. DON'T KNOW **[DO NOT READ]** **[SKIP TO C20]**

C19. How much money did you get for it?
[RECORD DOLLARS; ENTER $0 IF RESPONDENT SAYS "NOTHING"] **[SKIP TO C21]**

-98. REFUSED **[SKIP TOC21]**
-99. DON'T KNOW **[SKIP TO C21]**

C20. How much did you pay to dispose of it?
[RECORD DOLLARS; ENTER $0 IF RESPONDENT SAYS "NOTHING"]

-98. REFUSED
-99. DON'T KNOW

C21. Did you replace the **[ApplianceVar]** you disposed of with a different one?
1. Yes
2. No **[SKIP TO C30]**
-98. REFUSED **[SKIP TO C30]**
-99. DON'T KNOW **[SKIP TO C30]**

C22. Was your replacement **[ApplianceVar]** brand new when you got it, or was it used?
1. New
2. Used
-98. REFUSED
-99. DON'T KNOW

C23. Did you get the replacement **[ApplianceVar]** from an appliance dealer at either a retail store or on the internet? **[IF RESPONDENT SAYS "Craigslist," ASK THEM TO SPECIFY WHETHER THE SELLER WAS A DEALER]**
1. Yes, got it from a dealer
2. No, did not get it from a dealer **[SKIP TO C29]**
-98. REFUSED **[SKIP TO C29]**
-99. DON'T KNOW **[SKIP TO C29]**

C24. When you bought the replacement **[ApplianceVar]**, did you talk to the salesperson or dealer about how to dispose of your old **[ApplianceVar]**?
1. Yes
2. No **[SKIP TO C29]**
-98. REFUSED **[SKIP TO C29]**
-99. DON'T KNOW **[SKIP TO C29]**

C25. Did the sales person tell you about **[SCE/PGE]'s** appliance recycling service?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

C26. Did the sales person offer to dispose of the old appliance for free?
1. Yes **[SKIP TO C29]**
2. No
-98. REFUSED
-99. DON'T KNOW

C27. Did the sales person tell you they would dispose of the appliance for a charge?
1. Yes
2. No **[SKIP TO C29]**
-98. REFUSED **[SKIP TO C29]**
-99. DON'T KNOW **[SKIP TO C29]**

C28. How much did you spend for the replacement **[ApplianceVar]**?Was it…
1. Free
2. Less than $100
3. More than $100

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C29. **[IF C22=2]** What would you have done if the specific replacement **[ApplianceVar]** had not been available? Would you have…
1. Found another used unit
2. Bought a new unit
3. Not replaced your appliance
4. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW [DO NOT READ]

C30. **[IF C21=2, -98, OR -99]** Do you plan to get a replacement appliance in the near future?
1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

D. Appliance Recycling Program

Now I have just a few general questions about the appliance recycling service offered by **[SCE/PG&E]**.

D1. **[SCE/PG&E]**'s service helps save energy by removing and recycling unwanted or out of date appliances. Do recall hearing about this service before today?
1. Yes
2. No **[SKIP TO D5]**

-98. REFUSED **[SKIP TO D5]**
-99. DON'T KNOW **[SKIP TO D5]**

D2. How did you first hear about the recycling service? **[DO NOT READ]**

1. Appliance store
2. Information that came with a **[SCE/PG&E]** bill
3. Information that came in a letter or brochure from **[SCE/PG&E]**
4. Email from **[SCE/PG&E]**
5. Utility representative
6. Other utility resource **[SPECIFY]**
7. Referral from friend/neighbor
8. Movie Theater
9. Newspaper/Pennysaver
10. Radio
11. TV
12. Truck ad
13. Website
14. News story
15. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

D3. Have you ever had an appliance picked up by this service?

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

D4. Why didn't you use this recycling service for the appliance(s) we discussed earlier? **[DO NOT READ; RECORD MULTIPLE RESPONSES]**

1. Didn't have any appliances to recycle
2. Rebate is too low
3. Wait time is too long
4. Cannot be home as required when unit is picked up
5. Unit was not working
6. Need secondary unit for food/beverage storage at certain times of the year
7. Wanted to retain secondary unit for future use
8. Planned to give the unit away to friend/relative
9. Planned to sell the unit
10. Have not heard of the service until now
11. We rent/ landlord decides
12. Signed up /but no one ever came to pick it up
13. Dealer/ Retailer picked up/Disposed of the old one
14. Inconvenient (Misc.)
15. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D5. How likely would you be to use the appliance recycling service the next time you have an extra refrigerator or freezer that is working? **[READ LIST]**
[IF NEEDED: The service would pay you $35 to pick up your used, working refrigerator or freezer.]
1. Not at all likely
2. Somewhat likely
3. Very Likely

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

E. ARP Preferences

E1. Would you be more likely to use the appliance recycling service if it offered more than the current $35 rebate?
1. Yes, more likely to use the service
2. No

-98. REFUSED
-99. DON'T KNOW

E2. **[IF E1= 1]** How much would you need to be offered so that you would be very likely to use this service?
[RECORD DOLLARS: $1-500]

-98. REFUSED
-99. DON'T KNOW

E3. Would you be more likely to use the service if the wait time between when you call to schedule and when the appliance is picked up were shorter than 1 to 2 weeks?
1. Yes, more likely to use the service
2. No

-98. REFUSED
-99. DON'T KNOW

E4. What is the maximum number of days you would wait?
1. Same day
2. **[RECORD DAYS, 1-30]**

-98. REFUSED
-99. DON'T KNOW

E5. Would you be more likely to use the service if your old unit could be picked up by the appliance dealer at the time a new unit was being delivered?
1. Yes, more likely to use the service
2. No

-98. REFUSED
-99. DON'T KNOW

E6. Is there anything else that would make you more likely to use the appliance recycling service in the future?
1. **[RECORD COMMENTS]**
2. Nothing/Can't think of anything
-98. REFUSED
-99. DON'T KNOW

F. Awareness, Knowledge, and Attitudes about ARP Benefits

Now I have some general questions for you about refrigerators and freezers.

F1. Before you decided to dispose of your appliance, were you aware that a refrigerator or freezer in your home can cost $180 or more a year for electricity?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

F2. Were you aware that the refrigerant in refrigerators and freezers is harmful to the environment if not properly disposed of?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

F3. **[IF D1=1]** Did you know that **[SCE/PG&E]**'s recycling service…
[READ LIST. RECORD FOR EACH: 1=YES; 2=NO; -98=REFUSED; -99=DON'T KNOW]
a. …Takes apart and recycles all of the metals and glass from the appliances it collects?
b. …Removes, and recycles or destroys the coolant, motor oil, and insulation from the appliances it collects?
c. …Almost none of the materials from the appliances **[SCE/PG&E]** recycles go to a land fill?

F4. **[IF D1=1] [SCE/PG&E]**'s recycling service DOES dispose of all the appliance parts in an environmentally safe manner. Knowing that, how much more likely would you be to participate in **[SCE/PG&E]**'s appliance recycling service in the future? Would you be…
1. Much more likely
2. Somewhat more likely
3. Not at all more likely
-98. REFUSED
-99. DON'T KNOW

F5. **[D1≠1]** How much more likely would you be to participate in **[SCE/PG&E]**'s appliance recycling service in the future if you knew that the **[SCE/PG&E]** service disposed of all the refrigerator and freezer parts in an environmentally safe manner? Would you be…
1. Much more likely
2. Somewhat more likely
3. Not at all more likely

-98. REFUSED
-99. DON'T KNOW

We're almost finished with the survey. I have just few general questions for you, and then a few final questions about your household.

F6. Have you heard of a carbon footprint? **[IF NECESSARY: A carbon footprint is the amount of gases containing carbon that are produced when you burn fuels and use electricity. This includes but is not limited to the energy consumption in your home, your transportation, your diet, and your purchases.] [DO *NOT* READ RESPONSES]**
1. Yes
2. No
3. Yes, I have heard the term "carbon footprint" but I do not know what it means

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F7. Next, I'm going to read a list of energy-saving actions. For each action please tell me if your household has already taken the action. Did you… **[RANDOMIZE ACTIONS] [READ EACH ACTION. RECORD FOR EACH: 1=YES; 2=NO; 3=CAME WITH THE HOUSE; -98=REFUSED; -99=DON'T KNOW. DISTINGUISH BETWEEN, "1=YES, INSTALLED IT MY/OUR SELVES" AND "3=CAME WITH THE HOUSE"]**
a. …install an attic vent to keep the attic cooler?
b. …install programmable thermostats?
c. …install ceiling fans?
d. …install motion detectors for lights?

F8. On a scale of 1 to 7, where 7 is Strongly Agree, and 1 is Strongly Disagree, please tell me how much you agree or disagree with the following two statements.
a. I compare prices of at least a few brands before I choose one.

[RECORD NUMBER 1-7]

-98. REFUSED
-99. DON'T KNOW

b. I do NOT feel responsible for conserving energy because my personal contribution is very small.

[RECORD NUMBER 1-7]

-98. REFUSED
-99. DON'T KNOW

F9. I'm going to read you a list of 6 reasons why people might change their daily actions to save energy. Please tell me which of these would motivate you the MOST to save energy? **[READ CHOICES] [IF RESPONDENT SAYS "DON'T KNOW," PROBE: "if you had to choose from the following reasons which one would motivate you the most"] [RANDOMIZE]**

1. Saving money
2. Maintaining Health
3. Protecting the environment
4. For the benefit of future generations
5. Reducing our dependence on foreign oil
6. Helping California lead the way on saving energy

-98. REFUSED
-99. DON'T KNOW

G. Customer Characteristics

G1. How many refrigerators do you currently have in your home? **[RECORD NUMBER]**

-98. REFUSED
-99. DON'T KNOW

G2. **[IF G1>0]** How many of those refrigerators work? **[RECORD NUMBER; MAKE SURE NUMBER IS LESS THAN OR EQUAL TO NUMBER IN G1]**

-98. REFUSED
-99. DON'T KNOW

G3. How many stand-alone freezers do you currently have in your home? **[RECORD NUMBER]**

-98. REFUSED
-99. DON'T KNOW

G4. **[IF G3>0]** How many of your stand-alone freezers work? **[RECORD NUMBER; MAKE SURE NUMBER IS LESS THAN OR EQUAL TO NUMBER IN G3]**

-98. REFUSED
-99. DON'T KNOW

G5. Which of the following types of housing units would you say best describes your home? Is it a… **[READ CHOICES]**

1. Single-family detached house
2. Single-family attached house
3. Duplex
4. Building with 2-4 units
5. Building with 5 or more units
6. Mobile home or house trailer

7. Other (specify)
-98. REFUSED
-99. DON'T KNOW

G6. How many bedrooms do you have in your home? **[IF EFFICIENCY OR STUDIO APARTMENT, BEDROOMS=0]**
[RECORD NUMBER]
-98. REFUSED
-99. DON'T KNOW

G7. How many years have you lived in your home? **[ROUND TO THE NEAREST HALF YEAR; USE 0.5 FOR 6 MONTHS OR ½ YEAR]**
[RECORD NUMBER]
-98. REFUSED
-99. DON'T KNOW

G8. About when was your home first built?
1. Before 1950
2. 1950 to 1959
3. 1960 to 1969
4. 1970 to 1977
5. 1978 to 1979
6. 1980 to 1989
7. 1990 to 1994
8. 1995 or later
-98. REFUSED
-99. DON'T KNOW

G9. Including yourself, how many people currently live in your home year-round?
[RECORD]
-98. REFUSED
-99. DON'T KNOW

G10. **[IF G9>0]** Including yourself, how many of the people currently living in your home year-round are in the following age groups? **[TOTAL SHOULD EQUAL RESPONSE FROM G9; RECORD -98 FOR REFUSED OR -99 FOR DON'T KNOW]**
a. Less than 18 years old **[RECORD NUMBER]**
b. 18 to 24 **[RECORD NUMBER]**
c. 25 to 34 **[RECORD NUMBER]**
d. 35 to 44 **[RECORD NUMBER]**
e. 45 to 54 **[RECORD NUMBER]**
f. 55 to 64 **[RECORD NUMBER]**
g. 65 or older **[RECORD NUMBER]**

G11. Do you or members of your household own your home, or do you rent it?
1. Own/ Buying
2. Rent/ Lease
3. Occupy rent-free
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

G12. Have you remodeled your home in the past 5 years?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

G13. What is the highest level of education you have completed? **[DO NOT READ]**
1. No schooling
2. Less than high school
3. Some high school
4. High school graduate or equivalent (e.g., GED)
5. Some college
6. College degree
7. Graduate or professional degree
8. Post graduate
-98. REFUSED
-99. DON'T KNOW

G14. How would you describe your race? **[DO NOT READ; RECORD UP TO 5 RESPONSES]**
1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Pacific Islander
6. Other **[SPECIFY]**
-98. REFUSED
-99. DON'T KNOW

G15. Are you Spanish, Hispanic or Latino?
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

G16. What was your household income from all sources in 2011, before taxes? Please stop me when I reach the category that best describes your household's income. **[READ LIST; IF NECESSARY, SAY: "This information is confidential and will only be used for the purpose of characterizing study respondents."]**

1. Less than $20,000
2. 20 to less than $30,000
3. 30 to less than $40,000
4. 40 to less than $50,000
5. 50 to less than $60,000
6. 60 to less than $75,000
7. 75 to less than $100,000
8. 100 to less than $150,000
9. 150 to less than $200,000
10. More than $200,000

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

G17. What is the primary language spoken in your home? **[DO NOT READ LIST]**

1. English
2. Spanish
3. Mandarin
4. Cantonese
5. Tagalog
6. Korean
7. Vietnamese
8. Russian
9. Japanese
10. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

G18. **[RECORD GENDER, DO NOT ASK]**

1. Female
2. Male

Those are all the questions I have for you. Thank you for participating in our survey. This will help [Southern California Edison/ Pacific Gas & Electric] to better serve their customers.

[IF NECESSARY: If you have any questions about this survey please call [FOR SCE: Caroline Chen at 619-423-1512/ FOR PG&E: Andy Fessel 415-973-6236]

Appliance Nonparticipant Disposer Study Sample Disposition 10-31-12

	Total cases	SCE	PG&E
Total cases	***15726***	***9766***	***5960***
01 Completed Interview	***302***	150	152
02 ARRANGE CALL-BACK - OUT OF HOME	***16***	11	5
03 RESPONDENT NOT AVAILABLE/TOO BUSY	***71***	41	30
04 NO ANSWER	***571***	467	104
05 ANSWERING MACHINE	***3536***	2474	1062
06 BUSY	***82***	63	19
07 INCOMPLETE SURVEY/SCHEDULE CALLBACK	***3***	2	1
10 INITIAL REFUSAL - SOFT	***1805***	985	820
12 INITIAL REFUSAL - HARD - MENTIONED DO NOT CALL LIST	***174***	79	95
13 INITIAL REFUSAL - HARD	***413***	190	223
15 BLOCKED NUMBER	***20***	13	7
17 DUPLICATED NUMBER	***3***	2	1
20 DISCONNECT	***2136***	1388	748
21 BUSINESS	***433***	335	98
22 FAX MODEM LINE	***171***	101	70
23 LANGUAGE BARRIER (NON-SPANISH)	***175***	111	64
24 HEARING PROBLEM/OTHER PROBLEM WITH RESPONDENT	***64***	41	23
25 RESPONDENT GONE FOR REMAINDER OF SURVEY	***9***	7	2
26 TERMINATED SURVEY	***88***	35	53
27 CELL PHONE	***35***	27	8
30 SPANISH LANGUAGE	***527***	446	81
41 NQ - MISCELLANEOUS	***18***	9	9
(INTRO) 60 - DID NOT DISPOSE OF ANY IN LAST 4 YEARS *	***4482***	2491	1991
(INTRO) 61 NO ONE IN HOUSEHOLD FAMILIAR WITH DISPOSAL	***166***	85	81
(INT02) 62 - PICKED BY UTILITY	***290***	153	137
(INT02) 63 - REFUSED PICKUP	***6***	4	2
(INT03) 64 - RECEIVED REBATE CHECK	***27***	12	15
(INT03) 65 - DK/REFUSED PICKUP	***24***	10	14
(INT04) 66 - INCORRECT UTILITY	***24***	5	19
(INT04) 67 - DK/REFUSED UTILITY	***2***	1	1
(INT05) 68 - DID NOT DISPOSE OF ANY	***12***	7	5
(INT06) 69 - Disposed before 2008	***9***	4	5
(INT09) 71 - Not disposed of in last 4 yearsl	***5***	1	4
(INT07) 72 - APPLIANCE WAS LESS THAN 10 C FEE	***27***	16	11

*** Note: An additional 1,517 not qualifed on the Disposal Survey went on to the 2nd Appliance Survey and are counted in the 2nd Appliance Disposition.**

SCE / PG&E ARP Nonparticipant Secondary Appliance Owner Survey

Research Topic	Survey Question
Number and description (type, condition, frequency of use) of secondary refrigerator(s) and freezer(s); length of ownership	B1 to B4, C1 to C13, D1 to D12
Consideration of and experience with disposal	C14 to C17; D13 to D16; H1 to H2
Program awareness	E1 to E4
Motivation for possible future participation	E5; F1 to F5
Attitudes, knowledge, and awareness of *program benefits* and energy-efficiency in general; motivations to save energy	G1 to G4
Segmentation	**Error! Reference source not found.** to G8, H9
Customer characteristics and demographics	H3 to H16

A. Introduction

Hello, my name is _____. I am calling on behalf of **[SOUTHERN CALIFORNIA EDISON / PACIFIC GAS & ELECTRIC]**. We are conducting a survey about refrigerators and freezers.

[IF NEEDED SAY, "THE SURVEY TAKES ABOUT 15 TO 20 MINUTES."]

[IF NEEDED SAY, "I'M CALLING FROM GILMORE RESEARCH GROUP, AN INDEPENDENT RESEARCH FIRM."]

A1. Do you have more than one *working* refrigerator or freezer in your household?

1. Yes **[SKIP TO A4]**
2. No **[THANK AND TERMINATE]**

-98. REFUSED **[THANK AND TERMINATE]**

-99. DON'T KNOW

A2. Is there someone else in your household who might know about the appliances in your household?
1. Yes
2. No **[THANK AND TERMINATE]**

A3. May I speak to that person or have his/her name?
1. Yes **[TRANSFER TO NEW CONTACT AND BEGIN SURVEY INTRODUCTION AGAIN. OR, IF NOT AVAILABLE, RECORD NAME AND ESTABLISH A GOOD TIME TO CALL BACK.]**
2. No **[THANK AND TERMINATE]**

A4. Who is your electric company? **[READ LIST IF NECESSARY]**
1. Southern California Edison/ SCE
2. Pacific Gas & Electric/ PG&E
3. Other **[THANK AND TERMINATE]**

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW **[THANK AND TERMINATE]**

B. Appliance Information

B1. Not counting the main refrigerator in your kitchen, how many working refrigerators or stand-alone freezers do you have in your household?
1. None **[THANK AND TERMINATE]**
2. One
3. More than one **[RECORD NUMBER, 2-20]**

-98. REFUSED **[THANK AND TERMINATE]**
-99. DON'T KNOW **[THANK AND TERMINATE]**

B2. **[IF B1=2 READ: "Is the appliance…"; IF B1=3 READ: "Are all of the appliances…"]** very small, such as an under-counter refrigerator? **[DO NOT READ LIST]**
1. Yes **[Thank and Terminate]**
2. No

-98. REFUSED
-99. DON'T KNOW

B3. How many are working *refrigerators*? **[DO NOT READ LIST]**
1. None
2. One
3. More than one **[RECORD NUMBER, 2-9]**

-98. REFUSED
-99. DON'T KNOW

B4. **[SKIP IF B1=2 AND B3=2]** How many are working stand-alone *freezers*? **[DO NOT READ LIST]**
1. None
2. One
3. More than one **[RECORD NUMBER, 2-9]**

-98. REFUSED
-99. DON'T KNOW

[IF B2= 2 THEN GO TO C1 AND SAY, "THE NEXT FEW QUESTIONS ARE ABOUT YOUR SECONDARY REFRIGERATOR."]

[IF B2= 3 THEN GO TO C1 AND SAY, "THE NEXT FEW QUESTIONS ARE ABOUT THE SECONDARY REFRIGERATOR THAT YOU USE MOST OFTEN."]

[IF B2=1 AND B4= 2 THEN GO TO D1 AND SAY, "THE NEXT FEW QUESTIONS ARE ABOUT YOUR STAND-ALONE FREEZER.]

[IF B2=1 AND B4= 3 THEN GO TO D1 AND SAY, "THE NEXT FEW QUESTIONS ARE ABOUT THE STAND-ALONE FREEZER YOU USE MOST OFTEN.]

[IF (B2= 1 OR B2= -98 OR B2= -99) AND (B4= 1 OR B4= -98 OR B4= -99) THEN THANK AND TERMINATE]

C. Secondary Refrigerators

C1. How long has the refrigerator been a secondary or spare unit? **[IF NEEDED SAY, "A MAIN REFRIGERATOR IS TYPICALLY IN THE KITCHEN, A SECONDARY OR SPARE IS USUALLY KEPT SOMEPLACE ELSE AND MIGHT OR MIGHT NOT BE RUNNING OR PLUGGED IN ALL THE TIME."]**
1. **[RECORD NUMBER OF MONTHS]**
2. **[RECORD NUMBER OF YEARS]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C2. How long have you had *any* spare refrigerators **[IF NEEDED SAY, "INCLUDING THIS ONE AND OTHER SPARE REFRIGERATORS YOU HAD BEFORE IT"]**?
1. **[RECORD NUMBER OF YEARS]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C3. Did you buy your spare refrigerator or get it for free? **[DO NOT READ LIST]**
1. Bought it
2. Received it for free
3. Was here when I moved into my home **[SKIP TO C6]**

-98. REFUSED **[SKIP TO C6]**
-99. DON'T KNOW **[SKIP TO C6]**

C4. **[ASK IF C3=1 OR C3=2]** And was your spare refrigerator new or used when you **[ANSWER FROM C3]**? **[DO NOT READ LIST]**
1. New
2. Used
-98. REFUSED
-99. DON'T KNOW

C5. **[ASK IF C3=1]** Did you buy it from a retail store or from an individual? **[DO NOT READ LIST]**
1. Retail store
2. Individual
-98. REFUSED
-99. DON'T KNOW

C6. Did you ever use it as your primary refrigerator before it became a spare? **[DO NOT READ LIST]**
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

C7. In the last year, how often has the refrigerator been used? Was it… **[READ LIST]**
1. Kept running all the time
2. Used only for special occasions
3. Used only during certain months of the year
4. Never plugged in or running
5. Other **[SPECIFY]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C8. What condition is the refrigerator in? Would you say: **[READ LIST; ENTER ONLY ONE RESPONSE; IF UNIT NEEDED NEW COMPRESSOR, RECORD AS 3=HAS MECHANICAL PROBLEMS]**
1. It works and is in good physical condition
2. It works but needs minor repairs like a door seal or handle.
3. It works but has some mechanical problems or needs major repairs.
4. Or, it doesn’t work
5. Other **[SPECIFY]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C9. **[SKIP IF C7=4]** Would you say that the refrigerator is typically…**[READ LIST]**
1. Empty
2. About a quarter full
3. About half full
4. About three-quarters full
5. Mostly or completely full

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C10. Approximately how many years old is the refrigerator?
[RECORD NUMBER OF YEARS OLD, 0 TO 75]
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C11. What type of unit is it? **[READ LIST]**
1. Side-by-side
2. Top freezer
3. Bottom freezer
4. Single Door
5. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C12. Approximately what size is it in cubic feet? **[READ LIST IF NECESSARY]**
1. Very small (10 to less than 13 cu. ft.)
2. Small (13 to less than 17 cu. ft.)
3. Medium (17 to less than 20 cu. ft.)
4. Large (20 to 23 cu. ft.)
5. Extra Large (more than 23 cu. ft.)

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

C13. Why do you have more than one refrigerator? **[DO NOT READ LIST; MARK ALL THAT APPLY]**
1. I have a large family and need extra space for storage
2. I buy in bulk at warehouse/bargain stores (such as Costco, Sam's Club, BJs, etc.)
3. I need/like separate storage for beverages
4. I need extra storage for special events/holidays
5. Hunting/fishing needs
6. Medical storage
7. I had the space to keep it when I got a new one
8. Other **[SPECIFY]**

-98. REFUSED
-99. DONT KNOW

C14. Have you ever considered disposing of the refrigerator? **[DO NOT READ LIST]**

1. Yes **[SKIP TO C16]**
2. No

-98. REFUSED
-99. DON'T KNOW

C15. Why not? **[DO NOT READ LIST; MARK ALL THAT APPLY]**

1. I need the extra storage **[SKIP TO D1]**
2. I like having the extra storage **[SKIP TO D1]**
3. It would be too much hassle to get rid of it **[SKIP TO D1]**
4. I don't want to pay to dispose of it **[SKIP TO D1]**
5. I have never thought about disposing of it **[SKIP TO D1]**
6. Other **[SPECIFY]** **[SKIP TO D1]**

-98. REFUSED **[SKIP TO D1]**
-99. DON'T KNOW **[SKIP TO D1]**

C16. What options for disposing of the refrigerator have you considered? **[DO NOT READ LIST - CLARIFY IF NEEDED TO FIT LIST BELOW. FOR EXAMPLE: WOULD YOU HAVE GIVEN IT AWAY OR SOLD IT? TO WHOM?] [MULTIPLE RESPONSES ALLOWED]**

Selling it…

1. To a private individual (for example, a family member/neighbor/friend/co-worker, or a stranger)
2. To an appliance dealer

Giving it away for free to…

3. A private individual (including if you leave it behind when you move, or if you install it in a rental house or second home)
4. A charity organization
5. An appliance dealer

Having it picked up…

6. As part of the delivery service with the purchase of a new or replacement appliance
7. By someone else for junking or dumping

Hauling it…

8. To the landfill/dump or threw it away yourself, or having a community waste service dispose of it
9. To a waste management or recycling center yourself

Other…

10. Leaving it on the curb for someone to take for free
11. Disposing of it in some other way **[SPECIFY]**
12. Keeping it

-98. REFUSED
-99. DON'T KNOW

C17. If you got rid of it, would you get another refrigerator or freezer to replace the spare refrigerator you dispose of? **[DO NOT READ LIST]**
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

[IF B4= 2 THEN GO TO D1 AND SAY, "THE NEXT FEW QUESTIONS ARE ABOUT YOUR SECONDARY FREEZER."]

[IF B4= 3 THEN GO TO D1 AND SAY, "THE NEXT FEW QUESTIONS ARE ABOUT THE SECONDARY FREEZER YOU USE THE MOST OFTEN."]

[IF B4= 1 OR B4= -98 OR B4= -99 THEN GO TO E1]

D. Secondary Freezers

D1. How long have you had the stand-alone freezer?
1. **[RECORD MONTHS]**
2. **[RECORD YEARS]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D2. How long have you had *any* stand-alone freezers **[IF NEEDED SAY, "INCLUDING THIS ONE AND OTHER STAND-ALONE FREEZERS YOU HAD BEFORE IT"]**?
1. **[RECORD NUMBER OF YEARS]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D3. Did you buy your current freezer or get it for free? **[DO NOT READ LIST]**
1. Bought it
2. Received it for free
3. Was here when I moved into my home **[SKIP TO D6]**
-98. REFUSED **[SKIP TO D6]**
-99. DON'T KNOW **[SKIP TO D6]**

D4. **[ASK IF D3=1 OR D3=2]** And was your current freezer new or used when you **[ANSWER FROM D3]**? **[DO NOT READ LIST]**
1. New
2. Used
-98. REFUSED
-99. DON'T KNOW

D5. **[ASK IF D3=1]** Did you buy it from a retail store or from an individual? **[DO NOT READ LIST]**
1. Retail store
2. Individual
-98. REFUSED
-99. DON'T KNOW

D6. In the last year, how often has the freezer been used? Was it… **[READ LIST]**
1. Kept running all the time
2. Used only for special occasions
3. Used only during certain months of the year
4. Never plugged in or running
5. Other **[SPECIFY]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D7. What condition is the freezer in? Would you say: **[READ LIST; ENTER ONLY ONE RESPONSE; IF UNIT NEEDED NEW COMPRESSOR, THEN IT HAD MECHANICAL PROBLEMS]**
1. It works and is in good physical condition
2. It works but needs minor repairs like a door seal or handle.
3. It works but has some mechanical problems or needs repairs
4. Or, it doesn't work
5. Other **[SPECIFY]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D8. **[SKIP IF D6=4]** Would you say that the freezer is typically…**[READ LIST]**
1. Empty
2. About a quarter full
3. About half full
4. About three-quarters full
5. Mostly or completely full
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D9. Approximately how many years old is the freezer? **[RECORD NUMBER OF YEARS OLD, 0 TO 75]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D10. What type of unit is it? **[READ LIST]**
1. Upright Freezer
2. Chest Freezer
3. Other**[SPECIFY]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D11. Approximately what size is it in cubic feet? **[READ LIST IF NECESSARY]**
1. Small (10 to less than 13cu. ft.)
2. Medium (13 to 16 cu. ft.)
3. Large (more than 16 cu. ft.)

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

D12. Why do you use an extra freezer? **[DO NOT READ LIST; MARK ALL THAT APPLY]**
1. I have a large family and need extra space for storage
2. I buy in bulk at warehouse/bargain stores (such as Costco, Sam's Club, BJs, etc.)
3. I freeze extra produce
4. I need extra storage for special events/holidays
5. Hunting/fishing needs
6. Medical storage
7. I have the space to keep it
8. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

D13. Have you ever considered disposing of the freezer? **[DO NOT READ LIST]**
1. Yes **[SKIP TO D15]**
2. No

-98. REFUSED
-99. DON'T KNOW

D14. Why not? **[DO NOT READ LIST; MARK ALL THAT APPLY]**
1. I need the extra storage **[SKIP TO E1]**
2. I like having the extra storage **[SKIP TO E1]**
3. There's too much hassle involved with removal **[SKIP TO E1]**
4. I don't want to pay to dispose of it **[SKIP TO E1]**
5. I just have never thought about disposing of it **[SKIP TO E1]**
6. Other **[SPECIFY]** **[SKIP TO E1]**

-98. REFUSED **[SKIP TO E1]**
-99. DON'T KNOW **[SKIP TO E1]**

D15. What options for disposing of this freezer have you considered? **[DO NOT READ LIST-CLARIFY IF NEEDED TO FIT LIST BELOW. FOR EXAMPLE: WOULD YOU HAVE GIVEN IT AWAY OR SOLD IT? TO WHOM?] [MULTIPLE RESPONSES ALLOWED]**

Selling it…
1. To a private individual (for example, a family member/neighbor/friend/co-worker, or a stranger)
2. To an appliance dealer

Giving it away for free to…

3. A private individual (including if you leave it behind when you move, or if you install it in a rental house or second home)
4. A charity organization
5. An appliance dealer

Having it picked up…

6. As part of the delivery service with the purchase of a new or replacement appliance
7. By someone else for junking or dumping

Hauling it…

8. To the landfill/dump or threw it away yourself, or having a community waste service dispose of it
9. To a waste management or recycling center yourself

Other…

10. Leaving it on the curb for someone to take for free
11. Disposing of it in some other way **[SPECIFY]**
12. Keeping it

-98. REFUSED
-99. DON'T KNOW

D16. If you got rid of this stand-alone freezer, would you get another freezer or refrigerator to replace it? **[DO NOT READ LIST]**

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

E. Appliance Recycling Program

Now I have just a few general questions about a service offered by your electric utility.

E1. **[SCE/PG&E]** provides a refrigerator and freezer removal service called the Appliance Recycling Program. This service helps save energy by removing and recycling unwanted or out of date appliances. Do you recall hearing about this service? **[DO NOT READ LIST]**

1. Yes
2. No **[SKIP TO E5]**

-98. REFUSED **[SKIP TO E5]**
-99. DON'T KNOW **[SKIP TO E5]**

E2. How did you first hear about the recycling service? **[DO NOT READ LIST; MARK ONLY ONE RESPONSE]**

1. Appliance store
2. Information that came with a **[SCE/PG&E]** bill
3. Information that came in a letter or brochure from **[SCE/PG&E]**
4. Email from **[SCE/PG&E]**
5. Utility representative
6. Other utility resource **[SPECIFY]**
7. Referral from friend/neighbor
8. Movie Theater
9. Newspaper/Pennysaver
10. Radio
11. TV
12. Truck ad
13. Website
14. News story
15. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

E3. Have you ever had an appliance picked up by this service? **[DO NOT READ LIST]**

1. Yes
2. No **[SKIP TO E5]**

-98. REFUSED **[SKIP TO E5]**
-99. DON'T KNOW **[SKIP TO E5]**

E4. How long ago did you use the appliance recycling service? **[DO NOT READ LIST]**

1. Within the last year **[SKIP TO F1]**
2. 1 to 2 years ago **[SKIP TO F1]**
3. More than 2 years **[SKIP TO F1]**

-98. REFUSED **[SKIP TO F1]**
-99. DON'T KNOW **[SKIP TO F1]**

E5. How likely would you be to use the appliance recycling service to dispose of an extra, working refrigerator or freezer? The service would pay you $35 to pick up your used, working refrigerator or freezer. **[READ LIST]**

1. Not at all likely
2. Somewhat likely
3. Very Likely

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F. ARP Preferences

F1. Would you be more likely to use the appliance recycling service if it offered more than the current $35 rebate? **[DO NOT READ LIST]**
1. Yes, more likely to use the service
2. No difference

-98. REFUSED
-99. DON'T KNOW

F2. **[IF F1= 1]** How much would you need to be offered so that you would be very likely to use this service?
1. **[RECORD DOLLARS: $1-$500]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

F3. What is the maximum number of days you would be willing to wait between when you schedule the pickup and when your appliance actually gets picked up? **[DO NOT READ LIST]**
1. Same day
2. **[RECORD DAYS: 1-30]**

-98. REFUSED
-99. DON'T KNOW

F4. Would you be more likely to use the service if your old unit were picked up at the same time your new unit was being delivered? **[DO NOT READ LIST]**
1. Yes, more likely to use the service
2. No

-98. REFUSED
-99. DON'T KNOW

F5. Is there anything else that would make you more likely to use **[SCE/PG&E]**'s appliance recycling service in the future?
1. **[RECORD COMMENTS]**
2. Nothing/Can't think of anything

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

G. Awareness, Knowledge, and Attitudes about ARP Benefits

Now I have some general questions for you about refrigerators and freezers.

G1. Are you aware that keeping and using an extra refrigerator or freezer can cost $180 or more a year for electricity? **[DO NOT READ LIST]**
1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

G2. Are you aware that the refrigerant in refrigerators and freezers is very harmful to the environment if not properly disposed of? **[DO NOT READ LIST]**

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

G3. **[IF E1=1]** Did you know that **[SCE/PG&E]**'s recycling service…
[READ LIST. RECORD FOR EACH: 1=YES; 2=NO; -98=REFUSED; -99=DON'T KNOW]

a. …Takes apart and recycles all of the metals and glass from the appliances it collects?
b. …Removes, and recycles or destroys the coolant, motor oil, and insulation from the appliances it collects?
c. …Almost none of the materials from the appliances **[SCE/PG&E]** recycles go to a land fill?

G4. **[SCE/PG&E]**'s recycling service ensures that all the appliance parts are disposed of in an environmentally safe manner. Knowing that, how much more likely would you be to participate in **[SCE/PG&E]**'s appliance recycling service in the future? Would you be… **[READ LIST]**

1. Much more likely
2. Somewhat more likely
3. Not at all more likely

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

We're almost finished with the survey. I have just few general questions for you, and then a few final questions about your household.

G5. Have you heard of a carbon footprint? **[IF NECESSARY: A carbon footprint is the amount of gases containing carbon that are produced when you burn fuels and use electricity. This includes but is not limited to the energy consumption in your home, your transportation, your diet, and your purchases.] [DO *NOT* READ RESPONSES]**

1. Yes
2. No
3. Yes, I have heard the term "carbon footprint" but I do not know what it means

-98. REFUSED
-99. DON'T KNOW

G6. Next, I'm going to read a list of energy-saving actions. For each action, please tell me if your household has already taken the action. Did you… **[RANDOMIZE ACTIONS]** **[READ EACH ACTION. RECORD FOR EACH: 1=YES; 2=NO; 3=CAME WITH THE HOUSE; -98=REFUSED; -99=DON'T KNOW. DISTINGUISH BETWEEN, "1=YES, INSTALLED IT MY/OUR SELVES" AND "3=CAME WITH THE HOUSE." IF THE RESPONDENT REPLACED A UNIT THAT CAME WITH THE HOUSE, RECORD AS "1=YES."]**

a. …install an attic vent to keep the attic cooler?
b. …install programmable thermostats?
c. …install ceiling fans?
d. …install motion detectors for lights?

G7. On a scale of 1 to 7 where "7" is "Strongly Agree" and "1" is "Strongly Disagree", please tell me how much you agree or disagree with the following two statements.

a) I compare prices of at least a few brands before I choose one. Would you say "7," you strongly agree, "1," you strongly disagree, or some number in between? **[RECORD NUMBER 1-7]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

b) I do NOT feel responsible for conserving energy because my personal contribution is very small. Would you say "7," you strongly agree, "1," you strongly disagree, or some number in between?
[RECORD NUMBER 1-7]

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

G8. I'm going to read you a list of 6 reasons why people might change their daily actions to save energy. Please tell me which of these would motivate you the MOST to save energy. **[READ LIST; MARK ONLY ONE RESPONSE]** **[IF RESPONDENT SAYS "DON'T KNOW," PROBE: "if you had to choose from the following reasons which one would motivate you the most"]** **[RANDOMIZE]**

1. Saving money
2. Maintaining Health
3. Protecting the environment
4. For the benefit of future generations
5. Reducing our dependence on foreign oil
6. Helping California lead the way on saving energy
7. All of the above **[DO NOT READ]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H. Customer Characteristics and Demographics

H1. Have you ever disposed of a refrigerator or freezer in the past? **[DO NOT READ LIST]**

1. Yes
2. No

-98. REFUSED
-99. DON'T KNOW

H2. **[IF H1=1]** What did you do with it? **[DO NOT READ LIST - CLARIFY IF NEEDED TO FIT LIST BELOW. FOR EXAMPLE: WOULD YOU HAVE GIVEN IT AWAY OR SOLD IT? TO WHOM?] [MARK ONLY ONE RESPONSE]**

Sold it…

1. To a private individual (for example, a family member/neighbor/friend/co-worker, or a stranger)
2. To an appliance dealer

Gave it away for free to…

3. A private individual (including if you leave it behind when you move, or if you install it in a rental house or second home)
4. A charity organization
5. An appliance dealer

Had it picked up…

6. As part of the delivery service with the purchase of a new or replacement appliance
7. By someone else for junking or dumping

Hauled it…

8. To the landfill/dump or threw it away yourself, or having a community waste service dispose of it
9. To a waste management or recycling center yourself

Other…

10. Left it on the curb for someone to take for free
11. Disposed of it in some other way **[SPECIFY]**
12. Kept it

-98. REFUSED
-99. DON'T KNOW

H3. Which of the following types of housing units would you say best describes your home? Is it a… **[READ LIST]**

1. Single-family detached house
2. Single-family attached house
3. Duplex
4. Building with 2-4 units
5. Building with 5 or more units
6. Mobile home or house trailer
7. Other **[SPECIFY]**

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H4. How many bedrooms do you have in your home? **[IF EFFICIENCY OR STUDIO APARTMENT, BEDROOMS=0]**
[RECORD]
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H5. How many years have you lived in your home? **[ROUND TO THE NEAREST HALF YEAR; USE 0.5 FOR 6 MONTHS OR ½ YEAR]**
[RECORD NUMBER]
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H6. About when was your home first built? **[READ LIST IF NECESSARY]**
1. Before 1950
2. 1950 to 1959
3. 1960 to 1969
4. 1970 to 1977
5. 1978 to 1979
6. 1980 to 1989
7. 1990 to 1994
8. 1995 or later

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H7. Including yourself, how many people currently live in your home year-round? **[RECORD NUMBER]**
-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H8. **[IF H7>0]** Including yourself, how many of the people currently living in your home year-round are in the following age groups? **[READ LIST]** **[TOTAL SHOULD EQUAL RESPONSE FROM H7; RECORD -98 FOR REFUSED OR -99 FOR DON'T KNOW]**

a.	Less than 18 years old	**[RECORD NUMBER]**
b.	18 to 24	**[RECORD NUMBER]**
c.	25 to 34	**[RECORD NUMBER]**
d.	35 to 44	**[RECORD NUMBER]**
e.	45 to 54	**[RECORD NUMBER]**
f.	55 to 64	**[RECORD NUMBER]**
g.	65 or older	**[RECORD NUMBER]**

H9. Do you or members of your household own your home, or do you rent it? **[DO NOT READ LIST]**
1. Own/ Buying
2. Rent/ Lease
3. Occupy rent-free
-98. REFUSED
-99. DON'T KNOW

H10. Have you remodeled your home in the past 5 years? **[DO NOT READ LIST]**
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

H11. What is the highest level of education you have completed? **[DO NOT READ LIST]**
1. No schooling
2. Less than high school
3. Some high school
4. High school graduate or equivalent (e.g., GED)
5. Some college
6. College degree
7. Graduate or professional degree
8. Post graduate
-98. REFUSED
-99. DON'T KNOW

H12. How would you describe your race? **[DO NOT READ LIST; RECORD UP TO 5 RESPONSES]**
1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Pacific Islander
6. Other **[SPECIFY]**
-98. REFUSED
-99. DON'T KNOW

H13. Are you Spanish, Hispanic or Latino? **[DO NOT READ LIST]**
1. Yes
2. No
-98. REFUSED
-99. DON'T KNOW

H14. What was your household income from all sources in 2011, before taxes? Please stop me when I reach the category that best describes your household's income. **[READ LIST; IF NECESSARY, SAY: "This information is confidential and will only be used for the purpose of characterizing study respondents."]**

1. Less than $20,000
2. 20 to less than $30,000
3. 30 to less than $40,000
4. 40 to less than $50,000
5. 50 to less than $60,000
6. 60 to less than $75,000
7. 75 to less than $100,000
8. 100 to less than $150,000
9. 150 to less than $200,000
10. More than $200,000

-98. REFUSED **[DO NOT READ]**
-99. DON'T KNOW **[DO NOT READ]**

H15. What is the primary language spoken in your home? **[DO NOT READ LIST; MARK ONLY ONE RESPONSE]**

1. English
2. Spanish
3. Mandarin
4. Cantonese
5. Tagalog
6. Korean
7. Vietnamese
8. Russian
9. Japanese
10. Other **[SPECIFY]**

-98. REFUSED
-99. DON'T KNOW

H16. **[RECORD GENDER, DO NOT ASK]**

1. Female
2. Male

Those are all the questions I have for you. Thank you for participating in our survey. This will help [Southern California Edison/ Pacific Gas & Electric] to better serve their customers.

[READ IF NECESSARY] If you have any questions about this survey please call [FOR SCE: Caroline Chen at 619-423-1512/ FOR PG&E: Andy Fessel 415-973-6236]

SCE / PG&E Secondary Appliance Sample Disposition 11-27-12
Average time 13 minutes

	Total cases	SCE	PG&E
Total cases	12180	778 5	4395
01 Completed Interview	400	200	200
02 ARRANGE CALL-BACK - OUT OF HOME	34	13	21
03 RESPONDENT NOT AVAILABLE/TOO BUSY	282	176	106
04 NO ANSWER	872	627	245
05 ANSWERING MACHINE	4138	2466	1672
06 BUSY	96	70	26
07 INCOMPLETE SURVEY/SCHEDULE CALLBACK	27	14	13
10 INITIAL REFUSAL - SOFT	1079	710	369
12 INITIAL REFUSAL - HARD - MENTIONED DO NOT CALL LIST	88	41	47
13 INITIAL REFUSAL - HARD	386	228	158
15 BLOCKED NUMBER	15	10	5
17 DUPLICATED NUMBER	4	3	1
20 DISCONNECT	1458	1118	340
21 BUSINESS	252	212	40
22 FAX MODEM LINE	119	78	41
23 LANGUAGE BARRIER (NON-SPANISH)	118	84	34
24 HEARING PROBLEM/OTHER PROBLEM WITH RESPONDENT	44	38	6
25 RESPONDENT GONE FOR REMAINDER OF SURVEY	7	5	2
26 TERMINATED SURVEY	167	90	77
27 CELL PHONE	24	19	5
30 SPANISH LANGUAGE	336	309	27
41 NQ - MISCELLANEOUS	35	27	8
66 - INCORRECT UTILITY	47	13	34
67 - DK/REFUSED UTILITY	16	10	6
73 - NO SPARE APPLIANCE	1849	1105	744
74 - DK/REFUSED - SPARE APPLIANCE	182	63	119
75 - NO SPARE APPLIANCES	20	12	8
76 - DK/REF SPARE APPLIANCES	2	0	2
77 - UNDER COUNTER APPLIANCE	79	43	36
78 - NONE/DK/REFUSED - WORKING APPLIANCES	4	1	3

SCE/PG&E Process Evaluation Interview Guide: Appliance Recycling Program

SCE/PG&E Program Staff

Name of Interviewee: **Interview Date:**

Thank you for taking the time to talk with us today about the program. I represent The Cadmus Group, Inc., the firm performing the process evaluation for Southern California Edison and Pacific Gas and Electric's Appliance Recycling Program. The purpose of this interview is to gather information on program processes, operations, and activities during the 2010-2012 program years. Please note that this is not an audit, and our intention is not to evaluate any individual's performance. Because of your role in the program, your perspective is very important to us, and we appreciate your taking the time to share it with us. We expect this interview to take about one and a half hours. If we run out of time today, we may also need to schedule a follow-up session in the near future.

About the Interviewee

1. What is your role in the program?
2. How long have you been involved with the ARP program?
3. Who do you work closely with on the program outside of SCE/PG&E?

Program History, Design, and Theory

4. What significant changes in the program have you seen over time with regard to:
   - Internal management (e.g., communication, tracking processes, QA/QC)?
   - External management (e.g., communication, tracking processes, QA/QC)?
   - Program delivery (scheduling, pick-up, rebates)?
   - Trade ally involvement (especially retailers)?
   - Marketing (e.g., messaging, website)?
5. (SCE only) How do management, trade ally involvement, and delivery differ for the Retail Appliance Recycling Program Trial?
   - What was the impetus for the trial program?
6. How successful do you think a program targeted at second appliance owners would be?
   - What do you think would be the key barriers to implementing such a program?
   - What could be done to overcome the barriers?

7. Do you think there is potential for adding other appliances to program offerings, e.g., clothes washers, room ACs?
    - What issues could arise with adding other appliances?
        - Estimating/verifying energy savings
        - Implementation cost
        - Logistical challenges (e.g., scheduling, verifying equipment eligibility)
        - Technological barriers

Program Goals

8. What were the targeted numbers of appliances for recycling in 2010-2012 by SCE/PG&E?

9. How are the program's participation and savings goals determined?
    - Is the goal setting process effective?

10. What are the program's process goals, if any (e.g., trade ally participation, market transformation, increased awareness, education of trade allies, minimization of logistical problems, cancelation rates)?

11. How have the goals changed from the 2006-2008 goals?

12. What program components are key to meeting the program's goals (incentives, education, marketing…)?
    - How are they designed to reach the goals?

13. In your opinion, how has the program performed during 2010-2012 (in terms of both process and savings/participation goals)?
    - Why do you think this is?
    - Did you have to make any mid-program changes to meet the goals?

Internal Program Management (Staff, Administrative Processes, QA/QC)

14. How many staff members are involved in running the program at SCE/PG&E? What are their roles (e.g., program implementation, marketing, data tracking, call center)?

15. Can you provide us an org chart showing all parties involved in implementing the program?

16. How effective are program management, administration, and internal communication overall?
    - What areas do you think could be improved?
17. Were there any program staffing changes at SCE/PG&E since the 2006-08 program?
18. How often do you receive reports from implementers?
    - What do these reports include?
    - Are you satisfied with them?
    - How do you use them?
    - Can you provide us with an example of a monthly report?
19. What are the QA/QC procedures for this program?
    - How does the implementation/logistics contractor determine whether the unit is working and eligible for the program?
    - How does the implementation/logistics contractor verify the participant is a SCE/PG&E customer?
    - How effective are the QA/QC procedures?

External Program Management

20. Overall, how satisfied are you with the performance of JACO/ARCA/Enerpath as implementers?
    - What, if any, problems have occurred with the implementers during this cycle?
    - In what ways could the implementers improve their performance?
    - (SCE only) Are there differences between JACO's and ARCA's implementation?
        - What are their relative strengths and weaknesses?
    - What are the advantages of (using/not using) Enerpath?
21. How do you communicate with the implementers? How frequently?
    - Are these lines of communication effective?
22. How vital do you think the ARP is to JACO/ARCA/Enerpath's business models? How big a portion of their business comes from the SCE/PG&E ARP?
23. Do you coordinate the program with <the other IOU's> ARP? How?

Program Delivery

24. Does a program operations manual exist, and if so, may we have an electronic copy of it?

25. What are the key steps in the program's delivery, and who is responsible for them?
    - (SCE only) What are Enerpath's responsibilities? How is their system working? What challenges has it faced?
26. Have ARCA/JACO/Enerpath's roles or responsibilities changed from the 2006-08 program (e.g., in terms of IOU contracts, customer contacts, scheduling, liability)?
    - Why? How did previous evaluation findings influence these changes?
    - How have the roles or responsibilities changed?
    - What effects have these changes had on program operation, customer satisfaction, cancelation rate, and the program's ability to meet its goals?

Scheduling

27. Has the pick-up scheduling process changed since the 2006-08 program?
    - If so, why? How did previous evaluation findings influence these changes?
    - How has the scheduling process changed?
    - What effects have these changes had on program operation, customer satisfaction, cancelation rate, and the program's ability to meet its goals?
    - (SCE only) Have there been any changes to Enerpath's operations?
28. What feedback have you gotten from customers about the scheduling process?
    - Do you have recommendations for improving the scheduling process?
29. What procedures are in place to handle cancelations?
    - Who tracks cancelation information? What data are tracked?
    - Does anyone follow up with customers who cancel pick-ups?
    - How has the cancelation rate changed over time?
    - Do you have any suggestions for reducing the number of cancelations?

Pick-up

30. Have any of the pick-up or disposal practices or process changed since the 2006-08 program?
    - If so, why? How did previous evaluation findings influence these changes?
    - How have the program's pick-up and disposal processes changed?
    - What effects have these changes had on program operation, customer satisfaction, cancelation rate, and the program's ability to meet its goals?

31. How frequently are appliances found to be ineligible at the time of the pick up? How does ARCA/JACO handle these situations?

Rebates

32. Have there been any changes to the rebate process since the 2006-08 program?
    - If so, why? How did previous evaluation findings influence these changes?
    - How has the rebate process changed?
    - What effects have these changes had on program operation, customer satisfaction, cancelation rate, and the program's ability to meet its goals?

33. What feedback have you gotten from customers about the rebates and the rebate process?

34. What is your perception of the rebate amount? Is it about right? Too high? Too low?

Challenges

35. Were there any challenges to implementation during the 2010-2012 program years?
    - How were those challenges resolved?

36. What ongoing challenges does the program's operation face? What recommendations do you have for resolving them?

Target Audiences & Trade Allies

37. Who are the targeted customers for this program?

38. Who do you consider trade allies for this program, including formal and informal relationships (e.g., new and used appliance retailers)?

39. How were/are trade allies chosen, and what outreach takes place to involve them?

40. Which trade allies are most active?
    - Are you satisfied with the level of trade ally involvement/activity?
    - Did any trade allies stop participating during the 2010-2012 timeframe? Why?

41. How could interactions/relationships with trade allies be made more effective in terms of reaching program goals?

42. Are there any other program partners or stakeholders (e.g., EPA RAD)? What roles do they play?

Program Marketing

43. Who is responsible for marketing the program?

- (If not SCE/PG&E) What role does SCE/PG&E play?

44. What marketing channels are used?
    - What methods have proved particularly effective?
    - What methods are not effective or yield more drop-outs/cancelations?
    - What other marketing methods do you think should be tried?
45. What are the key marketing messages (e.g., incentives offered, monthly utility bill reductions, environmental benefits)?
46. How has the program's marketing changed since the 2006-08 program?
    - Why was the program's marketing changed? How did previous evaluation findings influence these changes?
    - How has the marketing changed?
    - What effects have these changes had on program operation, customer satisfaction, cancelation rate, and the program's ability to meet its goals?
47. How do trade allies play a role in marketing the program?
    - Are they incented to promote the program? How?
48. How effective is the program marketing?
    - How is marketing effectiveness measured?
    - Are marketing metrics tracked?
49. Are there any groups among customers in the SCE/PG&E territory that are more or less aware of the program?
50. What marketing crossover occurs between the ARP and other EE programs, e.g., ENERGY STAR refrigerator rebates?

Customer Interaction

51. How do customers sign up for the program?
    - Which methods (e.g., IOU phone center, IOU website, ARCA/JACO phone center) are used most often?
    - What customer information do you collect at sign up? What additional information would be helpful? What information is not needed?
    - What changes have you seen in methods used over time?
    - What suggestions do you have for changes in sign-up methods?

- How are ineligible customers handled?

52. How satisfied are customers with the program? How could customer satisfaction be improved?

53. How do you collect, document, and track customer complaints? What are the most frequent complaints?
    - How does the program respond to complaints? How is that process working?

54. What feedback has come back through trade allies about customer satisfaction?

Final Thoughts

55. What do you consider the biggest challenges or concerns for the program?

56. What are the program's greatest successes or most important achievements?

57. Are there additional data that should be collected to better track program metrics?

58. What suggestions do you have for future enhancements/improvements to the program?

59. What final comments would you like to share about the program?

SCE/PG&E Process Evaluation Interview Guide: Appliance Recycling Program

JACO/ARCA/Enerpath Program Staff

Name of interviewee: **Interview Date:**

Thank you for taking the time to talk with us today about the program. I represent The Cadmus Group, Inc., the firm performing the process evaluation for Southern California Edison and Pacific Gas and Electric's Appliance Recycling Program. The purpose of this interview is to gather information on program processes, operations, and activities during the 2010-2012 program years. We expect this interview to take about one and a half hours. If we run out of time today, we may also need to schedule a follow-up session in the near future.

About the Interviewee

1. What is your role in the program?

2. How long have you been involved with the ARP program?

3. Who do you work closely with on the program both your organization and externally?

Program History, Design, and Theory

4. What significant changes in the program have you seen over time with regard to:
    - Management (e.g., communication, tracking processes, QA/QC)?
    - Program delivery (scheduling, pick-up, rebates)?
    - Trade ally involvement (especially retailers)?
    - Marketing?

5. (Regarding SCE only) How do management, trade ally involvement, and delivery differ for the Retail Appliance Recycling Program Trial?

6. How successful do you think a program targeted at second appliance owners would be?
    - What do you think would be the key barriers to implementing such a program?
    - What could be done to overcome the barriers?

7. Do you think there is potential for adding other appliances to program offerings, e.g., clothes washers, room ACs? Would your firm be interested in doing this? If so, which appliances would you consider recycling?

- What issues could arise with adding other appliances?
  - Estimating/verifying energy savings
  - Implementation cost
  - Logistical challenges (e.g., scheduling, verifying equipment eligibility)
  - Technological barriers

Program Goals

8. What were the targeted numbers of appliances for recycling in 2010-2012 by SCE/PG&E?
9. How are the program's participation and savings goals determined?
   - Is the goal setting process effective?
   - What is JACO/ARCA's involvement in the goal-setting process?
10. What are the program's process goals, if any (e.g., trade ally participation, market transformation, increased awareness, education of trade allies, minimization of logistical problems, cancelation rates)?
11. How have the goals changed from the 2006-2008 goals?
12. What program components are key to meeting the program's goals (incentives, education, marketing…)?
    - How are they designed to reach the goals?
13. In your opinion, how has the program performed during 2010-2012 (in terms of both process and savings/participation goals)?
    - Why do you think this is?
    - Did you have to make any mid-program changes to meet the goals?

JACO/ARCA Program Management (Staff, Administrative Processes, QA/QC)

14. How many staff members at JACO/ARCA are involved in running the program? What are their roles (e.g., program implementation, marketing, data tracking, call center)?
15. Can you provide us an org chart showing all parties involved in implementing the program?

16. Within your company, how effective are program management, administration, and internal communication relating to this program?
    - What areas do you think could be improved?
    - How often do you send SCE/PG&E reports?
    - What do these reports include?
    - Can you provide us with an example of a monthly report?
17. How effective is your relationship with the IOU(s)? Are there any aspects that could be improved?
18. How vital is the SCE/PG&E ARP to your business model? How big a portion of your business comes from the SCE/PG&E ARP?

Program Delivery

19. Does a program operations manual exist, and if so, may we have an electronic copy of it?

Signup and Scheduling

20. How do customers sign up for the program?
    - Which methods (e.g., IOU phone center, IOU website, ARCA/JACO phone center) are used most often?
    - What customer information do you collect at signup? What additional information would be helpful? Could any information be dropped without affecting the program?
    - What changes have you seen in signup methods used over time?
    - What suggestions do you have for changes in signup methods?
    - How are ineligible customers handled?
21. How are the pickups scheduled?
    - How long does a customer usually wait from the time they schedule a pickup to when the pickup actually happens?
    - What feedback have you gotten from customers about the scheduling process?
    - What recommendations do you have for improving the scheduling process?
22. What procedures are in place to handle cancelations?
    - Who tracks cancelation information? What data are tracked?
    - What follow up is done with customers who cancel pick-ups?
    - How has the cancelation rate changed over time?

- Do you have any suggestions for reducing the number of cancelations?

Pick-up

23. How frequently are appliances found to be ineligible at the time of the pick-up? How do you handle these situations?

24. Please describe the data collection process at pick-up.
    - Who is responsible for data entry?
    - How are unit data verified/measured?
    - Please describe the QA/QC protocol for unit data?

Rebates

25. What feedback have you gotten from customers about the rebates and the rebate process?

26. What is your perception of the rebate amount? Is it about right? Too high? Too low? Could it be increased or decreased without affecting the program?

Challenges

27. Were there any challenges to implementation during the 2010-2012 program years?
    - How were those challenges resolved?
    - (JACO only) How do the implementation challenges differ between the SCE and PG&E service areas?

28. What ongoing challenges does the program's operation face? What recommendations do you have for resolving them?

Target Audiences & Trade Allies

29. Who are the targeted customers for this program?

30. Who do you consider trade allies for this program, including formal and informal relationships (e.g., new and used appliance retailers)?

31. What role do trade allies play in the program? How do trade allies play a role in marketing the program?
    - Are they incented to promote the program? How?

32. How were/are trade allies chosen, and what outreach takes place to involve them?

33. Which trade allies are most active?
    - Are you satisfied with the level of trade ally involvement/activity?
    - Did any trade allies stop participating during the 2010-2012 timeframe? Why?

34. How could interactions/relationships with trade allies be made more effective in terms of reaching program goals?

35. How does this program interact with the EPA RAD program, in term of:
    - Data tracking and reporting?
    - Compliance requirements?
    - Partnerships with retailers?

36. Are there any other program partners or stakeholders (e.g., subcontractors)? What roles do they play?

Program Marketing

37. Who is responsible for marketing the program?

[Continue with this section only if implementer has involvement in marketing]

38. What marketing channels are used?
    - What methods have proved particularly effective?
    - What methods are not effective or yield more drop-outs/cancelations than others?
    - What other marketing methods do you think should be tried?

39. What are the key marketing messages (e.g., incentives offered, monthly utility bill reductions, environmental benefits)?

40. How has the program's marketing changed since the 2006-08 program? Why was it changed?

41. How effective is the program marketing?
    - How is marketing effectiveness measured?
    - Are marketing metrics tracked?

42. Are there any groups among customers in the SCE/PG&E territory that are more or less aware of the program?

43. (JACO only) Are there differences in overall customer awareness of the program between the SCE and PG&E service areas?

Customer Interaction

44. How satisfied are customers with the program? How could customer satisfaction be improved?

45. How do you collect, document, and track customer complaints? What are the most frequent complaints?
    - How does the program respond to complaints? How is that process working?

Final Thoughts

46. What do you consider the biggest challenges or concerns for the program?

47. What are the program's greatest successes or most important achievements?

48. Are there additional data that should be collected to better track program metrics?

49. What suggestions do you have for future enhancements/improvements to the program?

50. What final comments would you like to share about the program?

SCE/PG&E Process Evaluation Interview Guide: Appliance Recycling Program

SCE/PG&E Market Actors: Dealers/Disposal Companies/Recyclers/Manufacturers

RED text indicates a skip pattern or instruction

GREEN texts indicates optional specifications or prompts

[DO NOT READ] Key Researchable Aspects of Interview

- Improve our understanding of refrigerator and freezer recycling activities outside of ARPs:
  - What are interviewees' definitions of appliance recycling?
  - Which appliance components do and do not get recycled/reclaimed/disposed of environmentally soundly and otherwise?
- Gain insight into dealers'/disposal companies'/recyclers'/manufacturers' roles in and perceptions of the used appliances market
- Gain insight into dealers'/ disposal companies'/recyclers'/manufacturers' roles in and perceptions of the appliance recycling market
- Gain insight into dealers'/ disposal companies'/recyclers'/manufacturers' involvement in voluntary government recycling programs
- [Manufacturers Only] Determine whether appliance recycling, end-of-life disposal (and associated environmental concerns), or other life-cycle analyses are included in the appliance design process
- [Disposal Companies/Recyclers Only] Improve our understanding of the recycling and disposal market's dynamics by gathering information about appliance disposal companies' business models
- Inform development of program theory for potential sub-programs by reviewing program opportunities for recycling appliances other than refrigerators and freezers

Name of Interviewee: _____ Interview Date: _____

Name of Organization: _____

Thank you for talking with me/us today. I/we work for The Cadmus Group, Inc., and we have been hired by Southern California Edison and Pacific Gas and Electric to evaluate their Appliance Recycling Programs. We are interviewing **[dealers/disposal companies/recyclers/manufacturers]** like you to get a better understanding of the **[residential refrigerator and freezer/appliance recycling]** industry from your perspective.

Before we begin, I would like to say that your insights and opinions are very important to the utilities in their efforts to improve their programs and develop new ones, and I really appreciate your taking your time to share them with me/us today.

We expect this interview to take about 20 minutes.

About the Interviewee

1. To begin, please describe what your company does, and your role at your company.

Appliance Recycling Overview

2. As you may know, utility appliance recycling programs often partner with the U.S. EPA's Responsible Appliance Disposal, or RAD, program, which has a specific definition of recycling for refrigerant-containing appliances. How does your company/organization define "appliance recycling?"
    a. How does this definition vary for different appliance types?
    b. Does this definition include reuse, such as resale on the used appliance market?
    c. Is appliance recycling important to your company/organization, and why?
    d. What benefits do you see to appliance recycling?

[DEALERS AND DISPOSAL COMPANIES ONLY] Interviewee Role and Perception of Used Appliances Market

3. Does your organization sell used refrigerators and freezers or other major household appliances?
    a. *[If yes continue, otherwise skip to Q6]* Please specify the types of appliances you sell.
    b. Do you sell used appliances to retail stores, individuals, or both?
        i. If both, what percent of your sales are to retailers? What percent are to individuals?
    c. Do you sell used appliances via Craigslist or other online methods?
        i. If so, about what percent of your sales are through Craigslist?
        ii. What percent of your *Craigslist* sales are to retailers? What percent are to individuals?
    d. Where do you get the used appliances that you sell? (*If necessary offer examples: from a retailer's appliance pick-up service, from an independent company's pick-up service, from another used appliance dealer, from Craigslist)*

e. How do you decide which used appliances to sell? *(If necessary offer examples: age, size, condition, features.)*

4. Have you noticed any changes in the used appliance market since 2010?
    a. *[If yes continue, otherwise skip to Q5]* Is demand for these used products growing or shrinking?
    b. In your opinion, what is causing this change?

5. What are the benefits and drawbacks to your organization of encouraging customers to recycle their old appliances rather than selling or giving them away?

Interviewee's Appliance Recycling and Replacement Services

6. Does your organization offer pick-up, recycling, or replacement services for appliances such as refrigerators and freezers? *[If yes continue, otherwise skip to Q9]*

7. Please describe these services.
    a. *[Ask 7a- 7e only if respondent does not give these details]*Do you charge a fee for removing an appliance? What is the removal fee?
    b. What products are eligible for removal and recycling through your service? *(If necessary offer examples: refrigerators, freezers, room ACs, electronics, clothes washers, commercial/industrial equipment etc.)*
    c. What happens with the products that get removed? *(Probe for detail on what happens to appliance components.)*
    d. Does anything different happen with appliances that are in good working condition?

8. Has your organization ever considered including the removal and recycling of any additional appliances?
    a. Why have you decided for or against including them?

9. Currently, most utility-sponsored appliance recycling programs focus on refrigerators and freezers. Do you think there is potential for adding other appliances such as clothes washers, room ACs, set top boxes, or other electronics to utility program offerings?
    a. Would you be supportive of utilities expanding their programs to include other appliances?
    b. Do you think this would affect your business? If so, how?

Participation in Federal and State Government Programs

10. Based on EPA's list, your organization **[partners/does not partner]** with the EPA's Responsible Appliance Disposal (RAD) Program, is this correct? *(If needed: The RAD Program is a voluntary partnership program that helps protect the ozone layer and reduce emissions of greenhouse gases. RAD program partners recover ozone-depleting chemicals*

from old refrigerators, freezers, window air conditioners, and dehumidifiers using best practices determined by the EPA.)

a. *[If respondent is a RAD partner, continue; otherwise skip to Q11]* What percent of appliances your organization obtains do you recycle and report to the RAD program each year? *[Specify if the percentage is based on the number, weight, or volume of appliances.]* Does the percentage vary by appliance type?
   - What happens with the appliances recycled and reported to the RAD program?
   - *[Ask if less than 100%]* What happens to the remaining appliances? *(If needed: What percent are sold as working units? Are there any appliances that are neither sold as used working units nor recycled and reported to RAD?)*

b. How have these percentages changed since 2010?

c. How do you anticipate it will change in the next few years?

d. *[Ask if some appliances are sold as working units]*How do you decide which appliances will go through the RAD program and which will be transferred to the used appliance market (and, if applicable, which go through other channels)?
   - Does your organization have policies about this in place?
   - Are there specific characteristics that determine if an appliance will be recycled and reported to the RAD program? *(If necessary offer examples: appliance type, size, age, condition, features, etc.)*

11. Your organization **[is/is not]** listed a Certified Appliance Recycler (CAR) for the California Department of Toxic Substances Control's (DTSC) CAR Program, is this correct? *(If needed: A CAR is certified to remove and properly manage certain potentially hazardous materials – known as "materials that require special handling" – from discarded major appliances.)*

a. *[If yes respondent is CAR certified, continue; otherwise skip to Q13]* What percent of appliances your organization obtains do you recycle and report to the CAR program each year? *[Specify if the percentage is based on the number, weight, or volume of appliances.]* Does the percentage vary by appliance type?
   - What happens with the appliances recycled and reported to the CAR program?
   - *[Ask if less than 100%]* What happens to the remaining appliances? *(If needed: What percent are sold as working units? Are there any appliances that are neither sold as used working units nor recycled and reported to CAR?)*

b. How have these percentages changed since 2010?

c. How do you anticipate it will change in the next few years?

d. *[Ask if some appliances are sold as working units]*How do you decide which appliances will go through the CAR program and which will be transferred to the used appliance market (and, if applicable, which go through other channels)?
   - Does your organization have policies about this in place?
   - Are there specific characteristics that determine if an appliance will be recycled and reported to the CAR program? *(If necessary offer examples: appliance type, size, age, condition, features, etc.)*

12. *[Ask only if respondent participates in both RAD and CAR]* Do you report the same number of recycled appliances to both the RAD and CAR programs?
    a. If not, why not? How do you decide which program to report to? Can you estimate the percentage of appliances that are reported to both programs?

[MANUFACTURERS ONLY] Design Process Impacts

13. Generally speaking, what are the major environmental concerns that your company considers in the process of designing a new residential refrigerator or freezer?
    a. How do these considerations affect the disposal or recycling of the appliance?
14. *[Ask this question only if not clear from Q13]* Does your design process take into consideration what happens to the appliance when it stops working?
15. What other specific life-cycle or cradle-to-grave environmental impact analyses, if any, are included in the appliance design process?

[DISPOSAL COMPANIES/RECYCLERS ONLY] Disposal Business Models

16. What products generate the most revenue or are the most important ones your organization sells? *(Probe for both appliance types and components. If needed offer examples: ferrous metal, copper, used appliances, etc.)*
    a. Do you extract and sell ferrous metal?
    b. What are the target markets for your products? *(If needed offer examples: international companies, domestic companies, individual customers)*

Utility ARPs

17. Are you familiar with any utility-sponsored appliance recycling programs?
    a. *[If yes continue, otherwise skip to closing]* Which programs are you aware of?
    b. Do you partner with any of these programs?
    c. Do these programs have any positive or negative effect on your organization?
    d. How are utility-sponsored recycling programs changing the refrigerator and freezer market, if at all?
    e. Do you think these programs are helping protect the environment?
    f. Do you have different opinions about different utilities?
    g. Do utility-sponsored recycling programs impact your business in any way? Is it a positive or negative impact?

Closing

Those are all the questions we have for you today. Thank you again for taking the time to speak with us – we appreciate your input.

SCE/PG&E Process Evaluation Interview Guide: Appliance Recycling Program

SCE/PG&E Market Actors: Other Utilities

Name of Interviewee: **Interview Date:**

Name of Organization:

Thank you for taking the time to talk with us today about the program. I represent The Cadmus Group, Inc., the firm that was hired to conduct a process evaluation for Southern California Edison and Pacific Gas and Electric's Appliance Recycling Program. Because of your role in the **[appliance/recycling]** industry, your perspective is very important to us, and we appreciate your taking the time to share it with us. We expect this interview to take about a half hour.

Key Researchable Aspects of Interview

- Review utility's benefits quantification of extracted materials from recycling collections
- Determine the value associated with landfill space/avoidance of primary material extraction and assess whether the interviewee thinks these values can be reliably monetized
- Identify additional non-energy benefits that interviewee thinks can be credibly quantified and monetized
- Collect data on the life of nonparticipating appliances, including appliances collected by retailers and disposers through the EPA's RAD program; gain insight into which components of these products do and do not get recycled, and interviewees' definitions of "recycling"
- Inform development of program theory for alternative sub-program design by reviewing program opportunities and options
- Inquire about opportunities and options for the inclusion of other appliances into utility ARP programs. For programs that already include recycling of other appliances, identify which components of these products do and do not get recycled.

About the Interviewee

1. Please describe your role at your company.
    - How long have you held this role?

Life of Nonparticipating Appliances

2. How does your organization define, "appliance recycling?"
    - Probe:
        - Does this definition vary for different appliance types?
        - Does this definition include reuse, such as resale on used appliance market?

- Why is recycling important?
- What are the benefits of this process?

3. What services do you specifically offer with respect to appliances, recycling, and replacement?
   - Do you charge a fee for removing an appliance? What is the removal fee? If you don't charge fees, do you offer any incentives for removal?
   - What other products (outside of refrigerators and freezers) are eligible for removal and recycling through your service? (i.e., room ACs, electronics—including set top boxes in particular, clothes washers, etc.)
   - What happens with the products that get removed?
   - What components of the products do and do not get recycled?
   - Does anything different happen with appliances that are in good working condition?

4. Are you familiar with any utility-sponsored appliance recycling programs (outside of your own programs)?
   - *[If yes ask bulleted questions, otherwise skip to Q5]* Which programs are you aware of?
   - Do you partner with any of these programs?

5. What do you think about utility-sponsored recycling programs in terms of if/how are they changing the market in any way, helping the environment, their cost-effectiveness, etc.?

6. Does your organization partner with the EPA's Responsible Appliance Disposal (RAD) Program? *(If needed: The RAD Program is a voluntary partnership program that helps protect the ozone layer and reduce emissions of greenhouse gases. RAD program partners recover ozone-depleting chemicals from old refrigerators, freezers, window air conditioners, and dehumidifiers using best practices determined by the EPA.)*
   - *[If yes ask bulleted questions, otherwise skip to Q4]* What happens with the appliances disposed of through the program?
   - Are all appliances recycled or are some transferred to the used appliance market? How do you determine which route each appliance will take? What percent are recycled and what percent are transferred to the used appliance market?

7. Does your organization act as a Certified Appliance Recycler (CAR) for the California Department of Toxic Substances Control's (DTSC) CAR Program? *(If needed: A CAR is certified to remove and properly manage certain potentially hazardous materials – known as "materials that require special handling" – from discarded major appliances.)*
   - *[If yes ask bulleted questions, otherwise skip to Q5]* What happens with the appliances disposed of through the CAR program?
   - Do any of the appliances go through both the RAD (for window air-conditioning units and dehumidifiers) and CAR programs? What percentage? In what ways are

these appliances handled differently from appliances going through just one of the programs?
    - Are all appliances recycled or are some transferred to the used appliance market? How do you determine which route each appliance will take? What percent are recycled and what percent are transferred to the used appliance market?

8. What would happen to the secondary market (specifically in terms of environmental effects) for used appliances without the current utility benefits/incentives that are in place?
    - Would all the appliances be recycled or would some be transferred to the used appliance market? How would these decisions be made? What percent do you think would be recycled and what percent would be transferred to the used appliance market?

Alternative Sub-Program Design

9. Currently, most utility-sponsored appliance recycling programs focus on the removal of refrigerators and freezers from the appliance market. Do you think there is potential for adding other appliances to these types of program offerings? (e.g., clothes washers, room ACs)

10. *[If organization offers a removal service]* Has your organization ever considered allowing appliances to be removed and recycled through your service in addition to those we discussed earlier (i.e. clothes washers, room AC's, electronics such as set top boxes, etc.) *[Q3]*?
    - Why have you decided for or against including these additional measures?
    - When (what year) did your organization consider including these measures?
    - (If utility considered adding additional measures several years ago) Do you think your organization will reconsider adding more appliances or electronics in the next couple of years? Why/not?

11. *[If organization accepts "other appliances"]*: Do you claim savings for recycling in addition to savings for high-efficiency equip? For example, for clothes washers, utilities should claim savings for difference in consumption between standard efficiency & Energy Star, but do you (the utility) also claim some kind of early replacement of keeping the old unit from being transferred to another household and staying on the grid?

12. What issues could arise from a utility adding other appliances to their recycling program?
    - Difficulty estimating/verifying energy savings
    - Implementation cost
    - Logistical challenges (e.g., scheduling, verifying equipment eligibility)
    - Technological barriers
    - Challenges regarding recycling/disposal of hazardous components in an environmentally sound manner (including compliance with California's applicable toxic substance disposal laws)
    - Concern expressed by market actors (e.g., used appliance/electronics dealers)

SCE/PG&E Process Evaluation Interview Guide: Appliance Recycling Program

SCE/PG&E Market Actors: Government Agencies

RED text indicates a skip pattern or instruction

GREEN texts indicates optional specifications or prompts

[DO NOT READ] Key Researchable Aspects of Interview

- Determine policies, requirements, goals, volumes, materials covered by state recycling/reclamation/disposal laws and programs
    - What are interviewees' definitions of appliance recycling?
    - For which refrigerator/freezer materials does state law dictate recycling/reclamation/disposal?
    - What are the current levels of compliance with applicable laws?
- Assess whether non-energy benefits of refrigerator/freezer recycling/reclamation/disposal can be credibly quantified and monetized
    - Landfill space
    - Avoidance of primary material extraction; assess whether these values can be reliably monetized
    - Refrigerant, GHG, and other chemicals
- Gather government perceptions of utility-sponsored recycling programs
- Inform development of program theory for alternative sub-program design by reviewing program opportunities and options for the recycling of other appliances
    - Identify existing recycling/reclamation/sound disposal activities for materials in other appliances
    - Identify potential non-energy benefits of recycling/reclaiming/sound disposal of materials in other appliances

THE CADMUS GROUP, INC.

Name of Interviewee: _____ Interview Date: _____

Name of Organization (circle one): CalRecycle [Call Electronics Waste Recycling 916-341-6269], California Department of Toxic Substances Control (DTSC) [Teresa Rizzardo 916-323-3624]

Thank you for talking with me/us today. I/we work for The Cadmus Group, Inc. and we have been hired by Southern California Edison and Pacific Gas and Electric to evaluate their Appliance Recycling Programs. We are interviewing **[government agency staff]** like you to get a better understanding of the appliance recycling market from the **[government]** perspective.

Before we begin, I would like to say that your insights and opinions are very important to our program evaluation, and I really appreciate your taking your time to share them with me/us today.

We expect this interview to take about 20 minutes.

About the Interviewee

1. To begin, please describe your role at your organization.

Appliance Recycling Overview (For all appliances recycled)

2. As you may know, utility appliance recycling programs often partner with the U.S. EPA's Responsible Appliance Disposal program, which has a specific definition of recycling for refrigerant-containing appliances. How does your organization define appliance recycling?
    a. Does this definition vary for different appliance types?
    b. Does this definition include reuse, such as resale on used appliance market?
    c. Is appliance recycling important to your company/organization, and why?
    d. What benefits do you see to appliance recycling?

Appliance Recycling Regulations and Government-Sponsored Programs

3. ***For CalRecycle &* DTSC:** Can you provide additional details of compliance rates regarding state level regulations/rules for recycling or disposing of refrigerators and freezers? Specifically:
    a. What is the rate of compliance with state regulations/protocols for removing appliance refrigerant and oil? What trends have you observed over time?
        - What is the split of disposal methods (% destroyed vs. reclaimed)
            - Dumps?
            - Recycling?
    b. Do you happen to know the rate of compliance for recycling, reclaiming, and/or destroying of Mercury and PCBs?
        - What is the split of disposal methods (% destroyed vs. reclaimed)
            - Dumps?
            - Recycling?
    c. **For DTSC:** Has the implementation of AB1447 changed rates of compliance?

d. For components that are destroyed, are there rules governing how those materials get destroyed?
e. Are there any improvements you'd like to see to the enforcement of appliance disposal/recycling regulations?
f. What proportion of recycling facilities do you typically see recycling…?
    - Glass
    - Plastic
    - Foam
    - Rubber
    - Fiberglass
    - Compressors
    - Capacitors
g. How much do you see prices vary for…?
    - Ferrous metal
    - Copper
    - Aluminum
    - Glass
    - Plastic
    - Foam
    - Rubber
    - Fiberglass
    - Compressors
    - Capacitors
    - Refrigerant
    - Oil
    - Mercury
h. Which materials have direct retail (non-wholesale) value…?
    - Glass
    - Plastic
    - Foam
    - Rubber
    - Fiberglass
    - Compressors
    - Capacitors
    - Refrigerant
    - Oil
    - Mercury

For CalRecycle: Does CalRecycle partner with other agencies, companies, or organizations to reduce emissions of ozone-depleting substances (ODS) and greenhouse gases (GHGs) by recovering foam and refrigerant from appliances?

Valuation of Non-Energy Benefits

4. One of the topics we are researching in our evaluation is the monetary value of non-energy benefits associated with appliance recycling. These benefits can include things like reduced emissions of carbon-containing compounds, job creation, and avoided landfilling. Does CalRecycle quantify and monetize any of these benefits?
    a. If so, how do you determine monetary values for these benefits *(If necessary specify: for example, how do you determine carbon prices?)*
        - Are there any benefits associated with the avoidance of primary material extraction? Can these benefits be quantified?
        - What is the cost associated with filling up a landfill? How does the cost vary by region? Who absorbs these costs?
        - What happens to carbon credits obtained by removing GHG emissions through appliance recycling?
    b. If not, why not? Is there any movement toward recording the benefits of responsible appliance disposal?
    c. ***For CalRecycle:*** If utilities cannot claim avoided GHG emissions from ARP programs, do the ARP programs have a relationship with ARB and the California carbon market?

Utility ARPs

5. Are you familiar with any utility-sponsored appliance recycling (including all appliances) programs?
    a. *[If yes continue, otherwise skip to Q8]* Which programs are you aware of?
    b. Do you partner with any of these programs?
    c. What is your opinion of utility-sponsored recycling programs? (If needed prompt: are they changing the market in any way, are they helping the environment, are they effective?)
    d. Do you have different opinions about different programs?

6. Do you have any recommendations for utilities that are designing and implementing these programs? *(If necessary offer example: for example, do you recommend particular methods of appliance disposal, or do you have ideas about new program opportunities for utilities?)*

7. What do you think would happen to the used appliance market if the current utility-sponsored appliance recycling programs no longer existed?
    a. What effect do you think the termination of the programs would have on the environment?
    b. Do you have any information about how California's used appliance market differs from markets in other parts of the US?

Other Appliances

8. Currently, most utility-sponsored appliance recycling programs focus on the removal of refrigerators and freezers from the appliance market. Do you think there is potential for including other appliances in these types of program offerings (e.g., clothes washers, room ACs)?

9. What challenges do you foresee from a utility adding other appliances to its recycling program? [Read list if respondent requests challenge examples or needs to be prompted]
    a. Estimating/verifying energy savings
    b. Implementation cost
    c. Logistical challenges (e.g., scheduling, verifying equipment eligibility)
    d. Technological barriers

10. ***For CalRecycle:*** What is CalRecycle's role in the *current* recycling of these other appliances throughout the state with regard to:

    a. Policies
    b. Requirements
    c. Volumes
    d. Materials covered

SCE/PG&E Process Evaluation Interview Guide: Appliance Recycling Program

SCE/PG&E Market Actors: EPA RAD Personnel

Name of Interviewee: **Interview Date:**

Name of Organization: EPA RAD

Thank you for taking the time to talk with us today about the program. I represent The Cadmus Group, Inc., the firm performing the process evaluation for Southern California Edison and Pacific Gas and Electric's Appliance Recycling Program. Because of your role in the disposal industry, your perspective is very important to us, and we appreciate your taking the time to share it with us. We expect this interview to take about a half hour.

Key Researchable Aspects of Interview

- Collect data on the life of nonparticipating appliances, including appliances collected by retailers and disposers through the EPA's RAD program, including which components of these products do and do not get recycled, and interviewees' definitions of "recycling"
- Identify characteristics of the used appliances market and ARP's role within this market
- Inform development of program theory for alternative sub-program design by reviewing program opportunities and options

About the Interviewee

1. Please describe your role at your company.
    - How long have you held this role?

Life of Nonparticipating Appliances

2. What is your definition of recycling?
    - Why is recycling important?
    - What are the benefits of this process?

3. What products are eligible for removal and recycling through the RAD Program?

4. What happens with the appliances disposed of through the program?
    - What components of the products do and do not get recycled?

5. Are all appliances recycled or are some transferred to the used appliance market?
    - What do you believe is your organization's role in creating the used appliance market?

6. What is your opinion of utility-sponsored recycling programs? (i.e., are they changing the market in any way, are they helping the environment, are they effective, etc.)
    - Do utility-sponsored recycling programs impact your program in any way? Is it a positive or negative impact?

Characteristics of the Used Appliances Market

4. In recent years (since 2010) have you noticed a change in the used appliance market?
    - *[If yes ask bulleted questions, otherwise skip to Q7]* Is demand for these products growing or shrinking?
    - In your opinion, what is causing this change?

5. What are the benefits and disadvantages of encouraging customers to recycle their old appliances versus selling or giving them away?

Alternative Sub-Program Design

1. Currently, most utility-sponsored appliance recycling programs focus on the removal of refrigerators and freezers from the appliance market. Do you think there is potential for adding other appliances to these types of program offerings? (e.g., clothes washers, room ACs)
    - What issues could arise with adding other appliances?
        - Estimating/verifying energy savings
        - Implementation cost
        - Logistical challenges (e.g., scheduling, verifying equipment eligibility)
        - Technological barriers

6. Has your organization ever considered allowing additional appliances to be removed and recycled through your program?
    - Why have you decided for or against including these additional measures?